COMMENTARY

COMMENTS ON PETER CARSTENSEN'S "CREATING WORKABLY COMPETITIVE WHOLESALE MARKETS IN ENERGY"

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I. INTRODUCTION

Professor Carstensen's article says, in essence, that policy makers have failed to structure U.S. electricity markets to support competition, that current regulatory reforms are of dubious value to consumers, and that the prospects for improvement are not bright. My view is that this assessment is too pessimistic because it defines structural improvements too narrowly. Also, several readily identified and available reforms can help address many concerns about existing market power in electricity markets, and several states are already acting to implement these reforms.[1]

In many ways, this comment is a different take on the same questions that Diana Moss addressed in her highly useful electricity market power literature review: what are the pressing market power problems in electricity markets and how are we doing, as a nation, in dealing with them?[2] Professor Carstensen aids his analysis of these questions with a parallel treatment of market power concerns in the U.S. natural gas industry. This parallel treatment is apt because many of the reformers from the natural gas industry are active in the electric power industry reforms,[3] and there is some convergence between electricity and natural gas markets.[4]

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1. These Comments focus on the electricity industry and are not necessarily applicable to markets in other industries. Because this is a Comment rather than a primary Article, it is assumed that readers are familiar with Professor Carstensen's Article, important peculiarities of electricity markets, and associated policy issues. Useful references in this regard include: STEVEN STOFT, POWER SYSTEM ECONOMICS: DESIGNING MARKETS FOR ELECTRICITY (IEEE Press and Wiley-Interscience 2002); TIMOTHY J. BRENNAN, KAREN L. PALMER & SALVADOR A. MARTINEZ, ALTERNATING CURRENTS: ELECTRICITY MARKETS AND PUBLIC POLICY (Resources for the Future 2002); SALLY HUNT, MAKING COMPETITION WORK IN ELECTRICITY (John Wiley & Sons, Inc. 2002); FED. TRADE COMM'N, COMPETITION AND CONSUMER PROTECTION PERSPECTIVES ON ELECTRIC POWER REGULATORY REFORM: FOCUS ON RETAIL COMPETITION (Sep. 2001); FED. TRADE COMM'N, COMPETITION AND CONSUMER PROTECTION PERSPECTIVES ON ELECTRIC POWER REGULATORY REFORM (Jul. 2000).

2. Diana Moss, *Electricity and Market Power: Current Issues for Restructuring Markets (A Survey)*, 1 ENVTL. & ENERGY L. & POL'Y J. 11 (2006).

3. For example, the Gas Industry Standards Board decided to broaden its scope to include electric power markets as well as natural gas markets. Accordingly, it has changed its name to the North American Energy Standards Board. *See* Press Release, North American Standards Board, Bylaws for North American Standards Board (Dec. 6, 2001), *available at* http://www.naesb.org/pdf/120601pr.pdf.

4. For example, the settlement of the FTC's challenge to a merger between DTE and MichCon, respectively the electricity and natural gas distribution firms in the Detroit

One way to read Professor Carstensen's article is as an effort to return to the basic structure-conduct-performance paradigm of industrial organization economics in examining market power in electricity markets and in evaluating U.S. regulatory reform efforts to date. The basic propositions that Professor Carstensen emphasizes are (1) that electricity markets should have as many suppliers as technically feasible, and (2) if there are stages of production where a competitive structure is unlikely, vertical integration between the monopolized stages and potentially competitive stages of production is problematic for existing competition and for effective entry at the potentially competitive stages.[5] For electricity markets, I generally agree that moving away from a structure with a single generating firm in an area is likely to promote competition, but, in my view, Professor Carstensen goes too far by suggesting that an atomistic market structure is necessary for effective competition in these markets.[6] I generally agree that transmission access (unbundling) is necessary for distant generators to compete with generators located close to a load because transmission overbuilds are highly unlikely and there is no alternative electric power delivery technology on the horizon to the best of my knowledge.[7] For this reason, transmission is fully regulated and is likely to remain so. With regard to vertical unbundling more generally, I think that a real contribution of Professor Carstensen's paper is bringing attention to the historical unbundling decisions in rail transportation that resulted in prohibitions against railroads owning the commodities that they carry.[8]

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area, focused on the loss of actual and potential competition between electricity and natural gas to serve customers contemplating on-site generation of electric power fueled by natural gas. *See* John C. Hilke, *Convergence Mergers: A New Competitive Settlement Model from Detroit,* ELEC. J., Oct. 2001, at 13–18.

