

# ARTICLE

## ELECTRICITY AND MARKET POWER: CURRENT ISSUES FOR RESTRUCTURING MARKETS (A SURVEY)

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### ABSTRACT

This paper surveys the legal economic literature on market power in electricity over the last fifteen years. Many of the market power issues in electricity fit within the broader, long-familiar rubric of antitrust analysis. But electricity also displays special characteristics and complexities that may require a more tailored approach—or even special guidelines—for competition analysis. Most of the current research regarding market power in electricity focuses on five major areas: (1) withholding; (2) measuring market power; (3) market definition; (4) vertical issues; and (5) remedies. Numerous forms of withholding pose policy issues, which are confounded by a virtually nonexistent role for antitrust and various impediments to effective regulatory enforcement. Much research has also been devoted to measuring market power, particularly in the aftermath of the California energy crisis. While empirical studies that diagnose and quantify market power are useful, they may also deflect attention from the broader issue of structural reforms that would address market power better than behavioral fixes. Market definition has been a key issue in merger and market-based rate policy—revealing the importance of transmission constraints and demand conditions in defining relevant markets. Current

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modeling approaches are limited in their usefulness, however, thus introducing the debate over simulation models. New vertical issues have also emerged over the last fifteen years. New forms of ability to foreclose rivals (e.g., transmission rights and reliability) and incentives (e.g., increased concentration and M&A activity) pose policy challenges in light of renewed interest in the benefits of vertical rebundling. Finally, the research on remedies exposes the tension between structural reforms and behavioral fixes that has polarized antitrust and regulatory approaches to dealing with market power. But, outside the realm of merger review, antitrust law and analysis will likely continue to play a very limited role in electricity markets, leaving the burden largely on the shoulders of regulators.

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“The future, according to some scientists, will be exactly like the past, only far more expensive.”

John Sladek<sup>1</sup>

## I. INTRODUCTION

Few domestic industries have witnessed the sweeping changes experienced in the process of restructuring the U.S. electricity sector. Virtually all aspects of the industry have been affected by federal and state restructuring initiatives, including opening access to wholesale transmission systems, state-level generation divestiture and retail access, the formation of Regional Transmission Organizations (RTOs), standards governing affiliate conduct and interconnection, and merger policy and enforcement.

The complexity of the U.S. restructuring experience makes it a first stop on the “lessons learned” agenda for policymakers contemplating or grappling with sector reforms and liberalization abroad. At the same time, the challenges posed domestically have prompted policymakers to consider the lessons from foreign experience. Today, a number of issues might be considered central to the restructuring debate. For example, what are the appropriate (and realistic) roles of regulation and antitrust enforcement in dealing with different forms of market power? How will the role of RTOs, market monitors, and market design develop as experience extends the debate on transmission pricing and market power mitigation? Without federal siting authority, how will transmission be efficiently expanded?

These questions lead to the central policy issues in restructuring: how to promote competitive wholesale markets that will deliver benefits to consumers greater than those offered by the traditional model of regulated natural monopoly. Perhaps the greatest threat to this goal is the exercise of market power through generation withholding and exclusionary conduct designed to deny rivals’ access to inputs such as electricity transmission and fuel transportation.

A number of factors have complicated market power over the last decade. For example, merger and acquisition (M&A) activity has changed the structure of some regional U.S. electricity markets, producing high levels of concentration with one or two dominant firms, where the potential for consumer harm is high, and effective remedies may be unavailable. The rise of the

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1. *In* SHAWN KENNEDY, FUNNY CRYPTOGRAMS 87 (2003).

unbundled generation sector in the 1990s also introduced market participants with incentives different from those of the vertically-integrated utility, as reflected by the surge in withholding by merchant generators in California. Ongoing changes in markets have produced new “abilities” and “incentives” to exclude rivals, such as the anticompetitive use of transmission rights and Transmission Loading Relief (TLR).

These examples pose issues that are very different from what regulators and antitrust enforcement experienced before the bulk of restructuring. As long as restructuring remains a transitional process, the relentless march of competitive issues will continue. But experience over the last fifteen years reveals that *both* regulation and antitrust may be insufficient to effectively deal with the competitive issues dealt out by restructuring; antitrust because it cannot (by design) address certain problems, and regulation because it uses an inadequate set of policy tools.

The burgeoning legal economic literature on market power in electricity tells the story of evolving challenges to competition policy. It is populated by research and policy analysis by academics, practitioners, and government agencies; and is an ongoing dialog carried out in workshops and conferences. This literature provides *post mortem* analysis on past problems, critiques of current policies, and prescriptions for next policy steps and reforms. It is arguably the venue in which the heavy-lifting of empirical and policy analysis takes place and, in turn, informs the broader policy debate in legislatures, regulatory agencies, and antitrust enforcement.

This survey attempts to bring some order to the economic and legal literature on market power in restructuring electricity markets. While the focus is on what has recently been written about electricity, the discussion recognizes the sixty year history of antitrust literature dealing with the long-familiar basics of market power, market definition, and competitive effects. Electricity fits into much of this framework, but also poses novel and challenging issues for antitrust analysis, as it is applied in antitrust enforcement and in the regulatory arena.

Because this survey is broad-based, it opts for coverage at the risk of sacrificing in-depth analysis of particular issues—a task left for another time. The paper distills the major themes in the literature that might be helpful for guiding restructuring policy. As with most complex public policy issues, there are no easy or definitive answers. Rather, there are perspectives, assessments of performance and experience to date, and policy

options. The literature reviewed covers the fifteen year period beginning in the early 1990s, when a number of initiatives accelerated restructuring activity and cites to journal and law review articles, working papers, reports, and presentations.<sup>2</sup> A broad grouping of the research produces a total of five major categories: (1) withholding, (2) measuring market power, (3) modeling and market definition, (4) vertical issues, and (5) remedies. The research on each of these five topics is presented first in each of the following sections, followed by policy issues. The paper concludes with major observations.

## II. WITHHOLDING

### A. Overview of the Literature

One category of the literature examines withholding, a subset of market power exercised at the horizontal level. Withholding is made possible by virtue of a firm's control (e.g., through ownership or contract) of generating resources.<sup>3</sup> Withholding can, and often does, involve transmission, but *control* of transmission is not always critical to its success. These strategies can be implemented, therefore, by integrated *and* unintegrated generators.

The research addresses at least four possible withholding strategies designed to raise prices above competitive levels: (1) physically withholding generation output (e.g., shutting a generator down for "maintenance"); (2) dispatching generation in an order *other* than from least to highest marginal cost ("out-of-merit-order") to create transmission congestion.<sup>4</sup> (3) strategic withholding, or restricting output to create transmission congestion in an area of market dominance, thereby raising price; and (4) economic withholding, or strategically bidding above marginal cost. The harm resulting from withholding is delivered directly to consumers through higher prices in cases of physical or economic withholding. The path to the consumer is more indirect in the case of strategic withholding and out-of-merit-order dispatch since transmission congestion initially harms

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2. *E.g.*, Energy Policy Act of 1992, Pub. L. No. 102-486, 106 Stat. 2776 (codified in scattered sections of 16 and 42 U.S.C.) (giving FERC authority to order wheeling, the first open access conditions imposed in mergers, and earlier market-based rate authority approvals).

3. Other strategies such as predatory pricing are exercised at one level of production, but are different from withholding.

4. Least cost operation of a generation portfolio is achieved by adding generators (as demand increases) in increasing order of their marginal cost.

competitors, then consumers. In the California crisis *post mortems*, most experts agree that withholding contributed to high prices.<sup>5</sup>

Electricity markets display a number of characteristics that potentially exacerbate withholding. For example, elasticities of demand and supply are typically very low.<sup>6</sup> Thus, the more insensitive consumption is to price, the higher will be a price increase if a monopolist withholds output. Supply inelasticity (during times when capacity is constrained) also contributes to high price increases, since at high levels of demand, higher-cost resources must be brought into service if marginal and inframarginal resources are withheld.<sup>7</sup>

Much of the literature points out that a firm's incentive to withhold output from a generator does not require a large share of the market.<sup>8</sup> This is somewhat at odds with antitrust's concern with the relationship between big market shares (and concentration) and greater potential for anticompetitive harm.<sup>9</sup> "Incentive" means whether a withholding strategy is profitable—i.e., if the profit lost on capacity withheld is more than compensated by profits earned on sales at supra-competitive prices. For example, when supply is tight, a profit-maximizing firm can produce a significant price increase by withdrawing only a small amount of marginal capacity. Thus, even if the seller has

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5. See, e.g., Robert McCulloch, *Revisiting California*, PUB. UTIL. FORTNIGHTLY, Apr. 1, 2002, at 28, cited in Jacqueline Lang Weaver, *Can Energy Markets Be Trusted? The Effect of the Rise and Fall of Enron on Energy Markets*, 4 HOUSTON BUS. & TAX L.J. 1, 17 (2004).

6. See, e.g., Gregory J. Werden, *Identifying Market Power in Electric Generation*, PUB. UTIL. FORT. Feb. 15, 1996, at 16–21; Chris Decker & Tim Keyworth, *Competition Law and Commodity Markets: The Case of Wholesale Electricity*, ECON. AFF., Dec. 2002, at 32, 34.

7. Marginal generating resources have marginal costs at or near the market-clearing price, inframarginal resources have marginal costs less than the market-clearing price, and extramarginal resources have marginal costs above the market-clearing price. All are possible candidates for withholding. See, e.g., Richard Green, *Did English Generators Play Cournot?* (Univ. of Cambridge, Dep't of Applied Econ., Working Paper CWPE 0425, Apr. 2004), available at <http://www.econ.cam.ac.uk/electricity/publications/wp/ep41.pdf>; Kai-Uwe Kuhn & Matilde P. Machado, *Bilateral Market Power and Vertical Integration in the Spanish Electricity Spot Market* (CEMFI Working Paper No. 0414, Sept. 2004), available at <ftp://ftp.cemfi.es/wp/04/0414.pdf>.

8. E.g., Severin Borenstein & James B. Bushnell, *Electricity Restructuring: Deregulation or Reregulation?* 16 (Univ. of Cal. Energy Inst., Program on Workable Energy Regulation Working Paper PWP-074, 2000), available at <http://www.ucei.berkeley.edu/PDF/pwp074.pdf>.

