

Chapter 8

Public Policy Issues and Legislative Strategies

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Public Policy Issues and Legislative Strategies

This chapter provides a broad overview of a number of the public policy issues and potential legislative responses associated with creating a more competitive electric power industry. The policy options in this chapter are aimed at the general technical and institutional changes that may be required to expand competition among potential suppliers of electric power, including increasing access to transmission services, and not at the direct implementation of the scenarios used in OTA's analysis.

This policy discussion targets three areas of potential congressional concern. The first area includes the key technical and institutional changes that must occur to assure that the reliability and economy of operation of the bulk power systems do not suffer in any competitive transition. The chief responsibility for assuring their successful implementation will rest on the electric power industry, including new competitive generators. While regulators and legislators will be directly involved in the initial decisions on what competitive changes will be adopted, they have only an indirect role in implementation and system operations. Nevertheless, there are a range of actions that can be taken to encourage a smooth transition.

The second area of concern embraces the broad public policy questions that will be central to any debate over fundamental changes in the regulation of electric utilities and bulk power markets:

- . encouraging broader market participation,
- . expanding transmission access,
- . changing existing Federal laws and regulations, and
- . establishing an appropriate balance in Federal and State regulation of electric power.

A range of alternative legislative strategies are identified for each.

The third area of congressional concern is the lack of information, analysis, and experience to support decisionmaking about electric power industry structure and regulation. Notable areas where additional research and information are needed are bulk power markets, transmission system capabilities, the po-

tential efficiency gains from expanded competition, and the availability of other alternatives to achieve similar efficiency gains. Related areas that also merit further investigation are the impacts of competition on other Federal energy and environmental goals. Finally, we include some possible legislative responses to the possibility raised by recent scientific studies that exposure to power frequency fields may pose a human health hazard.

TECHNICAL CONSIDERATIONS— POLICY OPTIONS AND ISSUES

Enhancing and Preserving Reliability and Economy in a More Competitive Industry

A fundamental goal of the regulated electric power system has been to maintain reliability of the system while providing economical service. Any shift to a more competitive industry structure would not alter this goal, but its achievement would depend on successfully continuing coordinated planning and operation of the bulk power system.

The bulk power system consists of generation and transmission resources that are planned and operated together in a coordinated fashion. Currently most generation and transmission facilities are integrated either because they are both owned and controlled by the same vertically integrated utility or they are tied together through a local control area. Competitive trends are already modifying that traditional model. The system today already has absorbed a significant increase in bulk power transfers and the entry of nonutility generators—mostly qualified cogenerators and small power producers. The terms and conditions for the transactions that have driven these incremental changes were largely dictated by the integrated utilities and power pools. It is not at all clear, however, whether more extensive or rapid changes can be as easily accommodated and whether effective system operating arrangements will evolve to adequately protect reliability.

Increasing bulk supply competition and expanding transmission access will generally involve a separation or unbundling of the ownership and/or operation of generation and transmission facilities.

The extent could range from modest changes, as in scenarios 1 and 2, to more extensive long-term industry restructuring, as in scenarios 3, 4, and 5. As long as competitive generation¹ makes up only a small portion of the generating resources in an integrated system, most control and coordination problems posed by these alternative suppliers should not be serious and can be handled by available technologies and operating procedures. With more and more new utility and nonutility generators supplying bulk power to the system, however, the degree of separation in operation and ownership will grow and direct utility control could potentially decrease. As the portion of the generating base not directly under utility operation grows, maintaining effective coordination of planning and operations will become more complex, but not impossible. Similar difficulties arise as the number of wheeling transactions increase—because the bulk systems operations center has less direct control over the generators pushing power onto the lines. For the system to function reliably and effectively, some entity must coordinate the individual generation and transmission components. Under all scenarios, but especially scenarios 2 through 5, this may require additional agreements and operating guidelines, and in some instances, creation of new institutions and operating relationships that would include non-utility buyers and sellers in the cooperative efforts.

Meeting the Technical Requirements for a More Competitive Generating Sector

It is possible that as competition assumes a greater role in the generation sector the number and diversity of electric power producers will increase. With such a change would come greater technical and institutional challenges in meeting the three main requirements for coordinating the bulk power system:

1. adjusting generator output to follow load changes;
2. maintaining reliable operations; and
3. coordinating power transactions among inter-connected systems.

Effective generation control and coordination for the expanded competitive system as a whole will be

achieved through some combination of equipment and operating agreements, contractual obligations, and other subsidiary arrangements.

Generation Control for Load Following—Control centers and generators must establish operating agreements and maintain the equipment necessary to follow moment-to-moment fluctuations in load. This frequency regulation equipment includes the central automatic generation control systems, governors on the generators, and metering, communication, and accounting equipment to measure generator performance under an agreement to provide load following service. Responsibility for load following can be assigned in contracts and coordination agreements. For **nondispatchable** units, arrangements might be made to provide and compensate for these services by either reducing the amount paid to the generator or assessing a share of the associated system costs.

An integrated system also requires that generating units be scheduled to follow daily, weekly, and seasonal **load cycles**. A control center for an integrated utility or a tight power pool usually follows a previously established unit commitment schedule and ramps up or down the individual generating units as needed to follow actual or predicted loads. Schedules are **usually set to** achieve the best economic dispatch of available units. Because off-peak loads may be only 50 percent or less of peak loads, systems require a large fraction of schedulable generation to be able to follow daily, weekly, and seasonal load variations. Some units, such as nuclear plants and large fossil-fired steam turbines, are used to meet fairly constant or base loads and are considered “noncycling.” A firm power sale committing the output of a specific generating unit to serve a specified wholesale or retail customer, which might be a typical bulk power transaction under a more openly competitive system, could be considered as a noncycling unit for load following.

