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## The Failure of Federal Authorities to Protect American Energy Consumers from Market Power and Other Abusive Practices

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# ***FEATURE ARTICLES***

## **The Failure of Federal Authorities To Protect American Energy Consumers From Market Power and Other Abusive Practices**

By Mark N. Cooper\*

Director of Research, Consumer Federation of America

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**CONCLUSION****INTRODUCTION**

This paper argues that in the past couple of decades, federal antitrust,<sup>1</sup> commodity oversight,<sup>2</sup> and consumer protection<sup>3</sup> authorities have failed to prevent widespread abuse of American energy consumers. Based on blind faith in markets and an overzealous deregulation ideology, rather than an empirical assessment of the

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<sup>1</sup> By agreement between the Department of Justice (DOJ) and the Federal Trade Commission (FTC), oil industry mergers are reviewed by the FTC. Wikipedia - Federal Trade Commission, [http://en.wikipedia.org/wiki/Federal\\_Trade\\_Commission](http://en.wikipedia.org/wiki/Federal_Trade_Commission) (last visited May 5, 2007).

<sup>2</sup> The Commodity Futures Trading Commission (CFTC) oversees commodity trading and traders. Wikipedia - Commodity Futures Trading Commission, <http://en.wikipedia.org/wiki/Cftc> (last visited May 5, 2007). The Securities and Exchange Commission (SEC) has authority over the corporate form of traders, particularly hedge funds. Wikipedia - The Securities and Exchange Commission, <http://en.wikipedia.org/wiki/SEC> (last visited May 5, 2007).

<sup>3</sup> The Federal Energy Regulatory Commission (FERC) reviews some energy sector mergers (in the electricity and natural gas sectors) and oversees interstate wholesale markets. The U.S. Department of Energy gathers information and reports on all energy sectors. As an executive branch agency, it has administrative authority over some aspects of the energy sector, like the strategic petroleum reserve.

fundamentals of energy markets, they allowed energy markets to become too concentrated and failed to exercise responsible oversight of energy trading practices and wholesale markets.

Market forces in the energy sector are extraordinarily weak because energy markets exhibit extremely low elasticities of supply and demand, high barriers to entry and other structural characteristics that make them inflexible. These market fundamentals render both physical energy markets, where energy commodities are produced, transported and consumed, and financial commodity markets, where energy contracts and futures are traded, extremely vulnerable to the exercise of market power and other abusive practices.<sup>4</sup> Lax enforcement in merger analysis and market oversight has cost consumers hundreds of billions of dollars.

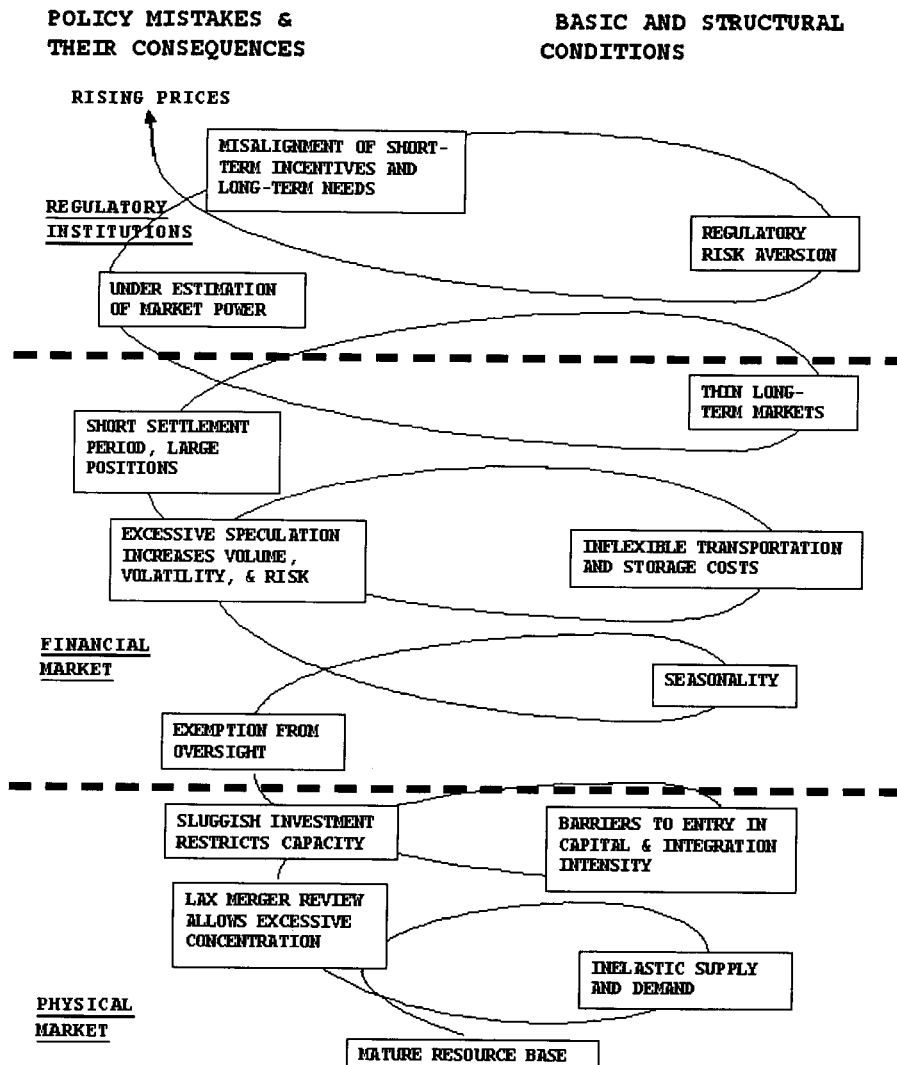
The paper is divided into four parts. Part I begins with a discussion of the analytical framework taken from traditional market power and merger analysis, which emphasizes the importance of market fundamentals. It then applies that framework to describe the weak market forces in the energy sector. Part II presents a case study of lax merger review in the petroleum industry. Part III presents a case study of lax commodity trading oversight focusing on the natural gas sector. Part IV presents a case study of the inadequate provision of structural safeguards in the deregulation of the electricity sector.

Singling out a different energy sector to highlight a different aspect of the broader failure of consumer protection should not be taken to mean that the problems identified did not occur in all three sectors. Lax merger review affected both oil and natural gas. Poorly designed deregulation affected natural gas and electricity. Commodity market manipulation and abuse affected all three energy markets. Moreover, these three failures of public policy interacted to expose American consumers to a brutal spiral of rising and volatile energy prices in all three sectors (see Exhibit I-1).

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<sup>4</sup> Mark Cooper, Citizens Research, *Industrial Organization and Market Performance in the Transportation and Communications Industries* (1985), used the term “vulnerable” to describe several of the sectors discussed in this paper.

## Exhibit I-1: Physical, Financial and Regulatory Factors in the Explosive Spiral of Energy Prices



As in all policy debates, the industry has a different account. Their story is that prices just reflect the normal working of the market – “its just supply and demand.” On one level this article agrees – supply and demand elasticities are so low that these markets are vulnerable and prone to volatility. It is policymakers who have let the public down by failing to adopt policies that protect consumers from exploitation in these markets where market forces are weak and prone to market failure. On another level, this paper disagrees with the “its just supply and demand” claim. In concentrated, inflexible markets, supply becomes a strategic variable that entities with market power manipulate to increase profits over the long term and institutional structures make markets more or less vulnerable, more or less responsive to “external” events. Neither supply nor the reactions to tight markets are givens. Again, public policy matters. While the back and forth debate is important and interesting, this paper presents the case from the consumer point of view.

## **I. Fundamentals of MARKET POWER Analysis**

### **A. Antitrust Analysis**

In a seminal 1981 *Harvard Law Review* article,<sup>5</sup> William Landes and Richard Posner, two of the leading Chicago School law and economics practitioners,<sup>6</sup> asked “what degree of market power should be actionable?” They responded: “the answer in any particular case depends on the interaction of two factors: the size of the market (total volume of sales) and the antitrust violation alleged.”<sup>7</sup>

In a section entitled *Market Share Alone is Misleading*, they argued that antitrust authorities should take market fundamentals into account. In assessing the potential impact of market power, “the proper measure will attempt to capture the influence of market demand and supply elasticity on market power.”<sup>8</sup> Their intention was to convince antitrust authorities to ease up on enforcement, but the proposition could work in both directions. Markets that have low

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<sup>5</sup> William M. Landes & Richard A. Posner, Market Power in Anti-trust Cases, 94 Harv. L. Rev. 937 (1981).

<sup>6</sup> Lawrence Sullivan and Warren S. Grimes, The Law of Antitrust: An Integrated Handbook 27 (Hornbook Series, West Group, 2000), refer to the article as influential and note the debate it caused. They are generally critical of the Chicago School approach.

<sup>7</sup> Landes and Posner, *supra* note 5, at 953 .

<sup>8</sup> *Id.* at 947.

elasticities or high total dollar stakes could certainly demand more scrutiny, not less. Landes and Posner acknowledged this in some respects.

In all of the examples, the effect of adopting the approach advocated in this paper was to reduce or eliminate the inference of market power drawn from market share data. This will probably be the result in most cases of using our approach, simply because exclusive and uncritical focus on market share data tends to produce an exaggerated impression of market power. In some cases, however, our approach will result in correcting an underestimation of market power based on market share.<sup>9</sup>

This paper argues the latter is the case in the energy sector.

Landes and Posner focus on the most common indicator of market power, the Lerner index,<sup>10</sup> which measures the extent to which prices are marked up over costs. "We point out that the Lerner index provides a precise economic definition of market power, and we demonstrate the functional relationship between market power on the one hand and market share, market elasticity of demand, and supply elasticity of fringe competitors on the other."<sup>11</sup> The Lerner Index is frequently expressed as the inverse of the elasticity of demand, but Landes and Posner rendered it in a somewhat different formulation.

$$L = \frac{(P - C)}{P} = \frac{1}{E^d} = \frac{S_i}{e_m^d + e_j^s(1 - S_i)}$$

where:

$S_d$  = the market share of the dominant firm  
 $e_m^d$  = elasticity of demand in the market

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<sup>9</sup> *Id.* at 950.

<sup>10</sup> F.M. Scherer & David Ross, *Industrial Market Structure and Economic Performance* 70-71 (Houghton Mifflin 1990) ("[T]he Lerner Index[is] defined as: "[L] = (Price - Marginal Cost)/ Price...Its merit is that it directly reflects the allocatively inefficient departure of price from marginal cost associated with monopoly. Under pure competition, [L]=0. The more a firm's pricing departs from the competitive norm, the higher is the associated Lerner Index value. A related performance-oriented approach focuses on some measure of the net profits realized by firms or industries.").

<sup>11</sup> Landes & Posner, *supra* note 5, at 938.

$e_j^s$  = elasticity of supply of the competitive fringe  
 $s_i$  = market share of the fringe.

In other words, this formula says that the markup of price over cost will be directly related to the market share of the dominant firm and inversely related to the ability of consumers to reduce consumption (the elasticity of demand) and the ability of other firms (the competitive fringe) to increase output (the elasticity of supply).

Because Landes and Posner were arguing against a simplistic and mechanical focus on market share in market power analysis, they noted that their own formula should not be applied mechanically. They incorporated a number of traditional concerns by arguing that each of the terms in the equation should be defined to reflect other market characteristics in specific applications.<sup>12</sup> Thus excess capacity, rather than simple market shares, barriers to entry, and long distance transport (such as a broad market definition), among other factors, should inform the definition of the competitive fringe.<sup>13</sup> On the demand side, substitutability (product definition) should be carefully examined.<sup>14</sup>

A series of responses to the Landes and Posner article was published in the *Harvard Law Review* the following year. These responses suggested limitations and improvements to the Landes and Posner approach. One of the main criticisms was that the authors were analyzing only the dominant firm market share in the numerator, when oligopolies are a more typical situation.<sup>15</sup> An improvement was suggested in which the Lerner index was related to a measure of the overall market concentration – the Herfindahl Concentration Index (HCI). The HCI is the sum of the squares of the market shares of all the producers in the market. Importantly, the Lerner Index is equal to the HCI divided by the elasticity of demand.

$$L = \frac{HCI}{E_d} = \frac{\sum s_i^2}{E_d}$$

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<sup>12</sup> *Id.* at 949.

<sup>13</sup> *Id.*

<sup>14</sup> *Id.*

<sup>15</sup> Richard Schmalensee, Another Look At Market Power, 95 Harv. L. Rev. 1789, 1797 (1982); Janusz A. Ordover, Alan O. Sykes & Robert D. Willig, Herfindahl Concentration, Rivalry, and Mergers, 95 Harv. L. Rev. 1863-1867 (1982).



The HCI uses the market shares of all participants in the numerator of the fraction since oligopolists may not "compete."<sup>16</sup>

Another suggested improvement for the formula was to adjust it to take into account the key factor of strategic interactions and historic behavior. A term can be included which adjusts for the special impact of the market shares of other firms<sup>17</sup>

$$L = \frac{(P - C)}{P} = \frac{HCI (1 + k)}{E^d}$$

where  $k$  = the effect of strategic interaction

If the likelihood of strategic interaction will reinforce the efforts of the dominant firm to raise prices, then  $k$  can be set positive. If a uniquely vigorous competitive response is likely, then  $k$  can be set negative. When  $k$  equals zero, there is no strategic interaction effect. Estimating the value of  $k$  is a subjective process, but it does add an important element to relating market structure to market performance through conduct.

## B. Merger Analysis

At roughly the same time as the responses to the Landes and Posner article appeared, the Department of Justice (DOJ) and the Federal Trade Commission (FTC) issued updated *Merger Guidelines* to frame the approach to merger analysis. The *Merger Guidelines* describe their concern with market power as follows:

Market power to a seller is the ability profitably to maintain prices above competitive levels for a significant period of time. In some circumstances, a sole seller (a "monopolist") of a product with no good substitutes can maintain a selling price that is above the level that would prevail if the market were competitive. Similarly, in some circumstances, where only a few firms account for most of the sales of a product, those firms can exercise market power, perhaps even approximating the performance of a monopolist, by either explicitly or implicitly coordinating their actions. Circum-

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<sup>16</sup> Other scholars argue that the formulation assumes Cournot oligopoly behavior. W. Kip Viscusi, John M. Vernon & Joseph E. Harrington, Jr., *Economics of Regulation and Antitrust* 149 (MIT Press 2000).

<sup>17</sup> Ordoover, Sykes and Willig, *supra* note 15, at 1860-62.

stances also may permit a single firm, not a monopolist, to exercise market power through unilateral or non-coordinated conduct — conduct the success of which does not rely on the concurrence of other firms in the market or on coordinated responses by those firms. In any case, the result of the exercise of market power is a transfer of wealth from buyers to sellers or a misallocation of resources.

Sellers with market power also may lessen competition on dimensions other than price, such as product quality, service, or innovation.<sup>18</sup>

The *Merger Guidelines* recognize that market power can be exercised with coordinated, or parallel activities and even unilateral actions in situations where there are small numbers of market players.<sup>19</sup> The area of non-collusive, oligopoly behavior has received a great deal of attention. A variety of models have been developed which demonstrate that small numbers of market participants interacting in the market, especially on a repeated basis, can learn to signal, anticipate, and parallel one another to achieve outcomes that capture a substantial share of the potential monopoly profits.<sup>20</sup>

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<sup>18</sup> U.S. Dep't of Justice & Fed. Trade Comm'n, Horizontal Merger Guidelines § 0.1 (1997) [hereinafter Horizontal Merger Guidelines]. A similar concern applies to monopsony power:

Market power also encompasses the ability of a single buyer (a "monopsonist"), a coordinating group of buyers, or a single buyer, not a monopsonist, to depress the price paid for a product to a level that is below the competitive price and thereby depress output. The exercise of market power by buyers ("monopsony power") has adverse effects comparable to those associated with the exercise of market power by sellers. In order to assess potential monopsony concerns, the Agency will apply an analytical framework analogous to the framework of these Guidelines.

<sup>19</sup> Sullivan and Grimes, *supra* note 6, at 530. .

The rule of thumb reflected in all iterations of the Merger Guidelines is that the more concentrated an industry, the more likely is oligopolistic behavior by that industry.... Still, the inference that higher concentration increases the risks of oligopolistic conduct seems well grounded. As the number of industry participants becomes smaller, the task of coordinating industry behavior becomes easier. For example, a ten-firm industry is more likely to require some sort of coordination to maintain prices at an oligopoly level, whereas the three-firm industry might more easily maintain prices through parallel behavior without express coordination.

<sup>20</sup> John B. Taylor, Economics 303-308 (Houghton Mifflin 2001); W. Kip Viscusi, John M. Vernon & Joseph E. Harrington, Jr., Economics of Regulation and

The identification of when a small number of firms can exercise this power is not a precise science. Nevertheless, when the number of significant firms falls into the single digits there is cause for concern. "Up to perhaps six firms one has oligopoly, and with fifty or more firms of roughly similar size one has competition; however, for sizes in between it may be difficult to say. The answer is not a matter of principle, but rather an empirical matter."<sup>21</sup>

In order to assess the potential for the exercise of market power resulting from a merger, the DOJ/FTC analyze the level of concentration as measured by the Herfindahl-Hirschman Index (HHI). This measure takes the market share of each firm, squares it, sums the result, and multiplies by 10,000 to clear the decimal.<sup>22</sup> The HHI is the HCI with the fraction cleared.

Not only can the HHI be directly related to the Lerner Index, as noted above, it also has an easy interpretation.<sup>23</sup> A market that is made up of 10 equal-sized firms will have an HHI of 1000. Each firm has a 10 percent market share.<sup>24</sup> In such a market, the top four firm concentration ratio (CR4), which is also frequently used to describe market concentration, would be 40 percent.<sup>25</sup> The DOJ considers a market with fewer than the equivalent of 10 equal-sized firms to be concentrated.

The DOJ considers an HHI of 1800 as the point at which a market is highly concentrated. To appreciate this level of concentration, note that a market with five equal sized firms would have an HHI of 2000 and be considered highly concentrated. A market with six equal sized firms would have an HHI of 1667, just below the highly concentrated level. Thus the highly concentrated threshold falls between the equivalent of five and six equal sized firms, or the equivalent of 5.5 equal sized firms. The four firm concentration ratio would be 72 percent, assuming equal-sized firms. Markets with an

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Antitrust 97-142 (MIT Press 2000); Jean Fudenberg, & Jean Tirole, *Noncooperative Game Theory for Industrial Organization: An Introduction and Overview in Handbook of Industrial Organization* (Richard Schmalensee & Robert D. Willig eds., North-Holland 1989).

<sup>21</sup> James Friedman, *Oligopoly Theory* 8-9 (Cambridge University Press 1983).

<sup>22</sup> William G. Shepherd, *The Economics of Industrial Organization* 389 (Prentice Hall 1985).

<sup>23</sup> The HHI can be converted to equal-sized equivalents as follows:

Equal-sized voice equivalents =  $(1/\text{HHI}) \times 10,000$ .

<sup>24</sup> Squaring the share yields 100 points for each firm, multiplied by 10 firms ( $10 \times 10 \times 10$ ).

<sup>25</sup> Shepherd, *supra* note 22, at 388.

HHI between 1000 and 1800 are considered moderately concentrated.

These thresholds are consistent with longstanding economic analysis, which had been framed in terms of the market share of the top four firms. As William Shepherd put it:

Tight Oligopoly: The leading four firms combined have 60-100 percent of the market; collusion among them is relatively easy.

Loose Oligopoly: The leading four firms combined have 40 percent or less of the market; collusion among them to fix prices is virtually impossible.<sup>26</sup>

The *Merger Guidelines* identify the types of mergers that will raise competitive concerns as follows:

Mergers producing an increase in the HHI of more than 100 points in moderately concentrated markets post-merger potentially raise significant competitive concerns depending on the factors set forth in Sections 2-5 of the Guidelines. . . .

Mergers producing an increase in the HHI of more than 50 points in highly concentrated markets post-merger potentially raise significant competitive concerns, depending on the factors set forth in Sections 2-5 of the Guidelines. Where the post-merger HHI exceeds 1800, it will be presumed that mergers producing an increase in the HHI of more than 100 points are likely to create or enhance market power or facilitate its exercise.<sup>27</sup>

The magnitude of the price increase that is of concern is identified as a “small but significant and nontransitory increase in price (SSNIP).”<sup>28</sup>

The Merger Guidelines suggest asking the question using a 5% SSNIP – that is asking whether a nontransitory price increase of 5% or more would be profitable for a hypothetical monopolist. Nonetheless, the Merger Guidelines explicitly recognize that “the nature of the industry” may lead enforcement agencies to use some

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<sup>26</sup> *Id.* at 4.

<sup>27</sup> Horizontal Merger Guidelines, *supra* note 18, § 1.51(b)-(c).

<sup>28</sup> Federal Trade Commission, *The Petroleum Industry: Mergers, Structural Change, and Antitrust Enforcement* 21 (2004) [Hereinafter FTC Report].

other, more appropriate price standard. The FTC staff frequently has used a one-cent-per-gallon price increase in defining the relevant market for petroleum mergers.<sup>29</sup>

### C. Quantifying the Importance of Market Fundamentals

Landes and Posner provided a simple analytical exercise to make their point on the importance of elasticities of supply and demand, calculating the market share necessary to achieve a 20 percent mark-up of price over cost. I focus on 5 and 10 percent increases, since the FTC and the DOJ concern themselves with price increases as low as 5 percent,<sup>30</sup> particularly in an industry where the dollar value of output is very large, as is true with petroleum products. As shown in Exhibit I-2, in the face of low elasticities of supply and demand, firms can gain market power with relatively small market shares and at low levels of concentration. Under the assumptions of low elasticities of supply and demand, market shares around 10 percent yield market power to raise price significantly.

#### Exhibit I-2: Landes and Posner Formula Showing Sensitivity of Market Power to Elasticities (Percent Mark-up of Price Over Cost)

	Elasticity of			Market Share		Mark up at DOJ/FTC Threshold			
	Supply			Necessary for firm		HHI =1000		HHI=1800	
				to charge prices		Lead firm		Lead Firm	
				above marginal cost of		Share		Share	
		High	Low	10%	5%	10%	31%	18%	41%
Elasticity of		2.5	0.5						
Demand									
	High 3	X		50	26	2	7	4	9
	High 3		X	36	19	3	9	5	13
	Low 1	X		27	14	4	11	6	18
	Low 1		X	14	7	7	23	16	33

<sup>29</sup> *Id.* at 22.

<sup>30</sup> Wikipedia – SSNIP, located at [http://en.wikipedia.org/wiki/SSNIP\\_Test](http://en.wikipedia.org/wiki/SSNIP_Test) (last visited May 5, 2007).

**Source:** Elasticity examples and formula from William M. Landes & Richard A. Posner, *Market Power in Antitrust Cases*, 94 HARV. L. REV. 958 (1981).

Also shown in Exhibit I-2 are the results of an exercise that applies the Landes and Posner formula to the DOJ/FTC thresholds, under two sets of assumptions. First, we assume equal size firms. This is the lower bound of the mark-up under the Landes and Posner approach. We also calculate the mark-up assuming the largest firm that would still keep the HHI below the threshold. If a five percent increase in the mark-up is a concern, then the thresholds seem correct. Even with high elasticities as defined, the mark-up in highly concentrated markets is a source of concern. When either supply or demand elasticity is low, moderately concentrated markets are a source of concern. Moreover, as we move through the moderately concentrated range under these elasticities the mark-up approaches the level that triggers concern. As the market structure becomes dominated by a single firm, the concern about market power approaches or exceeds the threshold in all cases. Finally, as one firm has a larger role, even in the moderately concentrated range, concern about the exercise of market power increases.

