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ROUNDTABLE ON COMPETITION ISSUES IN THE ELECTRICITY SECTOR

-- United States of America --

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COMPETITION ISSUES IN THE U.S. ELECTRICITY SECTOR

Written Contribution from the United States of America¹

Overview of Regulation and the Basic Structure of the U.S. Electricity Sector

(1) Please summarize the basic structure of the electricity sector in your country ...

1. Because of the geographic size, population distribution, and history of the U.S. electricity sector, the U.S. has a diverse and geographically segmented electric power system. On average, generation accounts for 62% of retail prices, while transmission accounts for 9%, and distribution accounts for 29%. Coal is the most important fuel for generation (51.8%), but natural gas, nuclear, and hydro are also important fuel sources. Natural gas is the predominant (90%+) fuel for new generators. There are three different transmission interconnection areas in the U.S. The U.S. transmission system was designed to serve the limited purpose of providing backup generation in case of unanticipated generation or transmission shortfalls by individual local, vertically -integrated monopoly utilities that were regulated to be largely self-sufficient. Private, for-profit firms account for approximately 75% of retail sales. Cooperatives, municipal systems, and state and federal power authorities account for the rest of the U.S. industry. Local distribution is generally provided by a franchised utility regulated by the state's public utility commission.

2. An overview of U.S. electric power institutions, facts, and figures is appended. Additional descriptive material is available on the Internet at the U.S. Department of Energy's Energy Information Administration web page: <http://www.eia.doe.gov>.

3. Since the early 1990s, the federal government has been implementing reforms to increase competition in electricity markets at the wholesale level. States accounting for approximately half of the U.S. population have implemented some degree of retail competition.² The reform process is still underway at both the federal and state levels. Highly publicized problems in the wholesale and retail markets involving California have increased public scrutiny of regulatory reform in the U.S. electric power sector.³ The most significant recent event to address these concerns is the release of proposals by the

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² Issues regarding state retail competition programs were the subject of a Federal Trade Commission staff report entitled Competition and Consumer Protection Perspectives on Electric Power Regulatory Reform: Focus on Retail Competition. The report was issued by the FTC in September 2001, available at <http://www.ftc.gov/reports/elec/electricityreport.pdf>.

³ See John C. Hilke and Michael Wise, AWho Turned Out the Lights? Competition and California's Power Crisis, Antitrust 15:3 (Summer 2001), for a discussion of the circumstances and policy decisions leading to California's reliability difficulties and unusually high electricity prices. The period of elevated prices and reliability problems in California lasted from approximately May 2000 to September 2001.

Federal sector regulator to implement a standard market design (SMD) for wholesale markets throughout the U.S.⁴

4. Regulation of the U.S. electricity sector reflects the federal structure of the U.S. government in the U.S., that is, both states and the Federal government have electricity sector regulators with separate, but partially overlapping responsibilities.⁵ At the national level, the electricity sector regulator is the Federal Energy Regulatory Commission (FERC). Historically, FERC's jurisdiction has centered on wholesale electricity sales and associated high voltage transmission services. FERC has legislative authority to establish rates for wholesale electricity sales and for transmission services that are just and reasonable. For several years, FERC has generally granted market-based rate authority (for wholesale transactions) to generators meeting its market power screen.⁶

5. Historically, state jurisdiction has centered on retail electricity rates and service. Retail service is supplied primarily by private, for-profit, vertically integrated utilities with monopoly franchise areas. States generally regulate retail electric power rates and service through a public utility commission. In a state that has not implemented a retail competition (also termed customer choice) program, the public utility commission typically employs rate-of-return criteria to determine retail prices. Retail rates usually differ for residential, commercial, and industrial customers. In a state with a retail competition program, rates are often controlled de facto by continued regulation of prices for a state designated provider of last resort (POLR). Prices charged for POLR service remain regulated by the state public utility commission. The POLR supplier is the default supplier if a retail customer fails to select an electricity supplier or if the alternative supplier selected by the retail customer exits. In many states, the regulated prices for POLR service have, for extended periods of time, fallen below prices at which new suppliers can profitably enter.⁷ States also retain control over the siting of generation and transmission lines within their borders.

6. Authority to review mergers in the electric power industry is held concurrently by FERC and the federal antitrust agencies. For mergers between electricity suppliers, the Department of Justice Antitrust Division is the primary antitrust agency. For mergers between electricity suppliers and fuel suppliers, either DOJ or the Federal Trade Commission is the applicable antitrust agency. State public utility

⁴ United States of America Federal Energy Regulatory Commission (FERC), Notice of Proposed Rulemaking (July 31, 2002), Docket No. RM01-12-000, Remedying Undue Discrimination through Open Access Transmission Service and Standard Electricity Market Design.

⁵ FERC and state commissions also divide responsibilities for regulating the natural gas sector. Most of the natural gas extraction sector has been deregulated through legislation. [See, i.e., Natural Gas Policy Act of 1978 and the Natural Gas Wellhead Decontrol Act of 1989.] FERC retains authority to regulate prices and service levels of natural gas interstate pipelines, but has implemented extensive regulatory reforms in this sector that have substantially increased competition. These measures include standardization of terms of business practices and contracts in natural gas trading and transportation, and market rules by which control of a portion of capacity within a pipeline can be obtained by parties other than the pipeline owner (a Astraw-in-the-pipe concept). State public utility commissions generally retain jurisdiction over rates and service for local natural gas distribution. Several states have customer choice programs (retail competition) regarding the supplier of natural gas even though local gas transportation usually continues as a franchised, regulated, monopoly.

⁶ FERC's market power screen for determining whether market-based rates for wholesale electricity sales should be granted has been subject to considerable debate. Recently, FERC adopted an alternative, more stringent market power screen, but anticipates that the market power evaluation and remedy portions of its SMD proposals may impact substantially the existing market-based rates screening process and may eliminate the need for a market power analysis for individual utilities.

