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**TOWARD RESOLVING THE ACCESS ISSUE:
USER-OWNERSHIP OF ELECTRIC TRANSMISSION GRIDS**

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EXECUTIVE SUMMARY

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As indicated by proposed legislation (H.R. 2224, sponsored by Rep. Edward Markey) pending before the Congress, constrained access to electricity transmission systems is the most important obstacle to achieving a more competitive electric power industry. Three trends—imbalanced supplies of electricity among different regions, growing interconnection of local utilities, and the increasing potential for electric power trading—suggest that efficient operation of transmission systems will be increasingly important to the performance of the electric power industry.

The potential gains to consumers and the industry of efficient operation of transmission systems are significant. Over a two-year period, a power marketing experiment involving the Western Systems Power Pool found that trading over larger transmission grids yielded \$71 million in efficiency improvements. Significant further improvements would accrue through the addition of transmission capacity, yet the mechanism to do so was missing from this experiment. It is also missing from the industry as a whole. For the electric power industry to yield substantial cost savings to consumers, long-term transmission development concerns must be resolved.

Most policy options for addressing the transmission access issue either fail to provide incentives for the efficient management and coordination of transmission capacity or fail to safeguard against monopolistic risks. For example, the present arrangement of utility-controlled transmission raises significant monopoly problems that make flexibility-impairing regulation necessary. On the other hand, mandated wheeling is likely to result in poor-quality transmission service, as it does not provide incentives for the owner of the transmission facility to expand capacity. Finally, a common carriage system would raise the cost of service by preventing transmission users from coordinating pricing and investment decisions. Instead of harnessing market incentives, each of these approaches encourages parties to rely primarily on the legal and regulatory process to determine transmission-access policy.

User-ownership of transmission grids offers a means of effectively addressing these problems. By facilitating entry onto the transmission system through either acquisition of existing capacity or investment in incremental new capacity, joint ownership of transmission would (1) reduce market power residing in transmission ownership and control, and (2) provide managers of the system—users—powerful incentives to efficiently operate and coordinate transmission capacity.

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Under a voluntary, incremental approach, user-ownership could occur where utilities determine that there are net benefits in selling capacity and where potential competition in transmission capacity exists to adequately protect users. To encourage holders of transmission to open ownership up to users, regulators could offer to deregulate prices, limit certification of new facilities to environmental issues, and eliminate any legal 'obligation to serve.' Utilities would honor all existing obligations to franchise customers.

This voluntary approach to resolving the problem of transmission access has the great advantage of allowing joint ownership where it is judged to be in the best interests of the parties involved as well as providing valuable knowledge with which to evaluate the policy's wider applicability.

TOWARD RESOLVING THE ACCESS ISSUE: USER-OWNERSHIP OF ELECTRIC TRANSMISSION GRIDS

By Douglas A. Houston

I. INTRODUCTION

The most important obstacle to achieving a more competitive electric power industry centers on conditions of access to the transmission systems through which power is moved from generation plants to consumers. Many utilities now are willing to cede some control over their transmission assets as the price they must pay to take the next steps in this evolution toward power marketing. To many industry observers, however, utility-controlled transmission forms a seemingly impenetrable barrier to competition and therefore either the control or the direct ownership of transmission must be fully wrenched from the utilities. Otherwise, the utilities will rig access conditions so that newcomers always are at a disadvantage.

Legal scholar Richard Pierce, for example, categorically states, "Every scholar who has analyzed the structure and performance of the electricity industry has concluded that effective competition cannot exist in the bulk power market without mandatory equal access."¹ Transmission is seen as a gatekeeper: it can be closed in defense of the regulated marketplace or opened to support a greater number of participants.

As sellers and buyers increasingly attempt to break through this transmission gateway, utilities argue in response that any policy that legally forces them to yield access to outsiders is potentially damaging to services for current users of the system. The current transmission networks in the United States were designed largely for vertically integrated independent utilities; these lines may not support extensive trading without quality impairment. To date, U.S. regulators have approached the issues of market competition and transmission access with caution and dealt with the conflicts between regulation and competition in a piecemeal fashion. No overarching policy changes have been made at either the state or federal level. Instead, modifications are derived from other actions, such as merger approvals. These case settlements do not set precedents, leaving an outsider's status uncertain. Because most exchanges of power are long-term commitments between buyers and sellers, uncertainty over transmission policy increases transaction risk and dampens development of power markets.

The proposal discussed in this paper views transmission policy as first requiring that ownership rights to the transmission assets be redefined in such a way that the incentives of owners are consistent with efficient, competitive operation of the transmission system. Instead of wheeling or common carriage, the paper proposes user-ownership of regional transmission systems. The advantages are twofold. First, users-as-owners can be provided with incentives to build and operate efficient

organizations, in addition to being governed by rules for ongoing adjustments to ownership, assets, and activities. Second, widespread user-ownership of transmission networks can eliminate much of the monopolization risk without recourse to direct regulation. While common carriage and wheeling might achieve the latter, they would not accomplish the former.²

User-owned transmission systems would provide more services over more territory than occurs today, becoming, in effect, regional networks. By facilitating entry either through acquisition of existing units of capacity or by making incremental system investments, competition in power supply would be promoted. Thus, barriers to entry would be lowered. To encourage holders of transmission to open ownership up to users, regulators could offer to deregulate prices, limit certification for new facilities to environmental issues, and eliminate any legal "obligation to serve."

By operating on a voluntary basis, in the short run this transmission proposal would not significantly alter the structure of the industry or create uncertainties for participants. This incremental approach would have the great merit of allowing user-ownership where participants are certain of its net benefits and, importantly, providing valuable experience in which to judge its broader applicability. In addition, by not mandating that all transmission systems make this significant structural change, the proposal is more likely to be politically acceptable.

To some extent, this evolutionary approach to joint userownership is occurring in the industry. For example, both the Maine Electric Power Company and the Vermont Electric Power Company are jointly-owned transmission companies, each acting as the middleman for interutility transactions. Georgia Power Company and the Municipal Electric Authority of Georgia have operated an integrated transmission system since 1976. In 1985, Public Service of Indiana reached an agreement with the Indiana Municipal Power Agency and the Wabash Valley Power Association that gives undivided ownership interest in the transmission lines to all participants.³ What is missing in these cases, however, is the right of each owner-participant to sell or lease its capacity rights in the transmission systems to "outsiders," or for outsiders to enter the system by incremental investments in capacity. Thus, the transmission systems remain largely closed and, as such, the opportunities for marketing in power are necessarily limited.

The role of transmission in the power industry is examined in Section II; this includes a brief look at the technical aspects of the transmission of electric power, the institutional restraints and management practices under regulation, and recent trends and proposals on transmission access. Section III contains a proposal for user-ownership restructuring of transmission assets in the United States. An interest-group assessment of the prospects for such reform is made in Section IV.

II. TRANSMISSION OF ELECTRIC POWER: AN OVERVIEW

In the early and mid-1980s, utilities were startled by a series of state-level decisions that disallowed some assets from being included in rate bases. To do this, commissions applied a doctrine of "used and useful," which was interpreted to mean that utilities could earn a return only on assets providing service to customers. Utilities have reacted to this important change in their risk exposure by reducing the amount of capacity they are willing to add to the rate base.

One consequence of this change is the increased use of power marketing to balance supply among utilities. Additionally, utilities have built stand-alone generation capacity outside direct regulatory control and relied upon new independent sources of power production, especially independent power producers (IPPs) and qualifying facilities (QFs). The latter organizations have grown due to the incentives for small power producers established in the Public Utilities Regulatory Reform Policies Act of 1978 (PURPA). As nontraditional power production and exchange relationships grew, a new set of demands was placed on transmission networks, and, in turn, on access policies.

The issue of what constitutes monopoly power in transmission lies at the heart of this debate, pitting transmission-owning utilities against nonowning users and would-be users, and spilling over into jurisdictional disputes between the federal regulator, the Federal Energy Regulatory Commission (FERC), and the state public utility commissions.

To understand what might be the feasible public policy option, it is first useful to anchor the discussion by examining transmission's historical purposes, technical properties, and legal and institutional features, including recent initiatives that are changing this landscape.

A. Purposes of Transmission Systems

Utility transmission systems provide the paths along which power moves from generation plants to the substations controlling access to the final consumers. In 1988, approximately 620,000 circuit miles of transmission lines existed in the United States; these lines span a range of voltages from 22 to 800 kilovolts. The consumers at one end of transmission make up a load center: a distribution territory established by the utility, a city-owned or cooperative system, or an industrial operation. Utilities have historically built transmission lines for their captive accounts, under the presumption that these exclusive geographical markets would remain intact. Traditionally, each utility has produced the vast majority of the power used by its own customers. Thus, the existing configuration of transmission lines and generation plants reflects the historical intent to make each producer a full-service, vertically integrated provider to the consumers in its franchise territory.

