

# THE STRUGGLE OVER ELECTRICITY TRANSMISSION ACCESS

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## Introduction

Transmission access is one of the most highly debated issues in the electric utility industry. The basic argument centers on property rights: the owner's rights of controlling transmission lines as opposed to the rights of independent suppliers and consumers to engage in trade. Specifically, groups of electricity consumers and nonutility power producers want guaranteed access to transmission facilities, mandatory "wheeling" (see Electricity Consumers Resource Council 1987; Hobart 1987; and National Independent Energy Producers 1987). They seek legislation or regulatory rules that would impose an "obligation to transmit" requirement on transmission system owners. The struggle over transmission access rights has become especially fierce over the last few years. Interest groups have expended substantial resources to persuade legislative, judicial, and regulatory bodies to their point of view.<sup>1</sup>

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<sup>1</sup>Several bills have been introduced in Congress and state legislatures giving users transmission access rights. For example, in late 1987 Rep. Lynn Martin of Illinois introduced legislation that would amend the Federal Power Act to give state public utility commissions the authority to order "intrastate" wheeling and customer wheeling. Over the last 10 years, there have been more than a dozen antitrust cases involving transmission access and more are anticipated (see Pace and Frame 1987, p. 1).

The Federal Energy Regulatory Commission has received numerous comments on transmission access and pricing issues in response to its 1985 Notice of Inquiry on wholesale electricity transactions and transmission policies (Docket No. RM85-17-000). The responders included state public utility commissions; many privately owned utilities and their trade associations; and trade associations of rural electric cooperatives, publicly owned utilities, and industrial customers.

The electric utility industry strongly opposes these groups' attempts to obtain transmission access rights. The industry argues that unless utilities maintain control over the use of their transmission systems, major technical, economic, and equity problems are likely to arise.<sup>2</sup>

This paper outlines the current struggle over transmission access and identifies its major sources and participants. A theoretical framework is developed to illustrate the magnitude of the maximum "fighting" costs that groups would be willing to incur to preserve the status quo (in the case of electric utilities) or to obtain users' transmission rights (in the case of consumer groups). These costs are compared with the social welfare costs of pricing inefficiencies currently affecting the electric utility industry. Although the analysis assumes stationary demand and cost conditions, it provides a reasonable benchmark of the economic costs associated with the status quo. Numerical examples estimating these economic costs are also presented.

Whether all fighting costs are wasteful (i.e., represent social costs) is a major issue permeating the transmission access debate. For example, costs expended by consumers to obtain wheeling rights so that they can shop for cheaper power may ultimately produce efficiency gains. These gains are shown to be potentially substantial. For purposes of public policy, these gains must be assessed against the costs of reallocating the property rights of the transmission network from utilities to users. After a review of various policy alternatives, the paper concludes that the sizable sums being spent by special-interest groups over transmission access may warrant an immediate response by the Federal Energy Regulatory Commission (FERC). A longer-term solution may require congressional action.

## The Current Situation

The electric utility industry is becoming increasingly competitive. The Public Utility Regulatory Policies Act (PURPA) of 1978, rising retail rates, and technological improvements in small-scale generating facilities have improved the economic viability of nonutility power production. Nonutility producers believe they can compete with electric utilities in a true marketplace, but one in which they would have guaranteed transmission access. Without this assurance, nonutility producers fear that they may be deprived of selling their

<sup>2</sup>For example, the Edison Electric Institute (1987, Exhibit D, p. 25) stated to the Federal Energy Regulatory Commission: "Apart from potential adverse impacts from mandatory customer wheeling on system reliability and economic dispatch, which are significant and should not be ignored, the remaining consequence is a shift in dollars between the utility's other customers and the entity gaining such access."

power in particular markets.<sup>3</sup> Consequently, their ability to obtain necessary capital funding is jeopardized.

Customers with industrial and wholesale requirements have recently found opportunities and incentives to purchase lower-priced power, owing to unprecedented surplus capacity and rate differentials among nearby utilities. Some wholesale customers have successfully switched to other utilities.<sup>4</sup> Industrial customers have threatened to shop for cheaper power, but they are hindered by state public utility statutes granting utilities exclusive franchises for retail services.<sup>5</sup> Both wholesale and industrial customers are pressing for mandatory wheeling (i.e., forcing transmission-network owners to transport electricity from generators under prespecified conditions) to create opportunities to purchase cheaper power.