⁷ Often state legislation to implement a customer choice program requires that POLR service be offered at a price that is a fixed percentage below previous regulated prices and that this price level be maintained for several years.

commissions and state attorneys general also review proposed mergers between electricity suppliers (or between an electricity supplier and a firm that supplies fuel to competing electricity suppliers -- a convergence merger).

7. Recently, a number of traditional divisions in jurisdiction between FERC and the states have come under scrutiny. FERC's proposals for wholesale standard market design include FERC's assertion of jurisdiction over all transmission services. Legislation before Congress on electricity regulation includes provisions for granting transmission siting authority to FERC.

8. Another recent development is increased awareness of the critical role of POLR prices in retail competition programs. Texas is the most recent state to commence a retail competition program and its POLR pricing, unlike that in most other states, is subject to frequent adjustments based on changes in fuel costs.

Factors Affecting Market Power

9. Due to the size and diversity of the U.S. electricity sector, conditions affecting market power differ greatly between areas. Consequently, it is not possible to provide a single characterization of U.S. electricity markets. Instead, we identify policy issues and relevant U.S. examples of the various factors affecting market power.

(2) Market Structure

Horizontal Market Structure

10. Note of Introduction: Accurate descriptions of market structure depend on accurate identification of the relevant market or markets. In the electricity sector, market definition is often a substantial and difficult task. Important elements in determining the relevant market include lack of extensive practical storage of electric power, transmission congestion, transmission loop flows, and diversity in the marginal costs of different types of generators. In past investigations, U.S. antitrust authorities have found that each segment of time constitutes a separate product market and that the relevant geographic market fluctuates on the basis of demand levels and associated transmission congestion patterns.⁸ Often, in geographic product market analysis information about transmission congestion in geographic product market analysis is so complex that computer simulations of load flows and prices are the most practical method to access the relevant geographic markets. For this reason, market share calculations such as the HHI, that are relied upon extensively in other contexts, have often been supplemented for analysis of electricity markets. Failure to assess carefully the relevant markets in the electricity sector is likely to result in poor understanding of market structure and errors in policy formulations regarding market structure and market power remedies.

11. In the setting of a bid-based electricity spot market,⁹ market structure assessment in the U.S. has generally focused first on overall concentration (usually HHI) and then on concentration of generation in

⁸ Although each time period constitutes a separate product market and geographic market, analysis of groups of time periods with similar conditions makes the process more manageable.

⁹ In a bid-based market, all bidders that are dispatched receive the market clearing price. This price is the bid of the highest priced generator that is dispatched.

various segments of the supply curve. At any specified position of the demand curve, the generators in one segment of the supply curve are most likely to establish the market clearing price. Concentration among generators is often evaluated in at least three sections. The first section includes the base-load plants with the lowest marginal costs (including nuclear plants, run-of-stream hydro facilities, and some coal-fired plants). These plants are seldom at the margin.¹⁰ The second section consists of the mid-merit plants with intermediate-level marginal costs (typically combined cycle natural gas and coal-fired plants) that are at the margin during periods of intermediate demand. The third section includes the peaking plants with the highest marginal costs (typically conventional natural gas fueled generators, and pump storage or other pondage hydro facilities) that are at the margin during periods of high demand. When considering incentives to raise prices and withhold output of generators at the margin, ownership of inframarginal generators by suppliers with marginal generators is also considered. This is based on concern that holders of inframarginal capacity will have incentives to withhold marginal capacity because of increased margins on sales of electricity from their inframarginal generation units. Again, explicit computer simulation modeling may be informative in conjunction with market structure measures.

12. Concerns about existing market power in generation are particularly acute in areas where and when transmission congestion limits imports from other areas, concentration among suppliers inside the transmission constraint is high, and entry is impeded.

Vertical Market Structure

13. The degree of vertical integration differs in different sections of the U.S. at present. FERC policy toward vertical integration between transmission and generation continues to evolve toward increased separation. Until 1996, FERC's approach to reduce discrimination in access to transmission primarily was limited to individual utilities that sought FERC approval for mergers. FERC Orders 888 and 889 in 1996 instituted open access transmission for all areas of the country. Subsequently, FERC found that the behavioral rules in Orders 888 and 889 were not fully effective, although wholesale trading activity increased substantially. At the same time, FERC encouraged the formation of independent system operators (ISOs) that would control transmission in an area, but not own it. Four areas established ISOs under order 888¹¹ and all utilities were required to post (on the Internet) estimated available transmission capacity on their transmission lines. In order to discourage discrimination against competitors in transmission services more effectively, FERC issued Order 2000. Order 2000 further encouraged formation of regional transmission organizations (RTOs) in all areas of the country. This order described the minimum characteristics and functions of RTOs (which were similar to those of existing ISOs).¹² In Order 2000, FERC explicitly recognized that an RTO may be a for-profit independent transmission owner or Transco. Most recently, FERC has proposed implementing a standard market design (SMD) on a

¹⁰ In a bid-based, single price, market with merit order dispatch, the generator with the highest bid that is dispatched is the generator at the margin. Its bid sets the market clearing price.

¹¹ These areas were California, Pennsylvania and other mid-Atlantic states, New York, and New England. Texas also organized its Interconnect (ERCOT) on this basis.

¹² FERC Order 2000 included four minimum characteristics of regional transmission organizations to ensure robust wholesale competition: independence from generation owners, geographically broad scope and regional configuration, authority to operate the grid on a nondiscriminatory basis, and operation of the grid to ensure short-term reliability. FERC also required that each regional transmission organization carry out seven minimum functions: designing and administering tariffs for use of the grid, managing congestion on the grid, managing parallel path flows, offering ancillary services, managing creation and distribution of information on transmission availability, monitoring market behavior, and planning and expansion of the transmission grid.

nationwide basis.¹³ This latest set of proposals focuses primarily on addressing wholesale market power concerns on a regional basis through independent transmission providers (ITPs). Major market power remedy components of the SMD proposals include market power assessments and monitoring of market performance and participant behavior by an independent market monitoring unit in each area,¹⁴ local market power mitigation through must-run obligations and bid caps,¹⁵ overall safety-net bid caps, triggered area-wide bid caps, and resource adequacy requirements applied to load-serving entities. The SMD proposals also would abolish exemptions from open access policies that have, heretofore, been granted for transmission that serves load subject to retail price regulation by individual states (bundled transmission services).

