Chapter Ten

Energy: The Importance of Competition and the Role of Antitrust

Energy policies—especially, policies toward the electricity, oil, and gas industries—must be near the top of the agenda for the new administration in 2009. In fact, the next several administrations will have to confront all of these issues with determination and a commitment to competition because it will take many years to solve the nation's energy problems. For decades, poorly designed and poorly managed policies regarding electricity production, transmission, and distribution, fossil fuels, and renewable energy have made only very modest progress in improving the performance of the energy sector. As a result, the United States has for many years squandered time, opportunities, and resources in its quest for energy security and consumer well-being.

That competition policy has an important role in energy policy may seem surprising. Competition policy typically is thought of as a mechanism to keep prices low and to increase consumption—seemingly the opposite of what is required to reduce the nation's use of and dependence on fossil fuels. Yet competition can play an important role in three major and related ways. The first is to ensure that energy prices reflect marginal costs, including the full social costs of extraction and use of fossil fuels. When private costs do not include environmental, health, and other social costs, production and usage decisions are distorted even in what appears to be a highly competitive market.

Also having high priority are programs to foster the development of new technologies involving energy sources more benign than fossil fuels and that use energy more efficiently. Correct price signals will help. But the government will also need to take explicit action through policies that promote the adoption of new energy sources and technologies along the least costly path of adjustment and away from sources of greenhouse gases. Energy development policy in the past has not been attentive to the hazards of market power, with the result that the benefits of policy have been compromised by the creation of major market problems.

Third, energy policy often involves the development of new market institutions and the modification of existing ones, but in electricity and petroleum refining, the design and operation of these markets have been fundamentally flawed. The result is that crucial institutions and processes have gone awry, with higher costs to consumers and major new costs borne by some producers. At the same time, some players have reaped supra-normal profits by exploiting these mechanisms to their own advantage.

The importance of competition is therefore clear. The primary instruments of competition are antitrust policy and regulatory policy. Antitrust seeks to prevent anticompetitive practices, while regulatory policy strives to ensure full recognition of costs and prudent decision-making by companies having broad social effects.

In industries such as electricity and petroleum refining and marketing, collusion, mergers and joint ventures can create or enhance monopoly power, while boycotts, product ties and refusals to deal can extend monopoly power from one market into others. These practices can harm competition by raising price, by foreclosing smaller, potentially more efficient producers from disciplining the market, and by preventing new firms from bringing new energy technologies to the market. The first line of defense against anticompetitive mergers and suspect business practices is rigorous review by agencies that are best suited to performing it. Their mission is to prevent the erosion of competition and the creation of barriers to entry into energy industries.

Competition policy also includes the government's role in creating and regulating markets for maximum efficiency. Good market design is crucial for giving market participants the right incentives to engage in efficient decisions about pricing, output, and innovation. Three examples illustrate the importance of market design. First, the most promising method of efficiently curtailing emissions of greenhouse gases (GHGs) is likely to be a cap-and-trade program, such as is currently being created by several U.S. states and the European Union. But the effectiveness of the cap-and-trade approach depends on designing a well-functioning competitive market in emissions permits. Second, the design of wholesale markets for electricity inevitably involves a mix of regulated and less- or unregulated entities whose operations must dovetail.

Third, given the severity of the energy problem, there is a fundamental contradiction between the need and desire to make technology available broadly and the use of the

intellectual property system to motivate private investment. Programs to support the development and diffusion of new technology are most effective if government grants and subsidies are constructed to promote innovative competition, rather than to support industry-wide joint ventures in research and development or to award a "winner take all" contract that creates a monopoly in a new technology. Energy technology policy may also need to include a large measure of up-front incentives to promote broad innovative effort. Goals should be defined in terms of research accomplishments that move in the right direction and reward the outputs and success from unrestricted competition. As these examples illustrate, market design is an important component of competition policy and has important applications in energy.

This chapter explores the role of competition policy in energy. After summarizing the major recommendations, the chapter proceeds by outlining the dimensions of the U.S. energy policy problem. It then moves on to some important principles that should be considered when applying competition policy approaches in energy markets. The chapter then examines a number of specific instances in which competition policy can help in electricity, GHG emissions allowances markets, and domestic petroleum refining and marketing.

MAJOR RECOMMENDATIONS

With respect to electricity:

- Impediments to the ability of the federal antitrust laws to reach anticompetitive conduct involving wholesale electricity rates, such as the filed rate doctrine, and overbroad application of judicially created exemptions from the antitrust laws, such as the state action doctrine, implied immunity doctrine (as applied in *Credit Suisse*), and primary jurisdiction doctrine should be removed.

- The federal antitrust agencies should take major responsibility for determining if a merger is likely to adversely affect competition and for crafting appropriate remedies for anticompetitive combinations. The Federal Energy Regulatory Commission (FERC) should cite to or incorporate the antitrust merger analysis in its merger orders.

- Ongoing collaboration between the FERC, the Department of Justice (DOJ) Antitrust Division, and the Federal Trade Commission (FTC) should be encouraged to ensure that the engineering-economic aspects of market analysis are adequately reflected in antitrust merger analysis.

- FERC should promote structurally competitive markets through its market-based rate policies, ensure that its methodology accurately captures the dimensions of electricity markets, and avoid making grants of market-based rate authority in exchange for nonrelated concessions that promote its public interest agenda.

- Proposals for the establishment of new markets or regulatory "patches" to poorly functioning markets operated by Regional Transmission Organizations (RTOs) should be carefully scrutinized by the FERC, in conjunction with the federal antitrust agencies, to determine their effect on competition, efficiency, and incentives for entry and innovation. RTOs should, in general, focus the bulk of their attention on management of the grid and transmission planning.

- FERC should attempt to address discrimination problems in bilateral electricity markets by considering more aggressive forms of unbundling (e.g., structurally) generation from transmission, when it is reasonably likely that the benefits of unbundling exceed the costs.

- Major cost savings and environmental benefits can stem from giving economically appropriate standing for energy efficiency, conservation, and demand response to compete with generation. Entry conditions and the structure of electricity markets can be fundamentally more competitive if consumers can offer demand response in competition with generators.

- Energy policy must take steps to educate consumers and policy makers about the damage being done by flat retail electricity rates and the threat that they pose for society by distorting investment and innovation decisions in the energy sector. Flat rates should be replaced with rate structures that better reflect marginal costs.

With respect to carbon emissions:

- The design and implementation of carbon emissions allowance markets should involve a high degree of coordination between state and federal regulatory, antitrust, and reliability agencies that oversee all related and affected markets, including centralized and bilateral electricity markets, natural gas markets, and other markets for emissions allowances.

- As a precursor to addressing market design issues under a cap-and-trade approach, structural issues in carbon markets are worth investigating. It would be worthwhile to do a simple critical loss calculation to determine if any participant in a carbon market has a sufficiently large asset position that the losses it would take on purchasing and withholding allowances would be exceeded by increases in profits to its low carbon electricity assets. In broader carbon markets, market design is the first line of defense against anticompetitive strategies.

- The design of carbon emissions allowance markets should strive to prevent the exercise of market power and market manipulation. To prevent collusion, initial auctions for carbon emissions allowances should use single-round formats with restrictions on any one firm purchasing more than a specified percentage. Implementing frequent uniform-price auctions, equal treatment of allowances, and making future allowances available for auction in advance promote price discovery, low transactions costs, and long-term electricity capacity planning.

- Monitoring schemes for carbon emissions allowance markets should receive careful attention and draw from other experiences with allowance trading and even centralized electricity markets.

With respect to petroleum:

- Refining bottlenecks deserve continued attention in the FTC's analysis of petroleum refining-marketing merger cases. Mergers that increase control of refinery capacity in congested, strategically located, or boutique fuel facilities

should be carefully scrutinized to explore fully the possibility of unilateral withholding as a theory of competitive harm.

- More subtle mechanisms involving coordinated interaction in petroleum mergers should factor into FTC merger analysis, including the role of exchange agreements between refiners in facilitating coordination on price and output and the effect of mergers on the incentive to restrict or increase investment in refining capacity.

- The FTC should exhaustively consider vertical theories of harm in its merger review. High levels of refining and wholesale marketing integration and concentration emphasize the importance of adequately evaluating potential vertical effects.

- Natural gas serves as the fastest growing fuel source for electric power generation and potentially competes with electricity and gasoline in some major applications. The antitrust agencies would be well advised to look at convergence issues and loss of potential competition between fuels when they examine mergers. Such mergers should be viewed through the lenses of raising rivals' costs and harm to actual or potential competition between electricity and natural gas.

With respect to new energy technologies*:*

- The federal government can play a useful role in hastening the development of new technologies for exploiting energy resources that produce little or no GHG emissions by designing regulatory, grant and direct subsidy, and tax incentive programs that promote competition in both innovation and energy production.

- Energy technology policy may need to include a large measure of up-front incentives to promote broad innovative effort. Goals should be defined in terms of research accomplishments that move in the right direction and reward the outputs and success from unrestricted competition.

I. The Dimensions of the Energy Policy Problem

Almost 80 percent of all U.S. energy comes from fossil fuels.[1] Oil accounts for 40 percent of all energy use, and about 99 percent of all energy that is used in transportation.[2] Imports account for about 60 percent of all oil use.[3] There is now widespread agreement that the most important long-term energy policy problem facing the U.S. and the world is reducing substantially emissions of GHGs from burning fossil fuels. The solution will involve the development of large, reliable, and affordable alternatives to current technology, major technological improvements to the continued use of fossil fuels where necessary, and a public commitment to conservation. A menu of wide ranging priorities and proposals has developed to meet these objectives, as a number of candidates in the 2008 presidential race and leading environmental and energy organizations have acknowledged.[4]

Fossil fuels dominate energy use because the private cost faced by both producers and users of fossil fuel energy has historically been very low. This in turn is the case largely because the true social cost of consuming fossil fuels is not paid by either suppliers or users of this energy. Among these social costs are the undesirable, costly effects of GHGs and other emissions from burning fossil fuels, and the national security concerns arising from the transfer of revenues from the United States to nations with interests adverse, even threatening, to our own. The consequences of unduly low prices are, first, that energy users have little incentive to use energy efficiently, and, second, that more benign sources of energy must overcome a substantial cost disadvantage to induce energy users to switch to them.

