

CHAPTER 3

MARKET POWER

Introduction

The basic premise underlying the anticipation of benefits arising from electric industry restructuring is that the generation function can and will operate as a competitive market. The validity of this assumption requires that no owner of generation facilities in a restructured industry be able to exert significant market power influences on the pricing or availability of electricity. Virtually all parties recognize that, in light of the physical characteristics of electricity and existing industry organization and infrastructure, proactive measures must be taken in a restructuring process to alleviate factors which, if left unchecked, could result in anti-competitive practices. However, there is great diversity in opinions as to the degree of potential market power concerns and what actions are necessary to overcome such concerns. In any event, a simple declaration of competition and customer choice, without substantive and deliberative restructuring, is most likely to result in neither competition nor choice. In fact, such a superficial approach could result in the emergence of unregulated monopolies.

Perspective

As with many other restructuring issues, the resolution of the potential market power issue cannot be thoroughly defined in advance. The full scope of this issue will only be revealed through an evolutionary restructuring process which undoubtedly will require in-course corrections. Therefore, policy makers must take every precaution to anticipate and frustrate undue market power influences in advance since the potential public interest costs of policy missteps could be great. Adding to the complexity of fulfilling this responsibility, extreme care must be exercised in policy development to avoid unintended and unacceptable system reliability degradation.

Unsettled jurisdictional responsibilities further complicate such policy efforts. It seems logical that a combination of federal and state statutes and energy regulatory policies will be required to address such issues in addition to the traditional corrective anti-trust activities of the U.S. Justice Department and the states' Attorneys General Offices. However, it is not clear how the lines of federal and state legislative and agency responsibility for policy development and enforcement will be drawn or how efforts will be coordinated.

In view of the currently envisioned functional unbundling of the industry and the regional interstate nature of a competitive generation market, it appears to the Staff that it may largely be left to Congress and federal agencies such as FERC to assert primary leadership in developing and enforcing policies aimed at preventing market abuses. On the other hand, the states primary role may be to encourage the development of competitive market structures through regulatory "carrots and sticks". At a minimum, the states should restrict the release of utility assets to the competitive market until adequate market structures and federal protective mechanisms are in place. Once assets are released, the states may have limited authority to remedy market power abuses.

Types of Market Power

Conceptually, there are two types of supplier market power concerns--vertical market power and horizontal market power. Vertical market power arises from single-firm or affiliate ownership of two or more steps in a production and market delivery process where one of the steps provides the firm with control of a bottleneck in the process. Such control enables the firm to give preference to itself or its

affiliate over competitive firms. Horizontal market power arises from a firm's local ownership concentration of a single process step within a defined market area. If such concentration is sufficient with respect to certain other market conditions, the firm can influence the supply-demand equilibrium, and hence prices, simply by withholding production. Both vertical and horizontal market power concerns are present with respect to electric industry restructuring.

There are several interrelated industry conditions that both individually and collectively accentuate such concerns. Large vertically integrated electric utilities own and control the transmission system within their respective service territories, as well as the bulk of generation facilities. Although interconnected with the transmission systems of other utilities, each utility (or each group of utilities in a power pool) built its transmission system to serve its control area from its own vertically integrated operations. The interconnections with neighboring utilities have been constructed largely to provide emergency back-up power for reliability purposes; they generally were not built to serve as the interstate highway for transporting bulk power deliveries in a competitive regional market. Therefore, the transmission systems of many utilities have severe power import capability limitations which may restrict the competitive pressures that can be exerted by generation resources outside the control area.

The physical nature of the interconnected grid, which relies on the integrated operation of transmission and generation, exacerbates concerns relative to utility control of the transmission system, power import limitations, and concentrated local ownership of generating facilities. Specifically, generating unit dispatch affects the transmission system transfer capability. For example, the transmission system cannot transport large bulk power deliveries over long distances without the voltage support provided by generation facilities close to load centers. This phenomenon gives rise to what are referred to as "must-run" generating units which would command market power if the pricing of their output is not restrained in some manner. Further, since system loading conditions are dynamic, several different generating facilities may fall into the "must-run" category at various times for varying duration over the course of the year. In this sense, specific generating plants may have market power.