Divestiture

14. There have been some divestitures of generation as part of the U.S. regulatory reform process, but most of these have not been associated directly with market power remedies to date. Instead, most have been associated with establishing the market value of generation assets in states that decided to implement retail competition programs. Since most generation assets in the U.S. are owned by for-profit firms and most of these investments were encouraged or required by state regulators, when a state changes its regulatory regime it may decide to compensate owners of generation for any decrease in the value of those assets (stranded costs). Some states (including New York and Massachusetts, for example) determined that the most accurate method to determine the amount of stranded costs is to sell these assets. These states required utilities to divest generation assets if the suppliers wanted to be part of the state=s stranded cost recovery program. In Massachusetts, for example, divestiture was required, but the generation assets of each utility were acquired by a single buyer, so no change in concentration occurred.¹⁶ New York=s divestiture requirements resulted in decreased concentration of ownership of generation because several different buyers acquired generating units. In California, the state did consider market power issues in requiring that half of thermal capacity be divested by the two largest privately owned utilities to divest half of their thermal generating capacity. Some of the Californian utilities also voluntarily sold all of their thermal generating capacity and another large utility was required to do so as a result of concurrent merger proceedings. Overall concentration of generation in California decreased somewhat as a result of the divestitures because multiple buyers were involved in the divestitures.

15. Evaluation of the effectiveness of state divestiture programs is overshadowed by other decisions that these states made with respect to their retail competition programs. One difference that proved

¹³ The antitrust agencies have provided comments to FERC during the evolution of unbundling policies at FERC. For example, in its competition advocacy comments on FERC proposals for Order 888, the FTC staff questioned the effectiveness of behavioral rules to prevent discrimination in transmission services. In comments on proposals for Order 2000, the FTC staff generally supported the minimum characteristics and functions of RTOs identified by FERC, but encouraged FERC to add provisions that would increase incentives for RTOs to operate efficiently and to provide customer service. In comments on the initial standard market design proposals, the FTC staff elaborated on its efficiency concerns about RTOs and highlighted the option of requiring forward bilateral contracting by generators with market power as a potential structural remedy.

¹⁴ The established ISOs each have a market monitoring unit already. California also has a separate market surveillance committee whose members include academics and other electric power economic experts.

¹⁵ The bid cap would prevent a generator from bidding above a given level, but would not prevent it from receiving the market-clearing price if this price exceeded the bid cap and the plant is dispatched by the market operator.

¹⁶ This type of divestiture does reduce vertical integration between generation and transmission and may, therefore, reduce vertical discrimination problems.

important was the degree to which the divestitures involved vesting contracts¹⁷ for the output of the divested generation. Most states with divestiture programs also included fixed price, multiyear POLR programs that would be supplied by the divested generation units under vesting contracts of the same duration. In most instances, the incumbent utility remains the POLR provider. It remains to be seen how POLR programs will be supplied once these vesting contracts expire.¹⁸ By contrast, the California retail plan called for exclusive reliance on spot market trades to satisfy retail demand by the three largest distribution utilities.¹⁹ As a result, no vesting contracts (and the implied hedges against changes in wholesale prices) were arranged by the largest divesting utilities in California.²⁰

16. FERC has not required generators to divest transmission capacity. Rather, it has encouraged such firms to relinquish control of transmission facilities to independent regional transmission operators (ISOs in Order 888, RTOs in Order 2000, and Independent Transmission Providers (ITPs) in the SMD proposals). In the Southeast and West (outside of California), RTO formation has been slow and fragmentary. There is widespread agreement that the behavioral rules under FERC Orders 888 and 889 were not fully successful in eliminating discrimination in transmission services. There is general agreement that discrimination in transmission under ISOs is minimal. Remaining discrimination concerns focus on the independence from generators= interests of the governance processes for determining market rules.

(3) *Congestion Pricing of the Transmission Network*

17. Congestion in transmission is a growing concern in part due to wholesale market regulatory reforms that have reduced other impediments to wholesale trades. Over the past decade, the volume of wholesale trading has increased sharply. Policy studies have identified several transmission links that are frequently congested. Examples of areas with congestion bottlenecks include Path 15 between northern and southern California, Florida, Michigan, New York City, Long Island, and portions of Connecticut and Wisconsin. Congestion on these and other links in the transmission network are most severe during peak demand periods (i.e., office hours on weekdays during summer) and when there are generator or transmission outages. Within transmission constrained areas, generators are more likely to have market power. The issue is aggravated by economic growth, slow progress on demand-side participation (i.e., real-time metering and other forms of price-responsive demand), and long delays in siting of additional generation or transmission.

18. Although a number of transmission pricing arrangements have been used in the U.S., there is increasing agreement that nodal, locational marginal pricing (LMP) represents the best practice available. Under LMP, transmission charges reflect the congestion costs of supplying power at a particular location (node) on the transmission grid. Part of the support for LMP stems from the observed market power

¹⁷ Under a vesting contract, a load-serving entity retains the right to purchase electricity (from the new owner of its divested generation assets) at predetermined prices (sometimes with a fuel-cost adjustment clause, however) for the duration of its POLR obligation.

¹⁸ The state of Maine takes a different approach. It bids out the POLR contracts to the lowest priced, reliable generation bidder.

¹⁹ Expectations that customer buying groups would form to arrange bilateral contracts at lower prices were not fulfilled.

