September 2003

Movin' Juice: Making Electricity Transmission More Competitive

By Lynne Kiesling and Adrian T. Moore

Reason Public Policy Institute

A division of the Los Angeles-based Reason Foundation, Reason Public Policy Institute is a nonpartisan public policy think tank promoting choice, competition, and a dynamic market economy as the foundation for human dignity and progress. Reason produces rigorous, peer-reviewed research and directly engages the policy process, seeking strategies that emphasize cooperation, flexibility, local knowledge, and results. Through practical and innovative approaches to complex problems, Reason seeks to change the way people think about issues, and promote policies that allow and encourage individuals and voluntary institutions to flourish.

Reason Foundation

Reason Foundation advances a free society by developing, applying, and promoting the libertarian ideas of individual liberty, free markets, and the rule of law. Reason Foundation uses journalism and public policy to influence the frameworks and actions of journalists, policymakers, and opinion leaders.

Reason Foundation is a tax-exempt research and education organization as defined under IRS code 501(c)(3). Reason Foundation is supported by voluntary contributions from individuals, foundations, and corporations. The views are those of the author, not necessarily those of Reason Foundation or its trustees.

Policy Study No. 314

MOVIN' JUICE: MAKING ELECTRICITY TRANSMISSION MORE COMPETITIVE

BY LYNNE KIESLING AND ADRIAN T. MOORE

Executive Summary

The dramatic blackouts in the Midwest and Northeast in August of 2003 have focused our attention on electricity policy once again. This time the issue is the grid—the transmission network that transports electricity across regions. Our policies governing electricity transmission—regulating it and moving slowly toward changes to support competitive wholesale electricity markets—are getting a sharp look from more people than ever.

Existing long-distance transmission infrastructure is insufficient to support the changes that have come about in the industry since the deregulation of the early 1990s that led to the dramatic increase in the trade of generated electricity.

Ways to remedy this situation fall into three categories: build and upgrade transmission, build generation closer to population centers, or reduce the demand for transmission services. This study provides an analysis of the institutional changes being proposed and debated, particularly FERC's RTO policy. By establishing RTO rules, FERC can move the industry toward building and managing a national grid network. But at the same time, FERC risks creating an ordered competition— competition engineered based on an assumption about how competition ought to be— rather than a competitive order, which arises spontaneously from human action and economic evolution based on choices and change over time. While ordered competition through the RTO structure could simply be a step to move the industry toward an institutional structure in which a competitive order can emerge, it is at best only part of the legislative and regulatory changes that would produce competition in the industry. To do that, legislative and regulatory changes will have to focus on removing barriers to entry and to technological change in the industry.

Our recommendations encourage the use of distributed generation technology, innovative forms of contracting, and other institutional and technological changes that would increase the contestability of the transmission segment of the electricity value chain, and could do so in a flexible, open-ended way.

Table of Contents

Part 1

Introduction

The dramatic blackouts in the Midwest and Northeast in August of 2003 have focused our attention on electricity policy once again. This time the issue is the grid— the transmission network that transports electricity across regions. Our policies governing electricity transmission—regulating it and moving slowly towards changes to support competitive wholesale electricity markets—are getting a sharp look from more people than ever.

Each crisis in electricity policy—the California electricity meltdown, the Enron bankruptcy, and now this blackout—throws up roadblocks to change. People's natural reaction to crisis is to seize upon the false security of the past. But competition and the use of markets have continued to increase in the electricity industry.

This has created some difficult structural issues, particularly involving electricity transmission. The existing long-distance transmission infrastructure is insufficient to support the changes that have come about in the industry since the deregulation of the early 1990s that led to the dramatic increase in the trade of generated electricity. Historically, utilities have owned their own generation, transmission, and distribution assets, making them "vertically integrated." Policymakers are now focusing on the deficiencies of a transmission grid built for the contiguous, local, vertically integrated monopolies of yesteryear, not for the dynamic markets across time and place of today.

Ways to remedy this situation fall into three categories: build and upgrade transmission, build generation closer to population centers, or reduce the demand for transmission services. Both the Federal Energy Regulatory Commission (FERC) and Congress are in the process of implementing changes that may lead to both the construction of new transmission and the reduced need for additional transmission. FERC is promoting institutional change by ordering the formation of regional transmission organizations (RTOs), through which transmission owners will build and manage the grid over larger areas than before. FERC is also working with industry participants to standardize the technical requirements for interconnecting distributed generation (DG) facilities to the grid, which will lead to more consumers generating their power locally and will help reduce the demand for transmission services and therefore reduce the amount of additional necessary grid construction. Congress continues to consider legislation to remove some long-standing legislative barriers to investment in transmission infrastructure, including repealing the Public Utility Holding Company Act of 1935 (PUHCA) and its barriers to competition as well as providing supporting legislation to complement FERC's activities in standardizing technical DG interconnection requirements.

This study provides an analysis of the institutional changes being proposed and debated, particularly FERC's RTO policy. By establishing RTO rules, FERC can move the industry toward building and managing a national grid network. But at the same time—FERC risks creating an ordered competition, competition engineered based on an assumption about how competition ought to be—rather than a competitive order, which arises spontaneously from human action and economic evolution based on choices and change over time.[1] While ordered competition through the RTO structure could simply be a step to move the industry toward an institutional structure in which a competitive order can emerge, it is at best only part of the legislative and regulatory changes that would produce competition in the industry. To do that, legislative and regulatory changes will have to focus on removing barriers to entry and to technological change in the industry.

The FERC RTO policy recognizes that improved transmission coordination and investment can make generation markets more competitive, but it does not recognize that the reverse is also true. Changes in generation regulation and technology can make transmission more or less competitive, and therefore indicate that transmission is no longer a natural monopoly. The key to this process is regulatory change that reduces the barriers to entry that keep transmission from being contestable.[2]

Regulation of the electricity industry is evolving away from its traditional "command and control" treatment toward more use of choice and markets. It does, though, retain the government-granted monopoly franchise in the transmission and distribution portions of the value chain. In so doing it overlooks the potential contestability of those segments of the industry, and stifles potential beneficial technical and institutional change and innovation. Transmission policy decisions at the federal level continue to be influenced by this natural monopoly theory of transmission, and this study analyzes those decisions and their likely implications for the adoption of technological and contractual innovations that would take advantage of transmission's contestability.