There are other physical characteristics of the electric system which compound concerns with respect to potential conditions conducive to market abuse. Since electricity generally cannot be efficiently stored, it must be generated simultaneously with demand on a real time basis. There is great variability in daily, seasonal, and yearly demand which is highly sensitive to extreme weather conditions. A competitive market is likely to exert pressure to lower generating reserve levels since investment in capacity to serve very high peak loads for a few hours every few years, even at exorbitant prices, may not be economically justifiable. In the long-term, these economic pressures would likely increase the cost effectiveness of load management measures. However, in the short-run, there may be initial investment barriers to load management options and limited economical substitutes for electricity. Therefore, during peak demand conditions when the weather is most extreme and electricity is most essential in the context of public health and welfare, the potential for market power abuse may be the greatest. The consumers most vulnerable to these conditions may be those with the least financial resources. Finally, as discussed in the *Horizontal Market Power* section, there may be considerable market entry barriers for new competitive generation facilities.

Vertical Market Power

By controlling the transmission system, vertically integrated utilities control the access of generation competitors to the market. Left unfettered, it would be in the financial self-interest of these utilities to offer preferential transmission service to their own generation facilities, limiting physical access to competitors or charging higher prices. Without the availability of economical transmission service to deliver its product to the market, the generation of competitors may have little, if any value.

In efforts to encourage the development of competition in the wholesale electricity market, the Congress and FERC have recognized the problem of vertical market power associated with utility control of the transmission system. In the Energy Policy Act of 1992 ("EPAct"), FERC was granted the authority to order utilities to provide transmission access to non-utility generators at a FERC-approved rate. On April 24, 1996, FERC issued Order 888 requiring electric utilities to offer third parties comparable wholesale transmission services under open-access tariffs. This Order did not require utilities to turn over control of their transmission systems to a third party or require corporate divestiture of utilities' generation and transmission operations. However, it did offer guidelines on the establishment of independent system operators ("ISOs") and it required the utilities to functionally unbundle their transmission business from their power marketing business.

The concept behind the ISO is relatively simple, but essential for the development of a competitive retail generation market. It basically requires that an independent party, with no economic interests in generation or other market functions, control the operation and maintenance of the transmission system and provide non-discriminatory pricing and access to all market participants. The ISO provides a dual function in ensuring reliable grid operations as well as helping to alleviate vertical market power. The ISO may also serve as the initiating mechanism for the development of larger regional interstate competitive generation markets as compared to the traditional industry structure which is frequently characterized by smaller utility-specific control areas.

From a vertical market power perspective, the most important aspect of the ISO is the establishment of a governance structure which ensures independence from transmission owners and all other market participants. In addition to having clear authority over the operation and maintenance of all transmission facilities within its region, the ISO must have the authority to redispatch generation in response to transmission congestion and may need approval authority over scheduled generating unit maintenance. The ISO must also play a key role in the provision and pricing of ancillary services and must manage the dissemination of market information related to transmission system operations. A final essential element of the ISO is the ability to plan and effect needed transmission system enhancements in a timely manner in order to relieve constraints that prevent competitive generation from reaching the market. This mechanism is critical for achieving the transmission infrastructure investment required for evolution to large well-functioning competitive regional markets from the typical utility-specific control area structure that currently exists.

While conceptually sound in mission, several fundamental questions remain with respect to the implementation of ISO structure and function. The complexity of the issues and details involved in the establishment of a successful ISO will require significant time and effort for appropriate resolution. For example:

- How will transmission and generation planning be coordinated to ensure an optimal grid configuration?
- How will the ISO be able to secure needed transmission enhancements?
- Will the ISO be able to develop and implement pricing which reflects individual user impacts on the grid?
- What ancillary services should be provided by the ISO and how will they be priced?

- How will the ISO administer "must-run" units and transmission congestion?
- Will the ISO be able to develop the information systems necessary to provide for full retail wheeling?
- Will the ISO have the authority to ensure reliable grid operations and be able to enforce that authority?

In short, while development of the ISO is an initial and essential step of the restructuring process, a successful implementation is not automatic. As discussed in the *Independent System Operator* section of the *Market Structure* chapter of this report, there are several on-going efforts to develop ISOs at the present time; but there is no fully functional ISO in operation.

As an initial concern, both the states and FERC appear to have severe limitations on their authority to order the development of regional ISOs. FERC has some leverage to encourage utilities seeking merger approval to place its transmission assets under control of an ISO, but likely will experience difficulty in reaching utilities not seeking merger approval. States may be able to direct the development of a state-specific ISO; however, in most cases, state boundaries do not define a rational or workable regional market. This condition is especially prevalent in states like Virginia which is served by several multi-state utilities. In short, under current statutes, it appears that regional ISO development depends largely on the voluntary efforts of utilities with encouragement provided by regulatory incentives.

