Federal officials increasingly are turning to command-and-control policies for the nation's power grid.

FERC's New Regulatory Agenda

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DURING THE PAST YEAR AND A HALF, the Federal Energy Regulatory Commission (FERC) has embarked on a significantly more regulatory course than it was on before. The new approach is most evident with respect to transmission, where FERC's leadership is moving aggressively to divide the nation's grid into a small number of quasi-governmental entities called Regional Transmission Organizations (RTOs), and to prescribe in detail how those RTOs should operate. The prospect of greater regulation is not restricted to the transmission sector; FERC is taking a much more hands-on approach to the wholesale power market. That approach includes active "market monitoring" that will place generators under the continuing threat of price caps, mandated refunds, and loss of market-based rate authority.

FERC's new regulatory activism is occurring without sufficient analysis of whether the approach will improve the functioning of markets or be beneficial for consumers. Despite the fallout from the California and Enron episodes, the arguments in favor of electricity competition are as strong as ever. The question, however, is whether competition can be achieved by substituting a new regulatory regime for the old one — as FERC is in the process of doing — or whether competition requires reducing the role of government in the marketplace.

California and Enron The expansion of regulation at the federal level is partly a reaction to the California electricity crisis and the Enron collapse, both of which have diminished policymakers' enthusiasm for deregulation. Unfortunately, some have drawn the wrong lessons and incorrectly concluded that California's problems resulted from too much deregulation and manipulation of the market by Enron and other power suppliers.

While the California disaster had multiple causes (see "Special Report: The California Crisis," Fall 2001), the single most important cause was failing to deregulate at the retail level and thus to allow the demand side of the market to work. That was the principal factor in the unraveling of the wholesale market. The promise to California consumers that prices would drop immediately on the introduction of competition was not realized because competition was never really introduced and prices at the consumer level were not allowed to reflect supply and demand. Most importantly, when those forces changed, the mechanisms were not in place to allow the market to respond. If competitive markets had been in place — i.e., if more deregulation had taken place — California would have avoided the rolling blackouts that it experienced and its prices would have been lower and less volatile.

THE ELECTRICITY DEREGULATION MODEL

Until recently, electricity was provided by vertically integrated, regulated utilities responsible for all major functions — generation, transmission, distribution, and retailing. The deregulation model toward which the industry has been moving reflects the view that generation and energy services can be competitive, but the "wires" segments of the industry — transmission and distribution — retain natural monopoly attributes and therefore need to remain subject to regulation. The model consists of the following elements:

- A largely deregulated wholesale generation sector.
- An interstate transmission sector, which remains regulated at the federal level.
- Local distribution systems, which continue to be regulated by the states.

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- A competitive sector for retail power and energy services.

Given the historical division of regulatory responsibilities, the first two elements are in the domain of the federal government, while the last two are in the domain of the states. The recent experience in California illustrates the interdependence of the wholesale and retail markets and the risks inherent in pursuing deregulation of those markets along separate tracks.

Regulation in theory The overall success of deregulation depends, to a large extent, on the treatment of transmission. An efficiently functioning transmission network, with appropriate incentives to maintain and invest in capacity, is essential to increase reliability, avoid market power problems, and achieve the full benefits of electricity competition. Indeed, transmission is far more important than the relatively small percentage of the electricity dollar it represents. It is also far more important under a competitive regime than under traditional regulation because it needs to support a much larger range of transactions.

The two most difficult electricity deregulation issues are related to transmission:

- How can deregulators achieve coordination (or, alternatively, reduce "balkanization") among disparate elements of an interconnected grid?
- How can deregulators assure open access to the grid by competing generators and marketers?

Policymakers must resolve both of those issues in ways that are consistent with maintaining incentives to maintain and expand grid capacity.

We have some experience with respect to the open access issue from other network industries, most notably the telephone industry. We have much less experience with respect to the coordination issue. Indeed, because electricity has never been left to the market, we do not know what solutions the market would arrive at if left to its own devices.

Coordination Electricity has physical characteristics that make it unique among network industries and that make the transition to competition more difficult. The electricity network is an interconnected, alternating current network, which means that activities in any one part have effects in other parts. Because it is not a switched network, the output cannot simply be sent from one point to another. Rather, suppliers inject electricity into the network and consumers draw electricity out, and the balance between supply and demand must be maintained continuously. Electrons injected into the transmission network do not flow on any preordained path, but rather flow along the path of least resistance. (This is referred to as "loop flow" or "parallel flow.") They frequently flow through more than one transmission provider's facilities. Similarly, capacity decisions affect-

ing one part of the network may have implications elsewhere.