FERC is trying to shape institutional change to reduce transaction costs and bring about the benefits of competition in a structured, ordered way, but must be conscious of the possible costs of its decisions and its failure to capture the potential benefits of contestability. FERC's effort at institutional and regulatory change to promote competitive electricity markets is a welcome departure from the historical "command-and-control" forms of utility regulation that are changing at both the federal and state levels. However, retaining the premise that natural monopoly conditions characterize transmission, and that such conditions imply the need for ongoing economic regulation, means that this institutional change is only an incremental step, and may have some unintended costs as a result of institutional path dependence. Mandating a particular institutional structure, especially one based on natural monopoly theory, will forestall the discovery of possibly superior alternatives that exploit decentralized knowledge. Many mechanisms exist by which a regulatory system (even one undergoing mild liberalizing) based on such a strong assumption about industry and market characteristics can raise substantial barriers to the emergence of superior alternatives. One is that it locks in the transaction costs of a regulated monopoly transmission grid with no mechanism to encourage the lowering of transaction costs. By mandating the way electricity is transmitted, it also precludes local entities from using local knowledge to discover new arrangements tailored to their specific needs, such as new ways to contract for wholesale wheeling of electricity or new distributed generation interconnection agreements. The combined federal and state regulation of the industry complicates the entry barrier story even further.

Over the past decade the electricity industry has seen deregulation and privatization in various nations, and with various degrees of success. No country or state has moved to complete deregulation; all have retained some vestiges of control over pricing, service, or entry decisions for some or all parts of the electricity supply chain. These moves have created an ordered competition, not a competitive order.[3] These vestiges of control and desire to manage competition undermine precisely the highest value benefits associated with deregulation, and incorporating the potential for transmission's contestability into federal electricity policy will enable market participants to capture those benefits.

Part 2

The Issue: Transmission in a Restructuring Electricity Industry

In restructuring the industry, what kind of institutional change in transmission would enable freely competitive generation markets and allow further evolution of competition in the industry? We cannot ask this question in a vacuum, but must look at the historical and institutional context in which current policies operate.

A. Overview of Regulatory Issues in Electricity

The electricity industry is historically characterized by high fixed costs and economies of scale, and has been regulated as a natural monopoly. Electricity is not storable, and it is difficult and costly to transport over long distances. As a result of these traits and its historical policy treatment, the electricity industry tends to be regional, and demand and supply change little with prices.

However, the California experience has taught us how false this view is. Demand turns out to be more responsive to prices than people thought, when the institutional environment is changing. When San Diego's electric rates more than doubled in the summer of 2000, demand fell by an average of 1.6 percent, and by 6 percent during peak periods.[4] People would have cut electricity use even more if they had not anticipated that rate controls would be reinstated. Under monopoly regulation, where prices change only very slowly, usually in small bits, and only after public and political debate, demand and supply of electricity don't change much even when prices do change. California's restructuring also showed that the supply of electricity can change when regulatory constraints are loosened. California has seen an explosion in the number of generation plant projects since restructuring and throughout the recent crisis, notwithstanding the existence of substantial regulatory uncertainty.

The most important defining characteristic of electricity in the United States is known as Kirchoff's Law, which states that in an alternating current network, electrons follow the path of least resistance. Because the physical flow of electrons almost never corresponds to the financial contracts for its sale and transmission, a seller cannot "label" or specify which electrons he is sending to which buyer. This technical reality has created the need for sophisticated system balancing in the network to maintain reliable delivery of electricity to customers, and has frequently contributed to the rationale for continuing regulation of the industry.

State-level regulation of electric utilities is based on the grant of an exclusive local monopoly franchise. Historically, utilities have owned their own generation, transmission and distribution assets, and were responsible for providing reliable bundled service to their "native load," or service territory as defined in their franchise agreement with their state public utilities commission or regulatory agency. Thus, utilities have become isolated "kingdoms unto themselves," fragmenting transmission ownership in the electricity industry.

In addition to historical and technical limitations on the openness of electricity markets, the recent fiasco in California has prompted many observers to claim that electricity markets "can't be trusted." But the aberration of California in the larger picture of electricity deregulation has more to do with poor policy choices than with market failure.[5] The net benefits of electricity deregulation still seem substantial. But the continuing regulation of transmission investment undercuts even larger potential benefits that would come from a more market-based approach to the grid itself and to empowering substitutes and alternatives to grid construction.

The local, vertically integrated and monopolistic form of utilities has historically generated some concerns that utilities could abuse their power. These concerns led states to introduce rate and service area regulation under public utilities commissions, thus regulating, but also isolating, the electricity industry from any market competition that would keep quality high and rates low. Smith persuasively presents the rent-seeking theory, arguing that state utility regulation arose out of the interests of incumbents in protecting their industry from competition, not from a public or consumer concern about monopoly power and possible price increases.[6] He cites evidence that between 1900 and 1920, the states that initially adopted utility regulation actually had lower prices and profits, not monopoly prices, which would be consistent with a rent-seeking theory of regulation.[7]

Monopoly franchises are also justified as a way to avoid duplication of facilities, with such duplication deemed wasteful by neoclassical theory of industries with economies of scale. Yet a study of cities with two or more electric utilities competing head-to-head for customers over parallel systems found that competing utilities do not underutilize capacity or have higher rates, as natural monopoly theory (and regulators) would have it.[8] Even in cases where the neoclassical story regarding economies of scale holds, it is not clear that regulated monopoly franchises offer any solution. In fact the capital-intensiveness of the electricity industry increased promptly after monopoly regulation was imposed early in the 20th century.[9] By the 1990s, regulatory regimes that tied utility profits to capital investment had created considerable wasteful capital investment.[10]

This excess capacity and over-investment led to higher electricity prices, and in the last decade several states have moved to introduce competition in the industry to some degree. One important component of this move is usually the unbundling of the electricity value chain into its generation, transmission, and distribution components. The Federal Energy Regulatory Commission (FERC) has facilitated this move through several orders, particularly Order 888 (1987) encouraging open access to transmission and Order 2000 (1999) mandating the formation of regional transmission organizations (RTOs).[11] These policy decisions are based on the belief that transmission remains a natural monopoly as such transmission must remain regulated. One consequence of the RTO implementation will probably be the construction of many miles of high-voltage transmission as a corresponding evolution to the changes in the generation portion of the industry; and, as stated in the President's energy policy proposal in May 2001, RTOs are likely to be able to use eminent domain to acquire land and rights-of-way for this expansion.

B. Industry Background and Regulatory History

The supply of electricity has three components: generation of electricity from a fuel source, transmission of electricity to its local market, and distribution in the local market to consumers. Each of these parts of the supply process requires substantial capital investment, and the industry exhibits network characteristics because of binding physical constraints. Alternating current electricity cannot be stored, nor can it be "labeled" and delivered from seller to buyer. Thus electricity networks must operate within small tolerances to maintain reliability, and defining property rights over electricity on the grid is technically impossible at this time.

At the beginning of the 20th century, many private companies provided electric service under nonexclusive franchises. These franchises meant that companies could compete, provide different services, or install systems using different frequencies or voltages over areas as small as a block or as large as an entire city. Many customers also generated their own power. This fragmentation, in conjunction with the competing standards of direct current (Edison) and alternating current (Westinghouse), created messy and chaotic operating environments for electric companies. [12] The chaos gave entrepreneurs opportunities to consolidate multiple small companies into one holding company, as did the fact that alternating current enables transmission of electricity beyond two miles (the then-binding constraint for direct current) at higher voltage.