Obviously, the success of a regional ISO will depend upon its independence and the ability to develop and enforce the specific rules and regulations required to fulfill the ISO's mission. The major players involved in this effort will likely be the ISO membership, other market participants, the North American Electric Reliability Council ("NERC"), FERC, and the states. Since FERC has asserted jurisdiction over unbundled transmission service, state involvement in the on-going operations of regional ISOs may be limited. However, the formation of an ISO is likely to require state approval with respect to the transfer of operational control over utility transmission assets to the ISO. Therefore, the states may be able to exert significant influence on at least the initial ISO structure. State-specific ISOs may allow for even more state jurisdiction. In any event, due to existing expertise and ownership interests, vertically integrated utilities are likely to be heavily represented in the establishment of ISOs as well as in the development of their rules, regulations, and pricing policies.

Given the complexities involved in restructuring the operation of the dynamic interconnected transmission system, resolving associated pricing issues, and maintaining system reliability, vertically integrated utilities may have the opportunity to unduly influence the results to advance their self-interests. Therefore, the participation of public interest representatives in ISO development and/or approval must be accompanied by competent technical and economic expertise. This is noteworthy in that traditional regulation has generally placed greater emphasis on economic considerations and less on technical considerations. Greater technical expertise may be needed by the FERC and state regulators to ensure an appropriate balance between technical issues and competitive interests.

Horizontal Market Power

While the successful development of an ISO may address vertical market power concerns, it does not solve the problem of horizontal market power. The combination of concentrated ownership of

generating assets within a control area and the limited power import capability may provide several of the large vertically integrated utilities with significant market power, at least in the short-run.

Case in point, Virginia Power controls virtually all generating capability within its control area, which has a peak load of approximately 15,000 MW. The Company's transmission system provides for a maximum power import capability, under ideal conditions, of approximately 3,000 MW to 4,000 MW. In other words, approximately 70 percent to 80 percent of the entire load must be served by Virginia Power generation resources during peak demand conditions. Even during periods of relatively low demand, some power must be purchased from the Company's generating resources if load is to be served. For example, based on Virginia Power's actual 1996 load duration curve, demand in its control area exceeded 6,100 MW over 90 percent of the hours during the year. More than 50 percent of the time, demand exceeded 8,200 MW, which is over double the maximum power import capability. As load grows and the disparity between such load and maximum power import capability increases, the Company's ability to manipulate prices would seem to increase.

One potential solution to this type of market power would be to require divestiture of a substantial portion of utilities' generating assets. However, these assets would have to be transferred to many different owners to prevent the new owners from exercising market power. While it is not clear what percent of total market capacity ownership is necessary to exert significant market power, it is probably much less than other industries where the product is less essential and can be stored. Further, subsequent to any initial divestiture, a consolidation of ownership through mergers or asset sales could result in a reappearance of the same concerns.

As indicated earlier, individual plants or units may have market power irrespective of ownership because of the facility's location with respect to system loading and voltage support requirements. Of course, voltage support is frequently identified as an ancillary service which should be provided by the ISO. However, the ISO, in some instances, would have no alternative but to procure this service from a specific plant for certain periods of varying duration. Under such conditions, the facility would in effect be a "must-run" generating unit. While price regulation of such non-competitive transactions may be a possible approach for preventing market abuse, obviously, divestiture would not be a cure for this ill.

From a practical perspective, it is not clear that states have the authority to order asset divestiture. California skirted this issue by providing incentives that effectively required that utilities divest 50 percent of their fossil generating plants in order to recover stranded cost. However, such a tactic might be ineffectual with respect to utilities that do not have stranded costs, as may be the case for certain Virginia utilities. The multi-state operations of some utilities may also pose a problem with respect to conflicting policy directions of different states.

In any event, while divestiture may become desirable or even necessary in the future as restructuring evolves, the Staff believes it is premature to pursue this strategy at the current time before the development of a fully functional ISO. As noted previously, once assets are released to the competitive market, especially through a divestiture process, a state may have difficulty reasserting regulatory jurisdiction in the event of unanticipated adverse developments.

The theoretical market solution for a situation in which a firm charges prices that are above long-run marginal costs would be the market entry of new generation competitors. Of course, given the disparity between loads and import capability with respect to Virginia Power's control area, it would require a significant number of new entrants and probably a long period of time to adequately resolve market power concerns. Additionally, there are still substantial concerns with respect to potential market entry barriers.