In the alternative, as shown in Exhibit I-3, the HHI necessary to achieve a specified mark-up of price over cost at various market elasticities of demand can be calculated. Again we use 5% and 10% mark-ups. At low levels of elasticity (1-2), a 5 percent mark-up can be achieved at relatively low levels of concentration. At moderate levels of elasticity (2-3), the thresholds appear well-chosen.

#### Exhibit I-3: HHI Necessary to Achieve a Lerner Index Mark-up

Price Increase		
	10%	5%
Elasticity of Market Demand		
1	1000	500
2	2000	1000
3	3000	1500
4	4000	2000
5	5000	2500

#### **D. Commodity Price Manipulation and Influence**

The analysis of commodity price manipulation is not as formalized as the antitrust/merger analysis, but the same principles apply. The weaker the key market forces, the more vulnerable the commodity is to price manipulation. The same basic factors come into play here.

The extent of market power depends on supply and demand conditions, seasonal factors, and transport costs. For commodity markets, however, transportation and storage take on special importance. These transport cost-related frictions are likely to be important in many markets,

including grains, non-precious metals and petroleum products. All else equal, the lower the storage costs for a commodity, the more elastic its demand.

Economic frictions (including transportation, storage, and search costs) which impede the transfer of the underlying commodity among different parties separated in space or time can create the conditions that the large trader can exploit in order to cause a supracompetitive price. . .

Although the formal analysis examines transportation costs as the source of friction, the consumption distortion results suggest that any friction that makes it costly to return a commodity to its original owners (such as storage costs or search costs) may facilitate manipulation.

Transportation costs are an example of an economic friction that isolates geographically dispersed consumers. The results therefore suggest that any form of transaction costs that impedes the transfer of a commodity among consumers can make manipulation possible.<sup>31</sup>

The characteristics of energy commodities are fundamentally different from simple financial commodities. The key elements are the supply-side difficulties of production, transportation and storage,

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<sup>31</sup> Stephen Craig Pirrong, *The Economics, Law and Public Policy of Market Power Manipulation* 9-10, 24, 59 (Kluwer 1996). See also Jeffrey Williams & Brian Wright, *Storage and Commodity Markets* (Cambridge University Press 1991); Angus Deaton and Guy Laroque, *On the Behavior of Commodity Prices*, 59 *Rev. of Econ. Stud.* 1-23 (1992).

and the demand-side challenges of providing for a continuous flow of energy to meet inflexible demand, which is subject to seasonal consumption patterns.

[T]he deliverables in money markets consist of a “piece of paper” or its electronic equivalent, which are easily stored and transferred and are insensitive to weather conditions. Energy markets paint a more complicated picture. Energies respond to the dynamic interplay between producing and using; transferring and storing; buying and selling – and ultimately “burning” actual physical products. Issues of storage, transport, weather and technological advances play a major role here.

In energy markets, the supply side concerns not only the storage and transfer of the actual commodity, but also how to get the actual commodity out of the ground. The end user truly consumes the asset. Residential users need energy for heating in the winter and cooling in the summer, and industrial users’ own products continually depend on energy to keep the plants running and to avoid the high cost of stopping and restarting them. Each of these energy participants – be they producers or end users – deals with a different set of fundamental drivers, which in turn affect the behavior of energy markets. . .

What makes energies so different is the excessive number of fundamental price drivers, which cause extremely complex price behavior.<sup>32</sup>

Manipulation of markets narrowly defined as “the exercise of monopoly or monopsony power in a futures market (or more generally a derivative securities market) and/or the cash market for the underlying commodity near the expiration date of the future (derivative security)”<sup>33</sup> and studies of classic attempts to corner or squeeze markets receive a great deal of attention in the commodity market literature. However, this type of behavior is only a small part of the story. Other behaviors like insider trading, or blatant fraud, are recognized

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<sup>32</sup> Dragana Pilipovic, *Energy Risk: Valuing and Managing Energy Derivates* 3 (McGraw-Hill 1998).

<sup>33</sup> Pirrong, *supra* note 31, at 6. Monopsony is a situation where there is a single or few buyers of a good or service, which enables the buyers to control (lower) the price paid for the good or service.



by the public, but there are a host of more technical behaviors that others see as problematic.

The list is large indeed: trading ahead of customers (*front-running*), repeated purchases at rising prices (*bulling the market*), repeated sales at falling prices (*bearing the market*), buying or selling to activate resting limit orders so as to touch-off technical rallies or declines (*gunning the stops*), rigged trading at the open or close, wash sales, and spreading of rumors. . .

It is essential to distinguish the exercise of market power near expiration of a futures contract from the effect of large trades that move prices.<sup>34</sup>

Whether or not all of these behaviors to “move prices” violate some statute, they can have an effect on prices and pricing behaviors. Consumers and policymakers should care about both manipulation and behaviors that “move prices.” In fact, virtually everything on this list of horrors has been alleged to have occurred in energy markets in the past decade, backed up with consent decrees, fines and court cases. The important point, here, however, is not that these behaviors take place, but that the structural conditions that make them possible are very deeply engrained in energy markets and have a broad impact on prices.

## E. Energy Market Fundamentals

### 1. Overview

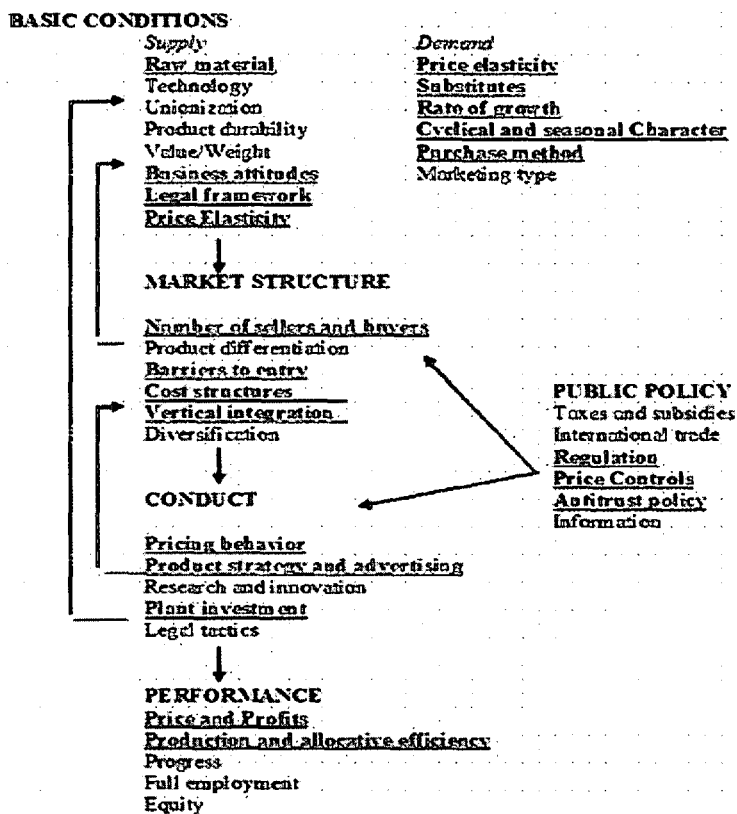
What emerges from this discussion is a framework for analysis that is traditionally known as the structure, conduct, performance paradigm (SCP).<sup>35</sup> In SCP analysis the central concern is with market performance, since that is the outcome that affects consumers most directly (see Exhibit I-4). The highlighted items will be discussed in the analysis of the energy sector in this paper.

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<sup>34</sup> *Id.*

<sup>35</sup> Scherer and Ross, *supra* note 10, at 4-6; Shepherd, *supra* note 22, at 5.

**Exhibit I-4: The Structure, Conduct, Performance Paradigm**  
**(Highlighted items are Discussed in this Analysis)**



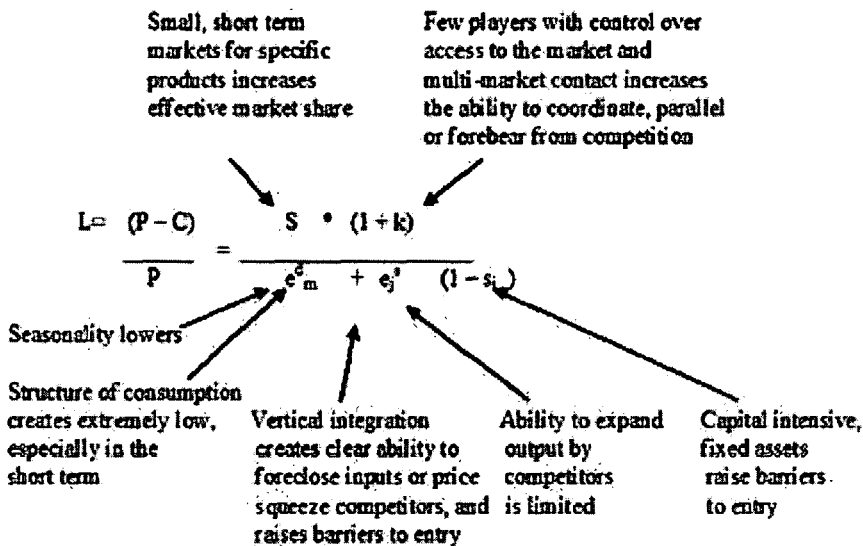
**SOURCE:** F. M. Scherer & David Ross, *Industrial Market Structure and Economic Performance* 5 (Houghton Mifflin 1990).

The concept of performance is multidimensional. The measures of performance to which we traditionally look are pricing, as above, as well as quality and profits. Pricing and profits address both efficiency and fairness. They are the most direct measure of how society's wealth is being allocated and distributed. The performance of industries is determined by a number of factors, most directly the conduct of market participants. Do they compete? What legal tactics do they employ? How do they advertise and price their products? Conduct is affected and circumscribed by market structure. Market structure includes an analysis of the number and size of the firms in the industry, their cost characteristics and barriers to entry. Basic

conditions of supply and demand also deeply affect market structure. Public policy is also recognized as playing a key role in this paradigm. Antitrust and regulation are the two key policy areas discussed in this paper, while price controls will be mentioned in the discussion of electricity.

The multidimensional view of markets offered by this framework fits the fundamental economic traits of energy production and consumption well. Energy markets are highly complex. Their volatility poses particular challenges for policy and economic analysis. The economic characteristics of energy commodities can be readily placed in the analytical framework as the following schematic shows (see Exhibit I-5).

**Exhibit I-5: Key Characteristics Increasing the Likelihood of the Market Power in the Energy Sector**



Inflexibility of demand and its sensitivity to weather renders the market volatile and vulnerable to abuse. The elasticity of market demand is very low in the short-term and low in the long-term. Demand shows strong seasonality patterns, which lowers the elasticity at key moments. The demand side cannot be counted on to discipline abusive pricing behavior. Institutional and economic barriers make it difficult for consumers to self-supply or bargain effectively for supplies.

The elasticity of supply is low. Short-term supply responses are constrained by the difficulty of storing energy. Significant addi-

tions to supply require substantial lead times, making the supply-side “lumpy” and slow. Provision for reserves is uncertain in a competitive market because the provision of reserves is unattractive to business interests, unless peak prices are extremely high. Consequently, markets may be chronically tight or subject to extreme price volatility.

Since production assets are sunk and demand is immobile, the transportation system stands at the intersection of many of the energy industry problems. The transport components of the industry – pipelines for oil and gas, transmission and distribution in electricity – are presently natural monopolies and are likely to remain so for the foreseeable future. Because of the severe conditions that typify energy markets, concentration must be considered in very narrow geographic and product terms. Isolated, concentrated local markets enable local suppliers to drive prices up. In these tight markets, collusion is not necessary to drive prices up; parallel actions by a small number of suppliers are sufficient. Even though peaks are short in duration, they can impose huge price distortions because of the large quantities consumed and extremely low elasticities.

## **2. Demand Is Inelastic**

The continuous flow of large quantities of product to meet highly seasonal demand is the central characteristic of the demand side of the market. Examining price and income elasticities leads to the conclusion that energy is a necessity of daily life. The price elasticity is quite low, while the income elasticity is higher, but still relatively low.<sup>36</sup>

Energy consumption is determined by the physical and economic structure of daily life. Demand is generally predictable in a seasonal pattern.

People need to drive on a daily basis because of the way our communities are built and our transportation systems designed. Stores are far from homes. Homes are far from work. Social and after-school activities are dispersed. In most communities, mass transit is scarce and inconvenient. We own more cars and drive more miles on a household basis over time. These trends and patterns have be-

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<sup>36</sup> See generally Lester Taylor, *Telecommunications Demand: A Survey and Critique* 82 (Ballinger 1980). Taylor argues that a necessity is characterized by a low price elasticity of demand and a moderate income elasticity of demand. In the face of rising prices, the low price elasticity indicates that substitution away from the commodity is difficult and the moderate income elasticity indicates that reduced demand imposes welfare losses, as households are forced to devote a larger share of their income to the commodity.

come stronger and more deeply entrenched as our society has become wealthier and the tendency for two-earner households has grown. For the past three decades there has been an almost perfect, one-to-one correspondence between economic growth and the growth of total miles driven.

People consume natural gas for heating primarily and, increasingly, for electricity. The amount they consume is dictated in large part by the kinds of buildings in which they live and work and the energy efficiency of the appliances they use. Natural gas has become the fuel of choice for many residential uses. It has been the favorite of the electricity industry for about a decade.

The central role that electricity plays in modern life is obvious. There are simply no substitutes for lighting and refrigeration, or to power the appliances that fill twenty-first century homes in the developed world.

The demand elasticity for gasoline has been studied hundreds of times in the U.S. and abroad. The best estimate of short-term elasticity, usually measured by demand response in a period of about a year, is  $-.2$ .<sup>37</sup> In other words, when prices increase by 10 percent, demand declines by only 2 percent. The best estimate of the long-term elasticity is about  $-.4$ .<sup>38</sup> While fewer estimates of the elasticity of demand for natural gas have been made, the results are similar.<sup>39</sup> Short-term elasticities are in the range of  $-.3$ ; long-term elasticities are in the range of  $-.6$ . An occasional estimate of long-term elasticity is in the neighborhood of  $-1.0$ . The best evidence from electricity markets is that the short-run elasticity of demand is in the range of 0

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<sup>37</sup> See Molly Espey, *Gasoline Demand Revisited: An International Meta-Analysis of Elasticities*, 20 *Energy Econ.* 273 (1998) (identifying 363 estimates of short-term elasticity. The median is  $-.23$  for the short term and  $-.43$  for the long term); Hilke A. Kayser, *Gasoline Demand and Car Choice: Estimating Gasoline Demand Using Household Information*, 22 *Energy Econ.* 341 (2000) (estimating the short-term elasticity in the U.S. at  $-.23$ ); Steven L. Puller & Lorna A. Greening, *Household Adjustment to Gasoline Price Change: An Analysis Using 9 Years of US Survey Data*, 21 *Energy Econ.* 45 (1999) (finding a one-year price elasticity of  $-.34$ , but modeling a more complex structure of responses within shorter periods. They find a larger elasticity of miles traveled in the first quarter after a price shock ( $-.69$  to  $-.76$ ), but that demand "snaps back." The larger reduction in miles driven is still "inelastic." Moreover, the reduction in miles driven is larger than the reduction in fuel consumed since it appears that households cut back on the most efficient driving miles (i.e. higher speed vacation miles)).

<sup>38</sup> Molly Espey, *Explaining the Variation in Elasticity Estimates of Gasoline Demand in the United States: A Meta-analysis*, 17 *Energy J.* 59 (1996) (tbl. 2 shows that the average elasticity of demand for U.S. only studies at  $-.42$ ).

<sup>39</sup> See Douglas R. Bohi, *Analyzing Demand Behavior: A Study of Energy Elasticities* (RFF Press 1981).

to  $-0.1$ . In San Diego, where prices doubled during the summer of 2000, the elasticity of demand was less than  $-0.03$ .<sup>40</sup> A study of demand reduction in programs found elasticities to be quite low. The model programs achieve elasticities in the range of  $-0.03$  to  $-0.1$ .<sup>41</sup> Long-run elasticities may be somewhat higher, but they are generally considered to be considerably less than  $-1$ .<sup>42</sup>

The low elasticity of demand is now recognized as a critical factor in rendering the market volatile and vulnerable to abuse. When demand is inelastic, consumers are vulnerable to price increases, because they cannot cut back or find substitutes for their use of the commodity.

### 3. Supply Is Inelastic

Short-term supply in the energy industry is also extremely inelastic. That is, it cannot be quickly increased. The key elements are the supply-side difficulties of production, transportation and storage for providing a continuous flow of energy.<sup>43</sup>

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<sup>40</sup> James Bushnell & Erin Mansur, The Univ. of Cal. Energy Instit., The Impact of Retail Rate Deregulation on Electricity Consumption in San Diego 9-15 (2001) (a variety of models show elasticities ranging from  $.05$  to  $.1$ ).

<sup>41</sup> Eric Hirst & Brendan Kirby, Edison Elec. Inst. and the Project for Sustainable FERC Energy Policy, Retail-Load Participation in Competitive Wholesale Electricity Markets 6 (2001), available at <http://www.hemplinglaw.com/articles/PRDRReport.pdf>. and Peter M. Schwartz et al., Industrial Response to Real-Time Prices for Electricity: Short-Run and Long-Run, 40 Econ. Inquiry No. 4, 597, (2002)).

<sup>42</sup> Reviews of dozens of studies can be found in Bohi, *supra* note 39, and Robert S. Pindyck, The Structure of World Energy Demand (MIT Press 1979). See also Paul Joskow & Richard Schmalensee, Markets For Power: An Analysis of Electric Utility Deregulation, 156, 183 (MIT Press 1983) (concluding that many geographic markets would exhibit market power problems, in large part because the empirical evidence dictated the use of low elasticities of demand, in the range of  $.1$  to  $.5$ ). A decade-and-a-half later, Kenneth Rose reviewed more recent literatures and found short-run elasticities in the range of  $.2$ . Kenneth Rose, Nat'l Regulatory Research Instit., Electric Restructuring Issue for Residential and Small Business Customers 47 (2000) (citing E. Raphael Branch, Short Run Income Elasticity of Residential Electricity Using Consumer Expenditure Survey Data, 14 Energy J. 111 (1993)) and long-run elasticities of about  $1.0$  (citing Leonard S. Hyman, Pub. Utilities Reports, America Electric Utilities: Past, Present and Future (1988)). In analyzing the California market, Borenstein and Bushnell state that "[they] have run simulations for elasticities  $0.1$ ,  $0.4$ , and  $1.0$ , a range covering most current estimates of short-run and long-run price elasticity." Severin Borenstein & James Bushnell, An Empirical Analysis of the Potential for Market Power in California's Electricity Industry, 47 J. of Ind. Econ. 302 (1999).

<sup>43</sup> Fed. Trade Comm'n, Midwest Gasoline Price Investigation, 4 (2001) [here-

Because of the nature of the underlying molecules, the production, transportation and distribution networks are extremely demanding. Energy is handled at high pressure, at high temperature and under other physical conditions that are, literally, explosive. These systems require integrity and real time balancing much more than other commodities. Many sources of energy are located far from consumers, requiring transportation over long distances. Transportation and distribution infrastructure is extremely capital intensive and inflexible.<sup>44</sup> The commodities are expensive to transport and store. They are delivered over a network that is sunk in place with limited ability to expand in the short and medium term.

Refineries, storage facilities, pipelines and transmission grids, and generating units are not only capital intensive, but they take long lead times to build. They have significant environmental impacts. In the short term, their capacity is relatively fixed. Refineries must be reconfigured to change the yield of products. Although pipelines and transmission grids have largely depreciated their historic, sunk costs, expansion would be capital intensive. Thus, capacity is generally fixed in the short and mid-terms as well.

Accidents, such as fires, explosions and breakage of equipment have a special role in networks such as these. Because of the demanding physical nature of the network, accidents are prone to happen. Because of the volatile nature of the commodity, accidents tend to be severe. Because of the integrated nature of the network and demanding real time performance, accidents are highly disruptive and difficult to fix. But, accidents do not just happen. The tight supply-demand balance that results from industry decisions to close refineries or reduce reserve margins may also contribute directly to the occurrence of accidents. The extremely high capacity utilization that creates high levels of profit also puts additional stress on equip-

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inafter Midwest Gasoline Price Investigation] available at <http://www.ftc.gov/os/2001/03/mwgasrpt.htm>..

<sup>44</sup> Douglas Gagax and Kenneth Nowotny, Competition and the Electric Utility Industry, 10 *Yale J. on Reg.* 63 (1993); Keith Gilsdorf, Testing for Subadditivity of Vertically-Integrated Electric Utilities, 62 *S. Econ. J.* 126-38 (1995); J. Stephen Henderson, Cost Estimation for Vertically Integrated Firms: the Cost of Electricity, in *Analyzing the Impact of Regulatory Change in Public Utilities* (M.A. Crew ed., Lexington Books 1985); Erick Hirst & Brenda Kirby, Dynamic Scheduling: The Forgotten Issue, *Pub. Util. Fort.*, (Apr. 15, 1997); David L. Kaserman & John W. Mayo, The Measurement of Vertical Economies and the Efficient Structure of the Electric Utility Industry, 29 *J. Indus. Econ.* 483 (1991); John E. Kwoka, Jr., *Power Structure: Ownership, Integration, and Competition in the U.S. Electricity Industry* (Kluwer Academic Publishers 1996); Mark J. Roberts, Economies of Density and Size in the Production and Delivery of Electric Power, 62 *Land Econ.* 378 (1986).

ment.<sup>45</sup>

These physical and economic characteristics render the supply-side of the market inelastic.<sup>46</sup> Given the basic infrastructure of supply in the industry, the availability of excess capacity and stocks to meet changes in demand is the critical factor in determining the flexibility of supply. Since output is slow to respond to price, stockpiles, storage and importation of product become critical elements of the gasoline market.

Stocks are the key factor in policy responses to market power where supply is inelastic. Every investigation of every product price spike in the past several years points to “unusually low stock” as a primary driver.<sup>47</sup> But stock levels are no accident; they are the result of business decisions.

Prices run up quickly because of even slight disruptions in the supply-demand balance, and producers are slow to react because they do not fear that others can bring the product to market and steal their business. Consequently, prices are said to be “sticky downward.”<sup>48</sup> The majority of published studies find support for the “rockets and

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<sup>45</sup> D. J. Peterson & Sergej Mahnovski, *New Forces at Work in Refining: Industry Views of Critical Business and Operations Trends* 43 (RAND Corporation 2003).

<sup>46</sup> Timothy J. Consodine & Eunnyeong Heo, *Price and Inventory Dynamics in Petroleum Product Markets*, 22 *Energy Econ.* 527 (2000) (concluding that “supply curves for the industry are inelastic and upward sloping.”) See also Timothy J. Consodine, *Separability, Functional Form and Regulatory Policy in Models of Interfuel Substitution*, 11 *Energy Econ.* 82 (1989).

