

**OVERVIEW OF ISSUES RELATING TO  
THE RETAIL WHEELING OF ELECTRICITY**

Kenneth W. Costello  
Associate Director

Robert E. Burns, Esq.  
Senior Research Specialist

Youssef Hegazy, Ph.D.  
Research Associate

THE NATIONAL REGULATORY RESEARCH INSTITUTE  
The Ohio State University  
1080 Carmack Road  
Columbus, Ohio 43221-1002

May 1994

This report was prepared by The National Regulatory Research Institute (NRRI) under a contract with the New Mexico Public Utility Commission (NMPUC). The views and opinions expressed in this report reflect those of the authors only and do not necessarily reflect those of the NMPUC or the NRRI.



## TABLE OF CONTENTS

	Page
<b>LIST OF TABLES</b> .....	v
<b>FOREWORD</b> .....	vii
<b>ACKNOWLEDGEMENTS</b> .....	ix
<b>SECTION</b>	
<b>1 Background</b> .....	1
<b>2 State Activities</b> .....	11
<b>3 Summary of Positions</b> .....	19
Supporters .....	20
Opponents .....	24
State Commission Perspective .....	32
<b>4 Legal Considerations</b> .....	35
Are States Permitted to Require Retail Wheeling? .....	35
How Can States Permit or Require Retail Wheeling? .....	51
<b>5 Technical Considerations</b> .....	55
Definitions of Wheeling .....	55
Potential Problems and Solutions .....	57
Technical Measures To Correct for Wheeling Impediments .....	65
Final Comments .....	67
<b>6 Economic/Policy Considerations</b> .....	69
General Effects of Retail Wheeling .....	69
Effect on Core Customers .....	77
Economic-Efficiency Arguments .....	80
Wholesale Versus Retail Wheeling .....	83

**TABLE OF CONTENTS--Continued**

	Page
<b>SECTION</b>	
<b>7 Lessons To Be Learned from the Effects of Competitive Forces in Regulated Industries</b> .....	87
<b>8 A General Assessment of Retail Wheeling</b> .....	93
<b>POSTSCRIPT</b> .....	101
Michigan Public Service Commission Interim Decision .....	101
California's Rule-Making Proposal .....	102

## LIST OF TABLES

	Page
1 Major Topics Addressed During Michigan PSC Retail-Wheeling Proceedings .....	13
2 Benefits of Retail Wheeling: Perspective of Industrial Consumers .....	21
3 Questions Pertaining to Stranded-Investment Costs .....	28
4 Comparison of Electric Power and Natural Gas Industries .....	73
5 Policy Questions Relating to Retail Wheeling .....	86
6 Regulatory Responses to Competitive Forces .....	87
7 Potential Benefits and Costs of Retail Wheeling .....	95



## **FOREWORD**

The NRRI conducted a survey of the legal, technical, and economic issues associated with the retail wheeling of electricity. The work was performed under a contract with the New Mexico Public Utility Commission. This report represents the product of that work.

This report should help state public utility commissions in addressing the complex and wide-ranging questions relating to retail wheeling. It presents a balanced overview of the positions and arguments of the different interest groups currently participating in the retail-wheeling debate. A major conclusion reached is that retail competition, induced by end-use transmission access, could radically change the structure, operation, and performance of the electric power industry. State commissions may therefore want to begin to understand and study the consequences of retail wheeling for the electric power industry and regulation. We hope that this report will assist our clientele in this regard.

Douglas N. Jones, Director  
NRRI  
Columbus, Ohio  
May 1994



## **ACKNOWLEDGEMENTS**

The authors gratefully acknowledge the review by Dr. Michel L. Hiser of the Michigan Public Service Commission of an early draft of the report. The authors are also grateful for the excellent job of editing and typing by Dr. Francene Sevel and Ms. Marilyn Reiss, respectively.



## 1. BACKGROUND

The electric power industry is next on the block to undergo radical transformation. It has seen competition edging into individual markets, particularly the bulk power market. Market forces in the coming years will continue to penetrate the industry as interest groups progressively perceive the benefits of competition, the costs of traditional regulation, and monopoly power exhibited by electric utilities.

The recent movement toward more competition in the electric power industry has recently provoked a debate over the merits of retail wheeling. Specifically, a dialogue on whether retail customers should have the right to purchase their power requirements from sources other than the local utility has sprung up in several states including New Mexico. No state has enacted broad legislation, either requiring or granting authority to a state public utility commission to order retail wheeling.<sup>1</sup> Growing pressures will inevitably bring the day when this is no longer true. It is a matter of time before some state, either through legislative action or commission initiative, will open up the doors for retail wheeling.<sup>2</sup>

At the outset it is important to distinguish between retail wheeling and other forms of wheeling in the electric power industry. Wheeling can be defined as the use of the transmission facilities of one network to deliver power of and for another entity or entities.<sup>3</sup> A wheeling transaction typically involves a utility transmitting power for two other utilities that are not

---

<sup>1</sup> Last year, the Nevada Legislature authorized retail wheeling as part of an economic development bill to lure firms to locate new plants in the state and other states have authorized retail wheeling on a selective basis (see section 4).

<sup>2</sup> On April 20 of this year the California Public Utilities Commission prepared rules that would ultimately permit retail wheeling for all customers. The Postscript of this report contains a summary of those rules as they pertain to retail wheeling. The Commission ruling could have significant ramifications for other states. Because this report was being finalized at the time the Commission's order was issued, no complete analysis of the order was performed.

<sup>3</sup> This definition was taken from Kevin Kelly et al., *Some Economic Principles for Pricing Wheeled Power* (Columbus, OH: The National Regulatory Research Institute, 1987), 270.

physically interconnected. Under such a transaction, which is wholesale in nature, the transmitting utility is neither the seller or buyer of power. Wholesale wheeling occurs when the buyer of power resells the wheeled power to retail customers. An example is an investor-owned utility (IOU) wheeling power for a municipality located in its control area. Another example involves the selling of power by an exempt wholesale generator (EWG) to a utility for resale by that utility. While these two examples fall under the definition of wholesale wheeling, important differences exist. The first example involves a partial or full requirements customer of a utility receiving transmission service from the same utility in order to purchase power from another supplier.<sup>4</sup> This form of wholesale wheeling is similar to retail wheeling, where the direct purchaser of the wheeled power is the end user of the power. The second example does not involve the utility losing any sales to another supplier. Rather, the utility purchases power to lower its cost of service or increase its reliability or both.

Retail wheeling involves a retail customer of a utility obtaining transmission service to purchase power from another supplier.<sup>5</sup> Retail wheeling includes self-service wheeling, where the local utility transmits power within its control area from a generation site to a consumption site both owned by the same entity. An example of retail wheeling is an industrial customer in a utility's service area buying power from another utility or from a cogenerator.

As discussed in this report, the fact that retail wheeling is rare in the United States can be attributed to a combination of legal, technical, and economic impediments.

---

<sup>4</sup> See, for example, Rodney Frame and Joe D. Pace, "Approaching the Transmission Access Debate Rationally," in *Transmission Group Working Paper No. 1* (Washington, D.C.: National Economic Research Associates, 1987), 3.

<sup>5</sup> *Ibid.*, 3.

Most wholesale wheeling does not create problems regarding obligation to serve and stranded investment, and fewer legal and economic problems ensue.

Overall, wholesale wheeling (defined as the condition under which the utility purchaser continues supplying its requirements customers the same amount of power) is less problematic because it:

- (1) should not cause severe financial problems for any utility;
- (2) does not fundamentally affect the "regulatory compact;"
- (3) would create fewer planning problems;
- (4) should potentially cause less inefficiencies (a full discussion of this point is made in section 6);
- (5) involves less controversy over the equity effects; and
- (6) entails no change in the relationship between a utility and its requirements customers.

A major stimulus behind the recent interest in retail wheeling was the passage of the Energy Policy Act of 1992 (EPAAct).<sup>6</sup> The legislation, in particular sections 721-726, prohibits the Federal Energy Regulatory Commission (FERC) from ordering retail wheeling. As interpreted by some experts, the Act or federal law in general, does not prohibit a state from allowing retail wheeling. Whether or not retail wheeling should be allowed is a matter for state legislatures or state commissions to decide.<sup>7</sup> Proponents of retail wheeling point to the Act's so-called "savings clause," which they argue prevents FERC from preempting any state law regulating retail wheeling.

Although this report concurs with this point of view, some analysts have argued that

---

<sup>6</sup> An overview of EPAAct is presented in Kenneth W. Costello et al., *A Synopsis of the Energy Policy Act of 1992: New Tasks for State Public Utility Commissions* (Columbus, OH: The National Regulatory Research Institute, 1993).

<sup>7</sup> See, for example, Steve Michel, "A Customer's View of Retail Wheeling," paper presented at The National Regulatory Research Institute/U.S. Department of Energy National Seminars on Public Utility Commission Implementation of the Energy Policy Act of 1992, Portland, Oregon, July 16, 1993.

EPAct does not grant state legislatures or state commissions any authority to order retail wheeling nor does it remove existing federal jurisdiction over transmission activities in interstate commerce. Their interpretation of the "savings clause" is that it leaves unchanged the authority of the states from their pre-EPAct status.<sup>8</sup> Where these analysts appear to be on more solid ground is their assertion that a definite answer to the question of how much authority do states have will ultimately require a court decision.

In the eyes of some consumer groups, EPAct has reduced the uncertainty over the legality of retail wheeling. This might be a major reason why industrial groups in many states have begun to press for retail wheeling. Some of this pressure is being directed at the state legislature, which in most states may have to amend existing statutes to allow retail wheeling.

Several factors behind the recent interest in retail wheeling can be identified. First, a large price differential exists between utilities, caused partially by the significant differences of recent capital expenditures among utilities.<sup>9</sup> Second, the current electricity prices of most utilities are high relative to the cost of new generation facilities;<sup>10</sup> there is also a strong correlation between

---

<sup>8</sup> The "savings clause" (subsection 212(h) of the amended Federal Power Act) says that:

Nothing in this subsection shall affect any authority of any State or local government under State law concerning the transmission of electric energy directly to an ultimate consumer.

According to one interpretation, this clause does not affect the FERC's exclusive jurisdiction in interstate commerce. Consequently, the clause does not change any state authority or power as is "otherwise lawful." (See Donald M. Salazar, "Power Transmission and Wheeling Issues: How Do They Affect Us All," paper presented at Today's Energy Environment: Discourse on Law and Policy, continuing legal education conference of the State Bar of New Mexico, Albuquerque, New Mexico, May 27-28, 1993.)

<sup>9</sup> Drazan-Brubaker and Associates, Inc., "Rate Disparities by State for 20,000 kW Industrial Loads with a 68 percent Load Factor," prepared for the Electricity Consumers Resource Council (ELCON), 1992.

<sup>10</sup> See, for example, Charles M. Studness, "The Pressures of Competition," *Public Utilities Fortnightly* (June 15, 1993): 31-32. The author argues that existing rates of most electric utilities are high compared to the costs of generation from new gas-fired, combined-cycle power facilities. Consequently, the emergence of retail competition would place great pressure on electric utilities to lower their rates. According to the author, this pressure would affect both high-cost and low-

utilities with the highest prices and utilities with the largest price-marginal cost differential. Third, the recent emphasis on economic development and new jobs has led state legislatures (for example, the Nevada Legislature), commissions, and industrial groups to vocalize the importance of competitive electricity prices. Fourth, industrial customers argue that utility-funded demand-side management (DSM) programs have caused electricity prices to rise while the benefits of such programs have mostly accrued to nonindustrial customers.<sup>11</sup> Finally, the current belief of many stakeholders and analysts that more competition in the electric power industry is desirable leads to the logical conclusion that retail wheeling must be instituted to advance competitive forces in the industry.

This report addresses to varying degrees a number of questions relating to the legal, technical, and economic sides of retail wheeling. These questions should assist policymakers and analysts in evaluating a retail wheeling statute or rule. These questions include:

1. How would retail wheeling influence the rate-making practices of state public utility commissions?
2. How would retail wheeling affect the near- and long-term economic performance and structure of the electric power industry?
3. How would retail wheeling enhance competition in the electric power industry? Would retail competition necessarily promote the public interest?
4. What current inefficiencies in the electric power industry would retail wheeling potentially reduce or eliminate?
5. How would retail wheeling affect both the long-standing "regulatory compact" between state regulators and electric utilities, and current regulatory practices in general?
6. How could retail wheeling be carried out in a way that protects core customers from

---

cost utilities.

<sup>11</sup> See, for example, the presentation of John Anderson of ELCON before the NARUC Committee on Energy Conservation ("Retail Wheeling and Its Relationship to Integrated Resource Planning," *NARUC Bulletin*, No. 49-1993 (December 1993), 10-12.)

higher rates and lower reliability?

7. What are the major arguments of interest groups with regard to their positions on retail wheeling?
8. How do state utility commissions view retail wheeling? What are their major concerns?
9. Do state utility commissions and state legislatures have the legal authority to require retail wheeling? Are they preempted by the federal government? How does EPAct affect the authority of states to order retail wheeling? If states do have authority, what legal issues remain and how can they best be addressed?
10. What are the potential technical problems associated with retail wheeling? For example, would retail wheeling adversely affect electric power system reliability? What are the feasibility and cost of resolving these problems?
11. What general lessons for retail wheeling can be learned from the entry of competition in other previously highly monopolized industries?

This report does not attempt to provide definite answers to all of these questions. Instead, it examines them in a neutral posture. The authors believe that many of the issues associated with retail wheeling lie within a "gray area," where analysts, interest groups, and policymakers can, with good reason, take polar positions.

As this report points out, the debate surrounding retail wheeling will pit different interest groups with an intensity rarely seen at the state level. The dollars at stake are substantial, especially for those utilities who potentially can lose large profits from having to compete at the retail level with other suppliers.<sup>12</sup> Utilities and the financial community alike see the possibility of

---

<sup>12</sup> Utility opposition to retail wheeling derives in part from the large net-revenue losses that could result. For those utilities with large unamortized generation assets, especially those with recently completed nuclear power plants, the losses could be significant. These losses can be measured by the extent to which the utility is unable to recover the full value of sunk costs that would otherwise occur under normal regulatory practices. To avoid such losses, electric utilities are likely to expend substantial resources to block any legislation or regulation that would jeopardize its control of the transmission system for retail transactions.

large capital losses, with electricity prices driven down to market-based levels.<sup>13</sup> For utilities with high production costs, relative to the average cost for the region within which they operate, the future seems especially dim in a retail-wheeling world.

From the consumer side, retail wheeling offers opportunities for searching out suppliers who can offer the best deals. The fact that current prices vary substantially among utilities and many if not most nonutility suppliers can generate electricity below most utilities' current prices, provides good opportunities for consumers to lower their electricity costs.

This report focuses on several regulatory issues, some touching on fundamental regulatory principles, that state legislatures and state commissions will need to address in their assessment of retail wheeling. They include: (1) the unbundling and pricing of generation and transmission services, (2) protection of nonwheeling customers, (3) utilities' franchise rights and obligations, (4) allocation of costs from temporary surplus capacity, (5) the efficacy of rate-or-return regulation in a retail-wheeling environment, and (6) the effect of retail wheeling on integrated resource planning and, in particular, utility-financed DSM programs. This report groups the issues surrounding retail wheeling into three categories: legal, technical, and economic/policy.

---

<sup>13</sup> See, for example, Merrill Lynch, *Electric Utility Industry Competitive Position--A Distinguishing Factor*, Special Electric Utility Report (New York: Merrill Lynch, September 1, 1993).

This report also summarizes the positions of various interest groups concerning retail wheeling. Proponents of retail wheeling include industrial consumers, nonutility power producers, and market-liberal economists. Their common position, at least in public, is that the current inefficiencies in the electric power industry can only be eliminated or significantly diminished by competition at the retail level. Of course, industrial customers and nonutility generators see retail wheeling as advancing their economic interests, notwithstanding the possibility that the public interest or aggregated economic welfare may diminish. Opponents of retail wheeling include most electric utilities,<sup>14</sup> small-consumer groups, conservationists/environmentalists, and the financial community.<sup>15</sup> These groups perceive retail wheeling as jeopardizing the interests of their constituents.

In assessing the social acceptability of retail wheeling, it would be valuable for policymakers to have access to some sort of conceptual framework that enumerates the expected general effects. As argued in this report, the actual effects of retail wheeling cannot be cast in any precise or quantitative form. Retail wheeling would likely have broad implications for both the future structure of the electric industry and the future form of regulation. Trying to predict the effects in general terms, let alone in quantitative terms, is a most difficult task. Examining the effects, however, can assist policymakers in systematically assessing retail wheeling, including the effects on different consumers and on the future performance of the electric power industry.

In predicting the potential benefits and problems associated with retail wheeling, it may be instructive to draw upon the experiences of other industries, namely, those that have made or are currently undergoing the transformation from a heavily regulated, highly monopolistic industry to a more competitive one. Retail wheeling should strengthen competitive forces in the electric power industry, as well as transform regulation. This is similar to what has occurred over the last

---

<sup>14</sup> A large number of utilities, while realizing that retail wheeling would make their lives more difficult, have nevertheless acknowledged that it is inevitable and believe consideration of how it should be carried out should begin today.

<sup>15</sup> It may be more accurate to say that many in the financial community now believe that retail wheeling may occur sooner than what was expected a year or so ago but worry about the adverse effects it could have on the financial condition of many electric utilities.

several years in the telecommunications and natural gas industries. Further, retail wheeling could have widespread ramifications for the electric power industry and its regulation by state commissions. It would open the door for the entry of new competition throughout the industry. This, in turn, would radically change how utilities ultimately price their services and operate and plan for their electric power system. Specifically, utilities would be forced to price their noncore services on the basis of market conditions and to achieve high levels of productive efficiency. Economic theory and experiences in other industries predict that this would likely happen.

Probably the greatest challenge facing a state public utility commission when instituting retail wheeling is how to effectively regulate in an environment where a utility would have monopoly power in some retail markets while encountering competitive conditions in others. Past experiences in other industries have demonstrated the inefficiencies and other distortions created by tightly controlled rate-of-return regulation in such a hybrid market that is part competitive, part monopolistic. This report identifies some of these problems and discusses general ways in which state commissions can deal with them.

For retail wheeling to become palatable, legislatures and commissions must address the question of how to minimize the negative effects on core customers in the short term. Different approaches exist to achieve this. These have been applied in other transformed regulated industries, notably the telecommunications and natural gas industries.

Finally, the pressure for retail wheeling will not likely fade away. In fact, the posture of some interest groups, especially electric utilities, that retail wheeling cannot and will not work will increasingly lose credibility as time passes. In addition to industrial customers, nonutility and utility-affiliated generators will in the future push hard for the right to sell their electricity to retail customers. Given this expectation and the complexities of issues surrounding retail wheeling, state commissions may want to begin a dialogue as soon as possible. Some electric utilities have increasingly expressed the opinion that retail wheeling will come. They have already begun to prepare for future competition by transforming their corporate culture, better understanding their customers' needs, cutting their costs, and restructuring their internal organization.

## 2. STATE ACTIVITIES

Retail wheeling has entered the legislative and regulatory arenas in several states. Although no state has enacted comprehensive retail wheeling laws or regulations, much activity and dialogue have started to merge around the country.

Probably foremost, the Michigan Public Service Commission, conducted proceedings on whether it should approve an experimental retail-wheeling tariff for both Consumers Power and Detroit Edison.<sup>16</sup> Although the commission has not yet reached a decision at the time of this writing (December 1993), the recommendation by the administrative law judge (ALJ) in his proposal for decision took the position that the commission does not have the statutory authority to compel retail wheeling.<sup>17</sup> Somewhat surprisingly (see section 4), the ALJ found that the commission instead has authority over prices, terms, and conditions of retail-wheeling service. As a major finding, the ALJ questioned whether retail wheeling would be in the public interest, since the evidence pointed to a negative effect on most customers. Overall, the ALJ recommended that the commission not authorize mandatory retail-wheeling tariffs for Consumers Power and Detroit Edison. Consequently, he denied the consortium of industrial customers', the Association of Businesses Advocating Tariff Equity (ABATE), proposal for a mandatory experimental program.<sup>18</sup> The commission is expected to reach a decision early this year.

---

<sup>16</sup> Michigan Public Service Commission, Case Nos. U-10143 and U-10176.

<sup>17</sup> See the Postscript for a summary of the Commission's April 11, 1994 interim order. As with the California ruling, time did not permit the authors to conduct a detailed review of the order.

<sup>18</sup> *Notice of Proposal for Decision*, Case Nos. U-10143 and U-10176, Michigan Public Service Commission, August 26, 1993. The ALJ, however, did not oppose optional retail-wheeling tariffs.

A summary of the ALJ's initial decision and other issues surrounding the dockets is contained in "Mich. ALJ Recommends PSC Only Allow Retail Wheeling On Voluntary Basis," *Electric Utility Week* (September 6, 1993): 1, 10-11; "Michigan ALJ Says Regulators Cannot Force Utilities Into Test Run," *Electric Power Alert* (September 29, 1993): 6; and "Michigan ALJ Says State Can Permit, But Not Force Retail Wheeling," *Inside F.E.R.C.* (September 6, 1993): 1-2.