The transmission lines of utilities also are interconnected with surrounding utilities. This permits some selling of power (economy power exchanges), sharing of reserves, and emergency backup. Most of these functions are performed within power pools, constellations of utilities by region. These coordinating efforts administratively are broken out into nine reliability councils forming the North American Electric Reliability Council. Power pools are an important means of sharing within the industry, but the coordination within the pools is typically "loose" (limited). Historically, they have not been a means of sharing generation capacity obligations; utilities instead have applied pooling transactions more commonly to supplement, balance, and provide security.⁴ Yet increasingly, due to the rise of unbalanced supplies, utilities within pools engage in requirements and economy transactions and capacity-related exchanges to meet longer term requirements.⁵

The 1990s promise to be an era of "unbalanced" electricity capacities, making the use of power pools to correct regional imbalances more pressing. In analyzing the generation capacity reserve margins among utilities, a 1990 report of the Department of Energy concluded: "The margins shown for 1993 and beyond are such as to change 'concern' to 'alarm'."⁶ Wholesale capacity and energy purchases will place significant stress on transmission systems. Yet utilities have expanded their transmission capacities with little planning for broader transmission demands that marketing of electricity would stimulate.

In part, today's transmission conditions reflect a transition to more integrated grids in which ownership is broadly shared. An example of a development in this direction is the California-Oregon Transmission Project, a partnership of municipal and investor-owned public utilities and the Western Area Power Administration. This project will create another link in the Pacific Northwest-Pacific Southwest intertie, permitting an additional 1,600 megawatts of power to be sold or exchanged among utilities in these regions.⁷

Power pools demonstrate attractive gains from voluntary coordination, hinting at even greater value from more extensive relations.⁸ Yet, utilities have been hesitant to take additional steps such as centralizing dispatch, the operation of multiple utilities' generating capacity according to the marginal cost of power.⁹ Technologically, transmission grids are capable of doing much more.¹⁰

Utilities argue, however, that voluntary wheeling among utilities requires careful planning and coordination. Without appropriate physical and institutional protection, they claim, wheeling-on-demand for outsiders can disrupt the entire system of power delivery. Reliability would suffer, costs would increase, and franchised consumers would pay more for basic services. If utilities have to yield access to other participants (some of whom may be competitors and/or customers of the utility) but also have to supply their native load customers, then wheeling will present a continuing confrontation between the "haves" and the "have-nots." As will

be discussed in the next section, this points to a need to explore the context of trade in power. Briefly, the public utilities' continuing obligations to serve, coupled with weak property rights in transmission, are the primary causes of inefficiency and growing divisiveness within the industry.

B. Physical Functions of Transmission

Transmission networks operate according to Ohm's and Kirchhoff's Laws. Electricity flows over an entire network; the divisions among lines are based on the impedance characteristics of those lines. This flow within a network is determined by the configuration of lines making it up, their physical characteristics, and the various "load" centers--that is, the generation plants and consumer points of access.¹¹ The physical properties of electricity networks suggest that just as generation reserve margins are necessary to maintain reliable service, so too are transmission line reserve margins.

When separate utilities wish to transfer electricity, the transmission interconnection is made across control areas that meter and regulate the flows according to agreements between utilities. Most of the flow control is managed by changing supply (i.e., the importer reduces supply and the exporter increases it). All parties must monitor and control the flows. Such activities are not only feasible but frequently accomplished.¹² Increased transmission cooperation among utilities can reduce the costs and risks associated with greater exchange. Indeed, a few large holding companies, such as American Electric Power, and "tight" pools, such as the New England Power Pool (NEPOOL), engage in complex and subtle shifting of loads among numerous generation plants; units are ordered ("dispatched") on line according to cost characteristics.

In sum, electric power networks are complex in ways that demand consideration of an entire network operation when a single transaction is explored. Unexpected and unplanned uses can cause damage to others--negative "third party" effects. Utilities now present these facts as arguments against wheeling. The precise measurement of these costs, however, is rarely if ever known, and current rules of thumb could err considerably.¹³

C. Legal Status of Transmission Access

Transmission use is significantly controlled by law and regulatory treatment. Most questions of access to transmission systems today fall within the jurisdiction of the Federal Energy Regulatory Commission (FERC). Acting under the authority of the Federal Power Act (FPA) of 1935 to regulate wholesale power transactions in interstate commerce, and with an extended reach of this authority resulting from Supreme Court rulings, FERC has become the primary arbiter over wheeling transactions. To date, the access issue is frequently simplified to a question of

mandatory wheeling, legally requiring one utility to transport the electricity of two or more other parties.

As outlined in several Supreme Court and lower court cases, the authority of FERC to compel any utility to wheel power for another party is quite limited. The leading case was *Otter Tail Power Co. v. U.S.*,¹⁴ in which the Court concluded that Congress did not intend for independent commissions to order wheeling. In a 1980 case, *New York State Electric & Gas Corp.*,¹⁵ the Second Circuit Court supported the position that FERC could not interfere with a wheeling contract (by loosening its restrictions) without, in effect, ordering wheeling in contradiction to the wishes of Congress. In *Richmond Power Light v. FERC*,¹⁶ the District of Columbia Circuit concluded that utilities that entered into voluntary wheeling agreements could not later be forced to wheel. In addition, the Public Utility Regulatory Policy Act (PURPA) of 1978 gave FERC a very limited authority to mandate wheeling,¹⁷ but due to the imposing conditions set out in the law, no FERC wheeling actions have been taken under PURPA authority. Although FERC's authority to order wheeling as an antitrust remedy is limited, according to the famous *Otter Tail* ruling, the courts do indeed have such authority.¹⁸

In recent cases, FERC has shown a greater willingness to consider mandating wheeling when utilities are requesting favorable treatment on mergers and trade. An important application is the PacifiCorp merger in 1988. Here, the desire of a large utility, PacifiCorp, to merge with another utility, Utah Power and Light, was conditioned upon the merged firm allowing wholesale transmission access to lessen the likely anticompetitive effects of the merger.¹⁹ PacifiCorp accepted these terms to gain the merger. FERC was careful not to make this case a precedent for future mergers: ". . . a requirement that it wheel power for competitors in order to ameliorate the likely anticompetitive effects of the merger would not serve to make the merged company a common-carrier. Thus, the Commission is not doing indirectly (making the merged company a common carrier) what it is prohibited from doing directly."²⁰

D. State Actions on Transmission Access

Recently, states have become more active in the transmission access and wheeling debates. These actions, surprisingly, have been in areas previously considered federal domain. States have had jurisdiction over most certification and siting of transmission lines, while FERC has exercised jurisdiction over the interstate transmission of electricity. Supreme Court rulings seemingly have provided authority to FERC in pricing of transmission services,²¹ but, because the revenue requirements are typically recovered by retail pricing, the state can exercise some control.

It seems probable that increased claims of state authorities are linked to the growth of the wholesale market in power, in which both independent producers and

consumers play a larger role.²² For example, in Florida, the Florida Public Service Commission (FPSC) sought to establish a statewide rate for the transmission of QF power and to order the wheeling of qualifying-facility (QF) power.²³ FERC denied both requests, arguing that the actions by the state commission would overstep their limited authority.

Perhaps the first major test of the boundaries between state and federal jurisdiction over transmission will be resolved in a Wisconsin case. In 1989, the Wisconsin Public Service Commission (WPSC) set out guidelines for least-cost planning. The Commission asserted that efficient design and operation of the statewide electric transmission network formed an indispensable component of such a plan, and therefore it directed utilities to develop and implement a comprehensive system of multiple transmission "cost and use sharing agreements."²⁴ This order declares that control of the transmission system is necessary if the state is to control capacity planning and development of least-cost options. The decision was appealed to the state circuit court.²⁵ Unlike the Florida case, the WPSC order is grounded on a state statute that provides the state commission's authority to engage in supply planning. Wisconsin's actions could be mimicked by other states, pointing to a rising conflict between state and federal regulatory authority with respect to control of transmission systems.

One reason for the growing state challenges is that FERC has not taken industry-wide action on issues of competition among industry participants, including clarification of crucial transmission access issues. Still, FERC case decisions move toward greater access for outsiders. In a September 1990 order, FERC rejected a request for market-based rates on energy and capacity sales between two Iowa parties, arguing, among other reasons, that one of the parties held considerable market power in transmission.²⁶ The order argued that a lack of open-access transmission tariffs or offer of open-access services to all generators by the requesting utility or its neighbors constituted a monopoly situation. Commissioner Trabandt asserted that this forces "utilities participating in a bid, if they win and want market rates, to open their own transmission systems to all comers or show that their neighbors have done so."²⁷ He also has concluded that the commission's desire to use conditioning power and other indirect means to force greater transmission access whenever possible "has become increasingly open and obvious."²⁸

The commission has yet to state an industrywide policy toward transmission access, claiming that it does not have sufficient authority to do so. Because state commissions are legally responsible for the supply systems within their states, and because these relationships are increasingly dependent upon wholesale contracts with new players (QFs and IPPs), they are likely to continue pursuing the issues surrounding transmission access.²⁹ These tensions between state and federal regulators will grow until the issues of transmission access are resolved among the regulators themselves, in the courts, or by congressional action.