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[1] ENERGY INFO. ADMIN., ANNUAL ENERGY REVIEW 2006, *available at* http://www.eia.doe.gov/emeu/aer/pdf/pages/sec1_7.pdf.

[2] ENERGY INFO. ADMIN., ANNUAL ENERGY REVIEW 2006, *available at* http://www.eia.doe.gov/emeu/aer/pdf/pages/sec2_8.pdf.

[3] ENERGY INFO. ADMIN., ANNUAL ENERGY REVIEW 2006, *available at* http://www.eia.doe.gov/emeu/aer/pdf/pages/sec5_5.pdf.

[4] *See* the statements of 2008 presidential candidates who identified energy separately as an issue on their campaign websites, including John Edwards, Barack Obama, Hillary Clinton, and John McCain. *See also* Pew Center on Global Climate Change, http://www.pewclimate.org (last visited June 23, 2008) and the National Energy Commission, http://www.energycommission.org (last visited June 23, 2008).

To the extent that policy seeks to attack these issues, the instruments are, in two senses, regulations and subsidies. The first sense is that the many current subsidies and regulations that perversely actually favor energy inefficiency—for example, policies that disfavor mass transit—must be eliminated. The second sense is that regulations and subsidies must start to be used affirmatively and wisely to encourage greater energy efficiency and more benign sources of energy.[5] Such uses would include higher taxes on fossil fuels and fuel economy standards. And related to all of these policies is antitrust, which must oversee and prevent anticompetitive mergers and practices that distort prices to consumers and incentives for producers.

While beyond the reach of our antitrust laws, it is instructive to note that among the causes of high oil prices are supply curtailments by the cartel of leading oil exporting nations, the Organization of the Petroleum Exporting Countries (OPEC), as well as growth in world demand arising from rapid economic development of many countries around the world, and, quite possibly, speculation. OPEC is not going away, and demand growth promises to be a long-term trend. Moreover, new oil supplies are unlikely to be found in sufficient quantity to remedy what most now believe will be an enduring problem of high prices.

But even these high prices—however painful they may be—do not solve the problem of energy markets. It still falls to government to curtail subsidies, to implement appropriate regulations, and to promote the invention and adoption of technologies that reduce oil use and GHG emissions. Competition policy is an important element of a least-cost strategy for solving the energy problem because its ultimate goal is to increase efficiency, both with respect to the importance of prices' reflecting costs in the short term and the incentives it creates for investment in cost-saving technology over the longer-run.

Because there are a number of competition policy tools that could be used to achieve the goals of energy policy, choosing the right ones arguably poses the biggest challenge to the next administration. The task also requires that these tools be applied in numerous and diverse energy sectors with varying degrees of market failure, structural market conditions, stakeholder interests, and oversight by regulatory and antitrust authorities.

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[5] For example, the run-up of oil prices since mid-2007 has been the focus of much attention, leading to the proposal for a summer gas tax holiday. Many factors have caused high oil prices, the least of which is the very low (by world standards) federal tax on gasoline.

II. Guiding Principles for Promoting Competition in Energy Markets

Four guiding principles for promoting competition in energy markets are useful to consider. One is the importance of championing the instruments that will promote energy goals, as opposed to specific fuels or technologies. A second is acknowledging the infeasibility of competition in many energy markets. A third is deference to the principles of antitrust in enforcing the rules of competition and aiding in the development of regulatory policies. And a fourth is rationalizing the roles of multiple stakeholders in policymaking.

A. Championing the Instruments of Competition to Meet Energy Goals, as Opposed to Specific Fuels or Technologies

Competition policy ultimately has less to say about which particular energy sources or technologies are best for achieving energy policy goals and more about the instruments that can promote least-cost and, ideally, low-carbon choices and innovation. Since the private sector will likely play a major role in rationalizing energy supply and demand in the United States, incentives are critical for efficient decisionmaking. Firms with proper incentives should be in the best position to pick "winners," that is, the technologies that ultimately succeed. There are a number of approaches that can pave the way for aligning incentives so that competition can play a productive role in energy markets. Fuel choice and technology decisions can then be made on a decentralized basis, without the need to promote a particular fuel or technology.

As noted earlier, one approach is internalizing all costs in fuel prices, including the risks of dependency and other externalities such as GHG emissions and other pollutants. Many of these costs have already been internalized through caps and trading systems for SO_2 but the harder-to-quantify damage resulting from the risks of dependency on unstable nations and the military costs of protecting U.S. foreign interests have not.[6] A second approach is to provide information that allows both firms and consumers to make the most efficient choices regarding fuels and technologies.

For example, demand response such as metering and real-time pricing (in which electricity prices vary from hour to hour based on market conditions) can play a

[6] *See, e.g.*, Harry G. Broadman, *The Social Costs of Imported Oil*, 14 ENERGY POL'Y 242 (1986).

potentially large role in reducing demand for electricity.[7] However, for demand response to be effective, it must be deployed in large quantities, making it difficult to mandate or manage.[8] Competition policy recommends instead that sellers and buyers be provided with accurate information and incentives to make their own adjustments in fuel use and consumption.[9]

A third approach is working to eliminate long-term, distortionary policies that skew the actual costs of production such as subsidies and import restrictions. For example, the ethanol "fallacy" demonstrates the perils of poorly motivated government energy policies directed at specific fuel sources. Corn-based ethanol is not a cost-effective source of transportation fuel and its heavy subsidies are imposing additional harm by driving up food prices,[10] a higher-than-anticipated GHG impact, and the distortionary effects of tariffs on cheaper cane-based ethanol. Collectively, these problems have created multimarket effects, including driving up prices for other agricultural commodities and stimulating wasteful investment in refining infrastructure.

Finally, a fourth approach is to promote government-subsidized energy research and development (R&D). Since the invention of hybrid seeds in the late 19th century, the federal government has played an important role in supporting research and development. Private markets tend to underinvest in innovation because the benefits arising from the creation of new knowledge cannot be fully captured by its creator. Thus, it makes sense for government to subsidize R&D. But R&D subsidies are most effective if they are done in a way that promotes innovative competition.

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[7] Smart-grid technology is likely to become an important part of demand response by digitally monitoring demand to optimize grid usage and performance. *See, e.g.,* Patrick Mazza, *Powering Up the Smart Grid*, CLIMATE SOLUTIONS, July 2005, http://www.climate.org/2002/green-energy/PoweringtheSmartGrid.pdf. *See also Comment of the Federal Trade Commission on Wholesale Competition in Regions With Organized Electricity Markets,* FERC Docket No. RM-07-19 (April 17, 2008), http://www.ftc.gov/be/v070014b.pdf.

[8] *See, e.g.*, Paul L. Joskow, *Energy Policies and Their Consequences After 25 Years*, 24 ENERGY J. 17, 21 (2003).

[9] *See, e.g.*, NAT'L ASS'N OF REGULATORY UTIL. COMM'RS, DECOUPLING FOR ELECTRIC & GAS UTILITIES: FREQUENTLY ASKED QUESTIONS (FAQ), http://www.naruc.org/Publications/NARUCDecouplingFAQ9_07.pdf.

[10] *See, e.g.*, THE GLOBAL SUBSIDIES INITIATIVE OF THE INTERNATIONAL INSTITUTE FOR SUSTAINABLE DEVELOPMENT, BIOFUELS – AT WHAT COST? GOVERNMENT SUPPORT FOR ETHANOL AND BIODIESEL IN THE U.S. 55 – 61 (2006), http://www.globalsubsidies.org/IMG/pdf/biofuels_subsidies_us.pdf.

For example, government R&D programs are more effective if the government avoids "picking winners," namely, designing new technologies itself or granting an R&D subsidy in an area of new technology to a single firm or consortium. Government should also foster innovative competition within an industry, rather than create government-subsidized industry-wide R&D joint ventures. Tax incentives and grant programs that are available to multiple entities within broad technological areas are more likely to create significant innovations and to create a competitive market in a new technology.

B. Acknowledging the Difficulty of Achieving Competitive Energy Markets

Energy markets are a unique mix in nearly all dimensions. They include both market institutions such as centralized markets for electricity and energy futures contracts and nonmarket institutions such as reliability organizations and market monitors. Interrelated energy markets also display a number of varying market failures. These range from natural monopoly to externalities to thin or missing markets. Highly fragmented markets—despite the "appearance" of competition—may not deliver the true benefits of competition. In some centralized electricity markets, for example, a lack of coordination among buyers, suppliers, and other agents can produce an over- or undershooting of optimal levels of investment.

Collectively, these factors underscore the limitations of energy markets and signal a role for government to address them through rules or public enterprise if competitive markets operating under proper incentives are not possible.[11] To achieve energy policy objectives, therefore, it may be necessary to level the playing field by judiciously applying limited-term subsidies to "jumpstart" new technologies, to push markets over a tipping point onto a more efficient long-term path, or to offset advantages given to competing incumbent technologies.

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[11] Many energy markets are highly interrelated, so considering each in isolation misses important indirect effects that policies in one sector may have in another sector. *See, e.g.,* Finn Roar Aune, Rolf Golombek, Sverre A.C. Kittelsen, & Knut Einar Rosendahl, *Liberalizing the Energy Markets of Western Europe—a Computable Equilibrium Model Approach*, 36 APPLIED ECON. 2137 (2004). Some energy markets are also largely beyond the immediate reach of U.S. regulatory or antitrust enforcement. The global market for crude oil, for example, is governed by OPEC—the most injurious cartel in history.