<sup>47</sup> *Energy Info. Admin.*, *Petroleum 1996: Issues and Trends* 27 (1997). The U.S. Department of Energy identified “lower than normal gasoline stocks” in a chapter entitled “Spring ’96 Gasoline Price Runup.” *Energy Info. Admin.*, *Assessment of Summer 1997 Motor Gasoline Price Increase* 5 (1998); See also *Midwest Gasoline Price Investigation*, *supra* note 43 (showing how the FTC reached a similar conclusion). In analyzing the Midwest price spike of 2000, the Department of Energy again found stocks to be the culprit, starting an analysis entitled *Supply of Chicago/Milwaukee Gasoline Spring 2000*. In explaining the early spring price run-up in 2001, inventories were the starting point: “Low petroleum inventories set the stage for our current situation, as they did last year both for heating oil and for gasoline.” Statement of John Cook, Director, Petroleum Division, U.S. Department of Energy, Subcomm. on Energy and Air Quality, H. Comm. of Energy and Commerce (May 15, 2001).

<sup>48</sup> *Energy Info. Admin.*, *Price Changes in the Gasoline Market* (1999) (reviewing several decades of studies with mixed results in the analysis of gasoline price asymmetry – the tendency of prices to increase rapidly, but fall slowly. The report concludes that there is strong evidence of pattern asymmetry (i.e. prices do rise faster than they fall) but not amount asymmetry (eventually they fall back all the way). This is not the majority view, however.).



feathers” view.<sup>49</sup> Prices rise like rockets and float down like feathers<sup>50</sup> When energy markets become as concentrated as they are in America, the feathers do not float all the way down.

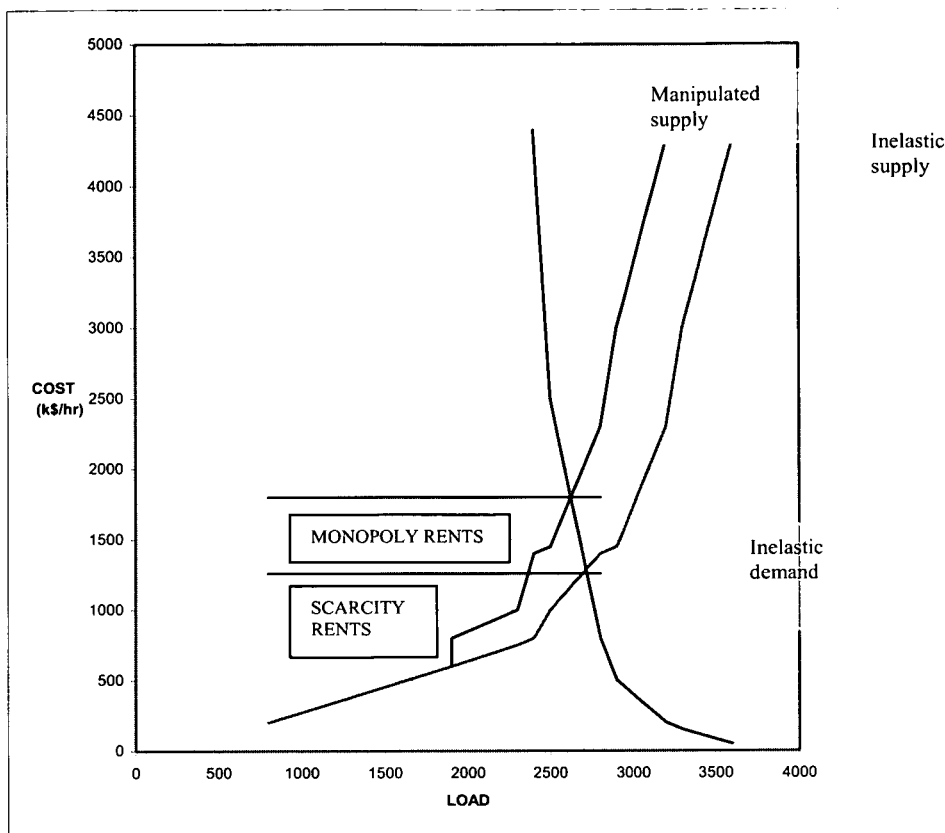
#### **4. Scarcity and Monopoly Rents**

The problem of price shocks that afflict energy markets goes beyond the abuse of market power. Thus, the inelasticity of supply and demand give rise to two deviations from a typical competitive market, creating excessive scarcity rents in addition to monopoly rents (see Exhibit I-6, which uses the actual electricity supply curve for in Florida). Because of the extremely small response by supply and demand to price changes, these markets generate large quantities of scarcity (inframarginal) rents.

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<sup>49</sup> Barry Reilly & Robert Witt, *Petrol Price Asymmetries Revisited* 20 *Energy Econ.* 297-298 (1998).

<sup>50</sup> Robert W. Bacon, *Rockets and Feathers: The Asymmetric Speed of Adjustment of UK Retail Gasoline Prices to Cost Changes* 13 *Energy Econ.* 217 (1991); Mario Galeotti et al., *Rockets and Feathers Revisited: An International Comparison on European Gasoline Markets* 25 *Energy Econ.* 189 (2003); Severin Borenstein & Andrea Shepard, *Sticky Prices, Inventories and Market Power in Wholesale Gasoline Markets*, 33 *RAND J. of Econ.*, 116 (2002); U.S. Gen. Accounting Office, *Energy Security and Policy: Analysis of the Pricing of Crude Oil and Petroleum Products* (1993). Moreover, one fundamental difference between the price spikes of recent years and the “rockets and feathers” debate should be underscored. In the recent circumstances, we are not dealing with crude oil price changes alone, so the question is not whether refiner/marketer margins “catch up,” or whether some of the change in crude oil price ends up in the refiner/marketer pockets (bottom line). The recent price spikes have been significantly driven by refiner/marketer margins. Even if margins return to historic levels after the spike, there is no doubt that a net increase in marketer margins has occurred.

**Exhibit I-6: Scarcity Rents vs. Monopoly Rents**

An economic rent is “a payment to a factor in excess of what is necessary to keep it at its present occupation.”<sup>51</sup> More importantly, “in perfect competition, no rents are made by any factor, because changes in supply bid prices of inputs and labor down to the level just necessary to keep them employed.”<sup>52</sup> In theory, these sources of overcharges (scarcity rents) would be competed away if supply and demand elasticities were high and energy markets worked well. In reality, because of the economic characteristics and social impacts of the energy industry, supply and demand do not respond. The results are elevated prices and a transfer of wealth from consumers to producers that achieve little or no real costs savings or efficiency gains. Excessive scarcity rents accrue where changes in supply are slow or

<sup>51</sup> George Pearce, *The Dictionary of Modern Economics* 124 (MIT Press 1984).

<sup>52</sup> Graham Bannock, et al., *Dictionary of Economics* 128 (Penguin 1987).

nonexistent,<sup>53</sup> exactly the circumstances that apply to energy markets. The supply curve is so severe (supply is so inelastic) that the scarcity rents make up the vast majority of the market price as demand moves toward the peak. Supply cannot respond to price signals, thus the owners of existing facilities just collect windfall profits.

Scarcity rents also pose a transitional problem in electricity markets. Existing facilities have proven to be far more valuable than their book costs, which are all that can be reflected in regulated rates. If utilities capture those plants at book value, but can price them at market in the future, the cost of electricity increases. The assets that would earn these rents have gained their advantage from historic utility financing. Unless the market windfall is passed back to consumers, electricity prices increase. If they are not passed back to consumers, they can be used by incumbents as a cross-subsidy to frustrate competition. Scarcity rents can be eliminated, e.g. taxed away or passed back to consumers, without harming economic efficiency.<sup>54</sup>

Market power is a separate problem. The ability of producers to withhold supply or to hold out for high prices gives them an incentive to drive prices farther above costs to increase profits, by shifting the supply curve to the left. Distinguishing between real and artificial scarcity becomes difficult. The markup of price over cost increases in lock step with the reduction of available plants, even in systems with excess capacity.<sup>55</sup> From the economic point of view, scarcity rents are wealth transfers that do not contribute to economic efficiency because they are inframarginal. Monopoly rents are wealth transfers that detract from economic efficiency. Landes and Posner concerned

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<sup>53</sup> Donald Rutherford, *Dictionary of Economics* 137 (Routledge 1992) (identifying the origin of the concept as being associated with land, and hence occasionally referred to as "ground rents." "As land was regarded in classic economics as the only fixed factor of production, it alone earned rent. However, as any factor of production can be fixed in supply, "rent" can be earned by any factor of production. Popular examples of factors with an inelasticity of supply abound; lab[o]r can earn economic rent as persons with rare talents (e.g. opera singers and top sports players) have high earnings largely consisting of economic rent.").

<sup>54</sup> Because supply of a fixed asset does not respond to price changes, there is little or no dead weight loss. Taylor, *supra* note 20, at 350 ("Economic rent is the price of anything that has a fixed supply. Economic rent is also sometimes called pure rent. Economic rent is a significant concept in economics precisely because the quantity supplied does not depend on the price. Thus, a tax on economic rents would not change the amount supplied; it would not affect economic efficiency or cause a deadweight loss.").

<sup>55</sup> Richard Rosen, et al., *Tellus Inst., Can Electric Utility Restructuring Meet the Challenges It Has Created* (2000); Aleksander Rudkevich, Max Duckworth & Richard Rosen, *Tellus Inst., Modeling Electricity Pricing in a Deregulated Generation Industry: The Potential for Oligopoly Pricing in a Poolco* § 6 (1997).

themselves only with the deadweight efficiency loss associated with market power,<sup>56</sup> but the *Merger Guidelines* recognize both the wealth transfers and the efficiency impacts of market power. From the consumer point of view, both matter.

## II. Failure of Merger Review in the PETROLEUM Industry<sup>57</sup>

### A. The FTC's Lax Standard

Failing to take these market fundamentals into account, the FTC focuses its attention on highly concentrated markets, those with HHIs above 1800. This lax view of market concentration pervades the FTC's analysis, as the FTC concluded in its analysis of hundreds of mergers between 1994 and 2004:

Prime suppliers at the state level in March 2004 were either unconcentrated or moderately concentrated (by Merger Guidelines standards) in all but eight states and the District of Columbia. While state-level HHI tended to increase between December 1994 and March 2004, these changes have not resulted in HHI in the highly concentrated range.<sup>58</sup>

This interpretation of the data is a perfect example of the bias in favor of concentrated markets. Nothing matters but highly concentrated markets. Contrast the FTC's discussion to that of the Government Accountability Office (GAO). The unit of analysis is exactly the same – state wholesale gasoline markets (grouped by Petroleum Administrative Defense Districts or "PADDs"). The time period is approximately the same: 1994 to 2002. However, the discussion is quite different:

As can be observed, the wholesale gasoline markets in 16 states in PADD I (the East Coast) were moderately concen-

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<sup>56</sup> Landes & Posner, *supra* note 5, at 954 (where the cost of market power is measured only as the deadweight loss).

<sup>57</sup> This section draws on Mark Cooper, American Bar Association, Record Prices: Record Oil company Profits: The Failure of Antitrust Enforcement to Protect American Energy Consumers (2004) [Hereinafter Cooper, Record Prices] and Mark Cooper, The role of Supply, Demand, Industry Behavior and Financial Markets in the Gasoline Price Spiral, A Report Prepared for the Wisconsin Attorney General [May 2006 (Hereinafter, Cooper, Natural Gas)].

<sup>58</sup> FTC Report, *supra* note 28, at 230-1.

trated in 2002, compared to 7 states in 1994. Also, in PADD I, the number of states that had unconcentrated wholesale gasoline markets decrease from 10 in 1994 to just 1 in 2002. Some key mergers that affected PADD I during this period include Exxon-Mobil, BP-Amoco, and Shell-Texaco (Motiva).

In PADD II (The Midwest) the wholesale gasoline markets in 5 states were highly concentrated, 8 were moderately concentrated, and 2 were unconcentrated as of 2002. By comparison, in 1994, there were no highly concentrated markets, 7 states were moderately concentrated, and 8 states were unconcentrated in this PADD. Some key mergers that affected PADD II during this period included Marathon-Ashland, Marathon-Ultramar Diamond Shamrock (UDS), BP-Amoco, Shell-Texaco (Equilon) and UDS-Total.

The wholesale gasoline market in all the states in PADD III (the Gulf Coast Region) except one had become moderately concentrated in 2002, compared to 1994 when all were unconcentrated. Key mergers that affected PADD III during the period include Exxon-Mobil, Shell-Texaco (Motiva), Marathon-Ashland, and Valero-UDS.

For the States included in PADDs IV and V (the Rocky Mountain and West Coast, respectively), wholesale gasoline markets remain in the moderately or highly concentrated range in 2002 as in 1994. Within this range, concentration levels increased in all but one state in PADD V between 1994 and 2002. Key mergers that affected PADD IV during this period included Shell-Texaco (Equilon), Phillips-Tosco, Conoco-Phillips, and UDS-Total. Key mergers that affected PADD V during the period included Tosco-Unocal, Shell-Texaco (Equilon), Chevron-Texaco, Phillips-Tosco, and Valero-UDS.<sup>59</sup>

Unlike the FTC, the GAO examined changes throughout the full range of market concentrations. The GAO observed a tremen-

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<sup>59</sup> U.S. Gen. Accounting Office, *Energy Markets: Effects of Mergers and Market Concentration in the U.S. Petroleum Industry* (2004) [hereinafter *Energy Markets*].

dous shift toward moderately concentrated markets.

Exhibit II-1 summarizes the impact of that merger wave on refining and gasoline markets. In 1994, 47 percent of states were unconcentrated, while 43 percent were moderately concentrated and 10 percent were concentrated. By 2002, only 8 percent of markets were unconcentrated, while 75 percent were moderately concentrated and 18 percent were highly concentrated.

#### **Exhibit II-1: Changes in Market Concentration**

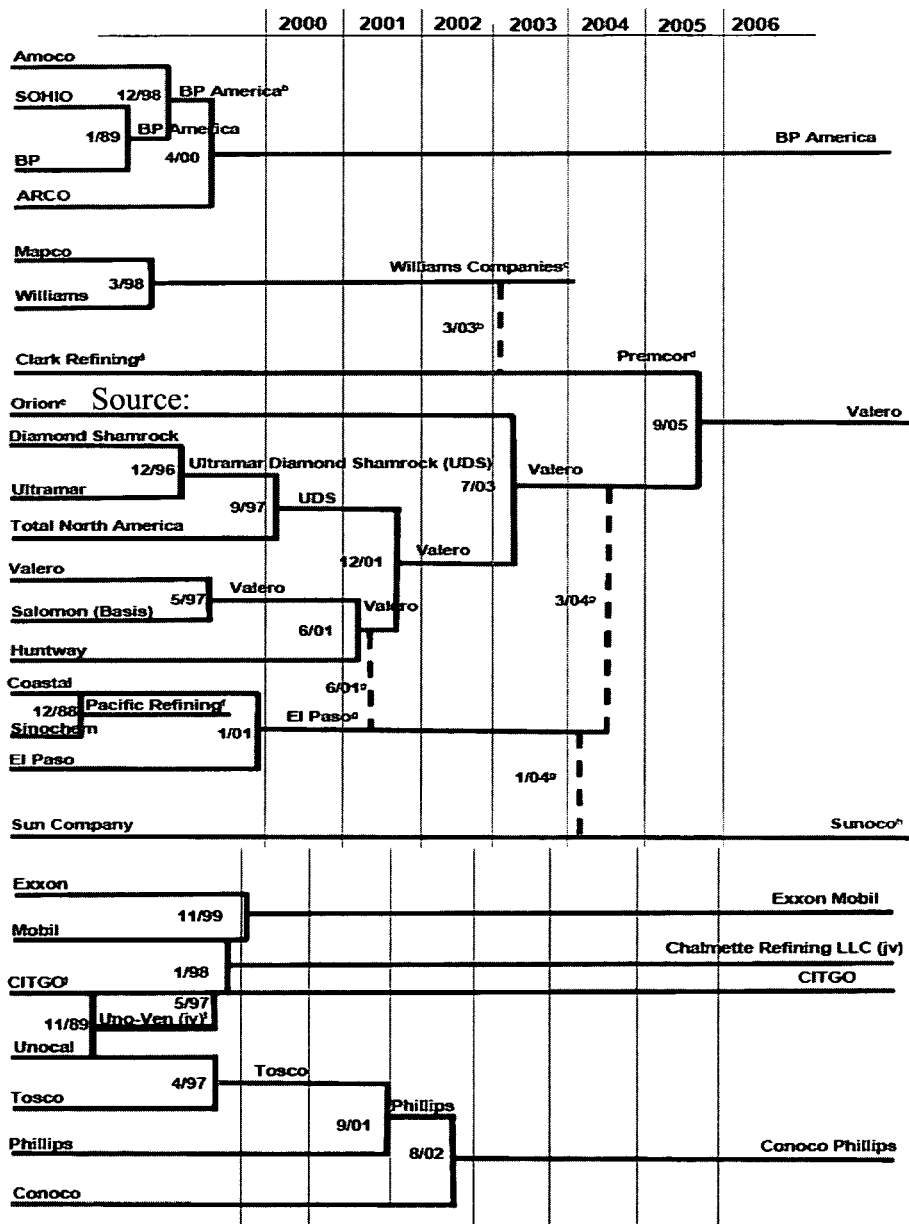
<b>Changes in Market Concentration</b>	<b>Percent of Markets Classified as:</b>			<b>Avg. HHI</b>
	<b>Unconcent.</b>	<b>Moderately</b>	<b>Highly</b>	
<b>State Wholesale Gasoline</b>				
1994	47	43	10	1162
2004	8	75	18	1696
<b>Refiner PADDs</b>				
1990	43	57	0	973
2003	14	71	14	1346

**Source:** U.S. GEN. ACCOUNTING OFFICE, ENERGY MARKETS: EFFECTS OF MERGERS AND MARKET CONCENTRATION IN THE U.S. PETROLEUM INDUSTRY (2004)

In the aggregate, we observe that only four of the 51 markets analyzed by the FTC were unconcentrated, while nine were highly concentrated. In 30 markets, the increase in concentration was over 300 points in markets that were in the moderately concentrated range. In another 8 markets, the increase was over 100 points in markets that were in the moderately concentrated range. Thus, three-quarters of the markets experienced increases in concentration that could have resulted in an unacceptable increase in market power if the supply and demand elasticities we have identified are taken into account.

The analysis also includes the changes in the refining markets at the level of petroleum administrative defense districts, the traditional market for refining. It includes two submarkets that the FTC identified separately – the Upper Midwest (Illinois, Indiana, Kentucky, Michigan, Ohio, and Wisconsin) and California. Four of the five PADDs experienced a substantial increase in concentration. Three of the five fell in the moderately concentrated range; one fell in the highly concentrated range. Both the submarkets exhibited a substantial increase in concentration and fell in the moderately concentrated range.

The cumulative effect of the merger wave is depicted in Exhibit II-2. Twenty five major refiners were reduced to seven. This analysis also takes a “big picture” point of view, assessing the overall merger wave, something the FTC fails to do in its merger review.



**Source:** <http://tonto.eia.doe.gov/FTPROOT/financial/mergers/dwnstream.pdf>

The FTC's focus on highly concentrated markets and large changes in HHI is evident in its recent (1996-2003) merger review activities (see Exhibit II-3). The action the FTC claims to take is generally to restore the competitive landscape to its pre-merger levels where it perceives a threat of market power. However, if it is using the wrong standard, it may allow mergers that increase market power or take measures that are inadequate to prevent the exercise of market power.

### **Exhibit II-3: Federal Trade Commission Action and Inaction on Oil Company Mergers**

Post-Merger HHI	Threshold Not Violated	Threshold Violated	
	No Action Needed	No Action Taken	Conditions Imposed
Up to 1399	9	11	0
1400 – 1799	5	15	55
1800 – 7000+	0	26	153
<b>Total</b>	<b>14</b>	<b>54</b>	<b>208</b>

**Source:** FED. TRADE COMM'N, *THE PETROLEUM INDUSTRY: MERGERS, STRUCTURAL CHANGE AND ANTITRUST ENFORCEMENT* (2004), Table 2-6.

Looking at the combination of post-merger concentration and merger-induced change, we identified over 50 merger situations, or about one-fifth of the total, in which the FTC took no action but should have, based on the earlier analysis. It took no action in mergers where the HHI was below 1400. It took no action in one-fifth of the cases when the post-merger HHI was in the range of 1400 to 1799. It took no action in one-sixth of the mergers where the post-merger market was highly concentrated.

## **B. Vertical Integration**

The previous discussion focused on horizontal concentration. Vertical integration between segments of the industry may have an impact as well. Vertical integration by dominant firms may create a



barrier to entry requiring entry at two stages of production,<sup>60</sup> or foreclosing critical inputs for competitors in downstream markets.<sup>61</sup> Vertical arrangements may restrict the ability of downstream operators to respond to local market conditions.<sup>62</sup> Vertical integration not only removes important potential competitors across stages of production,<sup>63</sup> but also may trigger a wave of integrative mergers,<sup>64</sup> rendering small independents at any stage extremely vulnerable to a variety of attacks.<sup>65</sup> GAO found evidence here as well.<sup>66</sup>

Gasoline markets are vulnerable to the negative effects of vertical integration. Product must move downstream from the refinery or the tanker to the pump. Vertically integrated operations are closed to independent sources of supply. They may impose zonal pricing formulas or restrictions on sources of supply on their distribution outlets.<sup>67</sup> With vertical integration, the market may be less responsive than it could be both in the short term, since competing product has difficulty getting into individual markets at the end of a vertically<sup>68</sup> integrated chain, and in the long term because new competitors in any market may have to enter at several stages of the business.

The GAO provides a detailed description of the changes in

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<sup>60</sup> Scherer & Ross, *supra* note 10, at 526 (formulating the issue as follows "[t]o avoid these hazards, firms entering either of the markets in question might feel compelled to enter both, increasing the amount of capital investment required for entry.").

<sup>61</sup> Shepherd, *supra* note 22, at 289-290 (describing this issue as follows: "[o]res, special locations, or other indispensable inputs may be held by the integrated firm and withheld from others. The integration prevents the inputs from being offered in a market, and so outsiders are excluded. A rational integrated firm might choose to sell them at a sufficiently high price.").

<sup>62</sup> *Id.* at 294 (arguing that integration by large firms creates this problem. Restrictions may be set on areas, prices or other dimensions ... Only when they are done by small-share firms may competition be increased. When done by leading firms with market shares above 20 percent, the restrictions do reduce competition.)

<sup>63</sup> Martin K. Perry, Vertical Integration: Determinants and Effects, 1 Handbook of Industrial Organization 197 (Richard Schmalensee and Robert D. Willig eds., North-Holland 1989).

<sup>64</sup> *Id.* at 247.

<sup>65</sup> Scherer & Ross, *supra* note 10, at 526-527; Shepherd, *supra* note 22, at 290.

<sup>66</sup> Energy Markets, *supra* note 59, at 5-9.

<sup>67</sup> Steven Borenstein, A. Colin Cameron & Richard Gilbert, Do Gasoline Prices Respond Asymmetrically to Crude Oil Price Changes?, 112 Q. J. of Econ. 305 (1997).