As the amount of noncycling or nonscheduled generation in a system increases, both the difficulties of providing cyclical load following and the economic costs of doing so can increase. Potentially, the

¹By “competitive generation” we mean bulk power obtained through a competitive procurement process from a generator that is not owned and operated directly by the purchasing utility. The supplier could be another utility (or a subsidiary or affiliate), a PURPA qualified facility, or an independent power producer.

burdens of system support could fall heavily on the utility controlling the system and its generating units. Under a competitive system where generators are paid only for the electricity they generate, some mechanism must be in place to encourage competitive suppliers to follow load cycles since it may require operating their facilities below capacity. This will require the negotiation of specific agreements for dispatch and scheduling control for load following, the establishment of compensation schemes or preferences for load following competitive suppliers, and the assessment of load cycling system charges for nonparticipating generators.

Generation Control and Reliability-Control over generation is also needed to schedule and control power flows between interconnected systems. This is essential to minimize the potential for unintended power exchanges on transmission lines between systems.

All interconnected generating units must be under some coordinated control for security in case of emergencies. The type of control required to prevent bulk system failures is more immediate than that used for load following. Agreements are also needed to resolve system engineering problems and to maintain system operations within stability limits.

Maintaining spinning reserves and “ready reserves”² as substitute power supplies in case of emergencies is necessary for system reliability and security. To meet this obligation the system maintains generating units that are operating or standing by to provide needed power on short notice. In a competitive generating sector, the costs and responsibilities for maintaining system reserves may need to be reallocated.

Legislative and Regulatory Initiatives-The responsibility for establishing an adequate technical framework to support a more competitive generating sector will largely fall on the electric utilities, the competitive generators, and the industry’s various voluntary and professional associations. And a successful transition will depend on their cooperative efforts. There are, however, a few areas where Federal and State legislators and regulators can further the technical and institutional changes needed to assure adequate system coordination. The

first area for possible government action is improving information gathering and research to support a competitive industry structure. A few State regulatory agencies and utilities are already jointly pursuing these changes. They are still a minority, however.

Although there already has been some experience with integrating competitive supplies into utility systems, most of these transactions have been on a small scale. Unbundling generation and bulk power system support functions will require development of new standards, data collection practices, and analytical methods that are acceptable to all or most participants. Much can be done using existing technology and methods and adapting them to a new operating environment. Perhaps the primary areas where additional information and research are needed to establish a firm technical foundation for a more competitive electric generation sector are: a) coordinated operations, and b) coordinated planning.

Most utilities support integrated system operations by allowing their generating units to be dispatched to follow loads and maintain reliability. In a more competitive bulk power market, not all generators may be willing or able to follow loads. This could result in an unbundling of generation functions and of the responsibilities for providing them. This raises issues of how to maintain coordination and how to apportion system support cost equitably. If competitive generators agree to allow their plants to be dispatched and/or scheduled cyclically, the control center will need detailed cost and operating information for the units. Appropriate contractual agreements or guidelines will need to be devised to assure compliance with load following responsibilities and to require information sharing. New and better means of calculating a precise value for load following and cycling services will need to be developed either to compensate load following generators or to establish a preference in bidding systems. An acceptable method will also be needed for determining the costs of and setting prices for providing load following services through scheduling or full dispatchability.

Among the possible policy initiatives available to assure that the industry adequately anticipates and

²Ready reserves include generating units and interruptible loads that can be dispatched within 10 minutes.

meets the technical and institutional challenges of a changing bulk power system are the following:

- Regulatory agencies could establish guidelines for determining and allocating the costs of providing unbundled services, such as load following, and the additional support services related to system reliability.
- Regulatory agencies and utilities could work together to establish minimum or standard bulk power purchase agreements that provide for the necessary technical conditions of generation control, coordinated operations, and specific obligations for system support services and/or payments.³ More flexible arrangements could also be negotiated, provided that adequate provisions were made to preserve reliability.
- Regulators may need to require that competitive supply contracts contain adequate enforcement and default terms to assure that power supplies will continue to be available. Alternatively, regulators may need to approve larger reserves for reliability and load following purposes, as well as possible increases in transmission system capacity.

As part of their obligation to serve, public utilities have the responsibility to plan for future power needs. This utility planning is often conducted with close review and oversight by State regulators and in cooperation with other utilities. Generation control and system engineering considerations are incorporated into these internal planning activities. Information about demand forecasts and resource plans are frequently shared among utilities through NERC regional and subregional councils and other voluntary associations to assure that individual utility resource plans are consistent with regional reliability guidelines.

Most of the current planning efforts rest on a model of an integrated utility meeting its own needs in cooperation with its neighboring systems. New planning methods may be required to integrate potential competitive power supplies in resource plans and operating guidelines and to accommodate new uncertainties that they may bring. New mechanisms or institutions may be needed to promote participation in cooperative planning by competing

generators to assure that overall system operating standards **are** achieved.

- State regulators could require utilities to provide more detailed descriptions of system needs and technical requirements in filings with regulatory agencies or bulk power solicitations so that alternative suppliers could effectively compete to provide reliable service. This obligation would be imposed on integrated utilities and on transmission and distribution utilities under a restructured industry.
- Regulators might consider structuring the resource planning in a competitive system to facilitate and encourage long-term planning that allows more systematic choices about generation mix, type, location, environmental impacts, demand management, and conservation strategies.

Meeting the Technical Requirements for a More Open Transmission System

Under any approach to expanding access to transmission systems, the primary technical challenges will be in accommodating a greater diversity among generators and bulk power customers and in handling an increased number of wheeling transactions.