C. Deferring to Antitrust Principles in Enforcing the Rules of Competition and Designing Regulatory Policies

Competition policy in energy markets is best promoted by giving a significant amount of deference to antitrust in enforcing rules and aiding in the design of regulatory policies so as to minimize their effect on undermining competition. This general concept was echoed by Antitrust Modernization Commission (AMC), when it stated in its 2007 final report:

> When the government decides to adopt economic regulation, antitrust law should continue to apply to the maximum extent possible, consistent with that regulatory scheme. In particular, antitrust should apply wherever regulation relies on the presence of competition or the operation of market forces to achieve competitive goals . . . . Courts should interpret savings clauses to give deference to the antitrust laws, and ensure that congressional intent is advanced in such cases by giving the antitrust laws full effect.[12]

However, the U.S. antitrust laws cannot deem illegal some of the most troubling anticompetitive conduct that we see in electricity markets, including the type of withholding that was the source of the California energy crisis. Even if antitrust cannot address this problem, it is still important for antitrust principles to shape regulatory policy approaches. This includes ensuring that electricity markets are appropriately designed and structurally conducive to competitive outcomes. Antitrust principles can also ensure that market monitoring does not create incentives for anticompetitive conduct or chill incentives for entry by lower-cost, low carbon technologies.

Similarly, achieving the goal of capping GHG emissions is best achieved by an allowance trading program or an emissions tax. These instruments rely on decentralized decisions, based on market signals, to determine how the emissions goal will be accomplished. The role of competition policy is to assure that the responses to price signals are made competitively, so that compliance costs are minimized. This requires a market design that minimizes concentration to avoid strategic behavior, and good information such as clear price signals, and low transactions costs for trading.

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[12] ANTITRUST MODERNIZATION COMM'N, REPORT AND RECOMMENDATIONS 338 – 39 (2007), *available at* http://govinfo.library.unt.edu/amc/report_recommendation/toc.htm [hereinafter AMC REPORT].

D. Considering Multiple Stakeholders in Energy Policy

Competition policy must be sensitive to the fact that numerous stakeholders and oversight authorities, each with different objectives and statutory mandates, can potentially influence energy policy outcomes. These include: the federal antitrust agencies, DOJ and FTC, the federal energy regulatory agency, FERC, the Department of Energy (DOE), the Environmental Protection Agency (EPA), RTOs, the North American Electric Reliability Council (NERC), and state regulatory commissions and offices of attorneys general. This complex mix implies that analysis and recommendations concerning the competitive aspects of energy policy cannot be directed at any single or subset of agencies or interest groups.

A workable competition-based approach to energy policy must consider how each interest participates in shaping approaches and implementation without the process getting out of hand. For example, a number of proposals and policies attack the problem of "high" gasoline prices, including: anti-price gouging laws, oil import taxes, gasoline taxes, proposals to break up the petroleum industry, development of a government-owned and operated strategic petroleum refinery reserve, divorcement and open supply laws, and enforcing the Sherman Act against OPEC. Uncoordinated and haphazardly applied state and federal policies with different missions and priorities can create severe market distortions and ultimately work against competition policy objectives. Special effort should thus be made to avoid conflicting policies and to encourage coordination among federal agencies with multiple enforcement authority and between federal and state programs.

III. Electricity Restructuring, Market Design, and Merger Review Authority

Perhaps more than any other industry, electricity demonstrates the limits of the market and the challenges of market restructuring. The industry landscape has long been dominated by vertically integrated utilities, but this picture of the industry has become far more diverse. Stand alone distribution companies, merchant generators, plus nonmarket institutions (e.g., RTOs) and reliability standards organizations (e.g., NERC) all now play significant roles. Thus, competition policy faces the hurdle of balancing the strengths of the market against the comparative advantage of other nonmarket mechanisms.

Two of the major outcomes of restructuring are the forms of market organization and the approaches to dealing with the discrimination problem, namely vertically integrated transmission owners frustrating or denying access by rival generators to the grid. In the first case—market organization—trading in many parts of the United States is organized around centralized auction markets for energy, capacity, and other products in six major RTOS. In the remainder, bilateral trading (without an RTO) is the major form of market organization.[13] In the second case—addressing discrimination—we see "functional" unbundling of transmission and generation in most bilateral markets, whereby open access, interconnection standards, and standards of conduct remain the only restraints against discrimination.[14] In RTO markets, "operational" unbundling requires vertically integrated transmission owners to turn over control of their systems to an RTO.[15]

Hindsight has given us much to think about in regard to the efficacy of FERC's policy choices. "Structural" (as opposed to functional or operational) unbundling (i.e., divestiture of generation) has much to recommend it in terms of eliminating the incentive for exclusionary conduct. But some evidence indicates that divestiture could jeopardize the economies of coordination associated with vertically integrated ownership of generation and transmission.[16] Whether mandatory RTOs would have been the better policy choice is also unclear. Critics cite the high costs of setting up and implementing

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[13] There are seven operating RTOs in the United States: the Pennsylvania-New Jersey-Maryland Interconnection; New York Independent System Operator; Independent System Operator New England; California Independent System Operator; the Southwest Power Pool; Midwest Independent Systems Operator; and ERCOT (Texas).

[14] *See generally* Regional Transmission Organizations, Order No. 2000, 81 FERC ¶ 61, 285 (2000) and Order on Rehearing, Order No. 2000-A, 90 FERC ¶ 61,201 (2000); Standardization of Generator Interconnection Agreements and Procedures, Order 2003, 104 FERC ¶ 61,103 (2003) and Order 2003-A, 104 FERC ¶ 61,220 (2004); Standards of Conduct for Transmission Providers, Order 2004, 105 FERC ¶ 61,248 (2004) and Order 2004-A, 107 FERC ¶61,032 (2004).

[15] *See* FED. ENERGY REGULATORY COMM'N, PROMOTING WHOLESALE COMPETITION THROUGH OPEN ACCESS NON-DISCRIMINATORY TRANSMISSION SERVICES BY PUBLIC UTILITIES, Order 888, 75 FERC ¶ 61,080 (1996). In antitrust, the discrimination problem is described as "exclusion" (e.g., foreclosure or raising rivals' costs) or denying generators in the wholesale market access to transmission as an input. The objective of unbundling is to reduce or eliminate the ability and/or incentive of the vertically integrated firm to frustrate rivals' attempts to get access to transmission—either because the firm does not control transmission or because it cannot profit from a price increase. The FTC refers to RTO control of transmission as "structural" unbundling, which we reserve for situations in which generation is fully divested from transmission.

[16] Some states, including Pennsylvania, New York, and Nevada mandated divestiture as part of state-level restructuring plans. *See also* John Kwoka, *Vertical Economies in Electric Power: Evidence on Integration and Its Alternatives*, 20 INT'L J. INDUS. ORG. 653 (2002).

RTOs and their involvement in designing a myriad of complex wholesale energy and capacity markets.[17] These latter functions extend well beyond the original intention that RTOs would manage grid congestion and plan transmission. Empirical evidence also indicates that prices in bilateral markets may well be lower than in RTO regions.[18] Moreover, RTOs raise a seemingly intractable set of equity and efficiency questions, including who pays for new transmission and approaches to congestion pricing.

Even this brief snapshot illustrates that the stakes and challenges in electricity restructuring are enormous and the competition problem pervasive. For example, the effort to advance the cause of developing retail electricity prices that track wholesale prices has been a long and frustrating process. Indeed, the entire retail pricing system for electric power in most states contravenes the core economic principle of prices that reflect marginal costs. This is because a flat rate scheme creates massive subsidies for consumption when costs are highest, massive penalties for consumption when costs are lowest, and simultaneously *invites* generators to try to exercise market power. Moreover, persistent price-cost gaps are common in centralized energy markets, there are periodic price spikes and outages, and strategic withholding is commonplace. Mergers have changed the structure of regional electricity markets that are characterized by high barriers to entry. All of these factors threaten the intended benefits of restructuring. The challenge for competition policy is therefore to determine the correct roles for antitrust and regulation.

A. The Problem of Market Power

Perhaps the most pressing competitive problem in both centralized and bilateral electricity markets is market power and its effects on short-term market efficiency and longer-term innovation and entry by low carbon and potentially more efficient generation

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[17] *See, e.g.*, AM. PUB. POWER ASS'N, CONSUMERS IN PERIL: WHY RTO-RUN ELECTRICITY MARKETS FAIL TO PRODUCE JUST AND REASONABLE RATES (2008), *available at* http://www.appanet.org/files/PDFs/ConsumersinPeril%2Epdf. For a list of the markets operated by most RTOs, see, for example, FED. ENERGY REGULATORY COMM'N, 2006 STATE OF THE MARKETS REPORT 21 (2007), *available at* http://www.ferc.gov/market-oversight/st-mkt-ovr/som-rpt-2006.pdf.

[18] Electricity prices have increased nationally and in particular regions of the country in the last five to ten years. These increases are likely due to escalating fuel costs but also to the high costs of restructuring electricity markets. *See, e.g.*, John Kwoka, *Restructuring the U.S. Power Sector: A Review of Recent Studies* (2006), *available at* http://www.appanet.org/files/PDFs/RestructuringStudyKwoka1.pdf.

technologies. Electricity displays a number of characteristics that make markets potentially susceptible to the exercise of market power. Most electricity markets are dominated by just a few firms, many of which possess significant market power during certain times of the year and depending on transmission constraints.