<sup>68</sup> Scherer and Ross, *supra* note 10, at 526-527; Shepherd, *supra* note 22, at 290.

gasoline marketing that have worked to diminish competition:

According to industry officials, two major changes have occurred in U.S. gasoline marketing since the 1990s, partly related to mergers. First, the availability of unbranded (generic) gasoline has decreased substantially.<sup>69</sup>

The second change identified by industry officials is that refiners now prefer dealing with large distributors and retailers.<sup>70</sup>

Consolidation at the refining level has allowed large refiners to dictate the terms of supply contracts, including minimum volume requirements.<sup>71</sup>

Distributors said that refiners who supply them with branded gasoline preclude them from operating stations within certain proximities of major metropolitan markets where the refiners generally prefer to locate their company-owned and –operated and lessee dealer stations.<sup>72</sup>

Academic studies corroborate the effect of market power in specific mergers at a very micro level of analysis.<sup>73</sup>

Against this background and given the nature of the industry, the enforcement actions the FTC takes might not effectively address the underlying problem. Divesting to other large players who are not in a particular market might not alleviate problems, since the industry has so much multiple market contact that codes of behavior easily emerge. Divesting to a smaller player within the market can have the effect of increasing the general level of concentration in the market, albeit less than merely allowing the merger to pass without divestiture. Because market forces are weak, this may result in an increase

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<sup>69</sup> Energy Markets, *supra* note 59, at 76.

<sup>70</sup> *Id.* at 5.

<sup>71</sup> *Id.* at 77.

<sup>72</sup> *Id.* at 73.

<sup>73</sup> Richard Gilbert & Justine Hastings, Competition Policy Ctr., Univ. of Cal., Berkeley, Vertical Integration in Gasoline Supply: An Empirical Test of Raising Rivals' Costs 27 (2001); see also Justine Hastings, Competition Policy Ctr., Univ. of California, Berkeley, Vertical Relationships and Competition in Retail Gasoline Markets: Empirical Evidence from Contract Changes in Southern California (2000).

in market power and rising prices.

## **C. The Impact of Petroleum Industry Consolidation**

### **1. Gasoline**

Reflecting the effects of horizontal concentration and vertical integration, the GAO found that mergers contributed to price increases.

[The] GAO's econometric analyses show that oil industry mergers and increased market concentration generally led to higher wholesale gasoline prices. . . . Six of the eight specific mergers GAO modeled – which mostly involved large, fully vertically integrated companies – generally resulted in increases in wholesale prices for branded and/or unbranded gasoline of about 2 cents per gallon, on average. . . Increased market concentration, which captures the cumulative effect of mergers as well as other market structure factors, also generally led to higher prices for conventional gasoline, which is sold nationwide, and for boutique fuels – that has been reformulated for certain areas on the East Coast regions and in California to lower pollution. The price increases were particularly large in California, where they averaged about 7 cents per gallon.<sup>74</sup>

The GAO report, however, may underestimate the impact of the merger wave on prices in the oil industry. The study considered only the effect on wholesale gasoline prices, but changes in retail markets may also contribute to higher prices. Its data stopped in 2000 when gasoline prices were just beginning to take off. Additional mergers took place and the price increases attributable to domestic refining and marketing sectors grew substantially thereafter. Learning how to behave in a tight oligopoly can raise prices. The GAO report did not consider how strategic gaming in an increasingly consolidated industry raised the general price level, as the tight oligopoly of oil giants learned how to exploit its market power with experience. The study shows that increased refinery utilization rates

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<sup>74</sup> U.S. Gen. Accounting Office, *Energy Markets: Mergers and Other Factors that Affect the U.S. Refining Industry*, Testimony Before the Subcommittee on Energy Policy, Natural Resource and Regulatory Affairs, Committee on Government Reform, House of Representatives 1 (2004), available at <http://www.gao.gov/new.items/d04951t.pdf>

and decreased inventories of product add a great deal to price on a seasonal basis, but does not consider the fact that the trend of tightening markets across time, which company documents show was an intended consequence of the merger wave, raised the overall level of price. The study shows that “supply” disruptions also have a large impact on price, but does not consider slow reactions to disruptions as a consequence of the merger wave.

In building its econometric model, the GAO sought to control for other factors that might account for any observed price differences, other than increases in concentration. It found that “low gasoline inventories, high refinery capacity utilization rates and supply disruptions increased wholesale gasoline prices.”<sup>75</sup> The impact is substantial and it is quite likely that these variables are actually the indirect effects of strategic behavior and not beyond the reach of public policy.

There is ample qualitative evidence that the mergers were intended to reduce redundant capacity.<sup>76</sup> While the econometric approach controls for fluctuation of capacity in the short term, it does not address the question or determine the causes of the long-term trend of increased utilization rates and reduced inventory ratios. The explanation given by the GAO for the observed effect underscores the policy concern – “We found that prices were higher because high refinery utilization rates in oil refining industry leave little room for error in predicting short run supply.”<sup>77</sup> Because the markets are insufficiently competitive, when firms make a mistake and get caught short, they simply raise the price. There is no competitive discipline.

A March 2001 FTC report, authored by Chairman Robert Pitofsky in response to the mid-2000 gasoline price spike, noted that by withholding supply, the oil industry was able to drive prices up and thereby increase profits.<sup>78</sup> The FTC identified the complex factors in the spike and issued a warning:

The spike appears to have been caused by a mixture of structural and operating decisions made previously (high capacity utilization, low inventory levels, the choice of

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<sup>75</sup> Energy Markets, *supra* note 59, at 128.

<sup>76</sup> Ron Wyden, The Oil Industry, Gas Supply and Refinery Capacity, More than Meets the Eye, An Investigative Report (2001), available at [http://wyden.senate.gov/leg\\_issues/reports/wyden\\_oil\\_report.pdf](http://wyden.senate.gov/leg_issues/reports/wyden_oil_report.pdf) (references internal memoranda from Chevron and Texaco, complaining about surplus refining capacity on the West Coast).

<sup>77</sup> Energy Markets, *supra* note 59, at 139

<sup>78</sup> Fed. Trade Comm’n, Midwest Gasoline Price Investigation (2001).

ethanol as an oxygenate), unexpected occurrences (pipeline breaks, production difficulties), errors by refiners in forecasting industry supply (misestimating supply, slow reactions), and decisions by firms to maximize their profits (curtailing production, keeping available supply off the market). The damage was ultimately limited by the ability of the industry to respond to the price spike within three or four weeks with increased supply of products. However, if the problem was short-term, so too was the resolution, and similar price spikes are capable of replication. Unless gasoline demand abates or refining capacity grows, price spikes are likely to occur in the future in the Midwest and other areas of the country.<sup>79</sup>

A 2003 RAND study of the refinery sector reaffirmed the importance of the decisions to restrict supply. It pointed to a change in attitude in the industry, wherein “[i]ncreasing capacity and output to gain market share or to offset the cost of regulatory upgrades is now frowned upon.”<sup>80</sup> In its place we find a “more discriminating approach to investment and supplying the market that emphasized maximizing margins and returns on investment rather than product output or market share.”<sup>81</sup> The central tactic is to allow markets to become tight by “relying on . . . existing plant and equipment to the greatest possible extent, even if that ultimately meant curtailing output of certain refined product.”<sup>82</sup>

[Indeed, many RAND discussants] openly questioned the once-universal imperative of a refinery not “going short” — that is not having enough product to meet market demand. Rather than investing in and operating refineries to ensure that markets are fully supplied all the time, refiners suggested that they were focusing first on ensuring that their branded retailers are adequately supplied by curtailing sales to wholesale markets if needed.<sup>83</sup>

The RAND study drew a direct link between long-term structural changes and the behavioral changes in the industry, drawing the

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<sup>79</sup> *Id.* at i-4.

<sup>80</sup> Peterson & Mahnovski, *supra* note 45, at 16.

<sup>81</sup> *Id.* at 42.

<sup>82</sup> *Id.* at 17.

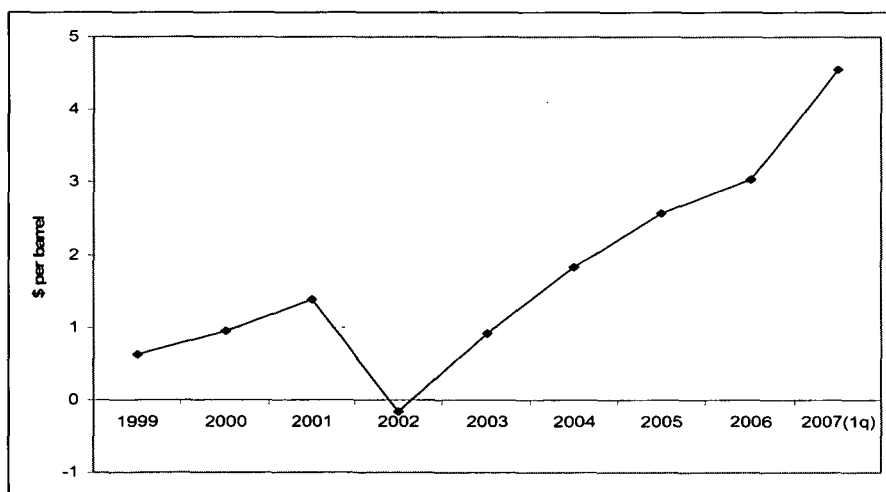
<sup>83</sup> *Id.* at 17.

connection between business strategies to increase profitability and pricing volatility. It issued the same warning that the FTC had offered two years earlier:

For operating companies, the elimination of excess capacity represents a significant business accomplishment: low profits in the 1980s and 1990s were blamed in part on overcapacity in the sector. Since the mid-1990s, economic performance industry-wide has recovered and reached record levels in 2001. On the other hand, for consumers, the elimination of spare capacity generates upward pressure on prices at the pump and produces short-term market vulnerabilities. Disruptions in refinery operations resulting from scheduled maintenance and overhauls or unscheduled breakdowns are more likely to lead to acute (i.e., measured in weeks) supply shortfalls and price spikes.<sup>84</sup>

The record profits that the industry achieved in 2001 by tightening capacity and changing behavior were just the beginning of the story (see Exhibit II-4). Income fell in 2002 due to the severe recession following September 11, but once the economy began growing again, refining profits exploded. By the first quarter of 2007, they were triple the record set in 2001. Moreover, the rate of growth in of profits on domestic refining was much faster than foreign refining. The strategic behavior of the industry had paid off handsomely.

#### Exhibit II-4: Net Income From Refining/Marketing



<sup>84</sup> *Id.* at xvi.

**Source:** Energy Information Administration, *Performance Profiles Tables: 2005*, and *Selected Financial and Operating Data for a Consistent Set of Energy Companies* for First Quarter 2007.

Decisions about stockpiling of product are business decisions. Stocks are measured as the number of days of demand for gasoline held in storage. It is the stocks above this level that are available to respond to shifts in demand or price. The reserves above the lower operational level<sup>85</sup> have declined to very low levels. They generally are in the range of a couple of days, compared to four or five days in the early 1990s and over a week in the 1980s.

Refinery expansion has not been sufficient to alleviate the pressure on price and this business strategy is likely to keep it that way for at least a decade. A comment by the chairman of ExxonMobil reported in the *Wall Street Journal* makes it clear that the industry continues to behave in this anticompetitive, anti-consumer manner and will do nothing to alleviate the pressure on the refining market:

Exxon Mobil Corp. says it believes that, by 2030, hybrid gasoline-and-electric cars and light trucks will account for nearly 30% of new vehicle sales in the U.S. and Canada. That surge is part of a broader shift toward fuel efficiency that Exxon thinks will cause fuel consumption by North American cars and light trucks to peak around 2020 – and then start to fall.

“For that reason, we wouldn’t build a grassroots refinery,” in the U.S. Rex Tillerson, Exxon’s chairman and chief executive, said in a recent interview. Exxon has continued to expand the capacity of its existing refineries. But a new refinery from scratch, Exxon believes, would be bad for long-term business.<sup>86</sup>

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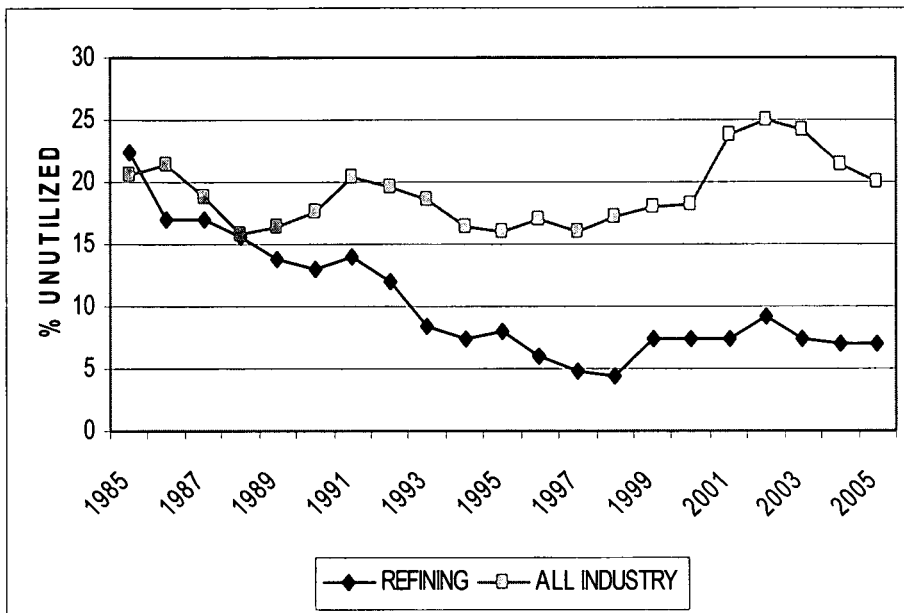
<sup>85</sup> U.S. Dep’t of Energy, Energy Info. Admin., Petroleum Supply Monthly 145 (2000) (defining the lower operational inventory as follows:

Lower operational Inventory (LOI): The lower operational inventory is the lower end of the demonstrated operational inventory range updated for known and definable changes in the petroleum delivery system. While not implying shortages, operational problems or price increases, the LOI is indicative of a situation where inventory-related supply flexibility could be constrained or non-existent. The significance of these constraints depends on local refinery capability to meet demand and the availability and deliverability of products from other regions or foreign sources.).

<sup>86</sup> Jeffrey Ball, As Gasoline Prices Soar, Americans Resist Major Cuts in Con-

Exhibit II-5 shows the capacity utilization in the refining sector over the past two decades. The downward trend in spare capacity began in the mid 1980s as a result of policies to eliminate subsidies to keep capacity on line and dispersed in ownership and geography. The decline continued through the late 1990s and the refining industry has maintained an extremely low level of spare capacity compared to all industry. All industry carries about 2.5 times the amount of spare capacity. The irony is that petroleum products, with their low elasticities, are particularly vulnerable to this tight market situation.

**Exhibit II-5: Spare Capacity in Refining v. All Industry**



**Source:** Calculated from Board of Governors of the Federal Reserve System, *Federal Reserve Statistical Release, Industrial Production and Capacity Utilization*; Energy Information Administration, U.S. Department of Energy, *U.S. Percent Utilization of Refinery Operable Capacity*.

This pattern of behavior is not restricted to investments in refining. As the *Wall Street Journal* noted in mid-2004, “with prices soaring as much as 50 percent . . . oil titans from Texas to Tehran are awash in record revenue. But as the money floods in, they are spend-



ing little extra in finding and extracting more petroleum.”<sup>87</sup> Just as we have seen in the refining sector, where companies will not invest to expand refinery capacity that might put downward pressure on price, the same mentality afflicts the companies in the production sector. The companies call it “capital discipline,”<sup>88</sup> but it means a tight market and a permanent condition of excess profits. The *Wall Street Journal* cites a Chevron/Texaco spokesperson, defending the fact that “the company has made no major shifts in investment plans because of the price boom. ‘Our long-term price guidelines are around the low \$20s’ for U.S. benchmark crude.”<sup>89</sup> The *Journal* points out that this is “well below the average of \$29 at which oil has traded since 2000.”<sup>90</sup> The result of the refusal to invest in production capacity has “led to one of the biggest potential disconnects between supply and demand in the 150-year history of the oil business.”<sup>91</sup>

Other industry analysts have similar concerns.

For several years oil producers have proved reluctant to match their spending to expected demand, says John Westwood, chief executive of British energy industry consultant Douglas-Westwood. Mr. Westwood traces part of the dearth in spending to oil companies’ recent merger binge, where they bought growth through acquisitions rather than exploration. . . . “As far as we’re concerned, this is not a real [supply] crunch. This is just a practice.”<sup>92</sup>

The *New York Times* underscored the consternation of some with a front page headline “An Oil Enigma: Production Falls Even as Reserves Rise: No Clear Picture Emerges to Explain Discrepancy.”<sup>93</sup> Ironically, it selected Chevron/Texaco to illustrate the fact that oil companies were producing less of their reserves. The turning point

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<sup>87</sup> Awash in a Gusher of Cash, Oil firms Are Reluctant Investors, *Wall St. J.*, August 26, 2004, at A-1, A-2 .

<sup>88</sup> *Id.*; ExxonMobil, 2005 Annual Report 5 (2006); Chevron, 2005 Annual Report 2 (2006) (using the term “capital discipline”) [Hereinafter Awash].

<sup>89</sup> Awash, *supra* note 87, at A-2.

<sup>90</sup> *Id.*

<sup>91</sup> *Id.* at A1.

<sup>92</sup> Susan Warren, Fear Factor in the Oil Industry is Driver Behind Rising Prices, *Wall St. J.*, June 3, 2004, at A-4.

<sup>93</sup> Alex Berenson, An Oil Enigma: Production Falls Even as Reserves Rise, *N.Y. Times*, June 12, 2004.

was 2000. Strategic behavior was clearly in evidence.

## 2. Natural Gas

This pattern of behavior was not limited to oil. The mergers and subsequent strategic behavior affected natural gas as well. When “The Majors’ Shift to Natural Gas,”<sup>94</sup> as an Energy Information Administration document put it, behavior in the industry changes. With the entry of major producers into the market, investment patterns changed. Investment decisions largely determined the state of the resource base. With majors shifting their focus in the late 1990s, production exceeded reserve additions, creating the condition for a tightening of the market. When prices began to rise, the response was slow. As Standard and Poor’s noted in 2004:

It is unclear that producers are investing enough to grow production materially – and this follows a year [2003] in which the domestic gas production (including acquisitions) of integrated producers appears to have declined. . .

[M]ajor integrated companies, which appear to be reinvesting only 30 to 40 percent of their domestic cash flow in the United States, have made strategic decisions to allow their shallow-water and onshore natural gas production to deplete to redeploy capital to international (mainly oil) projects.<sup>95</sup>

The majors –BP-Arco-Amoco, Exxon-Mobil, Chevron-Getty-Texaco, ConocoPhillips – were lagging in the effort to replace their reserves.<sup>96</sup> Listing the names reminds us of how many firms disappeared in the merger wave of 1996-2002. These four majors accounted for about half of all the gas marketed in North America.<sup>97</sup>

Drilling activity does respond to price increases, but it has been muted. Since 1999, which saw the lowest natural gas price in the past decade, there has been a doubling of the rig count, compared

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<sup>94</sup> Energy Information Administration, *The Majors Shift to Natural Gas* (September 2001)

<sup>95</sup> Jeff Beattie, U.S. Oil and Gas Producers Investing in Mergers, Not More Drilling – S&P, *Energy Daily*, Apr. 26, 2004.

<sup>96</sup> Mark Cooper, Midwest Attorneys Gen. Natural Gas Working Group, *The Role of Supply, Demand and Financial Commodity Markets in the Natural Gas Price Spiral*, 39-45 (2006) (Hereinafter Cooper, *Natural Gas*).

<sup>97</sup> *Gas Daily* 7, December 12, 2005.

to a six-fold increase in the price of oil and a similar increase in the price of natural gas. Nevertheless, the rig count was higher in 1996-1999 when the price was less than half of what it was in 2005. The implicit elasticity of the supply of rigs with respect to price is considerably less than one. Rigs drilling for natural gas show not only a faster rate of growth, but also a larger price increase.<sup>98</sup> The long period of low levels of drilling, followed by the rapid expansion, contributes to the inefficient and sluggish response. Capacity is destroyed during the down cycle and then the rush to increase capacity increases the cost.

“When price returns get high enough, people expand capacity. The returns are the highest we’ve seen for land rigs in a few decades. . .” Manufacturers building new rigs can expect a return of 25% to 30%.<sup>99</sup>

Drilling rig day rates have doubled since 2000 and new rigs are available only if a producer is willing to guarantee long-term leasing at these higher rates.<sup>100</sup>

At the same time, it is clear that price increases have far outstripped the increases in costs.<sup>101</sup> As an analysis in the *New York Times* under the headline “High Profits, Sluggish Investments,”<sup>102</sup> pointed out after the announcement of yet more record profits, “[t]he real issue, though, is not how much the oil companies are making, but what they are doing with the money. In too many cases, they seem to have only a limited interest in investing it in projects that might help prevent or ameliorate a new energy crisis.”<sup>103</sup> The article noted that Exxon essentially decides what to invest based on its projections of prices and “Exxon’s price forecasts have not risen much in recent years, even though market prices have soared.”<sup>104</sup> The dramatic shift in behavior among the majors is also unprecedented. “I checked back

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<sup>98</sup> Foster Report No. 2538 at 2.

<sup>99</sup> Gas Drilling Drives Market for New, Rebuilt Rigs, *Gas Daily*, Feb. 7, 2006, at 6.

<sup>100</sup> Independent Producers Spell Out Efforts to Address Natural Gas Market Issues in Wake of Storms, Foster Report No. 2563, Oct. 20, 2005, at 20.

<sup>101</sup> Cooper, *Natural Gas*, *supra* note 96, at 35-39

<sup>102</sup> Floyd Norris, High Profits, Sluggish Investment, *N.Y. Times*, Feb. 3, 2006, at C-1.

<sup>103</sup> *Id.*

<sup>104</sup> *Id.*

to 1976, and found that until 1997, Exxon always invested more than it made. Now it invests less than half of its profits.”<sup>105</sup>

Exxon’s ability to choose its target price and not fear that it will lose out to others who act more aggressively is one indication of its market power. The fact that Exxon invested more than it earned until the onset of industry consolidation in the mid-1990s underscores the fact that companies generally use two major sources of cash to invest in an industry. Depreciation, which is the return of capital, and net income, or return on capital, are the two primary streams of cash flow.

### 3. The Cost of the Price Run-up

The structural conditions in the domestic gasoline industry have only gotten worse as demand continues to grow and mergers have been consummated. Increases in prices and industry profits should come as no surprise. Given these broader concerns, the GAO study may severely underestimate the impact of the mergers on gasoline prices. An approach that gives a broader perspective is to examine the domestic spread on gasoline. The domestic spread is the difference between the pump price of gasoline, minus taxes, and the cost of crude oil. It represents the amount that the domestic industry takes for refining and marketing. The bulk of this comes in the refining sector. Exhibit II-6 shows the domestic spread against a baseline of the average for the 1990 to 1999 period. The increase in the domestic spread was just under 18 cents per gallon, raising the price at the pump by over \$170 billion in the 2000-2006 period.

Exhibit II-6 also shows the domestic ratchet in natural gas. I isolate the effect of crude oil using the historic relationship of crude to natural gas. The projected price for natural gas is based on the historic ratio of crude to gas of 10 to 1. This backs out the effect of crude price changes, although the link between natural gas and crude prices has been eroded over time.<sup>106</sup> The increase in natural gas prices in the 2000-2006 period was about \$1.50 per thousand cubic feet (mcf) for a total of more than \$235 billion. The total for these two vital energy commodities is \$400 billion.