E. Initiatives: Voluntary Wheeling and Transmission Sharing Agreements

Increasingly, utilities have been willing to legally bind themselves to provide transmission access as a means of reaching other goals. The leading edge of this effort may be Public Service Company of Indiana's quest for greater marketing flexibility. To achieve it, they negotiated to open their transmission lines to all who will reciprocate. PSI's initiative appears quite reasonable. They had excess capacity and neighboring utilities had shortages. As CEO James E. Rogers said, "I have a vested interest in seeing the market open up and become deregulated."³⁰ FERC's response, in an order issued June 28, 1990, made PSI the first electric company in the nation to have blanket authority to make long-term, market-based sales.³¹ Although this ruling does not extend to other utilities, it is reasonable to expect many more power companies with supply imbalances to seek open trade, and the price seems to be "open access" of transmission lines.

Many analysts predict that most new industry capacity in the 1990s will come from nonregulated sources. These include: utilities with excess power to sell; IPPs that have sprung up to serve utilities or directly serve "retail" customers; Qualifying Facilities (QFs), the small generation operations that are outgrowths of PURPA's encouragement of small, nontraditional power sources; and other nonutility players in the power market, such as co-generators.³²

In an attempt to learn more about the impacts of increased wholesale power marketing, in 1987 FERC allowed a limited experimentation with market-based transmission and bulk-power sales for the Western Systems Power Pool (WSPP).³³ This is not a power pool, but rather an agreement among a large group of utilities to enter into traditional coordination sales at nontraditional prices.³⁴ In January 1991, this "pool" proposed a 10-year agreement to replace the bulk-power marketing experiment.

The WSPP experiment in market-based pricing and trading began with 15 members in 1987, and, by early 1991, had grown to 31. The consulting firm, Strategic Decisions Group, gathered data and evaluated the pool's performance over the period May 1988 through April 1990.³⁵ During the two years, 16 percent of the transactions among members were estimated to have been due to the WSPP's operation. Of these transactions, 90 percent could not have occurred without WSPP, and 30 percent would have failed without WSPP because of unavailable transmission service access. The estimated short term efficiency gains were \$71 million, of which 35 percent involved third-party transmission transactions.

The short term benefits only hint at the gains from efficiently expanding transmission capacity. Although most participants in the experiment recognized that long term investment needs were the *primary* consideration in developing power markets, WSPP, because of its short-term, experimental nature, provided the

participants with little incentive to consider market-based resolutions to transmission capacity decisions. As a result, understanding of how power marketing might evolve has been considerably curtailed.

Regional transmission "have nots," such as QFs and industrial consumers, have argued against regulators releasing pricing control because utilities owning transmission within the pool still retain great market power that could be used against competitors in bulk-power markets.³⁶ FERC's initial ruling, issued April 23, 1991, would have placed significant restraint on the market pricing aspects of the new agreement. The commission stated: "Without adequate assurance the exercise of market power will not occur...we must modify the pricing aspects of the proposal to ensure that the prices charged for coordination energy, transmission and exchange services will be just and reasonable under the FPA."³⁷ The WSPP was granted a stay from this ruling in early May, and a rehearing will be made. Concerns about WSPP by industry participants and FERC tend to be directed less at short-term pricing principles and more at long-term conditions of access. As they grapple with wholesale power market developments, potential abuses of market power by owners of transmission play a major role in FERC's explanations of their decisions.³⁸

F. Mandatory Wheeling and Common Carriage

In the electric power industry, competitive problems and the demand for regulation stem from control of transmission systems. Indeed, it is the monopoly issue alone that calls for any further regulation in transmission. Thus, if transmission monopolization is remediable, then little economic justification remains for legal restraints on this industry above the local distribution level.

Numerous studies in recent years have attempted to analyze and, in some cases, propose solutions to the institutional barriers to competition in the electric power industry, and, in particular, in the transmission sector. In the United States, these include analyses by the Congressional Office of Technology Assessment (OTA), the National Regulatory Research Institute (NRRRI), the Edison Electric Institute (EEI), the National Governor's Association (NGA), the State of Illinois, and the Federal Energy Regulatory Commission (FERC).³⁹ Generally, these studies have examined solutions that force transmission access legally, typically by mandated wheeling or common carriage.

Because the legal foundation for regulators to order wheeling is not well-grounded, wheeling issues will continue to be settled on a case-by-case basis without an amendment to the Federal Power Act. Case-by-case wheeling agreements, however, have led to more uneven treatment across the industry, further highlighting the access issue: If mandatory access is good in jurisdiction X, then why not in Y? Consequently, calls for a federal wheeling authority that would establish a public interest basis for access are likely to grow.

With a federal mandatory access law (and reform to the Public Utility Holding Company Act), IPPs could become dominant power suppliers to today's integrated utilities. Mandatory wheeling, however, cannot guarantee that clear, detailed conditions of entry can be specified in advance so that a nonowner can understand his position under all contingencies over the long time period that power contracts typically last. It also does not provide incentives for the owner of transmission facilities to expand capacity. Thus, the access obtained could be for poor-quality service.

Another approach, common carriage, would attempt to reduce market power in transmission by uncoupling ownership of transmission from generation, and enforcing access rules universally. By isolating and regulating only the monopolistic transmission sector, the objective is to permit competitive wholesale trading among independent parties. Transmission still would require constant regulation to assure that it fulfilled obligations to provide open access. Bulk-power dispatching, control functions, and other transmission services would be "unbundled," and all saleable services would be subject to price and service regulation.

Utilities have vehemently argued against any such "dismemberment" policy for many of the same reasons used against wheeling. Indeed, economists have added cautionary notes. Paul Joskow and Richard Schmalensee, in their influential book, *Markets for Power*, presented a critique of structural separation that emphasized the likely losses in coordination and planning effectiveness from pulling utilities apart.⁴⁰ They also emphasized that a transmission supergrid could dominate the industry unless closely regulated.

Central to the common carriage approach is bilateral contracting between sellers and buyers, with transmission serving as a necessary, but discrete input. Simplifying and distancing transmission services from power transactions requires unbundling transmission services. Bundled services are perceived by some as economically unnecessary and potentially monopolistic.⁴¹ Yet numerous economic (cost-minimizing) reasons exist to bundle components of service as a normal condition of access. Doing so complicates the simple buyer-seller contract, suggesting that complex, systemwide problems could be ameliorated if the transmission firm could act as the agent for other affected parties in power transactions. But common carriage, by definition, disallows extensive coordination or market-making roles for the grid company, or its active involvement in supplying ancillary services. Instead, common carriage treats transmission firms much like local telephone exchange companies that are either excluded or substantially restricted from entering information service markets. The local telephone exchange, treated in this way, is seen as the mere carrier, not the originator, augmentor, or transformer of messages. Creating a regulatory environment for transmission companies that is similarly restrictive could be damaging to the efficient development of markets in power.

By definition, common carriers also are prevented from controlling access conditions or prices. If access under regulation is encouraged by lowering transmission prices, then generation firms would be encouraged to overproduce. In effect, they would receive an implicit subsidy, with the costs borne by other transmission users who would suffer lesser reliability or other impairment to quality of service. Part of efficient transmission system is the discipline of access denial where access generates net costs. Common carriage moves the industry away from this.

In sum, a transmission grid, structurally separate and obligated to act as a common carrier, would have no means of coordinating critical pricing and investment decisions with its users. Utilities today implicitly concede the weakness of existing transmission development practices when they plead that the present systems cannot handle diverse market demands. Forcibly opening transmission in order to "permit" competition would provide owners with no economic incentive to wisely develop and maintain transmission capacity. Additionally, the complex issues of allocating valuable transmission capacity will become highly politicized, encouraging interest groups to engage in wasteful struggles for access. The weaknesses of common carriage, however, do not imply that all structural reforms are similarly flawed. Structural transmission reform need not be imposed in this manner: a voluntary, market-based remedy--joint user-ownership--can improve the economic efficiency of the industry, while reducing threats of monopoly.