Samuel Insull was one such entrepreneur, who recognized the importance of load factor and using peak-load pricing to manage load, used new technology creatively, and helped create an industry with large economies of scale in generation.[13] By 1907 he had consolidated 20 companies in Chicago into Commonwealth Edison, and became a role model for others in the industry. In that same year the states of Wisconsin and New York extended their railroad regulation to electric utilities, in an effort to counteract possible monopoly power on one hand and ineffectual or corrupt municipal officials on the other. By 1914, 45 states had enacted state public utility regulation. Insull had also noted that regulation codified and justified the monopoly status of utility companies and allowed the utilities to sell equity more easily and borrow money at lower interest rates.[14]

Part of this regulation of electric utilities was the granting of exclusive monopoly franchises for specific service territories to the utilities. [15] Although the details vary by state, the franchise also carries with it an obligation to serve all present and future customers in the service territory at a reasonable cost.[16] This obligation to serve all customers in a territory persists to this day as a fundamental characteristic of the monopoly franchise and has served to eliminate possible competition that could face utilities, including competition from new technologies for distributed generation.

Thus for the past 90 years the electricity industry in the United States has been subject to regulation of its prices and operating decisions, and has been characterized by vertically integrated local utilities operating as government-granted and government-regulated monopolies. Regulation primarily has taken place at the state level, although the Federal Power Act of 1935 reinforced the ability of states to regulate prices and operations. It has taken the form of rate-of-return regulation, where the state-level public utilities commission or some other rate-making authority takes input cost and capital cost data from the utilities and determines the rate that they would be

allowed to charge to different classes of consumer (residential, commercial, industrial). This rate includes a rate-of-return markup so that the utility earns a return on its capital investment.

Even regulators have long acknowledged that this is a mediocre arrangement at best; this system is far from capturing the rich and complex web of information that would lead to "efficient" pricing and supply of electricity. One of the most pernicious and counter-productive incentives inherent in rate-of-return regulation is the Averch-Johnson effect, where the utility has an incentive to invest in excess capacity because that investment would increase its rate base and thus increase its effective return—the "logic" is "if you invest more, you get to charge more."[17] Note that this correspondence differs dramatically from how we usually think of the effects of investment in a dynamic economy, where an impetus for capital investment comes from lowering your costs to create more room for profit margin or for lowering prices.[18]

Over decades, the cumulative effects of these investment decisions have been more and larger central power plants and more expensive electricity than we might have seen otherwise. In California, on the eve of its restructuring legislation in 1996, the three electric utilities had approximately 25 percent excess capacity and there was capacity to import power equivalent to a further 20 percent of demand. Electric system engineers recommend 7.5 percent to 15 percent excess capacity to ensure reliability of service, and some foresight is required when building large plants in the expectation of demand growth, but customers in California and elsewhere began thinking that paying higher rates for such excess capacity was unnecessary.

Technological change has also helped bring about the deregulation and restructuring efforts that we have seen thus far. Electricity generation has become more efficient and cost-effective at smaller scales, undercutting the historical tendency of large central generating plants to exploit economies of scale. As the technology of generation has changed, the economics of generation has also changed, and large power plants are no longer the only way to lower the long-run average cost of producing electricity. Technological change has made distributed generation possible and more cost effective over time. It has also improved transmission's ability to carry electricity over longer distances with less line loss.

At the same time, deregulation of the wholesale electricity market under FERC Order 888 gave rise to increasing capacity for trading electricity across broader geographic regions. It also led to more mature real-time and futures markets and contract mechanisms for trading electricity, and to improved information technology and software to manage complex trading regimes. A power trader in California's restructured and constrained electricity market had to "make over 500 bidding decisions and over 100 decisions on capacity allocation in the course of 24 hours."[19]

Other legislative changes shaped the evolution of this industry. In 1978 Congress passed the Public Utility Regulatory Policy Act (PURPA). PURPA unleashed further change by allowing independent power generators in the industry for the first time, instead of having power generated either by the utility or by a federal generation facility.

> *The primary motivation for PURPA was to encourage improvements in energy efficiency through expanded use of cogeneration technology and to create a market for electricity produced from renewable fuels and fuel wastes. It was not motivated by a desire to fundamentally restructure the electricity sector and to create an independent competitive generation sector. However, it turned out to have effects significantly different from what was intended when it was passed. PURPA was largely responsible for creating an*

> *independent generation sector and the supporting market and regulatory institutions to create a competitive market for new generating resources.*[20]

Thus the combination of evolving technological change and the regulatory change that PURPA engendered enabled a dramatic upheaval in the generation portion of the industry, with entrepreneurs seizing opportunities to provide goods and services in ways that had not been seen before, or even conceived of before, in the industry.[21] As a result, generation has become more efficient, and entrepreneurs have developed sophisticated risk management strategies and tools to hedge the risks (such as the prices of fuels used) of generation. In this way, and in others, electricity is becoming more like a commodity as market forces change the industry.

C. Transmission Policy

The regulatory changes in PURPA (1978) and the Energy Policy Act (1992) unleashed many unintended changes in electricity generation, leading to the appearance of competition in wholesale markets in many states.[22] These wholesale market changes and the opening up of some retail competition have put pressure on the transmission network to evolve into an infrastructure for transporting an energy commodity. In cases where transmission is scarce and there are bottlenecks, regional electricity price variations persist and can become more volatile. Transmission bottlenecks and insufficient network infrastructure provided one of the many causes of the price volatility seen in California in 2000 and 2001, and FERC has been working diligently over the past five years to solve these problems by updating transmission regulation and policy.

Transmission policy, though, is still based on the premise that transmission is a natural monopoly, and therefore should continue to be regulated. While somewhat outdated by now, this statement captures the fundamental idea underlying the ongoing regulatory treatment of transmission:

> *And even though economies of scale have disappeared in the generation segment of the industry and competition is considered workable there, there are still tremendous economies of scale in transmission that make competition in this segment of the industry unworkable. Consequently, transmission providers will likely continue providing services as franchised monopolies subject to cost-of-service regulation at the local, state, and/or federal level*[23]

This statement is outdated because subsequent FERC proposals in Order 2000 would implement performance-based ratemaking instead of cost-of-service or rate-of-return regulation. However, the monopoly franchise persists, as does the belief that transmission should continue to be regulated as a natural monopoly and law should block redundant entry.

The idea that having more transmission capacity than the minimum necessary to carry typical electricity flows would be unnecessarily costly continues to permeate public policy regarding transmission, including FERC's recent decisions. This perspective does not incorporate due consideration of other alternatives to the existing transmission grid, such as distributed generation, nor does it acknowledge the security benefits of redundant systems, such as a buffer to help prevent blackouts like that in the Northeast and Midwest in August 2003.