The transmission system is an integral component of the overall bulk power system, and it functions through the coordinated control and operation of generating units to move power within and between interconnected systems. Wheeling transactions require some entity to coordinate generation and reactive power sources to maintain voltage and frequency, minimize inadvertent flows over other systems, and provide for security and reliability. Expanding bulk power transfers also raises issues of how to schedule and allocate available transmission capacity, how to cost and price unbundled transmission system support services, and how to encourage construction of needed capacity. The technical challenges and the likely cost and reliability impacts of increased wheeling will depend strongly on who the buyers and sellers are, their mutual obligations, the type of service required, and the volume of transactions. It will also be important to include

³Some State PURPA and competitive bidding programs already have some forms of standard contract terms. These standard arrangements could be expanded so that technical concerns are addressed more explicitly.

assessments of future transmission needs in overall system planning for generation and transmission resources.

The major challenges in accommodating moderately expanded transmission access are primarily institutional, but overcoming these hurdles is central to its technical feasibility. Under most, if not all, scenarios for change, it will be necessary to create new methods and procedures of coordination, capacity allocation, accounting, and compensation for unbundled transmission services. Increased wheeling transactions or a more open transmission system will create challenges for operation and planning and may require the establishment of new entities and working arrangements to take over some of the functions now performed by integrated utilities, power pools, and cooperative agreements among utilities.

Expanding transmission services also involves some technical challenges. The reliable operation of the Nation's transmission systems requires coordinated control of most generators that are connected to the system. Coordination in a more competitive system with expanded wheeling would function essentially the same as in the existing system, but there would likely be many more transactions to execute. Under a competitive system, the responsibilities for providing certain system support functions might be shifted from integrated utilities to alternative generation suppliers. Control center operations and planning will become more complex.

There are significant technical differences between wheeling services required for a purchasing integrated utility with its own generation and wheeling services for a retail customer or requirements utility without its own generation. If the purchaser has its own generation, it generally has the ability to follow load and provide for reliability. If it does not, the wheeling customer will have to arrange for equivalent reliability protection with the wheeling utility or bulk power supplier.

Firm transmission agreements tying a specific generator to a specific customer could cause serious challenges for system operators in preserving reliability and economy. As the volume of such transactions increases, the restrictions they impose on economic dispatch and security constrained dispatch may result in additional costs and reserve

requirements on the integrated system. Additional transmission and generating facilities may be needed for system reliability, which makes this problem similar to that presented in integrating nondispatchable generation.

An additional generation control problem that could increase with more wheeling is the need to provide frequency regulation for customers with no generators of their own. Integrated utilities now provide such services to their full requirements or distribution only utility customers. If expanded competition reduces the integrated nature of the electric power industry, more wholesale and retail customers could require frequency regulation services from one source but base load and cycling power from another.

The bulk power system infrastructure and operations will have to evolve to accommodate the changes that would arise under expanded transmission access. Control centers may need to be upgraded with more personnel and equipment to handle more transactions. New and improved software for control area operations and accounting will be needed to execute and track unbundled transactions.

Information and Research Needs—Laying the institutional and technical foundations to support greater levels of wheeling in a more competitive bulk power system will require new and different information, an increased sharing of information, and development of new and different ways of planning, operating, and administering the transmission systems. At the same time that unbundling creates a more urgent need for information sharing, competitive pressures to withhold timely information will also increase.

The development of acceptable and accurate estimates of transmission capacity and availability will be increasingly important in a competitive environment. There is also a need for more generally acceptable and understood methods for use in setting specific transmission system limitations. The analytical methods and standards in use today are largely the result of cooperative efforts by integrated utilities and rest heavily on complex system studies, professional judgments, and agreements among power system engineers. The criteria can vary from system to system and region to region. While these

specially tailored standards reflect the complexity of local bulk power systems, they may make effective oversight of more flexible transmission pricing and denials of transmission access unworkably complex. Without a common and acceptable approach to questions of transmission availability and capability, it may prove exceedingly difficult for competitors and regulators to resolve transmission access disputes.

In order to be able to compete effectively in the marketplace, purchasers and suppliers will want to know when, where, and at what price they can move power. If a transmission entity claims that it lacks the capacity to accommodate a desired trade, that judgment could be challenged. Competitors and regulators will need more acceptable, objective standards for assessing transmission availability to assure that control over transmission systems is not being used to unfair competitive advantage and/or that transmission utilities are fulfilling their obligations to provide adequate capacity.

In addition, accurate and acceptable measures must be developed for determining the additional system costs that wheeling transactions impose on the primary parties involved and on other systems.

Legislative and Regulatory Initiatives—Most of the responsibility for assuring that the transmission system continues to function reliably in a more competitive structure will necessarily rest on the electric power industry. But legislators and regulators also have an important role to play because the provision of transmission services will remain a monopoly under virtually any credible industry structure. It is likely that growth of a more competitive generating sector will require much more vigorous regulation of transmission access and pricing than currently exercised by Federal and State regulators. The following are among the major areas where legislative and administrative actions will be required if it is decided to expand transmission access. Some activity in these areas is already ongoing but to a far lesser extent than actions on competitive supplies.

An effective regulatory framework will need to be established to oversee transmission arrangements and appropriate transmission pricing policies. Compensation policies could be developed for inadvertent flows and constraints imposed on other systems

from wheeling transactions. To the extent that the existing system does not provide this guidance, this will likely require action at both the Federal and State levels.

Congress could require the Federal Energy Regulatory Commission to establish guidelines or rules for determining and allocating the costs of providing unbundled transmission services, including additional support services related to system reliability. (FERC could also move to establish these regulatory standards on its own initiative.)

State regulators could encourage or require integrated utilities to consider overall regional transmission capacity needs in their planning activities. The costs of providing all or part of an adequate transmission capacity could be included in the ratebase.