This price increase translated into increased profits. In the period between 1985 and 1999 the major oil companies earned a return on equity of about 3 percentage points less than the Standard and Poors Industrials. The historic pattern over fifteen years, where oil companies earned somewhat less than the S&P Industrials is, in fact,

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<sup>105</sup> *Id.*

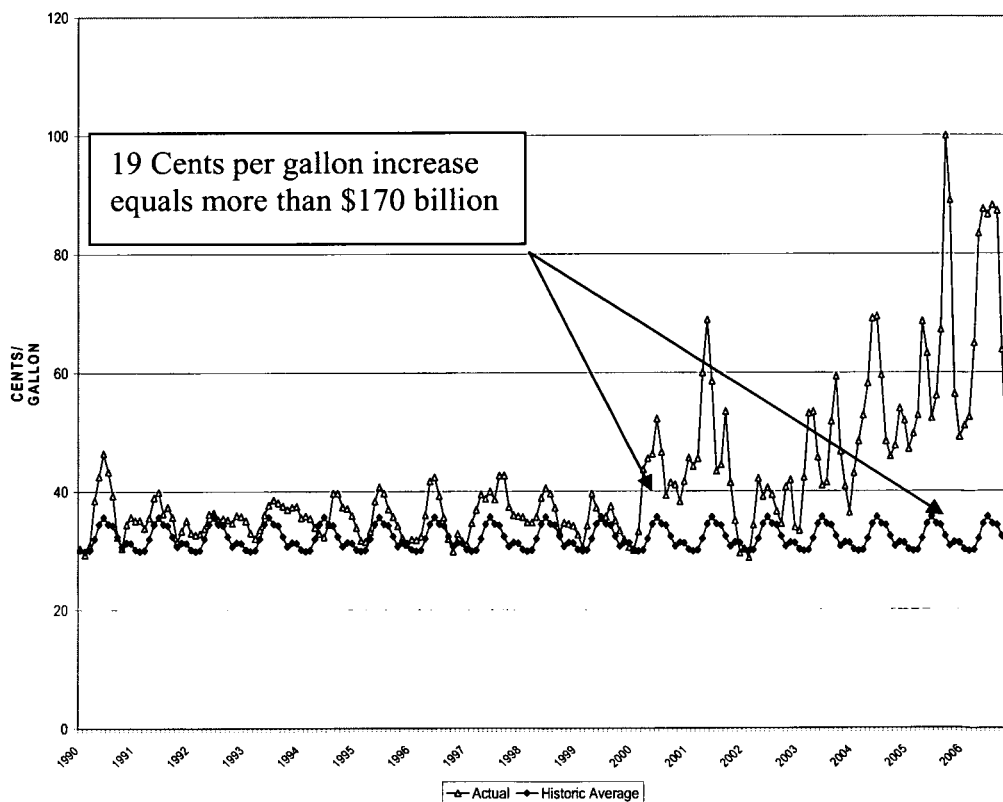
<sup>106</sup> Cooper, Record Prices, *supra* note 57, at 21-28.

the proper baseline. The return on equity should reflect the underlying risk in the sector. Wall Street measures riskiness by the variability of profits (measured by the Beta),<sup>107</sup> and the major oil companies are well below the average by this measure. The reason is that demand for oil is highly inelastic - it does not fluctuate widely. Competition is weak and barriers to entry are high. As a result, the oil industry faces less business risk than other large companies.

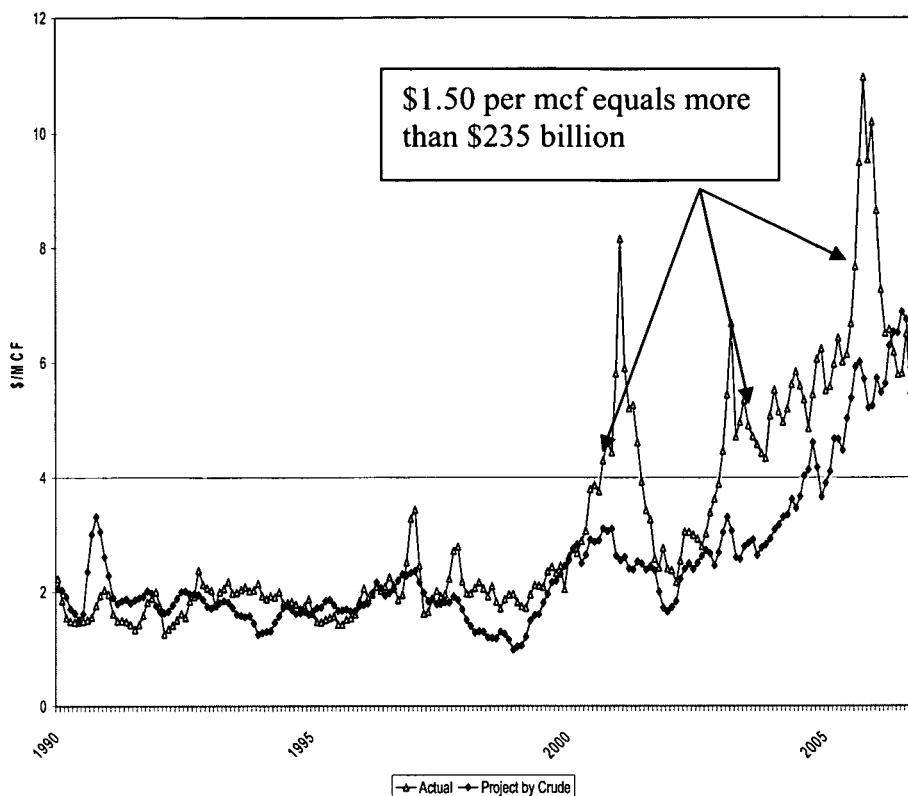
The industry has set records for profits year after year since the turn of the 21st century (see Exhibit II-7). Five of the six most profitable years since the oil embargo of 1973 have occurred since 2000. The total increase in pre-tax profits exceeds \$200 billion, using the historic relationship of return on equity for oil companies compared to the S&P industrials.

### Exhibit II-6: The Upward Spiral of Domestic Petroleum Product Prices

#### The Domestic Spread on Gasoline



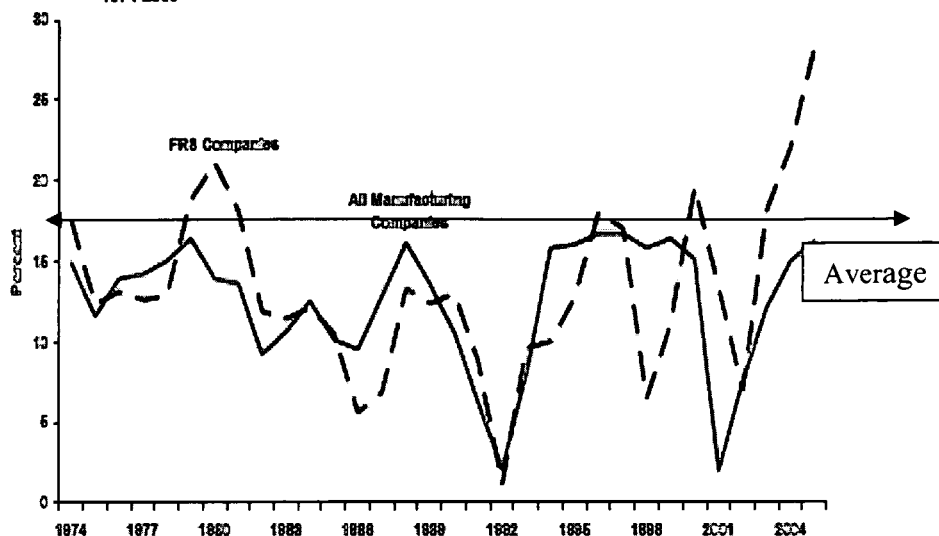
<sup>107</sup> Wikipedia – Beta Coefficient, [http://en.wikipedia.org/wiki/Beta\\_coefficient](http://en.wikipedia.org/wiki/Beta_coefficient).

**Domestic Ratchet in Natural Gas**

**Source:** Mark Cooper Record Prices: Record Oil Company Profits: The Failure of Antitrust Enforcement to Protect American Energy Consumers (September 2004), at 21-28.

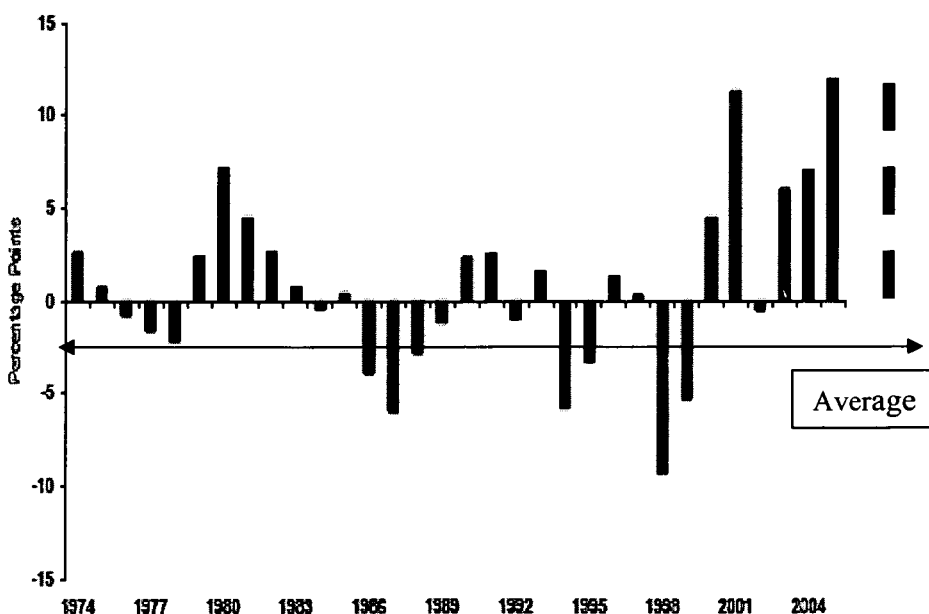
## Exhibit II-7: Major Oil Company Return on Equity is Far Above Historic Levels

Figure 2. Return on Stockholders' Equity for FRS Companies and All Manufacturing Companies, 1974-2005



Sources: FRS Companies: Energy Information Administration, Form EIA-28 (Financial Reporting System). All Manufacturing Companies: U.S. Census Bureau Quarterly Financial Report, All Manufacturing Companies.

Figure 3. Difference Between FRS and All Manufacturing Companies Return on Stockholders' Equity, 1974-2005



Sources: FRS Companies: Energy Information Administration, Form EIA-28 (Financial Reporting System). All Manufacturing Companies: U.S. Census Bureau Quarterly Financial Report, All Manufacturing Companies.

**Sources:** Energy Information Administration, *Performance Profiles of major Energy Producers: 2005* (Washington, D.C.:U.S. Department of Energy, December 2006); company annual reports to estimate 2006.

The picture is even more distressing when one looks at cash flow – which is made up almost entirely of the return of and on capital.<sup>108</sup> The majors simply cannot absorb the flood of cash. The increase in expenditures on exploration and development in the U.S. and Canada, which will do the most for natural gas markets in the U.S., is dwarfed by the increase in cash flow, as are total capital expenditures. The excess cash flow goes into increasing cash hoards, mergers and acquisitions, dividends and buy-backs of stock.

We do not see the level of increased domestic production activity from the international majors and certain large North American independents that we would expect to see in a rational, competitive marketplace at current gas prices, which have been at a sustained average annual price of greater than \$5.00 per MMBtu since mid-2002. . . The flight overseas by dollars realized from domestic gas prices realized since 2000. . . effectively means that the American consuming public is financing international projects. Such activity, in turn, helps to support the continued high level of domestic gas prices by resulting in a reduced level of domestic production with an increased per-unit cost than would otherwise be indicated by the level of domestic prices.<sup>109</sup>

“Most of the large integrated and larger majors are building up cash. After having gone through the exercise of debt reduction, share buybacks, and dividend increases, the companies are still looking at sizeable cash flow. . .

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<sup>108</sup> When an investment is depreciated, the capital is returned to the investor. Wikipedia – Depreciation, <http://en.wikipedia.org/wiki/Depreciation>. This return of capital is a major source of cash flow. Return on capital or investment is the income that companies earn and a second major source of cash flow. Wikipedia – Return on Investment, [http://en.wikipedia.org/wiki/Return\\_on\\_investment](http://en.wikipedia.org/wiki/Return_on_investment).

<sup>109</sup> James R. Choukas-Bradley & Michael Donnelly, City of Mesa, A Report on Projected Natural Gas Prices and Dynamics of the Natural Gas Market for 2005 and Beyond (2005), available at <http://www.cityofmesa.org/utilities/gas/pdf/PROJECTED-NATURAL-GAS-PRICES-RPT.pdf>.



"We believe that this cash build-up, and the lack of attractive new places to invest, will fuel more merger and acquisition activities."<sup>110</sup>

Looking at capital spending patterns for both exploration and acquisitions, on industry analysis noted that "M&A spending did draw a greater share of the funds, nearly all at the expense of development outlays."<sup>111</sup>

#### **D. The Trigger for the Price Explosion**

When the extremely low elasticities identified earlier in this paper are highlighted, the question immediately arises, "why don't energy companies push prices higher?" It would appear that they are leaving rents on the table. Because they are not extracting every penny, some argue that there must not be market power present. There is also the question of the sudden onset of the pricing pattern when the problem had been building. Is there a trigger?

The answer to both questions is that the exercise of market power is as much a political process as an economic one. Pricing, especially for commodities as vital as energy, must not elicit political reactions. The oil companies had been accumulating market power, and the election of an industry-friendly administration was a signal that more could be extracted (See Exhibit II-8).

There is no doubt that the arrival of the Bush Administration in 2001 represented a dramatic shift in policy. The National Energy Policy Development Group was formed under Vice President Cheney in the spring of 2001.<sup>112</sup> Crude oil prices were well off their historic highs at that moment, while the domestic spread was at the first of several peaks.<sup>113</sup> Nevertheless, when the National Energy Policy Development Group released its report, the underlying problem was portrayed as one in which "over-dependence on any one source of energy, especially a foreign source, leaves us vulnerable to price shocks, supply interruptions and in the worst case, blackmail."<sup>114</sup>

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<sup>110</sup> Analyst Expects Active Year for E & P Mergers, *Gas Daily*, Jan. 17, 2006, at 1-6.

<sup>111</sup> Study: North American Gas Producers Lead Pack, *Gas Daily*, Sept. 27, 2005, at 4.

<sup>112</sup> National Energy Policy Development Group, *National Energy Policy* (2001).

<sup>113</sup> Cooper, *Record Prices*, *supra* note 57 at 23-24.

<sup>114</sup> President George W. Bush, Remarks at the River Centre Convention Center by the President to Capital City Partnership (May 17, 2001) (transcript available at

The resulting policy recommendations were tilted strongly in favor of the industry.<sup>115</sup> The Vice President quickly became embroiled in controversy over questions of excessive industry influence in its deliberations, a dispute that went all the way to the Supreme Court of the United States.<sup>116</sup>

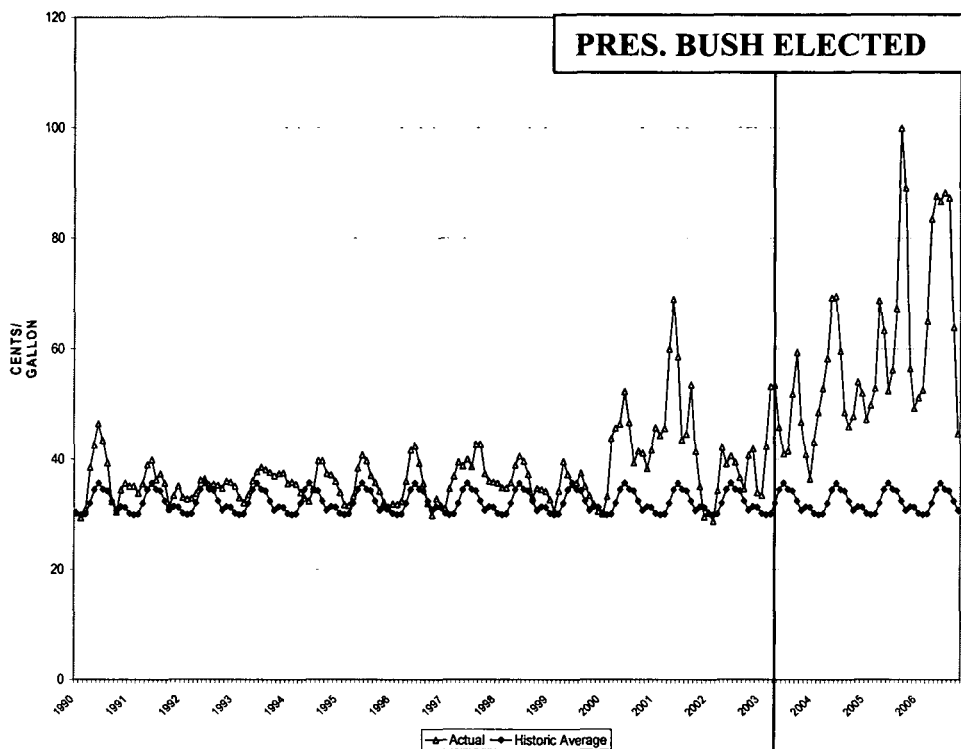
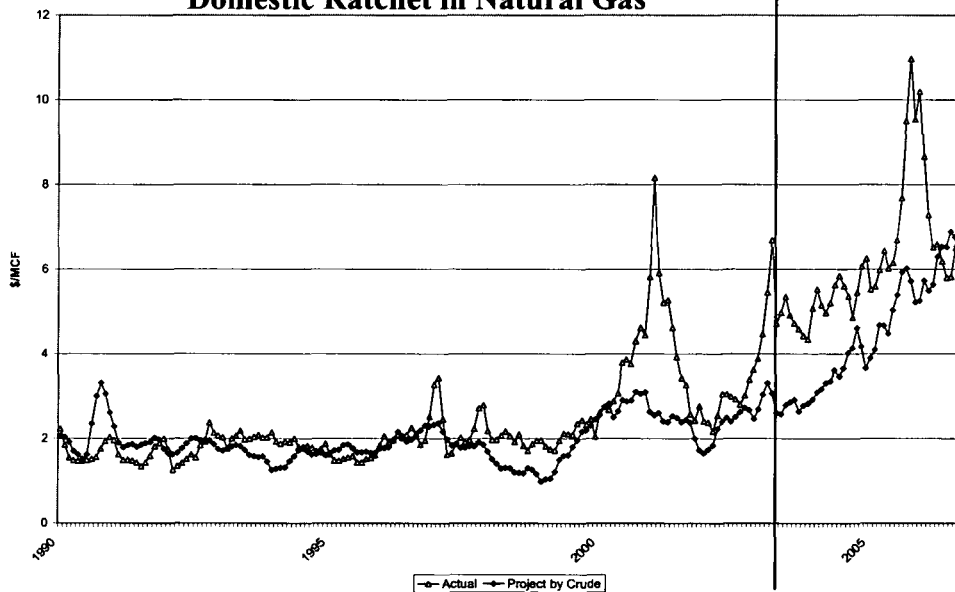
The high level of engagement by energy industry executives, like former Enron's CEO Kenneth Lay, in securing the rapid appointment of a new Chairman at the Federal Energy Regulatory Commission ("FERC") and in gaining access to the policy process was another favorable signal

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<http://www.whitehouse.gov/news/releases/2001/05/20010517-2.html> ); Mike Allen & Dana Milbank, Bush Issues Energy Warning; President Unveils New Policy, to Praise and Attacks on Party Lines, Wash. Post, May 18, 2001.

<sup>115</sup> Mark Leibovich, The Strong, Silent Type; Vice President Cheney Doesn't Suffer Small Talk When He's Looking at the Big Picture, Wash. Post, Jan. 18, 2004, at F-3. Secretary of the Treasury O'Neill recounts that the Vice President responded to the criticism of some of the administration policies with the blunt statement that, "[w]e won the mid-terms [elections], this is our due." The quote is from Secretary of the Treasury O'Neill's account of vice President Cheney's reaction to O'Neill's complaint that the tax cuts would create a severe fiscal crisis.

<sup>116</sup> Supreme Court to Hear Cheney Task Force Case, Energy Daily, Dec. 16, 2003.

**Exhibit II-8: The Political Trigger for the Energy Price Spiral****The Domestic Spread on Gasoline****NATURAL GAS WELLHEAD PRICE**  
**Domestic Ratchet in Natural Gas**

to the industry.<sup>117</sup> The initial refusal and delay of the administration to recognize that manipulation had played a large part in the California energy crisis and the delayed and minuscule penalties imposed sent another signal to the oil industry.<sup>118</sup> The timid approach the FERC took in response to reports of natural gas price manipulation reinforced the message.<sup>119</sup>

The Bush Administration also moved quickly to roll back air conditioner efficiency standards that had been set by the Clinton Administration. These would have curbed the demand for electricity – reducing the need for as many as 50 power plants. They would have particularly affected natural gas consumption, since summer peaking demand draws heavily on natural gas.<sup>120</sup> Vice President Cheney made the administration's lukewarm attitude toward energy efficiency clear, when he relegated it to "a personal choice," not a policy option. The Administration ultimately lost a court battle over this decision, but the signal could not have been stronger, and the long fight against the rule underscored how committed they were to not following this path.

The tilt toward the industry reached its zenith in the administration's energy bill, which did not pass until 2005. As one long-term observer of Washington energy policy put it, "[s]ome blame must rest with the White House and Vice President Cheney, whose task force, meeting in secret with energy industry leaders, wrote the

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<sup>117</sup> Transcript of interview with Ken Lay, *Frontline* (PBS television broadcast June 6, 2001); George Lobenz, "Documents Detail Enron Push for Wood, Brownell," *Energy Daily*, August 2, 2004.

<sup>118</sup> See Teena Davis, *Dynegy Settle Power Fight with California*, *Energy Daily*, Apr. 28, 2004. The California Attorney General reached a settlement with Dynegy for \$280 million to settle complaints about price manipulation in about 6 months in 2000-2001. Included in the total was a settlement of \$3 million that the Federal Energy Regulatory Commission had reached with Dynegy. In other words, the FERC has agreed to just about one penny on the dollar of the ultimate abuse (see Davis, Teena, "Dynegy Settle Power Fight with California," *Energy Daily*, April 28, 2004).

<sup>119</sup> Jeff Beattie, *FERC Still Unsure About Reliability of Gas Price Reporting*, *Energy Daily*, Nov. 5, 2003.

<sup>120</sup> Toru Kubo, Harvey Sachs & Steven Nadel, *Am. Council for an Energy-Efficient Econ., Opportunities for New Appliance and Equipment Efficiency Standards: Energy and Economic Savings Beyond Current Standards Programs* (2001), available at <http://www.aceee.org/pubs/a016execsum.pdf>; Steve Nadel & Howard Geller, *Am. Council for an Energy-Efficient Econ., Smart Energy Policies: Saving Money and Reducing Pollutant Emissions through Greater Energy Efficiency* (2001), available at <http://www.aceee.org/pubs/e012execsum.pdf>.

libretto for the bill.”<sup>121</sup> The central premise of the energy bill pushed by the administration was that energy companies need more money to boost production of domestic energy supplies. To that end, a grab bag of subsidies – totaling over \$20 billion – was earmarked for the oil and gas industry, while other expensive alternatives would also receive assistance.<sup>122</sup> On the natural gas side, the bill promoted costly backstop technologies, like liquefied natural gas imports and an Alaska natural gas pipeline, which would lock in high gas prices.