²⁰ Because the California divestitures of generation did not have associated vesting contracts, the bids for these generators were higher than initially expected. This reduced the amount of stranded costs to be recovered by the divesting utilities.

drawbacks associated with other approaches. Experience with zonal pricing in California suggests that unless zones are small and frequently adjusted, zonal pricing results in inefficient grid operations and opportunities to game the market. In areas that rely on command and control solutions to congestion, transmission line relief (TLR) orders issued by the grid security organization have been found to be highly inefficient and susceptible to strategic manipulation. LMP also finds support because it provides efficient investment signals regarding the size and location of new generators or transmission lines. Further, LMP (when matched with real-time pricing) fosters efficient investment decisions by retail customers regarding distributed generation and demand curtailment devices.

19. FERC's SMD, as well as the existing transmission arrangements in the New York and PJM²¹ ISOs, provide for financial transmission rights (FTRs)²² offered by the market operator. In PJM, for example, most transmission risks can be hedged by purchasing FTRs from PJM. PJM estimates that FTRs, in aggregate, provided a hedge against 99% of transmission congestion pricing risk in 2001.²³ Some proposals call for auctioning of these rights under SMD. Other proposals call for distribution of FTRs to existing transmission customers (coupled with an active resale market).

20. Although LMP and associated FTRs help provide efficient investment incentives to suppliers and help transmission customers to hedge transmission pricing risk, they do not solve market power problems directly.²⁴ Concern has been expressed that some suppliers might monopolize FTRs and try to exercise market power through the market for FTRs. Some proponents of LMP suggest that applying Ause or lose rules to FTRs would reduce such concerns.²⁵ To date, it is difficult definitively to separate the effects of LMP from the effects of other regulatory provisions in actual generation siting decisions. Participants in PJM have indicated recently that siting decisions within PJM appear to be responding to the price signals provided by LMP.²⁶

21. Generally, we are unaware of special rules associated with transmission lines that facilitate trade with Canada or Mexico. There are two aspects of such lines worth noting, however. First, since individual states control transmission and generation siting, concerns have been voiced that any individual state would be reluctant to authorize siting of a transmission line or generator that is primarily likely to serve customers in another state. Indeed, states with low electricity costs have indicated that they are reluctant to lose the comparative economic development advantage they have from low-cost power. Second,

²¹ PJM stands for Pennsylvania, New Jersey, and Maryland. The state of Delaware and the District of Columbia are also within PJM.

²² The holder of an FTR is entitled to the revenues charged to users of a transmission line because of congestion on that line over a particular time period. If the holder of the FTR elects to use the line during this period, it is able to use the line with no net financial cost to itself other than the price of obtaining the FTR. Essentially, it can outbid any other user because it gets back any congestion charges on the line by owning the FTR.

²³ PJM Market Monitoring Unit, PJM Interconnection State of the Market Report 2001 (June 2002), p. 119. Pages 115 to 141 of this report provide a description of PJM's FTR process, history, and results.

²⁴ Indirectly, LMP may reduce market power by providing efficient pricing signals for generation and transmission investments.

²⁵ See, for example, Coalition for a Competitive Electric Market, ACapacity Rights Open-Access Tariff for the Pennsylvania-New Jersey-Maryland (APJM) Interconnection, filed before FERC, June 19, 1997, and the CREPC Transmission Pricing Working Group, ATransmission Pricing in the Western Interconnection, November 13, 2000.

²⁶ Transmission policy discussions at the Analysis Group Economics Conference on Electric Industry Restructuring Issues, Chicago, Ill., September 10, 2002.

imports from Quebec to the U.S. involve use of DC connections to the U.S. grid because Quebec is a separate, nonsynchronous grid.

22. Grid expansion is one of the functions of RTOs explicitly identified by FERC in Order 2000. Under Order 2000, RTOs are supposed to develop policies governing grid expansions. Some proposals for grid expansion policies of RTOs allow merchant transmission projects (e.g., a transmission projects undertaken by investors that do not own or operate transmission in the area of the new transmission line). Two merchant transmission projects of this type have recently been approved by FERC. One of these involves an underwater transmission cable between Long Island and Connecticut. FERC's standard market design proposals contain another provision for augmenting transmission investment incentives. Under this proposal, FERC or a regional advisory siting committee would identify the most significant potential grid additions. If FERC found that the system benefits from a prospective transmission project exceeded the benefits investors would be able to appropriate (by selling the FTRs associated with the project), FERC could, for example, authorize a higher allowed rate of return on that project.²⁷

(4) Market Rules

23. FERC's SMD proposals include provisions for a voluntary,²⁷ bid-based, security constrained, day-ahead market operated by the ITP in each region.²⁸ Each ITP would also operate a bid-based, security constrained, real-time spot market. Nodal pricing would be used for both buyers and sellers in both markets. Locational energy prices would reflect transmission congestion and line losses. It is anticipated that 80% to 90% of transactions will be bilateral trades, but that spot market pricing will substantially affect pricing of bilateral trades. The FERC proposals combine elements from, and are generally consistent with, actual and proposed market rules in the Eastern U.S. ISOs and the preliminary designs put forward in the Midwest and the California market re-design. (Each ITP would also operate markets for ancillary services.)

24. To date, only generators or energy traders bid into the day-ahead and real time spot markets as suppliers under normal circumstances.²⁹ The FERC SMD proposals include provisions for adding demand-side bidding. The demand side could participate as sellers by offering to supply operating reserves (agree to reduce consumption at the ITP's direction).

²⁷ United States of America Federal Energy Regulatory Commission, Notice of Proposed Rulemaking, Remedying Undue Discrimination through Open Access Transmission Service and Standard Electricity Market Design, Docket No. RM01-12-000 (July 31, 2002). Public comments are due on November 15, 2002.