In response to the increased demand for transmission services by third parties, electric utilities have generally opposed wheeling power to their current customers unless they are required to do so by contractual arrangements or regulatory decisions. The Federal Power Act allows electric utilities the discretion of whether to decline or provide transmission services to third parties.<sup>6</sup> As a result, utilities can deny transmission services to individual parties even when such transactions are economical.

For the electric utility industry, much is at stake, namely, the continuation of de facto exclusive franchises. By allowing retail cus-

<sup>3</sup>In these markets, producers may receive a higher price than they would otherwise. In the extreme case in which a nonutility producer is able to sell only to the local utility, the utility can exercise its monopsony power by offering the producer a below-market price and can purchase less power than is economically efficient.

<sup>4</sup>For example, some Illinois customers with wholesale requirements have been successful in signing contracts with lower-priced utilities or in getting rate concessions from the local utility (see "Four Illinois Munis Extract Rate Breaks from Comm Ed; General Defection a Spur").

<sup>5</sup>Most U.S. electric utilities have de facto exclusive franchises in which they are granted the right to be the sole supplier of electricity in a specified area in return for providing highly reliable service at a reasonable price (e.g., see Ill. Rev. Stat. 1985, ch. 111 2/3, pars. 8-406 and 407). Pace (1987, p. 277) interprets this privilege to include a situation where "if the customer purchases electricity at its present location, it must purchase it exclusively from the franchised or certificated local utility."

<sup>6</sup>Before the 1978 Public Utility Regulatory Policies Act, FERC had no authority to order wheeling. Although PURPA gave FERC explicit authority to order wheeling, this authority is extremely limited. For example, the commission has never ordered involuntary wheeling under PURPA. In addition, FERC has ruled that PURPA did not grant it any authority to mandate wheeling to rectify anticompetitive behavior. The courts also have tended to severely limit FERC's authority over wheeling.

With regard to the ordering of wheeling by states, it appears that the states are preempted by both the supremacy and commerce clauses of the U.S. Constitution (see Illinois Commerce Commission 1987).

tomers to search for cheaper electricity, transmission access would force utilities to act more like competitive firms, both in controlling their costs and in pricing services according to market conditions.<sup>7</sup> In the short run, present pricing practices, together with transmission access, undoubtedly would result in net revenue losses for utilities with high embedded costs (i.e., with large unamortized capital investment). Utility opposition to transmission access derives from these anticipated losses. These losses can be measured by the inability to recover the full value of sunk costs that would occur under traditional rate-of-return regulation.<sup>8</sup> To avoid such losses, the electric utility industry is likely to expend substantial resources to block any legislation or regulation that would diminish its control of the transmission system.

The present overpricing of electricity to industrial and wholesale customers is a major factor motivating consumers to shop around. This problem stems from several factors: traditional capital recovery accounting, the social contract between utilities and regulators, political considerations, and the monopoly power of local utilities.<sup>9</sup>

Inefficiently high prices have induced industrial customers either to purchase electricity from other suppliers or to generate their own electricity. In either case, the customer may require wheeling services from its local utility. For example, self-generation may produce surplus power that the owner of the facility may want to sell in the

<sup>7</sup>This outcome may also result from bypass induced by self-generation. The efficiency costs typically associated with uneconomical bypass or uneconomical wheeling may therefore be exaggerated when viewed only from a short-term or static perspective.

<sup>8</sup>Under traditional regulation, all prudent capital expenditures are allowed into the rate base where the utility earns a rate of return. If, however, the regulator applies a "used and useful" test to determine what portion of capital should be allowed in the rate base, or if the utility loses customers between rate cases, the utility's shareholders may have to absorb all or a portion of these losses. In the long run, these losses, or at least a portion of them, may be reflected in higher rates to captive customers.

<sup>9</sup>"Overpricing" refers to the standard of economic efficiency. Traditional capital recovery accounting requires too much of the costs of new power plants to be recovered from all customers in the early years and too little in the later years (see Streiter 1982). The social contract between utilities and regulators—that is, the agreement that a utility can recover all "prudent" costs from captive customers—may have protected the utility from imprudent decisions in view of the obvious problems regulators encounter in distinguishing between good and bad management practices. Political considerations, at least from the mid-1970s until recently, have generally favored residential users (see Wenders 1986). Recently, however, price discrimination against industrial customers has subsided with the filings by several utilities of discounted rates for industrial customers. Finally, the monopoly power of local utilities may prevent customers from purchasing electricity from more efficient suppliers. Some of the above factors, of course, can explain why current prices to all customers may be too high.

wholesale or retail market.<sup>10</sup> Thus, the costs incurred by customers to obtain wheeling rights, in addition to the electric utility industry's reactive costs, should be included in the social cost of overpricing industrial electricity. Utilities would more intensively oppose customer wheeling rights as prices deviate further from marginal costs, since "bypass" would result in larger net revenue losses. The sum of these "fighting" costs is measured in the following section.