Congress could require a more detailed study of the technical and institutional changes required for successful transition to a more open transmission system under one or more preferred competitive systems. The study might be coordinated by FERC or the Secretary of Energy. (Such a study would be useful even if the policy choice is to expand opportunities for transmission access and to allow competition among generating sources to evolve slowly under existing law and regulation.)

Federal and State Governments could fund necessary studies for resolving common problems in establishing standards for transmission availability, in costing and pricing of transmission services, and in minimum contract provisions for wheeling services. Alternatively, Federal and State regulators **could** provide a forum for development of a consensus approach by regulators, utilities, nonutility generators, and bulk power customers.

Creating a Stronger and More Flexible Transmission Network To Accommodate Industry Change and National Needs

Many proposals for expanding competition either have assumed that adequate transmission capacity would be available to allow the growth of competitive markets or have ignored transmission capability issues. The existing transmission networks already support higher levels of bulk power transfers than just 10 years ago, according to industry experts. At

times, during record-setting peak demands in the summer of 1988, transmission line constraints prevented power transfers to avoid voltage reductions and brownouts in New England. And although NERC reports that transmission capabilities are generally adequate for projected needs, its periodic reliability assessments note a number of key transmission constraints that it says could affect reliability and system security.⁴

Are the Nation's existing transmission systems and coordinated operations adequate to support expanded competition and increased wheeling?

There is no clear answer to that question because of uncertainties over what forms increased competition will take and where and under what conditions additional wheeling will be needed. There is also a lack of consensus over standards for determining adequacy. In looking at the technical feasibility of increasing transmission access, OTA found that there is no independent and systematic review of existing transmission system constraints and bottlenecks. Some constraints identified by NERC and others are tied to transmission lines that are the subject of protracted regulatory or court proceedings. Others involve limitations on particular wheeling transactions, and still others reflect temporary conditions arising from the loss of specific lines or power plants or from particular bulk power flow patterns. Evidence supporting a contention that we are currently suffering a long-term physical transmission shortage is spotty and anecdotal. OTA's own survey of electric utilities elicited a few examples of transmission constraints, but according to the respondents, few were of sufficient magnitude to offset the costs of correcting them.

Assessing Transmission Capability: Legislative and Regulatory Strategies

In the absence of any systematic and credible assessment of the strength and flexibility of the Nation's transmission system to support the growth of competitive bulk power markets, specific recommendations for physical system improvements cannot be made. Concerted efforts by Federal and State Governments and the utility industry will be vital to securing an adequate appraisal of the capabilities of our interconnected transmission networks.

Better assessments of transmission capability could lead to greater consensus over corrective actions and additional capacity and how to pay for them. Better analysis is needed on the adequacy and availability of transmission capacity for transmission system planning and regulatory oversight. More information is needed and improved analytical methods must be devised to carry out this task, however. Data are needed both for individual utility systems and for the larger interconnected grids. There are several ways of addressing these information problems.

On a national level, it maybe an appropriate time to commission a new detailed study of the capability of the Nation's transmission systems to serve projected needs and to respond to emergency situations. There have been at least two previous federally sponsored studies of the national power grids and it is generally agreed that the studies resulted in improved system operations.

There is a need for more frequent assessments of regional transmission capabilities and constraints to aid regulators, system planners, and transmission users. One approach is to continue relying on the transmission utilities and voluntary organizations, such as the North American Electric Reliability Council (NERC), to provide that information. This "voluntary" approach has at least several obvious disadvantages. First, their conclusions may be viewed with suspicion by regulators and competitors, particularly among independent power producers and public power agencies. Second, they may be unwilling to assume the increased responsibilities and risks for reporting and analysis without some regulatory concessions. Third, voluntary associations may lack the necessary authority to gain access to critical technical information or to share it with others. In a more diverse electric power industry, these organizations, which have traditionally been dominated by large integrated utilities, may need to expand to include wider participation in order to remain credible.

An alternative approach is to revise existing government reporting requirements at the State and Federal level to assure that sufficient information is obtained periodically to monitor the health of the transmission systems. It would be useful to involve

⁴See discussion in ch. 6 of this report.

the utilities, voluntary industry associations, energy planners, and regulators in identifying the necessary information and any additional reporting requirements.

Fundamental to the success of increased efforts to monitor the capability of transmission systems will be the development of standard methods for monitoring and measuring transmission capacity and availability. As noted above, despite their shortcomings, these standards are also needed for more effective transmission system oversight by regulators and could be developed through the regulatory process. Alternatively, government agencies could sponsor and participate in joint efforts with industry to develop appropriate technical guidelines to assess transmission capability under a competitive system.

In addition to improved reporting requirements, regulators may elect to require utilities to include more frequent and detailed assessments of their transmission systems with particular attention to analysis of potential physical improvements for increasing capacity or reducing bottlenecks and the costs and benefits of such actions. This transmission assessment could be included in system planning reports or in periodic reviews of utility operations and would be available to the public as well.

EXPANDING COMPETITION IN THE ELECTRIC POWER INDUSTRY— INSTITUTIONAL AND POLICY ISSUES

Enhancing Bulk Power Competition

There are four prerequisites for creating a more competitive generating sector. First, the existing regulatory and institutional structure must be altered either through evolution or by political decision to accommodate changes. Second, there must be a market opportunity as evidenced by an increased need for power, a potential for cheaper power, or a specialized niche such as that provided for qualified facilities (QFs) by the Public Utility Regulatory Policies Act (PURPA). Third, potential competitors must be able to enter the market to sell their services. Fourth, there must be a market-some mechanism to bring together buyers and sellers to make offers and

acceptances and to transfer the commodities or services sold.