These signals were in sharp contrast to the reaction of the Clinton Administration to the early signs of trouble in energy markets in 2000. As discussed above, after approving many of the mergers that led to the consolidation in the industry, President Clinton appointee Robert Pitofsky had issued a tough FTC report on the gasoline price spikes in the upper Midwest in the summer of 2000.<sup>123</sup> The Department of Energy had begun to express serious concerns about the abuse of market power in the electricity industry.<sup>124</sup> Similarly, the Clinton Administration created a heating oil reserve for the Northeast, another sign that it would take a stronger stance against the industry. In short, while the Clinton Administration and its anti-trust agencies had been lax, too, they did not have an energy price problem until the last moment. They reacted by becoming critical of the industry to some extent and by taking steps to alleviate prices. The Bush administration eliminated all criticism of the industry and adopted its spin, backed up with policies that were industry-friendly.

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<sup>121</sup> Llewellyn King, *The Energy Pig-Out Has Been Delayed*, *Energy Daily*, Dec. 2, 2003.

<sup>122</sup> *Id.* (identifying half a dozen columnists and newspapers who are usually strong supporters of President Bush who find the bill unacceptable).

<sup>123</sup> Fed. Trade Comm’n, *Midwest Gasoline*, *supra* note 43, at i-4. .

<sup>124</sup> Energy Info. Admin., *Horizontal Market Power in Restructured Electricity Markets* (2000), available at <http://www.pi.energy.gov/documents/HMPReport.pdf>.

### III. LAX Oversight Over Commodity Trading in Natural Gas<sup>125</sup>

#### A. Act One: Opening the Door to Abuse

The setting of wholesale natural gas prices through trading in commodity markets is a recent phenomenon. The first natural gas market center, known as the Henry Hub, was set up in 1988, soon after deregulation of “old gas” in 1985. Hubs are locations where natural gas pipelines meet and the services necessary to physically exchange natural gas are located for traders who want to take delivery. The wellhead price of natural gas was not fully decontrolled until 1989. Early in 1990, the first natural gas futures were traded on the New York Mercantile Exchange (NYMEX) (see Exhibit III-1).

A close look at the timing of the changes in trading activities and the movement of prices shows a coincidence that is just too striking to ignore. Exhibit III-1 overlays key points in the short history of natural gas commodity markets on the price history.

Natural gas prices were stable throughout the 1990s. While there were a couple of spikes in spot markets in the 1990s, spot and futures prices generally tracked the wellhead price closely in a narrow range of \$2 - \$3 per thousand cubic feet (mcf). After a slow start, these markets were said to be efficient in a technical sense.<sup>126</sup> This pattern came to a dramatic end in the spring of 2000.

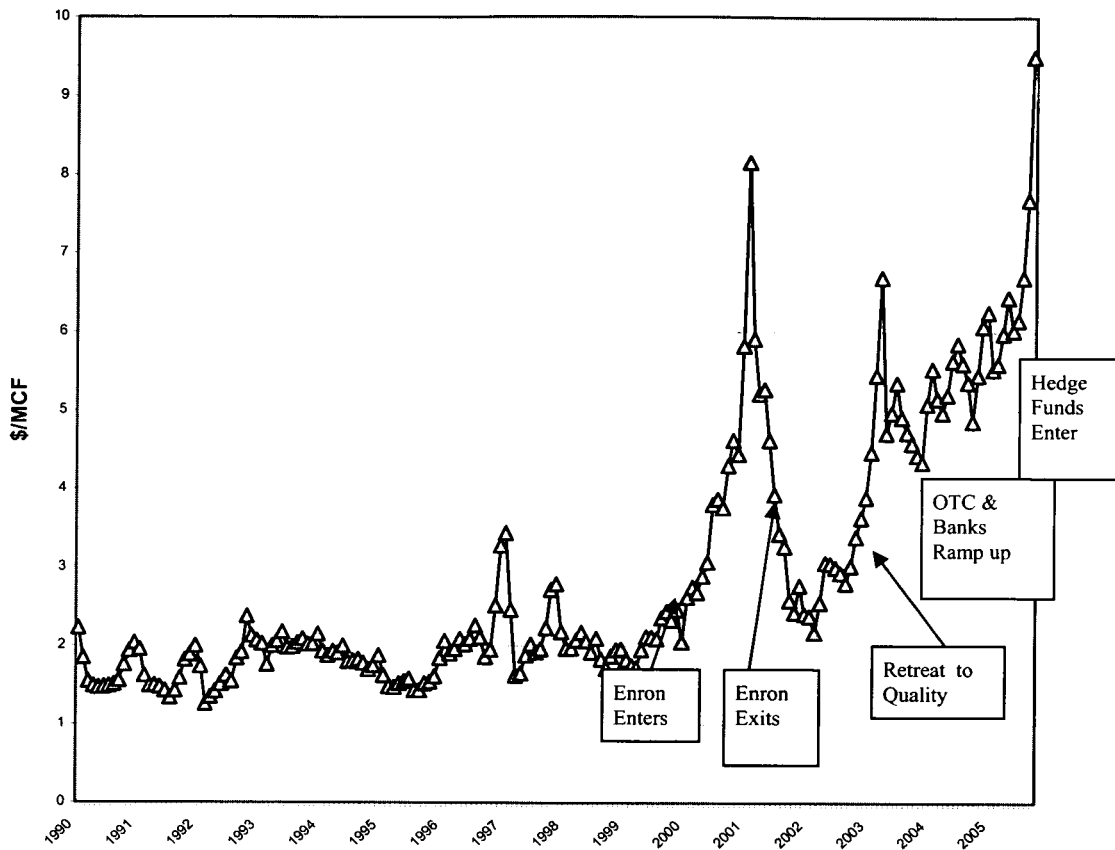
Electricity deregulation emerged in the mid-1990s while the FERC pressed deregulation and unbundling of natural gas pipeline markets, particularly in California. The California electricity deregulation and crisis, which was interrelated with natural gas prices, put pressure on these commodity markets.

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<sup>125</sup> This section draws heavily on Mark Cooper, *Responding to Turmoil in Natural Gas Markets: The Consumer Case for Aggressive Policies to Balance Supply and Demand* (December 2004) and Cooper, *Natural Gas*, *supra* note 57.

<sup>126</sup> John H. Herbert, *The Relations of Monthly Spot to Futures Prices for Natural Gas*, 18 *Energy* 1119-1124 (1993).

### Exhibit III-1: Wellhead Prices And Major Changes In Trading Activity



Soon thereafter Enron launched its Enron Online trading platform in November 1999. It had moderate levels of trading, about \$50 billion, through the first half of 2000. Subsequently, Enron's total trading exploded. In the first half of 2001, it did over ten times as much - half a trillion dollars.<sup>127</sup> Prices skyrocketed as well. Volumes escalated sharply and Enron played a key role. As a *New York Times* article noted, "[s]ome traders have said that Enron Online was dominant enough to enable Enron to set market prices."<sup>128</sup>

While the Western electricity markets attracted the most head-

<sup>127</sup> Donald Murray and Zhen Zhu, *Enron Online and Informational Efficiency in the U.S. Natural Gas Market*, *Energy J.*, Jan. 1, 2004.

<sup>128</sup> Alexei Barrionuevo, *Energy Trading Without a Certain "E,"* *N.Y. Times*, Jan. 15, 2005, at 3.

lines and revealed the most blatant abuses in terms of withholding of physical supplies and bogus trades, natural gas markets were not immune. Enron played a large role in these markets and when it collapsed, so too did much private trading.<sup>129</sup> A court ruling allowing a lawsuit against Enron for abuse of commodity markets can be used to make the point: "Enron was positioned to yank prices up because its Enron Online [EOL] trading platform controlled fully 40 percent of average daily trading on the Henry Hub natural gas spot market. Further, other traders in that market "routinely looked to EOL and Enron for current [Henry Hub] spot market pricing information," according to the Commodity Futures Trading Commission (CFTC) complaint.<sup>130</sup> The Henry Hub is the most important price setting spot market in the nation. This market share of activity by a single entity would virtually ensure that the hub was highly concentrated at that time.

In the spring of 2000, natural gas prices at the wellhead began a sustained period above \$3 that lasted for sixteen months. The average price of natural gas in 2000-2001 was about twice the price of the previous decade. Spot market prices peaked at four times the average of the previous decade. Coincidentally, this was the period in which, it later came to light, a number of companies were manipulating or attempting to manipulate the market.

Although Enron-style trading had earlier received some exemptions from oversight, the biggest long-term change in 2000 was not the spike in natural gas prices. Rather, it was the passage of the Commodity Futures Modernization Act (CFMA). While the CFMA did not change the legality of many of the activities that were taking place, it made it more difficult to detect them and it opened the door to many other types of transactions that raise concerns. As one analyst put it:

What did the Commodity Futures Modernization Act (CFMA) of 2000 do?

First, let me point out that the over-the-counter market in derivatives has never been adequately regulated. The market emerged only recently, and most of its growth has occurred in the past fifteen years. At first, this market was largely ignored by regulators, and after it grew to a size that

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<sup>129</sup> Energy Info. Admin., *The Natural Gas Industry and Markets in 2002* 2 (2004), available at <http://tonto.eia.doe.gov/FTPROOT/features/ngmarkets.pdf>.

<sup>130</sup> Jeff Beattie, Judge Green Lights Lawsuit, *Energy Daily*, Mar. 15, 2004, at 3.



demanded it be addressed, the regulators found it difficult to define the line of jurisdiction over the markets because of poorly written laws and richly endowed political opponents to such regulation.

Before passage of the bill in December 2000, the government retained authority over fraud and manipulation in the over-the-counter derivatives markets. In addition, market participants were restricted under Rule 35 from conducting over-the-counter markets like an exchange.

The CFMA was a major bill that drastically reduced the level of prudential regulation of derivatives markets. It reduced transparency and the government's surveillance abilities over exchange-traded derivatives, and it completely eliminated or "excluded" federal derivatives regulation of the over-the-counter market. Enron operated in that completely deregulated environment.<sup>131</sup>

This concern about the deregulation and lax government oversight of natural gas trading markets extends to consumers, including electric utilities<sup>132</sup> and large industrial users express similar concerns.<sup>133</sup> The law paved the way for abuse and the criticism is not lim-

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<sup>131</sup> Randall Dodd, *Untangling Enron: The Reforms We Need*, 45 *Challenge* 72-73 (2002), available at <http://www.financialpolicy.org/DSCChallengeEnron-Mar2002.pdf>.

<sup>132</sup> For example, in pushing for reform of the Act, the American Public Gas Association argues "Passage of the Commodity Futures Modernization Act of 2000 has significantly changed natural gas markets. As a result, we believe that the CFTC should be given additional authority to oversee and carefully monitor markets. Given the abuses in energy markets we have seen over the past several years, strong market oversight is more important than ever to protect consumers and ensure that markets are functioning properly. American Public Gas Association Wants More Done to Determine How Financial and Physical Markets Affect Natural Gas Prices, Foster Report No. 2573, Jan. 6, 2006, at 15.

<sup>133</sup> Natural gas traders on the New York Mercantile Exchange (NYMEX) were sharply criticized for "fostering high and volatile natural gas prices at U.S. consumers' expense" by Peter Huntsman, President and CEO of the corporation bearing his name.... Mr. Huntsman charged, "hedge funds and other paper traders on the New York Mercantile Exchange continue to enrich themselves while U.S. gas consumers are forced to endure the result of the world's highest and most volatile natural gas prices.... Mr. Huntsman is "surprised" that more natural gas consumers are not "outraged" over the imbalance in the U.S. economy created by a "natural gas pricing system that has been out of control since Congress enacted the Commodities Futures Modernization Act in 2000. No Reason for Natural Gas Prices to be so

ited to users and their advocates. A similar sentiment was expressed in a 2005 article in the *Journal of Futures Markets*.

Many scholars have recognized the cash-settlement manipulation problem, but few have formally addressed it. The lack of interest may be due to the fact that, until recently, most U.S. exchange-traded cash-settled derivative contracts were based on broad indices of very liquid stocks. Manipulation of such instrument requires very large trades that are costly to make and easy to detect through conventional surveillance.

The prospects for manipulation increased substantially with the passage of the Commodity Futures Modernization Act of 2000 (Act). The Act authorized trading in single-stock futures and narrow-based index instruments, and the Act specifically permitted cash settlement. These new instruments will not necessarily have liquid underlying securities. Further, all else equal, fewer numbers of securities will be easier to manipulate than larger numbers.<sup>134</sup>

The over-the-counter derivatives market in natural gas is a derivative that rests on a narrow base, whose liquidity at key moments is unclear, and is subject to no surveillance whatsoever.

Between the end of 2002 and the beginning of 2005, two dozen companies settled over thirty CFTC complaints of market manipulation or attempts to manipulate the natural gas market with fines running in excess of \$4 billion. The cases involved:

- the misreporting of information about storage, pipeline capacity and both the quantity and price of natural gas trades;
- abuse of affiliate relations;
- the improper sharing of insider information; and
- manipulation and charging of illegal prices.

These are the trading market abuses. In addition, there are a number of securities violations proven and pending.<sup>135</sup>

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High and Volatile, Huntsman Declares, Foster Report No. 2544, June 9, 2005, at 21.

<sup>134</sup> Hans R. Dutt and Lawrence E. Harris, Position Limits for Cash-Settled Derivative Contracts, 25 J. Futures Mkts. 945, 948 (2005).

<sup>135</sup> A list of over 30 cases involving \$4.4 billion of payments by natural gas

## B. Act Two: A Green Light for Unregulated Trading

By late 2001, signs of trouble at Enron were evident and trading began to dry up. In December 2001, bankruptcy shut down the trading platform. Trading did not recover for a period. "In February 2002, shortly after Enron declared bankruptcy, UBS took over Enron's natural gas and power trading operation and Enron Online. With little volatility to trade around, UBS started firing traders and switched off the Internet trading platform. By May 2003, UBS had closed the Houston operation."<sup>136</sup>

The historically high prices of 2000-2001 were not sustained. By the winter of 2002 the national economy was in a recession. The Enron-generation of energy traders was slipping into bankruptcy. The market evaporated in mid-2002 under suspicions of manipulation and fraudulent accounting. The trading aspect of the electricity and natural gas industries quickly returned to the relative safety of trading around assets and marketing activities.<sup>137</sup> These behaviors are derisively called a "flight to quality."<sup>138</sup> Perhaps not so coincidentally, prices moderated in 2002, declining by 25 percent on average, but settling about 50 percent higher than the decade of the 1990s. The relationship between crude oil prices and natural gas prices had moved back toward the average of the 1990s.

For some, the collapse of Enron Online and the merchant traders represented a loss, even a crisis.<sup>139</sup> To speculators this looked like an alarming situation of illiquidity. By late 2003 the big banks and large speculators began to enter and accelerate trading to deliver the consumer from the doldrums of low, stable prices. Again, public policy opened the door.

In the post-Enron period the rules of entry were relaxed to let more entities into these lightly regulated or unregulated markets.

Some lawmakers and consultants argue the government has done little to shore up the energy markets most susceptible to manipulation. The Federal Reserve relaxed rules in 2003 so that Commercial banks like Citigroup could take posses-

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companies to settle allegations of market manipulation is available from the author on request.

<sup>136</sup> Barrionuevo, *supra* note 128, at 3.

<sup>137</sup> Peter Fusaro, Hedge Funds: The Next Wave in Energy Trading, 3 PRMIA: Members Update 1, at 4 (July 2004).

<sup>138</sup> Peter Fusaro & Gary Vasey, Energy Comes into Focus for Hedge Funds, UtiliPoint: Analysts Corner, Dec. 17, 2004, at 1.

<sup>139</sup> See Murria and Zhu, *supra* note 127.

sion of physical commodities like oil in storage tanks . . . . The move allowed the banks to serve as dealers in commodity derivatives . . . .

“It is an effort by banks to move into the terrain that Enron abandoned in their bankruptcy . . . .

As early as October 2002, less than a year after Enron declared bankruptcy, the Commodity Futures Trading Commission started to write rules exempting commodity hedge funds from regulatory oversight.<sup>140</sup>

It appears that trading activity began to revive in late 2003 and price began to lift off again.<sup>141</sup> The massive influx of hedge funds appears to have ramped up in mid 2004 followed by the 2005 skyrocketing of prices.<sup>142</sup> After a hiatus of a year or so, the volume of trading increased dramatically and by mid-2004 it had returned to the level reached at the point of the collapse of the Enron generation of traders. This time trading was dominated by a completely new set of players – investment bankers and multinational oil and gas companies. As trading and prices began to mount, the hedge funds moved in. It appears that the number of energy hedge funds increased from about 100 to over 400,<sup>143</sup> and those specializing in energy commodity trading increased from 10 to over 200.<sup>144</sup> The volume of trading in over-the-counter markets has exploded. One estimate of over-the-counter trading through a NYMEX platform shows a sevenfold in-

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<sup>140</sup> Barrionuevo, *supra* note 128, at 3.

<sup>141</sup> See *Id.* Wall Street banks are notoriously fickle about their commitment to commodities trading. But the eye-popping profits earned by the market leaders, Goldman Sachs and Morgan Stanley, have spurred other banks to get into the game. In 2004, Goldman Sachs and Morgan Stanley earned about \$2.6 billion combined from commodities trading, most of that from energy. *Id.*

<sup>142</sup> *Id.* The new hedge funds are sucking scarce talent away from the banks. At least 450 hedge funds with an estimated \$60 billion in assets are focused on energy and the environment, including 200 devoted exclusively to various energy strategies. *Id.*

<sup>143</sup> Peter Fusaro & Gary Vasey, Energy Hedge Fund Ctr., Energy Hedge Funds: Its All About Risk/Reward 5, [www.http://energyhedgefunds.com/ehfc/modules/articles-4/content/EHFCarticle.pdf](http://energyhedgefunds.com/ehfc/modules/articles-4/content/EHFCarticle.pdf).

<sup>144</sup> Matthew Serynek, Investors Beware: What You Need to Know Before Investing in Energy, *The Desk*, Dec. 2005, at 37.

crease between June 2003 and June 2005.<sup>145</sup>

As a run-up to the trial of the top Enron executive, The *New York Times* ran a front-page Business Section article entitled “Energy Trading, Without a Certain ‘E’,”<sup>146</sup> describing the activities of energy hedge funds against the backdrop of Enron noting that “some industry officials question whether the funds are contributing to higher energy prices, or at least stoking more price volatility.”<sup>147</sup>

While the “E” in the *New York Times* headline intended to refer to Enron, it actually could stand for two more important “Es,” energy or equity. Huge sums of energy futures contracts are traded without being backed by the underlying assets or equity, which was Enron’s game. Because there are few requirements for backing, entry is extremely easy and trading can escalate rapidly. The price may be bid up, as suggested by the *New York Times*:

But with that revival comes questions from some financial market analysts about whether energy trading will be better able to withstand another potential meltdown . . . . [T]he latest ramp-up in trading has also been marked by an air of secrecy underscored by the proliferation of hundreds of hedge funds that are speculating on everything from crude oil to electricity in both regulated and unregulated markets. Many funds are being aided by investment from banks, which are also buying up distressed power plants and other remnants of the collapsed sector . . . .<sup>148</sup>

A debate continues to rage about whether the hedge funds are contributing to higher energy prices. The funds are borrowing as much as 10 times what they invest in some trades, analysts and traders say, contributing to short-term volatility that has complicated the energy purchases of many large energy users.<sup>149</sup>

This quote suggests the complexities of natural gas financial markets. First, large quantities of natural gas are traded in two kinds of markets – over-the-counter (OTC) and on exchanges. The OTC market is unregulated. The exchanges are regulated, but many be-

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<sup>145</sup> *Id.*

<sup>146</sup> Barrionuevo, *supra* note 128, at 3.

<sup>147</sup> *Id.*

<sup>148</sup> *Id.*

<sup>149</sup> *Id.*

lieve that regulation is too lax.<sup>150</sup> Second, the juxtaposition of hedge funds and large users highlights the distinction between financial instruments and the physical commodity. Third, the quote also highlights the essential characteristic of derivatives.<sup>151</sup> “Unlike their respective underlying commodities . . . however, derivatives are sometimes preferred as a trading tool for their leveraging capability. Leverage, in financial terms, is the effect of magnifying the outcome of an investment through the use of borrowed funds (credit).”<sup>152</sup>

While the analysts who hype the energy trading are adamant that this liquidity is good for the markets, they at least admit that it might “accentuate” upward trends. However, their descriptions are a cause for even greater concern.

Hedge funds bring increased sophistication, liquidity, and the risk culture and trading acumen to bear on energy commodities markets. Seeking new opportunities to obtain greater returns, hedge funds see energy markets as providing that opportunity. Likewise, the investment banks have a risk trading culture, deep pockets, and access to both physical and financial traders. Even the energy companies with surviving trading arms are now partnering with investment banks to sustain and improve trading operations while obtaining access to increased expertise, more sophisticated tools, and risk capital. Moreover, we have the multinational oil and gas companies with the balance sheet to put their capital at risk. It is no accident that BP is the No. 1 gas trader and in the top five in power trading; BP has the balance sheet and supply to play in this new financial market.<sup>153</sup>

The influx of new money and traders was massive.<sup>154</sup> When risk capital seeking higher returns starts to chase a commodity like

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<sup>150</sup> See *supra*, notes 132 and 133.

<sup>151</sup> The CFTC Glossary: A Guide to the Language of the Futures Industry, Commodity Futures Trading Commission, available at <http://www.cftc.gov/files/opa/cftcglossary.pdf>. A derivative is “a financial instrument, traded on or off an exchange,” that involves “the trading of rights or obligations based on the underlying product, but do not directly transfer property.”

<sup>152</sup> Fletcher, J. Sturm, *Trading Natural Gas* 31 (1997).

<sup>153</sup> Peter Fusaro, *The Rise of Financial Energy Trading Markets: Enter the Hedge Funds*, INSIGHT, Oct. 2005, at 2.

<sup>154</sup> Analysts: Funds Altered the Face of Trading in '05, *Gas Daily*, Jan. 3, 2006, at 4.

natural gas that is relatively fixed in supply and demand in the short and mid terms, it is hard to imagine that it will not have an impact on prices. Most attention was still focused on oil because that was a more mature market, but the effect was seen as spreading to natural gas.

More than 200 hedge funds already play or are set to play in energy commodities markets, and they are primed to bring more risk capital to bear in those markets. Evidence of their trading activities is already speculated to account for the much higher crude oil prices seen in recent months, and some analysts suggest that hedge fund activity may account for up to \$8 per barrel of total price. Additional evidence of their influence has been the 55% growth in open interest on NYMEX crude, heating oil, and gasoline contracts over the past year and the more violent and volatile intraday trading moving during recent months. What happened in oil has spread to gas, power, and coal.<sup>155</sup>

The figure of \$8 per barrel as a "hedge fund activity premium" in oil is a stunning number for mid-2004. It represents approximately 20 percent of the refinery acquisition cost in 2004 and two-thirds of the \$12 increase in refinery acquisition costs between 2002 and 2004. A study prepared for the U.S. Department of Energy suggested a disconnect between natural gas energy futures prices and the underlying resource costs of \$2.30 per thousand cubic feet (mcf) of natural gas production costs.<sup>156</sup> This figure is equal to about 20 percent of the natural gas wellhead price in 2006 and over 50 percent of the increase in natural gas wellhead prices between 2002 and 2006. By mid-2006, the estimates of a speculative premium on oil had risen to \$25 dollars per barrel, or about one third of the world price.<sup>157</sup>

The opportunity to straddle a variety of markets can also be exploited by the new players. They can take positions in lightly regulated exchanges and unregulated OTC markets, directly hold physical

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<sup>155</sup> Fusaro, *supra* note 153, at 3.