9. See, e.g., Severin Borenstein, James B. Bushnell, & Christopher R. Knittel, *Market Power in Electricity Markets: Beyond Concentration Measures*, ENERGY J., No. 4, 1999, at 65, 66; Aleksandr Rudkevich, Max Duckworth, & Richard Rosen, *Modeling Electricity Pricing in a Deregulated Generation Industry: The Potential for Oligopoly Pricing in a Poolco*, ENERGY J., No. 3, 1998, at 19.

a small amount of low-cost, inframarginal capacity, withholding may still be profitable because the seller collects a high price on each inframarginal unit of output it sells.

Critics point out that the failure of the Federal Energy Regulatory Commission's (FERC or Commission) first-generation market-based rate policy to recognize the small market share problem was a contributing factor to the California energy crisis. At that time, the Commission used a twenty percent market share threshold as evidence that a generator lacked "market dominance," a value that some argue was too high.<sup>10</sup> It is difficult, however, to lay the blame entirely on market share thresholds. FERC's approach to defining markets in market-based rate proceedings failed to account for transmission constraints and used the total of installed capacity (instead of only the capacity that could discipline a price increase) as a basis for calculating market shares. Had more accurate methods been used, the market share of the firm applying for market-based rate authority might well have been higher.

For all the debate about FERC's use of too-high market share thresholds in early market-based rate proceedings, there are detractors on the other side. For example, the Commission has been admonished for adopting a verbatim reading of the Federal Trade Commission/Department of Justice 1992 *Horizontal Merger Guidelines (Guidelines)* single-firm market share and concentration thresholds.<sup>11</sup> These thresholds, merger applicants have argued, are low and rarely employed in merger enforcement and therefore should not be applied in electricity.<sup>12</sup>

A high level of price volatility in electricity markets is a big piece of the withholding story. Electricity is a virtually nonstorable commodity, the demand for which must be continuously matched with supply to ensure reliability.<sup>13</sup> Demand varies significantly over a typical day and year, producing a potentially large number of time-differentiated product markets. There may be significant incentives to exercise market power during peak periods when transmission constraints bind and

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10. Timothy Duane, *Regulation's Rationale: Learning from the California Energy Crisis*, 19 YALE J. ON REG. 471, 514 (2003).

11. 1992 Horizontal Merger Guidelines, 57 Fed. Reg. 41,552 (Sept. 10, 1992); Horizontal Merger Guidelines, 4 TRADE REG. REP. (CCH) ¶ 13,104, at 20,569 (Apr. 8, 1997) (containing revised section 4 of the 1992 Guidelines); 1992 Horizontal Merger Guidelines with revisions, available at <http://www.ftc.gov/bc/docs/horizmer.htm>.

12. See MALCOM B. COATE & SHAWN ULRICK, FED. TRADE COMM'N, TRANSPARENCY AT THE FEDERAL TRADE COMMISSION: THE HORIZONTAL MERGER REVIEW PROCESS (1996–2003) 58 (Feb. 2005), available at <http://www.ftc.gov/os/2005/02/0502economicissues.pdf>.

13. Pumped storage hydropower is one of the only ways of economically storing electricity.

generating resources are scarce, but little or none during off-peak periods when neither condition holds. Market power, therefore, can be exercised for fleeting periods, but with significant adverse effects on consumers.

That market power is typically exercised for only limited periods of time in electricity is at least superficially at odds with the traditional interpretations of the *Guidelines*' "small but significant and non-transitory" increase in price (SSNIP) test for defining relevant markets.<sup>14</sup> Supra-competitive pricing in electricity is more than likely to be transient, as a result of the time-differentiated nature of the product and transmission constraints. But transient market power can nevertheless produce significant consumer harm. This feature of electricity is known well enough that recurrent episodes of transitory market power would be treated as non-transitory. But working within the confines of the SSNIP test requires careful attention to transmission constraints and capacity that could discipline a price increase for discretely defined demand conditions.

### B. Policy Implications

It is not surprising that considerable effort has been applied to analyzing withholding in electricity, for a number of reasons. First, withholding is a relatively novel form of market power in an industry that has traditionally been concerned with exclusionary conduct. Second, by most estimates, the magnitude of consumer harm resulting from withholding (at least in the United States) was significant, and FERC's passive approach to dealing with the California crisis generated demands that the agency justify its lack of intervention with reasoned analysis.<sup>15</sup>

Third, market design is a central focus of federal restructuring policy, but poorly designed electricity markets can encourage withholding. Regulatory "must-run" contracts for certain generators, single- or uniform-price bidding in power auctions, and price caps can, it is argued, create incentives for generators to withhold.<sup>16</sup> As a result, it is important to get

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14. 1992 Horizontal Merger Guidelines, *supra* note 11, § 1.1.

15. See, e.g., See ATTORNEY GENERAL BILL LOCKYER, ATTORNEY GENERAL'S ENERGY WHITE PAPER (Apr. 2004) at 8, available at <http://ag.ca.gov/publications/energywhitepaper.pdf>.

16. The UK transitioned from uniform to pay-as-bid pricing in the early 2000's. The Blue Ribbon report panel commissioned by the California Power Exchange argues that movement to nonuniform (i.e., as-bid) pricing could introduce inefficiencies, stunt capacity expansion, and weaken competition in new generation. See Alfred E. Kahn, Peter Cramton, Robert H. Porter, & Richard D. Tabors, *Uniform Pricing or Pay-as-Bid Pricing: A Dilemma for California and Beyond*, Blue Ribbon Panel Report, study commissioned by

market design “right.” Fourth, the antitrust laws provide an unwieldy tool with which to deal with withholding because it is difficult to separate innocent from anticompetitive behavior. This leaves FERC alone as the “cop on the beat,” but without the ability to intervene or punish offenders, its power is limited to merely mandating retroactive refunds and levying civil penalties.

Finally, the detection and punishment of withholding is difficult, because all sellers in single price markets receive the clearing price and are therefore better off as a result of supra-competitive pricing.<sup>17</sup> The incentive to exercise market power is a function of the probability that such behavior will be detected and the penalty for being caught. If market participants have no incentive to “inform” on their rivals, as with exclusionary conduct, the business of policing market power is left largely to non-market participants. This has produced a large and highly-specialized infrastructure devoted to behavioral rules, market monitoring, and penalties. But market monitors are relatively isolated, have developed complex mitigation strategies in a balkanized system, and are increasingly limited in their ability to disclose useful information.<sup>18</sup>

An important implication of the technical debates on withholding—assuming one accepts the arguments about small

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the California Power Exchange, Jan. 23, 2001, at 2, available at <http://www.cramton.umd.edu/papers2000-2004/kahn-cramton-porter-tabors-blue-ribbon-panel-report-to-calpx.pdf>; see also James B. Bushnell, Erin T. Mansur, & Celeste Saravia, *Market Structure and Competition: A Cross-Market Analysis of U.S. Electricity Deregulation* (Univ. of California Energy Inst., Working Paper CSEM WP 126, Mar. 2004) (discussing incentives created by single-price auctions), available at <http://www.ucei.berkeley.edu>; Peter Cramton, *Electricity Market Design: The Good, the Bad, and the Ugly*, PROC. OF THE HAW. INT'L CONF. ON SYS. SCI. 2 (Jan. 2003); James B. Bushnell & Frank A. Wolak, *Regulation and the Leverage of Local Market Power in the California Electricity Market* (Univ. of Cal., Berkeley, Competition Pol'y Ctr. Working Paper No. CPC00-13, May 2000), available at <http://repositories.cdlib.org/cgi/viewcontent.cgi?article=1013&context=iber/cpc>; U.S. GEN. ACCOUNTING OFFICE, RESTRUCTURED ELECTRICITY MARKETS: CALIFORNIA MARKET DESIGN ENABLED EXERCISE OF MARKET POWER 24 (Report No. GAO-02-828, June 2002), available at <http://www.gao.gov/new.items/d02828.pdf>; U.S. CONG. BUDGET OFFICE, CAUSES AND LESSONS OF THE CALIFORNIA ELECTRICITY CRISIS 38 (Sept. 2001), available at <http://www.cbo.gov/ftpdocs/30xx%5Cdoc3062/CaliforniaEnergy.pdf>. Several authors discuss auction types and tacit collusion. See, e.g., Friedel Bolle, *Supply Function Equilibria and the Danger of Tacit Collusion*, ENERGY ECON., Apr. 1992, at 94, 102; Rafael Emmanuel A. Macatangay, *Tacit Collusion in the Frequently Repeated Multi-Unit Uniform Price Auction for Wholesale Electricity in England and Wales*, 13 EUR. J. L. & ECON. 257 (2002); Natalia Fabra, *Tacit Collusion in Repeated Auctions: Uniform Versus Discriminatory*, 51 J. INDUS. ECON. 271 (Sept. 2003).

17. See, e.g., Diane C. Moody, *Ten Years of Experience with Deregulated US Power Markets*, 12 UTIL. POLY 127 (2004).

18. See, e.g., David B. Raskin, *The New Antitrust Regulators?*, ELEC. J., Apr. 1998, at 15, 19; Reinier Lock, *Surveillance of Competitive Electricity Markets: A New Paradigm in Antitrust Regulation?* ELEC. J., Mar. 1998, at 17, 25.

market shares and transient monopoly—is that they potentially call into question the accepted screening tools for market power. This would affect analysis and criteria applied in merger review, prosecution of conduct-based cases, and granting of market-based pricing authority. The unique features of electricity markets thus prompt the question: Should analytical standards develop mostly through precedent (e.g., agency decisions and the case law) or should electricity—much like health care or intellectual property—have special guidelines?<sup>19</sup> It is likely that the first will occur regardless of any special guidelines. But guidelines promulgated through a collaborative process involving both regulators and antitrust enforcers might facilitate a more coherent approach with clearly articulated standards.<sup>20</sup>

### III. MEASURING MARKET POWER

#### A. Overview of the Literature

Much time has been devoted in the literature to measuring market power. This research arose largely in response to the dramatic and highly publicized price spikes in California, evidence of withholding in England/Wales,<sup>21</sup> and similar scenarios in Norway, Denmark, Alberta, and Spain.<sup>22</sup> A number

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19. See Michael O. Wise, *Overview: Deregulation and Antitrust in the Electric Power Industry*, 64 ANTITRUST L.J. 267, 276 (1996) (noting that antitrust attempted to “ease transitional anxieties” in industries such as health care and intellectual property through special guidelines).