When most traffic was handled by vertically integrated utilities whose systems were much more self-contained than they are now, the interdependence was not a significant issue. It is a potential problem now that the transmission grid is used more heavily to transmit electricity over longer distances. The concern is that the grid has become "balkanized" — that while we have a large, physically interconnected grid, it is under the divided control of a number of smaller entities operating under different rules and pricing systems. That is a principal rationale for the creation of large RTOs.

Open access The transmission and distribution systems currently are monopolies. Their owners would be able to exert monopoly power — at least for a while — if market-based pricing were permitted. The development of distributed generation and merchant transmission companies may, over time, make the wires "contestable" and diminish or even eliminate the need for regulation. Given the inefficiencies of the regulatory process, it is arguable whether it would be better to deregulate the wires immediately — and stimulate the development of competition more quickly — or keep them regulated in some form. As a practical matter, there is very little support for deregulating transmission or distribution at the present time, and there is general agreement that they will remain regulated for the foreseeable future.

Transmission and distribution have many of the characteristics of essential facilities: Their absence precludes competition and, more importantly, they cannot economically be duplicated. That means that, for a competitive wholesale power market to develop, transmission owners need to provide access to wholesale generators and marketers on equal terms. Transmission owners who also are owners of generation should not be able to discriminate in favor of their own generation.

Economists traditionally have attempted to resolve the equal access problem through either behavioral regulation or structural regulation. The behavioral approach is simply to require transmission owners who also participate in the power market to provide access on the same terms to other participants. Specifically, the requirement would attempt to assure, albeit imperfectly, that transmission owners do not discriminate against competing producers and marketers in terms of price, physical conditions of interconnection, or any other terms of access to their transmission systems. The structural approach involves separating the regulated monopoly (transmission) from the unregulated competitive sector (generation) through divestiture or some other means. An independent transmission company, having no generation of its own, would have no incentive to discriminate against other firms. Thus, a properly designed structural approach obviates the need for behavioral open-access requirements.

There are structural approaches that fall short of divestiture, including various forms of unbundling, structural separation, and other ways of trying to assure the independence of the regulated entity's operations. For the electricity industry, a whole new family of structural approaches has been developed under the umbrella of the RTO.

The relative merits of behavioral and structural approaches depend on the specific situation and the characteristics of the industry. The existence of significant economies of scope between the regulated and unregulated sectors would argue for avoiding a structural separation and instead relying on behavioral restrictions. Behavioral restrictions would also be preferable if the terms of access to the regulated monopoly are relatively straightforward and easy to police.

The best solution would probably be to impose (behavioral) equal access requirements on firms that both generate and transmit electricity.

Deregulation of the long-distance telephone market provides the closest parallel to the current situation in electricity. In order to promote competition in the long-distance market, AT&T divested the local exchange carriers, which were to remain regulated monopolies. That facilitated the interconnection of competing long-distance carriers on a nondiscriminatory basis.

While the AT&T divestiture promoted the development of a competitive long-distance market, there is evidence that a similar result could have been achieved through behavioral requirements. Brookings economist Robert Crandall has compared the experience of a number of countries that mandated equal access but not vertical divestiture. He concludes, "All that is required to develop a more competitive long-distance market is the provision of interconnection with local carriers."

The electricity industry seems to be simple enough for equal access requirements to work. In addition, the industry exhibits some evidence of economies of vertical integration.

The best solution would probably be to impose (behavioral) equal access requirements, but exempt from those requirements transmission owners that do not also own (or are otherwise independent of) generation. This would provide a regulatory carrot to induce utilities to form independent transmission companies voluntarily. In fact, a large number of utilities have divested themselves of their generation assets, mainly in response to incentives provided by state competition plans. There is no point in imposing open-access regulation on stand-alone transmission companies.

But FERC has never decided between behavioral and struc-

tural approaches, and instead has imposed an ever-increasing set of both types of requirements on the transmission sector. Those requirements have been imposed equally on transmission entities whether or not they own generation or are inclined to favor some group of generation assets.

Regulation in practice The current path of transmission regulation started with the enactment of the Energy Policy Act of 1992 (EPAct), which provided that independent generators could petition FERC to order transmitting utilities to provide "wheeling services" for wholesale power transactions. That culminated in the adoption of FERC Orders No. 888 and 889, which required utilities that own, control, or operate interstate transmission to file non-discriminatory open-access tariffs. Those orders represent a behavioral approach to the problem of providing access to the transmission network.