In sum, the current struggle over transmission access resembles a "prisoner's dilemma" in which each side is unwilling to compromise and fears that slackening its stance would cause the other side to win. The social costs incurred during such strategies are often substantial and recurring (see Wenders 1987).

## Static Analysis

### *Theoretical Framework*

Figure 1 illustrates the case of an industrial customer (or, for that matter, a wholesale customer) who has an incentive to purchase electricity from a nonlocal utility supplier.  $D$  is the customer's linear demand schedule for electricity;  $P_1$  is the electricity price of the local utility;  $P_c$  is the electricity price of a competitive supplier; and  $MC_1$  is the local utility's constant marginal cost line. The customer can benefit from buying electricity from the other supplier by area  $A + B$ .<sup>11</sup> To gain transmission access, a risk-neutral customer would be willing to spend up to this amount.<sup>12</sup>

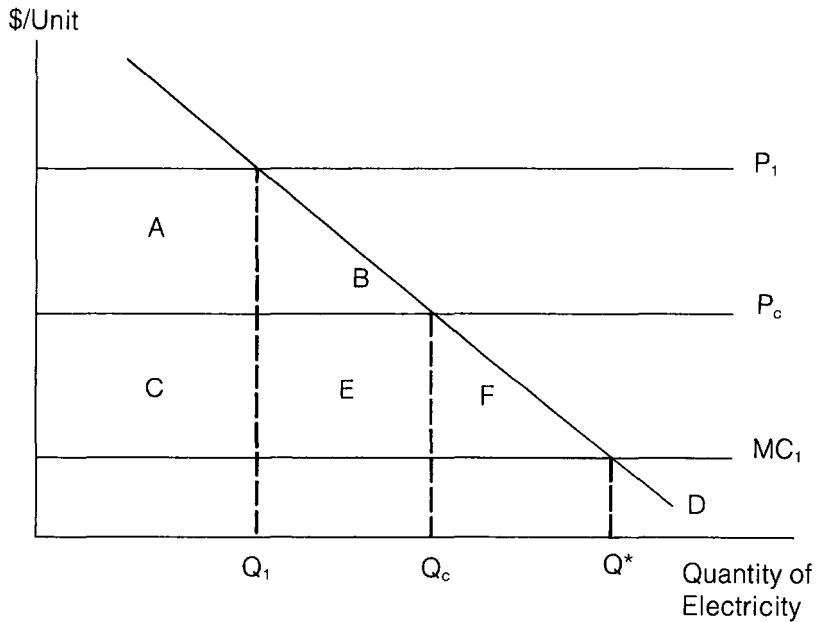
Since a customer's chances of gaining access to the transmission network by pressuring legislators or regulators are uncertain, the customer would expend only some portion of his *ex ante* economic benefits from switching suppliers. For industrial customers as a group, expenditures made to gain transmission access would likely be less, and possibly much less, than the level that maximizes their expected economic benefits. This is so because the group is unlikely to act effectively as a cohesive unit in obviating the free-rider problem. In

<sup>10</sup>Third-party wheeling would act to expand the market for surplus self-generated power. Rather than having to sell power only to the local utility—a classic case of a monopsonistic market—transmission access would enable the owner of self-generated power to sell power to those buyers willing to pay the highest prices. Buyers may include nonlocal utilities, retail customers, or another facility owned by the self-generator.

<sup>11</sup>Area  $A + B$  represents consumer's surplus under the assumptions that different electricity producers are perfect substitutes and that the income effect is zero; therefore,  $D$  measures the customer's Marshallian demand curve for electricity.

<sup>12</sup>See Higgins et al. (1985) for a discussion of the effects of risk preference on rent-seeking costs various groups are willing to incur.

FIGURE 1  
 STATIC ANALYSIS OF TRANSMISSION ACCESS



other words, some members of the group would reveal little preference for transmission access and would therefore devote few resources to the group's efforts.<sup>13</sup> The free-rider effect would probably be much less for the electric utility industry, since it is highly organized. Consequently, the fighting costs that the industry is willing to incur should correspond closer to the "maximum level" (measured later in this section).