In previous sections, we addressed some of the technical and institutional changes necessary to establish a foundation for a more competitive bulk power industry. We suggested a number of possible legislative and administrative actions that could be taken to build that foundation. But proposals for changing the regulatory and institutional structure of the bulk power industry raise many other legislative issues. Under different strategies for expanding competition and different levels of competitive changes, congressional action will be required for successful implementation. Without congressional action, competition may be limited or lopsided and evolutionary changes may make traditional utility regulation impractical and/or ineffective in achieving Federal and State electricity policy goals. It is also possible that in the absence of an aggressive regulatory presence the growth of a competitive generation sector may be so extensive that Congress or regulators may need to slow the process to allow the regulated transmission and distribution sectors adequate time to adjust their own operations and procedures. In this and following sections we outline some of the legislative issues that are likely to arise under alternative paths of industry change.

Creating a More Competitive Market Structure Under Existing Laws

Market forces have already gained a significant foothold in the electric power industry as a result of economic pressures on utilities and their customers and the influence of PURPA. Within fairly broad boundaries, existing competitive trends and administrative proposals would allow both electric power regulation and the generating sector to evolve to include more opportunities for competition among suppliers and greater reliance on market-based rates for bulk power. If these changes are viewed as desirable, Congress might allow administrative efforts to continue, while monitoring the impacts of limited competition within a regulated industry.

The extent to which a more competitive market structure is likely to evolve will depend greatly on the related but separate issues of access to and pricing of transmission services. In addition, the Federal Power Act, PURPA, and the Public Utility Holding Company Act (PUHCA) limit regulators'

exclusive reliance on competitively procured power costs in setting wholesale and retail rates and constrain broad participation in competitive power markets by some entities.

Congress could encourage further experimentation with more competitive markets and transmission access at the State level to gain additional information on possible savings and social costs and benefits. This might be achieved through congressional oversight of FERC and influence over the appropriations process.⁵ It would of course be essential that the results of any such experiments be monitored closely and rigorously analyzed for them to provide any effective or credible guidance for further congressional and administrative actions to change electric power regulation and market structure.

FERC has proposed a shift toward greater reliance on market forces in regulation in its notices of proposed rulemaking (NOPRS) on competitive bidding for setting avoided cost capacity payments under PURPA and “relaxed regulation and flexible pricing for IPPs [independent power producers]” under the Federal Power Act. Some observers note that FERC also has attempted de facto deregulation of wholesale economy sales through its general “hands-off” approach to reviewing negotiated prices.

Prospects for the growth of an extensive competitive generating sector under FERC’s proposed approach are somewhat uncertain because of existing statutory constraints on participation by utilities under PUHCA, the limited exemptions from Federal and State utility regulation under PURPA, and general uncertainties over future electric utility regulatory policies. Questions have also been raised as to whether FERC’s initiatives may exceed its statutory authority. On the other hand, the experience with rapid growth in QFs under PURPA and the appearance of some IPPs indicates that the current system can support at least some increased level of competitive supplies.

Legislative Actions To Promote Broader Participation in a Competitive Generating Sector

If the growth of a competitive generating sector is consistent with other national goals in energy policy and utility regulation, Congress may wish to reconsider several existing legislative restrictions that may limit some potential participants in a competitive generating sector. By modifying or repealing provisions of the Federal Power Act, PURPA, and PUHCA, Congress could significantly expand the ranks of eligible competitors in the bulk power markets. However, changes in these laws would be highly controversial and could jeopardize other important public interests and national policies.

Moreover, it is not clear that such actions are necessary to draw new participants into the bulk power industry. Most of the restrictions in existing laws are not absolute barriers to participants who want to build generating plants and sell electric power. Nevertheless there are some critics who would like to see the laws changed to expand exemptions from Federal and State public utility regulation. Under current law, most generators who sell power are considered public utilities. As a result, a generator might:

1. be required to file extensive financial and cost information with Federal or State regulators,
2. be limited in its ability to sell electricity at market rather than cost-based prices,
3. be required to maintain a “balanced” capital structure, and
4. be restricted from engaging in extensive non-utility businesses.

Some industry observers in FERC and elsewhere believe that the threat of being treated as a public utility deters potential investors in competitive generation. Electric utilities are also somewhat constrained from competing to sell power in areas remote from their interconnected system areas by the limitations in PUHCA, either because their operations as registered holding companies are highly restricted, or they fear losing their exempt status.

⁵It would also be possible for Congress to enact legislation providing a limited exemption from certain provisions of PUHCA and FPA, similar to those allowed under PURPA, to allow competitive market experiments to take place either for a limited duration or for specific classes of competitors. Congress could require that FERC closely monitor and report on any savings achieved, any additional system costs, and the effects on system operations and reliability.

PURPA offers a limited exemption from State and Federal public utility regulation, including PUHCA, to certain qualified facilities. These entities have been able to operate somewhat freely under the existing regulatory structure. Indeed, many utilities have joined the ranks of QFs through joint ventures with other parties to build and/or operate qualifying plants. Changes to the size, technology, and utility ownership restrictions for QF eligibility would be one way of expanding competition, however, this change could undercut a fundamental goal of PURPA to promote cogeneration, alternative energy technologies, and small power production.

On the other side, there are many utilities, State regulators, and consumer groups that would oppose any relaxation of laws governing public utilities either to attract new entrants to the industry or to ease the limitations on the competitive activities of regulated utilities. They argue that existing laws provide ample latitude for both utility and nonutility participation in competitive markets and that where certain activities may be constrained there may be important public policy considerations that would support maintaining the protections of existing laws, such as PUHCA.

Expanding Access to Transmission Services-Legislative Issues

A potentially significant mechanism for expanding competition in electric power generation would be to assure that potential competitors can gain access to needed transmission services at reasonable rates. Transmission access allows generators outside a host utility's territory to compete to provide electric power. As a prerequisite for expanding transmission access, there must be adequate transmission capacity available and arrangements to preserve system reliability.