Simultaneous with the promulgation of Orders No. 888 and 889, many utilities divested themselves of substantial amounts of generation, voluntarily or with the encouragement of their states. Many state competition plans provided favorable stranded-cost recovery treatment to utilities that divested or otherwise required or encouraged divestiture to alleviate market power concerns. From 1997 to 1999, almost 90,000 megawatts of generating capacity was either sold or offered for sale. The divestiture created utilities that had little or no generation capacity. That should have made some difference in the application of regulations designed to assure non-discriminatory open access, but it has not done so.

ISOs At the same time FERC was adopting Orders No. 888 and 889, it was joining state regulators in promoting the concept of the independent systems operator (ISO), which represents a structural solution to the open-access problem. Under an ISO arrangement, operational control of the transmission network is transferred to non-owner "independent" system operators. Thus, in addition to separating transmission from generation, the ISO structure separates transmission ownership from operational control of the transmission assets.

The ISO structure is designed to address three sets of issues arising from electricity restructuring:

- It attempts to go beyond FERC Orders No. 888 and 889 in ensuring nondiscriminatory open access to transmission facilities and in addressing concerns that vertically integrated utilities might favor their own generation over lower cost alternatives if they are in a position to do so.
- It attempts to address the coordination issue by centralizing a variety of functions over multiple owners' transmission systems. In most plans, the ISO is responsible for all operational aspects of the transmission network, including dispatching generation plants, pricing capacity, and determining whether new capacity is needed.
- It attempts to constrain the exercise of monopoly power on the part of the transmission network itself.

The ISO does not distinguish between vertically integrated utilities and stand-alone transmission companies. Indeed, stand-alone transmission companies are required to join ISOs.

While the structure of ISOs varies, stakeholder boards that are intended to take into account a variety of interests govern them all. In all cases, board members must be totally independent of the companies whose transmission assets they control. Some of the ISOs are more political than others, with California's reflecting more direct political influence.

The separation of ownership from operational control represents a very unusual economic model that has not been required for any other regulated industry. Despite its widespread acceptance in the electricity regulatory community, there is no evidence to indicate it will be successful. (See "Can Nonprofit Transmission Be Independent?" Fall 2000.)

Proponents of the ISO concept appear to approach transmission as a series of engineering problems and ignore the fact that institutions and incentives are important. The incentive structure that ISOs face is unknown and, therefore, the outcomes are unpredictable. Who do they represent: FERC, the grid owners, other participants in the market, or a combination of the above? The hallmark feature of ISOs is independence, but even that is open to question. FERC recently discovered that the California ISO provided preferential treatment to the California Department of Water Resources, which is now the main purchaser of power for California's two major utilities.

There are major questions about leaving important operational decisions concerning pricing and investment to non-profit boards that have no equity interest in the assets they manage. It would be difficult to apply incentive ratemaking to an ISO because the residual claimant is not the decision-maker. ISOs also are increasingly being required to take on regulatory functions, such as market monitoring. In the end, they are likely to become quasi-regulatory bodies engaged in politicized decision-making — a process we know does not lead to efficiency.

Order No. 2000 Order No. 2000 was FERC's first major policy initiative on transmission after Order No. 888. The new order formalized FERC's commitment to the Regional Transmission Organization (RTO) concept, broadly defined. Order No. 2000 was, however, written to permit significant flexibility in how RTOs are designed. In particular, the order is flexible enough to allow both ISOs and independent transmission companies (Transcos), wherein the owners retain operational control. Order No. 2000 also permits substantial discretion in drawing an RTO's geographic boundaries.

The Transco model avoids the incentive problems inherent in the ISO structure because it does not separate ownership from operational control of transmission assets. In contrast to ISOs whose incentive structure is basically unknown, Transcos have the same goals as all typical firms — to maximize profits and to price and invest accordingly. Obviously, when the Transco has monopoly power, its decisions are not always efficient. For that reason, Transcos would be subject to regulation (which, admittedly, introduces its own distortions). But, at least the Transco's incentive structure is known.

RECENT DEVELOPMENTS

While Order No. 2000 told transmission owners that they would need to place their systems under the control of RTOs,

it also indicated there would be substantial flexibility as to the design of the RTO. Many utilities have since devoted substantial resources to developing RTOs of different types that would meet with FERC's approval. Recent developments at the FERC signal a much more prescriptive, less flexible approach. They also indicate a resurgence of the ISO model at the expense of the Transco model.