The evidence presented in the Michigan proceedings offers several important lessons for other states. First, and probably most important, the issues, whether related to legal, technical, economic, or regulatory policy matters, are highly divisive (see Table 1).<sup>19</sup> In almost every circumstance, parties disagreed on these various facets of retail wheeling.<sup>20</sup> For example, parties differed over the following questions: What obligation should a utility have to provide standby power to a customer who switched to another supplier? How should ancillary or residual services (for example, generation reserve, load frequency control, load following, and reactive power) and transmission services should be priced? What authority does the state commission have to order retail wheeling? How long should a wheeling customer be prohibited from returning to the local utility and what should be the amount of advance notice required? What should be the major objective of a retail-wheeling program?

---

<sup>19</sup> A discussion of these issues from the commission staff perspective can be found in Michigan Public Service Commission Staff, *Initial Brief*, Case Nos. U-10143 and U-10176, June 24, 1993.

<sup>20</sup> The utility position on the economic and regulatory implications of retail wheeling is well-articulated in Joe D. Pace, *Direct Testimony Before the Michigan Public Service Commission*, Case Nos. U-10143 and U-10176, March 1, 1993; and John H. Landon, *Direct Testimony Before the Michigan Public Service Commission*, Case Nos. U-10143 and U-10176, March 1, 1993.

For an opposing position, see John A. Anderson, *Rebuttal Testimony Before the Michigan Public Service Commission*, Case Nos. U-10143 and U-10176, May 1993; and Maurice Brubaker, *Rebuttal Testimony Before the Michigan Public Service Commission*, Case Nos. U-10143 and U-10176, May 1993.

A more "middle-of-the-road" position is contained in Staff's *Initial Brief*, Case Nos. U-10143 and U-10176, June 24, 1993; and Michel L. Hiser, "Retail Wheeling: A Proposed Experiment in Michigan," paper presented at The National Regulatory Research Institute/U.S. Department of Energy National Seminars on Public Utility Commission Implementation of the Energy Policy Act of 1992, Indianapolis, Indiana, July 20, 1993.

TABLE 1

MAJOR TOPICS ADDRESSED DURING MICHIGAN PSC  
RETAIL-WHEELING PROCEEDINGS

- 
1. State authority over price, terms, and access (federal jurisdiction, state public utility statutes)
  2. State certification requirements for independent power generators
  3. Priority of transmission-access rights
  4. Pricing of transmission and ancillary services
  5. Coexistence of regulation and competition
  6. Service obligation of local utility
  7. Return rights of wheeling customers
  8. Reciprocity among utilities to wheel
  9. Effect of retail wheeling on utility planning, financing, utility regulatory authority, rates of nonswitching customers, utility organization, DSM programs
  10. Regulation of wheeling customers and generators
  11. Stranded investments
  12. Difference between physical and contractual wheeling
  13. Required costs of local utility to serve wheeling customer
  14. Major objective of retail-wheeling experiment
-

Second, the Michigan proceedings strongly suggest that if a state is to embark on retail wheeling it should begin on a small scale. This recommendation recognizes the great uncertainty over the effects of retail wheeling. Given the broad fundamental and highly uncertain effects of retail wheeling, it seems nonsensical for a commission or a legislature to initiate retail wheeling on a large scale within its state. Experimenting with retail wheeling on a pilot basis and only when a utility has the need for new capacity, both of which were proposed by parties in the Michigan dockets, seems a more rational policy.<sup>21</sup> This permits experimentation of an activity with highly uncertain outcomes and protects against stranded investments, probably the single most serious concern among opponents.

Third parties, in particular the electric utilities and industrial consumers, would be expected to expend substantial monies to convey their positions and points of view. In Michigan several witnesses, including consultants, appeared on behalf of the industrial customers and the utilities. This is not surprising given the significant effect that retail wheeling may ultimately have on the electric power industry.

Fourth, proponents of retail wheeling, in particular, industrial customers, diminish or tend to downplay the complexity of the broad range of issues that need to be addressed. Although, as discussed later, the barriers to retail wheeling tend to be exaggerated by electric utilities and other opponents of retail wheeling, major obstacles exist that would delay retail wheeling. These obstacles represent legitimate concerns of state legislatures and commissions that should be addressed during any thorough assessment of retail wheeling.

---

<sup>21</sup> Another alternative is to initially restrict wheeling to those customers who are likely to bypass the local utility system (for example, through self-generation) in the absence of retail wheeling. For example, a customer for which self-generation would be economical under existing utility prices, may be given the right to shop around for cheaper power. The utility may be better off providing transmission and residual services to a wheeling customer than losing the customer through self-generation.

Other states where retail wheeling is being discussed, to varying degrees, include California, Illinois, Nevada, New Mexico, Pennsylvania, Rhode Island, South Carolina, Texas, and Washington. The staff of the California Public Utilities Commission recently undertook a major study of the electric power industry at the request of the Commissioners.<sup>22</sup> The motive for the study was the recognition that a competitive/ regulatory mix is poorly suited to cope with today's electric power industry. The study recommended that California should reform its regulatory procedures in light of prevailing market conditions and future trends that are likely to emerge in the electric power industry. The California study identifies and evaluates four future regulatory strategies.

Two of the strategies, Strategy C--Limited Customer Choice and Strategy D--Restructured Utility Industry, include retail wheeling.<sup>23</sup> Under Strategy C, the utility would lose its exclusive-franchise status by being required to serve wheeling (or as the report calls them, "noncore") customers. In choosing the right to buy power from alternative suppliers, a customer must consent to additional risks and obligations. For example, the customer would be required to find its own sources of energy and capacity if not available from the local utility. Strategy D is similar to Strategy C in terms of the rights and obligations of customers who elect to choose different suppliers and of the local utility.

---

<sup>22</sup> Division of Strategic Planning, California Public Utilities Commission, *California's Electric Services Industry: Perspectives on the Past, Strategies for the Future* (San Francisco, CA: California Public Utilities Commission, February 1993).

Also, recently Governor Pete Wilson of California supported retail wheeling as part of revamping energy regulation in the state. (See "Governor Endorses Retail Wheeling in Overhaul of California Regulation," *Electric Utility Week* (December 13, 1993): 7.)

<sup>23</sup> *Ibid.*, *California's Electric Services Industry*, 180-193.

In August of last year, the Illinois Commerce Commission hosted a workshop on transmission access and pricing that highlighted retail wheeling.<sup>24</sup> In September, the Pennsylvania Public Utility Commission held a conference on future power needs, which included a discussion of retail wheeling.

Last year, Nevada became the first state in the country to authorize, through legislation, retail wheeling.<sup>25</sup> While this action was a step forward for retail wheeling, it should be noted that the legislation within which authorization was granted was part of an economic-development bill.<sup>26</sup> The major objective of the bill was to attract firms to locate new plants in the state. More precisely, it was targeted at one steel company contemplating whether to locate a \$100-million-energy-intensive steel "minimill" in Arizona or Nevada.<sup>27</sup> As a component of an economic-incentive package, the legislation requires a utility to offer retail wheeling to any firm that generates new industrial load, invests at least \$50 million in the state, and promises to stay in Nevada for at least thirty years.

In New Mexico a retail-wheeling bill presented earlier this year failed to pass. A special legislative joint interim committee, however, was formed to study the bill for two

---

<sup>24</sup> Illinois Commerce Commission and the Center for Regulatory Studies, "Workshop on Transmission Access and Pricing: Policy and Practice in Illinois," Chicago, Illinois, August 24, 1993.

<sup>25</sup> Nevada Senate Bill No. 231 (codified as Nev. Rev. Stat. chpts. 231, 361, 704), 1993. The legislation authorizes the Nevada Public Service Commission to order retail wheeling for a particular new industrial load if the commission can first ensure that the rates or charges assessed to other customers of the utility do not subsidize the cost of providing service to that business.

<sup>26</sup> "Nevada Ushers in Retail Wheeling Era with Economic Development Bill," *Electric Power Alert* (July 21, 1993): 9-10. The Nevada Commission bill on economic development must make certain findings relating to a business before it can qualify for retail wheeling.

<sup>27</sup> Notwithstanding the legislation, the steel firm apparently decided to locate the new "minimill" in Arizona. See "Target of Nevada Retail Wheeling Bill Says Arizona Is 'Preferred' Location," *Electric Power Alert* (November 24, 1993): 13-14.

years and then to report on how retail wheeling should be implemented in New Mexico.<sup>28</sup>

In May the Rhode Island Public Utilities Commission rejected a 250-megawatt proposal to arrange for the wheeling of power owned by Hydro-Quebec from the Canadian border to Rhode Island.<sup>29</sup> Once in Rhode Island, the power would have been delivered by the state's three major electric utilities to their industrial customers. The deal would have involved the sale of firm power under a four-year contract. The Commission disapproved the proposal largely because of the high price of electricity that was to be wheeled in relation to the current price of available wholesale power in New England.<sup>30</sup> The Commission also expressed concern that the proposal to provide preferential treatment to industrial customers may violate the state's public utility statutes.<sup>31</sup>

---

<sup>28</sup> See "Interest Builds Nationwide in Aftermath of New Mexico Legislative Fight," *Electric Power Alert* (April 14, 1993): 24-25; and "New Mexico Retail Wheeling Battle Continues To Draw National Attention," *Electric Power Alert* (May 26, 1993: T-5 - T-6).

A detailed description of the bill can be found in Tom C. Wray, "Retail Wheeling: A State Legislator's Approach," paper presented at Infocast, Inc. Conference, "Power Transmission-- Access, Pricing, and Policy," Washington, D.C., May 14, 1993.

<sup>29</sup> "R.I. PUC To Turn Down Hydro-Quebec `Retail' Wheeling Offer for 250 MW," *Electric Utility Week* (May 17, 1993): 3.

<sup>30</sup> Rhode Island Public Utilities Commission, *Statement Regarding Hydro-Quebec and Rhode Island Negotiations for Electric Power Sales*, press release by the Commission, May 20, 1993; and Rhode Island Public Utilities Commission, *Report to the Rhode Island General Assembly on the Offer of Hydro-Quebec To Sell Power To the Rhode Island Public Utilities Commission* (Providence, RI: Rhode Island Public Utilities Commission, January 11, 1994).

<sup>31</sup> See Rhode Island Public Utilities Commission, *Internal Memorandum on Utility Franchises and Retail Wheeling* (Providence, RI: Rhode Island Public Utilities Commission, May 5, 1993); and Rhode Island Public Utilities Commission, *Memorandum to the Retail Wheeling Subcommittee* (Providence, RI: Rhode Island Public Utilities Commission, April 28, 1993).

Retail wheeling activities in South Carolina, Texas, and Washington have been peripheral. A recent order by the South Carolina Public Service Commission encouraged one of the state's utilities, Carolina Power and Light, to consider retail wheeling as an option for integrated resource planning (IRP).<sup>32</sup> During a recent rule change proceeding on IRP that included retail wheeling, the Texas Public Utility Commission solicited comments.<sup>33</sup> Finally, and probably most insignificantly, an industrial group in Washington expressed the opinion that retail wheeling will come to the forefront in the state over the next few years because of a recent decision by the Washington Utilities and Transportation Commission. The decision allows one of the state's electric utilities to experiment with a decoupling mechanism that opponents argued will drive up electricity prices.<sup>34</sup>

---

<sup>32</sup> South Carolina Public Service Commission, *Integrated Resource Plan Filed by Carolina Power and Light Company*, Order for Docket No. 92-209-E, April 8, 1993.

<sup>33</sup> Texas Public Utility Commission, *Proposed Amendments To PUC Subs. R. 23.66*, 17 Tex. Reg. 998, February 7, 1992. Texas Public Utility Commission, *Questions Concerning Integrated Resource Planning*, Tex. Reg. 1107, February 19, 1993.

<sup>34</sup> "End-Users Eye Retail Wheeling To Remedy Washington Rate Hikes," *Electric Power Alert* (October 27, 1993): 13-14.

### 3. SUMMARY OF POSITIONS

Few subjects in the electricity arena within memory have the potential to be more divisive than retail wheeling. On one hand, supporters point to the gross inefficiencies in the electric power industry, which they argue only retail wheeling could correct. On the other hand, opponents argue that retail wheeling would create havoc in the electric power industry, which would undermine any gains recently made in improving the performance of the electric power industry.

Each side to the debate poses arguments that have merit. Their positions, however, are often motivated by perceptions of what effect retail wheeling would have on their narrow economic interests. Of course, in policy debates stakeholders are expected to provide information, make arguments, and take positions that are compatible with their own interests. For legislatures and regulatory bodies, the germane question is whether drastic change, such as retail wheeling, would be in the long-term economic interest of electricity consumers.<sup>35</sup> Policymakers would be foolish to completely ignore what special-interest groups have to say. After all, in an adversarial forum, interest groups provide most of the information required by policymakers to reach intelligent and rational decisions. In the case of retail wheeling, since it seems that the opposing sides have balanced resources, policymakers should have undistorted information from which to make decisions.

As noted earlier, the dollars at stake regarding retail wheeling are substantial. Policymakers should therefore expect opposing groups to expend many dollars and much effort to persuade policymakers. What makes the policymaker's task particularly difficult is the fact that many of the benefits and costs associated with retail wheeling cannot be

---

<sup>35</sup> The presumption is that, since regulation was formed to protect consumers from the monopoly power of utilities, the major goal of regulation should be to promote the long-term economic interests of their consumers.

measured with any precision. In other words, policymakers cannot apply a benefit-cost framework, even if conceptually sound, to impute dollar values to the benefits and costs.

Instead, what policymakers have to rely on are the predictions of economic theory and the experiences of other industries that have undergone transformation similar to that the electric power industry would undergo in a retail-wheeling environment. Lessons from the recent transformations of the telecommunications and the natural gas industries offer valuable insights into what general changes would likely result from retail wheeling. Economic theory has enjoyed increased credibility in recent years in its ability to predict major changes in some of the industries that have moved toward more competition and less regulation. Consequently, theory can provide a guide to understanding how retail wheeling would affect industry restructuring, pricing, regulatory practices, and other factors influencing firm and industry performance.<sup>36</sup>

### Supporters

At the present, the strongest supporters of retail wheeling include industrial customers, who in the near term would benefit the most relative to other electricity customers. Their major argument revolves around the premise that the increased competitiveness of the global marketplace has forced industrial firms to lower their current energy costs and to have better control of their future energy costs (see Table 2).<sup>37</sup>

---

<sup>36</sup> A recent article by Clifford Winston makes the point that:

Economists were generally successful in predicting the direction and size of the effects of regulatory reform on prices and profits. . .the evidence clearly shows that microeconomists' predictions that deregulation would produce substantial benefits for Americans have been generally accurate (at 1286).

See, Clifford Winston, "Economic Deregulation: Days of Reckoning for Microeconomists," *Journal of Economic Literature* 31 (September 1993): 1263-89.

<sup>37</sup> The industrial customers' arguments are presented in John A. Anderson, "Congress Has Prohibited Retail Wheeling--Or Has It?" paper presented at Infocast, Inc. conference, "Power Transmission--Access, Pricing, and Policy," Washington, D.C., May 14, 1993; and John A. Anderson, *Rebuttal Testimony Before the Michigan Public Service Commission*.

TABLE 2  
BENEFITS OF RETAIL WHEELING: PERSPECTIVE OF  
INDUSTRIAL CONSUMERS

- 
1. Incentive for efficient utility operation and planning, and innovations
  2. Avoidance of discriminatory pricing
  3. Incentive for efficient pricing
  4. Promotion of economic development and a stronger U.S. economy
  5. Write-down of utility assets to their economic value as determined by the competitive marketplace
  6. Promotion of society's well-being
- 

They point to wide rate differentials among electric utilities as evidence of both inefficiencies in the electric power industry and the potentially large benefits that can be realized by customers given the right to "shop around" for the lowest-priced electricity. Industrial customers and their lobbyists raise concerns regarding the inequality of industrial firms paying widely different electricity prices in today's internationally competitive world. As John Anderson, the Executive Director of the Electric Consumers Resource Council (ELCON), recently expressed, "it is very difficult to be a low-cost competitive producer when you are held captive by a high-cost [electricity] supplier."<sup>38</sup>

Industrial customers also generally oppose most social programs (such as DSM activities). They believe that these programs have created cross-subsidies, contributing to the high industrial

---

<sup>38</sup> Ibid., "Congress Has Prohibited Retail Wheeling--Or Has It?" at 3.

rates of some utilities and the wide rate differential among utilities. Industrial customers, as well as others, argue that retail wheeling would eliminate most of these programs and their cross-subsidization effect.

Industrial groups have recently shown where retail wheeling has worked.<sup>39</sup> Drawing upon a few examples, they argue that retail wheeling can work, notwithstanding the allegations of electric utilities and other groups opposing retail wheeling. Although industrial groups make a valid point in saying that retail wheeling has technically functioned without any apparent major problems, none of the examples given reflect retail wheeling on a large scale by a U.S. investor-owned utility. Policymakers, in these cases, did not have to deal with the complex economic and regulatory issues that would need to be addressed if retail wheeling operated on a large scale for an individual utility or for all of the utilities within a state.

Industrial groups contend that electric utilities grossly overstate the problems that would be associated with retail wheeling.<sup>40</sup> Concerning the stranded-investment problem, industrial groups argue that much of the unused capital that could result exemplifies "overpriced investment." Therefore, neither customers departing from a utility nor customers remaining, should be held responsible for these excessive costs. They instead believe that utilities should absorb these costs since they reflect the past actions of inefficient utility management. Industrial groups also argue that the magnitude of stranded-investment costs (which can be defined as the difference between a utility's price and marginal cost) would be mitigated at a time when the local utility requires additional generating capacity. Finally, they contend that the stranded-

---

<sup>39</sup> See, for example, Cleary, Gottlieb, Steen and Hamilton, "Memorandum for Dr. John A. Anderson Re: Retail Wheeling Examples," July 8, 1993. Verbal permission to use this memorandum was obtained from John P. Hughes of ELCON.

<sup>40</sup> The industrial customers' arguments made below in the text are presented in Steve Michel, "A Customer's View of Retail Wheeling;" Maurice Brubaker, *Rebuttal Testimony Before the Michigan Public Service Commission*; and John A. Anderson, "Congress Has Prohibited Retail Wheeling--Or Has It?"

investment problem is no more than a red herring as long as a customer gives the local utility adequate notice if it wishes to switch back to the utility.

A second potential problem raised by some electric utilities is the decline in off-system power purchases made by a local utility because of retail-wheeling commitments. The industrial groups argue that the lost savings from these unrealized transactions should not be reflected in the wheeling customer's transmission rate: the opportunity-cost pricing of transmission service is incompatible with conventional regulatory principles<sup>41</sup> and would only result in the local utility collecting monopoly rents.

Concerning the local utility's obligation to serve a wheeling customer, industrial groups argue that most utilities do not currently have to serve a customer if no power is available after making a "best efforts" attempt. Besides, utilities would normally have adequate information to know when a wheeling customer would return to the local utility. The reason for this is that the wheeling customer would almost always have a contract with another alternative supplier containing a termination provision.

Finally, industrial groups argue that the wheeling customer should have the same return rights as a new customer. This means that return customers would be charged a regulated price that corresponds to the price charged to other customers with similar load and size characteristics. Industrial groups argue that a utility should in fact "open its arms" for a return customer in the same way it would for any new customer.

As discussed later, industrial customers tend to diminish or downplay the transition difficulties of retail wheeling. Legislatures and commissions will need to address many complex issues before retail wheeling takes place, either on an experimental or a permanent basis. Proponents seem correct in arguing that no insurmountable legal, technical, regulatory, or economic barriers to retail wheeling exist. Reconciliation of these obstacles, however, will not come easily. Legitimate concerns raised by different interest groups will need to be addressed. A chief concern centers around the allocation of costs associated with past investments in generation. For retail wheeling to become politically palatable, industrial customers and others

---

<sup>41</sup> These principles include embedded-cost pricing procedures.

who want to shop around may have to acknowledge that they will have to shoulder responsibility for a portion of a utility's sunk investment costs for example, through transmission and distribution tariffs.

### Opponents

The leading opponents of retail wheeling are investor-owned electric utilities.<sup>42</sup> Other opponents include small-consumer groups, conservationists/environmentalists, municipal electric utilities, and rural electric cooperatives.<sup>43</sup> It should be said that electric utilities are not unanimous in their opposition to retail wheeling. Although apprehensive about it, many utilities believe that retail wheeling is inevitable and that is

---

<sup>42</sup> Arguments opposing retail wheeling can be found in Edison Electric Institute, *The Case Against Retail Wheeling: A Response to Advocates of Retail Wheeling*, Transmission Issues Monograph No. 5, July 1992; Joe D. Pace, "Wheeling and the Obligations To Service Problems," *Energy Law Journal* 8, No. 2 (1987): 265-302; and Rodney Frame and Joe D. Pace, "Approaching the Transmission Access Debate Rationally," *Transmission Research Group Working Paper No. 1*.

<sup>43</sup> See, for example, Ralph Cavanagh, "Letter to State Senator Tom Rutherford," February 23 1993. In the letter, Cavanagh, the Director of the Energy Program at the Natural Resources Defense Council, wrote that "if utilities are going to live or die solely by how cheaply they can sell their electricity, they will have every reason to avoid investing in measures to reduce pollution or to help customers save energy (at 2)."