5. Peter Carstensen, *Creating Workably Competitive Wholesale Markets in Energy: Necessary Conditions, Structure, and Conduct*, 1 ENVTL. & ENERGY L. & POL'Y J. 85, 119–20 (2006).

6. The addendum explains why several generators in an area are likely to be necessary to have effective competition in different time periods, each of which is a separate temporal product market.

7. Note that customers may benefit from transmission access available for use by distant generators, even if the local areas has numerous generators that are not able to exercise market power because of the competition between them. If the transmission access allows distant generators with lower costs to compete with local higher-cost generators, customers will benefit from switching to the distant generators and the efficient outcome may involve the exit of some or all of the local generators. *See* FERC: REPLY COMMENTS OF THE NORTH CAROLINA UTILITIES COMMISSION 33 (Dec. 2002), *available at* http://www.ncuc.commerce.state.nc.us/electric/rcomments.pdf.

8. Russell Pittman, *Structural Separation to Create Competition? The Case of Freight Railways*, REV. NETWORK ECON., Sept. 2005, at 181, *available at* http://www.rnejournal.com/articles/pittman_rne_sept05.pdf (discusses modern evidence of

The primary sources of my disagreements with the article are two-fold and center around its pessimistic assessment of the status and prospects for competition in the U.S. electric power industry.[9] First, there are conditions other than the number of market participants that are critically important in addressing market power concerns. Second, there are potentially important approaches to increasing the number of market participants that are neglected in the article. Both of these avenues of competitive restructuring have been successfully pursued by the Federal Energy Regulatory Commission (FERC) and several states. The net result of considering these two sources of disagreement is both a more optimistic picture of the state of regulatory reform efforts in U.S. electric power markets and a more positive view of FERC's efforts and those of some states. I am concerned that Professor Carstensen's article confounds the inherent complexities of regulatory reform in electricity markets with the delays and backtracking in the U.S. reform process instigated at least in part by strong parochial interests opposed to competitive electric power markets.[10]

II. HISTORICAL IRONY

Before detailing my disagreement with Professor Carstensen, I will elaborate on a historical irony about U.S. regulatory reform efforts in the electric power industry that partially explains, as Professor Joskow stated it, "The Difficult Transition to Competitive Electricity Markets in the U.S."[11]

When considering the drawbacks of cost-based rate regulation or nationalization as policies to address market power concerns about natural monopolies, economists often focus on the lack of incentives to minimize costs and to innovate. Some of these efficiency concerns follow from principal-agent problems associated with cost-based price regulation or nationalization, and some of them follow from the related public choice literature. Faced with a choice between forms of intervention, many

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the importance of economies of vertical integration in the rail industry).

9. I do not discuss here specific disagreements with Professor Carstensen about historical events and technical conditions that I expressed to him separately.

10. There are many public interest grounds for concerns about transitioning to competitive electric power markets such as loss of vertical efficiencies, existing market power, and lack of demand response, but these concerns are quite different than the interests opposed to increased competition because it diminishes market power and provides access to lower cost power to areas that have not had access in the past.

11. PAUL L. JOSKOW, THE DIFFICULT TRANSITION TO COMPETITIVE ELECTRICITY MARKETS IN THE U.S. (AEI-Brookings Joint Center for Regulatory Studies July 2003), *available at* http://www.econ.cam.ac.uk/electricity/publications/wp/ep28.pdf.