The probability of exercising market power is higher in the presence of high market share, high concentration, vertical integration, and little or no ability of consumers to adjust demand based on price signals. Elasticities of demand and supply are typically very low. Thus, the more insensitive consumption is to price, the higher a price increase will be if a monopolist withholds output.[19] Similarly, supply inelasticity during times when capacity is constrained contributes to high price increases, since at high levels of demand, higher-cost resources must be brought into service if marginal or inframarginal resources are withheld.[20]

The California electricity crisis of 2000 – 2001 is perhaps one of the best examples of how market power can significantly harm consumers. The crisis was triggered largely by poorly conceptualized deregulation and market design. For example, retail regulatory restraints interacted with unfettered market forces in wholesale markets that were unregulated but nonetheless noncompetitive.[21] The state restructuring plan capped the retail price electric utilities could charge and required those same utilities to purchase electricity from spot markets at unregulated prices. Thus, when electricity demand

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[19] For basic discussion, see, for example, Gregory J. Werden, *Identifying Market Power in Electric Generation*, 134 PUB. UTIL. FORTNIGHTLY 4, 16 (1996); Chris Decker & Tim Keyworth, *Competition Law and Commodity Markets: The Case of Wholesale Electricity*, 22 ECON. AFFAIRS 32 (2002).

[20] 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. *See, e.g.*, Richard Green, *Did English Generators Play Cournot?* (Univ. of Cambridge, Department of Applied Economics Working Paper CWPE 0425, 2004), *available at* http://www.econ.cam.ac.uk/electricity/publications/wp/ep41.pdf.

[21] Critics point out that the failure of FERC's first-generation market-based rate policy was a contributing factor to the California energy crisis. At that time, FERC used a ≤ 20 percent market share threshold as evidence that a generator lacked market dominance. However, FERC's approach to defining markets in market-based rate proceedings failed to account for transmission constraints and used installed capacity (instead of the capacity that could discipline a price increase) as a basis for calculating market shares. The net effect was large, unconcentrated markets comprised of firms with small market shares. *See, e.g.*, Timothy Duane, *Regulation's Rationale: Learning from the California Energy Crisis*, 19 YALE J. ON REG. 471, 514 (2002); BILL LOCKYER, ATTORNEY GENERAL'S ENERGY WHITE PAPER: A LAW ENFORCEMENT PERSPECTIVE ON THE CALIFORNIA ENERGY CRISIS (2004). *See also* John Kwoka, *Unilateral Withholding: Market Power and California's Electricity Crisis* (George Washington University Discussion Paper 01-01, 2001).

increased, the utilities had no incentive to expand output, and wholesale prices rose; but recovery of those costs was limited by the retail price cap.[22] Nonutility entities such as marketers (e.g., Enron) exacerbated the problem by creating artificial shortages or transmission congestion to drive up wholesale prices.

Typically we think of market power as exercised in one of two ways. One is classical market power, withholding capacity to drive up price, for which there are two possible strategies. For example, a firm acting unilaterally or in coordination with other firms can physically withhold generation output to drive up prices by shutting down a generator (e.g., for "maintenance").[23] Firms can also engage in economic withholding, or strategically bidding above marginal cost. The probability of harm from withholding is greater as the shares of individual firms and market concentration increase. This harm is transmitted directly to consumers through higher prices.

A second type of market power is vertical in nature and involves exclusion or limiting rival generators' access to the transmission needed to deliver electricity to consumers. Here, there are three potential strategies. First, the vertically integrated firm can dispatch generation out of "merit" order (i.e., other than from least to highest marginal cost) to create transmission congestion, exclude rivals from access to transmission, and thereby increase prices. Second, firms can strategically restrict output to create transmission congestion in an area of market dominance, thereby excluding rivals and raising price. Finally, reliability concerns are often cited as a basis for denying or providing lower quality transmission access to a rival generator—particularly renewables such as wind and distributed generation.[24] High markets shares and concentration also make the probability of harm from exclusionary conduct more likely. But unlike classical market power,

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[22] Environmental restrictions in California and low-water conditions in the Pacific Northwest placed additional constraints on supply.

[23] This type of withholding was the source of competitive concern in high profile mergers such as *Exelon/Public Service Electric and Gas. See, e.g.*, United States v. Exelon Corp. & Public Service Enterprise Group Inc., Competitive Impact Statement, Case No. 1:06CV01138 (D.D.C. 2006).

[24] *See, e.g.*, Diana L. Moss. *Competition or Reliability in Electricity? What the Coming Policy Shift Means for Restructuring*, 17 ELECTRICITY J. 11 (2004). For discussion of the unique properties of electricity that make markets problematic, see, for example, John Kwoka and Kamen Madjarov, *Making Markets Work: The Special Case of Electricity*, 20 ELECTRICITY J. 24 (2007).

exclusionary conduct harms consumers indirectly by first raising rivals' costs, which then result in higher consumer prices. Despite FERC policies designed to prevent it, discrimination in the electric power industry continues to be problematic.

In addition to harming competition and consumers in the shorter-term, exclusionary conduct also promotes other adverse affects over the longer term, namely it creates a barrier to entry to new, potentially more efficient generation, thereby stifling innovation. Supracompetitive prices associated with withholding can create incentives for entry by generators with costs higher than would be profitable under competitive market conditions. If market power problems remain uncorrected, this situation is exacerbated if certain generation technologies receive subsidies that artificially lower production costs or if the market monitoring regime changes. For example, if subsidies disappear or if market monitoring becomes more stringent by lowering price caps, high-cost incumbents and entrants are potentially at risk for becoming uneconomic.

B. Market Design

One challenge for competition policy is that the tools for addressing market power in electricity are in many cases absent, inadequate, or of limited applicability. For example, antitrust can, by design, do little to punish withholding of the sort witnessed in California. The logic for this is well-known, as Donald Turner noted in 1962:

> to hold 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 non-competitive oligopoly pricing."[25]

Outside of merger review or a successful Section 1 case involving tacit or explicit collusion, the inability of the antitrust laws to reach withholding narrows the scope of antitrust to Section 2 cases involving the alleged exclusion of rivals from access to transmission. However, a section 2 monopolization claim would require proof that a generator possessed monopoly power and took unfair, exclusionary actions to attain or

[25] Donald F. Turner, *The Definition of Agreement Under the Sherman Act: Conscious Parallelism and Refusal to Deal*, 75 HARV. L. REV. 622, 669 (1962).

maintain such power.[26] Where FERC has granted market-based rate authority based on a finding of competitive markets, such a showing could be more burdensome.

Moreover, federal antitrust claims are hampered by limitations imposed by the filed rate doctrine. Under the doctrine, a plaintiff cannot sue an electricity supplier based on rates that—though they are alleged to be the result of anticompetitive conduct—were filed with the federal agency responsible for overseeing such rates.[27] Overbroad application of judicially created exemptions from the antitrust laws such as the state action doctrine, implied immunity doctrine (as applied in *Credit Suisse*), and primary jurisdiction doctrine can also impede the effective application of antitrust laws in the electricity sector.

These limitations leave much of the business of dealing with exclusionary conduct and withholding to regulators under the "just and reasonable" standard in Section 205 of the Federal Power Act. In RTO markets, FERC seems satisfied that operational unbundling has addressed the problem of discrimination. But in bilateral markets, it is increasingly clear that regulatory restraints on discrimination provide insufficient tools to police the harmful discrimination that still occurs.[28] To detect and deter withholding, a regulation-intensive system of RTO-based market monitoring has sprung up.

Perversely, the uniform-price markets that typify most RTO-based energy markets can actually encourage withholding in the presence of market power.[29] A firm that owns both marginal capacity that could be withheld to drive up price *and* inframarginal capacity that

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

[27] *See, e.g.*, Montana-Dakota Util. Co. v. Nw. Pub. Serv. Co., 341 U.S. 246, 251 – 52 (1951)*;* James R. Atwood, *Antitrust, Joint Ventures, and Electric Utility Restructuring: RTGs and POOLCOs*, 64 ANTITRUST L. J. 323 (1999); Public Util. Dist. No. 1 v. IDACORP Inc., 379 F.3d 641 (9th Cir. 2004).

[28] FED. TRADE COMM'N, COMMENT ON STANDARDS OF CONDUCT FOR TRANSMISSION PROVIDERS, FERC Docket No. RM07-10000 (May 7, 2008).

[29] The U.K. transitioned from uniform to pay-as-bid pricing in the early 2000s. 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* 2 (2001) (Blue Ribbon Panel Report, study commissioned by the California Power Exchange).

could profit from a price increase might in fact be in an ideal position to withhold. This is because in a uniform-price auction, *all* output sold receives the market-clearing price.[30] This also means that nonwithholding sellers of output from inframarginal capacity benefit from supracompetitive price increases. And since there is less chance that competitors will complain about the exercise of market power under these circumstances, competition enforcement is denied an important source of information about suspected abuse.

Market monitoring regimes thus use a variety of regulatory tools, including a mix of ex ante price caps or structural market tests and ex post automatic penalties for bidding above cost-plus.[31] Effective market monitoring assumes that regulators have correctly defined and identified the exercise of market power (as opposed to scarcity), that they have accurately measured costs and the appropriate adder that serve as a cap on price, and that penalties are punitive enough to deter future bad behavior. Getting all of these estimates right is a tall order. And it arguably puts the regulator—who is likely to have imperfect information—in a position of second guessing the complexities and vagaries of the market.

Moreover, the combination of ex ante and ex post mitigation practiced in most U.S. RTOs potentially creates adverse incentives for market incumbents and new entrants.[32] Price caps that are too high or lax monitoring can encourage withholding and inefficient entry by high-cost generators. Price caps that are too low or overly aggressive monitoring can discourage efficient entry and chill competition. Moreover, ongoing changes to the regulatory regime can alter the profitability of generators that are in the market, creating regulatory uncertainty and potentially stranding investment or preventing owners of assets from recovering their costs of investment.

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[30] The actual cost/benefit analysis would compare the losses on the marginal capacity withheld to the gains on the inframarginal capacity still in the market. If the former exceeds the latter, then withholding is profitable (assuming an accurate assessment of the risks of detection).

[31] *See, e.g.*, David B. Raskin, *The New Antitrust Regulators?,* 11 ELECTRICITY J., 15 (1998).

[32] For an extensive discussion of market power mitigation in the U.S. and abroad, see, for example, THE BRATTLE GROUP, REVIEW OF PJM'S MARKET POWER MITIGATION PRACTICES IN COMPARISON TO OTHER ORGANIZED ELECTRICITY MARKETS (2007), *available at* http://www.pjm.com/committees/mrc/downloads/20070926-item-13-brattle-mitigation.pdf.