Actions Under Existing Law-At present, most transmission access and wheeling arrangements are voluntarily negotiated between the power purchaser and the wheeling utility. FERC oversees the terms and conditions of transmission agreements. FERC has very limited authority to order a utility to provide transmission service or to build new lines, although many public power utilities argue that FERC has not used its existing authority aggressively enough. State authority is also believed to be limited. A range of approaches have been suggested to promote

greater access to transmission services that do not require legislative changes. The following five approaches are representative.

One--relying on voluntary arrangements and the growth of competitive bulk power markets to create sufficient economic incentives for transmission utilities to open up their grids to other competitive suppliers. This approach leaves existing provisions unaffected. There has been some movement in several regions towards providing greater access to transmission services, notably in the Northeast and the Pacific Coast. A major limitation in this approach is that utilities may be unwilling to provide wheeling services to allow their current wholesale and large retail customers to shop for power from alternative sources. Even where a refusal to wheel can be found to be an unlawful anticompetitive practice, reliance on traditional antitrust enforcement to provide an effective and timely remedy may be impractical. A further objection to the current system is the lack of any provision for compensation to other utilities for unintended flows over their lines from other bulk power transactions.

Two--Changing the administrative process and policies to encourage voluntary access by providing more public information on wheeling arrangements and rates, setting deadlines for negotiating wheeling requests, providing a mechanism for mediation of disputes over wheeling, and collecting more data on the costs of providing wheeling services so that they can be more fully reflected in rates. This approach is similar to the first in that it does not require a change in legislation and could be accomplished administratively. This approach also suffers many of the disadvantages of the first approach, but may offer some incentive to utilities who might otherwise be unwilling to provide services. The change in the process could also provide a more detailed evidentiary record to support antitrust actions in cases of refusals to wheel.

Three--Using transmission pricing incentives to encourage transmission utilities to provide services and expand capacity. Some industry analysts have asserted that voluntary access could be encouraged if regulators were to change transmission pricing from a strict embedded cost basis to other approaches, such as "flexible" pricing, that include additional economic incentives. Other analysts have

suggested that improvements in cost-based transmission pricing would also be beneficial. FERC has approved several experimental transmission agreements with alternative pricing schedules.⁶

Four---Using existing authority to require access as a condition of participating in a competitive market. Because of Federal court decisions and various FERC decisions, the extent of FERC authority to require a utility to agree to provide transmission access as a condition for receiving favorable FERC action on the treatment of certain wholesale transactions is open to question. Some observers believe that FERC has such authority, while others do not. FERC has requested comment on this issue in its competitive bidding NOPR.

Five--Encouraging joint ownership and participation in transmission line construction and upgrades through conditioning authority, antitrust review, and authority over Federal power marketing agencies and cooperative loans, and Federal ownership and influence over rights-of-way. FERC and State agencies could encourage transmission utilities to allow participation in new transmission capacity by other utilities by conditioning approval of rates, transmission agreements, and other regulatory actions on such agreement by a petitioning utility. FERC has used its approval of Pacific Power & Light's acquisition of and merger with Utah Power & Light to expand access to the new utility's transmission lines under its authority to approve mergers under section 203 of the Federal Power Act.⁷ Bonneville Power Authority has been pressured to expand access to its transmission capacity to regional utilities. Federal land agencies granting rights-of-way over public land might condition such grants on sharing of the transmission capacity under a policy to maximize joint use of right-of-way corridors.

Changes in Federal Law To Expand Transmission Access--If reliance on existing law and admin-

istrative action to provide transmission services proves unworkable, ineffective, or undesirable, Congress could take legislative action on transmission access issues. Perhaps the most direct approach would be to amend the Federal Power Act and PURPA to provide more effective wheeling authority for FERC, as outlined in the five following approaches.

One--Providing new Federal wheeling authority as a remedy for refusals to wheel. Because of restrictive statutory provisions and court decisions, FERC and others contend that it has little effective authority to order a utility to provide wheeling services after it has refused to wheel in an exercise of monopoly power to restrict competition. Congress could amend the Federal Power Act to provide explicit authorizations for such remedial wheeling orders and could also authorize FERC to order a utility to increase transmission capacity if needed to comply with a remedial order. In amending the Federal Power Act, Congress could make clear that the PURPA amendments did not restrict wheeling as a remedy to monopoly or anticompetitive abuses. This change could also be coupled with pricing changes to provide more adequate compensation for transmission services and procedural changes to shift the burden of proof to the party denying access. One possible alternative mentioned in our discussion of scenarios would be the option of transferring greater authority over in-state wheeling, retail wheeling, and regional wheeling arrangements to State commissions.

Two--Providing Federal wheeling authority under a broad public interest standard. This approach, which forms the basis of the wheeling provisions in OTA's scenarios 2, 3, and 4, would allow FERC to order wheeling whenever it determined it was in the public interest. Essentially, this amendment would drop many of the restrictive conditions placed on mandatory wheeling authority under PURPA, espe-

⁶These include two bulk power marketing experiments: *Southwest Experiment*, FERC opinion No. 203, Docket No. ER84-155-000, Dec. 30, 1983 (see box 5-E in ch. 5 of this report); and the Western Systems Power Pool, *Order Accepting Experimental Rates for Filing*, FERC Docket No. ER87-97-001, Mar. 12, 1987 (box 5-Finch. 5). In 1988 FERC approved two transmission agreements with novel pricing schemes: *Pacific Gas & Electric*, FERC Docket No. ER88-219-000, Mar. 31, 1988, 42 F. E.R.C. 61,406, clarification issued June 1, 1988 (contract between PG&E and the Turlock Irrigation District); and *Pacific Gas & Electric*, FERC Docket No. ER88-302-001, July 5, 1988, 44 F.E.R.C. 61,010 (contract with the Modesto Irrigation District). The Turlock agreement is briefly discussed in ch. 5, box 5-G.