20. George B. Shepherd, Helen S. Shepherd, & William G. Shepherd, *Sharper Market Shares in the Merger Guidelines*, 45 ANTITRUST BULL. 835, 882–85 (discussing the limitations of the current guidelines that could inform such a collaborative process).

21. See, e.g., Catherine D. Wolfram, *Strategic Bidding in a Multiunit Auction: An Empirical Analysis of Bids to Supply Electricity in England and Wales*, 29 RAND J. ECON., 703, 724 (1998); Catherine D. Wolfram, *Measuring Duopoly Power in the British Electricity Spot Market*, 89 AM. ECON. REV., 805, 821 (1999); Frank A. Wolak & Robert H. Patrick, *The Impact of Market Rules and Market Structure on the Price Determination Process in the England and Wales Electricity Market* 20 (NBER Working Paper Series 8248, Apr. 2001).

22. See, e.g., David M. Newbery, *Power Markets and Market Power*, ENERGY J., No. 3, 1995, at 39; Kuhn & Machado, *supra* note 7; POWER POOL OF ALBERTA, ECONOMIC WITHHOLDING IN THE ALBERTA ENERGY MARKET 14 (Mar. 4, 2002); Svend Hylleberg, *On the Exploitation of Market Power in the Nordic Electricity Markets: The Case of Elsam* 19 (Univ. of Aarhus—Den., Dep’t of Econ. Working Paper No. 2004-05, Aug. 2004), available at <http://ideas.repec.org/p/aah/aarhec/2004-5.html>; Andreas Ehrenmann & Karsten Neuhoﬀ, *A Comparison of Electricity Market Designs in Networks* 25 (Univ. of Cambridge, Dep’t of Applied Econ., Working Paper CWPE 0341, Aug. 2003), available at <http://www.econ.cam.ac.uk/electricity/publications/wp/ep31.pdf>; Peter Møllgaard & Clas Kastbert Nielsen, *The Competition Law & Economics of Electricity Market Regulation* 9 (Univ. of Copenhagen, Ctr. for Indus. Econ., Discussion Paper 2003-04, Jul. 2003),

of analyses measuring market power in domestic U.S. markets have been performed for California,<sup>23</sup> PJM Interconnection, LLC (PJM),<sup>24</sup> and New England.<sup>25</sup>

The research involves a number of different techniques designed to disaggregate temporal price movements into their various explanatory components (e.g., market power, weather, scarcity, etc.). One commonly employed approach is to compare actual prices to “competitive” benchmark prices. But since benchmark prices are unobservable, it is often necessary to simulate competitive market conditions to obtain them. This research has exposed an important debate about the use of simulation models in diagnosing and measuring market power. In their debate with Joskow and Kahn, Harvey and Hogan note the sensitivity of simulation model results to underlying assumptions and thus recommend caution.<sup>26</sup>

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available at <http://www.econ.ku.dk/CIE/Discussion%20Papers/2003/pdf/2003-04.pdf>.

23. *Fact-Finding Investigation into Possible Manipulation of Electric and Natural Gas Prices, Order Approving Stipulation and Consent Agreement in Reliant Energy Services, Inc., et al.*, 102 F.E.R.C. ¶ 61,108, 61,286 (Jan. 31, 2003) (order approving stipulation and consent agreement); ANJALI SHEFFRIN, EMPIRICAL EVIDENCE OF STRATEGIC BIDDING IN CALIFORNIA ISO REAL TIME MARKET (Mar. 21, 2001), available at <http://www.caiso.com/docs/2001/04/27/2001042710305919478.pdf>; Severin Borenstein & James B. Bushnell, *An Empirical Analysis of the Potential for Market Power in California's Electricity Industry* (NBER Working Paper Series, Working Paper 6463, Mar. 1998), available at <http://papers.nber.org/papers/w6463.pdf>; Severin Borenstein, James B. Bushnell, & Frank A. Wolak, *Diagnosing Market Power in California's Deregulated Wholesale Electricity Market* (Univ. of Cal., Berkeley, Competition Pol'y Ctr. Working Paper CPC99'007, 1999), available at <http://repositories.cdlib.org/cgi/viewcontent.cgi?article=1019&context=iber/cpc>; Severin Borenstein, James B. Bushnell, & Frank Wolak, *Measuring Inefficiencies in California's Restructured Wholesale Market*, 92 AM. ECON. REV., 1376 (2002); SCOTT M. HARVEY & WILLIAM W. HOGAN, IDENTIFYING THE EXERCISE OF MARKET POWER IN CALIFORNIA (2001), available at [http://ksghome.harvard.edu/~whogan/Identifying%20the%20Exercise%20of%20Market%20Power%20in%20CA\\_122801.pdf](http://ksghome.harvard.edu/~whogan/Identifying%20the%20Exercise%20of%20Market%20Power%20in%20CA_122801.pdf); Paul L. Joskow & Edward Kahn, *A Quantitative Analysis of Pricing Behavior in California's Wholesale Electricity Market During Summer 2000*, ENERGY J., No. 4, 2002, at 1; Frank A. Wolak, *Measuring Unilateral Market Power in Wholesale Electricity Markets: The California Market, 1998-2000*, 84 AM. ECON. REV. PAPERS AND PROC. OF THE ONE HUNDRED FIFTEENTH ANN. MEETING OF THE AM. ECON. ASS'N 425 (2003).

24. Erin Mansur, *Vertical Integration in Restructured Electricity Markets: Measuring Market Efficiency and Firm Conduct* (Yale Sch. of Mgmt., Working Paper Series ES #32, Oct. 2003), [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=459593](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=459593).

25. James B. Bushnell & Celeste Saravia, *An Empirical Assessment of the Competitiveness of the New England Electricity Market* (Univ. of Cal. Energy Inst., Working Paper CSEM WP-101, May 2002), <http://www.ucei.berkeley.edu/PDF/csemwp101.pdf>.

26. PAUL JOSKOW & EDWARD KAHN, IDENTIFYING THE EXERCISE OF MARKET POWER: REFINING THE ESTIMATES (2001), available at [http://econ-www.mit.edu/faculty/download\\_pdf.php?id=554](http://econ-www.mit.edu/faculty/download_pdf.php?id=554); SCOTT M. HARVEY & WILLIAM W. HOGAN, MARKET POWER AND MARKET SIMULATIONS 23 (2002), available at [http://www.ksg.harvard.edu/hepg/Papers/Hogan\\_Harvey\\_Market\\_Power&Simulations\\_071602.pdf](http://www.ksg.harvard.edu/hepg/Papers/Hogan_Harvey_Market_Power&Simulations_071602.pdf); SCOTT HARVEY & WILLIAM HOGAN, ON THE EXERCISE OF MARKET POWER THROUGH STRATEGIC WITHHOLDING IN CALIFORNIA 32-34 (2001), available at <http://ksghome.harvard.edu/~whogan/>

A second approach is to use econometric techniques to evaluate price movements as a function of various explanatory variables such as bidding behavior (as a proxy for economic withholding) or plant availability (as a proxy for physical withholding). A third approach looks at the relationship of prices to marginal costs (i.e., the Lerner Index). Most studies conclude that generators in various liberalized electricity markets have exercised market power, either a little or a lot, and for extended or brief periods of time. This puts to rest, for the most part, arguments that high prices are accounted for purely by scarcity, a popular debate early in restructuring when the price volatility induced by market dynamics was chalked up to tight supply conditions.<sup>27</sup>

### B. Policy Issues

Measuring market power raises a number of issues. For example, accurate cost measurement is potentially difficult and as data gradually disappear from the public domain, price/cost margins may be harder to calculate outside of legal proceedings.<sup>28</sup> The use of market simulations to produce benchmark competitive prices also raises challenging issues, as discussed in the next section. Further, while the effort devoted to measuring market power in the wake of the California crisis is undoubtedly useful, one has to ask whether restructuring policy is well-served in the long-run by an institutional focus on measurement.

Joskow and Kahn note that measurement is “of value to policymakers to determine whether market power problems are sufficiently severe to require some policy response, and if they are, provide some modest guidance to choose among potential structural and behavioral mitigation measures.”<sup>29</sup> This view

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27. That is not to say that scarcity (e.g., hot dry weather that produces a low hydro year, environmental restrictions that prevented or delayed new capacity additions) did not play a role in a number of market events, particularly in California.

28. See, e.g., Timothy J. Brennan, *Mismeasuring Electricity Market Power*, REGULATION, Spring 2003, at 60, 60–62 (warning the use of average variable costs as a proxy for marginal costs because they do not reflect fixed costs, which can cause prices to exceed costs in peak periods); Nguyen T. Quan & Robert J. Michaels, *Games or Opportunities: Bidding in the California Markets*, ELEC. J., Jan./Feb. 2001, at 99, 106 (noting that the design of many electricity markets requires numerous separate bids, each of which would have to be compared to an appropriate cost—a potentially unmanageable task). Cost data are gradually disappearing from the public domain as competitive concerns relating to information disclosure increase. At some point, FERC will likely obtain most cost (and other forms of data) as part of a confidential discovery process, a procedural approach always pursued by the antitrust agencies.

29. JOSKOW & KAHN, *supra* note 26, at 30.

highlights the important dichotomy between regulatory and antitrust approaches to market power. First notes that what is “critical for antitrust . . . is not the extent to which price is above competitive levels, but the power to impose the price rise and make it stick . . . [and] the conditions that enable this pricing to occur.”<sup>30</sup> The emphasis is therefore on the underlying structural market conditions and specific forms of conduct that enabled the firm to exercise monopoly power.<sup>31</sup> With effective structural reforms, an emphasis on measurement and behavioral rules is necessarily reduced.

The different focus of regulation and antitrust is evident in the regulation of conduct, behavioral rules, market monitoring, and market power mitigation. For example, some observers note that in analyzing high prices during the summer of 2000, FERC Staff failed to account for even the possibility that market-based rates resulted from structural market conditions that made workable competition difficult in the California ISO and Cal PX spot markets.<sup>32</sup> Instead, the Commission instituted a complex system of mitigating bids.