economists would likely favor cost-based rate regulation over nationalization, because the efficiency and innovation incentive problems of nationalized firms can be even more severe than those facing private regulated utility firms.[12] Residual claimants are more dispersed for nationalized firms than for private regulated firms,[13] and nationalized firms operating as government agencies are sometimes required to operate in ways that add to their costs.[14] Many economists would, therefore, view the U.S. as lucky to have avoided the electric utility nationalization that became the predominant structure in most of the rest of the world. Ironically, in the transition to competition, nationalization has been a blessing in disguise, because it appears to have made the reform process more politically manageable. In particular, when the government owns the monopoly, vertical unbundling does not entail private stranded cost concerns and horizontal disaggregation does not entail forcing private firms to sell assets that they want to keep.[15] In short, the U.S. has a good historical excuse, in addition to federalism, for its difficulties in bringing competition to electricity markets. At the same time, whatever the historical excuses, the U.S. could risk a loss of comparative advantage (because electricity is a ubiquitous factor of production in traded goods) if it cannot match successful transitions to competition in foreign electric power markets that reduce foreign electric power costs relative to U.S. electric power costs.

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12. The issue of internal efficiency incentives is at the core of the economic rationales for privatization. *See*, *e.g.*, JOHN VICKERS & GEORGE YARROW, PRIVATIZATION: AN ECONOMIC ANALYSIS (MIT Press 1988); PRESIDENT'S COMMISSION ON PRIVATIZATION, PRIVATIZATION: TOWARD MORE EFFECTIVE GOVERNMENT (Mar. 1988), *available at* http://www.sciencedirect.com/science.

13. When principals are dispersed, organizing effective monitoring of agents becomes a public goods problem to the extent that the rewards of monitoring efforts by a principal (lower costs resulting in high profits) are shared with other principals even if they do not make a comparable monitoring effort.

14. A compelling description of X-inefficiency issues and over-staffing issues in the case of the corporatization of the New Zealand electricity system is BARRY SPICER ET AL., THE POWER TO MANAGE: RESTRUCTURING THE NEW ZEALAND ELECTRICITY DEPARTMENT AS A STATE-OWNED ENTERPRISE - THE ELECTRICORP EXPERIENCE (Oxford University Press 1991).

15. It is difficult to envision how the U.K. electricity reforms could have been initiated in anything like the actual time frame if the institutional complexities of the U.S. situation had been present. Effectively, the government was willing to absorb the stranded costs in the form of lower offer prices for its generation assets caused by the prospect of increasing competition.

III. COMMENTARY

A. Conditions Other than the Number of Market Participants Are Critically Important in Addressing Market Power Concerns

My primary sources of disagreement with Professor Carstensen remains, however, that electric power markets have some important and fairly unique properties. These properties include the impracticability of storing electric power, the physics of electricity transmission, and persistent economies of scale in transmission and distribution. Many of the conditions that prevent exercise of market power in other markets apply to electric power markets as well. I have termed this the consumer self-defense perspective on market power in electricity markets.[16] Just as in other markets, market power is less likely to be a problem in electric power markets if (1) there are several suppliers, (2) consumers have accurate and timely price information, (3) consumers can quickly and easily switch between suppliers, (4) consumers—practicably—can "make" instead of buy the product, (5) inventories are available to supplement current product when prices are high, or (6) long-term and short-term supply agreements are available to buyers. When these elements of a consumer self-defense perspective are considered more generally, each is a means of making residual demand facing a supplier more elastic. Each is also an element in antitrust analysis of horizontal mergers because of potential impacts on the elasticity of the residual demand facing each supplier. The price elasticity of residual demand facing each supplier is one of the primary conditions which determines the profitability of unilateral anticompetitive price increases (attempts by individual generators to exercise market power).[17]

My concern is that Carstensen's article overemphasizes the number of suppliers and overlooks other approaches that have an effect on the residual demand elasticity facing suppliers. I am somewhat more optimistic about competitive reforms in U.S. electric power markets because I hinge less of my evaluation of market power remedies on market share concentration. As in antitrust enforcement, economists tend to view concentration as an important indicator, but not the end of the story. The counter argument is that during peak periods, even firms with small

16. John C. Hilke, *A Consumer Self-Defense Perspective on Electricity Markets,* 33 LOY. U. CHI. L.J. 805 (2002).

17. Another contributor is the level and the shape of a supplier's cost curves.

market shares can have market power in electric power markets with highly inelastic demand and entry impediments, but one does not have to go all of the way to atomistic competition to address this concern.