C. Merger Review Procedures

Electricity restructuring policy initiatives over the last two decades have wrought significant changes in the industry. These include new market and nonmarket institutions, a changed ownership structure of transmission and generation, the use of the transmission system to accommodate higher volumes of wholesale transactions, and the introduction of new market participants such as power marketers, financial risk managers, and (increasingly) private equity firms. Superimposed on this background is a wave of merger activity that has further altered the structure of regional markets and incentives faced by both buyers and sellers. For example, roughly 100 electricity mergers were proposed between 1992 and 2006, totaling about $300 billion in assets with large transactions (i.e., in excess of a billion dollars) accounting for about 66 percent of the total.[33] Two-thirds of the transactions combined vertically integrated systems containing generation, transmission, and distribution, and one-third combined electric assets with upstream fuel or fuel transportation.

Mergers are important because while they can improve efficiency by lowering transactions costs and creating economies of scale, scope, and coordination, they can also create or enhance market power. However, merger-related efficiencies are easy to claim but often elusive in practice. In electricity there is even evidence that mergers have not resulted in efficiencies. Multiple agencies are involved in the review of electricity mergers—FERC, either DOJ or the FTC, and state regulatory commissions. But regulatory and antitrust agencies apply different standards of review, approaches to data collection, economic analysis, and remedies. These disparities create a good deal of uncertainty about the merger review process, potentially imposing redundancies and costs on consumers and the merging parties, unnecessary complexity in the review

[33] About 25 percent of these transactions were never consummated. This could reflect either a change of mind by one of the parties or a decision not to proceed, once there was some indication of enforcement interest.

process, and conflicting outcomes and remedies. [34] The AMC noted this concern in its 2007 final report when it stated "[r]eview by two different government agencies can impose substantial and duplicative costs. It can also lead to conflict."[35]

The electricity merger review "thicket" is becoming increasingly apparent as transactions are proposed with larger horizontal and vertical footprints. For example, the Exelon/Public Service Electric and Gas merger was approved by FERC with the parties' proposed up-front fixes and was challenged by DOJ and settled through a consent decree that required additional divestitures. But the deal ultimately failed to garner the approval of the New Jersey Board of Public Utilities without yet additional divestitures and other requirements. This experience highlights the potential conflicts created by dual regulatory and antitrust review.

For example, the difference between the antitrust "no harm to competition" standard and the regulatory "public interest" standard [36] can result in a merger challenge by an antitrust agency but approval by a regulatory agency if public interest factors (e.g., ratepayer protection, reliability, etc.) are deemed to outweigh anticompetitive effects. A number of other differences are also apparent. For example, in a prosecutorial-style antitrust investigation, the agency talks to numerous parties, including the merging firms and their customers, rivals, RTOs, and market monitors. All information is kept confidential and supports the examination of all the DOJ/FTC Horizontal Merger

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[34] FERC's merger review standards and analytical approach have a long and controversial history. For more extensive discussion and critique, see, for example, AMERICAN ANTITRUST INSTITUTE, AAI AND SIX MERGER POLICY EXPERTS PEN LETTER TO FERC ON ELECTRICITY MERGER REVIEW (2007), *available at* http://www.antitrustinstitute.org/Archives/Letter_to_FERC_on_SPS.ashx; FED. TRADE COMM'N, 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 (1996), FERC Docket No. RM96-6, *available at* http://www.ftc.gov/be/v950008.pdf.

[35] AMC REPORT, *supra* note 13, at x.

[36] The antitrust agencies enforce Section 7 of the Clayton Act (the FTC additionally enforces Section 5 of the Federal Trade Commission Act), which makes illegal mergers or acquisitions with effects that may "substantially . . . lessen competition or . . . tend to create a monopoly." *See* 15 U.S.C. § 45 and 15 U.S.C. § 18. FERC is charged under Section 203 of the Federal Power Act with finding that an electricity merger is consistent with the "public interest." This assessment is based on the evaluation of four factors: the effect on competition, ratepayer protection, the effect on regulation, and cross-subsidization. *See* 16 U.S.C. §824b (2000). The Energy Policy Act of 2005 expanded FERC's authority to review mergers involving certain generation assets and added a fourth public interest factor (no cross-subsidization). *See* Energy Policy Act of 2005, Pub. L. No. 109-58, 119 Stat. 594 (2005).

Guidelines' (Guidelines) factors, including market definition, competitive effects, entry, and efficiencies.[37] The DOJ and FTC typically rely on several sources of analysis in rendering decisions: their own assessments, information gathered from third parties, and the merging parties' analyses.

On the other hand, FERC regulations require that merger applicants use data from publicly available sources to show that the transaction will not harm competition.[38] Since most data in the public domain pertains to demand, market prices, generation costs and capacity, and transmission costs, capacity, and constraints, FERC's analysis really focuses on only two of the Guidelines factors—defining relevant markets and assessing the effect on concentration.[39] But publicly available data provides little or no support for the remainder of the Guidelines factors. This information is more likely to be revealed in confidential documents such as strategic and marketing plans, customer proposals and contracts, and internal communications that would be produced in an antitrust investigation. FERC also relies almost entirely on the applicants' analysis of their *own* transaction. In many cases, however, much of that analysis is inconsistent, calling into question the quality and predictability of the agency's decisionmaking.[40]

Bypassing key steps in a Guidelines-type analysis, relying on public data, and using applicant-filed analysis leaves an incomplete record. Entry and efficiencies can in some cases mitigate anticompetitive harm, so ignoring their effects can lead to a remedy for a nonproblematic merger. Similarly, an inadequate or unsuitable remedy may result from

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[37] DEP'T OF JUSTICE & FED. TRADE COMM'N, HORIZONTAL MERGER GUIDELINES, 57 Fed. Reg. 41,552 (1992), revised, 4 Trade Reg. Rep. (CCH) ¶13,104 (1997).

[38] The use of publicly available information in FERC filings and observance of ex parte rules, for example, promote the advocacy that characterizes a regulatory administrative process, allowing intervenors to corroborate applicants' analysis and findings.

[39] FED. ENERGY REGULATORY COMM'N, INQUIRY CONCERNING THE COMMISSION'S MERGER POLICY UNDER THE FEDERAL POWER ACT: POLICY STATEMENT, Order No. 592, 61 Fed. Reg. 68,595 (Dec. 30, 1996); FERC Stats. & Regs. ¶ 31,044 (1996); FED. ENERGY REGULATORY COMM'N, REVISED FILING REQUIREMENTS UNDER PART 33 OF THE COMMISSION'S REGULATIONS: FINAL RULE, Order No. 642, 65 Fed. Reg. 70,983 (Nov. 28, 2002); Filing Requirements Rule, FERC Stats. & Regs. ¶ 31,111. Ratepayer protection ensures that no merger-related costs are passed through to wholesale customers.

[40] *See, e.g.*, Diana L. Moss, *Antitrust Versus Regulatory Merger Review: The Case of Electricity*, 32 REV. INDUS. ORG. (forthcoming 2008).

the failure to articulate a clear theory of competitive harm. Moreover, even if a FERC-imposed remedy were suitable, there is still the issue of what type of remedy the agency imposes. The DOJ and FTC have typically taken the position that structural remedies such as divestiture of assets are superior to behavioral (i.e., conduct-based) fixes. Divestiture permanently reduces or eliminates the ability and incentive to adversely affect prices or output while behavioral fixes for mergers require ongoing oversight and reporting—something that regulators (not courts) are well-equipped to do. FERC, on the other hand, generally adopts conduct-based approaches ranging from monitoring of wholesale electricity markets, to contracts for the sale of output from generators (e.g., "virtual divestiture"). In some cases, FERC has accepted proposed up-front divestitures of generation assets that often do not specify the specific assets to be sold or their prospective buyers.

D. The Role for Competition Policy

What role can competition policy productively play in electricity markets? It is clear that electricity markets do not, in general, possess the characteristics that would lead to efficient outcomes in the short- and long-run. Thus, electricity restructuring must be accompanied by some centralized regulation—something that the vastly different experiences involving RTOs in California versus other regions of the country illustrates. Competition policy must therefore determine the correct roles for regulation and antitrust through a number of possible avenues. Regulation must provide clear and consistent rules where market outcomes are likely (e.g., as in gaming or manipulating markets) and maximize the role of competition in driving those outcomes. Competition must focus on underlying structural market conditions that determine whether outcomes are competitive, police anticompetitive conduct when possible, and vigorously enforce mergers.

First, FERC should promote structurally competitive markets through its market-based rate authority. In doing so, the agency should ensure that its methodology accurately captures the dimensions of electricity markets. Rigorous use of FERC's market-based rate authority review can ensure structurally competitive markets that minimize the need for excessive monitoring and mitigation of market power by RTOs.

Second, proposals for the establishment of new markets or regulatory "patches" to improve poorly functioning markets operated by RTOs should be carefully reviewed by

FERC, preferably in conjunction with the antitrust agencies. An ad hoc approach to correcting poorly functioning markets without returning to first principles of structural integrity, price discovery, and low transactions costs is likely to create more distortions than it cures. RTOs should be gradually steered in the direction of managing transmission and away from designing and operating markets under excessively regulatory frameworks or monitoring schemes.

Third, FERC should attempt to address discrimination problems in bilateral markets by considering more aggressive forms of unbundling generation from transmission. It is in those markets that entry by lower-cost, low-carbon technologies is potentially subjected to the full force of exclusionary conduct. Moreover, impediments to the federal antitrust laws' ability to reach anticompetitive conduct involving wholesale electricity rates, including the state action doctrine and filed rate doctrine, should be removed.