Figure 1 also shows that the local utility's net revenues would decline by area  $A + C$  when the customer bypasses the utility for another supplier. The utility's losses are a direct function of the difference between its marginal cost and price, which can be quite large for utilities that are completing high-cost baseload plants. Because these utilities have strong incentives to thwart bypass, they generally would refuse to transmit power purchased by a customer from another supplier. In Figure 1, utilities would be willing to expend a maximum of area  $A + C$  to counter efforts by consumers to gain transmission access.

<sup>13</sup>See Baumol and Ordober (1985) for a discussion of how the free-rider problem affects rent-seeking costs.

The maximum fighting costs are measured by area  $2A + B + C$ . This area is equal to the maximum combined costs incurred by consumer groups to gain transmission access and by electric utilities to maintain voluntary wheeling. These costs may produce no economic efficiency gains, and therefore they represent a social cost of continuing the current right of utilities voluntarily to supply transmission services. In comparison, allocative (pricing) inefficiency, excluding the fighting costs, is measured in Figure 1 as area  $B + E + F$ . This area is less than the maximum fighting costs. The probable minimum difference between the two areas is area  $2A$  (see Appendix).

#### *Additional Efficiency Issues*

If the electric utility industry is successful in preventing consumers from gaining transmission access, the cumulative fighting costs will have done no more than maintain the status quo. The heart of the current debate is whether this outcome would enhance efficiency, in relation to transmission access proponents winning the fight. If customer transmission access results in a reallocation of electricity production to more cost-efficient suppliers, the status quo may carry a high social cost. On the other hand, requiring utilities to wheel electricity for their present customers may be uneconomical, given existing regulatory pricing procedures. For example, an industrial customer may bypass a local utility in favor of another utility that has higher marginal costs. Many of the new high-cost baseload plants have high prices but low marginal costs. As a result, the prevention of customer wheeling may actually improve economic efficiency, at least over the short run.

One way to avoid uneconomic bypass by customers with transmission access rights is to allow market-based pricing. A utility would then be able to adjust its prices to short-run marginal cost in order to attract or retain customers. According to Figure 1, if the local utility offers a price equal to its marginal cost,  $MC_1$ , and loses a customer to another utility, the competing utility must have a lower marginal cost, assuming that all utilities can price as low as their marginal costs. The allocative efficiency gain from the local utility being pressured by competitive forces to offer a marginal cost-based price is measured by area  $B + E + F$ . Further, if electricity production is reallocated to more efficient suppliers, productive efficiency would also improve.<sup>14</sup>

<sup>14</sup>Productive efficiency may be improved since the varying prices charged by suppliers would more closely reflect each one's marginal costs. Consequently, the likelihood of customers being supplied by lower-cost producers in a region is greater than when such customers are constrained to purchase their electricity from local utilities at

So transmission access, accompanied by market-based pricing, may lead to large efficiency gains in the electric utility industry. But if this is the case, why can utilities refuse to transmit power for their customers, and why must utilities generally price their services on the basis of fully distributed costs? Two important reasons come to mind.

First, electric utilities as a group generally oppose disruption of their exclusive franchises and the creation of a truly competitive environment. In a competitive setting, price wars, threats of bankruptcies and mergers, and low profit margins would become more common.<sup>15</sup> For example, in Figure 1, competition may reduce the utility's net revenues by area  $A + C$ .

Second, most state public utility commissions and residential consumer groups would be likely to oppose, or at least be reluctant to support, a combined competitive pricing/customer transmission access regime.<sup>16</sup> A commission's main concern would be the economic effect on captive customers when customers switch to other suppliers. Under traditional rate-making practices, a utility's net revenue losses are eventually passed on to its remaining customers in the form of higher rates. This static perspective of competition assumes a zero-sum game in which there would necessarily be winners and losers. Although this assumption would likely hold up in the short run, in the longer run all customers may benefit from a more cost-conscious and price-efficient electric utility industry. But, because these benefits are less immediate and more uncertain than the costs, they would be greatly discounted by regulators and residential consumer groups. The long-run efficiency gains may be much greater than the static gains shown in Figure 1 as area  $B + E + F$ . The utility's marginal cost curve may shift downward as the result of competitive forces (induced by open transmission access) pressuring the utility to improve its internal productive efficiencies.

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embedded cost-based rates. In Figure 1, higher productive efficiency can be measured by multiplying the difference between the marginal costs of the local utility and the new supplier by the amount of electricity lost by the local utility.

<sup>15</sup>Electric utilities might be expected to argue that retail customer access to the transmission network, coupled with competitive pricing, would lead to "destructive, cut-throat" competition. This type of argument was favored by the electric utility industry at the beginning of this century in its support of state regulation (Jarrell 1978). The alleged social harm of competition was also an argument often used to support regulatory cartelization of other industries.