In the 1990s FERC began considering policy changes that would enable transmission to evolve to keep up with the changes in the generation sector. FERC was concerned that a lack of transmission

infrastructure investment would stifle generation markets. To that end FERC passed Orders 888, 889 and 2000.

Order 888 of 1995 requires transmission owners to provide open access to their grid at cost-based rates to non-owners, and that they participate in an information-sharing system to communicate their transmission capacity, the terms on which it is offered, and how it will be allocated in the case of excess demand.

> *While Order 888 is very long, the basic principles it embodies are simple: transmission owners must provide access to third parties to use their transmission networks at cost-based maximum prices and non-discriminatory terms and conditions, make their best efforts to increase transmission capacity in response to requests by third parties willing to pay for the associated costs, and shall behave effectively as if they are not vertically integrated when they use their transmission systems to support wholesale market power transactions.*[24]

Order 889 bolsters 888 by implementing OASIS, or Open Access Same-Time Information Systems, to operationalize the information sharing. All transmission owners in the United States have filed open access tariffs with FERC and complied with 888 and 889.

On March 4, 2002, the U.S. Supreme Court upheld the Federal Energy Regulatory Commission's right to ensure mandatory open access to transmission for wholesale and interstate retail electricity transactions through Order 888.[25] This decision affirms FERC's jurisdiction over the transmission of interstate power sales, an authority it has had since the Federal Power Act of 1935 (FPA) and reinforced most recently by the Energy Policy Act of 1992. Subsequent regulatory changes have moved pricing toward performance-based rates, but the rates paid for transmission remain regulated. In ruling for FERC and writing for the majority, Justice Stevens states that "... the landscape of the electric industry has changed since the enactment of the FPA, when the electricity universe was 'neatly divided into spheres of retail versus wholesale sales.'"[26] ... There is no language in the statute limiting FERC's *transmission* jurisdiction to the wholesale market, although the statute does limit FERC's *sale* jurisdiction to that at wholesale."[27]

Order 2000 is a companion policy to Order 888 in many ways. FERC Order 2000 is an effort to organize the many transmission owners in the United States into regional transmission organizations (RTOs). In the interest of encouraging efficient transmission investment and competitive wholesale markets, Order 2000 requires the formation of regional organizations that encompass all of the transmission owners in an area. Order 2000 did not dictate the size of the area, the number of participants or miles of transmission in the RTOs, but has instead left the determination of the membership and boundaries up to the transmission owners, saying that they have better information on the optimal configuration than does FERC. Order 2000 lays out the four minimum characteristics and eight functions that an RTO should possess (as shown in Table 1 below), but leaves the details up to the industry. FERC must approve RTOs (and has been requesting revisions to some proposals, and rejecting some), and the industry faces firm deadlines for establishing these organizations.

Table 1: FERC Order 2000 Regional Transmission Organization Guidelines	
Minimum RTO Characteristics	Independence from market participants
	Appropriate scope and regional configuration
	Possession of operational authority for all transmission facilities under the RTO's control
	Exclusive authority to maintain short-term reliability
Minimum RTO Functions	Administer its own tariff and employ a transmission pricing system that will promote efficient use and expansion of transmission and generation facilities
	Create market mechanisms to manage transmission congestion
	Develop and implement procedures to address parallel path flow issues
	Serve as a supplier of last resort for all ancillary services required in Order No. 888 and subsequent orders
	Operate a single OASIS site for all transmission facilities under its control with responsibility for independently calculating TTC and ATC
	Monitor markets to identify design flaws and market power
	Plan and coordinate necessary transmission additions and upgrades
	Provide interregional coordination

Source: FERC Order 2000, Docket Number RM99-2-000, pp. 152, 323-324

> *These guidelines were intended to be sufficiently flexible that the RTO is not a "one size fits all" policy prescription, which Order 2000 stated would be costly and ineffective at promoting competitive electricity markets. FERC has even avoided stipulating an ownership structure, saying that public or private, for-profit or non-profit, organizational structure decisions should be up to the regional transmission owners.*[28] *In the Final Rule, we noted that different organizational forms, such as ISOs, transcos, combinations of the two, could satisfy the characteristics and functions or even new organizational forms not yet discussed in the industry or proposed to the Commission. Likewise, the Commission did not propose a "cookie cutter" organizational format for regional transmission institutions or the establishment of fixed or specific regional boundaries under section 202(a) of the Federal Power Act (FPA)*[29].

Under Order 2000 the utilities that own existing transmission assets would retain ownership if they participate in an RTO. The RTO thus becomes a consortium group of owners that manage access to and reliability of their grid network.[30]

Orders 888 and 2000 combined to encourage unbundling, yet as written allow for industry flexibility in the voluntary determination of the terms and length of contract. This combination recognizes that as organizational forms, vertical integration and long-term contracting are to a great extent substitutes.[31] These changes would contribute to decreasing transaction costs in transmission, thereby increasing efficiency in the electricity industry.

D. Examples of Early RTO Submissions

Over the year and a half leading up to the FERC Standard Market Design proposal in November, 2002, groups submitted RTO proposals to FERC for approval.33 FERC is still evaluating proposals

carefully and working through an iterative process to make changes based on comments it has received.

For example, on October 16, 2000, GridFlorida sent FERC a filing to be an RTO serving peninsular Florida as a for-profit transmission company. The GridFlorida members are Florida Power & Light, Florida Power Corporation, and Tampa Electric Company. On March 28, 2001, FERC issued provisional approval of GridFlorida as an RTO. On May 29, GridFlorida submitted a compliance filing, with more revisions and stakeholder comments into the summer.

At the same time, three utilities in the Carolinas (Carolina Power & Light, Duke Energy, and South Carolina Electric & Gas Company) proposed GridSouth as an RTO for the Carolinas, submitting their filing on October 16, 2000. They proposed to operate as a for-profit transmission company. After comments and responses, FERC issued provisional approval on March 14, 2001. After a supplementary filing on May 14, 2001, FERC Commissioners then decided in July to order a single larger RTO for the Southeast region, using mediation processes with a neutral administrative judge.