The reason why the tension between structural and behavioral approaches to market power is important is that the more competitive markets produced by restructuring have eliminated many of the conditions that justified a dominant role for regulation and a passive role for antitrust.<sup>33</sup> Indeed, it is recognized that regulation has a comparative advantage in

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30. Harry First, *Regulated Deregulation: The New York Experience in Electric Utility Deregulation*, 33 LOY. U. CHI. L.J. 911, 927 (2002); see also Darren Bush & Carrie Mayne, *In (Reluctant) Defense of Enron: Why Bad Regulation Is to Blame for California's Power Woes (or Why Antitrust Law Fails to Protect Against Market Power When the Market Rules Encourage Its Use)*, 83 OR. L. REV. 207, 208 (2004); Lewis J. Perl, *Measuring Market Power in Electric Generation*, 64 ANTITRUST L.J. 311, 311 (1996).

31. *United States v. E.I. du Pont Nemours & Co.*, 351 U.S. 377, 391 (1956) (stating that an antitrust inquiry focuses on market power as the “the power to control prices or exclude competition”).

32. See *Staff Report to the Federal Energy Regulatory Commission on Western Markets and the Causes of the Summer 2000 Price Abnormalities*, No. 144196(1) (Nov. 1, 2000), available at [http://elibrary.ferc.gov/idmws/File\\_List.asp?document\\_id=2100511](http://elibrary.ferc.gov/idmws/File_List.asp?document_id=2100511), noted in Michael J. Gergen, George D. Cannon, Jr., & David G. Tewksbury, *Market-Based Ratemaking and the Western Energy Crisis of 2000 and 2001*, 24 ENERGY L.J. 321, 334 (2003).

33. After *Otter Tail Power Co. v. United States*, 410 U.S. 366 (1973), there were few Section 2 claims in electricity. The most recent claim is a Section 1 case. *United States v. Rochester Gas & Elec. Corp.*, 4 F. Supp. 2d 172, 173 (W.D.N.Y. 1998) (stating that Rochester Gas & Electric discouraged the University of Rochester from building a cogeneration plant by offering a low rate for service and other non-related benefits); see also, *Competitive Issues in Electricity Deregulation: Hearing Before the H. Comm. on the Judiciary*, 106th Cong. 45–59 (1999) (statement of Douglas Melamed, Principal Deputy Assistant Attorney General, Antitrust Division, U.S. Dep't of Just.), available at [http://commdocs.house.gov/committees/judiciary/hju62558.000/hju62558\\_0.htm#45](http://commdocs.house.gov/committees/judiciary/hju62558.000/hju62558_0.htm#45).

moving markets from monopoly or tight oligopoly to more competitive structures while antitrust has comparative advantage in maintaining competition.<sup>34</sup> If antitrust principles are to play a useful role in a restructuring electricity industry outside the realm of merger review (where enforcement is vigorous), attention to market structure and properly functioning markets is important.<sup>35</sup> But the approach adopted by regulators over the years has effectively institutionalized behavioralism, with less attention to market structure and more to policing anticompetitive behavior. This defies the early advice of antitrust which stated that structural remedies were easier to enforce and more likely to have long-lasting effects.<sup>36</sup> Some effort is necessary to reconcile these differences and to build a framework in which—even if antitrust cannot play a major role—the useful principles that underlie antitrust are put to use.

#### IV. MODELS AND MARKET DEFINITION

##### A. Overview of the Literature

It has long been recognized that the special characteristics of electricity supply, demand, and transmission have important implications for how markets are defined. When Schmalensee and Golub noted the importance of transmission constraints in defining the geographic boundaries of electricity markets in the early 1980s,<sup>37</sup> the availability of information on transmission capacity was limited. This has changed. For example, FERC's Order No. 889 instituted requirements for transmission-owning utilities to disseminate real-time information on transmission

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34. See, e.g., American Antitrust Institute, *Comments of the American Antitrust Institute Working Group on Regulated Industries to the Antitrust Modernization Comm. On Regulated Industries*, 109th Cong. (Jul. 15, 2005), available at <http://www.antitrustinstitute.org/recent2/435.pdf>.

35. See Bush & Mayne, *supra* note 30, at 283.

36. The Staff of the Bureau of Economics at the Federal Trade Commission has repeatedly made this case in FERC's proposed rulemakings, as has the Department of Justice in cases such as Microsoft. E.g., *Comments of the Staff of the Bureau of Economics of the Federal Trade Commission, In the Matter of Inquiry Concerning Commission's Merger Policy Under the Federal Power Act*, Docket No. RM96-6-000 (May 7, 1996), available at <http://www.ftc.gov/be/v960008.htm>; *United States v. Microsoft Corp.*, 253 F.3d 34, 80 (D.C. Cir. 2001); see also PI's Mem. in Supp. of Proposed Final J., *United States v. Microsoft Corp.*, No. 98-1232 (TPJ) (D.C. Cir. 2000), available at <http://www.usdoj.gov/atr/cases/f4600/4640.htm#III>.

37. See, e.g., Richard Schmalensee & Bennett W. Golub, *Estimating Effective Concentration in Deregulated Wholesale Electricity Markets*, 15 RAND J. ECON. 12, 25 (1984).

capacity and availability.<sup>38</sup> Moreover, under FERC's 1996 Merger Policy Statement that formally adopted the *Guidelines*, markets are defined so as to account for limitations on transmission capacity, losses, and generation cost differentials.<sup>39</sup> Table 1 summarizes key issues in various electricity mergers over the last ten years, most of which revolve around market definition.

Merging Parties/ Type of Merger	Year/ Region	Issues
Baltimore Gas & Electric and Potomac Electric	1997 Mid-Atlantic	Accounting for transmission constraints in geographic market definition; measurement of capacity.
Delmarva Power & Light and Atlantic Energy	1998 Mid-Atlantic	Time-differentiating demand in product market definition.
Nevada Power and Sierra Pacific	1999 West	Measurement of transmission availability in geographic market definition.
Northern States Power and New Centuries Energy	2000 Midwest	Isolating merger-related changes in market concentration from PUHCA-required integration of utility systems.
Carolina Power & Light and Florida Progress	2000 South	Measurement of transmission availability, transmission allocation, and market prices in geographic market definition.

**Table 1: Electric-Electric Mergers Raising Market-Definition Issues<sup>40</sup>**

Almost immediately after FERC issued the *Merger Policy Statement*, the push for something truer to the *Guidelines* began. The argument was that FERC's approach to defining markets around utilities interconnected—and trading partners—with a merging company was an inappropriate application of the *Guidelines* when the firm was not known to price discriminate.<sup>41</sup>

38. See generally Open Access Same-Time Information System (Formerly Real-Time Information Network) and Standards of Conduct, Order No. 889, 61 Fed. Reg. 21,737 (May 10, 1996); Open Access Same-Time Information System and Standards of Conduct, Order No. 889-A, 62 Fed. Reg. 12,484 (Mar. 14, 1997); and Open Access Same-Time Information System and Standards of Conduct, Order No. 889-B, 62 Fed. Reg. 64,715 (Dec. 9, 1997).

39. Inquiry Concerning the Commission's Merger Policy Under the Federal Power Act; Policy Statement, 61 Fed. Reg. 68,595 (Dec. 30, 1996) (FERC Order No. 592).

40. Diana L. Moss, *Electricity Mergers, Economic Analysis, and Consistency: Why FERC Needs to Change its Approach* 13 (Am. Antitrust Inst. Working Paper 04-02, 2004), <http://www.antitrustinstitute.org/recent2/348.pdf>.

41. See, e.g., *Comment of the Staff of the Bureau of Economics of the Federal Trade Commission Re: Inquiry Concerning the Commission's Merger Policy Under the Federal Power Act*, Docket No. RM96-6 (May 7, 1996), available at <http://www.ftc.gov/be/v950008.pdf>; Mark W. Frankena, *Analyzing Market Power Using Appendix A of FERC's Merger Policy Statement: Rationale, Reliability, and Results*, CCH POWER & TELECOM L., Jan.–Feb. 1998, at 29; Mark W. Frankena, *Geographic Market*

This approach was criticized as producing overly-small relevant markets, in which merger-induced changes in concentration would be more than likely to trigger the *Guidelines*' thresholds.<sup>42</sup> But attempts to introduce alternative analyses in merger proceedings that were more in keeping with the *Guidelines* produced little response, most likely because as time wore on, the Commission proved itself more adept at looking beyond concentration statistics to competitive effects, in which the likely market power story is typically told.<sup>43</sup>

In conjunction with a perceived misapplication of the *Guidelines* to electricity mergers, an increasing awareness has developed of the limitations of transportation-type models for evaluating merger-related effects.<sup>44</sup> This has been driven by two types of non-mutually exclusive research. One line of inquiry deals with strategic interaction on networks, which focuses on competitive issues relating to the operation of generation in the presence of transmission constraints. Hogan, for example, emphasizes the dependence of competition on transmission capacity and the importance of market analysis that is based on realistic network models.<sup>45</sup>

A second area of research revolves around the use of

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Delineation for Electric Utility Mergers, 46 ANTITRUST BULL. 357, 400–02 (2001); Mark W. Frankena, *FERC Must Fix its Electric Utility Merger Policy*, ELEC. J., Oct. 1996, at 32, 43; John R. Morris, *Finding Market Power in Electric Power Markets*, 7 INT'L J. ECON. BUS. 167, 176 (2000).

42. The FERC Appendix A methodology identifies as a “destination” market each customer that is directly or indirectly interconnected with, or that trades with, one or both of the merging companies. Markets are then defined using the “delivered price test” (all capacity that can be delivered to the market at prices less than or equal to 105 percent of the prevailing price in the market). This approach contrasts with the *Guidelines*, which (absent price discrimination) defines markets around the hypothetical monopolist's plant(s) and applies the SSNIP test to determine the scope of the relevant market.

43. *E.g.*, American Electric Power Co. & Central and South West Corp., 90 F.E.R.C. ¶ 61,242, 61,786; *order on reh'g*, 91 F.E.R.C. ¶ 61,129 (2000) (illustrating FERC's migration toward a more competitive effects-based analysis); Commonwealth Edison Co. & PECO Energy Co., 91 F.E.R.C. ¶ 61,036, 61,134 (2000) (illustrating FERC's migration toward a more competitive effects-based analysis).