<sup>16</sup>State commissions are less opposed to proposals promoting interutility wheeling, because such wheeling would have no expected upward effect on electricity prices and, in the long run, may defer the building of new generating capacity.



Above all, Figure 1 illustrates that consumers in competitive markets may realize large economic gains from a competitive pricing/transmission access environment. This gain is measured as the trapezoid area bounded by the customer's demand curve, the "non-competitive" price,  $P_1$ , and the local utility's marginal cost line,  $MC_1$ . This large gain should stimulate much activity by noncaptive customers to obtain transmission access rights. Since a sizable portion of the gain (area A+C) is extracted from utilities, however, they would try to thwart such efforts.<sup>17</sup>

The total social costs of reform and reactive activities by various interest groups may be substantial. These costs would be magnified if the outcome produces a decline in economic efficiency. For example, under present pricing procedures, if consumer groups succeed in obtaining transmission access, the less efficient utilities may supply additional electricity and the more efficient utilities may supply less. This outcome, which is a claim of the electric utility industry, cannot be disregarded (see Pace and Frame 1987; Illinois Commerce Commission 1987).

As stated above, however, combining transmission access with market-based pricing may greatly improve economic efficiency in the electric utility industry. Therefore, if customers gain transmission access rights that, in turn, provoke competitive pricing, the fighting costs may have a significant efficiency-enhancing effect. The basic argument is that in the absence of transmission access and large-scale bypass, utilities and their regulators would continue to price inefficiently on the basis of embedded costs. But with bypass induced by transmission access, regulation would attempt to protect the captive customers. The most efficient way of doing so would be to allow the utility to compete with other suppliers by offering market-based prices. Opponents of bypass, who argue that permitting customers to choose suppliers would reduce economic efficiency, neglect the likelihood of drastically changed pricing procedures under transmission access. In other words, it is presumed that pricing is unaffected by customers able to buy electricity from nonlocal utilities. Since the deadweight losses from present pricing practices would increase with bypass opportunities, regulators should have greater incentive to modify such practices. This is because deadweight losses reduce potential benefits that regulators can bestow on consumers and producers collectively (see Becker 1983).

<sup>17</sup>Area A + C may eventually be recovered from captive customers in the form of higher rates. Since some of these customers are politically active, the utility's shareholders may ultimately absorb the net revenue losses.

*Numerical Examples*

In computing the different areas in Figure 1 on an annual basis, one scenario is presented in which industrial customers of an Illinois utility are able to purchase cheaper electricity from utilities located in adjacent states. Applying actual 1988 data, the Illinois utility charges 5.75 cents per kilowatt-hour (kWh), and other utilities charge, on average, 4.09 cents per kWh (including market transaction costs and transmission charges). The Illinois utility's short-run marginal cost is 2.91 cents per kWh; its sales loss from bypass of industrial customers to other utilities is 10 million megawatt-hours.<sup>18</sup> Finally, it is assumed that the price elasticity of demand for industrial customers is one (in absolute terms). Based on this scenario, area 2A + B + C ("maximum fighting costs") is computed as \$474 million, area B + E + F ("allocative inefficiency") as \$70 million, and area 2A (the "minimum" difference between the two foregoing areas) as \$332 million. These calculations clearly illustrate the maximum fighting costs are large, both in absolute terms and relative to allocative inefficiency.<sup>19</sup> They also imply the potential benefits to be gained from legislative or regulatory action lessening the intensity of the transmission access battle. Furthermore, the calculations show a \$284 million loss in net revenue to the Illinois utility and a \$190 million gain to industrial customers who switch suppliers.<sup>20</sup>

Three other scenarios, presented below, assume that some industrial customers in northern Illinois, northern Indiana, or both bypass their local utilities and buy their electricity from downstate Illinois utilities belonging to the same power pool. The three scenarios are as follows:

- Scenario A: Surplus electricity from downstate utilities is sold only to northern Illinois industrial customers.
- Scenario B: Surplus power from downstate utilities is sold only to northern Indiana industrial customers.
- Scenario C: Surplus power from downstate utilities is sold to both northern Illinois and northern Indiana industrial customers on the basis of their relative existing industrial demands.

<sup>18</sup>This sales loss represents about one-fourth of the total sales made by Illinois investor-owned utilities to industrial customers.

<sup>19</sup>The estimated maximum fighting costs are almost seven times greater than the dollar value of the allocative inefficiency.