G. User-Specific Assets And Market-Based Structural Remedies

Assets that are highly user-specific characterize many industries--oil and gas pipelines, airports, and local public telephone exchanges.⁴² In these cases, each user must make investments that would be largely irrecoverable if access to the key asset then were denied. Such "bottleneck" assets also cannot easily be replicated or redirected to other uses. Thus, *both* owners and users face a large risk in engaging in contracts employing a user-specific asset. Generally, the problem is seen as one of disproportionate market power conferred upon the owner, but the owner, too, faces large losses if the user can evade contractual responsibilities.⁴³ The term "bottleneck" is not intended to mean a short-term capacity constraint that could be resolved merely by building more capacity. Rather, the bottleneck attribute, user-specificity, is intrinsic to the nature of the assets. It is, in other words, a structural issue that must be dealt with at that level. Thus, policy answers to the bottleneck problem that rely solely on pricing are short-term measures, and do not address the structural causes of inefficient provision of capacity in the first place.

What is needed is a structure of ownership that promotes desired behaviors. Often, vertical integration across the transacting parties is a solution to the bottleneck problem, and, in the electric power industry, was initially imposed as part of the overall regulatory solution to monopoly power residing in production and exchange of electricity. But today, utilities are deliberately weakening the vertical chain of

ownership by extending rights to other users of the transmission systems, often as quid pro quo with FERC so that the utilities can take advantage of marketing opportunities. This trend toward sharing legal rights in transmission--in response to the anticipated competitive environment--means that vertical integration is not likely to be a future remedy for the "bottleneck" concerns in this evolving industry and suggests that other approaches may be more valuable.

Joint ownership of the bottleneck facilities is one option. Recently, economists have placed more emphasis on this perspective: Vernon L. Smith⁴⁴ has suggested that capacity rights to a jointly owned system might be freely bought and sold; Arthur De Vany, Robert Michaels, and Rodney Smith⁴⁵ also have proposed a capacity right for natural gas pipelines; and Kenneth Costello⁴⁶ also has argued that such an approach might succeed for electricity transmission.

III. USER-OWNED TRANSMISSION GRIDS: A PROPOSAL

A. Overview

In the past, because of the large risks of building "user-specific" electricity generation, exclusive franchising was justified as a method of "securing" markets for producers. Yet these investment risks can also be substantially reduced if the assets in question are made less specific to particular users, in effect giving participants a broader market sweep. User-ownership of large transmission grids can extend the market, thereby diminishing the value of vertically integrated firms, such as most utility firms.⁴⁷ Put another way, the grid's openness increases the worth of non-integrated producer-marketers and middlemen who perform their limited tasks very well compared to cumbersome utility giants. Thus, the upshot from increasing the scope of the market is that more independent producers may be willing and able to enter--perhaps even without long-term contracts in hand. Conversely, with greater competition, retail purchasers will be capable of meeting their power demands at lower costs by relying upon the larger marketplace held within a transmission grid.

The proposal in this section seeks to accomplish three specific objectives: (1) broaden transmission system access through joint, private decision-making; (2) reduce the market power residing in transmission ownership and control; and (3) initiate the movement toward market trading in power, but not freeze the market structure. The rules required to achieve such objectives have been described by Lucinda Lewis and Robert Reynolds as "constitutional," permitting profit-seeking to guide the decision-making of the group, but inhibiting most strategic manipulation.⁴⁸

In overview, transmission assets would be reorganized voluntarily into large, privately held networks. As the regulated AT&T telephone monopoly was spun off into the separate Bell operating companies, transmission assets of the electric utilities would be separated from the electric utilities. These spun-off components would be

combined to form regional transmission networks owned by their users. Ownership would be alienable, generally with no restrictions about who could acquire capacity rights. Utilities, the federal public power administrations, and the Tennessee Valley Authority would meld their transmission lines into the jointly-owned systems.⁴⁹ While the proposal does not depend upon dismantling the remainder of public utility regulation to be workable, it would increase incentives to engage in trade, and therefore should accelerate movement toward power marketing, perhaps down to the retail level. Moreover, by offering transmission holders regulatory incentives to allocate ownership rights to transmission systems, regulators could encourage a voluntary, incremental approach to user-ownership.

The user-ownership proposal contains the following elements:

- (1) In return for some form of regulatory relief consistent with maintaining competition, utilities voluntarily spin off transmission assets from their other operations.
- (2) Transmission assets are reconfigured into regional transmission firms owned by their users. An initial assignment of ownership must therefore be made.
- (3) Ownership is stated in physical capacity shares, which are tradeable. Participants also can acquire capacity by subscribing to a capacity addition proposed by others, or by initiating their own.
- (4) With competition in transmission capacity in place, the "obligation to serve" principle, which now prioritizes uses (and rights) would be removed. Owners of the transmission system would establish jointly the conditions of system access and pricing, possibly with FERC oversight; antitrust laws would form the primary legal safeguard against collusion.
- (5) Utilities' franchised users would retain ongoing protection under public utility law; thus, all existing obligations to franchised markets must be honored by the utilities. Consumers (industrial accounts, municipalities, and others who can establish ownership in local distribution systems), however, would have a legal option to reject public utility regulation and engage in market purchases; by doing so, consumers would accept the ongoing risks of market dealing.

These actions demand a number of careful clarifications in law. In particular, the determination of initial participation shares in ownership and the definition of a capacity right must be made.

B. Initial Participation in New Transmission Firms

The initial ownership in the new grid organizations could be assigned according to the ownership share of each current transmission owner in the new network's initial capacity; thus, utilities would receive the bulk of capacity rights in each new system. Capacity from the public sector could be sold at auction, and, as a result, some capacity would be immediately available to nonutilities. Owners of the new transmission grid, for the most part, will not be able to identify specific assets that are "theirs": their ownership consists of capacity shares, giving them authority to place demands on the overall system capacity. Capacity then could be sold or leased to any market participants in a secondary market.

One reason to make the initial assignment of property rights primarily to utilities is that they would continue to represent the interests of their customers. With utilities retaining capacity rights, they can satisfy continuing obligations to their franchised consumers; thus, no captive consumers would be threatened by this structural change in the transmission sector. Should utility regulators choose, they could demand that utilities retain specified transmission capacity in support of their franchises.

Utilities, reasonably, fear losses from transmission restructuring, and the assignment of rights in the systems largely in their favor will facilitate their political support. By beginning with capacity ownership largely in the hands of these utilities, they would continue to exercise substantial control over operations and development of transmission systems. Moreover, because the approach advocated is for user-ownership to occur on a voluntary basis, utilities will not be forced to participate in their own dismantling. User-ownership will occur where utilities determine there are net benefits in selling capacity and where potential competition in transmission capacity exists to adequately protect power users.

Joint ownership reduces the risks of strategic manipulation by utilities and therefore assists in achieving a more orderly transition to a more competitive market. Utilities would be joined in transmission ownership by non-utility users with aggressive marketing objectives who will demand reliable long-term access; such firms are unlikely to engage in output-restricting cartelization strategies. Quite clearly, too, many present-day utilities have little desire to continue a defense of the public utility regime, and instead see their interests furthered by becoming power marketers.

In sum, under the user-ownership proposal, the movement to broader use and ownership of transmission should promote the ongoing development of power markets. In total, there would not be an immediate, radical reduction in the proportion of ownership held by utilities. On the other hand, the shift to joint user-ownership will accelerate trade in both transmission services and electricity, while

providing a structural means for the participants to deal with capacity and allocation issues.

C. Capacity Rights Ownership by Users in Transmission

Without public utility regulation, the United States electric power industry probably would have achieved user-ownership of transmission long ago as a means of both protecting and coordinating electricity trade. Today in the U.S. power industry, the limited joint ownership of transmission follows the capacity-sharing model.⁵⁰ This proposal seeks to extend this ownership by providing all potential users (many now excluded) with the opportunity to enter a transmission capacity market in two ways: (1) by acquiring existing capacity shares in a secondary market, or (2) subscribing to capacity shares in new transmission investments. The latter investments could be reviewed by FERC to assure that they are not manipulated by the current ownership to impede entry. Opening the transmission marketplace in this way allows smaller, non-integrated firms to enter and gain scale and scope economies in transmission. Many aspects of transmission, of course, are subject to scale or scope economies, and attempting to accomplish these functions with smaller operational units would be prohibitively costly. However, as the existence of shopping malls and stock exchanges indicate, the joining together of participants to produce certain scale results does not necessarily preclude their operating as smaller-sized firms and actively competing in most other areas.⁵¹

Ownership and control of transmission organizations through capacity-sharing agreements would be costly, but perhaps less so than would be ordering these transactions through discrete market exchange. Many coordinating and planning tasks facing the user-owners are difficult to specify in advance, and therefore are not easily written into ownership agreements. Additionally, the negative externalities that seem to afflict many power transactions (and for which the grid is, in part, a remedy) require that close attention be paid to the system-wide effects of use. Further, the grid may carry on numerous ancillary functions, such as making a spot power market, dispatching generating units, and operating a futures market in power. Using the grid for these purposes requires extending substantial decision-making authority to the managers of the system to limit or condition use. The lack of independence among transmission system users alters the nature of private property rights in grid capacity: When sold or leased, capacity shares must also transfer significant constraints and obligations.