²⁸ By contrast, the major California utilities relied primarily on the spot market until the final weeks of 2000. Most purchases of electricity by the major retail utilities (including procurement from their own generation facilities) were made through spot market purchases on the authorized exchange. Few bilateral trades or trades on private exchanges were allowed for the major retail utilities, although some long term forward contracting was allowed on the authorized exchange starting in 1999. [Carl Blumstein, et al., *The History of Electricity Restructuring in California*, CSEM working paper #103 (August 2002) available at <http://www.ucei.berkeley.edu/ucei/>.] The requirements for the major utilities to use the authorized exchange appear to have been engendered by a desire to spread the costs of establishing the exchange over a large volume of transactions and a concern that spot market trading would otherwise be thin and subject to inefficiencies. When FERC removed the requirement to trade on the California PX, the volume of trade on the PX declined rapidly and the PX was forced to file for bankruptcy.

²⁹ During the period of elevated wholesale spot market and short-term bilateral contract prices in California and the Western Interconnect in late 2000 and much of 2001, some exceptions were made on an adhoc basis under which load serving entities (retail suppliers) paid some large industrial users (aluminum refiners, for example) to cease operating entirely for an extended period of time.

25. Suppliers can reflect various physical characteristics (such as ramp rates, minimum run times and high/low operating levels and cost components in their offers. In both the day-ahead and real-time markets, sellers would have the option of submitting multi-part bids, e.g. submitting separate but related bids for start-up costs, no load costs and energy. are allowed to bid a wide schedule of offers.

26. The day-ahead market price is a forward price, while the real-time market price is called the spot price, since it is based on the actual physical delivery of energy. In fact, in most of the existing ISO markets, almost all of the power delivery is settled day-ahead, with only minor deviations settled in real time (i.e., to the extent a buyer or seller is short in its power position, it must purchase power at the applicable real-time price for the excess amount). The day-ahead price and real-time price have converged in the more efficient markets, such as the PJM-ISO.

27. Mechanisms to increase generation investment vary between ISOs. FERC's SMD proposals call for termination of the existing programs in favor of resource adequacy planning requirements. Existing programs entail a capacity market with payments made to generation owners and payments made by load serving entities. Various complaints have been made about existing programs ranging from charges of market manipulation by generation owners to concerns that the present programs are ineffective in promoting new generation investment. Another complaint is that the existing program does not encompass demand-side contracts that are good substitutes for incremental generation. FERC proposes to replace the present programs with a resource adequacy requirement under which load serving entities (retail suppliers) would be required to show that they have sufficient future resource commitments to meet projected future demand.³⁰ Load serving entities could meet this requirement in a wide variety of ways including demand-side load reduction agreements, existing generation, contracts for new generation, firm transmission and generation contracts for supply from outside the ITP area, and contracts for new transmission needed to access outside generation sources. Under FERC's proposals, failure to meet resource adequacy requirements would result in fines and an increased probability of being blacked out during system emergencies.

28. Assessments of the U.S. experience with wholesale spot markets have emphasized the adverse effect of poorly designed market rules.³¹ One of the widely accepted conclusions of these studies is that poor market rules can result in the exercise of market power. In particular, analysis of the market rules affecting California during the period of high prices and reliability problems suggest that suppliers developed strategies specifically to take advantage of provisions in the market rules that facilitated the exercise of market power.³² Although some suppliers eventually may be found to have violated the market rules, other exercises of market power appear to have been within the rules, even if they were harmful to customers and to market efficiency. A general consensus exists that good market rules are essential to effective competition and that one of the primary responsibilities of market monitoring organizations is to

³⁰ FERC bases its resource adequacy proposals on two concerns. First, price caps and other constraints that FERC expects to impose to prevent the exercise of market power will, at the same time, curtail investment incentives. Second, FERC perceives that there is a substantial free-rider problem regarding capacity reserves. FERC is concerned that individual load-serving entities underinvest in capacity reserves because these retail suppliers view pooled capacity reserves as a public good to which all load-serving entities have access on an equal, as needed, basis.

³¹ For example, see, the California ISO's Market Surveillance Committee report of September 6, 2000 entitled *AA* Analysis of the June 2000 Price Spikes in the California ISO's Energy and Ancillary Services Markets.

³² *Initial Report on Company-specific Separate Proceedings and Generic Reevaluations*; *Published Natural Gas Price Data*; and *Enron Trading Strategies, A Fact-finding Investigation of Potential Manipulation of Electric and Natural Gas Prices*, in Docket No. PA02-2," issued by FERC on August 13, 2002 and available on the FERC web site at: <http://www.ferc.gov/electric/bulkpower/pa02-2/pa02-2.htm>.

identify revisions in market rules that foster inefficiencies and the exercise of market power and propose improvements.

(5) *Bilateral, Long-Term and Forward Contracts*

29. With the partial exception of the California ISO prior to 2002, bilateral, long-term supply contracts have been and are allowed in U.S. wholesale electricity markets. FERC's resource adequacy proposals would encourage such contracts in the sense that they are treated as substitutes for owning generation capacity. States with retail competition regimes and generation divestiture requirements often did require multi-year vesting contracts (as part of the POLR program) for generation units that were divested by the incumbent utility. States that have not implemented retail competition often have resource adequacy requirements in place that allow some substitution between owned generation and contracted generation.

30. The general expectation is that the presence of bilateral long-term contracts reduces volatility in average wholesale electricity prices. The presence of long-term bilateral contracts covering much of real-time consumption limits the magnitude of wealth transfers that would occur in the event of a spot market price spike and requirements that all sales be through the spot market. For example, while wholesale prices surged throughout the western U.S. during latter half of 2000, resulting wealth transfers were proportionately much smaller outside of California because most electricity trades outside of California took place under long-term contracts (or under cost-of-service regulation from the retailer's own generation facilities.). Wholesale electricity customers in California were not hedged against increases in wholesale spot market prices.