Ironically, while investor-owned utilities on one side and rural electric cooperatives and public power groups on the other side were bitter opponents in the prolonged debate over wholesale wheeling, the trade associations representing the respective groups (namely, the Edison Electric Institute, the National Rural Electric Cooperative Association, and the American Public Power Association) have become allies in contesting retail wheeling. The rural electric cooperatives and municipalities, for example, fought hard to gain access to competitive wholesale supply sources for themselves while with equal fervor, closed ranks with the investor-owned utilities to oppose opening up the transmission grid to retail customers.

not too soon to start preparing for it now.<sup>44</sup> Earlier this year, the Chief Executive Office of Wisconsin Power and Light Company took the Edison Electric Institute (EEI) to task for publicly opposing retail wheeling.<sup>45</sup> He added that his utility counterparts generally agree that "retail wheeling is inevitable and it will ultimately result in the disintegration of many utilities."<sup>46</sup> The utility executive may have somewhat misrepresented the position of most utility CEOs concerning retail wheeling.

As an articulate opponent, if not the official spokesgroup for electric utilities, EEI raises several concerns with retail wheeling.<sup>47</sup> They cover a wide spectrum: legal, technical, economic, regulatory, and policy. The following include their major concerns:

1. States do not have the authority to order retail wheeling.
2. Retail wheeling, in most instances, would only result in cost reallocation, namely, lower prices to noncore customers and higher prices to core customers, rather than aggregated efficiency improvements; that is, retail wheeling is synonymous with the term "wheeling money."<sup>48</sup>

---

<sup>44</sup> See, for example, "Utilities Urged To Take Initiative On Retail Wheeling," *Electric Power Alert* (November 10, 1993): 115-16; "Nevada Utility Official Sees More States Looking To Retail Wheeling," *Electric Utility Week* (July 19, 1993): 13-14; and "Survey: Two-Thirds of Utility Execs Consider Retail Wheeling Inevitable," *Electric Power Daily* (January 12, 1994): 3. The survey, conducted by the Washington International Energy Group, was based on responses from 285 senior utility managers. The survey showed that competition was considered the top utility issue, followed by retail wheeling, wholesale wheeling, improving earnings, and loss of industrial customers.

<sup>45</sup> "WP&L Prefers To Prepare For Retail Wheeling; EEI Attacks Industrials," *Electric Utility Week* (June 7, 1993): 1-2.

<sup>46</sup> "WP&L CEO Says Most Utility Chiefs Agree: Retail Wheeling Inevitable," *Industrial Energy Bulletin* (June 4, 1993): 8-9.

<sup>47</sup> Many of these are discussed in Edison Electric Institute, *The Case Against Retail Wheeling: A Response to Advocates of Retail Wheeling*.

<sup>48</sup> "Wheeling money" implies that the generation of electricity continues to take place at the same facilities. Consequently, economic efficiency remains unchanged while wealth distribution occurs with wheeling customers benefitting at the expense of core customers or utility shareholders or both.

3. Retail wheeling would be discriminatory against customers who could not or would not avail themselves of the opportunity to shop around.
4. Retail wheeling would result in stranded investments, where costs may unfairly fall on utility shareholders or core customers, or both.
5. Retail wheeling would be contrary to the so-called "regulatory compact," when the local utility continues to be obligated to provide at demand the services still requested by wheeling customers, and wheeling customers are not held responsible for the stranded costs they impose on the local utility.
6. Retail wheeling, given the continuation of retail embedded-cost pricing, could create large economic-efficiency losses in the form of uneconomic bypass.
7. Retail wheeling could jeopardize the reliability and stability of the local electric power system.
8. Retail wheeling would result in customers willing to shop around to receive the benefits of competition without bearing the risks.

A rejoinder follows that identifies weaknesses of the EEI arguments. First, some legal experts believe that the states do have authority to order wheeling as long as it would not conflict with other state laws (see section 4). It is probably true, however, that the question of state authority will remain unsettled prior to a definitive court decision.

Second, the effects of retail wheeling would likely improve economic efficiency in the long term. As argued elsewhere in this report, retail wheeling should pressure both regulators and utilities to adopt pricing practices that are more closely in line with prevailing market conditions. Further, with competition significantly enhanced, retail wheeling would likely change the corporate culture of electric utilities and elicit more intensive cost-saving and innovative utility management practices.

Third, price discrimination would not necessarily result from retail wheeling. EEI's argument is that certain customers (namely, wheeling customers) would get the benefit of competitive prices while others would continue to pay embedded-cost prices. Of course, wheeling customers would stand to benefit when market conditions are

favorable to buyers.<sup>49</sup> At other times, however, when sellers have the upper hand, wheeling customers could pay more than what they would under regulated prices.<sup>50</sup> Electric utilities could hold down the price of core services in one of two general ways: by deregulating the noncore service or by establishing some form of rate-making system (for example, price caps) that could prevent revenue deficits suffered by a utility in the noncore market from raising prices in the core market.<sup>51</sup>

Fourth, stranded-investment costs do not necessarily have to fall on utility shareholders or core customers. (See Table 3 for six broad questions relating to stranded-investment costs.) Different approaches exist to treat these costs in a way that could be compatible with acceptable regulatory principles. For example, wheeling customers could pay a share of the stranded-investment costs through the services they purchase from the local utility. Some of these approaches are discussed in sections 6 and 7. Regulators in other industries had to deal with the issue of stranded-investment costs and, after much debate and time, they successfully did so. No reason comes to mind why the same should not hold for the electric power industry.<sup>52</sup>

---

<sup>49</sup> These conditions currently exist throughout most of the country.

<sup>50</sup> It is assumed here that wheeling customers could not return to the local utility and pay the existing regulated price anytime market prices rise to a level in excess of the regulated price.

<sup>51</sup> As discussed later, a push for regulatory reform may come directly from regulators themselves as they increasingly perceive in a growing competitive marketplace the frustration in trying to protect core customers through current rate-making practices.

<sup>52</sup> The stranded-investment issue has confronted FERC with respect to wholesale wheeling. See, for example, "NEES Seeks 'Stranded Investment' Provision in Transmission Deal," *Electric Utility Week* (November 22, 1993): 7; "CMP To Seek Stranded-Investment Recovery in NU Transmission Pact," *Electric Utility Week* (November 15, 1993): 1-2; and "PECO Responds to Critics of Exit Fee; Will File Open-Access Wheeling Tariff," *Electric Utility Week* (November 22, 1993): 11.

FERC expects to issue a notice of proposed rulemaking sometime this year regarding the recovery of electric utility stranded costs. The proposed rules will address three major issues: (1) jurisdictional authority over stranded costs recovery, (2) the definition of recoverable costs, and (3) the procedural approach for addressing stranded costs (See "FERC Still Stumped by Stranded Investment," *The Electricity Journal* (April 1994): 11.)

TABLE 3

QUESTIONS PERTAINING TO STRANDED-INVESTMENT COSTS

---

1. Does FERC or the individual state commission have jurisdiction for cost recovery?
  2. Should regulators provide generic guidance on stranded costs or make case-by-case decisions?
  3. Which stranded costs are recoverable?
  4. How should stranded costs be shared between customers and utility shareholders?
  5. How should stranded costs be shared between wheeling customers and other customers?
  6. How should stranded costs be recovered in tariffs?
- 
- 

Fifth, the "regulatory compact" would be violated if utilities have to provide retail-wheeling and ancillary services while at the same time are restricted by obligation-to-service constraints. One solution to the problem would be to loosen the utilities' service obligation to those customers who make the decision to shop around for lower-priced electricity. This means that the local utility would not have to accept a wheeling customer upon demand. An exception to this would occur when the customer has a contractual agreement with the local utility to supply service at the demand of the customer. Contracts, for example, could be used to have the utility provide the customer with standby, emergency, and other services required by the customer. Bilateral contracts could efficiently substitute for statutory and regulatory rules by specifying the terms and conditions of the local utility's service obligation.

Sixth, it is correct to say that regulatory embedded-cost pricing could cause a customer to

select another supplier who has lower prices but higher economic costs than the local utility. Analysts label such a condition as "uneconomic bypass."<sup>53</sup> Uneconomic bypass is generally viewed as undesirable. It could result in costly duplication of capital facilities and, potentially, higher prices for core customers. From a longer-term perspective, which is more appropriate in terms of adequately assessing retail wheeling and bypass threats, both regulators and utilities would face pressure to favor more efficient pricing of noncore services. In fact, it could be argued that in the absence of retail wheeling or bypass threats (such as self-generation), prices would continue to be set inefficiently.<sup>54</sup>

Seventh, proper operating precautions, in addition to contractual arrangements with noncore customers, could alleviate many of the technical problems associated with retail wheeling. With additional costs and the development of new technologies, transmission systems should be able to accommodate retail wheeling and maintain the integrity of the local electric power system.<sup>55</sup>

Lastly, customers who choose to shop around should bear the risks of doing so. These risks could be handled by contractual arrangements with the local utility. For example, the utility could provide the customer with standby service at an agreed-upon price. In the case where market price exceeds regulated price, the wheeling customer should not be automatically granted any rights to return to the local utility and enjoy the existing regulated service and price. A good

---

<sup>53</sup> A good discussion of bypass in the natural gas industry is presented in Paul W. MacAvoy, Daniel F. Spulber, and Bruce E. Stangle, "Is Competitive Entry Free? Bypass and Partial Deregulation in Natural Gas Markets," *Yale Journal on Regulation* 6, No. 2 (Summer 1989): 209-47. The authors argue that bypass can lead to higher industry cost when the local utility represents an efficient natural monopoly but is restricted by regulators from engaging in competitive pricing to those customers with bypass opportunities. When such restrictions exist, the authors conclude that bypass in most instances becomes a negative-sum game or uneconomical.

<sup>54</sup> The role of bypass threats in creating enhanced incentives for efficiency by a regulated firm is discussed in John T. Wenders, *The Economics of Telecommunications: Theory and Practice* (Cambridge, MA: Ballinger, 1987); and Harry G. Broadman and Joseph P. Kalt, "How Natural is Monopoly: The Case of Bypass in Natural Gas Distribution Markets," *Yale Journal on Regulation* 6, 2 (Summer 1989): 181-208.

<sup>55</sup> Section 5 contains a full discussion of technical issues and problems.

argument can be made that once a customer designates herself as a "shopping customer" the prices she is charged for commodity electricity should be deregulated. A customer would have available different suppliers of electricity that would compete with each other for that customer's business.

The financial community recognizes the large potential financial losses that could fall on many electric utilities as a result of retail wheeling. Competition at the retail sector could force electric utilities to write-down their assets toward market value. For some utilities the write-down could be significant. The resultant profit margin of utilities could also decline. The financial effects could be especially significant for those utilities that have both high embedded costs (caused largely by the high capital costs of new nuclear power facilities) and high production costs.

Recent publications by financial houses reflect their belief that retail wheeling is coming. Standard and Poor (S&P) has recently reappraised its credit rating of electric utilities on the basis of increased competitive forces.<sup>56</sup> The major reason given for the reappraisal was the awareness that competition in the electric power industry has moved faster than what was previously expected.

The new credit ratings compiled by S&P include such factors as a utility's competitive position, supply adequacy, markets, the regulatory environment, and company management; these factors are combined to assess a utility's vulnerability to increased competition.<sup>57</sup>

A publication by Fitch Investors Service in July 1993 presented a new credit-rating method that takes into account the vulnerability of a utility to competition.<sup>58</sup> In assessing a utility's ability to be competitive, the new method incorporates such determinants as customer mix, reserve margins, and production costs. Fitch recognizes that retail wheeling would be a major threat to a utility's monopoly position. The extent to which a utility could effectively

---

<sup>56</sup> "Competition Forces S&P Reappraisal of Utilities and Financial Benchmarks," *The Electricity Journal* 6, 9 (November 1993): 8-10.

<sup>57</sup> Ibid.

<sup>58</sup> Fitch Investors Service, *Electric Utilities' Competitive Risk* (New York: Fitch Investors Service, July 1993).

unbundle its prices and services would improve its competitive position.

In August of 1993, Merrill Lynch published a special electric utility report that included a new index to assess the competitiveness of each electric utility in the country.<sup>59</sup> The index, called the Competitive Damage Index (CDI), incorporates the average total generating cost for a region, the total generation cost of an individual utility, the operating cost of generation for an individual utility, and other generating costs of an individual utility. The CDI compares the competitive position of a utility relative to other utilities within its region and throughout the country.

Other interest groups, in addition to electric utilities, have opposed retail wheeling. In the Michigan dockets, opponents of retail wheeling included the State's Attorney General, municipalities, and rural electric cooperatives.<sup>60</sup> The Attorney General's biggest concern was what effect retail wheeling would have on core customers. It proposed that if retail wheeling were to be adopted it should include the following safeguards: adequate notification period for return, segregation of retail-wheeling load from other utility loads, provision of unbundled ancillary services to wheeling customers at compensatory prices, and inclusion of certain amortization costs and other fixed costs in the rates for retail wheeling.<sup>61</sup>

Municipals opposed retail wheeling in the Michigan dockets because they believed it would result in anticompetitive practices by investor-owned utilities. They also argued that retail wheeling would have a disruptive effect on utility planning and operations.<sup>62</sup> Rural electric cooperatives feared that retail wheeling would jeopardize the financial well-being of their operations. Namely, they argued that it would result in utilities "cherry picking" their large profitable industrial loads.<sup>63</sup>

---

<sup>59</sup> Merrill Lynch, *Measuring Competitive Risk*, Utility Industry Report (New York: Merrill Lynch, August 23, 1993).

<sup>60</sup> Fitch Investors Service, *Retail Wheeling's Serious Setback*, Special Report (New York: Fitch Investors Service, November 15, 1993), 4-5.

<sup>61</sup> *Ibid.*, 4.

<sup>62</sup> *Ibid.*, 4.

<sup>63</sup> *Ibid.*, 4-5.

### State Commission Perspective

The views of state public utility commissions regarding retail wheeling and other forms of competition can be found in a recent survey by R. J. Rudden Associates and Fitch Investors Service.<sup>64</sup> Several questions relating to competitive forces in the electric power industry, including retail wheeling, were sent to fifty public utility commissions. Thirty-three commissions responded. Part of the responses represented the commission's assessment of the attitudes and positions of various stakeholders toward competition.

The responses contained the following key points pertinent to this report:

1. Existing legislative and regulatory policies generally are not supportive of retail wheeling. Seven commissions responded that their states prohibit retail wheeling.
2. Those respondents who believed that retail wheeling will occur predict that it will accelerate rapidly after 1995. Somewhat surprisingly, several commissions believed that retail wheeling will never be adopted within their jurisdictions.
3. Commissions have several concerns over retail wheeling; they include potential rate increases to core customers, the recovery of stranded investments, the utility management's ability to adequately respond to competition, increased challenges for effective regulatory oversight in a competitive environment, and the management of market risk.
4. State commissions judged that industrial customers and nonutility generators were the strongest proponents of retail wheeling. The investor-owned utilities, commission staffs, and consumer advocacy groups were the strongest opponents.
5. The majority of commissions expected retail wheeling to increase the overall business risk of electric utilities, the presence of market-based rates, service unbundling, the utilities' cost of capital, the need for IRP, rates to core customers, and regulatory oversight to protect core customers.

---

<sup>64</sup> R. J. Rudden Associates and Fitch Investors Service, *Electric Utility Competition: A Survey of Regulators* (New York: Fitch Investors Service, November 1, 1993).

A recent regulators' forum in the publication *Fortnightly* indicates that state commissions have several concerns over retail wheeling that are similar to those expressed in the Rudden/Fitch survey.<sup>65</sup> A typical comment was that before retail wheeling would be acceptable, core customers must be protected. From a state commission's perspective, acceptance of retail wheeling would presumably be much more likely if it could be shown that no class of customers would be worse off. Most regulators in the *Fortnightly* regulators' forum recognized that retail wheeling would cause fundamental changes in the electric power industry.

Taken as a whole, comments from state commissions strongly suggest that most are currently skeptical of the public-interest benefits of retail wheeling. The majority view the most serious problem as the likely adverse effect on core customers. Some perceive retail wheeling as a threat to utility-financed DSM programs and the IRP process. As articulated by Ralph Cavanagh, retail wheeling could be disruptive to IRP as currently practiced in several states by undermining the notion that electricity is a service rather than a commodity. According to Cavanagh and other conservationists, retail wheeling would lead to lower electricity prices, higher electricity consumption, and the inability of utilities to reflect environmental externalities in prices and DSM expenditures in electricity rates.<sup>66</sup> Although their predictions seem reasonably accurate, the societal implications are less clear: the competitive pressures stimulated by retail wheeling would move electricity prices toward more economically efficient levels. Thus, consumers (assuming other things held constant) would tend to make better decisions concerning how much money to spend on energy conservation.

---

<sup>65</sup> *Fortnightly* (November 1, 1993), Special Issue on Regulators' Forum, 25-33.

<sup>66</sup> See, for example, "NRDC Lobbies New York, Peter Bradford, in Campaign Against New York," *Electric Utility Week* (December 13, 1993): 9; and "Top Conservationist, Utility Lawyer Draw Lines in Retail Wheeling Debate," *Electric Utility Week* (August 2, 1993): 16-17.

## 4. LEGAL CONSIDERATIONS

Several key legal issues relate to retail wheeling. The first and most fundamental is whether state commissions or state legislatures are permitted to require retail wheeling. If state commissions or legislatures are permitted to require retail wheeling, which legal issues remain, and how and by whom can they best be answered? The second set of issues concerns how retail wheeling meshes with existing commission regulation and includes issues concerning the "regulatory compact."

### **Are States Permitted to Require Retail Wheeling?**

To answer the question of whether state commissions or state legislatures can mandate retail wheeling, one must first briefly review the legal history of wheeling. Then, one must answer whether state-required retail wheeling is preempted under current law, whether retail wheeling would violate the Commerce Clause, and whether state-mandated retail wheeling is permitted under current state statutes.

### **A Brief Legal History of Wheeling**

Wheeling has been defined by some experts as "the use of the transmission facilities of one system to transmit power of and for another entity or entities."<sup>67</sup> Others provide a definition that is more precise in that it conveys what happens during a wheeling transaction:

Wheeling is the use of the electric power system of one utility for the simultaneous receipt at one point and delivery at

---

<sup>67</sup> Kevin Kelly et al., *Some Economic Principles for Pricing Wheeled Power*, 270.

another of power, in like quantities and possessing like characteristics, [of and for another entity or entities.]"<sup>68</sup>

The concept of wheeling power, while not new, has only recently been the subject of regulation. Prior to 1927, state public service commissions exercised jurisdiction over most activities of electric utilities, including ratemaking authority over sales of electricity taking place over state lines. In the landmark case of Public Utilities Commission v. Attleboro Steam & Electric Company,<sup>69</sup> however, the United States Supreme Court struck down state commission regulation of electric rates for sales across state lines because the regulation imposed a direct burden on interstate commerce. The Court held that, while retail sales of electricity were essentially local in nature, wholesale transactions were national in character and thus were subject only to federal regulation under the Commerce Clause. At the time, however, there was no federal regulation of electric utility rates. This created a regulatory gap: interstate transactions of electricity were regulated by neither the states nor the federal government. The pressure to fill this regulatory gap resulted in the enactment of the Federal Power Act of 1935 (FPA).

The common carriage provisions that were first proposed for the Federal Power Act of 1935 were not enacted,<sup>70</sup> and the FPA contained no provisions concerning the ability of the Federal Power Commission (the predecessor to the Federal Energy Regulatory Commission [FERC]) to mandate wheeling of power. Nevertheless, the FPA provides that federal regulation applies "to the transmission of electric energy in interstate commerce and to the sale of electric

---

<sup>68</sup> Edison Electric Institute, *The Case Against Retail Wheeling: A Response to Advocates of Retail Wheeling*, 2.

<sup>69</sup> Public Utilities Commission v. Attleboro Steam & Electric Company, 273 U.S. 83 (1927).

<sup>70</sup> As originally drafted Part II of the FPA would have imposed common carrier obligations on electric utilities by making it "the duty of every public utility to furnish energy to, exchange energy with, and transmit energy for any person upon reasonable request. . ." S. 1725, 74th Cong. 1st Sess., sec 202(a); H.R. 5423, 74th Cong., 1st Sess., sec. 202(g).

energy at wholesale in interstate commerce."<sup>71</sup> Even so, before the 1960s, wheeling was relatively rare. Since the 1960s, however, there has been a tremendous growth in the transmission system and its use. The transmission system increased in size from about 20,000 circuit-miles in the early 1960s to approximately 130,000 circuit-miles in the early 1990s. Bulk power sales for resale increased from 87 billion kilowatthours (kWhs) in 1961 to 338 billion kWhs in 1987. And, wheeling transactions increased from 10 billion kWhs in 1961 to a high of 197 billion kWhs in 1985 (standing at 141 billion kWhs in 1987).<sup>72</sup> In response to the energy crisis of the 1970s, Congress enacted a five-part National Energy Act in 1978, which included the Public Utility Regulatory Policies Act of 1978 (PURPA).

Significantly, Title II of PURPA opened up entry into the wholesale generation market to a selective group of cogeneration and renewable resource power entities known as "qualifying facilities." Also, PURPA sections 203 and 204 amended the Federal Power Act by adding sections 211 and 212. These sections contain detailed substantive and procedural requirements that must be met before the Federal Energy Regulatory Commission can mandate wheeling.<sup>73</sup> These requirements taken together, however, created a series of barriers that were insurmountable: only under extremely

---

<sup>71</sup> Federal Power Act, section 201(b), 16 U.S.C. sec. 791 et seq. (1992).