Because transmission services would be determined by market forces under this proposal, regulation that prioritizes uses should be removed. Currently, utilities present their service obligation to captive retail consumers (native load) as the basis for setting out distinctions in the use of transmission. This approach, if extended to ownership, would cause similar asset distinctions. As a result, user-owners not having the highest priority classification would own an inferior asset that would produce

riskier, lower quality service and therefore could not trade freely with ownership marked with an obligation to serve. Regulators, however, easily could continue to impose service obligations on utilities with respect to serving particular retail customers without mandating transmission service levels. Instead, regulators need only set performance standards on delivered service, permitting a utility to acquire the necessary transmission service or capacity to reach the standard.

Capacity-sharing in a profit-based firm also must be evaluated in light of potential costs. Several difficulties are addressed below: risks of monopolization and exclusionary practices; impediments to effective investing and financing investments; difficulties of managing under user-ownership; and pricing.

D. Discrimination and Exclusion

The user-owned transmission system can be viewed as a club in which owners share privileges as well as obligations. The essential motivation for this closed form of organization is that a valuable quasi-public good is captured by the members. Within the user-owned transmission network, this public good is the reduced threat of strategic manipulation of the grid by owners. Other important benefits include the internalizing of external costs and providing a means of coordination and investment in the system. The latter gains, however, could be accomplished by other market-based organizational structures than user ownership, and therefore, the value of user-ownership rests critically upon how effectively it can reduce monopoly threats.

The gains from this form of organization, however, can be overwhelmed by other costs if intrusions are not controlled. The ability to define the conditions of use is vital to the functioning of this market institution, formed primarily to prevent arbitrary exclusions. This is not a contradiction, but merely a recognition that overuse of a system can damage service quality. Unlike a regulatory solution to the access problem, the voluntary user-owned organization inhibits monopolization by putting authority in the hands of those with a direct self-interest in coordinating power transmission efficiently. Although user-defined access immediately prompts concern about manipulations to deny entry, note that each owner can sell his capacity shares, enter long-term contracts with users, or sell transmission service in a spot market. An open market in capacity can exist.

Of course, those purchasing capacity also "acquire" rules placed on owners of the transmission grid. Therefore, as a basic safeguard against strategic manipulation, the rules regarding all aspects of ownership and operation should be universally applicable. If this were done, much discrimination against potential transmission users would be eliminated through the ongoing operation of markets in capacity shares and in transmission services. Rules could be reviewed by FERC for signs that they are strategically employed against outsiders.

Under user-owned transmission, much cost-increasing regulation targeted at market abuses should be avoidable. Undoubtedly, concerns about monopolization or cartelization of transmission, restrictions on access, and discriminatory pricing will remain. One form of regulation that can assist in preventing strategic manipulation of transmission grids by owners is antitrust law. The threat of an antitrust action can raise the costs to collusive price-fixing or to excluding entrants. Antitrust is also less intrusive than direct economic regulation, allowing the private ownership and control of transmission grids to do much of the work.

The proposed user-ownership policy would inherently leave entry open--all capacity shares are saleable, new investments in capacity to an existing system are feasible, rules regarding access are imposed universally, and new, separate transmission capacity remains as yet another competitive check. These features of user-ownership form the basic defense against exclusionary and discriminatory behavior by the grid owners while at the same time providing an efficient vehicle for providing transmission capacity.

E. Financing Transmission Investments and Managing the System

Investments in a user-owned transmission grid could occur in two ways: (1) any individual participant or coalition could add capacity to the system, subject to meeting the requirements of the grid company regarding protection of the system, or (2) the transmission firm could propose investments in capacity that would be subject to open subscription. After complying with the standards of the transmission organization, any technically competent party could add to the system in the first way without the specific approval of the user-owners.⁵² Such investors would become owners themselves, receiving system-wide capacity rights commensurate with the added capacity, which then could be marketed like all other capacity rights. The first avenue for investment would permit entry to the transmission sector of the industry without forcing a costly duplication of an entire system. It would be most useful when an expanding producer-marketer's demands are not being met by existing capacity investment plans, and provides another means of gaining entry. Attempts by the grid organization to exclude such entry for reasons other than the technical integrity of the system should be subject to antitrust action.

Perhaps more commonly, investments in capacity may be identified by the transmission organization's managers based on their analysis of information on the system. Clearly, the grid's management, as a result of their hands-on position, will have an informational advantage over outsiders. Participation rules should clearly provide that all competent parties, both in and out of the organization, be allowed to acquire capacity through such investments. In sum, the vital concern for policy toward transmission financing is to establish with reasonable confidence that: (1) investment opportunities can be identified and financed efficiently within a user-owned system, without denying market entry to qualified participants, and (2)

incremental capacity can be added by any party that is able and willing to abide by the technical standards of the transmission organization.

F. Management and Control Problems with User-Owned Grids

While user-owned transmission organizations are helpful in overcoming the bottleneck problem and internalizing system external costs and benefits, they may not be easy to control and manage. One obvious source of organizational tension lies between two objectives: effective technical management of a grid versus owner-control of grid policies. The managers of the grid require considerable autonomy to assure that complex operations are handled efficiently. On the other hand, grid managers cannot engulf all the authority of the user-owners; indeed, it would be illogical for users to acquire ownership for the purpose of exercising control and then to cede that authority over major policy issues to an independent management team. In general, the net value of providing close direction is great enough that user-owners will act as proprietors, unlike owners in publicly held corporations.

Bickering among owners is probable, and a governance system to mediate or arbitrate disputes will be useful. This clearly is costly and reduces further the net benefits of user-owned transmission enterprises. Indeed, high costs of governance may be the primary reason for the infrequency of user-owned enterprises in open markets, but they are useful particularly when highly-valued ends are not achievable by less costly means. In transmission, the net benefits of user-ownership should be compared to those of the most plausible, practical alternatives--continued public utility regulation amended either by wheeling or common carriage regulation. In that context, user-ownership compares favorably.

G. Regulation of Pricing

At present, the formulas approved by FERC for pricing transmission services are based on embedded costs and are far from marginal-cost pricing.⁵³ The embedded-cost method of pricing transmission service is typical of public utility regulation's cost-plus approach: A firm is allowed to recover a "fair" return on its historical investments plus out-of-pocket expenses. By not signalling the scarcity (marginal) value of service, embedded cost pricing leads to resource misallocation. For example, peak use clearly can damage quality of service, and embedded-cost pricing does not impose these costs on the users. Conversely, a transmission system with idle capacity sets too high a price under embedded cost methodology, discouraging full use of the system. Here, prices covering just short-run marginal operating costs are all that would be required for efficient use of resources. Embedded-cost pricing also does not account for the external costs of transmission service use.⁵⁴ Presuming that the proposed reforms promote competitive trade in transmission service and capacity, pricing that embodies opportunity or incremental cost principals will evolve within the marketplace.

Another concern with unregulated pricing is that the transmission grid owners might engage in cross-subsidization. For example, the transmission owners who also own generation plants might attempt to use high profits on transmission services to subsidize their power sales, undercutting the prices of producers who do not have an ownership position in the transmission firm. When applied to user-owned transmission grids, this argument is not convincing. With each owner able to sell or lease units of capacity openly, and new investment by outsiders feasible, market power is greatly reduced. To be successful, the cross-subsidizer must anticipate that some day he can raise prices to monopoly level in the subsidized market. Yet, given the openness of entry for power producers, a transmission-generation cartel would be improbable. Cross-subsidization fears provide no convincing rationale for price and service regulation of user-owned transmission systems.

Although a major user-ownership restructuring of transmission may be politically feasible only with price regulation,⁵⁵ price regulation, in general, suffers fundamental flaws that should be avoided in the transmission sector of the power industry, especially if the industry can be demonstrably more competitive. The allegedly objective measurement of cost under regulation is an illusion: It neglects the very real opportunity cost caused by the regulator's restriction of market search and action. Removing price regulation is sensible, considered in the context of user-ownership with tradeable capacity rights, augmented by antitrust law. The inability of regulators to define a regulatory pricing regime for transmission that does not cause significant efficiency losses is a warning that troubles await future attempts. Invariably, price regulation has become politicized, bureaucratized, and inflexible. The best price regulation for transmission under user-ownership is simply none at all.

IV. INTEREST GROUP ANALYSIS OF USER-OWNERSHIP

A. Regulatory Reform

Regulatory change is often difficult because the initial high costs of establishing the regulatory system are largely sunk and the ongoing costs of maintaining it are slight (relative to what reformers must bear). As a result, interest in deregulation may be limited and efficiency-enhancing reform and restructuring are difficult to initiate.⁵⁶ To gain support for significant regulatory change, a critically important factor is evidence that the proposal generates net benefits and that it is workable. Accordingly, the approach to regulatory change advanced here is to permit utilities to buy and sell ownership rights to transmission capacity. In absence of clear evidence that user-ownership would not appreciably enhance competition, regulators could facilitate the process by offering a corresponding reduction in regulation. By encouraging incremental change, this approach would allow the realization of user-ownership gains where they are most certain and provide valuable experience of the merits of this policy proposal.