> *In each, the Commission concludes that, while the scope and configuration of the proposals either are provisionally consistent with Order No. 2000 or do not meet Order No. 2000's scope characteristic, in order to successfully encompass the natural market for bulk power in the Southeast, it is necessary that the Southeastern transmission owners combine to form a single RTO.*[32]

A similar process took place in the Northeast, where three RTO proposals had been submitted: New England Independent System Operator (ISO), New York ISO, and the Pennsylvania-Jersey-Maryland Interconnect (PJM). FERC ordered mediation among the three to agree to a single RTO between July 24 and September 7, 2001, to create "fully integrated Northeastern markets, and a single Northeastern RTO to administer those markets and promote the development of new infrastructure."[33] They will have a single RTO and single market, integrating the separate ISOs into one RTO tariff for the region, based on locational marginal pricing (LMP) as used in the PJM, the software used in PJM, and one interconnection process for the entire region. The Northeast RTO will have sole operational responsibility for the entire grid in the region. It will use the PJM model as its platform and integrate best practices from the other two ISOs into the RTO implementation.[34] The other two regional RTOs, Midwest and West, are expected to evolve similarly in many respects.[35]

Attitude changes since July 2001 have shifted the interpretation of Order 2000 and the actual implementation of RTOs in the direction of "one-size-fits-all" solutions more than was articulated in the actual Order. This shift detracts markedly from the flexibility contained in Order 2000 and its promise to use local knowledge to shape institutional change. FERC has articulated its process as one of institutional experimentation, with the states as laboratories; in fact Pat Wood, FERC's chairman, was Chairman of the Texas PUC when it crafted its well-regarded deregulation legislation. However, the decision to have four RTOs (plus ERCOT), one per region, and that they should use some pricing method strongly based on PJM seems to indicate that the experiment has been concluded, and that FERC has determined the optimal institutional structure for transmission in the industry.

FERC is committing itself to competition by threat, rather than real contention against rivals to please customers, and so will not allow for the changes in consumer and supplier behavior and the

evolution of supply and demand that drive dynamic efficiency in true markets. FERC is committing to an ordered competition, attempting to engineer a market from the top down. In contrast, a competitive order would arise spontaneously, and not from the result of government or regulatory intervention. "The purpose of a competitive order is to make competition work; that of so-called 'ordered competition,' almost always to restrict the effectiveness of competition."[36]

Part 3

A Dynamic Competitive Order and Transmission Policy Alternatives

Industry participants have already created and implemented many sophisticated approaches to competition and innovative contracting, and FERC incorporated recognition of these benefits into Order 2000 and the resulting RTO structures. Although FERC's recent Standard Market Design proposals have moved away from large, uniform RTOs, its interpretation of its interpretation of Order 2000 and implementation of single RTOs by region, though, is an attempt to created ordered competition in the electricity industry. Furthermore, it ignores the possibility of experiencing the benefits of contestability in transmission, benefits that do not exist without the possibility for transmission substitutes to enter the market.

The most important argument for the benefits of electricity deregulation arises from dynamism and the discovery process. Institutional change that would unleash that dynamism in electricity would focus on ways to decrease monopoly rents, giving possible rent-seeking transmission owners less incentive to do so. Three mechanisms for achieving that goal exist, two of which are important institutional changes—use of contracting, technological change, and removing the monopoly franchises of utilities.

Efficiency over time depends on institutions that are economically and politically flexible enough to adapt to opportunities and encourage innovation and risk taking.[37] Institutions that do not adapt to discovery will wind up increasing transaction costs as the wedge grows between efficient practices and behavior accommodated by the static institutions. Increasing transaction costs in turn obscure or even eliminate opportunities for beneficial discovery and for direct market evolution. Contestability, for example, can be stifled by high transaction costs caused by static regulatory schemes that limit contract flexibility.

A. Contestability in Electricity Transmission Does Not Imply Parallel Wires

Technological change and contestability hold the keys to a dynamic electricity industry. Contestability—the possibility for competition—is an important feature of competitive markets because it promotes dynamic efficiency. Often the threat of potential competition can deter a company from raising its prices, because it knows that by doing so it may attract competitors. Electricity transmission faces some possible competition from entrepreneurs who may be willing to lay parallel lines. As with natural gas and telecommunications, redundant systems could be

profitable and cost-effective, but the more pressing competition could come from transmission of fuel to distributed generation sites instead of transmission of electricity.[38]

Technological change holds a lot of promise, as it has throughout history, for promoting contestability in transmission. Distributed generation and fuel shipment could serve as a competitive alternative to transmission; superconductors and other technological changes could change the relative costs of laying redundant transmission lines. Obstacles to technological change include the ongoing monopoly franchise and the ensuing rent seeking.

Distributed generation (DG) technology could provide substantial contestability for electricity transmission. Distributed generation uses small-scale power generation that is situated close to the load being served. Technological change has made DG sources such as gas turbines, microturbines, and other small-scale generation systems more economically viable. Capacity constraints and institutional volatility, as seen in the recent California crisis, have also contributed to the growth of DG alternatives. Distributed generation equipment manufacturers also tout redundancy as a security benefit that customers would enjoy from implementing DG systems.

DG creates contestability in transmission by enabling customers to substitute DG for electricity transmitted across the grid. This alternative could be particularly attractive to large industrial customers, who could build in as much reliability and redundancy as they believe they need for their operations without the need to construct elaborate, expensive grid capital. Some institutional and regulatory characteristics of the industry do hinder the adoption of DG, though. The public utility's obligation to serve customers, and the customer's commensurate obligation to be served by the public utility, is changing very slowly in the face of such technological change.[39]

Critics of the relevance of contestability in electricity transmission point out that to achieve the efficient outcome seen in perfectly competitive markets, the industry must have zero sunk costs. In an industry with sunk costs, the contestability model predicts that the actual outcome will not be the efficient outcome. [40] Sunk costs are a substantial factor in electricity transmission. That fact does not imply, that contestability is irrelevant in electricity transmission; rather, contestability in reality will occur to varying degrees in different industries and under different conditions, depending on the institutional environment, the regulatory environment, the demand characteristics in the industry, and technological change. For example, even in the presence of sunk costs, however, the natural monopolist may have difficulties in sustaining its position if technology is advancing quickly, or if firms in other industries are making similar advances."[41] Critics who dismiss the potential for contestability to deliver real benefits to consumers and innovative producers mistakenly compare a situation in reality to an idealized situation that is not likely to exist. Instead, policymakers should compare a regulatory environment that is sufficiently flexible to allow market participants to exploit what contestability there is to the real policy environment of the government-granted monopoly franchise. This real policy environment places a downward bias on incentives to discover and implement alternatives to electricity transmission, such as distributed generation.

B. Contracting Innovation Complements Transmission's Contestability

Contracting and technology matter a great deal in the electricity industry, and technological change is very likely to shape market structure. Because of the importance of technology and investment in the electricity industry, the dynamics of the industry have a strong impact on even the short-run decisions of industry participants. Regulators cannot command the information available to participants, nor can they anticipate technologies, transactions, and structures that have not yet been discovered. Market processes encourage dynamic efficiency better than any alternate institutional structure because markets create a context for comparing expectations over time, people's different preferences for risks, and the value of alternate uses of resources and talent. This industry will change in ways we cannot foresee, and the full potential of human creativity will only be brought to bear in the physical and financial aspects of this industry by the information and incentive aspects of the dynamic market process.