<sup>72</sup> Federal Energy Regulatory Commission, *The Transmission Task Force's Report to the Commission: Electricity Transmission: Realities, Theory, and Policy Alternatives* (Washington, D.C.: Federal Energy Regulatory Commission, October 1989), 8, 192. This report is commonly referred to as the FERC Staff Transmission Task Force Report. It was critiqued in an earlier NRRI report, Kevin Kelly, Robert E. Burns, and Kenneth Rose, *An Evaluation for NARUC of the Key Issues Raised by the FERC Transmission Task Force Report* (Columbus, OH: The National Regulatory Research Institute, 1990).

<sup>73</sup> A detailed analysis of the requirements of PURPA sections 203 and 204 is contained in another earlier NRRI report and is not repeated here. See Robert E. Burns, "Legal Impediments to Power Transfers," *Non-Technical Impediments to Power Transfers*, Kevin Kelly, ed. (Columbus, OH: The National Regulatory Research Institute, 1987).

limited circumstances could the FERC mandate wheeling. For all practical purposes the FERC's authority to order wheeling was ineffectual.<sup>74</sup>

Although the PURPA Title II provisions dealing with FERC's authority to wheel were ineffectual, the Title II provisions allowing for market entry of qualifying facilities (QFs) were most effective. By 1988, FERC approved about 62,000 megawatts (MW) of QF capacity and by some estimates half of all new capacity is now expected to be from nonutility sources. This created a demand for more economical sources of nonutility generation. Two major impediments to the development of nonutility generation remained. First, nonQF, nonutility generation could not develop without an exemption to the Public Utility Holding Company Act of 1935 (PUHCA).<sup>75</sup> Second, nonutility generation "must be able to obtain transmission service at cost-based rates for the wholesale power market to be competitive and robust."<sup>76</sup>

---

<sup>74</sup> Ibid. By ineffectual, we mean both ineffective and without the desired effect. As just noted, the FERC could mandate wheeling only under extremely limited circumstances, which taken together created an insurmountable barrier, effectively prohibiting FERC from mandating wheeling. It would have been disingenuous for Congress to enact such detailed legislation to permit FERC to mandate wheeling if it were the intent of Congress to prohibit FERC from mandating wheeling. The same result would have existed without the enacted legislation. Therefore, one can assume that the legislation was both ineffective and ineffectual.

<sup>75</sup> Daniel Duann, Robert E. Burns, and Mark Eifert, *Competitive Bidding for Electric Generating Capacity: Application and Implementation* (Columbus, OH: The National Regulatory Research Institute, 1988), 42-46; Kenneth Rose, Robert E. Burns, and Mark Eifert, *Implementing a Competitive Bidding Program for Electric Power Supply* (Columbus, OH: The National Regulatory Research Institute, 1991), 83-90; and Kenneth W. Costello, Edward H. Jennings, and Timothy W. Viezer, *Implications of a New PUHCA for the Electric Industry and Regulators* (Columbus, OH: The National Regulatory Research Institute, 1992).

<sup>76</sup> FERC Staff Transmission Task Force Report, 171; also see, Douglas Houston, *Toward Resolving the Access Issue: User-Ownership of Electric Transmission Grids*, Policy Insight No. 129 (Santa Monica, CA: The Reason Foundation, August 1991); and U.S. Office of Technology Assessment, *Electric Power Wheeling and Dealing* (Washington, D.C.: U.S. Office of Technology Assessment, May 1989).

Accordingly, when Congress sought to set out a new national energy strategy by enacting the National Energy Policy Act of 1992 (EPAAct), it addressed each of these issues in Title VII, the Electricity Title. Title VII contains two major interrelated parts: Subtitle A, which creates a new class of generators called "exempt wholesale generators," and Subtitle B which addresses transmission access and pricing.<sup>77</sup> Generally, Subtitle A provides that any person engaged (directly or indirectly through affiliates) in the business of owning and/or operating one or more facilities used to generate electricity at wholesale is exempt from the PUHCA. This removes the first barrier to nonutility generation in the wholesale power market. But it is Subtitle B that has the greater relevancy to this report.

Subtitle B begins by amending sections 211 and 212 of the FPA, removing the insurmountable barriers of PURPA and providing the FERC with broad, but limited, authority to mandate or order wheeling in the wholesale power market. For purposes of this report, it is less important to know the individual procedural provisions of transmission access or substantive provision of transmission pricing than to know the broader jurisdictional bounds of Subtitle B.<sup>78</sup> Taken together, EPAAct sections 721 and 722 amend sections 211 and 212 of the FPA to provide that any wholesale generator may apply to the FERC for an order requiring a transmitting utility to provide transmission services to the applicant. The order may include any enlargement of transmission capacity necessary for the services, although such an enlargement may be subject to any applicable state commission and local siting and environmental reviews. No order requiring transmission service may be issued if, after considering consistently applied regional or national reliability standards, guidelines, or criteria, the FERC finds that the order would unreasonably

---

<sup>77</sup> Of course, there is also Title VII, Subtitle C, comprised of one section. EPAAct section 731 provides that "nothing in this title or in any amendment made by this Title shall be construed as affecting or intending to affect, or in any way to interfere with, the authority of any state or local government relating to environmental protection or the siting of facilities." For our purposes, the only relevance that Subtitle C has is that it is but one demonstration that Congress did *not* provide that the FERC should have pervasive regulatory control over wholesale generation or interstate transmission.

<sup>78</sup> For a summary of these provisions, see Kenneth W. Costello et al., *A Synopsis of the Energy Policy Act of 1992: New Tasks for State Public Utility Commissions*, Chapter 3.

impair the continued reliability of electric systems affected by the order. Any wheeling order issued under section 211 will require the transmitting utility to provide wholesale transmission services at rates, terms, and conditions that meet the somewhat conflicting criteria found in section 212(a).<sup>79</sup> Thus, EAct greatly expands the FERC's jurisdiction over wheeling between entities in the wholesale power market, which includes EWGs, QFs, and utilities as sellers and utilities and municipalities as buyers, by allowing the FERC to order wheeling upon request of a seller if the transmission service would not unreasonably impair reliability.

It is also noteworthy that EAct section 722(2) amends FPA section 212(e)(1) to provide that FPA sections 210, 211, 212, and 214 should not be construed as limiting or impairing any authority that the FERC would have under any other provision of the law and that no requirement exists to use sections 210, 211, 212, or 214 in lieu of any other authority of law.<sup>80</sup> This is important because it also makes clear that FERC's authority under existing statutory or existing case law is not limited by the EAct provisions except as provided in those sections. Alternative statutory authority is still available: the parties are free to make use of FERC's other authorities and are not limited to these EAct provisions.

Of great importance for purposes of our later analysis are new FPA subsections 212(g) and 212(h). EAct amended the FPA by specifically providing that "no order [requiring transmission service] may be issued. . . which is inconsistent with any state law which governs the retail marketing areas of electric utilities."<sup>81</sup> Specifically, this has the effect of prohibiting the *FERC* from ordering retail wheeling to the extent that it would be inconsistent with state laws providing utilities with exclusive franchise areas. The subsection does not address the power of

---

<sup>79</sup> The FERC currently has an ongoing docket to help it sort out these seemingly inconsistent statutory criteria. See "Notice of Technical Conference and Requests for Comments in an Inquiry Concerning the Commission's Pricing Policy for Transmission Services Provided by Public Utilities Under the Federal Power Act," Docket No. RM93-19-000, issued June 30, 1993, with initial comments due November 8, 1993.

<sup>80</sup> Federal Power Act section 212(e)(1), as amended by EAct section 722(2), ----- U.S.C. sec. ----- (1992).

<sup>81</sup> Federal Power Act section 212(g), as amended by EAct section 722(3) ----- U.S.C. sec. --- -- (1992).

state commissions to order such retail wheeling nor does it address the authority of state legislatures from revising their laws governing retail marketing areas.

Section 212(h) of the FPA is even more direct. It provides that "no order [requiring transmission service] issued under the FPA shall be conditioned upon or require transmission. . . (1) directly to an ultimate consumer, or (2) to, or for the benefit of, an entity that would resell the power to an ultimate consumer, unless (a) the entity were a Federal Power Marketing Agency, the Tennessee Valley Authority, rural electric cooperatives, state agencies or political subdivisions, existing utilities or others with a statutory obligation to serve, or corporations or associations that are wholly-owned by one or more of the above, and (b) such an entity were "grandfathered" by providing electric service to the ultimate consumer on the date of EPAct enactment or would utilize transmission or distribution facilities that it owns or controls to deliver all such electricity to such consumer. . ."82 This clearly provides that the FERC cannot directly or indirectly through its conditioning powers require retail wheeling to ultimate customers. But what is most significant is how this subsection ends: ". . . Nothing in this subsection shall affect any authority of any state or local government under state law concerning the transmission of electric energy directly to an ultimate consumer."<sup>83</sup> By its own terms, the prohibition against FERC's authority to order retail wheeling does not affect any authority that might exist under state law concerning transmission to ultimate customers. The next subsection deals with the first of two key issues: Are state commissions preempted by federal law from authorizing or requiring retail wheeling to ultimate consumers?

### **Are State Commissions Preempted?**

The test of whether a state commission is preempted by a federal statute is clear, except in its application. The Supremacy Clause requires that federal law preempts state law or regulation

---

<sup>82</sup> Federal Power Act, section 212(h) as amended by EPAct section 722(3), ----- U.S.C. sec. --- (1992).

<sup>83</sup> Id.

where a conflict exists between federal and state law. Courts rely on a three-part test to determine whether state law is preempted by federal law. Preemption occurs when (1) there is express language indicating a Congressional intention to preempt state law, (2) a pervasive scheme of federal regulation creates the inference that state action is precluded, or (3) where a conflict between federal and state law exists.<sup>84</sup> Congress seldom specifically preempts state laws. Therefore, it is the responsibility of the courts to determine whether a pervasive scheme of federal regulation exists that creates an inference that state action is precluded or whether a conflict between federal and state law exists. Until the courts make a definitive statement on the topic of whether states can authorize or require retail wheeling, one can only speculate as to the ultimate outcome. An objective and neutral analysis of the possible outcomes follows.

Not surprisingly, the FPA does not expressly preempt state laws. Rather, it provides that the FERC has jurisdiction over "interstate transmission of electric energy" and provides it with the authority to set "rates, terms, and conditions of service."<sup>85</sup> How pervasive is the federal regulatory scheme? One key case dealing with transmission services in interstate commerce is F.P.C. v. Florida Power & Light Co.,<sup>86</sup> where the United States Supreme Court held that a utility's power transmission service is subject to FERC regulation even if the transmission never extends beyond the borders of the state, by virtue of the utility's interconnection to the interstate grid. Thus, interstate transmission service can occur even where all transmission facilities and all the parties to the transaction are located within a *single* state *if* the transmission service occurs over lines connected to the interstate grid.<sup>87</sup> The reasoning here is that even when transmission service involves parties only in one state, some *interstate* power and energy would be commingled with *intrastate* power and energy because of the utility's interconnection to the interstate grid. Thus, it can be argued that when "unbundled transmission service" is offered, even on an entirely

---

<sup>84</sup> Fidelity Federal Savings and Loan Association v. Delta Cuesta, 458 U.S. 141 (1982).

<sup>85</sup> Federal Power Act sections 201, 16 U.S.C. sec. 824(a), and 205, 16 U.S.C. sec. 824(d), respectively.

<sup>86</sup> F.P.C. v. Florida Power & Light Co., 404 U.S. 453 (1972).

<sup>87</sup> See, for example, Florida Power & Light Co., 40 FERC para. 61,045 (1987).

intrastate level, the FERC has authority over rates, terms, and conditions of the transmission service if the utility involved is connected to the interstate grid.

Yet, the broad authority of the FERC to set rates, terms, and conditions of transmission service in interstate commerce or as ordered under section 211, does not provide the FERC with unlimited authority. As noted above, FERC's authority to mandate or order retail wheeling is expressly limited under both EPAct and its predecessor PURPA. If the FERC is expressly unable to order or mandate retail wheeling and unable to revise the scope or the purview of state retail marketing areas provided for by state law, does that necessarily imply that appropriate state authorities cannot effectively change the scope or the purview of state franchise laws and permit retail wheeling to the ultimate customer? Opponents of retail wheeling have argued that a pervasive federal regulatory scheme concerning transmission service exists that precludes the possibility of retail wheeling. The reasons for this derive from the general and exclusive nature of FERC's jurisdiction over interstate transmission service, the interlocking nature of regional interstate transmission grids, and EPAct's virtual prohibition against retail wheeling.<sup>88</sup> They also have argued that the states are precluded from allowing or requiring retail wheeling because of the following doctrine: where Congress has made a decision to forgo regulation in a given area, this implies "an authoritative federal determination that the area is best left unregulated, and in that event [such a determination not to regulate] would have as much preemptive force as a decision to regulate."<sup>89</sup> Opponents also argue the saving clause *only* applies to limitations on state commission authority that might otherwise arise from the prohibition against FERC mandating retail wheeling and sham transactions. They contend that, under the division of authority set out in section 201 of the Federal Power Act, the FERC has exclusive authority over transmission service and states do not now and never have had authority to order or permit retail wheeling.

---

<sup>88</sup> See, for example, Donald M. Salazar, "Power Transmission & Wheeling Issues: How Do They Affect Us All?"

<sup>89</sup> *Arkansas Electric Cooperative Corp. v. Arkansas Public Service Commission*, 461 U.S. 375, 383 (1983), in dicta. Significantly, the holding of *Arkansas Electric Cooperative* allows state commissions to regulate electric cooperatives in the absence of a Congressional indication of intent that there was an authoritative federal determination that cooperatives be left unregulated.

They argue that any attempt of state commissions to order or permit retail wheeling would place the state commission in direct conflict with FERC policy.<sup>90</sup>

However broad and otherwise pervasive federal regulation of unbundled transmission service was or still is under the FPA as subsequently amended by PURPA Title II and EPAct Title VIIB, federal regulation is nevertheless expressly *limited* to mandating or ordering wholesale wheeling transactions and to setting prices, terms, and conditions for those transactions and other "unbundled" transmission service in interstate commerce. Congress has never extended federal rate regulation to transmission service that is bundled together with other intrastate retail services as a part of the total product provided to retail customers. Further, in one subsection of EPAct, the Congress recognized the legitimate role of state laws and regulations to create and enforce retail marketing areas (exclusive retail franchise areas).<sup>91</sup> It did so by expressly forbidding transmission orders that are inconsistent with those laws, by expressly forbidding federal regulation from requiring or conditioning a transmission order on "retail wheeling" or "sham wholesale transactions" to ultimate customers, and by expressly preserving state authority by stating that nothing in the prohibition against federal regulation involving "retail wheeling" or "sham wholesale transactions" affects any authority of any state or local government under state law concerning the transmission of electricity to ultimate customers. Thus, EPAct clearly draws a line limiting federal authority over transmission service. Before PURPA, following PURPA, and now after EPAct, federal regulation of transmission service in interstate commerce has been limited so that it does not interfere with state franchise laws or exclusive retail service territories

---

<sup>90</sup> Opponents of retail wheeling are likely to cite certain key United States Supreme Court cases in support of their position, including *Public Utilities Commission v. Attleboro Steam & Electric Co.*, 237 U.S. 83 (1927); *F.P. C. v. Florida Power & Light Co.*, 404 U.S. (1972); and *Schneidewind v. ANR Pipeline Company*, 485 U.S. 293 (1988). None of these cases, however, is exactly on point and arguably could be distinguished. For a contrary view, see Clark Evans Downs, "The Effect of the Energy Policy act of 1992 on access to transmission Services," presented at the New Mexico State University Conference on Current Issues Challenging the Regulatory Process, Santa Fe, New Mexico, March 15, 1994.

<sup>91</sup> EPAct sec. 722(3), amending Federal Power Act, sec. 212(g) and (h).

and transmission service that is bundled and a part of retail rates for retail service.<sup>92</sup> Also, federal rate regulation of transmission service cannot set rates, terms, and conditions for transmission service that is bundled as part of the cost of service to retail customers. Read from this perspective, the "savings clause" makes clear that federal regulation is limited and that this is a legitimate area for state laws and regulation.

Because the federal regulatory scheme is not pervasive and, while very broad, is not unlimited, states can address the fundamental issue of whether and to what extent

---

<sup>92</sup> It is worthwhile to note that the distinction between "retail wheeling" and "wholesale wheeling" in EPAct is a legal distinction. In fact, "wheeling" itself is merely transmission service for the benefit of others. The technological effect on an integrated interconnected interstate power grid of two identical wheeling transactions would be the same, whether they involved retail or wholesale wheeling. Both are in interstate commerce. Congress prohibits the FERC from mandating retail wheeling, however, in order to reserve jurisdiction over retail marketing areas (exclusive retail franchise areas) to the states.

they wish to allow or order jurisdictional electric utilities with franchise areas to permit ultimate customers into the market.<sup>93</sup> The existence and extent of the utility franchise or exclusive retail marketing area are solely a creation of state regulation and are the responsibility of state regulators and state legislatures to define their scope. Indeed, before or immediately following the enactment of EPAct, several state commissions and state legislatures addressed their authority to mandate retail wheeling.<sup>94</sup> A partial list follows. For example, the California Public Utility Code permits cogenerators to sell electricity to a maximum of two physically-adjacent properties. Connecticut, Florida, and Maine provide for "self-service wheeling," that is, wheeling from a cogenerator associated with an industrial plant to another facility with the same owner as that of the plant served by the cogenerator. A qualifying facility (QF) in Hartford, Connecticut, for example, sells electricity to Aetna Life and Casualty Insurance Company, and Pacific Gas & Electric wheels power from certain municipally-operated hydroelectric plants to San Francisco. In Florida, self-service wheeling is compelled by Commission rules unless adverse impacts can be demonstrated. Under New Hampshire's Limited Electric Energy Producers Act, a limited producer (of less than 5 MWs) may sell its electricity to a maximum of three retail customers. The New Hampshire Public Utilities Commission

---

<sup>93</sup> A significant cautionary note is in order here. Customers entering the market by means of retail wheeling may not be able to take full advantage of the generation sources available in the wholesale market. EWGs must sell exclusively in the wholesale market. EWGs cannot sell to ultimate retail customers without losing their status that exempts them from the PUHCA. Those engaging in retail wheeling may find their market to be less robust than the wholesale market that is accessible by their own host utility.

<sup>94</sup> The next several examples are taken from a survey done by the Edison Electric Institute as "Attachment B" to Donald M. Salazar, "Power Transmission & Wheeling Issues: How Do They Affect Us All?" and from Clearly, Gottlieb, Steen and Hamilton, "Memorandum for Dr. John A. Anderson, Re: Retail Wheeling Examples."

must approve all transactions, however. The Texas Public Utility Commission allows retail wheeling if the user is the sole consumer of the plant's thermal output or if the QF is less than 10 MWs and uses renewable resources.

In September 1985, the New York Public Service Commission permitted the Montenay International Corporation to supply electricity to customers within the Brooklyn Navy Yard, since Montenay built its own distribution lines and did not cross a transmission right-of-way. Several specific customers of Consolidated Edison of New York, including Shearson Lehman Brothers and General Motors, were granted the right to purchase directly from the New York Power Authority. Similarly, New York Power Authority-produced power is wheeled to two ultimate customers of the Long Island Lighting Company (LILCO), Brookhaven National Laboratory and Grumman Corporation. Numerous other New York examples exist. Also, the New York Public Service Commission stated that it has the authority to order utilities to wheel, but that rates, terms, and conditions of wholesale transmission service are to be set by the FERC (Order No. 88-15). To the extent that the above instances of retail wheeling were known during Congressional debate on EAct, there is a greater presumption that Congress did not merely enact "empty language" in passing the "savings clause" noted above.<sup>95</sup>

As noted in section 3 of this report, several states are considering and one state has adopted a retail-wheeling arrangement. State legislators and regulators must keep in mind, however, that once transmission service to ultimate customers is offered as an unbundled service, the transmission service is considered *interstate* commerce (except

---

<sup>95</sup> For example, state level examples of state-ordered intrastate, self-service, and retail wheeling are noted in the widely-distributed, stand-alone, pre-EAct paper sponsored by the Ad Hoc Committee for a Competitive Electric Supply System (ACCESS), a lobbying group favoring competitive bidding, transmission access, and retail wheeling. Jay Kennedy and Richard Baudino, *Retail Wheeling: Expanding Competition in the Electric Utility Industry* (Atlanta, GA: Kennedy and Associates, April 1991), 18-23.

perhaps for ERCOT voluntary transmission transactions, Alaska, and Hawaii).<sup>96</sup> Once unbundled transmission service is part of interstate commerce, the FERC has full authority to set prices, terms, and conditions of service.<sup>97</sup> Therefore, state public service commissions cannot set prices, terms, or conditions of retail transmission service once they have determined to permit retail wheeling. It is important for state commissions to understand the distinction between what is and what is not within their jurisdiction. With proper state legislation, state commissions can permit retail wheeling of power for some or all of what are traditionally retail customers. For example, state commissions can allow retail wheeling for only a few select industrial customers as an economic development measure to secure job growth, for some or all industrial customers, or for all customers, including commercial and residential. Once a state commission permits retail wheeling, however, setting the price, terms, and conditions of that transmission service is within the jurisdiction of the FERC. If state authorities attempt to set prices, terms, and conditions of service, this would create a direct conflict with federal law and regulation leading to state preemption. Thus, even though the authors argue that state legislatures and commissions can permit or require retail wheeling, without the ability to set rates, terms, and conditions of service, they might find this authority more akin to an abdication of jurisdiction to the FERC. Even if it is found to be in the public interest, without a more cooperative relationship than now exists between the states and the FERC on their existing joint (currently in the sense of split-the-baby, not concurrent) jurisdiction over transmission matters, state legislatures and regulators might find

---

<sup>96</sup> An interesting issue raised by unbundled transmission service being in interstate commerce is the effect of requiring reciprocity of retail wheeling with neighboring states. The idea being that generators from neighboring states would be allowed to provide power to retail customers in the host state only if they allow generators of the host state to provide power to their retail customers. Because unbundled transmission service is in interstate commerce, it is within FERC's exclusive jurisdiction to set prices, terms, and conditions of transmission service. If FERC's jurisdiction over setting prices, terms, and conditions is broadly read, as seems likely, limiting generators that can serve retail customers who are no longer subject to franchise area regulation might be held to be an impermissible burden on interstate commerce. Thus, FERC preemption may prevail.