Accordingly, I think it is worthwhile to take a look at the other items in the list of consumer self-defense conditions and relate them to recent developments and prospective developments in U.S. electric power markets.

Consumers have accurate and timely price information: Nearly any analysis of market power problems in electricity markets starts with the assessment that average cost retail pricing results in a market demand that is extremely inelastic.[18] This is a condition ideal for the exercise of substantial amounts of market power—potentially by suppliers controlling a modest proportion of total generation capacity in an area.[19] Many of the worst potential market power problems in electricity markets could be substantially relieved by greater price sensitivity of demand. Even modest reductions in consumption are likely to produce major price effects during peak demand periods when generators in the steep section of the supply curve set the market clearing price.[20] One of the most optimistic changes of the past couple of years is that several states with retail competition are waking up to the significance of real-time pricing for combating market power problems in electricity market.[21] An important footnote here is that many of the benefits from real-time pricing can be gained by exposing large customers to these rates, even if most residential customers continue with averaged rates.[22] The

18. Stoft explains, "Perhaps the most dramatic structural problem of power markets is the almost complete lack of demand response to fluctuations in the wholesale price. It is conceptually dramatic because it sometimes prevents the intersection of the market's supply and demand curves, a flaw so fundamental it is not addressed on any economic texts." STOFT, *supra* note 1, at 78.

19. Capacity in an area that is only available at prices far above the existing market clearing price does not constrain a small, but significant price increase by the owner of the generator that sets the market clearing price in that time period.

20. For example, the Electric Power Research Institute (EPRI) estimated that a 2.3% reduction in consumption during peak days can reduce spot prices by twenty-four percent. ROBERT LAURITA, ISO NEW ENGLAND 2003 DEMAND RESPONSE PROGRAMS, 6 (May 2003), *available at*: www.uinet.com/pdfs/ISODemandResponseProgram.pdf; *see also* FED. TRADE COMM'N, COMPETITION AND CONSUMER PROTECTION PERSPECTIVES ON ELECTRIC POWER REGULATORY REFORM: FOCUS ON RETAIL COMPETITION, ch. III (Sept. 2001), *available at* http://www.ftc.gov/opa/2001/10/elecretailcomprprt2001.htm.

21. New Jersey and Maryland are examples. *See, e.g.*, EDWARD J. BLOUSTEIN, ASSESSMENT OF CUSTOMER RESPONSE TO REAL TIME PRICING 7 (Sept. 6, 2005), *available at* http://policy.rutgers.edu.

22. *See, e.g.*, GEN. ACCOUNTING OFFICE, REPORT TO THE CHAIRMAN, COMMITTEE ON GOVERNMENTAL AFFAIRS, U.S. SENATE, ELECTRICITY MARKETS: CONSUMERS COULD BENEFIT FROM DEMAND PROGRAMS, BUT CHALLENGES REMAIN (Aug. 2004); CONSUMER

benefits of real-time pricing can include lower system costs due to flatter load profiles and more efficient investment incentives for consumers[23] as well as reductions in the market power of suppliers.[24]

Consumers can quickly and easily switch between suppliers: Having multiple suppliers in a market does little to protect established consumers from market power if switching is costly or time consuming. If switching is easy and customers have more attractive offers from other suppliers, efforts to impose anticompetitive price increases will cause consumers to switch to other suppliers, thus making the price increase unprofitable. At the retail level, states are entirely responsible for regulating switching. States have backed away from some requirements that produced high switching costs.[25] Texas reports that a large proportion of customers now understand that switching suppliers is relatively quick and easy.[26] At the wholesale level, the costs of switching include the costs of obtaining transmission service for a different source of supply. FERC's open access and RTO policies have been developed to avoid transmission discrimination as an element in wholesale switching costs.[27]

ENERGY COUNCIL OF AM., POSITIONING THE CONSUMER FOR THE FUTURE: A ROADMAP TO AN OPTIMAL ELECTRIC POWER SYSTEM (Apr. 2003), *available at* http://www.cecarf.org/Publications/MiscPub/RestExecSummary.pdf.