44. Moss, *supra* note 40, at 14–25 (assessing the consistency of market analyses using transportation-type models that are filed with merger applications at FERC, and indicating that analyses filed in different, sequential mergers in a number of relevant markets produce widely varying concentration results due, in part, to different economic experts using different models).

45. William W. Hogan, *A Market Power Model with Strategic Interaction in Electricity Networks*, ENERGY J., No. 4, 1997, at 107; *see also* Thomas Olivier Leautier, *Transmission Constraints and Imperfect Markets for Power*, 19 J. REG. ECON. 27 (2001); Judith B. Cardell, Carrie Cullen Hitt & William W. Hogan, *Market Power and Strategic Interaction in Electricity Networks*, 19 RESOURCES & ENERGY ECON. 109, 129 (1997); William W. Hogan, *Contract Networks for Electric Power Transmission*, 4 J. REG. ECON. 211 (1992).

simulation models in merger analysis.<sup>46</sup> Such models are better able to account for the effects of real-time system balancing requirements and loop flows that are specific to electricity markets.<sup>47</sup> Firm conduct can often have far-reaching effects on market participants, not easily captured by transportation-type models. Simulation models can improve accuracy and consistency by directly estimating outcomes if the merging parties (alone or in coordination with other suppliers) raise prices under different conjectures about rivals' behavior.<sup>48</sup> The antitrust agencies have encouraged the use of simulation models in a number of commentaries and have employed them in at least one challenged merger case.<sup>49</sup>

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46. The use of simulation models to evaluate unilateral effects of mergers is the subject of a separate literature, quite unrelated to the use of simulation models to assess competitive outcomes in complex electricity systems. *See, e.g.*, Daniel L. Rubinfeld & Roy. J. Epstein, *Merger Simulation: A Simplified Approach with New Applications* (Univ. of Cal., Berkeley, Competition Pol'y Ctr. Working Paper #CPC01'026, 2001), <http://repositories.cdlib.org/cgi/viewcontent.cgi?article=1000&context=iber/cpc>; Luke M. Froeb, *Unilateral Merger Effects and Economic Models* (May 3–4, 2004) (presentation at the 2004 Antitrust Conference: Antitrust Issues in Today's Economy); GREGORY. J. WERDEN, LUKE M. FROEB, & DAVID T. SHEFFMAN, *A DAUBERT DISCIPLINE FOR MERGER SIMULATION* (presentation at U.S. Department of Justice Antitrust Division Merger Enforcement Workshop, Feb. 16, 2004), <http://www.ftc.gov/be/daubertdiscipline.pdf>.

47. *See* Mark W. Frankena & John R. Morris, *Competition Simulation Models Enter the World of Energy Litigation*, POWER, Winter 1998, 8; *see also* FED. TRADE COMM'N, COMMENT OF THE FEDERAL TRADE COMMISSION: MARKET-BASED RATES FOR PUBLIC UTILITIES, Docket No. RM04-7-000 (July 16, 2004), <http://www.ftc.gov/os/comments/ferc/v040021.pdf>.

48. The current body of research considers the merits of different assumptions about firm behavior and the instruments of competition as they apply to the electricity industry. A number of studies point out the limitations of the fixed output assumption inherent in Cournot, which is somewhat at odds with electricity generators bidding blocks of output into the market. For discussion on supply function equilibria, *see* Paul. D. Klemperer & Margaret A. Meyer, *Supply Function Equilibria in Oligopoly Under Uncertainty*, 57 ECONOMETRICA 1243 (1989); Bolle, *supra* note 16; Talat Genc & Stanley S. Reynolds, *Supply Function Equilibria with Pivotal Electricity Suppliers* (Univ. of Arizona, Dep't of Econ., Eller College Working Paper No. 1001-04, Jul. 2004). On dominant firm models, *see* David M. Quick & Janis M. Carey, *An Analysis of Market Power Mitigation Strategies in Colorado's Electricity Industry*, 22 ENERGY J. NO. 3 (2001), at 55. On modeling Cournot behavior, *see* Borenstein, Bushnell & Knittel, *supra* note 9; Robert J. Graniere, *Horizontal Market Power in Generation* (National Regulatory Research Institute, Report No. NRRI 98-15, May 1998); Green, *supra* note 7; Perl, *supra* note 30; and Steven L. Puller, *Pricing and Firm Conduct in California's Deregulated Electricity Market* (Univ. of Cal. Energy Institute, Power Working Paper PWP-080, Jul. 2001), <http://www.ucei.berkeley.edu/PDF/pwp080.pdf>; Rudkevich, Duckworth & Rosen, *supra* note 9; Richard J. Green & David M. Newbery, *Competition in the British Electric Utility Spot Market*, 100 J. POLITICAL ECON. 929 (1992).

49. In *PacifiCorp/Peabody*, the FTC estimated the effects of a raising rivals' costs strategy (by the merged utility and coal supplier). *See* FED. TRADE COMM'N, ANALYSIS OF PROPOSED CONSENT ORDER TO AID PUBLIC COMMENT (1998), *available at* <http://www.ftc.gov/os/1998/02/9710091.ana.htm>; *see also* COLORADO ELECTRICITY ADVISORY PANEL, EVALUATION REPORT, at 2.1 (Nov. 1999), *available at* [http://www.dora.state.co.us/puc/projects/euir/s-w\\_pdf.zip](http://www.dora.state.co.us/puc/projects/euir/s-w_pdf.zip).

Finally, as noted earlier, FERC's methodological approaches to deciding whether to grant or renew market-based rate pricing authority have also been criticized, particularly in the context of the California *post mortem*.<sup>50</sup> Until recently, FERC's methodology for defining markets relied on analysis that failed to account for transmission constraints, time-differentiated products, and capacity that could discipline a price increase. FERC has recently revised its analytical requirements for market-based rate requests. These highly debated proposals make some improvements in market definition, but still rely largely on market-share analysis for evaluating the seller's potential for exercising market power.<sup>51</sup>

### B. Policy Issues

It is easy for electricity market definition to become lost among the higher-profile policy issues that have swirled around market power over the last decade. Market definition is methodological in nature, data intensive, and models require a good deal of explanation. But poor market definition can lead to costly Type I or Type II errors by producing enforcement inaction in cases where remedies are necessary or, alternatively, enforcement action when none is necessary. When used to sanction prospective behavior—as in the case of mergers and market-based rate authority, market definition is doubly important. In light of this, it may be time for FERC to open a generic proceeding that debates the use of simulation models in competitive analysis.

The industry now has a deeper understanding of the workings of networks and their influence on competitive relationships. This knowledge has assisted regulatory and antitrust enforcement with competitive effects analysis in

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50. See, e.g., Barry C. Harris & Mark W. Frankena, *FERC's Acceptance of Market-Based Pricing: An Antitrust Analysis*, ELEC. J., June 1992, at 38; James Bohn, Metin Celebi, & Philip Hanser, *The Design of Tests for Horizontal Market Power in Market-Based Rate Proceedings*, ELEC. J., May 2002, at 52; Peter Fox-Penner, Gary Taylor, Romkaew Broehm, & James Bohn, *Competition in Wholesale Electric Power Markets*, 23 ENERGY L.J. 281 (2002).

51. If the seller fails the initial round of tests, a competitive analysis based on the Commission's merger review standards can be submitted. See Duke Power, et al., Order on Updated Market Power analysis, Instituting Section 206 Proceeding and Establishing Refund Effective Date, 109 F.E.R.C. ¶ 61,270 (2004); AEP Power Marketing, Inc., et al., Order on Rehearing and Modifying Interim Generation Market Power Analysis and Mitigation Policy, 107 F.E.R.C. ¶ 61,018, (2004); AEP Power Marketing, Inc., et al., Order on Rehearing, 108 F.E.R.C. ¶ 61,026 (2004); Market-Based Rates for Public Utilities, Initiation of Rulemaking Proceeding on Market-Based Rates and Notice of Technical Conference, 107 F.E.R.C. ¶ 61,019 (2004); Boston Edison Re: Edgar Electric Energy Co., 55 F.E.R.C. ¶ 61,382 (1991).

mergers and in cases involving allegations of anticompetitive conduct. Working more complex economic modeling further into the electricity mainstream requires that economists find effective ways of educating legal experts and judges about its usefulness. Kovacic notes, in the case of game theory for example, that it has taken some time for it to be absorbed into the legal economic system. Game-theoretic models are mathematically complex, require large amounts of data and information (which judges may be reluctant to require litigants to provide), and lawyers must provide administrable standards acceptable in a courtroom.<sup>52</sup> Similar constraints might also apply to more sophisticated electricity market modeling.

That courts have lagged in their adoption of game theory (and more broadly, post-Chicago thinking) may suggest that the agencies are the best place to introduce new approaches since they might be absorbed more quickly. At the same time, the use of simulation models in electricity could be a doubled-edged sword. While such models can inform the issues, claims of discrimination and leveraging could potentially bog down in the disputes over data, assumptions, or sensitivity analysis foreshadowed by Harvey and Hogan. Thus, if it works its way successfully into the mainstream, simulation modeling may raise the bar on the technical complexity of market power analysis at the same time it raises the margin for error. It may be difficult for judges to comprehend and leave the public without an understanding of the reasoning that underlies policy decisions.

## V. VERTICAL ISSUES

### A. *Overview of the Literature*

A growing part of the literature examines relatively new vertical competitive issues in electricity. One prong of the research looks afresh at the question of whether vertical integration produces benefits that exceed those of the unbundled model. This research highlights the dichotomy between early, deintegration-based rationales for restructuring, and more recent attention to vertical relationships now that restructuring has proven a challenge. For example, vertical integration has been long recognized as a strategy for enhancing or maintaining market power through leveraging, tying, and two-level entry.<sup>53</sup>

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52. William Kovacic, *The Influence of Economics on Antitrust*, 30 *ECON. INQUIRY* 294 (1992).