(6) *Price and Quantity Controls*

31. The spot market price increases in California (and price increases for short-term bilateral contracts in the other western states), during the latter half of 2000, resulted in a crisis for wholesale price regulation at FERC. As stated earlier, nearly all generators in nearly all areas of the U.S., including California, were authorized by FERC to charge market-based rates for wholesale electricity sales. Market-based rates were granted because nearly all generators passed FERC's existing ex ante screen for market power. However, FERC determined, on an ex post basis, that some wholesale prices in California were not Adjust and reasonable, as required by law. Subsequently, FERC, the states, and the ISOs have been developing a variety of additional approaches to identify and remedy market power problems in U.S. wholesale electricity markets.

32. The fundamental market power issues in U.S. electricity markets stem from historical circumstances and cannot be addressed directly by U.S. antitrust laws and agencies. Over the past century when rate-of-return and service regulation was expected to continue indefinitely, mergers generally took place between electric utilities with regulatory review, but without antitrust review. Indeed, local regulated monopolies were the norm and mergers between neighboring local monopolies offered various cost savings that were shared with retail customers. Further, the grid was not developed with high volume wholesale trading in mind. As a result, high concentration and constrained transmission persist in some areas. Although the U.S. antitrust laws were designed to protect competition and prevent monopolization, they were not designed to create or restore competition.³³ Under U.S. antitrust laws, monopolies and

³³ An exception is when an antitrust agency challenges a completed merger and seeks divestiture of the acquired assets (usually of recently acquired assets). In such cases, the emphasis remains on future anticompetitive effects.

market power are not *per se* illegal and neither is the unilateral exercise of market power. Hence, the burden of ensuring that market structure supports competition in electric power markets falls to FERC and to state utility commissions. Efforts to undertake broad deconcentration of electric power markets through divestitures have not been implemented. Several of the states that decided not to implement retail competition did so in part based on studies of local market power problems that might arise under retail competition.³⁴

33. Absent structural remedies, efforts directly to curtail market power in U.S. wholesale electric power markets³⁵ have focused on bid and price caps and assessment of capacity withholding.³⁶ For example, FERC imposed a variety of bid caps in response to high wholesale spot market prices in California. FERC also has sought to determine if generators were withholding capacity in order to drive up wholesale prices in California.

34. Generally, when a generator is determined to be critical for system reliability reasons or because of other indications of market power, the ISO can require that supplier to operate at prices that are based on the plant's costs.³⁷ PJM, NYISO, and NEISO all have \$1,000/MWH bid caps.³⁸ The NYISO has implemented a variety of additional market power mitigation approaches that are triggered by congestion conditions or bids that are high relative to a supplier's previous bids.³⁹

35. An important new development regarding price and quantity controls is the FERC proposal to require forward contractual commitment of capacity by suppliers with market power. FERC's SMD proposals include provisions that require a supplier contractually to commit itself to supply the market during periods in which the supplier has market power as determined by the annual assessments of the

Post acquisition evidence of an increased exercise of market power is used primarily to lend credibility to concerns about future exercises of market power.

³⁴ The State of Colorado, for example, studied local market power issues in detail prior to deciding not to implement retail competition at this time. In 1998, the Colorado legislature established the Electricity Advisory Panel ... to study restructuring. The panel hired Stone & Webster (consulting firm) to determine whether the price we pay for electricity would be higher or lower than regulated prices if retail competition were introduced. Using complex economic models, Stone and Webster concluded that ... restructuring would lead to prices up to 29 percent higher than prices under regulation. Their conclusion is based on the economics of retail competition in low-cost states like Colorado, and would be exacerbated by Public Service Company's ability to control prices as the dominant supplier... [Office of Consumer Counsel, State of Colorado Department of Regulatory Agencies at <http://www.dora.state.co.us/occ>.]

³⁵ Indirectly, policies leading to elimination of transmission rate pancaking, implementation of organized spot markets, and installation of new natural gas pipeline capacity, for example, also are likely to reduce local generation market power. Pancaking occurs where an ISO (or RTO) is not in operation. In such areas, each time a wholesale electricity trade involves using the facilities of a different transmission owner, additional fees are charged.

³⁶ For discussion of FERC's initial proposals of this type, see the FTC staff comment in FERC Docket No. EL01-118-000, filed on January 7, 2002.

³⁷ In PJM, for example, must-run units built before July 9, 1996 receive the greater of cost plus 10% or LMP. [Joseph E. Bowring, A Market Monitoring in PJM, presentation to the SSG-WI Market Monitoring Workshop, San Francisco, CA (November 16, 2001); available on the Internet at <http://www.casio.com>.]

³⁸ Alice Fernandez, A Conference on Standard Market Design Issues, January 22-23, 2002, FERC..

³⁹ Alice Fernandez, A Conference on Standard Market Design Issues, January 22-23, 2002, FERC..

market monitor in the region.⁴⁰ The intent of these proposals is to prevent withholding by suppliers with market power. FERC would institute these requirements as part of the transmission access contract between a supplier and the ITP.

36. FERC's SMD proposals include penalties for withholding capacity and investigations of unscheduled withdrawals of capacity.⁴¹ Similarly, penalties are proposed for failure to supply power when a generator has bid⁴² or for consumption of power beyond the contracted amount by load serving entities.⁴³

(7) *Policies Affecting Entry and Expansion*⁴⁴

37. There are a variety of policies that favor or discourage entry in generation. Generation entry is encouraged under a wholesale competition regime by the prospect of earning returns greater than those that were allowed under regulation. Other policies that encourage generation entry include existing installed capacity programs of the ISOs, state resource adequacy requirements for traditional electric utilities, and FERC's proposed resource adequacy requirements. Entry of existing generators into more distant markets (through enhanced transmission access) is encouraged by policies that lower transmission transactions costs⁴⁵ and policies to give to merchant transmission investors the FTRs associated with their investment projects.