⁷There are already instances of joint ownership and operation of transmission by utilities in Georgia, Indiana, South Dakota, and Minnesota. For example, in Georgia, the statewide transmission grid is owned by a consortium of a private power company, municipal electric utilities, and rural electric cooperatives. Operating charges are assessed according to each group's use of the grid. Larry Hobart, American Public Power Association, personal communication, Nov. 21, 1988.

cially the requirement that the order must not disturb existing competitive relationships. As an additional option, included in OTA scenario 2, wheeling orders for very large retail customers might also be allowed, perhaps with a requirement that appropriate State regulatory agencies be consulted about potential impacts on other wholesale and retail customers and State policies.

Three--Providing for Federal action to reduce monopoly power over transmission services. The Federal Power Act could be amended to provide that if FERC determines that a major utility controlling significant transmission systems in a region either exercises or has a substantial potential to exercise monopoly power over transmission to the detriment of other utilities or the public interest, the transmission utility may be ordered to open up a portion of its capacity as a common carrier to other regional utilities and to maintain adequate transmission capacity to serve regional needs. Such an action would be a dramatic expansion of the FERC action in the *Utah Power & Light* decision where it found that approval of the proposed merger would likely result in unlawful monopoly control over regional transmission services unless conditions requiring expanded access for other utilities were adopted.

Finally, two additional approaches to expand access to transmission services involve a more direct Federal role in encouraging capacity expansion through more cooperative State planning efforts and expansion of the Federal role in providing regional transmission services.

Four--Authorizing the creation of multi-State regional transmission planning compacts. Congress could enact legislation that would establish regional compacts to promote regional cooperation and planning for transmission capacity. This approach was suggested by the National Governors' Association and is based in part on the regional nuclear waste compacts and the legislation creating the Northwest Power Planning Council.⁸

The authority of the regional commissions would be limited to assessing and planning for transmission needs. They would not site, certify, or approve transmission lines. However, States could individu-

ally require that lines be consistent with regional needs as identified in the regional plan in order to be approved by State regulatory authorities. Similar conditions could be imposed on approval of federally owned transmission facilities and on the use of Federal lands for rights-of-way.

Five--Authorizing the creation of new federally authorized transmission entities to provide wheeling services. The Federal Power Marketing Agencies (FPMAs) currently exist to market and transmit power produced from federally financed power facilities of the Bureau of Reclamation and the Corps of Engineers. The regional agencies are authorized to build and operate transmission lines to move power to customers and to contract with private utilities for wheeling services. From time to time, it has been suggested that the power marketing agency concept be expanded to provide regional transmission services for public power agencies, consumer cooperatives, and other utilities. The new agencies could be either directly under Federal control or federally authorized multi-State regional commissions. Another possible structure is to create federally chartered private corporations to own and run the transmission systems. Under scenarios 4 and 5, which would result in dramatic restructuring of the industry, creation of publicly owned transmission entities would be one way of disaggregating the transmission sectors to provide coordinated transmission services.

Restoring a Balance in Federal and State Regulatory Jurisdiction— Legislative Issues

Current competitive trends in the electric power industry have served to increase the tension that has always existed between Federal and State regulatory jurisdictions. Federal court and agency decisions and changing industry practices have tilted the balance toward a more dominant Federal influence over wholesale, and thus retail, power prices perhaps to a degree not anticipated in PURPA or the Federal Power Act. This trend will accelerate under a competitive bulk power market structure unless Congress changes existing laws to limit or override Federal court and agency decisions.

⁸National Governors' Association, *Moving Power: Flexibility for the Future*, Report of the Committee on Energy and Environment Task Force on Electricity Transmission, 1987.

Under the Federal Power Act, Federal regulation of interstate wholesale sales was seen as a necessary measure to fill a gap in State regulatory jurisdiction. With increasing interconnections among utilities, corporate restructuring, and an expansive interpretation of the jurisdictional provisions of the Federal Power Act, virtually all wholesale power sales involving privately owned utilities, except for those in Alaska, Hawaii, and parts of Texas, come under exclusive FERC jurisdiction. The same is true for transmission agreements, including those between utilities that are in the same State and otherwise subject to State jurisdiction.

Restoring State Primacy to Utility Regulation

If Congress wanted to reform Federal utility regulation to restore and strengthen the traditional model of State regulated utilities within a limited Federal system, possible legislative actions might include:

1. Limiting the application and/or extension of the *Mississippi Power* case on preemption of any inquiry into prudence of wholesale sales at the State level. This would allow State regulators to examine and rule on the reasonableness of wholesale power contracts by State jurisdictional utilities.⁹
2. Amending the Federal Power Act to return jurisdiction over most instate wholesale power and wheeling transactions to State authorities. This would in effect be accomplished by a legislative override of the *Colton* case preempting State jurisdiction over instate wheeling and power sales.¹⁰
3. Requiring FERC to defer to State agency decisions in matters that historically have been governed by State law, such as prudence and resource planning. Congress could require that FERC defer to prior State decisions on approved utility resource plans and the prudence of wholesale power purchase arrangements and to consult with State regulators on such matters in any FERC rate proceeding.
4. Modifying the Federal Power Act to provide that the creation of a utility holding company consisting of separate, but formerly integrated, generation, transmission, and distribution companies would not create a wholesale relationship subjecting transactions among these entities to exclusive Federal jurisdiction. This would limit the ability of utilities to escape State oversight by forming holding companies or generation subsidiaries to sell power to retail distribution subsidiaries that are either directly or indirectly controlled by the same parent corporation.
5. Amending the Federal Power Act to provide State regulators with access to interstate holding company books and records needed for State oversight and requiring FERC to cooperate in obtaining and sharing the information needed. This might include a FERC inquiry as to whether it collects adequate and appropriate information to oversee the utility industry. Closing this information gap for State regulators would allow more effective State oversight of multi-State transactions. States could certify to FERC their need for obtaining information from companies selling or transmitting power operating in interstate commerce.
6. Providing for a State role in any new Federal wheeling authority. FERC might be required to notify and consult with State regulators on wheeling petitions on such local matters as the potential impacts on native utilities and ratepayers or the desirability of retail wheeling.