The contract path is an important point in the analysis. In most industries, the contract path is well defined, and property rights are clear as title transfers from seller to buyer. In electricity, though, the contract path is unclear because of the physical and technical aspects of alternating current power—again, Kirchoff's Law means that electrons follow the path of least resistance. Thus, although a seller in Nevada could agree to sell 50 MW of power to a buyer in California, that contract really only amounts to the seller's right to put 50 MW of power on the grid, and the buyer's right to take 50 MW of power from the grid (with some adjustments for line loss). For contrast, consider oil or natural gas transmission, where property rights are clearly defined and easy to enforce throughout the flow of product from seller to buyer.

The physical characteristics of alternating current electricity serve as a binding constraint on the extent to which property rights can be defined and enforced over electricity during its transmission. For this reason, transaction costs in transmitting electricity can be higher than in transmitting fuel and generating electricity more locally, through distributed generation. The relative costs and benefits of these choices are complex and depend on local and changing circumstances. At various times either distributed generation or contracts may provide a lower-transaction-cost means of getting exchange.

Thus the point of flexible transmission policy should be to allow institutional arrangements that lower transaction costs (along with regular costs) according to unique, local, and dynamic conditions. Even with institutional change to decrease transaction costs, such as FERC's attempts to create RTOs and implement open access to transmission, transaction costs in electricity transmission are bounded away from zero because of the physical constraints of Kirchoff's Law. But that does not mean existing costs are closer to zero than the competitive alternative. Transmission policy ought to be seeking institutions that will drive costs right up against the Kirchoff constraint. The relevant question is: can we better decrease transaction costs through dynamic competition or regulation? There is a long-standing argument that regulation does so, that the transactions are too complex and transaction costs too high in a competitive market. However, consider the California state regulators at the Department of Water Resources, whom Davis pulled into the electricity-buying business only to learn just how inept and inexperienced they are relative to private-sector traders. Professional energy traders had built up substantial transaction-cost-reducing human capital and developed contract paths that reduce transaction costs in ways that the regulators had never envisioned.

Instead of RTOs based on the premise that natural monopoly implies regulation, a more dynamic institutional change may be to acknowledge that property rights matter, and that the contract path and its certainty and stability matter. If FERC imposes institutional change in the form of RTOs, then path dependence may lead to more costly and inefficient electricity provision relative to the path of institutional change that could evolve out of the flexibility to opt out of RTOs and build distributed generation, develop new contract paths, or some other unknowable future change that RTO path dependence would forestall. That path dependence could also lead to the construction of more transmission grid assets than under a more flexible transmission policy.

Part 4

Conclusion and Recommendations

Regulation in the transmission segment of the electricity industry is evolving. FERC's prevailing interpretation of Order 2000, and its implementation of RTOs in the United States, uses transmission policy to foster institutional change in the electricity industry. While FERC intends for this institutional change to encourage competition and healthy markets in the industry, its approach creates ordered competition, not a competitive order that will enable industry participants and other entrepreneurs to benefit from as yet unknown, undiscovered innovations in technology, organization and institutions. In other words, FERC's transmission policy does not capture the benefits of contestability of transmission, particularly from technological change in other aspects of the industry. As such, FERC risks decreasing the possible benefits that could arise from true competitive order in electricity transmission, and risks locking the industry into a relatively static institutional structure that resembles the traditional industry more than it does a dynamic, flexible one.

A policy change that would foster such dynamism would be to move customers away from their obligation to be served by the local public utility more aggressively than is now being done. This move would encourage the use of distributed generation technology, innovative forms of contracting, and other institutional and technological changes that would increase the contestability of the transmission segment of the electricity value chain, and could do so in a flexible, open-ended way.

The change that would be most effective in increasing the dynamism of the transmission part of the value chain, and thus the overall industry, is elimination of the monopoly franchise for public utilities. What would be the effect of eliminating the monopoly franchise? Most utilities operate under state regulation, with franchises that amount to government-granted monopolies. These utilities also own the majority of transmission assets in the United States. While those regulations persist, electricity transmission is much less likely to be contestable, and the establishment of RTOs will not change that fact.[42] If the monopoly franchises granted to utilities were abolished, then contractual arrangements could result in the efficient amount of electricity grid being built, which may be much less than we would build under the RTO structure that FERC is encouraging. As John Burton points out,

> *Elimination of the monopoly franchise would also likely shift resources from rent-seeking and superfluous discovery to more productive uses. Businesses are, of course, not simply concerned in these settings of ordered competition merely to evaluate the behaviour of regulators but also, if possible, to influence the policies of the regulatory authority in order to gain an advantage over their competitors (or to dissuade the regulator from granting such*

> *favours to the latter). In consequence, a regime of ordered competition inevitably engenders a spurious growth of regulatory lobbying which would otherwise not exist (in the absence of the regulatory superstructure that pervades the industry).*
>
> *Both the necessity of predicting regulatory developments and the prospective gains from lobbying to influence them depend, centrally, upon the degree to which the regulator of an ordered competitive process has discretion in policy evolution, and chooses to exercise it. In the absence of such discretion and its utilization—in the extreme case, if regulatory rules were fixed for all time—the need for anticipating regulatory behaviour and the prospect of influencing it—would be much reduced (in the limit, to zero).*
>
> *It is, however, a prominent feature of the UK model of utility regulation as it has evolved in actual practice (as against the rule-like/withering away conception proposed in the original Littlechild doctrine) that regulators have considerable discretion, and have commonly not avoided the temptation to utilize it.*

Transmission ownership is fragmented, but the benefits of maintaining the monopoly franchise are concentrated in those owners, while the costs are relatively more diffuse among electricity consumers.[43] There are some possible changes to the franchise agreement, though, that would create contestability for transmission and reduce its monopoly characteristics (monopoly or otherwise). Introducing real-time balancing markets, as FERC has done, contributes some. A simple change could be to allow customers to opt out of the obligation to be served under the utility franchise, and instead to allow them to connect directly to the grid or to serve themselves. Another change would be dramatic cutback in the state regulatory agencies' powers to stop proposed transmission lines. Polices like these exist in other countries that have successfully implemented more true electricity deregulation, such as the United Kingdom and New Zealand.

Under such a system, customers could form consortia to, for example, construct a shared distributed generation facility, perhaps using a combined heat and power (CHP) technology that uses waste heat to heat homes and offices. This arrangement would exploit the benefits of contracting and technological change to reduce the monopoly rents available to transmission owners and provide contestability to electricity transmission.

Technological changes have made transmission contestable; distributed generation (DG), in particular, has made potential competition more feasible and profitable, and has lowered entry barriers into the industry. As an example, increased DG implementation could obviate the need for regulated transmission, because any excessive price increase could drive customers off the grid. Over time, other technologies will develop that could provide further contestability for transmission.