23. STOFT, *supra* note 1, § 1.2–1.5.

24. *Id.* § 4.1–4.5. A caution here is that if suppliers are exercising market power in the form of temporal price discrimination, average pricing would represent the single monopoly price while time-sensitive pricing would represent third degree price discrimination. The welfare effects of third degree price discrimination are ambiguous.

25. For example, New Jersey had a "wet signature" requirement whereby a retail supplier had to confirm a customer's intention to switch by obtaining a signed agreement from each customer. Retail competitors found that few customers returned written agreements and this increased the marketing costs of retail competitors and contributed to low initial switching rates in New Jersey. Other states found that internet confirmations or voice recordings were sufficient proof of a customer's intention to switch between suppliers. New Jersey subsequently withdrew the wet signature requirement. *See* FED. TRADE COMM'N, COMPETITION AND CONSUMER PROTECTION PERSPECTIVES ON ELECTRIC POWER REGULATORY REFORM: FOCUS ON RETAIL COMPETITION, ch. V (Sept. 2001), *available at* http://www.ftc.gov/be/v000009.htm.

26. A Public Utility Commission (PUC) of Texas survey found that sixty-six percent of customers viewed the process of switching retail electric power suppliers as easy. Press Release, Tex. Elec. Choice, Texans Want Competition - In Football, Barbeque and Even Electricity (Nov. 10, 2003), *available at* www.powertochoose.org/media/press.asp?aid=149f&pageid=1 (last visited Feb. 25, 2006).

27. Recovery of Stranded Costs by Public Utilities and Transmitting Utilities, 61 Fed. Reg. 21,540 (Apr. 24, 1996) (codified at 18 C.F.R. pts. 35 & 385) [hereinafter FERC Order 888]; Open Access Same-Time Information System (Formerly Real-Time Information Networks) and Standards of Conduct, 61 Fed. Reg. 21,737 (May 10, 1996) (codified at 18 C.F.R. pt. 37) [hereinafter FERC Order 889]; Regional Transmission Organizations, 65 Fed. Reg. 809 (Jan. 6, 2000) (codified at 18 C.F.R. pt. 35) [hereinafter FERC Order 2000].

Consumers can practicably "make"—instead of buy—the product: On-site generation is the most direct option for consumers to make electric power. Consumers with on-site generation capability can help the system in several ways. First, because these customers have a "make" option, they are particularly price sensitive and can make it substantially more difficult for generators to profitably impose anticompetitive price increases. Second, the capacity of on-site generators can provide generation reserves that increase system reliability. Third, by flattening system load, the on-site generators allow the system to increase the proportion of low cost base-load generation capacity and decrease the proportion of high cost peak-load generation capacity. FERC has fostered efforts to develop connection standards for on-site generators as well as for new commercial generators. States are responsible for other important components of practicable on-site generation. One is the rates that on-site generators charge the local distribution utility for the power they transfer to the grid. Another is the rates that utilities or other suppliers charge to on-site generators for backup power.[28]

Inventories are available to supplement current product when prices are high: Electric energy storage technologies (other than the long-established pumped storage approach) are just developing (e.g. flywheels). The efficient development and diffusion of these technologies, just as those of on-site generation, is likely to depend on accurate and timely retail prices for electric power that is transmitted over the grid. This is largely an area of state regulation.

Long-term and short-term supply agreements are available to buyers: One constraint on short-term pricing is the price terms available under long-term supply agreements. Prices in long-term supply agreements are constrained by the costs of entry.[29] Hence, the availability of long-term supply arrangements associated with entry may help constrain short-term supply prices. An important task for FERC is to encourage availability of long-term transmission service agreements to match long-term generation investments. If a new generator lasts thirty years, but

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28. A useful discussion of on-site generation issues is CONSUMER ENERGY COUNCIL OF AM., DISTRIBUTED ENERGY: TOWARDS A 21ST CENTURY INFRASTRUCTURE (Jul. 2001), *available at* http://www.nrri.ohio-state.edu/dspace/bitstream/2068/569/1/DE+Final+Repor+7-01.pdf.