In a series of orders issued in July 2001, FERC stated that it was now pursuing a policy that would divide the country into four large RTOs — one for the Northeast, one for the Midwest, one for the Southeast and one for the West. While the commission has since retreated from the position that precisely four RTOs are needed, it maintains that large RTOs are needed to address coordination issues because the grid is interconnected over very large areas. FERC also appears to believe that it should, in effect, determine the boundaries of the regional markets by determining the boundaries of RTOs.

The commissioners have made a number of comments questioning whether the functions of an RTO could be performed adequately by a profit-making enterprise. Interestingly, there appear to be no comparable comments expressing reservations about the ISO incentive structure.

The commission's decisions reflect those views. In December 2001, FERC approved the Midwest ISO to be the RTO for a 20-state region. At the same time, FERC denied the request of the Alliance Companies (representing transmission systems in a region including Illinois, Michigan, Ohio, and Virginia) to form a for-profit Transco. Alliance was the most prominent effort to form a Transco; it had been under development for over four years, had first applied to FERC for RTO approval two-and-a-half years earlier, and had received conditional approval the previous July. FERC's decision to deny the Alliance application and order the companies to find ways of joining the Midwest ISO represented a sharp reversal of course and a major setback for the Transco concept. Subsequently, in April 2002, the commission issued two orders that established a framework for the Alliance and the TRANSLink Independent Transmission Company to operate under the umbrella of the Midwest ISO. Unfortunately, that framework seems to give most of the important functions to the RTO.

Cost-benefit analysis In February 2002, FERC released an "Economic Assessment of RTO Policy." The study is not, as advertised, a cost-benefit analysis of RTOs; it simply assumes that the efficiency benefits of electricity competition will flow from the establishment of RTOs and then goes on to estimate those benefits. Thus, the estimated benefits of RTOs are really the benefits from competition itself.

The study does not address the benefits and costs of the RTO form of organization relative to other ways of organizing the transmission grid. It does not show how RTOs will contribute to the development of competitive electricity markets, or evaluate whether they are the best way of achieving that important goal. It does not address the incentive questions associated with separating ownership from operational control of economic assets. The study does not even define what an RTO is.

Standards of conduct Responding to concerns that transmission providers could share information or otherwise advantage their energy affiliates, FERC proposed standards that require a separation of the transmission function from all sales functions, even for transmission providers that are members of RTOs. Employees engaged in transmission operations must operate independent of employees engaged in transmission sales or any other energy operation of the company.

Market design FERC has issued staff papers and held workshops in preparation for issuing a notice of proposed rulemaking on "standard market design" during the summer of 2002. (FERC's "gigaNOPR" standard market design was issued July 31 and is open for public comment until Oct. 15.) While the commission frequently states its desire to balance standardization with the flexibility to permit regional differences and market innovation, standardization appears to be winning out. Indeed, the staff papers indicate that RTOs will control every aspect of the market according to a FERC design — from what software to use to coordinating maintenance and outage schedules.

The RTO is to be in charge of long-term planning and choosing whether transmission, generation, or demand-side management would be the best solution to any particular supply constraint. Standard market design may even include procedures to ensure adequate generation, which supposedly is the competitive side of the market.

Wholesale market Finally, in November 2001, FERC issued a new policy for awarding market-based pricing privileges for generation. In the order, the commission withdrew market-based pricing privileges for three major utilities — AEP, Entergy, and Southern — and adopted a new, more restrictive Supply Margin Assessment (SMA) screen for determining whether market-based rate authority is appropriate. An applicant would fail the SMA screen if its generation supply was "pivotal" in the market — i.e., if its capacity exceeded the supply margin, defined as the market's surplus of capacity above peak demand. When it became clear that AEP, Entergy, and Southern would take FERC to court over the withdrawal, the commission rescinded its order concerning the three utilities. In effect, the new policy appears (at least at present) to apply only to new applicants for market-based pricing authority.

At the same time, FERC proposed a new open-ended refund obligation on all market-based rates. Sellers' market-based rate authority would be subject to refunds or other remedies to address anticompetitive behavior or exercise of market power. Producers and their stockholders would have reason to worry about the reliability of their revenue numbers if the sales could be challenged at a later date.

FERC'S NEW DIRECTION

While concerns remain about the ability of transmission owners to discriminate in favor of their own generation, the data show that a robust wholesale power market has developed during the past decade. According to the Energy Information Administration, roughly half of all electricity gener-

ated is traded on the wholesale market before being sold to consumers. Non-utility power producers accounted for almost 800 billion kilowatt-hours of production during 2000, or about 20 percent of total generation. The growth of the wholesale power market after EPAct's enactment is, in many respects, comparable to the growth of the long-distance telephone market after the AT&T breakup in 1984. The growth shows that there must be relatively open access to large portions of the transmission grid. Companies would not be investing in the wholesale marketplace and building and purchasing independent generation if they could not transport and sell the output.