<sup>97</sup> *F.P.C. v. Florida Power & Light Co.*, 404 U.S. 453 (1972).

retail wheeling too bitter a pill to swallow.<sup>98</sup>

### Commerce Clause Concerns

While state legislatures and state commissions may not be preempted from allowing or ordering retail wheeling, state commissions are probably preempted from setting the price, terms, and conditions of such retail wheeling service because it involves unbundled transmission service in interstate commerce. The issue of federal preemption, however, is only the first of two significant Constitutional hurdles that might prevent a state legislature or state commission from being able to enact a retail wheeling statute or order that passes Constitutional muster. The second hurdle is the Commerce Clause.<sup>99</sup> Although the FERC has jurisdiction over most situations involving transmission of electricity, courts are likely to use a "balancing test" to determine if states can act where the FERC does not have jurisdiction without creating an impermissible burden on interstate commerce. In other words, can a state permit or require retail wheeling without creating an impermissible burden on interstate commerce? The Courts would examine (1) the nature of the state regulation, (2) the state objectives, and (3) the effect upon the national interest in commerce.<sup>100</sup> When determining whether the Commerce Clause was violated,

---

<sup>98</sup> The topic, ways of relieving transmission jurisdictional disputes, is the subject of a forthcoming NRRI report by Robert E. Burns and Mark Eifert. See the "NRRI Comments In Response to the Federal Energy Regulatory Commission's Request for Comments in its Inquiry Concerning the Commission's Pricing Policy for Transmission Services Provided by Public Utilities Under the Federal Power Act" for a preview of the report.

<sup>99</sup> The proper approach to determining whether states are Constitutionally prohibited from allowing or ordering retail wheeling is a two-hurdle analysis considering first the question of federal preemption and second the question of whether the state action would violate the Commerce Clause. A two-hurdle analysis is appropriate because it is possible to be subject to federal preemption without violating the Commerce Clause, and vice versa. It is worth noting that in this circumstance, where the relevant statutes (the FPA and EPAct) were enacted as an exercise of the Commerce Clause, it is likely that if a proposed state action fails one hurdle, it will fail both.

<sup>100</sup> See *Panhandle Eastern Pipe Line Co. v. Public Service Commission of Indiana*, 332 U.S. 507, 517-18 (1947).

the Court would determine whether a statute regulates evenhandedly to effectuate a legitimate local public interest, and whether the effects on interstate commerce are only incidental. The state statute or regulation would be upheld unless it imposes a burden on interstate commerce that is clearly excessive in relation to the putative local benefits. If a local purpose is found, then the question becomes one of degree and balancing. The extent of the burden on interstate commerce that would be tolerated will depend on the nature of the local interest involved and on whether it could be promoted as well with a lesser impact on interstate activities.<sup>101</sup>

In the case of state legislative or state commission authority to permit or require retail wheeling, a clear local purpose exists in allowing the ultimate customers of a state to take advantage of the wholesale power market. A robust competitive wholesale power market when coupled with properly designed transmission service rates will create a dynamic competitive market that will provide ultimate customers with the lowest possible rates, as well as with choices over power quality and service reliability.<sup>102</sup> In a competitive world, having the ability to control the price of the factors of production, including power, can be crucial. There is a strong local interest in favor of retail wheeling: an interest in promoting industry and employment, and in lowering the cost of power to industrial, commercial, and residential customers.

Retail wheeling necessarily involves a "burden" on interstate commerce. If retail wheeling allows the ultimate customers to freely shop in the wholesale generation market, the "burden" created by retail wheeling would be to help create a more robust competitive wholesale generation market in power. If, on the other hand, retail wheeling is limited to intrastate transactions involving self-help between facilities owned by a cogenerator, a greater burden may indeed fall on interstate commerce, although the local interest might be as strong as before. In the authors' view, there should be little question as to whether retail wheeling would pass muster

---

<sup>101</sup> Pike v. Bruce Church, Inc., 397 U.S. 137 (1970).

<sup>102</sup> For a dynamic, competitive wholesale power market to develop, the FERC must link wholesale generation policy with its transmission service policy to promote the efficient use of both generation and transmission facilities. This can only be done by pricing that allows the highest-valued transactions to take place first. See the "NRRI Comments on Transmission Pricing."

under the Commerce Clause,<sup>103</sup> particularly if we are correct in our conclusion that the FERC would set rates, terms, and conditions for such unbundled transmission services. By setting appropriate rates, terms, and conditions, the FERC could assure that interstate commerce is not burdened, but rather promoted by retail wheeling.

### **How Can States Permit or Require Retail Wheeling?**

The issues discussed here relate to how well retail wheeling meshes with current state statutory and regulatory public utility law; and what should be done concerning the "regulatory compact" if retail wheeling is implemented.

Currently, every one of the fifty states have state laws that set up exclusive retail marketing areas for investor-owned electric utilities.<sup>104</sup> These laws and regulations take two forms. First, some commission-administered state laws specifically provide for service area assignments--territorial-type statutes. At least twenty-three states provide service area assignments under a territorial-type statute. These statutes frequently specify their purposes as: avoiding expensive duplication of facilities, improving efficiency, and minimizing service area disputes. Typically, these territorial-type statutes

---

<sup>103</sup> For a more thorough list of benefits from retail wheeling see Kennedy and Baudino, *Retail Wheeling: Expanding Competition in the Electric Utility Industry*; and John Anderson and John Hughes, *Competitive Sourcing of Retail Electric Power* (Washington, D.C.: The Electricity Consumers Resource Council, July 1993).

<sup>104</sup> Much of the following discussion on state laws dealing with utility franchise areas is based upon Samuel Porter and John Burton, "Legal and Regulatory Constraints on Competition in Electric Power Supply," *Public Utilities Fortnightly* (May 25, 1989): 24-36.

explicitly provide that the utility has the exclusive right and obligation to serve an identifiable service area.

Second, in at least thirty-eight states,<sup>105</sup> service area assignments are made through the commission's granting of a certificate of public convenience and necessity. These latter statutes do not expressly designate an exclusive service territory, but instead employ certificates of public convenience and necessity to assign retail service areas, normally evidencing an intention to have only one supplier in a service area. Often these statutes specify that they are meant to avoid duplication of facilities and to prohibit any entity from unreasonably interfering with existing utility service. New Mexico's Certificate of Convenience and Necessity law is representative of this type of statute.<sup>106</sup>

But, state territorial and certificate of convenience and necessity laws do not exist in isolation. They are part of what both legal scholars and utility practitioners recognize as the "regulatory compact." While the exact details of this compact vary in minor ways from state to state, the "regulatory compact" provides for the rights and responsibilities of regulated public utilities. Public utilities have the opportunity to collect a reasonable price for their services based on their prudently-incurred expenses and a reasonable return on prudent investments that are used and useful in providing service. Utilities have the right to impose reasonable rules and regulations on their customers. When providing adequate service at reasonable prices, utilities have the right to some protection against competition in their service areas. Finally, most utilities enjoy the right of eminent domain.<sup>107</sup>

In exchange for these rights, utilities have certain responsibilities. First, they have an obligation to serve all who apply for service from within their service area. Second, they must provide safe and reliable service. Third, they must not engage in undue price discrimination. In other words, all similarly situated customers receiving the identical service must be served on the

---

<sup>105</sup> Twenty-three and thirty-eight states total to more than fifty because both types of statutes are in place in some states.

<sup>106</sup> N.M. Stat. Ann. sec. 62-9-1 et seq. (1984 & 1987).

<sup>107</sup> Charles Phillips, *The Regulation of Public Utilities* (Arlington, VA: Public Utilities Reports, Inc., 1985), 106-107.

same terms and conditions and for the same price. Finally, public utilities can only charge just and reasonable rates and cannot earn monopoly profits.<sup>108</sup>

In essence, the problem with retail wheeling, regardless of its advantages, is that it destroys the existing "regulatory compact." Without protection of an exclusive retail marketing area, the fabric of the existing "regulatory compact" unravels or at worst is rent asunder. Retail wheeling opens up a Pandora's Box of nontrivial transitional issues, as well as issues regarding the public utility's rights and obligations as they coexists with retail wheeling.

Specifically, retail wheeling raises the issue of what is the utility's obligation to serve. Does it still exist for a class of core customers that are not allowed to engage in retail wheeling? Does the utility have an obligation to service customers that engage in retail wheeling but later want to return to the system? Can the utility, for all practical purposes, refuse retail-wheeling customers service given the likely political pressures when jobs and employment are at stake? Should the utility be allowed to charge whatever the market will bear to Prodigal customers that return unexpectedly after leaving the system or should they be charged cost-based rates? Should the utility be required to provide Prodigal customers that leave the system back-up or standby power and, if so, at what price? Should the utility be required to provide system support and, if so, at what price? There are no easy answers, and the answer given to each query affects the next.

Take the stranded-investment problem, for example. If utility investment that was prudently incurred, used, and useful before retail wheeling becomes stranded because it is "uneconomical" compared to other generation options, should the utility be able to recover a return on its stranded investment? If so, should core customers pay for it? If not, should the utility automatically be allowed to temporarily or permanently remove the plant from rate base and be allowed to treat the plant as an exempt wholesale generator in competition with other

---

<sup>108</sup> Ibid. Also, it is important to note that the "regulatory compact" is not necessarily a voluntary agreement which utilities have voluntarily accepted. The regulatory compact is often instead a balancing of utility rights and responsibilities, enacted by state legislatures and enforced by state public service commissions. When the regulatory compact is fundamentally changed, as would be the case if retail wheeling is permitted, then a fundamentally new regulatory compact with a new balancing of utility rights and responsibilities would be needed.

generators in the wholesale generation market? If stranded investment exists, how does one determine which plant investment is not being used? Does retail wheeling necessarily lead to the same result as would undue price discrimination?

These are but a small sample of the complex questions that retail wheeling raises. If retail wheeling is implemented on anything more than a limited experimental basis (and in some states even such an experiment might violate statutory law), there would need to be careful thought and consideration regarding how the "regulatory compact" needs to be rewritten. Although such a rewriting of the "regulatory compact" involves answering questions, the solutions of which would ultimately find their way into regulation as a new rewritten "regulatory compact," it may be best to use a collaborative approach under state commission supervision to help restructure the industry.<sup>109</sup>

---

<sup>109</sup> For a more thorough discussion of the type of collaborative approach that would be necessary, see Robert E. Burns, *Administrative Procedures for Proactive Regulation* (Columbus, OH: The National Regulatory Research Institute, 1988).

## 5. TECHNICAL CONSIDERATIONS

The general definition of wheeling is the transmission of electrical energy and power from a seller to a buyer, through the transmission lines owned by a third party. Wheeling comes in several forms. Several of these are more closely related to retail wheeling; they include: (1) customer-to-customer, where two customers within the wheeling utility's service territory buy and sell from each other, (2) customer-to-utility, utility-to-customer, where a customer within the wheeling utility's service territory buys (or sells) energy from a neighboring utility, and (3) utility-to-utility. Wholesale wheeling usually takes on the form of "utility-to-utility" wheeling, where a selling utility sells energy to the buying utility and the wheeling is done by other interconnected utilities.

Unlike wholesale wheeling, where the wheeling utility provides transmission services only, the retail-wheeling utility would in most cases be expected to provide distribution services in addition to transmission services. The other physical difference between wholesale wheeling and retail wheeling is that retail transactions will likely be more numerous, frequent, and spatially and timely diverse. Further, they will likely shift and fluctuate more frequently than wholesale transactions. These differences, if they in fact exist, will make retail transactions technically harder to handle. Although the list and attributes of the technical difficulties impeding wholesale and retail wheeling are similar, the severity of some of these impediments becomes more stringent under retail wheeling.

The focus of this section is on some of the technical problems associated with wheeling. These difficulties include parallel path problems, network congestion, transmission line capacities and line losses, metering problems, distribution limitations, and capacity and transmission planning problems. First, this section will distinguish between the contractual and physical aspects of wheeling.

### **Definitions of Wheeling**

In the literature, the definitions of wheeling in general and retail wheeling in particular have not recognized the effect of the different structures of power system

control, dispatch, and interconnection on power and energy transactions. Fred C. Schweppe (1985)<sup>110</sup> and others, pointed out two different definitions of wheeling:

(1) the *contractual* definition, which is the simultaneous purchase and sale of electricity of nonadjoining parties through the transmission lines of a third party (or parties); and (2) the *physical* definition, which is the change in actual power flows in transmission lines owned by other parties, when a seller sells to a buyer. These differences stem from the possibility that a wheeling could take place contractually, while no physical effect occurs; and the possibility that physical wheeling could take place when, under current contractual practices, no wheeling is happening.

If a wheeling transaction has no physical effects--if network flows are the same with wheeling as without it--then the transaction is nothing but a wheeling of "money." The wheeling in this case is no different from energy and power brokering or even power pooling. The contractual transaction, therefore, constitutes little more than a special price for selected customers, and it should not be seen as a wheeling transaction. It is not technically or economically feasible that a transaction can happen between two points without physically affecting other "noncontracted" points and lines. Therefore, in a contractual transaction, there must be an implicit assumption that all the interconnected parties, regardless of their participation in the transaction, are sharing the costs and the other effects of loop flow. That is exactly the assumption that institutes all the transactions taking place under the power pools and energy broker arrangements.<sup>111</sup> Hence, the term "wheeling money" implies that there are no waste, losses, or any side-effects.

To elaborate more on the above definitions, one would classify the structures of power

---

<sup>110</sup> F. C. Schweppe, R. E. Bohn, and M. C. Caramanis, *Wheeling Rates: An Economic-Engineering Foundation*, TR-85-005 (Cambridge, MA: Massachusetts Institute of Technology, 1985).

<sup>111</sup> For more reading on the legal and technical analysis of power pools and energy brokers, see Scott R. Herriot, "Competition and Cooperation in Deregulated Bulk Markets," *Deregulation and Diversification of Utilities*, M. A. Crew, ed. (Boston, MA: Kluwer Academic Publications, 1989), 143-163; and Scott R. Herriot, "The Organizational Economics of Power Brokers and Centrally Dispatched Power Pools," *Land Economics* 61, 3 (August 1985): 308-313.

systems as they relate to power transactions into three categories. First, the buyer and the seller of the wheeled power are not controlled by the same central control area, in which case the physical wheeling will happen any time a transaction takes place between the two. Second, only the transmission and distribution services of both the seller and the buyer are controlled by one central control area, in which case a physical wheeling is possible any time a transaction take place. Third, a central control area is fully dispatching and controlling the generation, transmission, and distribution services of both the seller and the buyer, in which case wheeling is nothing more than power pooling or power brokering. In a report by the Edison Electric Institute (1992),<sup>112</sup> the first two categories were mistakenly identified as nothing but economy energy arrangements. The striking difference between economy energy arrangements and retail wheeling is that retail wheeling gives consumers the option to choose the services and the prices that fit their profile of demand and activities. Transactions conducted in a utility-to-utility level (for example, economy energy) are designed to accommodate both utilities' benefits, obligations, and physical capabilities and constraints, but not necessarily the benefits of every customer. In retail wheeling transactions, however, the host utility might have to provide customers, who are seeking off-system power, with other important unbundled services (for example, frequency control, voltage stability, emergency service, and so on) as it always does under economy energy arrangements.

### **Potential Problems and Solutions**

In trying to describe the function of an electric network, analogies are often made to water and gas pipeline systems or to telephone networks and vehicular transportation models. This leads to a major misconception. The main difference between electric power systems and these other systems is that electric systems have no "busy signals" when electric lines are overloaded and no large storage facilities. Electric networks, therefore, are far more fragile than gas, telephone, or any of the other networks. If operating problems occur on a gas pipeline system,

---

<sup>112</sup> Edison Electric Institute, *The Case Against Retail Wheeling: A Response to Advocates of Retail Wheeling*.

the customers downstream may not be affected because so much gas is stored in the mains, and the effects will not be felt by those served from other pipelines. By contrast, if several large ultra-high-voltage (UHV) lines located in a single vital transmission corridor are inadvertently disconnected, electric service may be impaired throughout an entire region. If the phone circuits are overloaded, the telephone system responds with a busy signal; but no such signal is available to alert electricity users when the electric system is overloaded. After calling on all available capacity, the load dispatcher can only respond with voltage reductions and selective load shedding. Occasionally problems may develop so fast that cascading line and generator outages cause the power supply system for an entire region to fall apart and a blackout to ensue. In short, if part of the system experiences trouble, the entire system suffers. In other words, if a single transaction causes improper action, it may jeopardize service to thousands of others.

The technical problems associated with any change in the sources of power for the system or in the use of the transmission system can be quite serious and complex. Transmission and distribution networks are composed of various electric components such as transmission lines, capacitors, transformers, circuit breakers, and so forth. Each component is carefully designed to function within a specific range of operating conditions. If the electric transmission and distribution systems are not designed for the purpose of wheeling large and frequent quantities of power across the system, extensive use for wheeling could necessitate costly additions to the system.

The existence of a power network that interconnects all the parties involved (for example, producers, consumers, and wheelers) is essential to retail wheeling and open access for competitive transactions. It operates in a centrally-controlled fashion. This obvious (full competition/full control) contradiction raises a whole host of legal, administrative, economic, and technical questions.

The focus of the remainder of this section is to address some of the technical concerns that are related to that contradiction. First, what is the essential need of a centrally-controlled network? The list of essential services of the network and its control center provides the answer. These services include the following: (1) day-to-day coordination and dispatching, including load frequency control, economic loading,

voltage regulation, the provision of reactive power, the arrangement of beneficial exchange, and the day-to-day watchful, diligent monitoring of the entire electric power system; (2) provision of costly spinning and operating reserves needed for day-to-day regulating and emergency purposes, as well as the reserves needed for maintenance scheduling and ensuing overall system reliability; and (3) various emergency actions (often undertaken at high cost) directed at removing various problems.<sup>113</sup>

A second concern is whether the network and its controller, while maintaining the network integrity and safety, could handle the voluminous transactions created by retail wheeling and power-exchange competition. The following is a brief discussion of the most obvious technical difficulties arising with retail wheeling, and of some potential solutions to these problems.

### **Parallel Path and Loop Flow Problems**

The actual path taken by electric power wheeled across transmission systems is difficult to predict and impossible to measure. Electric current moves according to Kirchoff's Laws and essentially flows on the path of least electrical resistance. As a result of these physical laws, power moves across many parallel lines in often circuitous routes.<sup>114</sup>

For example, assume that four utilities (A,B,C, and D) are interconnected to each other through a tie-line between each of them. If utility A plans to wheel power to utility D, one might assume that the power will flow over transmission line AD which connects utility A to utility D. Realistically, the current may flow from utility A over line AB to utility B and then over line BD to utility D. Alternatively, the current may also flow from utility A over line AB to utility B, then

---

<sup>113</sup> These actions include the purchasing of alternative power supplies when outside sources fail, correcting for inadvertent error, and operating generating facilities out of economic order when transmission facilities are overloaded. For additional discussion about the economic and technical benefits of the power grid, see Gordon R. Corey, "Some Observations on Bulk Power Markets in the United States," *Public Utilities Fortnightly* (September 14, 1989): 25-30.

<sup>114</sup> For additional discussion about loop flow problems, see Federal Energy Regulatory Commission, *The Transmission Task Force's Report to the Commission: Electricity Transmission: Realities, Theory, and Policy Alternatives*.

down to line BC to utility C and then over line CD to utility D. In actuality, the current has numerous possible paths it can take depending on the loads on the individual transmission lines at the time. Most likely though, a portion of the wheeled current traveling over each transmission line would hinge upon transmission loads on those lines at the time. In sum, the actual flow of power may, and typically does, diverge widely from the contract path. As a result, the supposed economics of the contract path frequently have little to do with the actual costs of the power transfer. Furthermore, these loop flows can affect third parties distant from the intended power flows, and these third parties may, and often do, incur costs without compensation. Most utilities, however, consider the parallel path problem as a cost of interconnection and generally prevent other utilities from wheeling only if the additional transmission system loads cause capacity overload problems on portions of their transmission grid.