53. See, e.g., Albert A. Foer, *Institutional Contexts of Market Power in the Electricity*

But some analysis concludes that integration may reduce incentives for sellers to exercise horizontal market power in centralized markets because they are also buyers.<sup>54</sup> More attention is also being devoted to assessing the significant role of transactions costs and information asymmetries under the unbundled model.<sup>55</sup> Finally, some research revisits a number of earlier economic studies that assess and quantify the savings from vertical integration.<sup>56</sup>

A second area of the literature looks into potentially new forms of “ability” for sellers in vertical relationships to exclude rivals from access to inputs. For example, the ability to control transmission through transmission rights or congestion contracts raises issues similar to other exclusionary practices, even though the firm does not own transmission. Transmission rights take on value when transmission paths are congested, giving the rights holder access to congested transmission capacity (i.e., physical rights), or to hedge against congestion costs (i.e., financial rights).

Failure to release unused physical rights effectively takes transmission capacity off the market, preventing competitors from obtaining a critical input and increasing the value of the right-holder’s generation at the end of the constrained transmission path. Financial rights cannot be withheld but could potentially be used to affect the outcomes of the generation scheduling process, potentially by foreclosing markets.<sup>57</sup> Much of the research on transmission rights involves market simulation under different rights allocation scenarios. For example, granting of transmission rights to a seller in an importing region increases the incentive to restrict output to make such rights more valuable.<sup>58</sup>

“Ability” issues have also arisen in the context of numerous

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*Industry*, ELEC. J., May 1999, at 13.

54. See, e.g., Mansur, *supra* note 24; see also Kuhn & Machado, *supra* note 7.

55. Much of this is the thrust of the “New Institutional Economics.” See, e.g., Frank Bickenbach, Lars Kumkar, & Rudiger Soltwedel, *The New Institutional Economics of Antitrust and Regulation*, (Keil Institute of World Economics, Kiel Working Paper No. 961, Dec. 1999), <http://ideas.repec.org/p/kie/kieliw/961.html>; Wayne P. Olson, *Lessons from the New Institutional Economics*, ELEC. J., June 1997, at 46.

56. See, e.g., Robert J. Michaels, *Vertical Integration: The Economics That Electricity Forgot*, ELEC. J., Dec. 2004, at 11.

57. See James B. Bushnell, *Transmission Rights and Market Power*, ELEC. J., Oct. 1999, at 77.

58. See, e.g., Paul L. Joskow & Jean Tirole, *Transmission Rights and Market Power on Electric Power Networks*, 31 RAND J. ECON. 450 (2000); Severin Borenstein, James B. Bushnell, & Steven Stoft, *The Competitive Effects of Transmission Capacity in a Deregulated Electricity Industry*, 31 RAND J. ECON. 294 (2000).

electricity mergers over the last decade. For example, exclusionary theories supported FERC's conditional approvals of several electric-electric mergers: *PacifiCorp/Utah Power & Light*, *Ohio Edison/Centrior*, *American Electric Power/Central and SouthWest*, and the gas-electric merger—*Pacific Enterprises/Enova*. In general, the theories of competitive harm centered on the merger's effect on incentives and ability to strategically use transmission (i.e., electric or gas pipeline) to frustrate rivals' access to inputs and to leverage market power over transmission into complementary generation markets. For example, in the 1990 *PacifiCorp/Utah Power & Light* case, the Commission made an *Otter Tail*-like determination that the merger created the potential for the merged company to use its monopoly in transmission to gain a competitive advantage in the sale of bulk generation.<sup>59</sup>

Several years later, the arguments were more detailed. In *Ohio Edison/Centrior*, opponents alleged that the combination would give the merged company the incentive to discriminate against third party users of its transmission system. The Commission noted, “. . . [T]his merger has raised substantial concerns regarding post-merger access to and availability of transmission capacity internal to the FirstEnergy system. . . . Applicants could plan and operate their system in such a way as to potentially exercise [their] substantial generation market power . . .”<sup>60</sup> Similarly, in an expanded version of *Ohio Edison/Centrior*, opponents of *American Electric Power/Central and SouthWest* alleged that the merged company could strategically operate their transmission systems in conjunction with generation to foreclose competing generators from transmission markets.<sup>61</sup> Critics cited numerous foreclosure mechanisms—operating generation to create transmission constraints, curtailing transactions through the use of TLR, or misrepresenting the amount of transmission capacity available to rivals.

The connection between reliability and exclusionary conduct attracted attention after the Midwestern price spikes during summer 1999 and the eastern U.S. outage of August 2003. Studies find, for example, that TLR increased markedly during periods of high prices and price volatility.<sup>62</sup> Moreover, Moss finds

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59. Janal M. Kalis, *The Role of Antitrust in Promoting Competition in Electricity Generation and Transmission*, 11 J. OF ENERGY, NAT. RESOURCES, & ENVTL. L. 287 (1991); *Utah Power & Light Company et al.*, 45 F.E.R.C. ¶ 61,095, at 61,283 (1988).

60. *Ohio Edison*, 81 F.E.R.C. ¶ 61,110, at 61,408 (1997).

61. *Am. Elec. Power Co.*, 90 F.E.R.C. ¶ 61,242, Opinion 442, (2000).

62. See Narashimha Rao & Richard D. Tabors, *Transmission Markets: Stretching*

that over the last half of the 1990's, most TLR was requested by a small group of large, vertically-integrated utilities or power pools dominated by vertically integrated utilities.<sup>63</sup>

Finally, *Pacific Enterprises/Enova* were the parent companies of Southern California Gas (a monopoly pipeline serving southern California) and San Diego Gas & Electric (SDG&E—an electric utility also serving southern California), respectively. Both FERC and the Department of Justice (DOJ) opposed the merger on the basis that it would create the incentive and enhance the ability of the merged company to foreclose SDG&E's rivals or raise their costs. Foreclosure could be accomplished, for example, by cutting off competitors' access to gas transportation, forcing competitors to elect different receipt or delivery points, or by sharing competitive information on competitors' gas usage or planning with SDG&E.<sup>64</sup>

### B. Policy Issues

Vertical issues have taken somewhat of a back seat to withholding in the research on market power over the last fifteen years. This is not surprising given the high-profile public policy issues associated with withholding. Another reason might be that, in contrast to withholding, exclusion is under a structured system of regulatory "management." For example, access did not entirely cure the patient, so discrimination has been the subject of numerous follow-on initiatives. These initiatives include Order No. 2000 (RTOs), transmission codes of conduct—designed to prevent the anticompetitive exchange of information between transmission and generation affiliates, interconnection standards, and the failed standard-market design.<sup>65</sup> Nonetheless,

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*the Rules for Fun and Profit* (Tabors Caramanis & Associates Working Paper No. 327-0400, June 2000), [http://www.tca-us.com/Publications/fun\\_and\\_profit\\_ii.pdf](http://www.tca-us.com/Publications/fun_and_profit_ii.pdf). Rao and Tabors also examine the possibility of misrepresenting available transmission capacity postings on OASIS websites; see also Diana L. Moss, *Competition or Reliability in Electricity? What the Coming Policy Shift Means for Restructuring*, ELEC. J., Mar. 2004, at 11.

63. Moss, *supra* note 62, at 25.

64. See Proposed Final Judgment and Competitive Impact Statement, United States v. Enova Corp., 63 Fed. Reg. 33,396, 33,402–8 (June 18, 1998), available at <http://www.usdoj.gov/atr/cases/f1700/1789.htm>; San Diego Gas & Elec. Co., 79 F.E.R.C. ¶ 61,372, (1997) (Order Conditionally Approving Disposition of Facilities, Dismissing Complaint as Moot, and Denying Request for Consolidation). For a discussion of various gas-electric mergers, see David Balto & James Mongoven, *Deregulation and Merger Enforcement in the Natural Gas Industry*, 69 ANTITRUST L.J. 572 (2001).

65. See generally Regional Transmission Organizations, Order No. 2000, 81 F.E.R.C. ¶ 61, 285 (2000) and Order on Rehearing, Order No. 2000-A 90 F.E.R.C. ¶ 61,201 (2000); Standardization of Generator Interconnection Agreements and Procedures, Order 2003, 104 F.E.R.C. ¶ 61,103 (2003) and Order No. 2003-A, 104 F.E.R.C. ¶ 61,220 (2004);

the literature notes a resurgence of interest in vertical issues.

For example, ensuring that the benefits of transmission rights, which are very much a feature of modern centralized electricity markets, are not jeopardized by the potential for anticompetitive conduct will require a good deal of attention to market design. How rights are allocated and rules developed that govern the release of physical rights are important.<sup>66</sup> Similarly, ensuring that reliability is not used as a potential anticompetitive tool will require attention to how reliability standards are crafted, implemented, and enforced.

Vertical issues are particularly important in the context of the changed market structures brought about by restructuring. Kwoka notes that while entry of independent merchant generators during the 1990s may have had a deconcentrating effect on markets, these effects were partially offset by the fact that much of the generation divested during the same time was absorbed by only a few major energy firms.<sup>67</sup> New incentives to engage in exclusionary conduct have arisen from increasing market concentration and mergers that combine large generation portfolios or generation with gas transportation.<sup>68</sup> Questions raised by the research on the benefits of vertical integration, together with the emergence of new exclusionary mechanisms, will present challenges for policymakers if rebundling accelerates.

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Standards of Conduct for Transmission Providers, Order 2004, 105 F.E.R.C. ¶ 61,248 (2003); Order 2004-A, 107 F.E.R.C. ¶ 61,032 (2004); Federal Energy Regulatory Commission, Remedying Undue Discrimination Through Open Access Transmission Service and Standard Electricity Market Design, Notice of Proposed Rulemaking, Docket No. RM01-12-000, 67 Fed. Reg. 55,452 (Aug. 29, 2002), F.E.R.C. Stats. & Regs. ¶ 32,563 (2002).

66. Capacity release mechanisms for physical rights—similar to rules for natural gas pipeline capacity in place since 1996—have been suggested. *See, e.g.*, Richard Gilbert, Karsten Neuhoff, & David Newbery, *Mediating Market Power in Electricity Networks* (Univ. of Cal., Berkeley, Competition Policy Center Working Paper E02'322, 2002), <http://repositories.cdlib.org/cgi/viewcontent.cgi?article=1031&context=iber/cpc>; *see also* Steven Stoft, *Financial Transmission Rights Meet Cournot: How TCCs Curb Market Power*, 20 ENERGY J. 1 (1999).