Creating an Expanded Federal Role in Utility Regulation

If on the other hand, Congress concludes that a primary Federal role over wholesale sales is appropriate and that most State regulatory inquiries should effectively be preempted, it may want to consider whether FERC authority or procedures should be modified to provide equivalent protections for consumers, wholesale customers, and State and

⁹*Mississippi Power & Light Co. v. Mississippi ex rel Moore*, No. 86-1970, June 24, 1988. For suggestions by one State regulator on possible changes to Federal laws to give States a more effective role in regulating more competitive bulk power markets, see "Testimony of the Honorable Ashley C. Brown, Commissioner, Ohio Public Utilities Commission" in Oversight Hearing on Independent Power producers and the Public Utility Holding Company Act Before the Subcommittee on Energy and Power of the House Committee on Energy and Commerce, 100th Cong., 2d sess., Sept. 14, 1988.

¹⁰*Federal Power Commission v. Southern California Edison Co.*, also known as *C' @ Of Colton v. Southern California Edison Co.*, 376 U.S. 205 (1964).

local governments that have commonly been available in many States.

Alternatives to Competition for Achieving Reliability and Economy

Generation competition and expanded transmission access are but two reforms that have been urged as a means of making the electric power industry more economically efficient and providing lowest cost power to retail customers. Congress and other policymakers may want to investigate the extent to which other changes in the industry could yield many of the same benefits without requiring significant and possibly irreversible institutional changes. Examples include:

1. Promoting greater cooperation and more effective use of utility resources through expansion of power pools and coordination arrangements with increased use of central dispatch and interconnection agreements.
2. Encouraging experiments in facilitating economy bulk power markets such as the Western Systems Power Pool and the Florida Power Broker.
3. Allowing continuation of the trend toward consolidation of regulated private utilities with close Federal and State oversight and appropriate conditions to prevent growth of monopoly abuse particularly in the area of transmission.

Impacts on Other Public Policy Goals

Changes in the electric power industry structure could have consequences in other public policy areas such as environmental regulation, consumer protection, and energy policy. Among the specific policy areas that might be affected by legislative and regulatory changes to promote creation of a more competitive electric power industry include:

- conservation and least cost management programs of utilities and State regulatory agencies;
- PURPA incentives for cogeneration and alternative electric power technologies, including whether required QF purchases at avoided cost continue to be effective in meeting PURPA's energy policy goals;
- consumer representation and access to information for retail rate hearings at the State and Federal level;

- the effectiveness of current regulations in achieving environmental protection goals such as permitting standards for new electric plants, fuel mix, and plant repowering, and shifts in environmental impacts of power generation among regions and technologies; and
- energy R&D programs including impacts on industry funded efforts and on the viability of Federal incentive programs from a more competitively constrained and disaggregate industry.

These areas deserve particular oversight to ensure that the indirect impacts of expanding competition are as constructive as possible.

Better Information and Analysis for Public Decisionmaking

OTA found a notable lack of accurate and relevant information and analysis on many aspects of both existing bulk power transactions and competitive markets. The areas where improved information and analysis would be beneficial for policy makers include:

- information on patterns of bulk power trades and wheeling transactions (e.g., how much power is bought, sold, and wheeled, where, when, and at what prices);
- more accurate and complete information on the emerging competitive generating sector including nonutility generators (QFs and IPPs) and self-generators, (e.g., location, size, ownership, dispatchability, operating status, contract terms, and problems encountered);
- more analysis and identification of actual potential efficiency gains from competition; and
- more analysis of opportunities for and potential benefits of bulk power transactions.

To address this lack of information and analysis, Congress could require the Energy Information Administration and FERC to review existing data collection, analysis, and reporting activities and to report to Congress on: 1) proposals to revise or expand existing activities to provide more adequate coverage of electric power industry data and trends, and 2) recommendations for expanded data collection and reporting authority to cover any gaps in existing law or regulation.

Power Frequency Fields and Public Health

It now seems possible, based on the state of scientific research, that exposure to electric and magnetic fields, such as those produced by electric power systems, could pose a hazard to human health. While it is not yet possible to demonstrate that such hazards do in fact exist, and they may not, it is no longer possible based on emerging scientific evidence to assert categorically that they do not. The research results are complex and inconclusive. Nevertheless, concern is growing among policy makers and people living near existing or proposed transmission lines.

Power frequency fields from high voltage AC transmission and distribution lines are but one source of exposure. Electric blankets, household appliances, lighting fixtures, and inside wiring also create low-frequency electric and magnetic fields. These sources are far more common than transmission lines and may play a far more significant role in human health.

Policy makers are faced on the one hand with the possibility that people are being exposed to previ-

ously unrecognized hazards, and on the other with potentially unnecessary costs and delays in transmission construction. These uncertainties will persist under any strategy for expanded competition. Among the possible actions that Congress might consider are:

1. Funding additional research on potential health effects (including reexamination of research priorities in Federal military and civilian programs on biological effects) and on methods of shielding humans from exposure to electric and magnetic fields from powerlines, building wiring, electric equipment, and appliances.
2. Funding research necessary to determine the possible extent of health problems (e.g., actual field strength and exposure measurements, population studies, epidemiological studies).
3. Funding research into methods for establishing exposure guidelines for use in siting or relocating transmission lines to avoid exposure where it can be done prudently and without excessive cost.