Transmission's degree of contestability depends heavily on barriers to entry into ventures that could compete with transmission. The higher the entry barriers, the lower the contestability and the more able a firm is to exercise market power and raise prices. FERC's effort to coordinate DG interconnection standards across states will reduce technical entry barriers, in keeping with the technological change that has made DG scale small enough to provide a real threat of competition to transmission. DG is but an example of the technological possibilities for competition with the grid.

The largest remaining barriers are regulatory. The traditional, service-territory-defined government monopoly franchise and the ongoing natural monopoly regulation of transmission are the greatest barriers to potential competition against transmission. They are also the worst impediments to the application of technological change in ways that will create choice and benefits for consumers. Until government monopoly franchise regulations change at the state level, transmission's contestability, and the delivery of efficiency gains and choice to consumers, remain off limits by legal construct.

About the Authors

Lynne Kiesling is Director of Economic Policy at Reason Foundation. Dr. Kiesling's research focuses on regulation and technological change, and other issues in regulation and privatization. Before joining Reason Foundation, Dr. Kiesling taught economics and public policy at the College of William and Mary in Virginia, during which time she published extensively in academic journals. She has also worked as an international economic consultant for PricewaterhouseCoopers LLP. Dr. Kiesling holds a Ph.D. in Economics from Northwestern University, specializing in industrial organization, information theory, public finance and economic history. She also holds a B.S. in Economics from Miami University, Oxford, Ohio. Dr. Kiesling is also Senior Lecturer of Economics at Northwestern University.

Adrian T. Moore is Executive Director of Reason Public Policy Institute, the research division of the Los Angeles-based Reason Foundation, where he oversees all the Institute's policy research. His own research focuses on government management and regulation. Dr. Moore is co-author of *Curb Rights: A Foundation for Free Enterprise in Urban Transit*, published in 1997 by the Brookings Institution Press, and many policy reports and articles for national and local publications. He holds a Ph.D. in Economics from the University of California, Irvine.

Related Reason Public Policy Institute Studies

Lynne Kiesling and Brian Mannix, *Simplifying the Regulation of Electricity Markets*, Reason Foundation Policy Study No. 301, November 2002, www.rppi.org/ps301.pdf.

Lynne Kiesling, *Getting Electricity Deregulation Right: How Other States and Nations Have Avoided California's Mistakes*, Reason Foundation Policy Study No. 281, April 2001, at www.rppi.org/ps281.pdf.

Adrian T. Moore and Lynne Kiesling, *Powering Up California: Policy Alternatives for the California Energy Crisis*, Reason Foundation Policy Study No. 280, February 2001, at www.rppi.org/ps280.pdf.

Adrian Moore, *Integrating Municipal Utilities into a Competitive Electricity Market*, Reason Foundation Policy Study No. 271, June 2000, www.rppi.org/privatization/ps270.html.

Endnotes

[1] See John Burton, "The competitive order or ordered competition?: The 'UK Model' of utility regulation in theory and practice," *Public Administration*, vol. 75, no. 2, 1997, pp. 157-189.

[2] FERC is also currently pursuing uniform generation interconnection standards across the states. Such a standard would reduce transaction costs and barriers to entry to such new technologies as distributed generation, and would move toward decreasing barriers to entry and exploiting transmission's contestability. This policy, though, is beyond the scope of this analysis.

[3] Burton, "The competitive order or ordered competition?"

[4] James Bushnell and Erin Mansur, "The Impact of Retail Rate Deregulation on Electricity Consumption in San Diego," POWER Working Paper 082, April 2001, at www.ucei.berkeley.edu/ucei/PDF/pwp082.pdf.

[5] For a discussion of the causes of the failure of California's electricity restructuring, see Adrian T. Moore and Lynne Kiesling, *Powering Up California: Policy Alternatives for the California Energy Crisis*, Policy Study No. 280, (Los Angeles: Reason Public Policy Institute, February 2001), at www.rppi.org/ps280.pdf. For a comparison of the problems experienced in California with more successful efforts in other nations and states and examination of the policy differences between them, see Lynne Kiesling, *Getting Electricity Deregulation Right: How Other States and Nations Have Avoided California's Mistakes*, Policy Study No. 281, (Los Angeles: Reason Public Policy Institute, April 2001), at www.rppi.org/ps281.pdf.

[6] Vernon Smith, "Regulatory Reform in the Electric Power Industry," *Regulation* vol. 19, no. 1, 1996.

[7] Gregg Jarrell, "The Demand for State Regulation of the Electric Utility Industry", *Journal of Law and Economics*, 1978, pp.269-295.

[8] Walter J. Primeaux, Jr., *Direct Electric Utility Competition: The Natural Monopoly Myth* (New York: Praeger, 1986).

[9] Thomas Lyon, "Capture or Contract? The Early Years of Electric Utility Regulation," Paper presented at 2001 American Economic Association meetings.

[10] Ibid.

[11] Federal Energy Regulatory Commission, *Regional Transmission Organizations, Final Rule*, Docket Number RM99-2-00, Order 2000, Washington, D.C.; and Federal Energy Regulatory Commission, *Regional Transmission Organizations*. Docket No. RM99-2-001, Order 2000A, Washington, D.C.

[12] The standardization conflict between alternating current and direct current was intense and has led to much of the subsequent public policy regarding the industry, although it is beyond the scope of this analysis. Interestingly, some for-profit transmission projects are under way in the United States using direct current transmission. See Edison Electric Institute. "Historical Background—Electric Utility Industry," 1991, at www.eei.org/public/history.htm and Energy Information Administration, U.S. Department of Energy "Historical Overview of the Electric Power Industry," in *The Changing Structure of the Electric Power Industry 2000: An Update*, at www.eia.doe.gov/cneaf/electricity/chg_stru_update/chapter2.html.

[13] Contrary to today's assertions that demand is too inelastic for real-time pricing to work, "[Insuli] he also found that lower-cost power stimulated demand, while still earning healthy profits for his company." Richard Hirsh, "Emergence of Electrical Utilities in America" (1998) at americanhistory.si.edu/csr/powering. The Hirsh essay is the primary source for the material in this paragraph. See also Richard Hirsh, *Power Loss: The Origins of Deregulation and Restructuring in the American Electric Utility System* (Cambridge, Massachusetts: MIT Press, 1999).

[14] "In 1898, in an address before the National Electric Light Association (the forerunner of the Edison Electric Institute), Samuel Insull proposed that electric companies be regulated by state agencies that would establish rates and set service standards. The idea became increasingly appealing to investor-owned companies in the face of public enthusiasm for the growth of municipal electric systems." Edison Electric Institute. "Historical Background." Note the consistency of this statement with the rent seeking theory of regulation as articulated in Jarrell, "The Demand for State Regulation."

[15] Energy Information Administration, "Historical Overview of the Electric Power Industry."

[16] Edison Electric Institute. "Historical Background."