<sup>156</sup> Office of Oil and Gas, Energy Information Administration, An Assessment of Prices of Natural Gas Contract as a Predictor of Realized Spot Prices at the Henry Hub, October 2005.

<sup>157</sup> Permanent Subcommittee on Investigations, Committee on Homeland Security and Governmental Affairs, United States Senate, The Role of Market Speculation in Rising Oil and Gas Prices: A Need to Put the cop Back on the Beat (June 27, 2006P)

assets, and participate as large players in equity markets.<sup>158</sup> Chasing high profits in the energy sector in markets that lack transparency increases risk, which demands higher returns. “What is readily apparent from all of this activity is that the fund community now sees the energy complex fundamentals trending to higher prices and that it offers them an attractive sector in which to inflate sagging returns for investors.”<sup>159</sup> This prediction of increasing profits made in October 2004 proved quite correct. The bonus pool at Goldman Sachs, one of the key members of the “triangle of trading,” has raised some eyebrows.

The bonus pool, as we’ve heard ad nauseam, is overflowing with some \$11 billion. Mr. Paulson, the chairman and chief executive, alone took home 37 million, or about 800 times the median household income in the United States. Well done. The question is whether all of this is sustainable – and, of course, whether the bank hasn’t turned into a huge hedge fund.<sup>160</sup>

By mid-year 2005, given the lack of regulation and the huge sums of money changing hands, even the most ardent defenders of commodity trading became a little worried.

During this spring, one gas trader was front running overnight electronic gas markets on NYMEX’s Access, which is a NYMEX vulnerability. We don’t see adequate market surveillance and enforcement from either the SEC or the CFTC. We expect more hedge funds to blow up (some already have) in energy commodity trading and unfortunately more phantom and wash trading[,] i.e. “market manipulation.” This goes back to how traders are incented in the first place.

It’s really not necessary to create an environment in which criminal activity may flourish again as we are in the midst of the greatest commodity bull market for natural resources of all time . . . .

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<sup>158</sup> Peter Fusaro & Gary Vasey, *Energy Hedge Funds: Why Have They Appeared Now?*, *Commodities Now*, Dec. 2004, at 1.

<sup>159</sup> *Id.* at 2.

<sup>160</sup> Andrew Ross Sorkin, *Cheer to Deals that Fizzed (or Fizzled)*, *N.Y. Times*, Jan. 1, 2006, § 3, at 1.



We are in the ramp up stage for energy hedge funds and we are becoming convinced that there is a real business in a “due diligence” service of these startups.<sup>161</sup>

By the winter of 2005-2006, prices were not only high; they were also being described with a variety of terms including: “a disaster . . . a bit of a Gong Show,”<sup>162</sup> “out of control,”<sup>163</sup> “unusual,”<sup>164</sup> “wacky,”<sup>165</sup> “frenetic,”<sup>166</sup> “strange,”<sup>167</sup> and “a roller coaster.”<sup>168</sup> While these descriptions in the popular and trade press are striking, the fact that regulators with responsibility for oversight of various parts of the industry described pricing as “odd” and “erratic” at the winter meeting of the National Association of Regulatory Utility Commissioners is a source of even greater concern.<sup>169</sup> Indeed, “the unusual set of circumstances [has] made it particularly hard for FERC analysts to draw a clear picture of how markets are truly behaving – and why.”<sup>170</sup>

### C. A Broader Pattern of Abuse in Energy Markets

Natural gas was not the only energy commodity subject to abuse. “There are regular squeezes in the Brent [oil] market . . . People seem to do it in turn. It depends on who’s smart enough to move in a way nobody notices until it happens.”<sup>171</sup> In a

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<sup>161</sup> SEC Coup D’Etat, Energy Hedge, June 15, 2005, at 5.

<sup>162</sup> NYMEX Settles at New High; Cash Trading Thin, Gas Daily, Sept. 23, 2005, § 183.

<sup>163</sup> NYMEX Retreats, But Cash Prices Keep Rising, Gas Daily, Nov. 18, 2005, § 223.

<sup>164</sup> Harry Chernoff, Unusual Signals form the Natural Gas Markets, Energy Pulse, Nov. 30, 2005, [http://www.energypulse.net/centers/article/article\\_display.cfm?a\\_id=1150](http://www.energypulse.net/centers/article/article_display.cfm?a_id=1150).

<sup>165</sup> Jeff Beattie, Warm Winter Brings Wacky Price Pattern to Natural Gas Market, Energy Daily, Jan. 25, 2006; see also “Strange” Market Dynamics Led to Storage Gluts, Gas Daily, Feb. 14, 2006.

<sup>166</sup> NYMEX Up 26.6 Cents as Cold Weather Returns, Gas Daily, Feb. 6, 2006.

<sup>167</sup> “Strange” Market Dynamics, *supra* note 167.

<sup>168</sup> Spencer Jakab, Natural Gas Rides a Roller Coaster, Wall St. J., Feb. 21, 2006, at C-5; see also NYMEX Up 26.6 Cents, *supra* note 166.

<sup>169</sup> Beattie, *supra* note 165.

<sup>170</sup> “Strange” Market Dynamics, *supra* note 165.

<sup>171</sup> Randall Dodd & Jason Hoody, Learning Our Lessons: A Short History of

case brought by a private party in late 2001, the practical reality was revealed.

Tosco won a settlement claiming that Arcadia Petroleum (a British subsidiary of the Japanese firm Mitsui) engineered an elaborate scheme to manipulate oil prices in September of 2001 through the use of OTC derivatives and a large cash market position to corner the market in Brent crude oil. As a result, the price of Brent Crude soared between August 21<sup>st</sup> and September 5<sup>th</sup> and pushed its price to a premium over West Texas Intermediate crude oil (WTI) . . . .

*Dated Brent, which acts as a price marker for many international grades, is physical crude traded on an informal market, rather than a regulated futures exchange. This lack of regulation poses problems for oil producers and consumers seeking a fair price . . . . A typical Brent squeeze involves a company quietly building a strong position in short-term swaps called contracts for difference, or CFD's, for a differential not reflected in current prices. The company then buys enough cargoes in the dated Brent market to drive the physical crude price higher, which boosts the CFD differential . . . .*

*The company may lose money on the physical side, but it's more than compensated from profits on its offsetting paper position in the short-term swaps market. . . .*<sup>172</sup>

These abuses persist in markets that are actually more difficult to move than natural gas markets. For example, in January 2006, the CFTC reported a settlement in oil trading:

The CFTC said that it found that, on at least five occasions from November 2003 to March 2004, traders for Houston-based Shell Trading U.S. Co. and London-based Shell International Trading & Shipping Co. executed prearranged and noncompetitive trades in crude-oil futures contracts in violation of exchange rules. In each instance, the regulator found, Shell traders agreed to swap a prearranged quantity

of oil-futures contracts for delivery in the same month. . . .

Heavy wash trading in the natural-gas market in the U.S. earlier this decade undermined the credibility of that market. Oil-futures, however, are more liquid, making it much more difficult for isolated trades to distort prices. In late 2003, BP PLC agreed to a record \$2.5 million fine with Nymex, settling charges of improper crude oil trading, including wash trading.<sup>173</sup>

Note that the parent corporations of the two entities mentioned in these complaints are two of the largest natural gas marketers who account for almost one-third of the gas marketed in the U.S. The subsequent collapse in the fall of 2006 of a relatively small hedge fund, which had accumulated contracts equal to over one-third of national consumption for a single month in what may have been an attempt to corner the market, suggested that lesser actions to influence price were not out of the question.<sup>174</sup>

On April 29, 2006, the *New York Times* ran a front-page article under the headline "Trading Frenzy Adds to Jump in Price of Oil."<sup>175</sup> The *Times* article opens with a brief paragraph on the conditions in the physical market but then devotes about 36 column inches to the proposition that financial markets are adding to the price increase.

"A global economic boom, sharply higher demand, extraordinarily tight supplies and domestic instability in many of the world's top oil-producing countries – in that environment higher oil prices were inevitable.

But crude oil is not merely a physical commodity . . . . It has also become a valuable financial asset, bought and sold in electronic exchanges by traders around the world. And they, too, have helped push prices higher. . . .

"Gold prices do not go up because jewelers need more

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<sup>173</sup> Chip Cummins, Moving the Market: Shell Trader, Unit are Fined Over Bogus Oil Trades, Wall St. J., Jan. 5, 2006, at C-3.

<sup>174</sup> Amaranth Advisors, located at [http://en.wikipedia.org/wiki/Amaranth\\_Advisors](http://en.wikipedia.org/wiki/Amaranth_Advisors) (last visited May 24, 2007).

<sup>175</sup> Jad Mouawad & Heather Timmons, Trading Frenzy Adds to Jump in Price of Oil, N.Y. Times, Apr. 29, 2006, at A-1.

gold, they go up because gold is an investment,” said Roger Diwan, a partner with PFC Energy, a Washington-based consultant. “The same has happened to oil. . . .”

“It is the case,” complained BP’s chief executive, Lord Browne, “that the price of oil has gone up while nothing has changed physically.”<sup>176</sup>

Three key factors serve to drive the price spiral higher: volume, volatility and risk. The structure and availability of markets plays a role in allowing the volumes to increase.

Changes in the way oil is traded have contributed their part as well. On Nymex, oil contracts held mostly by hedge funds – essentially private investment vehicles for the wealthy and institutions, run by traders who share risk and reward with their partners – rose above one billion barrels this month, twice the amount held five years ago.

Beyond that, trading has also increased outside official exchanges, including swaps or over-the-counter trades conducted directly between, say, a bank and an airline. . . .

Such trading is a 24-hour business. And more sophisticated electronic technology allows more money to pour into oil, quicker than ever before, from anywhere in the world.<sup>177</sup>

The influx of new money is sustained by movements of different institutions and individuals into the market. “Everybody is jumping into commodities and there is a log of cash chasing oil,” said Philip K. Verleger Jr., a consultant and former senior advisor on energy policy at the Treasury Department.<sup>178</sup>

This fundamental observation had been offered a couple of years earlier in a front page *Wall Street Journal* article entitled, “Oil Brings Surge in Speculators Betting on Prices: Large Investors Playing Ongoing Rise is Increasing Demand and Price Itself.”<sup>179</sup>

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<sup>176</sup> *Id.*

<sup>177</sup> *Id.*

<sup>178</sup> *Id.*

<sup>179</sup> Gregory Zuckerman & Hinny Sender, Oil Brings in Speculators Betting on Prices – Large Investors Playing Ongoing Rise is Increasing Demand and Price Itself, *Wall St. J.*, Aug. 24, 2004, at A-1.

Oil has become a speculator's paradise. Surging energy prices have attracted a horde of investors – and their feverish betting on rising prices has itself contributed to the climb.

These investors have driven up volume on commodities' exchanges and prompted a large push among Wall Street banks and brokerage firms . . . to beef up energy-trading capabilities. As the action has picked up in the past year, those profiting include large, well-known hedge funds, an emerging group of high-rollers, as well as descendants of once-highflying energy-trading shops such as Enron Corp.<sup>180</sup>

In the same article in 2004, Allan Greenspan offered precisely this view of what had begun to happen in the financial markets.

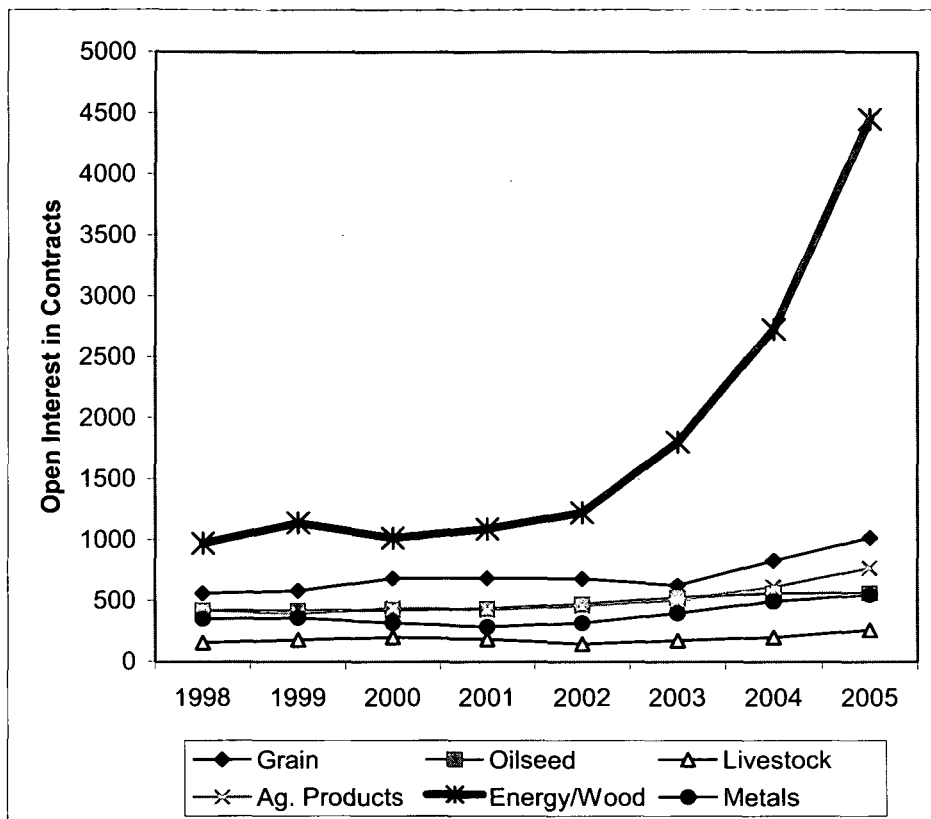
"The marked rise in the net long positions of noncommercial investors in oil futures and options since May 2003 has increased net claims on an already diminished global level of commercial crude and product inventories," said Federal Reserve Chairman Alan Greenspan in June of this year. Oil prices accordingly have surged."<sup>181</sup>

The notion is that the continual influx of money represents too much money chasing too few goods. Exhibit III-2, shows the dramatic increase in trading associated with energy commodities.

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<sup>180</sup> *Id.*

<sup>181</sup> *Id.*

**Exhibit III-2: Commodity Trading Of Non-Financial Instruments****(Average Month-end Open Interest)**

**Source:** Commodity Future Trading Commission, Annual Reports: Futures Statistics by Major Commodity Group.

The increase in Exhibit III-2 is the volume of contracts. The value of contracts also increased dramatically. Combined, the increase in total value was almost tenfold. Put another way, *the value of trading increased about \$7 billion per month, every month for three years.*

Even this comparison significantly underestimates the magnitude of the increase in commodity market activity in energies. The dollar value of these energy futures contracts has increased much more rapidly than for other commodities. Moreover, while the quantity of off-exchange (or over-the-counter) trading in agricultural derivatives is not significant, that for energy derivatives is.

#### D. Efforts to Understand and Correct the Problem have Failed

There are strands in the technical literature, particularly on energy, which support a number of propositions that lie at the core of the concern about the recent behavior of the natural gas market. These markets are inefficient, allowing supranormal trading profits.<sup>182</sup> Increases in volatility lead to higher risk premiums.<sup>183</sup> Increased volatility results in lower production as producers exercise their option to hold assets in the ground.<sup>184</sup> Increases in volatility drive spot prices farther above futures prices.<sup>185</sup> The important point here is that one cannot assume that the market is “working” just because it is a market. There are structural conditions that may impose inefficient and unnecessary costs on consumers, exploitation of tight markets, and opportunities for abuse.

This basic proposition is true of the broader literature on financial markets. There are strands in this literature that identify potential and actual abusive practices. Many of these are directly relevant to the energy market, including: manipulation facilitated by large positions,<sup>186</sup> lack of transparency,<sup>187</sup> structural advantages enjoyed by large traders,<sup>188</sup> the exercise of market power,<sup>189</sup> insider

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<sup>182</sup> William E. Shambora & Rosemary Rossier, Are There Exploitable Inefficiencies in the Futures Market for Oil, *Energy Econ.* (forthcoming).

<sup>183</sup> Robert H. Litzenberger & Nir Rabinowitz, Backwardation in Oil Futures Markets: Theory and Empirical Evidence, 5 *J. Fin.* 1538 (1995).

<sup>184</sup> *Id.* at 1537; Robert S. Pyndyck, The Dynamics of Commodity Spot and Futures Markets: A Primer, *Energy J.*, June 1, 2001, at 1.

<sup>185</sup> Litzenberger and Rabinowitz, *supra* note 185, at 1537.

<sup>186</sup> Dutt & Harris, *supra* note 134, at 947. (Containing a very recent reference. Reviews of broader literature can also be found in the article.).

<sup>187</sup> See generally, F. Drudi & M. Massa, Price Manipulation in Parallel Markets with Different Transparency, 78 *J. Bus.* 1625 (2005); M. Angeles de Frutos & Carolina Manzano; Trade Disclosure and Price Dispersion, 8 *J. Fin. Markets* 18 (2005).

<sup>188</sup> Robert Jarrow & Phillip Protter, Large Traders, Hidden Arbitrage, and Complete Markets, 29 *J. Banking & Fin.* 2803 (2005).

<sup>189</sup> See generally, Matti Liski & Juan-Pablo Montero, Forward Trading and Collusion in Oligopoly, 131 *J. Econ. Theory* 212 (2006); Matti Liski & Juan-Pablo Montero, Market Power in a Storable-Good Market: Theory and Applications to Carbon and Sulfur Trading, Center for Energy and Environmental Policy Research (2005) (Containing a very recent reference. Reviews of broader literature can also be found in the article.).

trading<sup>190</sup> and self-dealing,<sup>191</sup> trading practices that accelerate market trends,<sup>192</sup> perhaps causing them to overshoot.<sup>193</sup>

The academic literature focuses on fairly sophisticated transactions.

Cash-settled derivative contracts are susceptible to manipulation. Manipulative traders may profit by taking large positions in the contract and manipulating the underlying cash settlement price. Whether such manipulations would be profitable depends on whether the cost of manipulating prices in the underlying markets are less than the benefits of making favorable cash settlements.<sup>194</sup>

The citation above comes from an article that makes the case that position limits are necessary in these markets on the basis of very sophisticated situations in which surveillance will be a challenge. These manipulations rest on taking sophisticated contrary positions in different markets. Actions that appear as losses in one market are actually more than compensated by gains in another market. The complex types of manipulation that this sophisticated analysis identifies are different from the more blatant types of manipulation that attract headlines. The support for limits stems from the fact that oversight alone cannot detect abusive trading practices. The complex theory is as follows:

If manipulations were easily identified, increasing surveillance efforts would be sufficient to reduce manipulations by increasing the probability of detection and subsequent prosecution with regard to the narrow-based derivative contracts. Successful prosecution of manipulation, however, is difficult, because prosecutors must prove manipulative in-

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<sup>190</sup> Laura Nyantung Beny, *Do Insider Trading Laws Matter? Some Preliminary Comparative Evidence*, 7 *Am.L. & Econ. Rev.* 1446 (2005) (Containing a very recent reference. Reviews of broader literature can be found in the article).

<sup>191</sup> David E.M. Sappington & Burcin Unel, *Privately-Negotiated Input Prices*, 27 *J.Reg. Econ.* 263 (2005).

<sup>192</sup> *See generally*, Markus K. Brunnermeier & Lasse Heje Pedersen, *Predatory Trading*, 60 *J. Fin.* 1825 (2005).

<sup>193</sup> Matthew Pritsker, *Large Investors: Implications for Equilibrium Asset Returns, Shock Absorption, and Liquidity*, Finance and Economics Discussion Series, Federal Reserve Board (2005).

<sup>194</sup> Dutt & Harris, *supra* note 134, at 947.



tent (scienter). Manipulators may avoid liability by offering plausible alternative explanations for their trading in the underlying securities.<sup>195</sup>

Position limits directly limit manipulation by limiting the size of derivative positions that would benefit from manipulative practices. Position limits can potentially improve economic efficiency by reducing manipulation in a less costly manner than surveillance alone. However, they can be set too high or too low.<sup>196</sup>

Unregulated markets make the problem particularly acute. With huge sums being traded in these unregulated markets, regulators do not know what is going on. It is also the case that trading, even without manipulation, can have negative effects on the market and specific types of players therein.

Even when the settlements of cash-settled contracts are not purposefully manipulated, the settlement mechanism may increase underlying volatility when hedgers unwind their hedges if they have no incentive to control their trading costs. This generally is the case when hedgers trade out of their positions at the same prices that determine the final cash settlement price. The resulting price uncertainty may reduce trading by risk-averse traders and thus produce deadweight losses.<sup>197</sup>

The FERC<sup>198</sup> and the CFTC<sup>199</sup> both issued reports concluding that there has been no market manipulation, while the GAO is reserving judgment.<sup>200</sup> These studies have not laid the concerns to rest for a

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<sup>195</sup> *Id.* at 948.

<sup>196</sup> *Id.* at 948-949.

<sup>197</sup> *Id.* at 947..

<sup>198</sup> Federal Energy Regulatory Commission, High Natural Gas Prices: The Basics, February 1, 2006.

<sup>199</sup> Michael S. Haigh, Jana Hranaiova & James A. Overdahl, Price Dynamics, Price Discovery and Large Futures Trader Interactions in the Energy Complex, Commodity Futures Trading Commission (Apr. 28, 2005); see also A Review of Recent Hedge Fund Participation in NYMEX Natural Gas and Crude Oil Futures Markets, New York Mercantile Exchange (March 1, 2005).

<sup>200</sup> GAO Hints at Post-Katrina Price Tampering, Gas Daily, Feb. 14, 2006, at 1 (reflecting the statement that “other factors – such as market manipulation – may also have affected wholesale prices.”); see also Natural Gas: Factors Affecting

number of reasons.

Studies by the CFTC and the GAO “can’t assure the public that the over-the-counter market isn’t being manipulated.”<sup>201</sup> Even where the trading is regulated and regulators have taken a peak at what is going on, questions persist. “Studies by the New York Mercantile Exchange and the Commodity Futures Trading Commission have disputed the notion that hedge funds are having undue influence on pricing or volatility . . . [M]any traders have scoffed at the studies, saying that they focused only on certain months, missing price run-ups.”<sup>202</sup>

- The studies do not deal with a period in which there was a rapid run up in prices. It does appear that if you study the wrong months in the wrong markets, you will not learn very much.<sup>203</sup>
- The Commission does not have the data necessary to uncover many of the effects that are a concern.
- Blatant manipulation is not the only issue; the concern is a much broader range of behaviors and structural effects.
- The claim that the market is efficient is refuted by the detailed academic studies. The opinion about the efficiency of the natural gas market varies across time.<sup>204</sup>
- The assertion that the market provides liquidity and price discovery is in dispute. Out beyond a couple of months there is very little liquidity on the exchanges subject to CFTC jurisdiction.

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Prices and Potential Impact on Consumers, Testimony before the Permanent Subcommittee on Investigations, Committee on Homeland Security and Government Affairs, U.S. Senate, 109th Cong. (2006) (statement of Jim Wells, Director Natural Resources and Environment) (focusing on tight physical markets).

<sup>201</sup> Barrionuevo, *supra* note 128, at 3 (quoting Randall Dodd, director of the Financial Policy Forum).

<sup>202</sup> *Id.*

<sup>203</sup> Rocio Uria & Jeffrey Williams, The “Supply-of-Storage” for Natural Gas in California, University of California Energy Institute (Sept. 2005).