29. That is, a long-term supply contract with a new generator is a potential substitute for a long-term supply contract with an existing generator and anticompetitive price increases by existing generators may prompt entry by new generators or vertical integration by customers (on-site generation, for example).

transmission service agreements are limited to five years, the entrant is exposed to the risk that after five years it will not have sufficient transmission access to supply potential customers at competitive prices.

B. Other Ways of Increasing the Number of Market Participants

My second source of disagreement is the focus of the paper (Section II) on horizontal divestiture as the primary means to increase the number of suppliers and, therefore, to prevent exercise of market power through unilateral action or coordinated interaction.

The proposition that horizontal divestiture of generation by distribution utilities to multiple parties is one method to change the market structure from a monopoly to one with several suppliers is self evident. Indeed, states including New York, California, Texas, and Maine have pursued this policy to various degrees.[30] My point of disagreement is that horizontal divestiture is not the *only* way to increase the number of suppliers if there are too few to facilitate effective competition in some time periods. In fact, some of FERC's best work in the past decade has been directed at increasing the number of suppliers available to wholesale and retail customers by expanding the geographic scope of U.S. electricity markets. Reducing transmission rate pancaking and unbundling generation from transmission to discourage transmission discrimination (that narrows geographic markets) have both been actively pursued by FERC.[31] When geographic markets are expanded, more suppliers are able to reach each customer,[32] and supplies are less lumpy because

30. Massachusetts also ordered divestiture of generation, but allowed a single buyer to acquire all of a utility's generation assets. This still allowed competition between generators because the franchise areas were relatively small and well interconnected. Divestiture has primarily been used by these states as a method to exactly determine the level of stranded costs, rather than leaving the assessment to an administrative process.

31. FERC Order 888, *supra* note 27; FERC Order 889, *supra* note 27; FERC Order 2000, *supra* note 27.

32. Under the methodology for delineating markets in the DOJ/FTC Horizontal Merger Guidelines, each time period is a separate product market (because demand and supply in one period of time are largely independent of demand and supply in other time periods) and the size of the geographic market is likely to differ in different time periods as transmission congestion conditions change. In this context, the focus of analysis is on suppliers that could undermine a small, but significant (and non-transitory or recurring) price increase imposed by a profit-maximizing hypothetical monopolist of supply in the proposed market. Hence, not all capacity with transmission access is equally pertinent. Capacity only available at prices far above the existing market clearing price is not relevant in that time period and should not be considered in market concentration calculations. However, this capacity may be pertinent in other time periods when the market clearing price is higher. *See* FED. TRADE COMM'N (2000), *supra* note 1, ch. VI; *see*

generators can sell a portion of their output to several other potential wholesale customers. Similarly, FERC has worked to make entry less risky by standardizing requirements for connecting to the transmission grid. Another interesting approach to increase the number of suppliers is to allow retail customers to "sell" demand reductions back into the wholesale market. This has the potential of "killing two birds with one stone": such a program would directly increase the price sensitivity of demand facing incumbent generators *and* potentially vastly increase the number of suppliers since consumers that conserve during demand peaks would become new suppliers during these periods of time.[33]

IV. CONCLUSION

In summary, my view is that Professor Carstensen's article takes too narrow a view of the basics for competitive markets. Therefore, the paper misses some of the important good news from the regulatory reform front in U.S. electricity markets. When the paper asks: "are we there yet?", I would not answer "yes". I would, however, answer "yes" for the organized markets of the Northeast and Texas, because we are making discernible progress. At the top of my "to do" list in these areas are: more progress on price responsive demand, longer-term financial transmission rights, backstop transmission investment programs in the RTOs, and backstop transmission siting authority for FERC.

Let me conclude with three cautions. First, the good old days were not so good, and would not translate well into current conditions. For example, a great deal of independent generation investment was made in anticipation of low natural gas prices. However, many of these suppliers are facing difficult financial conditions as a result of higher natural gas prices. In the absence of regulatory reform, much of this capacity might well have been part of the rate base, just as many of the substantial nuclear plant cost overruns became part of the rate base in the 1970s. Under the regulatory reforms, consumers have not generally borne this investment risk as they once did.