However, FERC's policies have not been successful in stimulating needed investment in the grid. As indicated in reports by the Department of Energy and FERC, there are serious transmission bottlenecks in all parts of the country, including where ISOs exist, because of a lack of investment in transmission capacity. Data from the North American Electric Reliability Council show steady declines over the past decade in transmission capacity relative to demand. In 2000, normalized capacity relative to demand was 17 percent lower than it had been a decade earlier. The trends, which are not restricted to any particular region, are projected to continue for the next decade.

The costs of inadequate transmission are substantial. They include market power, loss of reliability, the use of higher-cost generators when lower-cost generators are not fully utilized, costly ancillary services, and delays in connecting new generators. The DOE conservatively estimated the costs of transmission congestion in the California, PJM, New York, and New England ISOs at about $450 million per year. FERC found that costs of congestion in New York in the summer of 2000 alone were over $700 million. Clearly, the ISOs have yet to create an environment that is conducive to investment. That is not encouraging. While it is still unclear exactly how investment decisions will be made in the world that FERC is creating, there is little doubt that the ISO/RTO sector will have a major (and probably decisive) voice.

RTOs will interfere with another major regulatory policy goal: the implementation of some form of incentive ratemaking for transmission to substitute for the cost-based ratemaking currently in place. Incentive ratemaking would, among other things, give transmission owners incentives to relieve congestion. But it will be difficult for incentive ratemaking to be successful in a regime in which decision-making is divided between the RTO and the transmission owner, and in which the major decision-maker — the RTO — has no equity interest in the enterprise. It is very difficult to make a non-profit operator responsible for the financial consequences of its decisions.

Requiring open access along the lines of FERC Order No. 888 is a reasonable approach to the open-access problem. As discussed earlier, a behavioral approach along those lines was as successful in promoting competition in long-distance telephony as divestiture. To the extent that there are gaps in its coverage, FERC could work to improve Order No. 888 rather than imposing entirely new measures. FERC should also provide an incentive, in the form of exemption from open-access requirements, to firms that voluntarily separate transmission from generation.

The formation of RTOs with a standard market design is also intended to lead to a better-coordinated, less-balkanized transmission system. The FERC approach reflects an underlying assumption that individual transmission providers will not be able to find ways of coordinating their activities without the assistance of the government and, in particular, without being shoehorned into a single organization. In fact, the market is a great coordinating mechanism and firms throughout the economy coordinate their activities every day — frequently, in unanticipated, innovative ways — because they find it profitable to do so. In the absence of a FERC directive, transmission providers may well find it in their interest to merge their activities, adopt new technologies, or find some other way to internalize externalities.

Moreover, the formation of RTOs does not by itself solve the externalities problem. There still are different transmission owners operating under the RTO umbrella. The owners will either have to arrive at a negotiated solution or have one imposed on them. There is no obvious reason to believe that an imposed solution will be better than one that might be negotiated either with or without an RTO umbrella.

Finally, FERC's activities with respect to generation appear to signal a retreat from market-based pricing in that sector. The SMA screen is based on flawed economics. It would penalize large generators on the basis of size alone, and would deny market-based pricing to firms that would not find it in their interest to raise prices, even if they are in a position to do so. In addition, subjecting generators to open-ended refund obligations is likely to be a significant disincentive to investment.

CONCLUSION

By all available measures, there has been dramatic growth in the competitive bulk power market over the past decade. Despite that success, FERC's approach to both transmission and wholesale generation has recently become significantly more regulatory. The commission is retreating from market-based pricing for generation. With respect to transmission, FERC is proceeding on a path of imposing multiple new regulations simultaneously in an extremely complex area, without the benefit of any analysis to show that the new regulations are needed or that the benefits will outweigh the costs. Clearly, that is not a path that will produce much-needed incentives to invest in transmission capacity.

FERC needs to be much more attentive to the incentives of the institutions it is creating. If the commission does require membership in RTOs, it should do so in a very flexible manner. The design of an RTO (including geographic boundaries), the functions it should perform, and the way it should perform them are very complicated issues that should be permitted to evolve over time. FERC should allocate the minimum amount of functions to the RTO and permit independent transmission companies to develop under the RTO umbrella. And, to the extent that those entities are truly independent of generation, they should be subject to a much simpler regulatory regime and exempted from open-access requirements. R