67. John E. Kwoka, Jr. *Twenty-Five Years of Deregulation: Lessons for Electric Power*, 33 LOY. U. CHI. L.J. 885, 899–900 (2001–2002) (citing Cooper, who estimates that 80 percent of divested generation capacity was acquired by only a few unregulated utility subsidiaries). *See* Mark N. Cooper, *Reconsidering Electricity Restructuring: Do Market Problems Indicate a Short Circuit or a Total Blackout?* (Nov. 2000), available at <http://www.consumersunion.org/telecom/deregcd1100.htm>.

68. *See, e.g.*, David Hunger, *Analyzing Gas and Electric Convergence Mergers: A Supply Curve is Worth a Thousand Words*, J. REGULATORY ECON., Sept. 2003, at 161 (discussing measuring “ability” in foreclosure or raising rivals’ costs).

## VI. REMEDIES

### A. Overview of the Literature

Remedies for market power have been exhaustively debated in electricity. The bulk of this debate started in the 1990s with FERC's decision to functionally unbundle generation and transmission to curtail discrimination (instead of requiring structural separation). This landmark policy set the stage for the ongoing process of fine-tuning behavioral rules as the industry has changed. Remedies factor prominently in a number of areas.

Dual merger review by FERC and antitrust agencies highlights different approaches to remedies. Traditionally, FERC has opted for behavioral approaches, often targeting "ability" in problematic mergers by requiring the parties to agree to a number of conditions. These conditions have included open access requirements (in the pre-access era), independent market monitoring and conditions on the availability and priority of transmission service interconnecting the merged entities.<sup>69</sup> In contrast, the antitrust agencies have often (but not always) required divestiture.

There are mixed views on whether the turnover of transmission control to an independent RTO is a behavioral or structural remedy.<sup>70</sup> These seem to turn on whether a structural remedy is defined as one that alters the firm's ability or incentive to discriminate against rival generators, or one that changes the structure of the underlying market. RTOs are intended to constrain the exercise of market power through oversight and penalties. But they arguably expand the scope of the relevant market by eliminating duplicative transmission changes and improving transmission planning and congestion. So, it is probably fair to say that RTOs have elements of both behavioral and structural remedies. Table 2 highlights the contrast between behavioral and structural remedies imposed by FERC and the antitrust agencies on various mergers over the last decade.<sup>71</sup>

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69. The Commission also accepted a voluntary commitment of the merging firms to divest generation on CSW's system. The antitrust agencies never challenged a vertical merger involving the combination of transmission and generation, but did challenge a number of transactions that combined electric generation and gas transportation.

70. See David B. Patton, *Mitigating Market Power in a Deregulated Electric Utility Industry*, CCH POWER & TELECOM L., May/June 1998, at 8.

71. FERC had no jurisdiction to review the DTE/MCN and CMS/Panhandle mergers. See Ohio Edison Co., et. al., Order Conditionally Authorizing Proposed Merger, 81 F.E.R.C. ¶ 61,110, (1997); San Diego Gas & Elec. Co., Order Conditionally Approving Disposition of Facilities, Dismissing Complaint as Moot, and Denying Request for Consolidation, 79 F.E.R.C. ¶ 61,372, (1997); United States v. Enova Corp., Complaint, D.

The debates on remedies have evolved as electricity markets and market power problems are better understood. First, almost all experts agree that improvements in demand-side response and entry (by reducing market concentration and increasing reserve margins) would ease market power problems.<sup>72</sup> In the United States, widespread entry of merchant generators in response to restructuring established, until recently, a thriving independent generation sector. But the ability of retail electricity consumers to adjust their consumption in response to periodic episodes of high wholesale prices is possible only when metering and variable-rate programs are available.<sup>73</sup> Real-time pricing shifts consumption from peak to off-peak periods when demand is likely to be more price-responsive, reducing the potential gains to sellers from exercising market power.

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C. Cir. (Mar. 9, 1998), available at <http://www.usdoj.gov/atr/cases/f1700/1790.htm>; United States v. Enova Corp., Final Judgment (Mar. 9, 1998), available at <http://www.usdoj.gov/atr/cases/f5100/5114.htm>; Pacificorp, Agreement Containing Consent Order (Feb. 18, 1998), available at <http://www.ftc.gov/os/1998/02/9710091.agr.htm>; Pacificorp, Complaint (Feb. 18, 1998), available at <http://www.ftc.gov/os/1998/02/9710091.cmp.htm>; CMS Energy Corp., Agreement Containing Consent Order (June 2, 1999), available at <http://www.ftc.gov/os/1999/03/cmsagreement.htm>; Complaint (June 2, 1999), available at <http://www.ftc.gov/os/1999/06/cmsenergycmp.htm>; Dominion Resources, Inc. and Consolidated Natural Gas Co., Agreement Containing Consent Orders (Nov. 4, 1999), available at <http://www.ftc.gov/os/1999/11/dominionagr.htm>; Dominion Resources, Inc. and Consolidated Natural Gas Co., Complaint (Nov. 4, 1999), available at <http://www.ftc.gov/os/1999/11/dominioncmp.htm>; American Electric Power Co. and Central and South West Corp., Opinion and Order Reversing in Part, Affirming in Part, Vacating in Part, and Modifying in Part the Initial Decision, Opinion No. 442, 90 F.E.R.C. ¶ 61,242 (Mar. 15, 2000); DTE Energy, Inc. and MCN Energy Group, Inc., Decision and Order (May 18, 2001), available at <http://www.ftc.gov/os/2001/05/dtemcndo.pdf>; Complaint (May 18, 2001), available at <http://www.ftc.gov/os/2001/05/dtemcncmp.pdf>; and Entergy Corp. and Energy-Koch LP, Agreement Containing Consent Order (Jan. 31, 2001), available at <http://www.ftc.gov/os/2001/01/entergyagree.pdf>; Complaint (Jan. 31, 2001), available at <http://www.ftc.gov/os/2001/01/entergycmp.pdf>.

72. On demand-side response see, e.g., Kahn, Cramton, Porter & Tabors, *supra* note 16; Borenstein & Bushnell, *supra* note 8; Borenstein & Bushnell, *supra* note 23. On entry see, e.g., Newbery, *infra* note 75; Newbery, *infra* note 76; and Newbery, *infra* note 78 (discussing the scale of entry and entry in response to a contract market).

73. For greater detail and analysis, see FED. TRADE COMM'N STAFF, COMPETITION AND CONSUMER PROTECTION PERSPECTIVES ON ELECTRIC POWER REGULATORY REFORM: FOCUS ON RETAIL COMPETITION (Sep. 2001), available at <http://www.ftc.gov/be/v000009.htm>.

Merging Parties	Date, Type and Location	Agency Taking Action	Competitive Issues and Remedy
Ohio Edison/ Centerior	1997 Electric- Electric Midwest	FERC	<u>Issues:</u> Transmission foreclosure <u>Remedy:</u> Transmission priority, transmission capacity allocation, and price cap requirements, “expectations” that the merged company would relinquish control of its transmission to an Independent System Operator
Pacific Enterprises/ Enova Corp.	1998 Electric-Gas West	FERC and DOJ	<u>Issues:</u> Gas transportation foreclosure, deterrence of generation entry <u>Remedy:</u> Same-time pipeline capacity disclosure requirements (FERC) and divestiture of two gas-fired generators (DOJ)
PacifiCorp/ Energy Group PLC (Peabody Coal) <sup>a</sup>	1998 Electric-Coal West	FTC	<u>Issues:</u> Raising rival’s costs, deterrence of generation entry <u>Remedy:</u> Divestiture of coal mining properties, prohibitions on inter-affiliate transfer of non-public coal customers’ information
CMS Energy/ Panhandle Eastern	1999 Electric-Gas Midwest	FTC	<u>Issues:</u> Gas transportation foreclosure <u>Remedy:</u> Pipeline-to-pipeline interconnection requirement
Dominion Resources/ CNG	2000 Electric-Gas Mid-Atlantic	FTC	<u>Issues:</u> Gas transportation foreclosure, deterrence of generation entry <u>Remedy:</u> Divestiture of gas distribution assets
American Electric Power/ Central and SouthWest	2000 Electric- Electric Midwest	FERC	<u>Issues:</u> Transmission foreclosure <u>Remedy:</u> Market monitoring, obligation to join an RTO, accepted parties offer to divest generation
DTE Energy/ MCN Energy	2001 Electric-Gas Midwest	FTC	<u>Issues:</u> Lessening of competition between centrally supplied electricity and self-generation <u>Remedy:</u> Easement over portion of gas distribution capacity
Koch Industries/ Entergy <sup>1</sup>	2001 Electric-Gas South	FTC	<u>Issues:</u> Regulatory evasion <u>Remedy:</u> Transparency requirements for gas procurement

<sup>a</sup>The merger was not consummated—another firm eventually purchased Peabody Coal.

**Table 2: Mergers Conditionally Approved by FERC or Challenged by DOJ/FTC<sup>74</sup>**

Second, most advocates acknowledge that well-designed markets that minimize opportunities for gaming and the exercise of market power are critical to addressing market power problems. Implicit in this acknowledgement is that market design itself should not be the first line of defense for remedying

74. Moss, *supra* note 62.

the exercise of market power.<sup>75</sup> Rather, market design should follow from policies that promote market structures that are conducive to competitive outcomes. If policymaking is sequenced in this way, market designs are necessarily less cumbersome, less prone to gaming, administratively easier to implement, and focus less on market monitoring. For example, the failure to accurately assess the potential for anticompetitive outcomes and impose structural reforms in California market-based rate cases led to convoluted market designs and market power problems.

Third, the debates over divestiture are now far more complex than in the pre-restructuring era. For example, divestiture may not be the ideal remedy under certain circumstances.<sup>76</sup> While remedies must answer the stock questions of how much to divest, to whom, and how long the divestee must stay out of prohibited markets in electricity, the question of *what* units should be divested in order to address local market power concerns is also important.<sup>77</sup> For example, some generators must run at certain times due to reliability or environmental considerations. Those considerations will affect the value of those units if they are considered for divestiture and, consequently, the number or type of buyers. Moreover, divestiture of single generators (e.g., to cure a concentration problem in a small, constrained geographic market) may not be particularly attractive to potential buyers, who may want a portfolio of assets.