<sup>20</sup>The Illinois utility may earn a profit from providing transmission service and backup service to customers that switched. Utilities currently make little profit from wheeling power to third parties. Wheeling rates generally are based on embedded costs, which utilities claim are below their opportunity costs (National Regulatory Research Institute 1987).

## ELECTRICITY TRANSMISSION

Table 1 shows the estimated annual economic effect on the various parties affected by the bypass. The net revenue losses to the utilities victimized by bypass are large, and the benefits to the switching customers are likewise large. Furthermore, the efficiency gain for each scenario is substantial: \$99.0 million (scenario A), \$87.3 million (scenario B), and \$88.6 million (scenario C). These gains are a result of electricity being supplied by a lower-cost producer. The maximum fighting costs, representing the sum of the economic losses to the old supplier plus the economic gains to industrial customers, are also large: \$422.1 million (scenario A), \$454.4 million (scenario B), and \$444.5 million (scenario C). It is assumed that the downstate utilities, in spite of their short-term gain, will not lobby or undertake other activities in support of customer wheeling. Such an assumption is reasonable, given the electric utility industry's vigorous opposition to customer wheeling. Individual utilities would likely be reluctant to "buck the industry line."

**TABLE 1**  
**ECONOMIC EFFECT OF BYPASS BY INDUSTRIAL CUSTOMERS<sup>a</sup>**  
**(IN MILLIONS OF DOLLARS)**

Affected Party	Scenario		
	A	B	C
Northern Illinois Utility	(255.6) <sup>b</sup>	—	(181.8)
Northern Indiana Utility	—	(277.6)	(90.2)
Downstate Utilities	188.1	188.1	188.1
Illinois Industrial Customers	166.5	—	118.4
Indiana Industrial Customers	—	176.8	54.1
<b>Total<sup>c</sup></b>	<b>99.0</b>	<b>87.3</b>	<b>88.6</b>

<sup>a</sup>Several assumptions were made for the different parameters: electricity prices = 5.75¢ per kWh (northern Illinois utility), 5.98¢ per kWh (northern Indiana utility), and 3.90¢ per kWh (downstate utilities); short-run marginal costs = 2.91¢ per kWh (northern Illinois utility), 2.51¢ per kWh (northern Indiana utility), and 1.81¢ per kWh (downstate utilities); the potential industrial bypass losses for northern Illinois and northern Indiana utilities are  $20 \times 10^6$  megawatt-hours (MWhs) and  $8 \times 10^6$  MWhs, respectively. Finally, the potential market supply by downstate utilities to the northern areas is  $9 \times 10^6$  MWhs.

<sup>b</sup>The numbers in parentheses represent net revenue losses.

<sup>c</sup>The total dollar amount reflects the efficiency gain associated with each scenario. It equals the net benefit to utilities and industrial customers as a whole.

## Policy Alternatives

The efficiency gains measured in the preceding section do not account for potential costs that may result from reallocating property rights of transmission facilities from owners to users. For example, forced wheeling may jeopardize the reliability and stability of the transmission network (see Edison Electric Institute 1987; Pace and Frame 1987).

In addition, unless forced wheeling legislation and rules developed by regulators are explicit and well-specified, the rights of both owners and potential users would be ambiguous: would transmission owners be required to expand capacity when new demands are imposed; or would owners only have to find space on their existing networks to accommodate demand? If so, would access be conditional on additional wheeling's impact on the stability and reliability of the entire transmission network? Without explicit access rules, utilities face increased uncertainty on how much to expand their transmission capacity. They may be reluctant to invest in new capacity, especially if the prices they received for providing transmission services were below their opportunity costs. In the absence of market-based pricing of transmission services, noneconomic criteria would likely determine who obtains access to the network. Consequently, highest-value users may be denied transmission service because of occupancy by other users.

Forced wheeling may create an additional problem by increasing the external costs of operating the transmission network. Forced wheeling is likely to lower the reliability of electric service to consumers using interconnected utilities.<sup>21</sup> Unless transmission-service prices are adjusted upward to reflect these costs, efficiency losses would result.

Other alternatives that would give consumers and independent power producers increased access to the transmission network may be preferable. Vernon Smith (1987) proposes that unregulated parties can share ownership rights in a transmission line. He argues that this institutional arrangement can provide "competition in the presence of scale economies." Under his proposal, owners would have the

<sup>21</sup>Such use is referred to in the electric utility industry as the parallel path problem, which now occurs regularly. All interconnected utilities encounter the problem but tolerate it as a trade-off for increased reliability and improved transmission efficiencies.

right either to use their share of a transmission line or to sell (or lease) it to others. Consumers and independent power producers would be able to negotiate with owners for transmission access rights at a compensatory (unregulated) price. Compared with the forced-wheeling option (assuming present regulatory pricing procedures), Smith's proposal would give owners an incentive to expand their transmission capacity and to sell access rights to the highest-value users.