### **Network Congestion and Line Capacity**

If the transmission network is heavily loaded, bottlenecks may lead to congestion that will prevent full use of the cheapest plants. Often referred to as "out-of-merit" dispatch, the constrained use of the plants frequently can create a significant opportunity cost that can be assigned to consumers causing the congestion.

The congestion limitations arise in two principal forms. The first is the limit on the flow of power on an individual line. The thermal capacity of a transmission line sets an upper limit on the flow of power on that line. Through the interactions of Kirchoff's laws, a line limitation affects every other flow in the network. A change in generation or load at any bus will have some effect on the flow on the constrained line; hence, the constraint can affect the loading profile at each bus. A second major source of congestion in a power network arises from voltage magnitude constraints at buses. In normal operations or as an approximation of the more complicated worst-contingency analysis, voltage constraints define operating bounds that can limit the amount of power flowing on transmission lines. Even when power flows do not approach the thermal limits of the system and the transmission lines appear to have excess capacity, voltage limits can constrain the transfer capacity.

Voltage constraints inevitably require attention to both the real and reactive power loads and transfers in the alternative current (AC) transmission system. Recall that real power (the power that lights our lamps) is measured in watts or megawatts (MWs) and reactive power is measured in voltage-reactive or VARS and megaVARS (MVARs).<sup>115</sup> Power generation, load, and flow in an AC system are divided into both real and reactive power components. Without voltage constraints, the only matter of concern is the real power flow; it is common practice to ignore the associated reactive power analysis. But voltage can be affected by both real and reactive power loads, and the interaction between the two is critical in determining the induced limits on real power flows.

In reality, voltage limitations and the associated reactive-power compensation are prevalent. For example, the power shortages in New England and New York in 1988 were largely attributed to voltage and reactive power problems.<sup>116</sup> Consequently, accounting for the congestion limits created by thermal limitations on transmission lines may not by itself prevent losses of real power flows. Any new regime for transmission access must address the congestion problems created by reactive power and voltage constraints. The most direct method is to account for both real and reactive power when designing wheeling prices.

Existing transmission and distribution lines are capable of providing electrical service to all electric customers currently within a utility's service territory. Today's transmission and distribution system was primarily designed and constructed to transmit electricity from a utility's on-system generators at specific locations to its customers within its territory, and secondarily to transmit electricity from interconnection points for reliability and economy power transactions. This same transmission system may therefore be incapable of transmitting large quantities of power from outside sources to its retail customers or to other utilities. Additionally, every transmission line is designed to carry a certain maximum amount of electric current. If this maximum current is exceeded, then the transmission line will be damaged. Consequently, a

---

<sup>115</sup> Reactive power (VARs) is a purely mathematical concept used to define how far out of phase the current is with the voltage.

<sup>116</sup> G. Zorpette, "Moving Power Through the Northeast Corridor," *IEEE Spectrum*, August 1989): 46-47.

wheeling transaction may overload and damage the line.

### **Line Losses**

Even if a wheeling transaction does not cause transmission line damage, it can increase transmission line power losses. Transmission line power loss can be defined as the loss of power, in the form of wasted heat, associated with transmitting electrical current over a transmission line. Line loss is generally unavoidable and is directly proportional to the mathematical square of the current.<sup>117</sup> Therefore, doubling the current on a transmission line would cause quadrupled line losses. Line losses also are directly proportional to transmission distance--the greater the distance of electrical transmission over the same size transmission line, the greater the line losses associated with the flow of power. Wheeling transactions can increase transmission line losses substantially.

---

<sup>117</sup> On occasions line losses can be negative if, for example, the wheeled power flows in the opposite direction (that is, balances the load) of the other power transmitted by the utility.

## **Metering Problems**

The electricity requirements of a system constantly fluctuate. The actual power supplied to the system is dependent upon its load requirements at any given time. Thus, the party selling power must be sensitive to these load fluctuations. Two different methods are commonly used to handle this problem. The first and most efficient method focuses on the use of meters at the purchaser's delivery point(s). The amount of power delivered to the delivery points is instantaneously summed and telemetered to the generation dispatch center of the utility selling the power. In this way, the seller is constantly aware of the purchaser's instantaneous power requirements. In the second method, the seller of power provides scheduled allocations of power to the purchaser on a day-to-day basis. The party wheeling the power is responsible for providing the actual power requirements to the purchaser and for load fluctuations on the purchaser's system. Since metered delivery points are a requirement of any party purchasing off-system power, the exact amount of power supplied to the purchaser is known. The meters are read on a periodic basis (usually monthly) and the actual power supplied to the party purchasing off-system power is determined. The amount of actual power supplied is compared to the amount of scheduled power provided and the difference is calculated. If more power was actually supplied during the period than was scheduled, the seller would reimburse the party wheeling the off-system power for the previous month's deficiency in its following month's scheduled power.

The metering problems associated with retail wheeling could be complex and cumbersome. In order to accurately track customers' loads, a network of meters and telemetering would have to be installed from retail customers to the parties generating and supplying their power. Since the system load is adjusted automatically, the computer would instantaneously sum the demands of the retail customers and automatically adjust for the increase or decrease in load.

## **Distribution System Concerns**

Certain technical problems associated with wheeling of electricity are intertwined with legal issues. If a consumer decided to purchase off-system power, he would have to purchase the distribution services from his host's utility grid or construct his own distribution grid. If he purchases the service, the wheeled power would in most cases be distributed to him easily as long as it is within the distribution system limits. If he opts to construct his own grid, a whole host of legal issues would likely arise.

## **Generation and Transmission Planning**

If a customer in a utility's service area contracts for off-system power and wheeling, does that utility still have the responsibility to plan for generation and transmission capacity to serve that customer? Must the utility stand ready to service a former customer during system emergencies experienced by this customer's current supplier? Must the utility resume service to a former customer who wishes to again become that utility's customer at some future time? These are questions that will require answers before capacity planning can be done efficiently.

Retail wheeling could certainly harm a utility's ability to forecast future generating capacity requirements. A utility's load would now depend, among other things, upon the difference between the utility's own retail rates and the market price of electricity. Retail wheeling would also create transmission planning problems for utilities. Utilities wishing to provide service to off-system retail customers could require costly transmission line and system improvements. As a utility added and lost different off-system retail customers, changes in that utility's transmission system could be required.

## **Construction of New Lines**

Although a utility's transmission and distribution systems are capable of serving customers within its service area, existing transmission systems were not built with wheeling in mind. In

particular, the points of interconnection between utilities were not designed for retail wheeling. Thus, in order to make retail wheeling possible, in some instances improvements to the current transmission systems may be necessary. Construction of new transmission lines presents a large obstacle for retail wheeling. Utilities face many barriers in constructing new transmission lines. Construction of a transmission line is a lengthy and expensive project. Before construction of the transmission line begins, the required land must be purchased. Transmission lines are restricted to certain areas. Consequently, the proposed transmission-line construction must meet the requirements and obtain the approval of different federal and state agencies. The next section briefly illustrates how to improve the capabilities of the transmission and distribution network.

### **Technical Measures To Correct for Wheeling Impediments**

To make wheeling and competition possible, the previously discussed technical impediments have to be carefully handled. Legal, administrative, and pricing policies could correct for loop flow, metering, planning, and distribution problems. Line limitations and losses represent physical problems that could be solved only by either expanding or improving the networks physical capabilities. Because of environmental concerns and regulatory delays, electric utilities are now seeking practical alternatives to constructing high-voltage and ultra-high-voltage transmission lines. A recent utility trend is to more effectively use existing transmission lines and rights-of-way. For example, the power transfer capability of lines not operating at their thermal limits can be increased by the addition of series, shunt compensation, or the use of phase shifting transformers. Rights-of-way also can be made to carry more power by (1) raising the voltage on existing lower voltage lines, (2) converting AC lines to DC (direct current), (3) using hybrid lines where AC and DC lines occupy the same tower or the same right-of-way, or (4) by compacting the lines where more circuits are permitted in a given space. High-phase order transmission is one promising form of compaction that has been investigated.

High-voltage DC (HVDC) transmission is an area of particular importance. Thyristor converters rated 500 kV, 2,000 A have been developed using both air and liquid cooling. Several areas of development have made HVDC systems more cost effective over time and have greatly

improved their performance. They include direct light firing of thyristors, the development of higher voltage cells that lead to lower losses, greater control flexibility through the use of microprocessors and sophisticated new control functions (for example, multiterminal operation, real and reactive power control, and damping of subsynchronous oscillations), the reduction of convertor transformer losses, and better protection of equipment against overvoltages with the development of zinc oxide arresters. HVDC should play an increasingly important role in enhancing the capability of the transmission network to accommodate increased wheeling and competitive activities.

An economical way to increase the power transfer capability of an AC line is to install capacitors in series with the line to reduce its electrical impedance. Using zinc oxide discs with high-energy handling capability, series capacitors can be reliably protected against overvoltage by connecting series-parallel arrays of discs directly across the capacitors. The protection of turbine generators against subsynchronous oscillations, which may arise when series capacitors are used, has been accomplished using either passive filters or active thyristor dampers.

Another means of increasing the power transfer capability of existing transmission lines is the addition of shunt compensation in the form of switched capacitor banks or static VAR controls. Static VAR controls were initially applied to control the voltage flicker produced by electric arc furnaces. More recently, static VAR controls were applied to control rapid voltage fluctuations on power transmission systems and to improve the stability of large networks. Static VAR controls consist of thyristor switches, sometimes in conjunction with mechanical switches, to regulate the amount of inductance or capacitance connected to the transmission line for purposes of voltage regulation and increased power transfer.

These measures should significantly enhance the overall reliability and capability of electric power systems to comply with the new competitive regime. They have limitations and costs, however. In a recent study,<sup>118</sup> the enhancement potential and installation costs of five options of

---

<sup>118</sup> John G. Kappenman, "New Transmission Technologies: Implications for Operations and Planning," paper presented at the Conference on Contemporary Issues in Energy, Utilities, and Regulation, sponsored by The Wisconsin Public Utility Institute of University of Wisconsin, Madison, Wisconsin, October 12, 1993.

different technical measures were compared. These options, proposed to enhance the network transfer capabilities, are (1) fixed series capacitors and static VAR compensators (SVCs); (2) adjustable series and SVCs, and uncontrolled parallel paths; (3) the first option plus brakes and fast valving; (4) adjustable series and SVCs, and parallel paths controlled; and (5) the fourth option plus rapid response generation. The study concludes that power transfer could be increased by 35 percent, 50 percent, 60 percent, 70 percent, and 90 percent with the adoption of options 1 through 5, respectively. Assuming option 1 is the bench mark, the study found that the installation of option 2, 3, 4, and 5 are approximately 100 percent, 150 percent, 500 percent, and 800 percent more expensive than the installation cost of option 1. The savings that would result from the transfer of cheap and remote power by the enhanced network should be accounted for when conducting a cost/benefit analysis. The question remains whether utilities would be willing to invest in such measures if the economic benefits and rewards accrue mainly to consumers.

### **Final Comments**

Society has limited tolerance for actions which may disrupt electric service over a wide area. If numerous players are encouraged to engage in any sort of competition in the electric network, some workable enforcement procedures should be established to ensure that variances from the rigorous and unforgiving nature of operations on the grid are not compromised because of competitive pressure. Unlike natural gas transmission, electric wheeling can affect the reliability and stability of service over a wide area. Because electric utilities are interconnected and operate in parallel, the actions of one utility affect other utilities.

Contract language should be drafted to indemnify control area utilities and their load dispatchers against damage claims resulting from emergency actions taken in good faith to protect the network. That language should be approved by the appropriate regulatory authority. Such indemnification should be in place and approved before the network is opened up for wheeling and competition. This will be essential in a competitive environment.

Future wheeling must be disclosed and examined carefully to determine how the resulting

power flows may affect the various interconnected systems. Without such disclosure and coordination, it may be found that the output of a new generating addition cannot be delivered as planned without displacing existing uses of the transmission system or significantly impairing service reliability by exhausting transmission reserve capability. This capability may be needed to ensure that the grid can still operate efficiently and reliably even if a line or unit trips off.

Finally, assurance must be made that in a competitive environment the antitrust laws are interpreted to permit the minimal cooperative action needed to ensure the reliable and efficient development of the network. The regulator should maintain careful oversight to ensure that all design requirements and operating rules are being enforced.

## 6. ECONOMIC/POLICY CONSIDERATIONS

### General Effects of Retail Wheeling

Retail wheeling would undoubtedly advance the competition that is evolving in the electric power industry.<sup>119</sup> Along with EPAct and emerging market pressures, retail wheeling would move the future path of the industry toward a more balanced mix of market factors and regulation in determining performance and structure.

Allowing retail customers the right to purchase power from competing generators would affect the electric power industry in five major ways. First, by weakening a utility's monopoly power, it would directly enhance competition in retail markets. Second, it would eventually cause a change in the rate-making practices of state regulators. Third, it would stimulate vertical disintegration of the industry where some utilities may decide to exit the generation business. Fourth, it would reshape the "regulatory compact" by changing the service obligations of utilities and their status as the sole supplier of power within their franchise areas. Fifth, it would cause the industry to become more cost conscious and accommodating to the needs of individual

---

<sup>119</sup> In a recent paper Lewis J. Perl points out that retail wheeling may be needed to spread the benefits of competition in the electric power industry to end-use consumers. He argues that, in the absence of retail wheeling, tight regulation of retail electricity rates would continue; consumers would continue to pay for uneconomical investments; the price-marginal cost gap would continue; and risks of bad utility decisions regarding least-cost planning would continue to fall on consumers. Perl contends that true competition in the generation sector, where prices would be determined by market forces, requires retail consumers to have direct access to different generators. See Lewis J. Perl, "Retail Wheeling and Competition in the Electric Utility Sector," ELCON Conference on Utilities and Industrial Customers: Collaboration or Confrontation? Washington, D.C., October 14-15, 1993.

customers.<sup>120</sup> With regard to distribution services, most analysts would agree that the delivery of electricity constitutes a natural monopoly while the purchasing of electricity does not. Retail wheeling could, however, diminish the scope economies when a vertically-integrated utility provides both commodity electricity and transmission and distribution services to all of its retail customers.

The restructuring of the electric power industry, reflected in vertical disintegration, has both costs and benefits that are difficult to measure. Analysts who oppose vertical disintegration argue that it would diminish the benefits from economies of scale and scope that currently exist. With retail wheeling and natural-monopoly conditions at the retail level, the local utility could not protect itself against entry by other generators. These generators may be able to serve some of the local utility's customers but only at a higher cost to society. In technical terms, when costs are subadditive,<sup>121</sup> society may be better off by restricting the generation of electricity for customers within a specific service area to one firm--the local vertically-integrated utility. This suggests that policymakers should discourage or prohibit entry by other generators. Douglas Gegax and Kenneth Nowotny argue that vertical disintegration of the electric power industry would increase transaction costs, eliminate the economies of one firm providing different electrical services, and result in the loss of benefits from coordination among utilities.<sup>122</sup> In sum, opponents of

---

<sup>120</sup> See, for example, "CEOs Describe How to Survive the New Era: Squeeze Costs, Pamper Customers," *Electric Utility Week* (June 14, 1993): 5-6. Some utility executives believe that retail wheeling can be avoided or at least forestalled by better cost control and competitive prices.

<sup>121</sup> Subadditive costs refer to the condition where the local utility can provide all the demanded electrical service in its service area at a lower cost than if the same services were provided by two or more firms. See, for example, John L. Jurewitz, "The Deregulation of Electricity, paper presented at the Western Economics Association Meeting, Vancouver, B.C., July 1987. Jurewitz argues that:

[N]atural monopolies may not be 'sustainable' against competition. If competitive entry is allowed, enclaves of competitors may dismember the natural monopoly and overall efficiency. This potential 'nonsustainability' of natural monopoly presents a services problem for regulators (at 22-23).

<sup>122</sup> Douglas Gegax and Kenneth Nowotny, "Competition in the Electric Utility Industry: An Evaluation," *Yale Journal on Regulation* 10, 1 (Winter 1993): 63-88.

restructuring argue that although competition may generate some benefits in promoting cost efficiency and pricing efficiency, it would on net reduce economic efficiency by removing the scale and scope economies that currently exist.<sup>123</sup> With regard to distribution services, most analysts would agree that the delivery of electricity constitutes a natural monopoly, while the purchasing of electricity does not. Retail wheeling could, however, diminish scope economies that result from a vertically-integrated utility providing both commodity electricity and transmission/distribution services to all of its retail customers.

On the other side of this argument, advanced by industrial customers and market-liberal economists, is the position that restructuring of the electric power industry would produce large benefits to society. According to this view, vertical disintegration would strengthen market forces. These forces would lead to more efficient pricing, improved productive efficiency of utilities, and a more efficient structure of the industry.<sup>124</sup> By allowing the entry of potential cost-efficient generators and giving retail customers the right to purchase unbundled power directly from generators, it is argued the resultant stronger market forces would benefit consumers and society as a whole.<sup>125</sup>

---

<sup>123</sup> An argument against competitive entry in gas distribution markets is contained in Paul W. MacAvoy, Daniel F. Spulber, and Bruce E. Stangle, "Is Competitive Entry Free? Bypass and Partial Deregulation in Natural Gas Markets."

<sup>124</sup> For example, market forces would make more visible any inefficiencies associated with existing pricing practices. The utility together with its regulator would be pressured to eliminate cross-subsidies or else risk losing noncore customers to other suppliers.

<sup>125</sup> See, for example, "Terzic Sees Utilities Unbundling, New Firms Competing to Serve," *Inside F.E.R.C.* (May 24, 1993): 14-15.

It should be noted that both commissions and utilities may have compatible interests in restricting entry of new suppliers. This would not imply, as discussed later, that both groups would agree to the same pricing principles.

Each of the opposing arguments to the vertical-disintegration debate has some merit. Although quantification of the supposed effects is not possible, the experiences in other industries, in particular the telecommunications and natural gas industries, tend to favor the proponents of vertical disintegration.<sup>126</sup> Although disintegration undoubtedly had some costs, its unleashing of competitive forces has yielded large benefits to consumers.<sup>127</sup> Because the electric power industry has some unique features, caution should be taken in extrapolating these experiences.

For example, in comparing the electric power industry with the natural gas industry, where retail competition has evolved rather smoothly and quickly, notable differences come into view.<sup>128</sup> Table 4 shows the major ones. The fact that the electric power industry is currently highly vertically integrated means that when a utility sells less electricity to a customer it loses profits. In contrast, when a local gas distributor sells less gas to a customer it loses little or no profit as long as it continues to provide distribution service to that customer. Local gas distributors have therefore not had to deal with stranded investment questions and others dealing with the financial viability of a regulated firm.

Overall, the features of the electric power industry, at least when compared with the natural gas industry, make the creation of retail competition a more difficult task. This largely explains why retail competition was introduced with relative ease in the

---

<sup>126</sup> See, for example, Alfred E. Kahn, "Deregulation; Looking Backward and Looking Forward," *Yale Journal on Regulation* 7, 2 (Summer 1990): 325-54; and David B. Hatcher and Arlon R. Tussing, *State Regulatory Challenges for the Natural Gas Industry in the 1990s and Beyond* (Columbus, OH: The National Regulatory Research Institute, 1992).

<sup>127</sup> See, for example, Clifford Winston, "Economic Deregulation: Days of Reckoning for Microeconomists."

<sup>128</sup> A comparison of the legal, technical, and economic differences between the electric power industry and the natural gas industry is presented in Robert E. Burns, "Access to the Bottleneck: Legal Issues Regarding Electric Transmission and Natural Gas Transportation," *Natural Gas Industry Restructuring Issues*, J. Stephen Henderson, ed. (Columbus, OH: The National Regulatory Research Institute, 1986), 31-70; Rodney Frame and Joe D. Pace, "Approaching the Transmission Access Debate Rationally," 50-55; and John H. Landon, *Direct Testimony Before the Michigan Public Service Commission*, 33-42.

TABLE 4

COMPARISON OF ELECTRIC POWER AND NATURAL GAS INDUSTRIES

---

<u>Electric Power Industry</u>	<u>Natural Gas Industry</u>
1. Highly vertically integrated	1. Different owners of production, transmission and distribution assets
2. Nonstorability of electricity	2. Substantial gas storage capability
3. Need for backup electric service (unavailability of momentary substitute for electricity)	3. Fuel-switching capability by industrial customers
4. Multi-functional use of electric transmission lines	4. Unbundled characteristics of transportation service
5. Electric utility could lose substantial profits when customers buy electricity from another supplier	5. Gas distributors lose little or no profits when customers buy gas from another supplier
6. Loose control of electricity transmission in interconnected system	6. Precise control of gas transmission
7. Potential for large stranded investments with retail competition	7. Little stranded investments with retail competition

---

natural gas industry but not in the electric power industry. One should not conclude that because of its complexities retail competition in the electric power industry would be socially undesirable. It can safely be said that retail competition in the electric power industry faces more obstacles than in the natural gas industry. This, however, does not imply that retail competition would necessarily be bad for the electric power industry and consumers. What analysts and policymakers need to do in evaluating retail competition for the electric power industry is to look at the technological and economic conditions for that industry.