Fourth, the antitrust agencies should take major responsibility for determining whether a merger is likely to adversely affect competition. In its final report, the AMC recommended (1) that Congress take a closer look at the necessity of regulatory merger review by asking whether there are public interest factors that Section 7 of the Clayton Act would not adequately protect and (2) that the regulatory agency not "redo" the competition analysis of the antitrust agencies.[41] While this latter recommendation is subject to some interpretation, the antitrust agencies could take the lead in performing competitive analysis while the regulatory agency cites to or otherwise incorporates the antitrust analysis in its merger order. Short of relegating competition analysis in merger cases to a single agency, ongoing collaboration between the FERC, DOJ, and the FTC, and FERC's use of data requests, technical conferences, and trial-type hearings to perform a more complete Guidelines analysis, could harmonize the multiagency merger review process.

Fifth, major cost savings and environmental benefits can stem from giving economically appropriate standing for energy efficiency and conservation. This includes demand response to compete with generation, such as metering and entry conditions. The structure of electricity markets can be fundamentally more competitive if customers can

[41] AMC REPORT, *supra* note 13, at 342.

offer demand response in competition with generators. Providing utilities and consumers incentives to invest in demand response by decoupling utility profits from sales of megawatt-hours and providing consumers information on the benefits of efficiency and conservation would go a long way in promoting adjustment to a lower-carbon, more efficient generation portfolio.

Sixth, as noted earlier, one of the major ways in which competition policy can promote more efficient outcomes in energy markets is through retail prices that reflect marginal costs—or even approximations of marginal cost. While fundamental, this principle is very far from actual practice in U.S. energy policy. Despite the opposition to such policy, we strongly advocate educating consumers and policymakers about the harm from flat electricity rates both in terms of consumption and also in terms of distorted investment and innovation decisions in the energy sector

IV. Markets for Trading Carbon Emissions Allowances

There are currently nine bills in the 110th Congress for the reduction of GHG emissions in the United States. Most proposals favor a cap-and-trade approach to meeting the reduction targets.[42] Incentive-based systems, such as trading and emissions taxes, are instruments that rely on decentralized decisionmaking based on market signals to determine how the emissions goal will be accomplished. Regardless of the type of approach, incentive-based approaches to reducing emissions have arguably supplanted the command-and-control approach to meeting environmental goals that was prevalent before the 1990s. Moreover, in the case of carbon, it is notable that emissions are too "ubiquitous" for traditional command-and-control regulation to work effectively.[43] Assuming that emissions can be accurately monitored, incentive systems do not require any particular control technology and promote meeting environmental reduction targets at least cost.

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[42] *See, e.g.*, RESOURCES FOR THE FUTURE, COMPARISON OF EMISSION REDUCTION GOALS IN LEGISLATIVE PROPOSALS IN THE 110TH CONGRESS (2008), *available at* http://www.rff.org/rff/News/Releases/2007Releases/loader.cfm?url=/commonspot/security/getfile.cfm&PageID=29177.

[43] Inho Choi, *Global Climate Change and the Use of Economic Approaches: The Ideal Design Features of Domestic Greenhouse Gas Emissions Trading with an Analysis of the European Union's CO_2 Emissions Trading Directive and the Climate Stewardship Act,* 45 NAT. RESOURCES J. 865, 877 (2005).

At the most basic level, the difference between cap-and-trade and taxes is that under the former, the market for emissions allowances determines their price while under the latter, the government sets the price directly. The debate over cap-and-trade versus a tax to limit carbon emissions is important since both approaches have implications for economic efficiency, political feasibility, revenue generation, incentives for rent-seeking, and administrative costs.[44] One criticism of cap-and-trade is that it carries with it considerable administrative and transaction costs. It is also worth noting that a carbon tax would obviate some of the competition policy concerns regarding market design that cap-and-trade raises. While cap-and-trade and taxes are economically attractive alternative strategies, politics seems to be moving to cap-and-trade, and thus the major focus of competition policy should be market design, as discussed in the following sections.

A. How Emissions Allowance Trading Works

Establishment of emissions allowance markets follows a general consensus that enhanced price discovery, lower transaction costs, and the ability to monitor centralized trading activity will allow the competitive process to work better and thus deliver benefits to consumers. Emission trading is based on the issuance of emissions *allowances*, which give the holder the right to emit a specific amount of a pollutant. The total number of allowances is administratively set by the cap.

Once allowances are issued, firms must make a number of decisions, depending on the least-cost option. One is to install emissions reduction technology (e.g., scrubbers to remove SO_2 or carbon sequestration and storage technology). Another is to burn less polluting fuel. Yet another is to trade allowances, assuming a secondary market for trading allowances. Thus, firms that emit more than their allowance permits can buy allowances from those who pollute less. This way, the buyer pays to pollute and the seller receives a benefit from emitting less than what is allowed. Such a trading scheme

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[44] For a detailed discussion, see, for example, Gilbert E. Metcalf, Sergey Paltsev, John M. Reilly, Henry D. Jacoby & Jennifer Holak, *Analysis of U.S. Greenhouse Gas Tax Proposals*, (MIT Joint Program on the Science and Policy of Global Chance Report No. 160, 2008). Critics of cap-and-trade cite to its effect of worsening price volatility that can discourage investments in low-carbon technology, lengthy time periods required for implementation, complexity and lack of transparency, opportunities for manipulation by special interests, an exclusive focus on electricity, and inequitable distribution of tax revenues. *See, e.g.*, CARBON TAX CENTER, TAX VS. CAP-AND-TRADE, http://www.carbontax.org/issues/carbon-taxes-vs-cap-and-trade/.

equalizes marginal abatement costs across all polluting sources, so that total abatement for all sources is achieved at least cost.[45]

Centralized markets for emissions allowances do not "spring up" unassisted. They are usually designed, implemented, and monitored by regulatory agencies such as the Securities and Exchange Commission, the Commodity Futures Trading Commission, EPA, and FERC. Moreover, they require significant study and planning, with an eye to the lessons of experience. This includes a number of experiments, including the successful U.S. experience in trading SO_2 emissions allowances.[46] The European Union's GHG Emissions Trading Scheme (EU ETS) has been in effect since 2005 and is ten times the size of the U.S. tradeable allowance program for SO_2.[47] Several regional markets in the United States have also been established to trade allowances in NO_x.[48]

B. Design of Auction Markets for Carbon Emissions Allowances

Numerous questions arise in the process of designing an emissions allowance trading system, including the rules of trading, information disclosure, market structure, penalties for the exercise of market power and market manipulation, spatial and sectoral coverage of the trading system, the initial allocation of permits, whether allowances can be banked or borrowed, the organization of trading mechanisms, and the monitoring, enforcement, and compliance system.[49] For example, California has grappled with the problems of assigning reduction responsibility when much of the state's electricity is generated from

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[45] W. D. Montgomery, *Markets in Licenses and Efficient Pollution Control Programs.* 5 J. ECON. THEORY 395 (1972).

[46] *See, e.g.*, Robert Stavins, *What Can We Learn from the Grand Policy Experiment? Lessons from SO_2 Allowance Trading.* 12 J. ECON. PERSP. 69 (1998). For discussion of the European carbon experience, see Joseph Kruger & William A. Pizer, *The EU Emissions Trading Directive: Opportunities and Potential Pitfalls*, RESOURCES FOR THE FUTURE REPORT (RFF DP 04-24, Apr. 2004), *available at* http://www.rff.org/documents/RFF-DP-04-24.pdf.

[47] In 2009, ten northeastern states will begin trading carbon emission allowances under a cooperative, interstate Regional Greenhouse Gas Initiative (RGGI).The SO_2 program has been in place since 1995. *See, e.g.*, the EPA's acid rain program at http://www.epa.gov/airmarkets/progsregs/arp/index.html (last visited June 23, 2008).

[48] Charles Holt, William Shobe, Dallas Burtraw, Karen Palmer & Jacob Goeree, AUCTION DESIGN FOR SELLING CO_2 EMISSION ALLOWANCES UNDER THE REGIONAL GREENHOUSE GAS INITIATIVE: FINAL REPORT (2007), *available at* http://coopercenter.org/econ/rggi_final_report.pdf.

[49] Catherine Boemare and Philippe Quirion, *Implementing Greenhouse Gas Trading in Europe: Lessons from Economic Literature and International Experiences*, 43 ECOLOGICAL ECON. 213, 213 (2002).

coal-fired power plants located outside the state and linking together different emissions programs. It is also important to consider how a cap-and-trade system interacts with other emissions reductions programs, regulations, subsidies, and tax credits.[50]

The design of an auction for the initial sale of allowances should ensure that firm responses to price signals are made competitively so that compliance costs are minimized. A number of features increase the probability of this outcome. One is a lack of market concentration to avoid unilateral or collusive strategic behavior. A second feature is good information such as transparency (i.e., clear price signals) and low transactions costs for bidders. And a third is economic efficiency, i.e., allowances are obtained by those who place the highest value on them.

Virtually every emissions allowance trading initiative has had to resolve the problem of how allowances should be initially allocated to sources of emissions. In some cases, the entire initial distribution is free and in others, such as the RGGI and EU ETS, a certain percentage of allowances is auctioned off. The allocation scheme is important because it has implications for the relative impact of compliance costs on market participants. Free distribution, for example, may minimize the immediate financial impact on firms that create emissions, thereby reducing disruption and the resistance of industry to the program. But this approach can create entry barriers because new entrants must purchase allowances from firms that own them. Auctioning off allowances, on the other hand, has been shown to be generally superior in terms of economic efficiency and revenues can be used to finance a variety of investments or reduce distortionary taxes. [51]

C. The Role for Competition Policy

What role can competition policy productively play in designing GHG emissions markets? How auctions are designed will inevitably imply tradeoffs between economic efficiency, generation of revenues from sales of allowances, and other policy goals. However, some basic features can address key competitive issues. First, as a precursor to

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[50] MARKET ADVISORY COMMITTEE TO THE CALIFORNIA AIR RESOURCES BOARD, RECOMMENDATIONS FOR DESIGNING A GREENHOUSE GAS CAP-AND-TRADE SYSTEM FOR CALIFORNIA iii (2007), *available at* http://www.climatechange.ca.gov/publications/market_advisory_committee/2007-06-29_MAC_FINAL_REPORT.PDF.