From this perspective it is instructive to examine the likely response of interest groups to the user-ownership proposal and attempt to anticipate what coalitions might form in support of the proposal and which groups may oppose regulatory change. As a general rule, interest group support for a proposal such as user-ownership can be expected if the net benefits under the proposal exceed what could be obtained from other realistic options.

Indeed, industry regulation has become a more expensive process as competitive pressures have increased consumers' choices and reduced the above-normal returns that might be extracted from the regulated industry structure. Additionally, the number of participants to be accommodated in any future regulatory structure is growing. These newcomers have articulated political demands, and therefore the average return from regulation per interest group falls. Actions to halt these trends would be costly too, further reducing the net value of rent-seeking. In sum, a rational interest group may find the overall costs of fighting such battles exceed the likely benefits to competing directly. In such a case, market institutions could be attractive, especially if they can improve economic efficiency and minimize wasteful legal and political struggles.

The evolving interests of major participants in the industry are examined in more detail below. These groups today are less tightly knit than they were ten years ago, and changing expectations about the value of engaging in more aggressive marketing practices are a fundamental cause of these divisions. Those that believe that their wealth and organizational survival depend upon a regulatory "breakout" strategy are more willing to encourage access for others. Those who resist typically believe that the industry can carry on under a modification of existing regulation, at least for many years.

Again, one of the advantages of the evolutionary approach to regulatory change is that there need not be an industry consensus on the proposal's merits, which is often a significant obstacle to regulatory reform. Instead, individual industry participants who believe that forming voluntary user-ownership organizations is in their interests may proceed. In response to the competition generated under the open user-ownership organization, regulators can eliminate unnecessary restrictive regulation.

B. Utilities and Public Power Producers

Utilities have seen transmission as a crucial strategic asset. Control can eliminate competitive entry and assist in protecting the entire superstructure of public utility regulation. The costs of losing control of transmission are largely the benefits accruing to possession of exclusive territorial franchises; opening transmission will make this marketing arrangement far more difficult to defend. Therefore, resistance to transmission reorganization is rational behavior—as long as utilities believe their

interests will be best served by remaining within a regulatory framework much like today's. The strength of this resistance will depend upon, among other things, the expected payoffs of each course of action, the probabilities of outcomes, the cost of mounting political defenses, and the cohesion of utilities in pursuit of their objectives.

On many of these points, signs suggest that utility defense of regulated transmission is wavering. The value of being a public utility rather than a power producer-marketer is debatable; certainly, the regulatory exclusion of much capital cost from rate bases in the 1980s suggests a devaluation. Today, many utilities, not enamored with the public utility institution, are attempting to restructure themselves as power marketers; they generally are less concerned about sharing transmission ownership with "outsiders" than with obtaining access to alternative sources of cheap power. Broad, joint-ownership would be a valuable tool for utilities either short of capacity or with extra capacity to sell. To get beyond many constraints, a contingent within the investor-owned utility sector is likely to push for it. Their splintering from the traditional utility position reduces the credibility of any one organization that alleges to speak for investor-owned utilities.

Perhaps in recognition of the diverse views held by members, the investor-owned electric utilities' trade association, the Edison Electric Institute (EEI), has begun to take a softer position on transmission access, rather than stonewalling against changes, as it has in the past. EEI's position, in 1990, still stresses the value of retaining owners' control of transmission access to the extent that utilities can give priority to their franchised retail consumers and independently manage the transmission systems.⁵⁷ On the other hand, EEI now seems willing to explore options that implicitly extend ownership participation. In 1990, EEI favorably viewed many aspects of two proposals on access, one by the National Rural Electric Cooperative Association (NRECA) and the other by a group called the Large Public Power Council (LPPC). The NRECA proposal allows for "voluntary" planning across a regional transmission system by owners, whom they define as any utility (generator or distributor, that has legally mandated retail service obligations).⁵⁸ The closer alignment of EEI and NRECA, both politically influential lobbies, suggests the evolution of a potentially strong coalition.

Public power producers and cooperatives, in general, share much of the investor-owned utilities' ambivalence toward a user-owned grid. The cooperatives, through their generating and transmission arms (G&Ts), are more ardent traders of power than many investor-owned utilities. But like those utilities, they resist yielding property rights in transmission to outsiders who could become competitors for the cooperatives' native loads.

Taking a step toward joint-user ownership would be consistent with a core interest all these groups wish to defend: legally articulated and enforceable rights and responsibilities in transmission--rather than vaguely stated and inconsistently applied

rules of access. Thus, capacity-sharing user-ownership might be seen as a means of accomplishing these interests of utilities. On the other hand, alienable property rights in transmission capacity present market risks and opportunities which are incongruent with many regulated monopolists' skills and aptitudes. Utilities could greatly influence the choice of transmission policy--if they were willing to explore innovative solutions. Otherwise, in a few years they may have little choice, as wheeling or common carriage may be forced upon them by the gathering political support for expanded access. Thus, the value of leading this debate to an approach more favorable to their interests is considerable.

C. Independent Power Producers

The IPPs also have not offered strong support for structural change in transmission. Their major concern is that emerging bidding systems for new power supplies be structured so the IPPs will not be disadvantaged. To this end, the National Independent Energy Producers (NIEP) advocates that regulators force the utilities to commit to providing access at low prices for IPP bids.⁵⁹

The IPPs' short-term interests may be served by having regulators' force access from transmission-owning utilities without any significant costs or obligations falling on the IPPs. But increased wheeling or common carriage will lead to reduced incentives for efficient transmission system maintenance and construction, as previously discussed. Thus, IPPs also may find that their long-term interests are served better by a market-based, structural solution. Perhaps more than any other interest group, IPPs are positioned to gain from the development of power markets, an evolution that realistically cannot be directed by regulatory fiat or scattered case decisions, but instead will require federal legislation to reform ownership rights in transmission. Such rights would be particularly valuable to IPPs, and, under this proposal, clearly attainable.⁶⁰

D. Industrial Users

Industrial users fear that the transmission access debate will be diverted so that access will remain dominated by the utilities. A trade group for industrial consumers, ELCON, argues that the generating sector of the electric industry can be quite competitive, but, as stated by one representative, John Anderson: "Utility transmission service cannot be competitive and therefore must remain under strict regulation."⁶¹ This position is diametrically opposed to the view advocated in this paper. Industrial users are leery of proposals which rely on market competition in transmission ownership to deal with the market entry (access) issue. ELCON, by contrast, prefers direct regulation of access--in other words, a public transmission system. Yet industrial users are among the primary beneficiaries of greater competition emerging in the electric industry. Consequently, this set of power consumers stands to gain from supporting user-ownership which, by facilitating

competition in power generation *and* transmission, could make reliable power available at a lower cost.

E. Retail Consumers

This proposal does not directly alter the relationship between utilities and retail consumers. On the other hand, retail consumers, represented by distribution firms, cooperatives, and municipalities could, eventually, accept the opportunity to forego purchasing power under public utility regulation and make market purchases via the expanded transmission grid. For example, an independent retail account could request that its serving utility dissolve their relationship. This also would act to release the utility from its obligations to provide service as supplier of last resort. In exchange, the local customer would be free to recontract with the utility or any other suppliers. The retail account gains market flexibility, but would bear market risks—an essential tradeoff that must be accepted for the market to work. Clearly, if retail accounts could still impose costs on the old utilities, then utilities would have another reason to oppose power marketing.

Presuming, however, that public utility regulation continues for some time, then utilities will retain obligations to deliver reliable transmission services to their franchised consumers. Indeed, utilities point to this obligation when defending their position on transmission access issues. Regardless of the status of transmission, utilities could be required to maintain service standards for captive accounts comparable to those before the change, and state regulators could legitimately demand that the utilities hold sufficient transmission capacity so as not to jeopardize service commitments. Such protection will help allay fears of retail consumers that restructuring transmission causes them to face risks to service reliability. Overall, by presenting utilities with opportunities to obtain power at lower costs, the movement toward power marketing, accelerated by transmission reform, will benefit retail accounts.⁶²

F. Environmentalists

Environmental interests in transmission policy center on potential damage that may be inflicted on the land, water, and air, or threats to the health of citizens. For example, a new transmission policy believed to encourage construction of transmission lines raises the issue of health endangerment due to increased electromagnetic field exposure. The evidence of such health damage is inconclusive, but public perception is often at variance with such evidence, and politicians are likely to be sensitive to such grassroots issues. Possibly, environmentalists' opposition to new power lines could hike the costs of developing transmission grids by forcing an investor to acquire more land to create a "safe corridor."⁶³ These concerns are potential deterrents to development of a market-oriented grid.