38. Entry is discouraged by policies that delay or increase uncertainty about obtaining permission to site new plants and transmission lines. (Considerable controversy surrounds the appropriate weight that states should give to environmental concerns, neighborhood esthetics, and safety considerations relative to regional growth and efficiency priorities.) Entry is discouraged by bid caps, other market power remedies, and other sources of regulatory risk (e.g., ex poste refunds). Entry also may be discouraged by the policies that pool capacity reserves creating incentives for load-serving entities to free ride on the capacity reserves of other load serving entities.⁴⁶

39. The advent of retail competition has prompted a considerable amount of new generation investment in the affected states, primarily by independent generators. In general, areas with retail competition have seen substantial new generation investment.⁴⁷ The vast majority of new capacity has been and is expected to be natural gas-fueled generation.⁴⁸ Natural gas appears to be the fuel of choice for

⁴⁰ FERC SMD NOPR, Section IV.I.3.

⁴¹ FERC SMD NOPR, paragraphs 445 and 446.

⁴² FERC SMD NOPR, paragraphs 445 and 446.

⁴³ FERC SMD NOPR, paragraph 534.

⁴⁴ The policy concern is efficient entry. Encouraging entry per se is not generally the policy objective.

⁴⁵ Examples of reductions in transmission transactions costs include standardization of trading terms and arrangements, introduction of spot markets, and elimination of pancaked transmission rates.

⁴⁶ FERC SMD NOPR, paragraphs 460 to 473.

⁴⁷ For planned generation expansion statistics in the states with retail competition, see the FTC staff report of September 2001.

⁴⁸ The U.S. Department of Energy's Energy Information Administration reports planned generation additions. The report for 2000 indicates that 91% of U.S. planned capacity is natural gas fueled (47,549 MW out of 52,216 MW on a nameplate basis). At present, natural gas fueled units account for 20% of installed, nameplate capacity. [Table 14. AExisting Capacity and Planned Capacity Additions at U.S. Electric Utilities by Energy Source, North American Reliability Council Region, Alaska, and Hawaii, 2000," available on the Internet at:

new generation projects in part because of its relatively benign environmental effects, flexibility (low ramp up costs and delays), and technical improvements in the efficiency of natural gas generators. In the case of California, recent entry has also been encouraged by streamlined siting procedures.

40. FERC's intense interest in resource adequacy as part of its market power mitigation strategy is consistent with research findings of the California ISO's market monitor that when capacity reserves exceed 14% to 19% of reliable capacity, wholesale electricity spot market prices are less volatile and less likely to display increases associated with exercise of market power.⁴⁹

(8) Competition Law Enforcement

Mergers

41. The most recent publicly disclosed merger investigation between electric power suppliers involved a proposed acquisition of generation assets in Connecticut by another generation owner with plants in the same area. Investigation by the Attorney General of Connecticut indicated that the proposed acquisition by NRG of two generating facilities (with combined capacity of over 1000 MW) in New Haven and Bridgeport from Wisvest would substantially increase generation concentration in parts of the state that faced transmission constraints during peak demand periods.⁵⁰ The Connecticut Attorney General presented his concerns to FERC. FERC subsequently set a technical conference on the competitive effects of the sale. The parties cancelled the sale.⁵¹

42. The most recent, publicly disclosed convergence merger case involved an electric power distributor (DTE) and a natural gas distributor (MichCon) that both serve the Detroit, Michigan, area.⁵² In that investigation, the FTC staff found that electric power distribution services competed with natural gas distribution services for some customers and that the competition between the two would likely increase over time (absent the merger). The case was settled with an agreement by which the acquirer divested a perpetual right to use a portion of the natural gas distribution system in the Detroit area to a new entrant. The capacity available to the entrant can be increased as demand grows for end uses, subject to competition between gas and electric distribution services. The settlement was modeled on release capacity arrangements, which were effectively implemented previously for interstate natural gas pipelines.

<http://www.eia.doe.gov/cneaf/electricity/ipp/html1/t14p01.html>.]

⁴⁹ Anjali Sheffrin, APreliminary Study of Reserve Margin Requirements Necessary to Promote Workable Competition, California ISO Market Analysis Division (revised, November 19, 2001). [Available on the Internet at the California ISO's web site: caiso.com.]

⁵⁰ A Attorney General's Statement on Today's Announcement that NRG Will Not Acquire Wisvest's Plants in New Haven, Bridgeport (September 20, 2001) available at: <http://www.cslib.org/attygen/press/2001/nrgno.htm>.

⁵¹ A Compilation of Investor-Owned Utility Transactions for 2002, available at: <http://www.appanet.org/about/statistics/plantacquisitions.cfm>.

⁵² The case, its issues, and the terms of the settlement are described in John C. Hilke, A Convergence Mergers: A New Competitive Settlement Model from Detroit, *Electricity Journal* (October 2001), pp. 13-18.

43. Another notable FTC convergence case involved the acquisition of Peabody Coal Company (the largest U.S. coal supplier) by PacifiCorp, a generation owner in the western states.⁵³ An initial settlement was reached. The FTC complaint found that PacifiCorp would have had the ability profitably to increase prices in its electricity sales by raising the costs of coal to two large coal-fueled generators owned by its generation competitors. Peabody was the only practical coal supplier for these plants. These generators were likely to be marginal units at some times of the year in the Western Interconnect where PacifiCorp made wholesale electric power sales. The FTC staff also found that proprietary information on coal prices and use (available to PacifiCorp from acquiring Peabody) might allow PacifiCorp profitably to increase the prices of its wholesale electricity offers.

Collusion

44. There have been no recent, publicly announced antitrust investigations of collusion between electric power suppliers. To date, the investigations associated with the period of high prices and reliability problems in California have focused on unilateral activities. However, concerns about coordination between suppliers also have been expressed in the investigation of Enron's trading practices in the Western Interconnect.⁵⁴

Abuse of Dominance

45. There have been no recent, publicly announced antitrust investigations of monopolization or attempted monopolization by electric power suppliers.