Second, going back to traditional regulation would likely involve its own substantial transition costs. For example, relaxing the prohibitions on transmission discrimination may

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also the addendum.

33. For example, in the ISO New England Day Ahead Market, customers submit bids into the Day Ahead Market and are paid for reductions in projected load at the bid price or the day ahead clearing price. *See* LAURITA, *supra* note 20.

force cooperatives and municipal utilities to become more self-sufficient in generation, even if lower priced generation is otherwise ready and willing to serve them. As a result, this could be a costly proposition for customers of these organizations.[34]

Finally, the rest of the world is not standing still and has already learned from our costly mistakes in California.[35] To date, electricity regulatory reforms in other countries such as the United Kingdom, Australia, New Zealand, and Chile, have been quite successful in driving down costs.[36] Also, the European Union is closing in on a consensus model for electricity market reforms. To this end, it would seem odd that the country that successfully championed competitive markets through the cold war cannot get itself organized well enough to match the success of competition in this industry among its traditional allies.

V. ADDENDUM

A. Several Suppliers: Why Low Aggregate Concentration Is Likely to Be Necessary If There Are to Be Two or More Suppliers Competing to Set the Market Clearing Price in Each Time Period

Several aspects of the operation of electricity markets lead to the conclusion that several suppliers are likely to be necessary in an area for temporal electricity markets to have two or more suppliers competing to set the market clearing price. These elements suggest that several suppliers are necessary to avoid exercise of market power, but this is not the same thing as saying that atomistic competition is necessary. One potentially important way to assure that several firms affect the supply situation is to bring retail demand response into the wholesale market—this effectively converts many customers into potential suppliers of "negawatts"—reduced consumption that can substitute for generation.

Due to retail prices that average the procurement costs of

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34. JOHN C. HILKE, OBSERVATIONS ON THE HISTORY OF TRANSMISSION OPEN ACCESS AND REVISITING THE ISSUE OF EFFICIENCY INCENTIVES FOR REGIONAL TRANSMISSION ORGANIZATIONS (American Antitrust Institute 2005), *available at* http://www.antitrustinstitute.org/recent2/366.pdf.

35. Primarily these include retail rates that do not adjust for changes in fuel costs, severe restrictions on hedging activity by retail suppliers, and market rules that make it easier for suppliers to exercise market power. *See* John C. Hilke & Michael Wise, *Who Turned Out the Lights? Competition and California's Power Crisis*, ANTITRUST, Summer 2001, at 76.

36. A good insider's review of the effects of exposure to competition on utility operations is SPICER, *supra* note 14.

electric power over extended periods of time, consumption of electric power is more volatile than it would be if retail pricing tracked wholesale prices over time. Accordingly, retail demand for electricity is highly inelastic (at least in the short run) because retail prices do not reflect temporal fluctuations in the costs of producing electric power.

Wholesale demand at each point in time is entirely derived from retail demand at that point in time because electric power cannot be practicably stored in large quantities with existing technology (no inventories).

Due to the high volatility of consumption and generation technology that generally makes it less costly to use the full capacity of one generator before utilizing another generator, electric power suppliers in a given area use a variety of technologies and fuel sources with different cost structures.

Depending on the technology used and the fuel used, some generation units operate nearly all of the time they are physically capable of doing so (base load) while others operate only intermittently over the course a year.

In organized electric power markets, such as those within regional transmission organizations (RTOs), spot markets organized by the RTO have a central dispatch policy that pays generators on the basis of the market clearing price and dispatches all generators with bids equal to or below the market clearing price in each specific time period, taking into account transmission costs as well as generators' bids. The RTOs also organize markets for ancillary services necessary to maintain the quality and reliability of the system.

Due to the volatility of consumption and the wide variety of generators' marginal costs, the range of bids in electric power markets is often large. Traditionally, generators are divided into base-load, mid-merit, and peaking generators. Base-load generators, such as nuclear plants, have low marginal costs and cannot be rapidly brought on line. At the other end of the spectrum, peaking generators have high marginal costs and can be readily brought on line or taken off line for brief periods of time.