A convincing argument can be made, however, that a shift to power trading can reduce the demands for generation plant and for transmission lines. In effect, a utility can expand its trading to gain more capacity and thereby face less pressure to build new generation and supporting transmission capacity, which might impose costs on the environment. A user-owned transmission grid could assist the industry in economizing on capacity, lowering reserve margins needed for any given level of reliability, and reducing the pace of new investment. The argument holds for both generation and transmission.

Another related environmental concern is that investments in energy production, especially plants using carbon-based fuels, are damaging to the environment and health of the citizens. Because grids would facilitate more far-flung trading, utilities that would cause greater environmental damage by producing (perhaps in densely populated areas or with heavily polluting plants), can import energy from less densely populated areas and from cleaner plants. These external costs, of course, first need to be placed upon the producers (perhaps by tax or auction) but once internalized, producers (and consumers) have an incentive to use the grid to trade. Thus, user-ownership of transmission is likely to be consistent with protecting environmental interests.

G. Regulators

Because regulators face pressures mounted by the entrenched interests that have standing before them, as well as those presented by legislators and executive branch administrators, regulators normally behave conservatively; this is consistent with both their statutory authority and the basis for their future rewards. In general, interest groups that are now well represented favor limited reform of transmission in which they have a direct say, and FERC is likely to give them that influence. According to a DOE official, "Resolving the transmission problem is best accomplished through a cooperative effort involving FERC, state regulators, and the industry."⁶⁴ On the other hand, the industry, considered broadly, contains widely disparate views that may not easily be reconciled.

For these reasons--the need of a cooperative effort and the diverse interests of the industry--in addition to the merit of gaining experience and allowing participants to freely choose, the voluntary, incremental, regulatory approach advocated here is sensible. In this way, regulators will not have to work against entrenched industry interests, but instead, by offering the incentive of regulatory relief, will be in a position to work with those interests who expect to benefit from the user-ownership proposal.

Consequently, because the structural change envisioned under this approach will come slowly, the political and institutional costs involved in achieving user-ownership and resolving the transmission access problem will be relatively low.

V. CONCLUSION

The policy debate over the role of competition and markets in electric power continues to be waged over the issue of transmission access. Proponents of liberalized access claim that power marketers then could serve the industry well. Opponents claim that greater transmission access instead would increase costs and reduce the reliability of service to existing users. This paper has examined the basis for these concerns and argues that user-owned transmission networks can accommodate a more competitive *and* efficient industry. A major cause of the stunted development of markets in electric power today is that transmission within the regulatory system has not been permitted to evolve structurally in response to technological and competitive changes.

The essential transmission policy issue to be resolved is not whether to liberalize access, but whether to initiate a system of well-defined, private property rights in transmission so that monopoly threats are reduced by the nature of the incentives before the owners. Tradeable capacity rights in transmission capacity would facilitate entry for regional system investments and thus resolve many monopoly power concerns and significantly reduce the scope of regulation. It could do this without sacrificing broad planning and coordination, and without necessitating the formation of superutilities and superregulators. Such a user-owned transmission organization would serve three important objectives, all driven by the users' self interest: (1) broadening the transmission system (enhancing efficiency); (2) keeping transmission open (protecting against collusion); and (3) retaining the flexibility for this market to evolve as changes occur in other markets. By accelerating the movement to power marketing in the United States and benefiting electric consumers, these objectives would advance the electric industry's long term interests.

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Douglas Houston is an economist in the School of Business at the University of Kansas. He is the author of a number of articles on electric utility deregulation, such as "Privatization of Electricity in the United States," in Competition and the Regulation of Utilities (1991), "Privatization of the Tennessee Valley Authority," a 1988 Reason Foundation Policy Study, and "Deregulating Electric Utilities: A Market-Process Approach," in Cato Journal (Winter/Spring 1984).

Notes

1. Richard J. Pierce, "A Proposal to Deregulate the Market for Bulk Power," *Virginia Law Review* 72 (October 1986), p. 1215.
2. Wheeling, in the simplest form, refers to the completion of a power transaction between parties A and B over transmission lines owned by C. If coerced by law, the practice would be mandatory, not voluntary wheeling. Common carriage refers to the opening of transmission lines under rules that apply to all users under universally applicable rules. Common carriage removes the higher priority given to the existing owner's use that is typically extended under wheeling.
3. See Jeanne La Bella, "The Transmission Access Debate," *Public Power*, March-April 1989, pp. 22-23. The Georgia transmission system, unlike the Indiana case, is operated through a joint committee. Investments in capacity are coordinated, with each party's responsibility tied to coincident peak load.
4. *Power Pooling in the United States* (Washington, D.C.: Federal Energy Regulatory Commission, Office of Electric Power Regulation, December 1981), chapter 3.
5. Requirement sales are long-term, firm power sales made to utilities lacking an alternative source for meeting native load. Economy transactions are short-term energy sales from a seller's temporary surplus, and are typically purchased to reduce the buyer's energy costs by replacing higher cost energy from his own plants. Capacity transactions, if firm, treat the buyer as if he were a franchised customer. These can be long or short term and also can provide varying degrees of availability.
6. *Staff Report: Electric Power Supply and Demand for the Contiguous United States, 1989-1998* (Washington, D.C.: U.S. Department of Energy, March 1990), p. 22.
7. *California-Oregon Transmission Project Newsletter*, January 1991, Issue No. 14. Although this project seems to be moving to a partnership approach to transmission, it is unclear how access and pricing will be determined. The issue of ownership rights and responsibilities is clouded by the significant government participation in the project.
8. Indeed, the growth in extra-high voltage transmission (EHV) mileage as a percentage of total transmission mileage suggests the promise of "shipping" power greater distances. These lines are well suited to larger transmission systems. As EHV has expanded over the past decades, the ratio of

transmission miles to generation capacity has fallen. This may reflect, in part, a greater integration of the power industry, such that fewer EHV lines carry power into distant markets, allowing economical generation investments to be further from the consumer markets.

9. Steven G. Breyer and Paul W. MacAvoy, *Energy Regulation by the Federal Power Commission* (Washington, D.C.: The Brookings Institution, 1974).
10. One study suggests that the restraint may be due in part to the high transaction costs to a utility of operating in a pool. See Douglas Gegax and John Tschihart, "An Analysis of Interfirm Cooperation: Theory and Evidence from Electric Power Pools," *Southern Economic Journal* (April 1984), pp. 1077-1097.
11. A transmission system is unlike a "switched" network, like telephones, where messages can be diverted from one path to another. Electricity networks also are unlike pipelines, canals, or highways where the flow of gas, boats, or vehicles travel can be controlled to follow a particular path. By contrast, if a generating station enters power into an electrical network, electricity intermingles in the network. Scott Spiewak and Larry Weiss, *The Wheeling and Transmission Manual, 1989 Edition* (Washington, D.C.: Wheeling & Transmission Monthly Publications), chapter 7.
12. John L. Jurewitz, "The Electricity Transmission Access Debate," Paper presented at the Rutgers Advanced Workshop in Regulation and Public Utility Economics, July 1988.
13. Robert J. Michaels, "Reorganizing Electricity Supply in New Zealand: Lessons for the United States," *Journal of Contemporary Policy Issues* 7 (October 1989), footnote 14.
14. 410 U.S. 366 (1973).
15. 638 F.2d 385 (2d. Cir.1980).
16. 574 F. 2d 610 (D.C. Cir. 1978).
17. FERC might be able to order wheeling if convinced that significant resources and energy can be conserved, or reliability can be improved. Consideration is on a case by case basis. Also, the wheeling order: (1) must preserve existing competitive relationships, (2) must not unreasonably damage the wheeling utility's reliability and ability to serve its customers, (3) must not replace power that the wheeling utility would otherwise have provided under contract or

agreement, and cannot place the wheeling firm in a position where it absorbs a loss.