[51] Kruger & Pizer, *supra* note 46, at15.

market design, structural issues in carbon markets are worth investigating. For example, it would be worthwhile to do a simple critical loss calculation to determine if any participant in a carbon market has a sufficiently large asset position that the losses it would take on purchasing and withholding allowances would be exceeded by increases in profits to its low-carbon electricity assets. The broader the carbon market, the harder it will be for any single participant or group of participants to affect the carbon price and the less likely it is that withholding will appear attractive to or be likely to succeed. In broader carbon markets, therefore, auction design is perhaps the first line of defense against anticompetitive strategies.

Second, multiple-round (as opposed to single-round) auction formats can provide bidders with opportunities for signaling and detecting deviations from a collusive agreement. Auctions that are open to firms that financially qualify promote competition and limit opportunities for collusion. And rules that prohibit any one firm from purchasing more than a specified percentage of allowances prevent attempts to corner the market by a single market participant.

Third, certain design features can promote transparency, low transactions costs, and incentives for more efficient investment. For example, a more frequent uniform-price format is relatively simple and transparent and promotes price discovery.[52] Treating all allowances equally keeps transactions costs low. Moreover, making future allowances available for auction in advance aids electric utilities in planning investments in new generation.

Fourth, how emissions trading markets are monitored should receive careful attention. Lessons from the RTO experience in electricity markets might be usefully applied to GHG emissions markets. Moreover, since carbon markets are integrally related to underlying energy markets, coordination with the various federal and state authorities that oversee those markets is important.

V. Petroleum Merger Enforcement and Competition Policy

The volume of merger activity over the last two decades has transformed the domestic refining and market industry. The FTC reports 1,165 mergers involving domestic

[52] *Id.* at 6 – 7.

petroleum companies between 1985 and 2003. This activity is valued at roughly $500 billion, with transactions of a billion or more dollars accounting for about 86 percent of the total.[53] Activity in the downstream refining and marketing segment of the industry has been at the center of this flurry of consolidation. For example, while 85 percent of mergers between 1991 and 2000 were in exploration and production, 13 percent involved refining and marketing, and only 2 percent combined pipeline assets, two-thirds of the billion-dollar petroleum mergers in the U.S. involved downstream, integrated refining-marketing assets.[54]

Much of the merger activity in the refining-marketing segments of the domestic industry has occurred against the backdrop of fundamental changes in the structure of the refining sector, ongoing regulatory restrictions on the construction of new refinery capacity, and the shifting roles of the majors and independents. In any industry that has undergone such dramatic changes, enforcing the incipiency standard inherent in Section 7 of the Clayton Act is perhaps the strongest line of defense against the erosion of competition and creation of high entry barriers. [55] Such outcomes create obstacles to entry of low-carbon and potentially more efficient means of generating electricity, fueling the transportation fleet, and meeting industrial energy demands. It is therefore reasonable to ask whether changes in the industry are adequately recognized in the FTC's analysis of refining and marketing mergers.

A. The Difficult Position of the FTC

Much of the blame for high gasoline prices has been laid at the feet of the FTC in approving dozens of large mergers involving domestic refiner-markets over the last two decades. While the debate in the popular press rages over what can be done about

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[53] FED. TRADE COMM'N, THE PETROLEUM INDUSTRY: MERGERS, STRUCTURAL CHANGE, AND ANTITRUST ENFORCEMENT, at Table 4-14 (August 2004).

[54], Factors Contributing to Higher Gasoline Prices, Testimony of Jim Wells, Director, Natural Resources and Environment, Government Accountability Office, GAO-06-412T (Sept. 21, 2005), at 2.

[55] *See, e.g.,* Cargill, Inc. v. Monfort of Colo., Inc., 479 U.S. 104, 124 (1986) ("The Clayton Act, unlike the Sherman Act, proscribes certain combinations of competitors that do not produce any actual injury, either to competitors or to competition. An acquisition is prohibited by § 7 if 'the effect of such acquisition may be substantially to lessen competition, or tend to create a monopoly.' The legislative history teaches us that this Delphic language was designed 'to cope with monopolistic tendencies in their incipiency and well before they have attained such effects as would justify a Sherman Act proceeding.' ") (citations omitted).

"high" gasoline prices, the behind-the-scenes controversy in law and economics is over whether the FTC possesses the tools or perspective to adequately review petroleum mergers against a changed industry landscape. This controversy emphasizes the difficult and dichotomous position in which the FTC is often placed.

One criticism of the FTC is insufficient merger enforcement, even in light of a higher-than-average record of merger challenges in petroleum (i.e., 13 percent versus 2 percent overall). This view is highlighted by the Supreme Court case *Texaco Inc. v. Dagher*. In that case, an *unlitigated* issue was arguably the most important—i.e., that after the joint ventures between Texaco and Shell were approved by the FTC with divestitures, the parties still managed to substantially raise gasoline prices, despite a period of declining crude oil prices.[56] The FTC is also criticized for too-aggressive merger enforcement.[57] In recent years, the FTC's attempts to enjoin mergers in general have repeatedly been slapped down by federal district courts that appear disinclined to enforce the incipiency standard of Section 7. In *FTC v. Foster,* for example, a district court judge denied the FTC's request for a preliminary injunction to stop the merger, noting that projected market concentration was "not substantial compared to the FTC's enforcement record since 2001."[58]

Compounding the controversy over the FTC's role in merger enforcement is a voluminous body of empirical work that examines the price effects of refining-marketing mergers. This work evaluates the effects of increased concentration and post-merger wholesale and retail gasoline prices in the wake of particular horizontal and vertical combinations. The Government Accountability Office (formerly the Government Accounting Office) (GAO) has been at the forefront of this effort with numerous

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[56] *See* Dagher v. Saudi Ref., Inc., 369 F.3d 1108, 1113 (9th Cir. 2004), *rev'd*, Texaco Inc. v. Dagher, 547 U.S. 1 (2006) (The Court found that the setting of identical prices for different brands of gasoline under an economically integrated petroleum refining and marketing joint venture did not violate the per se rule against price fixing under Section 1 of the Sherman Act.).

[57] FED. TRADE COMM'N, ANNUAL REPORTS TO CONGRESS PURSUANT TO THE HART-SCOTT-RODINO ANTITRUST IMPROVEMENTS ACT OF 1976, 20th through 28th reports, Tables X and XI for 2-digit SIC code #29 or 3-digit NAIC code #324.

[58] FTC v. Foster, No. CIV 07-352JB/ACT**,** 2007-1 Trade Cases ¶75,725.

studies of the FTC's merger review process.[59] The FTC, which refutes most of the GAO's results, convened a conference in early 2005 to formalize the debate over merger-related price effects. There, a panel of experts emphasized the need for additional research to "test the validity of assumptions that underlie existing methodologies used to estimate merger price effects."[60] While this debate over relatively technical econometric issues rages on, the mixed empirical record leaves us doubting that the recent spate of petroleum mergers (and specific mergers) has not adversely affected prices for petroleum products paid by U.S. consumers.

B. Changes in the Landscape of Domestic Refining and Marketing

To better understand the role of merger enforcement in petroleum it is important to consider a number of major changes in the industry over the last two decades: (1) the altered market structure and distribution of refinery capacity; (2) changes in the roles of the majors and independents; and (3) high and increasing concentration in refining and wholesaling. Refining is perhaps the most changed segment of the domestic petroleum industry. For example, the number of operating refineries in the United States fell by 44 percent from 1973 to 2004, with no new facility constructed since the mid-1970s.[61]

Much of the decline in numbers of refineries can be explained by reduced incentives to operate small, inefficient facilities and subsequent work-off of obsolete and high-cost capacity induced by the phase-out of crude oil price controls in the early 1980s. Environmental restrictions, boutique fuel requirements, and the MTBE ban have more recently contributed to tight refinery capacity. And while refiners have increased

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[59] *See, e.g.*, GEN. ACCOUNTING OFFICE, GASOLINE PRICE INCREASES IN EARLY 1985 INTERRUPTED PREVIOUS TREND, GASO/RCED-86-165BR (1986); GENERAL ACCOUNTING OFFICE, EFFECTS OF MERGERS AND MARKET CONCENTRATION IN THE U.S. PETROLEUM INDUSTRY, GAO-04-96 (2004). For FTC analysis see, for example, John Simpson & Christopher T. Taylor, *Michigan Gasoline Pricing and the Marathon-Ashland and Ultramar Diamond Shamrock Transactions*, (FTC Working Paper No. 278, 2005) and Christopher T. Taylor & Daniel S. Hosken, *The Economic Effects of the Marathon-Ashland Joint Venture: The Importance of Industry Supply Shocks and Vertical Market Structure*, 55 J. INDUS. ECON. 419 (2007).

[60] Luke M. Froeb, James C. Cooper, Mark W. Frankena, Paul A. Pautler & Louis Silvia, *Economics at the FTC: Cases and Research, with a Focus on Petroleum*, 27 REV. INDUS. ORG. 223, 237 (2005).

[61] FED. TRADE COMM'N, *supra* note 53, at Table 7-1.

distillation capacity by 15 percent,[62] refinery utilization rates have increased markedly since the early 1980s, peaking at around 95 percent in the late 1990s.[63] Moreover, about 55 percent of U.S. operating distillation capacity in 2006 was in refining facilities with capacities greater than 200,000 barrels per day—a 36 percent increase over the last two decades.[64] Currently, a relatively few, large facilities thus account for more than one-half of total U.S. refinery capacity.