Another likely outcome of retail wheeling is that it would place pressure on both utilities and state commissions to change the procedure for setting prices. The current method of determining prices on the basis of cost-of-service principles would over time unravel. Competition would force prices in markets where customers can choose from different generators to gravitate toward market-based levels--long-run marginal costs. Faced with this inevitable prospect, utilities would at least initially be forced to use a two-tier pricing scheme: marginal-cost pricing for wheeling (noncore) customers and continuation of embedded-cost pricing for other (core) customers.<sup>129</sup>

In maintaining its profit level, a utility in such an environment would have an incentive for Ramsey pricing. It would attempt to set prices so that the difference between price and marginal cost is at the highest value for core services. Such a pricing strategy, as evident in history, is incompatible with political realities. State commissions have long opposed pricing strategies that discriminate against small customers. What is likely to shake out of this is deregulation of those services where consumers have choices among different suppliers. From an economic perspective, this would be desirable since the net benefit of continued regulation in such an environment would likely be negative. In the interim, state commissions may resort to some form of rate-making system, such

---

<sup>129</sup> As noted later, price caps can be applied to protect core customers from revenue deficits suffered by the utility in competitive or quasi-competitive markets.

as price caps, to protect core customers from lost revenues suffered by a utility in competitive markets.<sup>130</sup>

Retail wheeling would also cause a change in the "regulatory compact." This compact, in the form of *de facto* exclusive franchises, currently grants electric utilities the right to be the sole supplier of electricity in a specified service area in return for providing highly reliable service at a reasonable and fair price. One interpretation of the compact includes 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>131</sup>

Many observers would argue that since under retail wheeling customers would no longer be obligated to purchase electricity from the local utility, the utility should have no obligation to provide services (other than transmission and certain ancillary services at compensatory rates<sup>132</sup>) to those customers who previously switched to other suppliers and later decide to return to the utility. The fairness of this position seems beyond question: a reasonable *quid pro quo* for allowing customers the right to shop around for power is removing the obligation of the local utility to provide power to those customers at their request. If such customers want the insurance of local utility power, it can be argued that they should pay for that insurance under a contractual arrangement, rather than continuing to enjoy the regulatory protection provided by the service-obligation proviso in the old "regulatory compact."<sup>133</sup> Whether such insurance should be

---

<sup>130</sup> Under rate-of-return regulation a firm has the opportunity to receive revenues that correspond to its revenue requirements. This implies that whenever the firm receives fewer revenues from one group of customers it can petition its regulator to increase revenues earned from others by proposing to raise their prices. This is why commissions may tend to favor higher prices for customers with low political visibility: prices to politically-potent customers can be set at lower levels in order for the regulated firm to satisfy its revenue requirements.

<sup>131</sup> See Joe D. Pace, "Wheeling and the Obligation to Service."

<sup>132</sup> These services could include commission-mandated standby service. Ancillary services are defined as those retail electric services that wheeling customers would still receive from the local utility (see John H. Landon, *Direct Testimony Before the Michigan Public Service Commission*, 26).

<sup>133</sup> A good discussion of this argument is presented in Joe D. Pace, "Wheeling and the Obligation to Service;" and Rodney Frame and Joe D. Pace, "Approaching the Transmission

mandatory raises another question. If it is presumed that the local utility would be forced for whatever reason (for example, political) to provide service irrespective of whether a customer has purchased insurance, then a good argument can be made for mandatory insurance.

A last major economic effect of retail wheeling, is to place pressure on utilities to operate and plan their electric power systems more efficiently. More of the risks associated with poor management decisions would fall on the utility's shareholders. As evident in the recent experiences of regulated industries, increased competition has caused firms to cut their costs, in some cases dramatically.<sup>134</sup> These firms were forced to operate more efficiently so that their costs became commensurate with their reduced revenues induced by competition. One example of where this has occurred is in the natural gas industry, where producers and pipelines have trimmed their costs substantially over the last several years, and local gas distribution companies (LDCs) have recently begun to do the same. Electric utilities have also reduced their costs in response to increased competition at the wholesale level.<sup>135</sup> In a retail-wheeling environment, electric utilities would be expected to intensify their cost-cutting efforts.

One final note revolves around whether a state should allow the import of electricity purchased by retail customers from a state for which retail wheeling is not permitted. A valid argument can be made that it should, on the grounds that prohibition of power from a particular state could deprive a state of least-cost power. If a state really believes that retail wheeling could lower electricity prices, then it should not constrain the working of retail competition.

Another argument is that reciprocity would not be necessary. If one state decides to allow retail wheeling, other states, especially adjacent ones, would be under pressure to do the same. If they do not, certain customers may decide to locate in a retail-wheeling state, where (other things

---

Access Debate Rationally."

<sup>134</sup> Demonstration of this can be seen in the telecommunications industry and, more recently, the electric power and natural gas industries. For example, many U.S. electric utilities recently restructured their internal operations and laid-off larger numbers of workers, especially middle-management positions, in response to the increased competition expected in the coming years.

<sup>135</sup> A recent survey of electric utilities reported by the Washington International Energy Group in *1994 Electric Utility Outlook* showed that 72 percent of the respondents indicated that they have downsized during the last three years.

held constant) they would be expected to receive more favorable electricity rates.

### **Effect on Core Customers**

Retail wheeling, as argued above, can improve the long-term performance of the electric power industry. Because much of the potential benefits from retail wheeling are long term and devoid of reasonably accurate measurement, proponents of retail wheeling are at a disadvantage when advancing their argument. Opponents of retail wheeling, on the other hand, are better able to articulate to policymakers the potential costs associated with retail wheeling, which are more easily identified and short term in nature.<sup>136</sup> Partly for this reason, acceptance of widespread retail wheeling by policymakers may take several years to achieve.<sup>137</sup>

As a short-term cost, retail wheeling can potentially cause core customers to be worse off in at least five ways. First, it would tend to eliminate any cross-subsidies, if they do in fact now exist, that benefit core customers at the expense of other customers. Elimination of these cross-subsidies would improve economic efficiency. The ability of a utility to inflate prices to noncore customers, such as industrial firms, would diminish as these customers would have the opportunity to switch to another supplier if required to continue funding cross-subsidies. It is uncertain whether such cross-subsidies currently exist for electric utilities because of special discounted tariffs and contracts for industrial customers that have become popular in recent years. Overall, rate cases in recent years have tended to favor industrial customers, diminishing and conceivably reversing any cross-subsidies that may have existed.

Second, core customers may have to pick up the additional costs to the local utility's electric power system that are not recovered from the wheeling customer. Such an outcome

---

<sup>136</sup> See, for example, the arguments presented by Joe D. Pace, *Direct Testimony Before the Michigan Public Service Commission*; Rodney Frame and Joe D. Pace, "Approaching the Transmission Access Debate Rationally"; and Edison Electric Institute, *The Case Against Retail Wheeling: A Response to Advocates of Retail Wheeling*.

<sup>137</sup> It should be noted that the electric utilities do not have a common position on retail wheeling: some utilities flatly oppose it while others acknowledge its inevitability and are willing to start a dialogue on implementation issues.

would be inequitable, in addition to having an efficiency-diminishing effect. In providing transmission services to wheeling customers the utility would be required to provide ancillary services to maintain the technical integrity of its local control area. If, in addition, the local utility is obligated to provide standby or emergency service or to provide either partial or full requirement service on demand, further costs may be imposed on the utility. Unless these costs are properly measured and allocated to wheeling customers, core customers could face higher rates.<sup>138</sup>

Third, retail wheeling could cause more of the utility's fixed costs to be shifted to core customers. As stated elsewhere in this report, this problem could be mitigated, although not before much debate, in various ways. One approach is simply to prohibit the utility from imputing these fixed costs in the tariffs of core customers.<sup>139</sup> Another approach, which is more in line with the natural gas industry, is to include the wheeling customer's share of the fixed costs into the rates charged for transmission and other required services (for example, frequency control, reactive power, and generation reserve) that continue to be provided by the local utility.<sup>140</sup>

---

<sup>138</sup> Witnesses in the Michigan Public Service Commission dockets on retail wheeling, Case Nos. U-10143 and U-10176 debated how ancillary services should be priced. The two approaches presented were labelled the "top down" and the "bottom up" pricing methods. The first, advocated by the utilities, would subtract the avoided costs on the utility system when a customer purchases power from another supplier from the price that the customer was paying for full utility service. (Proponents of "top down" pricing argue that this pricing methodology would leave nonwheeling customers harmless and give potential wheeling customers the proper price signal in choosing suppliers; see John H. Landon, *Direct Testimony Before the Michigan Public Service Commission*, 29.) The second, advocated by industrial consumers, would determine the price of residual services on the basis of actual costs incurred by the local utility to provide these services. This would require unbundling the costs associated with each service.

<sup>139</sup> By preventing the utility from shifting their fixed costs to core or noncore customers, the utility would have an added incentive to cut costs: by not doing so, management would face the prospect of strong opposition from shareholders. Cost-cutting would represent the only option available to management to reestablish previously earned profits. Such a commission policy would impose additional risk on the utility. Consequently, on both economic-efficiency and equity grounds, the utility should have the opportunity to earn higher profits from good performance than what they can currently earn.

<sup>140</sup> See Suedeen G. Kelly, "Intrastate Natural Gas Regulation: Finding Order in the Chaos," *Yale Journal on Regulation* 9, 2 (Summer 1992): 355-406. This approach is consistent with the

Fourth, retail wheeling may preclude the local utility from purchasing off-system power. Such purchases presumably would lower the utility's cost of service and, thereby, the rates charged to core customers. Avoidance of this problem would involve assigning transmission-access rights to wheeling customers a lower priority than rights to the utility's bulk power purchases. Although such an assignment seems fairly straightforward to apply, it would probably receive strong opposition from wheeling customers, who would argue that depriving them of transmission-access rights could jeopardize the operation of their businesses. As another alternative, the local utility could reflect the opportunity costs of not transacting off-system power purchases in the prices for the services it continues to provide wheeling customers.

Fifth, retail wheeling may reduce the reliability of service for core customers. New challenges and constraints would be imposed on electric power system operators to assure the integrity and reliability of local control areas.<sup>141</sup> Although technical difficulties should eventually be worked out through proper contracting and pricing along with readjustments of operational procedures, short-term complications could arise.

### **Economic-Efficiency Arguments**

The benefits of retail wheeling should include consideration of the economic-efficiency effects. Although these effects should not alone determine the social desirability of retail wheeling, they constitute an important part of the current debate. It can be argued that unless retail wheeling offers the hope for a more efficient electric power industry in the long term, it should be rejected out of hand.

---

"top down" method advocated by the utilities in the Michigan dockets on retail wheeling (see footnote 138). The FERC also seems to be leaning toward including a stranded-investment fee in electricity transmission rates for wholesale customers. In a recent case (Docket No. ER94-129) involving New England Electric System subsidiary Massachusetts Electric, the Commission approved such a fee saying that it would "minimize the financial consequences to utilities from the transition to a competitive market and. . .insure that their remaining ratepayers are protected in such circumstances." One problem with shifting costs to wheeling customers is that they may see little or no decline in their electricity costs.

<sup>141</sup> See section 5 of this report.

Some opponents have argued that retail wheeling would make prices more inefficient, produce an uneconomical restructuring of the electric power industry, cause uneconomic bypass, reduce service reliability to core customers, require additional costs to maintain the integrity and stability of the local electric power system, and increase system-planning costs. These opponents, in other words, expect retail wheeling to increase economic costs while yielding minimal benefits to society at large.

Proponents, in contrast, argue that retail wheeling would improve economic efficiency, and thus be in the public interest, primarily by placing pressure on utilities to be more efficient in terms of both pricing and operation. Further, they argue that retail wheeling would also improve efficiency by shifting generation to those suppliers with lower economic costs. Previously, this report discussed some of the above arguments. A discussion of others follows.

First, many of the benefits to be realized from retail wheeling, as put forth by proponents, are more long-term in nature than the costs. More efficient prices and utility operation would not occur overnight. Regarding pricing, for example, a utility would first have to recognize the need for setting prices at market-based levels and then convince its regulators that such pricing is warranted in a more competitive environment. Effectuating market-based pricing would occur subsequent to the incurrence and exposure of the stranded-investment costs and of the additional system costs required to technically accommodate retail wheeling. Overall, the broad effects of retail wheeling include benefits that would not be identified until several years down the road and even then they would be indirect and difficult to measure.

Another observation is that little debate exists over the effect of retail wheeling on increasing competition and eliciting more operating efficiency on the part of the utilities. In fact, the consensus is that retail wheeling would force electric utilities to economize and pursue other ways to reduce their costs and better serve their customers' needs. For most utilities this will add further pressure to improve their management and operational efficiency. For some utilities this may result in downsizing of their operations or consolidating with other utilities. To the extent this is true, all customers including core customers could benefit from retail wheeling.

The proponent's argument that retail wheeling would shift generation to lower-cost suppliers hinges on the ability of utilities to readjust their prices in a timely manner in response to prevailing market conditions. As correctly maintained by some analysts, retail wheeling in an

environment of rigid or embedded-cost retail pricing could lead to uneconomic bypass.<sup>142</sup>

Uneconomic bypass implies that the customer switches suppliers because he gets a better deal but economic cost rises. This could easily happen when the local utility cannot adjust its prices below embedded costs. As noted earlier, competitive pressures induced by retail wheeling would pressure both utilities and their regulators toward market-based pricing. Until that time, however, pricing distortions could cause economic inefficiencies that are aggravated by retail wheeling.

One way to

---

<sup>142</sup> See Illinois Commerce Commission, *Electric Wheeling in Illinois* (Springfield, IL: Illinois Commerce Commission, 1987); and John H. Landon, *Direct Testimony Before the Michigan Public Service Commission*.

Uneconomic bypass is widely viewed as something to avoid: it can result in costly duplication of capital facilities and, potentially, higher prices to core customers.

avoid these inefficiencies is to allocate a portion of the stranded-investment costs to wheeling customers. It can be shown that when this occurs a customer would only switch away from the local utility when other suppliers have lower economic costs.<sup>143</sup>

The pricing-efficiency outcome of retail wheeling also is subject to debate. Some opponents argue that retail wheeling, assuming stranded-investment costs are reallocated to core customers, would cause inefficient pricing by driving down prices to noncore customers and raising prices to core customers.<sup>144</sup> Such a relative price movement, it is argued, would be incompatible with efficient-price rules, such as Ramsey ("second-best") pricing.<sup>145</sup> This argument may have some validity, if only in the short term. A complete analysis, however, would require consideration of whether customers who are most likely to switch suppliers, namely, industrial customers, are currently paying rates too high in relation to other customers according to the Ramsey-pricing rule. If they are, retail wheeling could actually improve efficient pricing. This condition may currently hold for many or most utilities, even though it has probably subsided in recent years. Another point to be made is that the Ramsey-pricing model assumes the firm has monopoly power in all of its markets. In other words, it does not account for the possibility of some customers generating their own electricity or purchasing their electricity from other suppliers. In a retail-wheeling environment, Ramsey pricing may not be sustainable.

---

<sup>143</sup> In other words, a customer would only switch suppliers when the utility has higher economic costs in addition to higher prices. This is consistent with the approach taken by several state commissions in setting rates for local gas transportation. See Robert E. Burns, Daniel J. Duann, and Peter A. Nagler, *State Gas Transportation Policies: An Evaluation of Approaches* (Columbus, OH: The National Regulatory Research Institute, 1989).

<sup>144</sup> See, for example, Rodney Frame and Joe D. Pace, "Approaching the Transmission Access Debate Rationally."

<sup>145</sup> Ibid.

## Wholesale Versus Retail Wheeling

In addition to the differences in jurisdictional authority and technical effects associated with wholesale and retail wheeling (see sections 4 and 5), dissimilarities in economic effects should be noted. Wholesale wheeling is defined here as a transaction for which the purchaser of the power is a vertically-integrated utility that resells the power to its own retail customers. Such transactions are commonly referred to as "interutility transactions."<sup>146</sup>

First, the distributional effects differ. Under retail wheeling the local utility loses profits by wheeling power to a customer who would otherwise have purchased its power from the local utility. In contrast, under the above definition of wholesale wheeling, when the local utility purchases bulk power for resale, for example Public Service of New Mexico purchasing economy energy for resale to its retail customers, it benefits by lowering its cost of service or improving its reliability and, consequently, all of its retail customers benefit.<sup>147</sup>

Second, the "bypass" aspect of retail wheeling makes it unattractive to both state commissions and utilities. Commissions are particularly concerned about the negative effect on core customers. Utilities are most concerned about the financial effect on shareholders and the breaking down of their exclusive-franchise status. Retail wheeling could jeopardize the financial condition of many utilities, while wholesale wheeling would not.

Third, in the case of wholesale wheeling the investor-owned utility purchaser of power for resale compares its decremental cost of generation with the delivered price of purchase power (including wheeling charges). In contrast, an end-use buyer of power under retail wheeling compares the price of power from the local utility with the delivered price of the cheapest

---

<sup>146</sup> Wholesale wheeling, as more broadly defined, would include transactions whereby the local utility transmits power for a partial or full requirements wholesale customer (for example, municipality), who in turn resells the power to its retail customers. These transactions would have characteristics similar to those under retail wheeling. Both, for example, would entail the local utility losing sales to a requirements customer (see discussion in section 1).

<sup>147</sup> Wholesale wheeling can also involve the local utility losing profits if it transmits power for one of its wholesale-requirements customers, such as a municipality or rural electric cooperative, who decides to purchase more or all of its power from another supplier.

alternative source.

The economic implication of this distinction revolves around the fact that the price of wholesale power is more likely to be market-based than the price of retail power. State commissions generally apply embedded-cost pricing principles, which creates the possibility of a consumer switching to a nonlocal utility supplier with lower prices but higher economic cost than the local utility. The problem, however, can be mitigated by a commission allowing the local utility to adjust its prices in accordance with the market forces invigorated by retail wheeling.

Wholesale power prices, on the other hand, have increasingly been based on bilateral agreement between buyers and sellers.<sup>148</sup> These prices are more reflective of market conditions than cost-of-service rules. Consequently, bypass at the wholesale sector would less likely have an uneconomical outcome.

Another difference between the two forms of wheeling lies with the potential for retail wheeling to fundamentally restructure and reorient the electric power industry in a way that could eventually eliminate much of the current inefficiencies and monopoly power in the industry. It is assumed here that market forces in the electric power industry would be greatly enhanced with the presence of retail competition. Widespread wholesale wheeling, which will likely occur in the coming years, would be expected to have substantial ramifications for the industry, but arguably at a lesser magnitude than retail wheeling.

Finally, it should be noted that if competition permeates throughout the electric power industry, from an economic perspective the distinction between wholesale and retail wheeling would probably become blurred. The retail utility in such a world will increasingly confront more competition from "bargain" sellers.<sup>149</sup> This will place pressure on the retail utility to price its power to selective customers at wholesale rates. Consumers will otherwise clamor more loudly

---

<sup>148</sup> Paul L. Joskow, "Regulatory Failure, Regulatory Reform, and Structural Changes in the Electrical Power Industry," Martin Neil Baily and Clifford Winston, eds. *Brookings Papers on Economic Activity: Microeconomics 1989* (Washington, D.C.: The Brookings Institution, 1989), 125-208.

<sup>149</sup> See, for example, Washington International Energy Group, *1993 Electric Utility Outlook* (Washington, D.C.: Washington International Energy Group, January 1993).

for retail access or for bulk-power pricing.

This section outlined some of the major economic/policy questions that state commissions will have to address with the advent of retail wheeling. Table 5 lists the major policy questions relating to retail wheeling that will likely confront state commissions in the years ahead.

TABLE 5

POLICY QUESTIONS RELATING TO RETAIL WHEELING

- 
1. What would be the meaning of "obligation to serve" in a retail wheeling environment?
  2. How would services be unbundled and priced to accommodate retail wheeling?
  3. How would the structure of the electric power industry change?
  4. What services would continue to be regulated? How should they be regulated?
  5. How could regulation and competition coexist?
  6. How could core customers be protected?
  7. What would be the responsibility of departing customers for the local utility's fixed costs?
  8. Should the "regulatory compact" be redefined and, if so, how?
  9. When and under what conditions should retail wheeling be allowed?
  10. How would conflicts between core and noncore customers be resolved?
  11. How would pricing for different electricity services change?
  12. How would utility-financed DSM activities and the IRP process be affected?
-

## **7. LESSONS TO BE LEARNED FROM THE EFFECTS OF COMPETITIVE FORCES IN REGULATED INDUSTRIES**

In assessing or trying to predict the economic ramifications of retail wheeling, it is instructive to observe other comparable experiences. What seems most germane is to draw upon the recent happenings in the telecommunications and natural gas industries. These two industries have in recent years more extensively relied on competitive forces in determining prices, industry structure, and other performance indicators. Although industry structures and technologies differ between the electric power industry and the telecommunications and natural gas industries, more intensive competitive conditions would have similar effects across the three industries. Several observations are made below on how competition has affected both regulators and firms (see, for example, Table 6).