46. FERC has received various complaints about discrimination in transmission access that entail a vertically integrated utility allegedly acting to increase the generating costs of its competitors. FERC apparently has found enough substance in these complaints to continue to propose additional forms of vertical separation between generation and transmission.

47. FERC investigations associated with increased wholesale market spot prices in California might also be viewed as investigations of abuse of dominance, however, none of the firms involved were dominant in the sense of owning large shares of the generation in the markets that include California. Part of the crisis in regulation triggered by the California events is that firms accused of exercising market power held relatively modest shares of total capacity in California and the West more generally. This fact has focused attention on aspects of electric power markets that may allow firms with modest market shares to exercise market power. It has also focused attention on assessments of market structure other than overall market concentration.

⁵³ Analysis of Proposed Consent Order to Aid Public Comment in the Matter of PacifiCorp et al., FTC File No. 971-0091 (February 18, 1998). This settlement became moot and was never finalized because another buyer outbid PacifiCorp.

⁵⁴ FERC letter to El Paso Electric Company, regarding Show Cause Order in PA02-2. Available on the Internet at: <http://www.ferc.gov/electric/bulkpower/pa02-2.htm>.

APPENDIX

**United States Electricity Statistics Excerpted from the Web Pages of the
U.S. Department of Energy
Energy Information Administration**

Data for 2000 (except where noted)

U.S. Net Production (Generation): 3,799,944 Million Kilowatthours

Utility: 3,015,383 Million Kilowatthours (79.4%)
Nonutility: 784,561 Million Kilowatthours (20.6%)

Retail Price Components

	Cents per kilowatthour	%
Generation	4.3	62.3
Transmission	.6	8.7
Distribution	2.0	29.0

Share of Industry Net Generation by Energy Source

Coal:	51.8%
Nuclear:	19.8%
Gas:	16.1%
Hydro:	7.2%
Oil:	2.9%
Other:	2.2%

U.S. Consumption (Retail Sales): 3,421,414 Million Kilowatthours

Average Retail Prices of Electricity Sold by Electric Utilities

(Cents per Kilowatthour)

Total	6.81 cents
Residential	8.24 cents
Commercial	7.43 cents
Industrial	4.64 cents
Gov. & railroads	6.56 cents

Electric Generating Capability (Megawatts)

Total	811,625 Megawatts
Utility	602,377 Megawatts
Nonutility	209,248 Megawatts

Number of Electric Utility Plants:	2,776
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Number of Customers

Total	127,567,517
Residential	111,717,711
Commercial	14,349,067
Industrial	526,554
Other	974,185

Number, Share of Capacity, and Share of Retail Quantity Sold, 1998

Class of Entity	Number	Share of Capacity (Nameplate)	Share of Retail Quantity Sold (Kilowatthours)
Investor-Owned	239	64.2%	75%
Cooperatives	912	3.9%	9%
Non-Federal Public	2,009	11.5%	15%
Federal	10	8.4%	1%
Nonutility Generators	2,110	11.9%	

State With Highest Average Electricity Price: Hawaii (14.03 Cents/ Kwh)

State With Lowest Average Electricity Price: Idaho (4.17 Cents/ Kwh)

Electric Utility Emissions, 1999 (Thousand Short Tons)

Sulfur Dioxide Nitrogen	11,968
Nitrogen Oxides	7,051
Carbon Dioxide	2,191,576

Electric Utility Fossil-Fuel Costs (cents per million Btu)

Coal	120.0 cents
Petroleum	445.0 cents
Natural Gas	430.2 cents

Power Transactions

1. On a national basis in 1999, wholesale power receipts (purchased power plus exchanges received and wheeling received) increased by 50 billion kilowatthours to reach 2,564 billion kilowatthours. Sales to ultimate consumers totaled 3,312 billion kilowatthours (including sales by retail power marketers), and 1,636 billion kilowatthours of this (49 percent) are from wholesale trade with other electric utilities (requirement and nonrequirement sales for resale). To supply electric energy in 2000, electric utilities had planned capacity resources on-hand for the summer of 766 million kilowatts and 779 million kilowatts for the winter, resulting in national capacity margins of 14.8 percent and 25.7 percent, respectively.

Transmission

2. The U.S. bulk power system has evolved into three major networks (power grids), which also include smaller groupings or power pools. The major networks consist of extra-high-voltage connections between individual utilities designed to permit the transfer of electrical energy from one part of the network to another. The three networks are (1) the Eastern Interconnected System, consisting of the eastern two-thirds of the United States; (2) the Western Interconnected System, consisting primarily of the Southwest and the areas west of the Rocky Mountains; and (3) the Texas Interconnected System, consisting mainly of Texas. The Eastern and Western Interconnects are completely integrated with most of Canada or have links to the Quebec Province power grid.

3. Overall reliability planning and coordination of the interconnected power system are the responsibility of NERC, a voluntary association. NERC has 10 regional councils that cover the 48 contiguous states and portions of Canada and Mexico. The councils are responsible for overall coordination of bulk power policies that affect the reliability and adequacy of service in their areas.

Electric Power International Trade

4. Imports of electricity in 1999 by electric utilities in the United States increased 3.7 billion kilowatthours to approximately 43 billion kilowatthours, while exports rose 11.7 percent to over 14 billion kilowatthours. Trade with Canada accounted for the vast majority of both imports and exports.

Demand-Side Management

5. In 1999, 848 electric utilities reported having demand-side management (DSM) programs. Energy savings for the 459 large electric utilities increased to 50.6 billion kilowatthours, 1.4 billion kilowatthours more than in 1998. These energy savings represent 1.5 percent of total annual electric sales of 3,312 billion kilowatthours to ultimate consumers in 1999. Potential peak load reductions of 43,570 megawatts were an increase of 2,140 megawatts over 1998.