The foregoing analysis raises concerns that refining in the United States is effectively a bottleneck in the production chain. In general, bottlenecks can have dramatic effects on prices, particularly when they are operated at the high utilization rates that have characterized the industry for several years. If consumption increases when capacity is tight, price increases reflect scarcity and appropriately ration demand. But if refiners deliberately shut down refining capacity (i.e., withhold), the supracompetitive price increase will directly harm consumers. Refining thus shares much in common in this regard with electricity: because capacity exists in discrete "chunks" that are utilized in increasing order of their marginal costs, one firm often owns more than one type of capacity, and demand fluctuates over time. Moreover a refiner or group of refiners need not hold a large share of capacity to profit from a withholding strategy. Even a small amount of capacity, if strategically withdrawn from the market, can produce a large price increase from which all firms with inframarginal capacity will benefit. The growth in size of refining facilities exacerbates such price effects because an outage at one large facility affects large volumes of refined products.

A second factor affecting the domestic industry landscape has been a fundamental shift in the role of the majors and independents over time. For example, a period of low profitability in the 1990s forced the majors to refocus their strategy on regional profit centers, resulting in spin-offs of refining capacity to the former independents. Refining

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[62] ENERGY INFO. ADMIN., U.S. OPERABLE CRUDE OIL DISTILLATION CAPACITY (THOUSAND BARRELS PER DAY) (updated October 26, 2007), *available at* http://tonto.eia.doe.gov/dnav/pet/hist/mocleus2m.htm.

[63] FED. TRADE COMM'N, *supra* note 53, at Table 7-1. Among other things, higher utilization minimizes the opportunity cost of holding excess capacity. *See, e.g.*, Jeremy I. Bulow, Jeffrey H. Fischer, Jay S. Crewell, Jr., & Christopher T. Taylor, *U.S. Midwest Gasoline Pricing and the Spring 2000 Price Spike*, 24 ENERGY J. 121 (2003).

[64] ENERGY INFO. ADMIN., RANKING OF U.S. REFINERIES (2007), *available at* http://www.eia.doe.gov/neic/rankings/refineries.htm and FED. TRADE COMM'N, *supra* note 53, at Table 7-4.

capacity owned by the majors fell from 72 percent in 1990 to 54 percent in 1998.[65] At the same time, the independents tripled their share of capacity from 8 percent to 23 percent, about two-thirds of which was based on assets acquired from the majors by firms such as Citgo/PDV America, Ultramar Diamond Shamrock, and Valero Energy. [66] Realignment of players in downstream markets contributes to harder-to-measure changes that merger analysis often dodges, such as the degree of vertical integration in upstream refining and downstream retail gasoline markets.[67] Moreover, when coupled with ownership of a bottleneck segment such as refining, integration raises particular concerns about foreclosure and the leverage of market power to the retail gasoline outlet level.

A third important consideration is high and increasing concentration in refining and wholesale markets. Market structure is likely to be at the heart of most major competition policy questions involving petroleum markets. Where debates over market structure in other industries can turn on the ease of entry and the role of innovation in expanding the scope of markets, energy markets are still defined largely around constrained transportation networks and production cost differentials. Data from merger transactions over the last twenty years indicate refining market concentration ranging from 1,800 to as high as 6,700 HHI.[68] Similarly, concentration in wholesale (e.g., terminalling or bulk supply) markets ranges from 1,565 to 4,600 HHI.[69]

Coupled with high concentration in specific markets, we also find increasing levels of market concentration in refining and wholesaling. Petroleum Administration for Defense Districts (PADDs) data for regional markets shown in Table 1 indicate double digit percentage increases in concentration from 1994 to 2002 in all the PADDs, with some areas moving from moderately to highly concentrated. These increases have likely been

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[65] ENERGY INFO. ADMIN., THE U.S. PETROLEUM REFINING AND GASOLINE MARKETING INDUSTRY (2004), *available at* http://www.eia.doe.gov/emeu/finance/usi&to/downstream/index.html.

[66] ENERGY INFO. ADMIN., U.S. DOWNSTREAM INDEPENDENTS ACQUIRE NATIONAL PROMINENCE IN THE 1990S (2001). *available at* http://www.eia.doe.gov/emeu/finance/sptopics/restructure/highlite4.html.

[67] *See* Justine S. Hastings & Richard J. Gilbert, *Market Power, Vertical Integration and the Wholesale Price of Gasoline*, 53 J. INDUS. ECON. 469, 470 (2005).

[68] FED. TRADE COMM'N, *supra* note 53, at Table 2-5.

[69] *Id.*

triggered by the gradual shutting down of refining capacity over time, the aggregate effect of mergers that *do not* exceed the Guidelines thresholds but nonetheless increase market concentration, and the effect of mergers that have not been adequately remedied. High concentration is problematic because it increases the probability of coordination among refiners.[70] For example, refiners can tacitly or explicitly collude on output or on investment in new capacity by suppressing excess refining capacity and using swap agreements as a means of restraining capacity and preserving market discipline.[71] Any discipline that new entry would bring to refining markets, however, is precluded by high sunk costs, environmental regulations, and the declining availability of domestic crude inputs.

Table 1

Changes in Refining, Wholesale, and Brand Concentration by PADD District (1994-2002)

Region	***Refining Concentration***			***Wholesale Concentration***		
	1994 (HHI)	***2002 (HHI)***	***% Diff.***	***1994 (HHI)***	***2002 (HHI)***	***% Diff.***
PADD I (East Coast)	1,742	2,126	31.3	1,125	1,343	19.9
PADD II (Midwest)	706	1,019	46.4	1,096	1,676	53.0
PADD III (Gulf Coast)	577	965	67.2	793	1,158	46.1
PADD IV (Mountain)	1,113	1,319	19.1	1,390	1,639	17.9
PADD V (West Coast)	1,011	1,246	24.3	1,699	1,961	15.4

Source:
Federal Trade Commission, *supra* note 53, at Tables 7-7, 9-6, and 9-7. Notes: 1994 HHI statistics for refining based on interpolation. Brand concentration based on state-level data, averaged to the PADD level.

[70] Numerous factors make refining more conducive to coordination. Wholesale refined products are relatively homogeneous, costs are relatively transparent, and demand follows predictable patterns. Inventories smooth any changes in demand without the accompanying price volatility that could undermine an agreement. F. M. SCHERER & DAVID ROSS, INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE 268 (1990).

[71] *See* James W. Brock, *Antitrust Policy and the Oligopoly Problem*, 51 ANTITRUST BULL. 227, 245 (2006). For an early discussion of capacity and investment in oligopolies see, for example, A. Michael Spence, *Entry, Capacity, Investment and Oligopolistic Pricing*, 8 RAND J. ECON. 534 (1977).

C. The Role for Competition Policy

What role can competition policy productively play in petroleum merger enforcement? As a preliminary matter, it is far more in the interests of competition and consumers to address any competitive problems associated with gasoline pricing as close to the source as possible, as opposed to enforcement of potentially distortionary price gouging laws or a return to price controls, both of which now seem to be serious threats. This implies a vigorous role for the FTC in blocking or remedying anticompetitive petroleum mergers that could contribute to high gasoline prices and continuing to monitor (and intervene in, if necessary) gasoline markets. A number of more specific recommendations emerge from the foregoing discussion. First, refining bottlenecks deserve more attention in crafting theories of harm in merger cases. Unless refining markets are defined on the basis of capacity constraints for specific products, the merging firms' ability and incentive to withhold capacity are likely to evade detection. Mergers that increase control of refinery capacity in congested, strategically located, or boutique fuel facilities should therefore be carefully scrutinized to fully explore the post-merger likelihood of unilateral withholding.

Second, the FTC has put forward coordinated effects theories of harm in numerous challenged cases. However, the range of possible behaviors those theories cover is not clear. If they are not already considered, more subtle mechanisms should factor into the FTC's analysis, including the role of exchange agreements between refiners in facilitating coordination on price and output. How mergers change incentives to restrict investment in refining capacity should also be evaluated in the course of merger reviews. These considerations are important in part because they will affect the remedies ultimately imposed. Since remedies must be tailored to the theory of competitive harm, it may be necessary to implement different or additional fixes, including forced expansion of refinery capacity or the cessation of swap agreements.[72]

A third factor is the importance of vertical theories of harm in merger review. It would be difficult to claim that the effect of the former independent refiners in buying up additional refining capacity and retail outlets has *not* increased the level of vertical

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[72] *See* DEP'T OF JUSTICE, ANTITRUST DIVISION, ANTITRUST DIVISION POLICY GUIDE TO MERGER REMEDIES 3 – 4 (2004).

integration in the U.S. industry. The FTC's challenges almost exclusively involve horizontal theories of competitive harm.[73] This is not to say that the agency has failed to consider vertical effects, but may have considered and abandoned them on the basis of a heavy burden of proof. Nonetheless, high levels of refining and wholesale marketing integration and concentration and troubling results of the economic studies of merger-related price effects emphasize the importance of considering how mergers can change the ability and incentive of integrated firms to foreclose rival distributors or retailers.

Finally, natural gas is important in and of itself because it serves both as the fastest growing fuel source for electric power generation and because it potentially competes with both electricity and gasoline in some major applications. The antitrust agencies would be well advised to look at convergence issues and loss of potential competition between fuels when they examine mergers. Many mergers between electricity distribution and natural gas distribution utilities were approved in an era when both were heavily regulated. Should new convergence mergers be proposed, they should be viewed through the lenses of raising rivals' costs and harm to actual or potential competition between electricity and natural gas.

Conclusion

Competition policy has an important but challenging role to play in promoting the energy policy goal of leveling the playing field for lower-carbon, more efficient fuels and technological innovation. Massive restructuring in both the electricity and petroleum industries emphasizes the importance of rigorous merger review and good market design in paving the way for a shift in the energy equilibrium in the United States. The design of relatively new markets for carbon emissions allowances can also benefit tremendously from the principles of competition. As the new administration tackles these and other problems, the synergies between the broader public policy goal of market-oriented approaches to energy markets and the critical role of competition policy will be clearer and the benefits more obvious.

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[73] FED. TRADE COMM'N, *supra* note 53, at Table 2-5.