Alternative transmission-access options include vertical disintegration of the electric utility industry, government ownership of transmission facilities, and more efficient pricing of transmission services. Although vertical disintegration may be the preferable long-run solution to the transmission access problem, it has potential problems that at this point are not well understood (see Joskow and Schmalensee 1983; Stelzer 1982).

Government ownership of the transmission network would be plagued with serious problems. First, the government would probably be less efficient than the private sector in operating and expanding transmission facilities. Second, a publicly owned transmission network would more likely set prices for transmission services that are less market oriented and more reflective of the political strengths of various users. Overall, the economic rationale for public ownership of the transmission network is unpersuasive. In the absence of substantial market failure that is uncorrectable by private ownership, little support exists for government ownership.

The "more efficient pricing" option, which is the one being pursued by FERC, seems sensible as a starting point (see Hesse 1988). Present pricing policies give utilities little incentive (and even a disincentive) to provide transmission services to third parties and to expand their transmission capacity (see Illinois Commerce Commission 1987; National Regulatory Research Institute 1987). Some of the present utility opposition to wheeling may dissipate if utilities are given an opportunity to profit from transmitting power for other parties. Flexible pricing of transmission services (e.g., auctioning transmission capacity or allowing prices below stand-alone costs) would also allow utilities to quickly vary their prices when market conditions change. Consequently, utilities may offer more transmission services, especially to those users who value these services the most and are therefore willing to pay the highest prices.

## Conclusion

Urgent action on transmission access may be warranted. Various interest groups are devoting substantial resources to the issue: con-

sumer and nonutility groups hope to obtain transmission access, and the electric utility industry hopes to maintain its complete control over the supply of transmission services. Because each side is spending large sums of money, some type of legislative or regulatory compromise balancing the interests of all participants is likely. For example, one policy alternative that may be politically acceptable involves giving nonutility power producers guaranteed transmission access while allowing utilities to earn greater profits from supplying transmission services to third parties.<sup>22</sup>

Under present transmission-service pricing procedures, there is some doubt whether customer access to transmission facilities would improve economic efficiency. The electric utility industry claims that the major economic effect of transmission access would be distributional rather than efficiency enhancing (i.e., "wheeling money") and that the reallocation of property rights would create technical and external-cost problems for transmission systems. On the other hand, continuance of a local utility's monopoly power may stifle competitive forces from creating a more economically efficient electric utility industry. The static analysis showed that the efficiency gains from competition could be substantial. Assessing which side is correct is made difficult by the uncertainty surrounding the economic efficiency effects of each side's proposed course of action.

Although the efficiency effect of transmission access is arguable, the large distributional effect is not. With substantial dollars at stake, both sides of the transmission access issue would likely continue to expend substantial sums of money to sway legislators and regulators to their respective positions. Which side will ultimately prevail is difficult to judge. Because of the concentration of power within the electric utility industry and its high degree of organization, it will be difficult for consumers and nonutility producers groups to gain transmission access rights. There seems to be, however, a political shift toward more competition in the electric utility industry, which would favor consumer and nonutility producers groups.<sup>23</sup>

In any event, politicians are unlikely to quickly resolve the transmission access issue since the potential gains from either side to

<sup>22</sup>The FERC appears to be receptive to market-based transmission service pricing by its approval of the proposed experiment of the Western Systems Power Pool (Docket No. ER87-97-001, 12 March 1987) and the Baltimore Gas and Electric's proposed auctioning of transmission capacity (Docket No. ER87-496-000, 7 August 1987).

<sup>23</sup>This shift is reflected in the increased demand for wheeling (discussed above). The benefits to noncaptive customers from switching suppliers have risen to the point where these customers lobby vigorously for transmission access rights. The FERC appears to be moving toward support of a more competitive electric utility industry (see Federal Energy Regulatory Commission 1987).

obtain their support are substantial.<sup>24</sup> As a stopgap policy, FERC may have to initiate action to resolve the conflict. Although its authority to order wheeling is currently constrained by the Federal Power Act, FERC can, through its pricing policies, give utilities more pecuniary incentives to accommodate third-party demands for transmission services.<sup>25</sup> FERC can also better specify the conditions under which a utility can refuse to provide transmission services. For example, the commission may require utilities to show that transmission capacity is inadequate (which would be a highly contentious issue) or that technical difficulties would result from transmitting power for a specific party.<sup>26</sup> Since the debate is over property rights, however, any FERC initiative unfavorable to electric utilities may be overturned by congressional or judicial action. Electric utilities would likely conduct an aggressive campaign if FERC were to force them to relinquish control of their transmission network.