Because electric power cannot be practicably stored, demand and supply must be nearly perfectly matched at every point in time in order to maintain system reliability. As a result, each time period is effectively a separate product market, with potential differences in the size of the associated geographic market based on transmission congestion conditions.

In this situation, not all generators provide a constraint on

efforts by the generator at the margin to raise prices above the competitive level. For example, if a five percent price increase above the competitive market clearing price is used in assessing which generators are in the market, the generators able to profitably undermine this price increase may be a small fraction of generators in the area (or with access to the area). That is, many generators in the area that may be in the market at some periods of time are not in the market at other periods of time when the market clearing prices are much lower. Hence, even if two firms in the area are sufficient to ensure competitive prices during the period of lowest demand, several generators are likely to be required in the area to have effective competition at all time periods. For example, if there are three segments in the supply curve, six generators would be required in order to have two generators competing to establish the market clearing price in each segment. Generally, aggregate concentration in electricity markets refers to all capacity or output shares at peak demand when all available generators are dispatched. This contrasts with the capacity or output shares that are applicable to a market structure analysis of a specific segment of the supply curve that will be pertinent when the market clearing price is within that segment.

B. Vertical Separation: Supply from Distant Generators Requires Transmission Access

Both transmission and distribution involve substantial economies of scale making overbuilds economically impracticable.[37] State and local governments control siting and have not generally allowed overbuilds. Under these conditions, the only way that a distant generator can supply a customer is by gaining access to the transmission and distribution systems. The only alternative is on-site generation, but this may be impracticable for some customers given existing technology and existing distribution infrastructure for delivery of fuels for on-site generation.

However, a transmission monopolist whose franchise area includes the prospective customer of the distant generation may have an incentive and the ability to block or discriminate in supplying transmission access for such a proposed transaction. In one scenario, the incumbent transmission owner has incentives

37. Illustrative figures developed by the Oak Ridge National Laboratory show that a 765 kV transmission line costs at least thirty percent less than a 500 kV line and at least eighty-five percent less than a 138 kV line, on a cost per MW-mile basis. FERC TRANSMISSION TASK FORCE, STAFF REPORT 215 (1989).

to discriminate against distant generators offering lower prices because the distant generator reduces the profitability of the transmission owner's generation investments either by idling them or making it more difficult for the transmission owner to evade rate regulation. In this scenario, transmission and retail rates are regulated on the basis of costs, plus a rate of return on investments, and these rates are below prices that would be charged in the absence of regulation. By buying power from its unregulated generation affiliate at prices above the competitive level, the utility is able to increase its profits at its unregulated generation affiliate and pass these "costs" on through increased regulated rates. This evades the rate regulation by inflating the costs of acquiring electric power above the competitive level. The distant generator in this scenario is a threat to the transmission owner because its offer may expose the fact that the procurement costs of the regulated utility are higher than they should be. If the distant generator displaces or forces a reduction in the prices paid to the unregulated generation assets of the transmission owner, the transmission owner's profits may fall.

In another scenario, regulatory evasion is not required to motivate the transmission discrimination. In this scenario, the incumbent transmission owner is already charging the monopoly price for transmission service and owns higher-cost generation capacity that may no longer be dispatched if the distant generator obtains transmission access. If so, the transmission owner may find it profitable to deny access to the transmission system or price it at a prohibitive level. It will do so as long as the gain from protecting the transmission owners' generation assets from competition is more than enough to offset the potential profits from offering transmission services to the distant generator. This same type of raising rivals' costs calculation was involved in the FTC's concerns about the proposed merger between PacifiCorp (a utility with extensive generation assets) and Peabody Coal Company (the sole fuel source for some large generators operated by rivals of PacifiCorp that set the market clearing price during some periods of time).[38] Utilities' efforts in areas with relatively high generation costs to identify and to recover stranded costs were based on the similar concern that some generation units required in an era of local generation self-sufficiency would no longer be economically viable if distant, lower cost generators have transmission access so that they can compete against the local higher-cost generators.

38. FED. TRADE COMM'N (2000), *supra* note 1, ch. 6.