[17] Harvey Averch and Leland Johnson, "Behaviour of the Firm under Regulatory Constraint," *American Economic Review*, Vol. 52, 1962.

[18] Empirical, particularly econometric, evidence of the Averch-Johnson effect has been mixed, although industry participants generally acknowledge its existence. A good summary of the issues and the research on this topic can be found in Kip Viscusi, John Vernon, and Joseph Harrington, *Economics of Regulation and Antitrust* (Cambridge, Massachusetts: MIT Press, 1998), pp. 386-91.

[19] Nguyen T. Quan and Robert J. Michaels, "Games Or Opportunities? Bidding In The California Markets," *Electricity Journal*, vol. 14, no. 1, January 2001.

[20] Paul Joskow, "Deregulation And Regulatory Reform In The U.S. Electric Power Sector," AEI-Brookings Joint Center working paper, 2000, p.19.

[21] While providing beneficial regulatory change, PURPA also instituted requirements to purchase electricity generated with renewable energy from qualifying facilities (PFs). While this seemed like a good idea to policymakers at the time, it saddled utilities with long contracts for expensively generated power, at a time when natural gas prices were falling to their lowest levels (due largely to natural gas deregulation). More than any other, this example highlights the unintended consequence and path dependence problems inherent in such portfolio standards and regulatory mandates. PURPA is also credited with making California officials shy away from long-term contracts, and thus not allowing generators and purchasers to enter into forward contracts when they passed AB 1890 in 1996.

[22] The Energy Policy Act removed several regulatory barriers facing independent power producers, allowing utilities to have ownership interests in independent power producers and to have ownership interests in power companies in other countries. It also encouraged transmission-owning utilities to allow more open access to non-owners, which would later be bolstered by FERC Order 888.

[23] Martin Baughman, "Investing in Transmission Facilities," in Hung-po Chao and Hilliard Huntington, eds., *Designing Competitive Electricity Markets* (Boston: Kluwer Academic Publishing, 1998), p. 137.

[24] Joskow, "Deregulation and Regulatory Reform in the U.S. Electric Power Sector," p.30.

[25] U.S. Supreme Court, *New York v. FERC*, 225F. 3d., March 4, 2002.

[26] Ibid at 691.

[27] Ibid at 14.

[28] However, there are several impediments to the formation of for-profit "transcos." First is the disincentive of incurring a capital gains tax; many of those who filed comments on Order 2000 said that utilities would want to retain ownership, or at least phase out grid asset sales, to avoid having to pay capital gains taxes. Another is the substantial cost of capital advantage afforded to non-profit and government owned transmission assets by federal tax-exempt debt rules.

[29] FERC *Order 2000A, Docket No. RM99-2-001,* p. 3.

[30] One important clarification in the ongoing consideration of RTO policy is the extent to which FERC intends the RTO structure to serve as a system reliability "overlay" institution and will not separate operational control from ownership. Similarly, clarifying the extent to which FERC's proposed institutional structure will still leave room for for-profit transcos would resolve questions of ongoing efficiency and investment decisions.

[31] Benjamin Klein, Robert Crawford, and Armen Alchian, "Vertical Integration, Appropriable Rents, and the Competitive Contracting Process." *Journal of Law and Economics* vol. 21, pp. 297-326.

[32] FERC, *RT01-100-000, Order Initiating Mediation,* July 12, 2001, p. 2.

[33] FERC *RTO1-99-000*, p. 7.

[34] There may be reason for caution on many aspects of this shift in interpretation: "... FERC singled out the operating platform and software of the PJM region and declared it to be the industry standard ... By now, however, we should have learned that public policy decisions can produce unintended consequences. The California fiasco, alone, should cause warning lights to go off whenever a public agency decides to impose not only market structures but also software solutions ... [this enforced consolidation] will lock in the Northeast electricity market to nothing more than a jazzy variation on the old utility paradigm." Maria Ilic and Leonard Hyman, "Don't Rush the Seamstress: Second Thoughts on the Marriage of the Northeast Grids" *Public Utilities Fortnightly* September 1, 2001, pp. 28-9.

[35] An important exception to these cases is the Electricity Reliability Council of Texas (ERCOT), which does not fall under FERC jurisdiction because its boundaries are entirely within Texas's' borders. ERCOT, though, provides the model upon which many of the characteristics of FERC's desired RTO structure are based.

[36] Friedrich A. Hayek, *Individualism and Economic Order* (Chicago: University of Chicago Press, 1948), p.111.

[37] Douglass C. North, *Transaction Costs, Institutions, and Economic Performance*, International Center for Economic Growth Occasional Paper No. 30, San Francisco: International Center for Economic Growth, 1992, p.9.

[38] For a compelling argument for why transmission is contestable, and why, therefore, for-profit transmission companies are viable, see James Liles, "Merchant Transmission: Building a Grid That Wall Street Can Understand," *Public Utilities Fortnightly*, September 15, 2001 pp. 24-36.

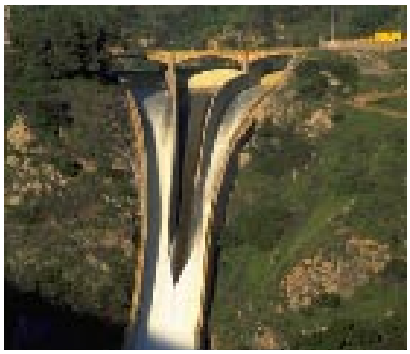
[39] The California Energy Commission provides an example of the regulations governing the construction, interconnection, and emissions of DG systems, at www.energy.ca.gov/distgen/permitting.html.

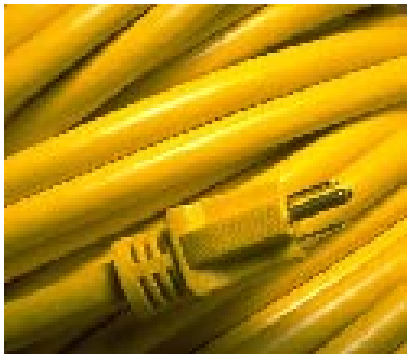
[40] William Baumol, John Panzar, and Robert Willig, *Contestable Markets and the Theory of Industry Structure* (New York: Harcourt Brace Jovanovich, 1982).

[41] Peter Hall, *Innovation, Economics and Evolution* (New York: Harvester,1994).

[42] Integrating real-time balancing markets into RTOs, as FERC has proposed, will remove some obstacles to distributed generation, wind power, and other intermittent forms of generation.

[43] This analysis of rent seeking also applied to generation, though, and we still saw competition in the industry through legislative and institutional change, so these static relationships and incentives may not dominate the decision-making process.



Reason Public Policy Institute
3415 S. Sepulveda Blvd., Suite 400
Los Angeles, CA 90034
310/391-2245
310/391-4395 (fax)
www.rppi.org