Finally the research notes the benefits of long-term contracting for removing generation from the control of sellers with market power. The absence of long-term contracting distinguishes the early England/Wales and California experiences from others in the United States.<sup>78</sup> Properly

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75. See, e.g., William W. Hogan, *Electricity Market Restructuring: Reforms of Reforms*, J. REGULATORY ECON., Jan. 2002, at 103; David Newbery, *Electricity Liberalisation in Britain: The Quest for a Satisfactory Wholesale Market Design* (Univ. of Cambridge, Dept. of Applied Economics, Working Paper 0469, 2002), <http://www.econ.cam.ac.uk/electricity/publications/wp/ep64.pdf>; Bushnell, Mansur, & Saravia, *supra* note 16; Kahn, Cramton, Porter & Tabors, *supra* note 16; Bushnell & Wolak, *supra* note 16.

76. See Borenstein, Bushnell, *supra* note 8. Divestiture in the British experience may have been more successful than in the U.S. See, for additional discussion, Newbery, *supra* note 22; David M. Newbery, *Mitigating Market Power in Electricity Networks* (Univ. of Cambridge, Dept. of Applied Economics, Cambridge Working Paper, May 18, 2002), <http://www.econ.cam.ac.uk/dae/people/newbery/files/rome.pdf>.

77. See Patton, *supra* note 70; Paul L. Joskow, *Restructuring, Competition, and Regulatory Reform in the U.S. Electric Power Sector*, J. ECON. PERSPECTIVES, Summer 1997, at 119.

78. See, e.g., Mansur, *supra* note 24; Bushnell, Mansur, & Saravia, *supra* note 16; Patton, *supra* note 70; Richard J. Pierce, Jr. *Realizing the Promise of Restructuring the Electricity Market*, 40 WAKE FOREST L. REV. 451(2005); David Newbery, *Issues and Options for Restructuring Electricity Supply Industries* (Cambridge Univ., Dept. of

structured contracts, some argue, are effective at preventing withholding since the generator under contract is required to sell all the output, leaving no ability to control its disposition. Such arrangements have also been introduced as merger remedies in the United States.<sup>79</sup> Finally, transmission expansion is recognized as an effective remedy for market power by broadening the scope of relevant markets and thereby reducing concentration and the potential for anticompetitive outcomes.<sup>80</sup>

### B. Policy Issues

In contrast to the early years of restructuring, a model of quasi-regulation (or quasi-competition) appears to have ultimately come to dictate the course of restructuring in electricity.<sup>81</sup> Certain aspects of market operation and firm conduct (e.g., generators with local market power) will always be subject to regulatory oversight and price regulation. Thus, remedies should be sensitive to potential conflicts generated by a mixed model of regulation and competition. For example, revoking market-based rate authority if an applicant fails the test may create market distortions that divestiture would not. Forcing divestiture in a “load pocket” where certain generators must run for reliability or environmental reasons may not be as effective as requiring transmission expansion.

But not all remedies are equally accessible or politically easy to impose. Divestiture has largely eluded federal regulators in the United States, either because of a conservative interpretation of FERC’s authority under the Federal Power Act, the failure of Congress to grant FERC new powers, or an institutional culture that revolves around behavioral fixes. For example, Congress steadfastly refuses to grant FERC the authority to order the siting of new transmission. These are not novel problems.

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Applied Economics, Working Paper 0210, 2002), <http://www.econ.cam.ac.uk/electricity/publications/wp/EP01.pdf>; U.S. GEN. ACCOUNTING OFFICE, *supra* note 16; Cf. Chloe Le Coq, *Long-Term Supply Contracts and Collusion in the Electricity Market* (SSE/ERI Working Paper Series in Economics and Finance No. 552, Feb. 2004) (arguing that under a model in which a contract market precedes a spot market for electricity, the contract market helps sustain collusion on the spot market), <http://swopec.hhs.se/hastef/papers/hastef0552.pdf>.

79. Louisville Gas and Electric Co., LG&E Energy Marketing, Inc., and Kentucky Utilities Co., Order Approving Merger, Accepting Proposed Agreements For Filing, Accepting And Suspending Open Access Transmission Tariff, And Establishing Hearing Procedures, 82 F.E.R.C. ¶ 61,308, at 62,219 (1998).

80. See, e.g., Borenstein, Bushnell, & Stoft, *supra* note 58.

81. See, e.g., William G. Shepherd, *Reviving Regulation—and Antitrust*, ELEC. J., June 1994, at 16; Diana L. Moss, *Promoting Competition in the U.S. Electricity Industry: What are the Big Policy Issues?*, ELEC. J., Apr. 2002, at 19.

Newbery, for example, notes that lawmakers in the European Union have at times failed to write into restructuring legislation the necessary informational requirements and enforcement power necessary to deal with market power.<sup>82</sup>

Perhaps the most troubling issue that arises from the foregoing discussion is the tension between behavioral and structural remedies in the U.S. industry. The U.S. industry has never been subject to the widespread structural reforms endemic to liberalization programs abroad. In many cases, those programs began with the privatization of a state-owned monopoly. This sequencing provides more opportunity to get the market structure “right.” In the United States, behavioral remedies have been the norm. And while California handed down important lessons on market design that should have pointed toward structural remedies, the current direction is now even more focused on behavioral rules and market power mitigation.

## VII. CONCLUSIONS

The foregoing survey provides an opportunity to synthesize current themes in the research on market power in electricity. These include withholding, measurement of market power, market definition, vertical issues, and remedies. While this literature is large and diverse, it still allows for two major observations.

First is the rapid change in focus and sophistication of analyzing competitive issues in electricity. Market power issues are complex and technical, and more advanced modeling approaches have been applied with increasing frequency. This work has undoubtedly advanced the understanding of market power in electricity, for example, by highlighting the possible need for special screening guidelines. But excessive focus on measurement and precision could obscure the bigger issues that should probably be at the core of restructuring—the importance of improving market structure and lessening the emphasis on behavioral rules and monitoring which may risk chilling pro-competitive behavior if the wrong criteria are applied.

Second, it is clear that outside the realm of merger review, antitrust has played a very limited role in dealing with market power. We are reminded with increasing frequency that antitrust can, by design, do little to punish withholding of the sort witnessed in California<sup>83</sup>

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82. Newbery, *supra* note 78.

83. The logic for this is well known, as Donald Turner noted in 1962: “. . .to hold

Indeed, most of the single firm conduct at question in the case of withholding would be unlikely to hold up under antitrust scrutiny. A Section 2 monopolization claim would require proof that a generator possessed monopoly power and took unfair actions to attain or maintain such power.<sup>84</sup> Neither of these could easily be shown for the withholding scenarios that do not involve the exclusion of competitors, particularly in cases where FERC granted market-based pricing authority.<sup>85</sup> This leaves FERC and the states to shoulder the enforcement burden in a major area of public policy concern. But FERC enforcement may be troubled by the limitations imposed by the Filed Rate Doctrine, particularly as it is applied to market-based rates.<sup>86</sup> And the states are rarely situated to step into electricity antitrust cases.

Moreover, it remains to be seen whether antitrust liability for refusals to deal (e.g., frustrating access to transmission) is affected by the precedent set forth in the Supreme Court's 2004 decision in *Trinko*.<sup>87</sup> While the similarities between access in telecommunications and electricity are numerous, it could be that the failure of the courts to impose liability will be guided more by a history of passive antitrust enforcement, not the direct portability of the *Trinko* decision across industry lines.<sup>88</sup> Finally,

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unlawful the charging of a monopoly price by a monopolist, or the maintaining of noncompetitive prices by oligopolists, would be to invoke a purely public utility interpretation of the Sherman Act. Congress [did not intend the courts] to act much like public utility commissions in order to cure the ill effects of noncompetitive oligopoly pricing." Donald F. Turner, *The Definition of Agreement Under the Sherman Act: Conscious Parallelism and Refusal to Deal*, 75 HARV. L. REV. 655, 669 (1962), cited in First, *supra* note 30, at 927; see also William G. Shepherd, *Dim Prospects: Effective Competition in Telecommunications, Railroads, and Electricity*, 42 ANTITRUST BULL. 151 (1997).

84. See Ray S. Bolze, John C. Peirce, & Linda L. Walsh, *Antitrust Law Regulation: A New Focus for a Competitive Energy Industry*, 21 ENERGY L.J. 79 (2000).

85. Possibly with the exception of strategic withholding, whereby a generator—by operating the asset so as to create transmission congestion—excluded competitors.

86. Under the doctrine, once a rate is filed and approved, it cannot be challenged except through noticed regulatory proceedings, something FERC and some courts have already recognized. See, e.g., ATTORNEY GENERAL BILL LOCKYER, *supra* note 15, at 9; James R. Atwood, *Antitrust, Joint Ventures, and Electric Utility Restructuring: RTGs and POOLCOs*, 67 ANTITRUST L.J. 323 (1999); Gregory Werden, Remarks at the American Antitrust Institute Fifth Annual Energy Roundtable Workshop, 'Open Access Revisited' (Jan. 11, 2005), available at <http://www.antitrustinstitute.org/recent2/368.pdf>.

87. See *Verizon Communications Inc. v. Law Offices of Curtis V. Trinko*, 540 U.S. 398 (2004). The decision does not recognize (nor does it reject) the essential facilities doctrine in cases of refusals to deal. It also articulates a very limited (if not completely limited) role for antitrust in an industry where open access policy is enabled by legislation and implemented by a regulatory agency.

88. Werden, *supra* note 86; see also J. Bruce McDonald, Antitrust Division Update: *Trinko* and Microsoft, remarks before the Houston Bar Association, (Apr. 8, 2004), available at <http://www.usdoj.gov/atr/public/speeches/204227.pdf>; Phillip Areeda, *Essential Facilities: An Epithet in Need of Limiting Principles*, 58 ANTITRUST L.J. 841,

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the parameters of any future Section 2 claims regarding exclusion could be affected by a fundamental reinterpretation of the essential facilities doctrine within the context of a restructuring industry. For example, do transmission constraints represent a legitimate business justification for denying or frustrating access to transmission?<sup>89</sup> Whether these scenarios will come to pass is unclear. If they do, their implication for the roles of antitrust and regulation will be significant.

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841–43 (1989) (discussing the limited nature of the Court’s essential facility finding in *Otter Tail*).

89. David S. Copeland, *Requiring Transmission Access by Electric Utilities: The Shifting Roles of Regulation and Antitrust*, 67 ANTITRUST L.J. 291 (1999); Wise, *supra* note 19.