As a long-run remedy to the transmission access problem, Smith's proposal seems most attractive. It would (1) enhance competitive conditions by reducing the market power of any one transmission owner; (2) continue existing benefits from economies of scale in transmission; (3) allow property rights to transmission access to be transferred in an efficient manner; (4) encourage owners of transmission lines to make economical investments in new capacity; and (5) define the actual property rights of owners and potential users of transmission lines.

Smith's proposal may make unnecessary much of the fighting costs that are now incurred by special interest groups. There would remain, however, the problem of the existing social contract whereby retail

<sup>24</sup>Proposed wheeling legislation may represent what is sometimes called "milker bills." McChesney (1987) describes milker bills as "legislative proposals intended only to squeeze private producers for payments not to pass the rent-extracting legislation." Because transmission systems constitute large sunk costs, electric utilities are vulnerable to politicians' rent-dissipating efforts. As McChesney points out, politicians have been active participants in the rent-seeking arena.

<sup>25</sup>It should be noted that the electric utility industry has argued that the existing transmission network is being utilized at or near its maximum capacity in many areas of the country. If this is the case, raising transmission prices would be expected, at least in the short run, to have an insignificant effect on the availability of transmission services. Consequently, higher transmission prices would effectively transfer income from the buyer and seller of electricity to the transmitter and thus result in small total economic welfare gains.

<sup>26</sup>Potential users are handicapped because of the information problem in determining independently whether a utility has available transmission capacity. Consequently, utilities are able to prevent economical trading simply by asserting that no transmission capacity is available. Even where forced wheeling is permitted, this problem would still exist.

consumers are required to purchase their electricity from a local utility. Changes in federal legislation, in addition to those implicit in Smith's proposal, would be needed to give retail consumers the right to choose their electricity suppliers. The benefits from giving retail consumers this right may be substantial.

## Appendix

The proof that the maximum fighting costs exceed the welfare cost of allocative inefficiency, at a minimum, by Area 2A is derived below.

First, the difference between the two areas, designated as MFC, is the maximum fighting costs minus allocative inefficiency. It can be written as

$$MFC = 2A + C - E - F.$$

From Figure 1, MFC can be expressed as

$$MFC = 2(P_1 - P_c) Q_1 + (P_c - MC_1) Q_1 - (P_c - MC_1)(Q_c - Q_1) - 1/2 (P_c - MC_1)(Q^* - Q_c).$$

Rearranging the terms, and simplifying,

$$MFC = 2Q_1 (P_1 - MC_1) - 1/2 (P_c - MC_1)(Q_c + Q^*).$$

Next, setting  $Q_c = \frac{e Q_1 (P_1 - P_c)}{P_1} + Q_1$ , and

$$Q^* = \frac{e Q_1 (P_1 - MC_1)}{P_1} + Q_1, \text{ where } e \text{ is the}$$

price elasticity of demand in absolute terms, MFC is equal to

$$MFC = 2Q_1 (P_1 - MC_1) - 1/2 (P_c - MC_1) \frac{eQ_1 (P_1 - P_c)}{P_1} + Q_1 + \frac{eQ_1 (P_1 - MC_1)}{P_1} + Q_1,$$

or

$$MFC = 2Q_1 (P_1 - MC_1) - 1/2 (P_c - MC_1) \left[ 2Q_1 + \frac{eQ_1}{P_1} (2P_1 - P_c - MC_1) \right].$$

Assuming  $e$  is equal to one, which falls within the range of estimated



price elasticities for industrial consumers of electricity (Bohi 1981), MFC simplifies to

$$\begin{aligned} \text{MFC} &= 2Q_1 (P_1 - \text{MC}_1) - 1/2 (P_c - \text{MC}_1) \\ &\quad 4Q_1 - \frac{Q_1}{P_1} (P_c + \text{MC}_1), \end{aligned}$$

or

$$\text{MFC} = 2Q_1 (P_1 - P_c) + 1/2 Q_1 (P_c - \text{MC}_1) \left[ \frac{1}{P_1} (P_c + \text{MC}_1) \right].$$

The first term on the right-hand side is Area 2A in Figure 1. The second term is therefore the residual, or the amount by which MFC exceeds Area 2A.

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