While the cost of new gas-fired generation has declined in recent years, required investment, construction lead times, and investment recovery periods are still substantial. The higher risks associated with a competitive market are likely to result in higher financing costs as well. In most situations, it would seem that Wall Street is likely to favor the projects of companies which own a large diversified portfolio of generating assets. In fact, it seems logical that the increased merger activity witnessed in recent years will continue. In the extreme case, the market could evolve into a tight oligopoly in which a relatively few firms control most of the generating assets. Such an event would likely be accompanied by a dramatic reduction in anticipated market benefits.

Should natural gas prices rise in the future to the extent that coal-fired generation becomes the economic generation of choice, all of these concerns increase dramatically given the significantly higher capital costs and construction lead times of coal units. Additionally, under such a scenario, the current control of sulfur dioxide emission allowances could provide a competitive advantage to existing utilities over new market entrants. New generating facilities are subject to much more stringent emission standards than those built prior to 1978. It should also be noted that existing utilities may have a competitive advantage in their control of significant potential nitrogen oxide offsets, which may be required for new generation in locations not in compliance with EPA ozone standards. This has implications with respect to gas-fired generating facilities as well as those fueled by coal.

Attendant issues to potential market barrier concerns in Virginia include the future availability of economic gas pipeline capacity and generation facility siting issues. Gas-fired generation is generally considered the current technology of choice with respect to new capacity. In central and eastern Virginia, current gas pipeline capacity during peak usage periods is limited. While some additional capacity is expected to become available in the near future as a result of upstream improvements, a significant number of new gas-fired generation facilities would require a substantial increase in pipeline capacity. Such an expansion would take time and would likely result in cost increases for transporting new gas supplies. Ultimately, the price of new generation would reflect this increased cost.

Under current Virginia statutes, only public service corporations have the power to exercise the right of eminent domain with respect to construction of public service facilities (i.e., transmission lines and power generating facilities). As a practical matter, such rights are dependent upon the issuance of a certificate of public convenience and necessity by the Commission. It appears to the Staff that the right of eminent domain may be essential for competitive generation companies attempting to construct major power generating stations. This may be especially crucial in developed areas near load centers where new generation would be most valuable or in the construction of a coal-fired facility that would require hundreds of acres of land. An associated siting issue that also must be addressed is the establishment of reasonable rights, conditions, and procedures which govern how competitive generation facilities will be interconnected with the grid while also ensuring that the public interest is adequately protected. Whether any of the above potential market entry barriers or related issues are sufficient to retard competition is a question that remains to be seen, but they do pose legitimate concerns that should not be dismissed lightly.

Conclusions

With respect to electric industry restructuring, there are significant concerns regarding the potential vertical and horizontal market power of large vertically integrated electric utilities. These concerns arise from the existing industry organization and infrastructure, as well as from the physical characteristics of electricity and its economic and social ramifications. Specifically, large vertically integrated utilities generally own and operate the transmission system within their control area as well as the vast majority of generation resources. Compounding these organizational concerns, significant transmission constraints and voltage support requirements frequently restrict power transfer capability into and within

specific control areas.

The Staff believes that the initial focus of restructuring efforts should be on the development of a fully functional ISO to serve as a mechanism for addressing vertical market power concerns, maintaining system reliability, and fostering the development of regional power markets. An essential element of the ISO must be the ability to effect needed physical enhancements to the transmission infrastructure. The complexity of the issues surrounding the successful development of an ISO will require a significant dedication of resources and time. However, this effort is critical to competitive

restructuring. In fact, without resolution of the vertical market power issue and reasonable confidence that the ISO can fulfill its mission, horizontal market power concerns are largely irrelevant.

It is difficult to quickly alleviate the concern of horizontal market power in the short-run. The Staff believes the best initial approach for this concern is to maintain regulatory control of existing generation assets until a sufficiently competitive market evolves. At the appropriate time, this evolution may be fostered by allowing for all new generation to be provided by the competitive market. The Staff believes that such a direction will require addressing the eminent domain issue as well as how to provide reasonable accommodations for interconnecting new generation with the transmission system. Subsequent to the successful development of the ISO, horizontal market power can be reevaluated. If concerns still exist at that time with respect to the development of a competitive generation market, the feasibility and desirability of generating asset divestiture should be considered.