First, once retail competition started to emerge in the telecommunications industry, both regulators and the firms had to address such issues as displaced or

TABLE 6  
REGULATORY RESPONSES TO COMPETITIVE FORCES

---

---

1.	Flexible and market-based pricing
2.	New rate-making procedures (for example, incentive regulation)
3.	Write-offs, accelerated capital-cost recovery, shifting of sunk costs to different customers
4.	Unbundling of services
5.	Increased reliance on contracting
6.	High priority in protecting core customers
7.	New obligation-to-serve requirements

---

---

stranded-investment, pricing flexibility, and system cost.<sup>150</sup> Broad-based incentive systems, such as price caps, are widely applied in the telecommunications industry to give firms more pricing flexibility to compete in noncore markets. At the same time they have protected core customers from rate increases caused by revenue deficits suffered by firms in competitive markets.<sup>151</sup> Further, such systems were instituted to allow the regulated firm an opportunity to earn higher (lower) profits from exceptionally good (bad) performance. Such an opportunity, it was argued, would achieve a more balanced risk-reward relationship for regulated firms.

Another observation is that a firm subject to more competition would attempt to engage in Ramsey-type pricing. A firm would want to establish prices so that the price marginal-cost differential is smallest for customers with supply options (noncore customers). A firm's incentive for Ramsey pricing becomes more intense as its markets become more dichotomized. Regulators, on the other hand, would prefer to keep prices down for small politically-visible customers. They would attempt to achieve this by sanctioning what is called "residual pricing" and by restricting entry of new suppliers. Under residual pricing, regulators attempt to extract maximum profits from customers who have less political clout in order to hold down prices for, say, residential customers.

As shown by events in the telecommunications industry and the natural gas and electric power industries, residual pricing tends to break down under competitive conditions; namely, when these customers who are asked to cross-subsidize other customers begin to have supply alternatives or gain political clout.<sup>152</sup> In the electric power industry over the last several years, industrial customers have exerted much pressure on utilities to give them price breaks that they argued were needed to maintain their competitiveness or to locate a new facility in a specific

---

<sup>150</sup> See, for example, Alfred E. Kahn, "Deregulation: Looking Backward and Looking Forward."

<sup>151</sup> Firms generally are also given flexibility in service offerings.

<sup>152</sup> A case study of this phenomenon for California gas distributors is presented in Robert L. Bradley, Jr., "Deregulatory Dynamics: Bypass and Reckoning in the California Gas Market," paper presented at the U.S. Department of Energy/National Association of Regulatory Utility Commissioners Conference on Natural Gas Use: State Regulation and Market Dynamics in the Post-636/Energy Policy Act Era, New Orleans, Louisiana, April 27, 1993.

utility's service area.<sup>153</sup> To a large extent, the push for retail wheeling by industrial customers is driven by expected price concessions from their local utility.<sup>154</sup>

History has also shown that with the emergence of competition, regulated firms try to thwart competition and may even attempt to use the regulatory process to obstruct it. Experiences in the telecommunications and natural gas industries illustrate the efforts of regulated firms with continued control over bottleneck facilities to keep out, or increase the cost for, potential rivals. As demonstrated in those industries, once nondiscriminatory or open access to those facilities becomes a reality, competitive forces quickly become visible. The opposition to retail wheeling by electric utilities reflects such an anticompetitive strategy. These utilities would understandably be expected, as their predecessors in other regulated industries did, to convince regulators that inhibiting competition or restricting entry of other firms within their current market area is in the public interest. Specifically, regulated firms argued that such constraints on competition would allow them to earn higher net revenues in potentially competitive (or contestable) markets, thereby preventing the rise of prices for core or residential services.

One major lesson from the transformation of some regulated industries is that when the forces of competition are robust, and regulators are reluctant to recognize and accommodate them, potential beneficiaries, such as rival suppliers and certain consumers, will articulate their concerns and arguments before legislative bodies. Legislatures will oftentimes overrule the regulator's decisions by enacting new laws. Another lesson is that when competitive forces are robust enough, regulators are ultimately left with little choice but to accommodate them. For example, regulators would depart from embedded-cost pricing methods for certain customers by sanctioning market-based prices. At some point, they will begin to realize that customers whose interests are of the most concern to them--residential customers--are better off when bypass by noncore customers is forestalled. Further, from the perspective of the economic theory of regulation, the "old way" of regulating in a competitive environment can produce large efficiency

---

<sup>153</sup> See Edwin A Rosenberg et al., *Contract Pricing of Electric and Telephone Service: Current Practice and Policy* (Columbus, OH: The National Regulatory Research Institute, 1992).

<sup>154</sup> Some industrial consumer groups have said that few customers would actually petition for retail wheeling.

losses that diminish the collective "gifts" that regulators can bestow on consumers and firms.

As exemplified in other regulated industries, retail competition would place greater pressure on regulators to allow a firm to compete on an equal basis with alternate suppliers. One important way of doing this is to allow the firm to unbundle its services, where prices over time would gravitate toward market-based levels. As an example, unbundled transportation service by local gas distributors was largely provided to thwart bypass threats by some retail gas consumers.<sup>155</sup> Bypass would have confronted regulation with the twin problems of cost shifting and stranded investment. Unbundling, in this case, by lowering the delivered price of gas to price-sensitive customers and thereby keeping them on the local gas distributor's system, prevented the LDCs from suffering profit losses. More recently, competitive pressures forced regulators to sanction market-based transportation rates.

Unbundling of utility services may result in a regulated firm terminating some of the services previously provided. For example, gas distributors have gradually, over the last several years, purchased less commodity gas. At some point, they may completely depart from the commodity gas business in noncore markets.

Experiences in other regulated industries encountering competitive pressures also show that sunk-cost facilities such as pipelines, local phone lines, and gas distribution systems continue to be regulated. Other services provided by the regulated firm either are deregulated or are good candidates for deregulation. At the minimum, these services become subjected to less tightly-controlled or more flexible regulation. Price caps, profit sharing, and other broad forms of incentive-based regulation were widely established for the telecommunications industry to better accommodate the competitive environment. For both economic and political reasons, regulators gradually realized that traditional rate-of-return regulation works less effectively when firms lack broad monopoly power. Experience has shown the difficulty of rate-of-return regulation to function effectively when a regulated firm serves different markets of varying degrees of competition.

Another important lesson, and one that has already been discussed in this report, is that

---

<sup>155</sup> Robert E. Burns, Daniel J. Duann, and Peter A. Nagler, *State Gas Transportation Policies*.

competition will force regulated firms to become more cost conscious. For example, many telecommunications firms restructured their internal operations and laid-off large numbers of workers, especially middle-management positions, in response to increased competition. To a lesser degree, the same occurred for natural gas firms and electric utilities. Interstate gas pipelines have substantially reduced their costs. The ramification of cost cutting is that both core and noncore customers ultimately benefit from increased competition.

Another expected effect of competition is that it would reduce the viability of the socially-oriented activities (for example, low-income programs and DSM programs) of regulated firms. Customers who now have choices of suppliers would attempt to avoid having to pay for these programs. This would especially be true if the programs cause the regulated price to rise above the market price. If these programs are to survive, they will have to be largely funded by either core customers or utility shareholders. In either case, there will be pressure to reduce utility subsidies and other expenditures targeted at such programs. Politically-visible core customers will resist having to pay higher prices and shareholders will oppose subsidizing socially-oriented activities that reduce their earnings.<sup>156</sup>

---

<sup>156</sup> Such a scenario corresponds to the predictions of conservationists/ environmentalists, who believe that retail wheeling would jeopardize utility-financed DSM programs and the IRP process.



## 8. A GENERAL ASSESSMENT OF RETAIL WHEELING

In assessing the social desirability of retail wheeling, a policymaker's task would be made easier if he or she could systematically weigh the benefits and costs. From an economist's perspective, a policy can be regarded as acceptable if it yields net benefits to society. Under this criterion, retail wheeling could be considered desirable if it improves economic efficiency. Below is a discussion regarding what it means to improve economic efficiency.

Policymakers, however, are also concerned about equity effects. In the case of retail wheeling a major concern for state regulators is what effect it would have on core customers or those customers who could not for whatever reason avail themselves of shopping around opportunities. As discussed earlier, this concern has probably more validity in the short term, where core customers may have to pick up a portion of utilities' costs stranded by large customers leaving the local utility system. In the longer term, retail wheeling may actually benefit core customers to the extent that retail competition would place pressure on utilities to operate and invest more efficiently. In any event, the equity effect of retail wheeling from a long-term perspective is difficult to quantify.

Assessing the social desirability of retail wheeling is more complex than simply judging the economic efficiency effects. Equity, legal, and technical effects, or as some would say constraints, should also be considered. In an environment devoid of legal, regulatory and technical restrictions, it can be argued that retail consumers should have the right to choose their power supplier. In the real world, however, those restrictions may, under certain circumstances, justify limiting consumers' choice of suppliers.

The motivation behind consideration of retail wheeling is that it has the potential to improve the economic efficiency of the electric power industry. Economic efficiency is made up of three components: cost, pricing, and trading. Cost efficiency requires that a firm provides reliable service at the lowest possible resource cost (both currently and in the future). Pricing efficiency entails the firm selling services at its marginal cost (assuming no externalities). Trading efficiency in the context of retail wheeling occurs whenever a retail customer imports power that

costs less to produce and deliver than if the local utility produced and delivered an equivalent amount of power.

As discussed earlier, the competitive outcomes from retail wheeling could pressure utilities to both price and operate more efficiently. Retail competition should move prices, at least for potential wheeling customers, toward market-based levels or toward marginal cost. Cost efficiency may also improve to the extent that the different prices offered by competing suppliers more closely reflect each one's marginal costs. The probability of customers being supplied by the lowest-cost producers in a region may also be greater than when such customers are restricted to purchasing their power needs from the local utility at embedded cost-based rates.

On the other hand, retail competition could be uneconomical if existing regulatory pricing procedures prevail. As an example, an industrial customer may purchase its power from a generator with a lower price but higher marginal cost than the local utility. Especially for utilities with high prices but low marginal costs, preventing retail competition may actually improve economic efficiency, at least over the short term.<sup>157</sup>

From a long-term perspective, retail wheeling could radically change the structure, operation, and performance of the electric power industry. The industry could see vertical disintegration of utilities that do not perceive themselves as high value producers, the breakdown of the "regulatory compact," a transformation of the integrated resource planning process, and fundamental changes in state regulation of service where customers have rights and the ability to shop around. Such major effects, while warranting consideration by policymakers, are next to impossible to quantify within a benefit-cost framework.

Table 7 lists the potential benefits and costs of retail wheeling. The word "potential" is included to convey the fact that the effects of retail wheeling, whether from the benefit or cost side of the equation, are largely theoretical in nature. Little empirical

---

<sup>157</sup> In a longer-term period competitive forces would pressure utilities to lower their prices in competitive retail markets to marginal cost.

TABLE 7

POTENTIAL BENEFITS AND COSTS OF RETAIL WHEELING

---

<u>Benefits</u>	<u>Costs</u>
1. More efficient utility pricing	1. Lower electric power system reliability and stability
2. More efficient utility operations and investments	2. Uneconomic bypass under existing retail pricing procedures
3. More appropriate "regulatory compact"	3. Stranded-investment costs
4. More efficient industry structure	4. Large distributional effect
5. Reduced price differentials among electric utilities	5. Lost economies of scope
6. Stronger U.S. economy	6. Incremental costs for upgrading or expanding transmission network to accommodate retail wheeling
	7. Jurisdictional disputes
	8. Higher prices to core customers
	9. Discriminatory pricing
	10. Breakdown of "regulatory compact"
	11. Abolition of IRP process

---

evidence exists around the world regarding the actual effects of retail wheeling and, more generally, retail competition in the electric power industry.

The benefits and costs identified in Table 7 are not strictly economic in nature. Some, such as stranded costs, are distributional in that someone benefits at the expense of another. The list attempts to embrace the major potential effects of retail wheeling as argued by various interest groups.

Several questions were posed in section 1 of this report that a policymaker should consider in assessing retail wheeling. These questions were addressed in subsequent sections. A summary of our findings relating to these questions follows:

1. Retail wheeling would place pressure on state regulators to sanction market-based prices for customers who are able to shop around. In recovering revenue losses, utilities would try to increase prices to core customers. Regulators may have to adopt new rate-making procedures (for example, price caps) to protect core customers in a retail wheeling environment.
2. To the extent that retail wheeling enhances economic efficiency, the effect would be felt more in the longer term. Currently major inefficiencies in the electric power industry stem from rigid nonmarket-based prices and weak incentives for utilities to control their costs and to make least-cost investments. In the presence of retail competition, utilities would have incentives similar to most unregulated firms in terms of improving both cost and pricing efficiencies. In the near term, economic efficiency may decrease if current retail pricing procedures prevail (which would not be expected).
3. Retail wheeling would undoubtedly enhance competition in the electric power industry. The current high degree of monopoly power exhibited by vertically-integrated electric utilities would greatly diminish. Experiences in other industries have generally shown that more competition is good for consumers and society at

large.

4. Retail wheeling could have a significant effect on the long-standing "regulatory compact." Most fundamentally, it would eliminate the exclusive franchises now given to electric utilities. Further, it would likely relieve utilities from an obligation to serve customers who choose to shop around for power. Finally, given the enhanced competition that retail wheeling would generate, retail prices would less be determined on the basis of a utility's prudent-incurred costs, allowing for a "fair" rate of return. The definition of "reasonable prices" would need to be reassessed in view of a competitive retail market.
  
5. The core customers of a utility may in the short term be adversely affected by retail wheeling. Retail wheeling would tend to phase out any cross-subsidies that currently benefit small customers. Core customers also would be hurt if utilities underprice services (for example, transmission and standby services) to wheeling customers. To the extent a utility shifts more of its fixed costs to price-inelastic services, core customers would be harmed. In a part competitive, part monopoly environment, utilities would have an incentive to price discriminate against price-inelastic customers. Finally, retail wheeling could cause short-term technical problems, which eventually should be resolved, jeopardizing the reliability of service of core customers.

In the longer term, following a transition period, core customers could gain from a more competitive retail market. Utilities would have strong incentives to operate and invest efficiently, benefitting both core and noncore customers.

6. The major opponents of retail wheeling, vertically-integrated utilities and conservationists/environmentalists, view retail wheeling as detrimental to their interests. The utilities fear the end of their *de facto* exclusive franchises. For many, profits could drop sharply as these utilities would either lose customers or be forced to offer market-based prices (which could be substantially lower than current prices). Conservationists/environmentalists

fear the end of the IRP process as currently practiced and utility-funded DSM activities. Both groups seem correct in their assessment of the damage that would be caused by retail wheeling to their interests. Since these groups are considering only their self-interests, no inference based on their arguments *per se* should be made regarding the social desirability of retail wheeling.

7. The strongest supporter of retail wheeling, industrial customers, tend to downplay the transition costs. Their argument that retail wheeling could improve economic efficiency in the electric power industry has much merit. Policymakers would need to consider, however, the myriad complex issues (for example, transition costs) surrounding retail wheeling. Reconciliation of these issues, some of which affect the fundamental tenets of public utility regulation, would take much time and effort.
8. State regulators throughout the country are most concerned about the effect of retail wheeling on core customers. Regulators would be much more receptive of retail wheeling if it could be shown that no class of customers would be worse off. Regulators generally acknowledge that retail wheeling would significantly affect the economic performance and structure of the electric power industry.
9. States seem to have the authority to allow retail wheeling. Based on the legal analysis conducted for this report, the Supremacy and Commerce Clauses of the U.S. Constitution would not prohibit states from either ordering or allowing retail wheeling. The states, however, would be preempted by FERC from setting the price, terms, and conditions of such retail service since it would involve unbundled transmission service in interstate commerce. In allowing retail wheeling, states would probably have to revisit their public utility statutes to accommodate a new "regulatory compact." The new "regulatory compact" would need to account for the fact that retail wheeling would impair utilities' exclusive franchises and their obligation to serve customers that choose to shop around.

10. Retail wheeling would require utilities to correct for the technical problems that could arise. These difficulties could stem from parallel path flows, network congestion, transmission line capacities and line losses, metering problems, distribution limitations, and capacity and transmission planning problems. These difficulties would likely be resolved over time, although at a cost to the utility and its customers. It would be costly to correct for these problems with today's technologies. Future advances in metering and transmission hardware and software, however, would likely drive down the costs.
11. The experiences of retail competition in other formerly highly monopolized industries indicate that with retail wheeling regulators would face serious challenges. Both utilities and regulators would likely have to consider new rate-making procedures and utility obligation-to-serve requirements, the treatment of stranded-investment costs, and the protection of core customers. A major lesson learned is that when regulators do not initially accommodate competitive forces they will ultimately be forced to do so. Put simply, retail competition in the electric power industry would dictate the practices of regulators. For example, regulators would ultimately sanction market-based prices, eliminate cross-subsidies, and allows utilities to compete on an equal basis with other suppliers.
12. Finally, in view of the great uncertainties over the potentially significant and wide-ranging effects of retail wheeling, it makes sense to avoid initially a broad-scale program. Alternatively, phasing-in retail wheeling, if that is possible, seems to have more merit.

## POSTSCRIPT

### Michigan Public Service Commission Interim Decision

On April 11 of this year the Michigan Public Service Commission issued an interim order that ordered a five-year, experimental retail program for Consumers Power and Detroit Edison.<sup>158</sup> The purpose of the experiment will be to determine whether retail wheeling is in the public interest and whether it should be implemented on a permanent basis. The proceeding (Case Nos. U-10143 and U-10176) was remanded to the administrative law judge for determination of rates, terms, and conditions of retail wheeling service.<sup>159</sup>

Because the experimental program would initiate with the utilities' next solicitation of new capacity, the Commission did not have to address the issue of stranded costs. Simply, if retail wheeling is looked upon as a resource to meet future demand, the utilities' current assets would not be stranded.

Perhaps the most controversial part of the order, the Commission ruled that it has jurisdiction over the rates, terms, and conditions of transmission service. The interim order also requires all third-party suppliers to obtain from the Commission a certificate of convenience and necessity and a franchise from a municipality within which the retail user is located.

The interim order also requires that the retail wheeling portion of a customer's load be physically separated from the full-service (bundled) portion and separately metered. Industrial customers argue that separate metering is both costly and unnecessary.

The Commission partially justifies its jurisdiction over retail wheeling by its perception that retail wheeling, rather than being a new service, represents the unbundling of existing retail services that fall within the Commission's authority. Thus, it reasons, unbundled retail delivery service is as much of a local service as bundled distribution.

### California's Rule-Making Proposal

---

<sup>158</sup> See "Michigan PSC Orders Retail Wheeling Experiment for Consumers, Detroit Ed," *Electric Utility Week* (April 18, 1994): 1, 12-13; and "Michigan Approves 'Experimental' Five-Year Retail-Wheeling Program, *Inside F.E.R.C.* (April 18, 1994): 1, 8.

<sup>159</sup> A final order is expected to be issued sometime in 1995.

On April 20 of this year, the California Public Utilities Commission proposed rules that would have significant consequences for the state's electric power industry.<sup>160</sup> The rules could act as a precursor to what will take place in other states during the next several years.

As a major feature of the rules, California's largest industrial customers would have the right to shop around for electricity starting in 1996, commercial customers starting in 1998, and finally all residential customers starting in the year 2002. Under the retail wheeling provision, all electricity suppliers including out-of-state suppliers, exempt wholesale generators, and PURPA-Qualifying Facilities would be able to sell their power directly to retail customers.<sup>161</sup> The California utilities would be obligated to provide transmission and distribution services on a nondiscriminatory basis to wheeling consumers who request such services. The Commission envisions that broad transmission and distribution access will lead to an active electric spot market and new electric services.

The proposed rules would also institute performance-based regulation to replace rate-of-return regulation. Bundled services to core customers, as well as transmission and distribution services, would be subject to regulatory pricing. The Commission argued that the new rate-making paradigm would provide stronger incentives for efficient utility operation and investment.

Regarding stranded-investment costs, the proposed rules would not allow all of these costs to be shifted from retail wheeling customers to other customers. As stated by one California Commissioner at a regulatory conference,

"Our rulemaking envisions separately calculating the value of . . . uneconomic [stranded] assets and collecting them from all ratepayers through a separate "transition cost surcharge."<sup>162</sup>

---

<sup>160</sup> See "Calif. PUC Steps Toward Retail Wheeling," *The Electricity Daily* (April 21, 1994): 1; and "Regulators Propose Direct Competition For Providing Electricity in California," *The Wall Street Journal* (April 21, 1994): A1. The Commission expects to adopt final rules in August of this year.

<sup>161</sup> The Commission envisions retail consumers to have direct access to generators, marketers, brokers, and other service providers in the competitive marketplace for energy services.

<sup>162</sup> Commissioner P. Gregory Conlon, Comments at the Conference on Innovative Rate Regulation for a Competitive Electric Utility Industry, co-sponsored by the Center for Regulatory Studies and the Institute of Government and Public Affairs, Chicago, Illinois, April 28, 1994.

The Commission, through its proposed rules, hopes to avoid cost-shifting and uneconomic bypass by unbundling and pricing individual services, and by allowing utilities to negotiate market-based prices with wheeling customers. "Revenue deficits" suffered by a utility would fall on utility shareholders. The Commission proposes to investigate the unbundling of utility services.

The Commission recognizes that retail wheeling, as well as a more competitive electric power industry in general, requires a new "regulatory compact." The new compact would loosen a utility's obligation to serve consumers who choose to purchase their electricity from other suppliers. For example, the Commission proposes that a wheeling customer wishing to return to the local utility as a full requirements customer be required to provide the utility, at the minimum, a twelve-month notice. The Commission also proposes that utilities should not be required to offer a returning customer the same tariff that would apply to new customers.