18. Additionally, wheeling has sometimes been gained by appeal to the Atomic Energy Act of 1954, Section 105(c), which requires that the Nuclear Regulatory Commission (NRC) review the antitrust implications of a utility building and operating a nuclear plant, and, on occasion, NRC has imposed wheeling obligations. Generally, the licensing conditions placed on an applicant appeared to have been targeted at improving supply conditions for small municipal and cooperative power systems. The opportunity to use NRC reviews for any purpose, however, is moot because of the halt of nuclear plant construction in the United States.
19. Docket No. EC88-2 (October 26, 1988).
20. Order at page 22.
21. *New England Power Co. v. New Hampshire*, 455 U.S. 332, 340 (1982); *FPC v. Southern Cal. Edison Co.* 376 U.S. 205, 209 n.5, 216; (1964) (City of Colton); *Florida Power & Light Co.*, 29 FERC 61,140 (1984) (Florida Power I).
22. Reimier H.J.H. Lock and Charles G. Stalon, "State-Federal Relations in the Economic Regulation of Energy," *Yale Journal of Regulation* 7 (1990), p. 458.
23. *Florida Power & Light Co.*, 29 FERC 61,140 (1984).
24. *Re Advance Plans for Construction of Facilities*; 102 PUR4th245 (Wis.P.S.C. 1989).
25. *Wisconsin Pub. Serv. Corp. v. Public Serv. Comm'n*, No. 89CV716.
26. ER90-40, ER90-41, and ER90-488.
27. As quoted in *Inside F.E.R.C.*, September 17, 1990, p. 12.
28. As quoted in *Inside F.E.R.C.*, September 17, 1990, p. 6.
29. For example, a 1990 report released by the California Public Utility Commission's strategic planning office highlights numerous obstacles faced by non-utility power producers who try to access utility transmission systems. See *California Energy Markets '95*, October 5, 1990, p. 13.

30. As quoted in George Melloan, "Killing Kilowatts with Energy Over-Regulation," *Wall Street Journal*, June 13, 1989.
31. *Re Public Service Company of Indiana, Inc.*, Docket No. ER89672-000 and ER89-672-001, Opinion No. 349 (F.E.R.C. 1990).
32. Bidding programs, originally established for the QFs, now have been extended to all-source bidding that includes IPPs, utilities, and demand-side management. But, currently, most bidding programs do not address transmission arrangements, leaving a bidding company to separately negotiate these terms with various utilities. The difficulties that this process imposes often restrain the bidding market to a single utility's service territory.
33. F.E.R.C. Docket No. ER87-97-000.
34. The original agreement sets out a principle that pool members would open transmission to long and short-term users and help parties' build new facilities, to the extent that utilities' customers or the share values of the participants are not affected negatively. See *California Energy Markets*, November 16, 1990, No. 81, p. 9.
35. *Western Systems Power Pool Assessment*, Final Report (Menlo Park, CA: Strategic Decisions Group, 1991), pp. ES-1-ES5.
36. See *California Energy Markets*, February 8, 1991, No. 92, p. 13.
37. Docket No. ER91-195-000 (April 23, 1991), p. 29.
38. See *Inside F.E.R.C.*, September 17, 1990, p. 6.
39. *Electric Power Wheeling and Dealing* (Washington, D.C.: Office of Technological Assessment, U.S. Congress, 1989); *Some Economic Principles for Pricing Wheeled Power*, National Regulatory Research Institute, 1987; *Customer Wheeling: A Fiction Contrary to the Public Interest*, Monograph No. 3, Edison Electric Institute, 1989; *Moving Power: Flexibility for the Future* (Washington, D.C.: National Governors' Association, 1987); and *Electric Wheeling in Illinois*, Illinois Commerce Commission, 1987; *Task Force Report on Transmission*, Federal Energy Regulatory Commission, October 1989.
40. Paul Joskow and Richard Schmalensee, *Markets for Power* (Cambridge, Mass.: MIT Press, 1983).
41. *Electric Power Wheeling and Dealing*, pp. 85-87.

42. Another interesting case of a bottleneck is the recent linking of American automatic teller machines owned by competing banks. The large open-access network that was formed increases the value of all ATM service. Rather than a monopolistic strategy, this integration seems to allow the banks to compete more effectively in the financial services where their expertise should lie, while jointly using the hardware forming the network.
43. Armen A. Alchian, Robert G. Crawford, and Benjamin Klein, "Vertical Integration, Appropriable Rents, and the Competitive Contracting Process," *Journal of Law and Economics* 21 (1978), pp. 297-325.
44. Vernon L. Smith, "Currents of Competition in Electricity Markets," *Regulation* (September/October 1981), pp. 23-29; and "Electric Power Deregulation: Background and Prospects," *Journal of Contemporary Policy Issues* 6 (July 1988), pp. 14-24.
45. Arthur S. De Vany, Robert J. Michaels, and Rodney T. Smith, "Defining a Right of Access to Interstate Natural Gas Pipelines," *Journal of Contemporary Policy Issues* (April 1990), pp. 142-158.
46. Kenneth W. Castello, "The Struggle over Electricity Transmission Access," *Cato Journal* 8, No. 1 (Spring/Summer 1988), pp. 142-158.
47. George J. Stigler, *The Organization of Industry* (Homewood, Ill: Irwin Publishers, 1962).
48. Lucinda M. Lewis and Robert J. Reynolds, "Appraising Alternatives to Regulation for Natural Monopolies," in *Oil Pipelines and Public Policy* (Washington, D.C.: American Enterprise Institute, 1979), pp. 135-140.
49. Public power and cooperatives have been a troublesome factor in the competitive evolution of the industry. By selling subsidized power, they inhibit a well-functioning, competitive marketplace. Also, the political wrangling over use of such public transmission assets as the Bonneville Power Administration's intertie into California interferes with market development. Privatization of these government enterprises should be a goal linked to general transmission policy for the industry. Privatizing the federal power authorities (especially the TVA and Bonneville) will be difficult because strong, well-organized interests (linked to received subsidies) favor continued government operation. On the background and prospects for Bonneville, see David L. Shapiro, *Generating Failure: Public Power Policy in the Northwest* (Lanham, MD: University Press of America, 1989). On the TVA, see Douglas A. Houston, "Privatization of TVA," in *Federal Privatization: Toward Resolving the Deficit Crisis* (Santa Monica, CA: Reason Foundation, 1988).

50. More commonly, capacity-sharing has been used to apportion rights in jointly-owned generation plants, a reasonable response to risks imposed when a producer must sink large investments in assets that could only be directed at the markets defined by the utility's franchise agreement.
51. See William R. Hughes, "Short-Run Efficiency and the Organization of the Electric Power Industry," *Quarterly Journal of Economics* 76 (1962), pp. 592-612.
52. The grid would be required to provide complete information to all potential users about the existing system and plans for its development.
53. See *Pricing of Transmission Service in Bulk Power Markets*, Edison Electric Institute, 1987. Embedded costs are developed by multiplying the regulator's approved rate of return on investment by the depreciated book value of transmission assets and adding average operating costs for the transmission system. These operating costs include payment for average line loss and numerous administrative charges allocated to transmission. Wheeling revenues then are set into prices to specific consumers in one of two ways. Under "rolled-in" costing, the entire system costs are allocated to a consumer based solely on usage. FERC also considers pricing that ties specific cost elements to a user based on the nature of his consumption (e.g., voltage levels), but in general, the first approach is used.
54. For example, loop flow problems typically are not considered, instead utilities let these externalities "balance out" among participants.
55. If so, then rate-base price regulation should be avoided. In other countries, Britain and New Zealand for example, price regulation of transmission has been seen as harmful to emerging wholesale power competition. A modest and more promising alternative is Littlechild's "RPI - X" price indexation. Under this approach, a regulator allows price increases up to a retail price index, less a factor representing some portion of the likely growth of technological productivity in the industry. See John Vickers and George Yarrow, *Privatization: An Economic Analysis* (Boston, MA.: MIT Press, 1988), pp. 106-107.
56. Robert E. McCormick, William F. Shughart, and Robert D. Tollison, "The Disinterest in Deregulation," *American Economic Review* 74 (December 1984), pp. 1075-1079.
57. Bruce Edelson, "In Support of Voluntary Transmission Services," *Public Utilities Fortnightly*, July 19, 1990, pp. 17-19.

58. According to Michael Oldak, regulatory counsel for NRECA, "While participation entitles these utilities to access on a priority basis at cost-based rates, it also includes obligations to provide load and resource data and forecasts--and requires a commitment to long-term support of the system." Michael Oldak, "A Plan for Transmission Access and Pricing," *Public Utilities Fortnightly*, July 19, 1990, p. 24.
59. Nancy H. Sutley and W. Harrison Wellford, "Our Views on Transmission Policy," *Public Utilities Fortnightly*, July 19, 1990, pp. 35-36.
60. Additionally, independent power development will depend upon whether Congress will change the Public Utility Holding Company Act (PUHCA) to exempt IPPs from most of the act's onerous restrictions.
61. John A. Anderson, "Competition and Efficiency in the Electric Utility Industry," *Public Utilities Fortnightly*, p. 14.
62. On the other hand, numerous risks accrue to consumers who continue under public utility regulation, and most regulatory risks cannot be hedged or insured against because of the absence of market mechanisms to do so.
63. Michael Freeman, "The Courts and Electromagnetic Fields," *Public Utilities Fortnightly*, July 19, 1990, pp. 20-22.
64. See *Inside F.E.R.C.*, November 26, 1990, p. 8.