<sup>204</sup> See John H. Herbert, The Relation of Monthly Spot to Futures Prices of Natural Gas, *Energy*, 18: 1993 Arthur De Vany & W David Walls, The Law of One Price in a Network: Arbitrage and Price Dynamics in Natural Gas City Gate Markets, 36 *J. Regional Sci.* 555, (1996).

Other, more recent studies cast further doubt on these conclusions.<sup>205</sup>

The FERC has also issued rules implementing the Energy Policy Act of 2005 that change its market monitoring procedures and implement new powers granted in the Act.<sup>206</sup> It has entered into a vague memorandum of understanding about sharing information.<sup>207</sup> The foregoing analysis demonstrates that a lot more than manipulation is at issue in the natural gas price spiral and suggests that much more needs to be done. Both the FERC and the CFTC are looking for a very narrow range of manipulative behaviors with a very narrow telescope. Unlike other physical commodities, a vast amount of trading of natural gas goes on in the OTC markets that are hidden from the view and are beyond the authority of these agencies. The indices that are based on this unregulated market activity have been unreliable and remain subject to doubt.

In the case of regulated activities, the changes at the FERC replicate the weaknesses of the CFTC approach by adopting its definitions and case law. It may be illegal to contrive to manipulate markets and there are new fines if you are caught doing so, but the FERC is going to have great difficulty proving manipulation when prices are "moved." It is precisely for this reason that the CFTC and the exchanges subject to its jurisdiction do more than rely on narrowly defined manipulation statutes to prevent abuse.

As noted above, exchanges adopt additional measures to limit the ability to move prices – like position limits and price change limits. Unfortunately, for natural gas, these remain far too lax. FERC has no authority to implement effective trading limits and the CFTC has chosen not to do so.

Efforts to ensure the accuracy of prices in the over-the-counter market have been equally unsatisfying. The indices on which many contracts rely are privately compiled reports of transactions. This reporting was entirely voluntary and unaudited. Misreporting was uncovered and the Federal Energy Regulatory Commission con-

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<sup>205</sup> Permanent Subcommittee on Investigations, *supra* note 157; see Robert J. Shapiro and Nam D. Pham, *An Analysis of Spot and Futures Prices for Natural Gas: The Roles of Economic Fundamental, Market Structure, Speculation and Manipulation* (August, 2006).

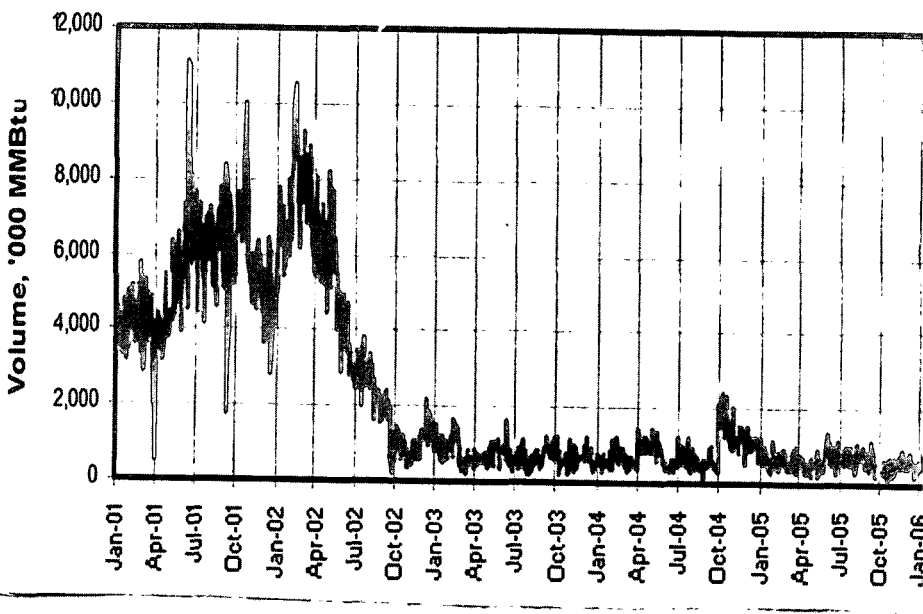
<sup>206</sup> Federal Energy Regulatory Commission Prohibition of Energy Market Manipulation, Order No. 670, Docket No. RM06-3-000, Jan. 19, 2006.

<sup>207</sup> Memorandum of Understanding Between The Federal Energy Regulatory Commission (FERC) and the Commodity Futures Trading Commission (CFTC) Regarding Information Sharing and Treatment of Proprietary Trading and Other Information (Oct. 12, 2005).

sidered reform. It chose to suggest a code of conduct. Reporting remains voluntary and unaudited. Those reporting must merely attest to the veracity of the reported transactions they choose to report.

When the spotlight was first turned on the construction of the survey, many firms ceased reporting their transactions. Now that the process has been reformed, the amount of reporting remains extremely low (see Exhibit III-3). The quantity of reported transactions is an extremely small fraction of the total gas consumed in the country – one to two percent. While there are other indices and one need not assume that gas should be transacted in this cash market to be consumed, the fact that such a small quantity of gas plays such an important role in price setting is a concern. This is particularly the case where the reported transactions are self-selected.

### **Exhibit III-3: Gas Daily Henry Hub Volume**



Source: Gas Daily

#### IV. Deregulatory Ineptitude in Electricity<sup>208</sup>

In the previous section we have seen that the fits of wild trading in natural gas were wrapped around the California electricity crisis. There were direct and indirect links, not the least of which was that the leading trader in first natural gas crisis, Enron, was also a key figure in California electricity deregulation. Recounting the plight of American energy consumers would not be complete without some mention of electricity and California. My purpose here is to highlight the central themes of this paper, strategic behavior and market power built on weak market fundamentals.

For almost a year from mid-2000 to mid-2001, as California electricity prices skyrocketed and the lights flickered, the FERC insisted that this was just the market working and nothing was wrong, blaming market forces of supply and demand.<sup>209</sup> Ironically on the very day that the FERC reinstituted price caps on the California Market in June of 2001, the Department of Energy came out with a study that declared that any limit on prices would hurt California.<sup>210</sup> Over five years later, a mountain of evidence suggests that the claims by both Federal agencies were dead wrong. There was massive manipulation of the California market<sup>211</sup> and price caps quieted the market.

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<sup>208</sup> This section draws on Mark Cooper, Motion to Intervene and Request for Rehearing of The Consumer Federation of America, Arizona Consumers Council, CALPRG, Colorado PIRG, Consumer Action, Consumer Federation of California, Consumer Fraud Watch, Democratic Process Center, Illinois PIRG, Mass PIRG, Massachusetts Consumers' Coalition, Michigan Consumer Federation, New York PIRG, Pennsylvania Citizens Consumer Council, Utility Consumers Action Network, and Virginia Citizens Consumer Council, Federal Energy Regulatory Commission, Docket Nos. EL00-95-012, EL00-98-000, Rt 01-85-000, EL01-68-000, 2001. Mark Cooper, Back to Basics in Analyzing the Failure of Electricity Restructuring: Accepting the Limits of Markets, presented at Energy Markets in Turmoil, Institute for Regulatory Policy Studies, Illinois State University, May 17, 2001; Mark Cooper, Recognizing Limits of Market, Rediscovering Public Interest in Utilities, in Robert E. Willett, ED. Natural Gas and Electric Power Industry Analysis (2003)

<sup>209</sup> See Cooper, Motion to intervene, *supra* note 208, for a general critique of FERC's failure to act.

<sup>210</sup> U.S. DOE, Office of Economic, Electricity and Natural Gas Analysis, The Impact of Wholesale Electricity Price Controls on California Summer Reliability (Washington, June 2001).-

<sup>211</sup> Attorney General Bill Lockyear, Attorney General's Energy White Paper: A Law Enforcement Perspective on the California Energy Crisis: Recommendations for Improving Enforcement and Protecting Consumers in Deregulated Energy Markets, April 2004, available at <http://ag.ca.gov/publications/energywhitepaper.pdf>.

### A. Profit Motivation Reduces Supply

The California energy crisis has been picked over numerous times. Here, this article focuses on the key themes of strategic behavior and market power that integrate into the earlier analysis. Faced with the prospect of deregulation, utilities restricted their investment.<sup>212</sup> Not only did utilities refuse to build power plants, they actively prevented as much as 4,000 megawatts of long-term resources from entering the system and failed to provide an equal amount of short term resources.<sup>213</sup> Utilities cut back on their spending on conservation, which led to a shortfall in demand reduction of a couple thousand megawatts. In defense of their distribution assets, they also fought steadfastly against distributed generation, which could have brought substantial capacity on line in addition to relieving demands on transmission assets.<sup>214</sup> Citing the impending competitive market, utilities refused to buy about a thousand megawatts of renewable energy that they were supposed to. Utilities failed to produce spot and interruptible contracts for large quantities of additional capacity to which they were committed.<sup>215</sup> When they were given the opportunity to enter into long-term contracts, they failed to fully avail them-

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<sup>212</sup> In addition to findings on market power cited above, see Bohn, et. al., Market Monitoring Committee of the California Power Exchange, Report on Market Issues in the California Power Exchange Energy Markets (Aug. 17, 1998) and Energy Information Administration, Horizontal Market Power in Restructured Electricity Markets (Mar. 2000).

<sup>213</sup> The key elements of this scenario were laid out in Michael Kahn & Loretta Lynch, California's Electricity Options and Challenges (August, 2000). An interesting perspective on perceptions about the crisis that tracks many of the arguments made below can be found in "Roundtable Dialogue on California Energy Crisis," Sacramento Bee (Dec. 24, 2000). William Marcus & Jan Hamrin, How We Got into the California Energy Crisis, (2001) [hereinafter Marcus, Crisis] at 2-3 (providing specific estimates of the size of each of the factors, as do Harvey Harvey, Hal et al., "California and the Energy Crisis: Diagnosis and Cure," Energy Foundation, March 8, 2001, at 1. .

<sup>214</sup> See Marcus, Crisis, *supra* note 213; see also Brent R. Alderfer, Monika M. Eldridge, & Thomas J. Starrs, Making Connections: Case Studies of Interconnection Barriers and the Impact of Distributed Power Projects, National Renewable Energy Laboratory 5 (2000), <http://www.nrel.gov/docs/fy00osti/28053.pdf>. The Department of Energy documented the difficulties that utilities created for the expansion of supply through distributed generation

<sup>215</sup> Marcus, Crisis, *supra* note 213 (providing the following figures: for long term resources 1400 MW renewables and cogeneration, 2000 MW of efficiency; for short term resources 2300 MW of uncontracted spot capacity and 2500 MW of bogus interruptible contracts. The California Energy Commission put distributed generation as high as 20 percent, or as much as 10,000 MW, by 2010.

selves of the hedging opportunities to mitigate the exposure to price run-ups.<sup>216</sup>

The independent power producers also did not build new power plants. Instead, they bought the existing ones. They *immediately* began running plants less than the previous owners.<sup>217</sup> On any given day during the price spikes these plants were producing between 2000 and 6000 megawatts less than their historic average.<sup>218</sup> The same independent generators also opposed long-term contracts, which would have kept utilities out of the volatile spot market.

The disappearance of these assets was part of a pattern of resource denial that has the effect of driving up the price of electricity.<sup>219</sup> This profit driven denial of resources equal to between 10 and 20 percent of peak demand had a substantial impact on price and performance.<sup>220</sup> As a result, the public welfare was placed at the mercy

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<sup>216</sup> Frank Wolak, et al. An Analysis of the June 2000 Price Spike in California ISO's Energy and Ancillary Service Market. Market Surveillance Committee of the California ISO. September 6, 2000, at 14; Alfred E. Kahn, et. al., Pricing in the California Power Exchange Electricity Market: Should California Switch from Uniform Pricing to Pay-as-Bid Pricing, California Power Exchange, Jan. 23, 2001, [www.cramton.umd.edu/papers2000-2004/kahn-kramton-porter-tabors-blue-ribbon-panel-report-to-calpx.pdf](http://www.cramton.umd.edu/papers2000-2004/kahn-kramton-porter-tabors-blue-ribbon-panel-report-to-calpx.pdf) (also recognizing that utilities did not take these opportunities, but excusing it by suggesting they did not trust regulators).

<sup>217</sup> Puller, Steven L., "Pricing and Firm Conduct in California's Deregulated Electricity Market," (University of California Energy Institute, Program on Workable Energy Regulation, November 2000). (showing an immediate reduction in utilization after deregulation and divestiture.)

<sup>218</sup> Kenneth Rose, The California Restructuring Meltdown and the Fallout in Other States, National Conference of State Legislatures, AFI/ASI Joint Winter Meeting, AFI Energy and Transportation Committee (Dec. 13, 2000) [hereinafter Other States] (noting how the summer of 1999 experienced price spikes), at 34 (showing an increase in unplanned outages between 1999 and 2000 of about 1,000 MW in June, 1,600 MW in July, and 2,500 MW in August); Marcus, Crisis, *supra* note 213, at 7 ("Forced outage rates for California natural gas plants over the past five years have gone from the traditional 5-10 percent per year outage rate to an average of almost 50 percent.").

<sup>219</sup> Severin Borenstein, et. al., Diagnosing Market Power in California's Restructured Electricity Market University of California Energy Institute (Aug. 2000), [www.ucei.berkeley.edu/](http://www.ucei.berkeley.edu/).

<sup>220</sup> Marcus, Crisis, *supra* note 213; William B. Marcus & Greg Russzon, Cost Curve Analysis of the California Power Markets, (Sacramento: JBS Energy, Inc., 2000) (calling it a summer 2000 shift). I calculate that the graphs show that the jump in gas prices runs the cost from 8.3 cents per kWh to 16.5 cents at 40,000 MW without the summer shift and 24 cents with the summer shift. At 45,000 MW, the price is 78 cents per kWh and at 35,000 MW, it is 11.4 cents. Adding 5,000 to 10,000 MW to the system has a huge benefit in relieving price pressures.).

of the weather, the ability of producers to game the market and the inability of regulators to prevent that gaming.

## **B. Regulatory Irresponsibility That Harms The Public**

For its part, the FERC prematurely deregulated price over the objection of many in California. In fact, the FERC fought California authorities to assert control over the Independent System Operator (ISO) and then deregulated the price of energy in the California wholesale market, even though its market analysis was fundamentally flawed. This enabled private interests to take advantage of the bad situation that they had helped to create. The FERC failed to reasonably analyze the market before it deregulated. It treated the state as one big market, when it is evident that there are distinct and separate north-south markets because of a transmission capacity constraint.<sup>221</sup> It failed to identify load pockets that would be constrained at peak times.<sup>222</sup> It deregulated ancillary services, even though it was told market power existed in these markets.<sup>223</sup> It accepted on faith that “must run” plants would mitigate market power, without any concrete plan to ensure that they did.<sup>224</sup>

More generally, the FERC rubber stamped industry rules on transmission capacity availability and transmission load relief that simply cannot ensure open transmission networks or prevent manipulation of transmission capacity availability.<sup>225</sup> The FERC also pur-

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<sup>221</sup> Severin Borenstein, et. al., *The Competitive Effects of Transmission Capacity in a Deregulated Electricity Market*, *Rand Jour. Econ* 318 (2000); Lisa G Dowden, et. al., *Market Power: Will We Know it When We See It?: The California Experience*, American Public Power Association (Dec. 2000); Marcus, *Crisis*, *supra* note 213.

<sup>222</sup> James A. Bushnell & Frank A. Wolak, *Regulation and the Leverage of Local Market Power in California's Electricity Market* (University of California, Berkeley, Working Paper No. CPC00-13), available at <http://repositories.cdlib.org/cgi/viewcontent.cgi?article+1013&context=iber/cpc>.

<sup>223</sup> Dowden, et. al., *supra* note 221; Marcus, *Crisis*, *supra* note 213.

<sup>224</sup> Dowden, et. al., *supra* note 221; Marcus, *Crisis*, *supra* note 213.

<sup>225</sup> Richard D. Tabors & Luis Paz Galindo, *Transmission Pricing in PJM: Allowing the Economics of the Market to Work* (May 12, 1999). Narasimha Roe & Richard D. Tabors, *Transmission Markets: Stretching the Rules for Fun and Profit* (TCA Working Paper, No. 327-0400). The importance of transmission is underscored in Borenstein, Bushnell and Stoft. Consumer Federation of America, “Request for Reconsideration,” Regional Transmission Organizations, United States of America, Federal Energy Regulatory Commission, Docket No. RM99-2-000; Order No. 2000, Session (Jan. 20, 1999). .



sued a remarkably permissive merger policy.<sup>226</sup> As a result, national and regional markets have become much more concentrated.<sup>227</sup>

The FERC refused to responsibly police the markets it irresponsibly deregulated.<sup>228</sup> It defended the secrecy of spot market bidding, which appears to have the effect of allowing tight oligopolies of bidders to play their games behind closed doors.<sup>229</sup> It refused to requisition and study bidding records for abusive patterns after the first price spikes in 1998,<sup>230</sup> and the second price spikes in 1999,<sup>231</sup> which emboldened strategic bidders for the really big killing of 2000.

The FERC approved rates without subjecting them to refund, so that market manipulators know they will never have to disgorge their ill-gotten gains.<sup>232</sup> It even rushed in to allow a hasty reorganization of one of the California utilities to shield its assets from its creditors.<sup>233</sup> As the only dissenting Commissioner put it, if the FERC had exercised more responsibility earlier, "capping spot market prices at variable operating costs plus a capacity adder . . . there is reason to believe that applicants would not be in such dire straits now."<sup>234</sup>

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<sup>226</sup> Mark Cooper, *Mergers and Open Access to Transmission in the Restructuring Electric Industry: Analytic Tools, Empirical Evidence and Policies to Build Effective Market Structures* (Apr. 2000), <http://www.consumerfed.org/pdfs/electmkt.pdf>.

<sup>227</sup> *The Changing Structure of the Electric Power Industry 1999: Mergers and Other Corporate Combinations*, Energy Information Administration, (Dec. 1999), <http://tonto.eia.doe.gov/FTPROOT/electricity/056299.pdf>.

<sup>228</sup> Dowden, et. al., *supra* note 221 (recounting the evidence presented to FERC on market power and FERC's seeming inaction); Mark Cooper, *Electricity Restructuring and the Price Spikes of 1998: A Need for More Vigorous Efforts to Protect Consumers* (June 21, 1999). (hereafter, *Spikes*) discusses the failure of FERC to react vigorously to complaints of market power in response to the 1998 price spikes.

<sup>229</sup> Dowden et. al., *supra* note 221.

<sup>230</sup> Cooper, *Spikes*, *supra*, note 228.

<sup>231</sup> A frustrated FERC staff member wrote a blistering critique of FERC's unwillingness to investigate transaction data in 1998 and 1999, just prior to the onset of the big problems in the California market in 2000. See Open Memorandum From: Ron Rattey, OMTR, To: FERC Staff (June 2, 2000), <http://www.mresearch.com/pdfs.202.pdf>.

<sup>232</sup> Dowden, et. al., *supra* 221.

<sup>233</sup> Order Authorizing Disposition of Jurisdictional Facilities, PGE National Energy Group, Inc. (Jan. 12, 2001), <http://elibrary.ferc.gov/idmws/search/results.asp>.

<sup>234</sup> Commissioner Massey, dissenting, Order Authorizing Disposition of Jurisdictional Facilities, PGE National Energy Group, Inc. (Jan. 12, 2001),

Consider the following example based on the Landes and Posner discussion and the empirical evidence from California. Assume a generator with a 10 percent market share in a market with a demand elasticity of .03 and a supply elasticity of .2. Assume the rest of the market is a “competitive fringe,” which could expand its output subject to the elasticity. The Lerner Index would be .48; prices would be marked up 48 percent above costs, a very substantial mark-up.

The 10 percent market share in the example approximates the size of the smaller out-of-state generators who abused their market power in California. In fact, this example underestimates the potential for the exercise of market power since the state is not one big market and the inability of some utility plants, which were run at all times regardless of price (must run plants), to expand output in response to market needs.<sup>235</sup> Thus, the “market” is frequently defined as only the fossil generators, and the competitive fringe could be considered only the fossil generators. Either the numerator of the Landes and Posner formula would be twice as large or the denominator would be half as large. Either way, the Lerner index would be substantially larger – about twice the size. This is roughly what we observe in the real world.<sup>236</sup>

Interestingly, we can find a similar scenario simultaneously unfolding in natural gas. The CPUC let the electric utilities out of natural gas storage requirements because they are noncore customers,<sup>237</sup> which is an absurd misdefinition of core and noncore that exacerbated the problem.<sup>238</sup> Large corporate consumers got out from under their obligations to keep fuel in storage, including electric utilities, and the obligation to have alternative fuel capacity since all these contingencies cost too much in a competitive market.<sup>239</sup> Simultaneously, utilities fought against increasing pipeline capacity into the state. Firm transmission rights and gas brokering functions were

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<http://www.caiso.com/docs/2000/12/01/2000120116120227219ex.html> (last visited May 24, 2007).

<sup>235</sup> Dowden, McDiarmid, and Huang, *supra* note 221; Marcus, *supra* note 213..

<sup>236</sup> Eric Hildebrandt, Impacts of Market Power in California’s Wholesale Energy Market: More Detailed Analysis Based on Individual Seller Schedules and Transactions in the ISO and PX Markets, Department of Market Analysis, California ISO (Apr. 2001); at 8 (finding mark-ups of 30 percent using the extreme assumptions of spot gas and NOx. Using more realistic assumptions would increase the estimate.).

<sup>237</sup> Wolak, et. al., *supra* note 216.

<sup>238</sup> Marcus, Crisis, *supra* note 214.

<sup>239</sup> Marcus, Crisis, *supra* note 214.

transferred to unregulated affiliates, who have every interest in charging the utility sister companies the highest price possible. The FERC deregulated a capacity constrained market with storage at unprecedentedly low levels.

Things would have been bad no matter what the California market institutions looked like, but the institutions certainly did not help matters and actually made them worse in a number of ways. The California Independent System Operator (CAL-ISO) adopted a one-price auction,<sup>240</sup> which pays the highest price to everyone in an

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<sup>240</sup> Alfred Kahn, et al. *supra* note 216, argue, based primarily on experimental results, that the bidding system does not matter much, compared to the problems of market power, tight supplies and inelastic demand and given the ability of those with market power to adapt their bidding strategies to any system. To the extent that the purpose is to prevent attention from being directed away from the important issues, this is a useful analysis, but the arguments miss the fundamental problem identified by other analysts and the victims of the one-price system. The critics of the one-price system focus on the massive economic rents and the lottery nature of the one price system, which exposes a few very high price offers to little risk, a bidding strategy which is consistent with the backward bending supply curve (see the sources cited at notes 12 and 13 in Alfred Kahn, et al., *supra* note 216).

McDiarmid, Dowden, and Davidson, A Modest Proposal: Revoke the Nobel Price? Recognize the Limitations of Theory? Or Grant a License to Steal?, *Electricity J.*, January/February 2001, summarizes the lottery nature of this type of auction as follows:

‘I know that a simple bidding strategy of bidding very high on the last few MW will be extremely profitable for everyone, including me, if I have enough MW already running at the time, and so I will follow that strategy and I expect anyone else in the business to have enough brains to see the same advantage.’

They describe the huge rents as follows:

the cost difference from a market-clearing price of \$75 or one of \$1,075 is \$50 million per hour, or \$500 million per 10-hour peak period. If the bidding behavior of one of the last few suppliers were rational then, the failure of a 100 MW unit to be dispatched would mean that the last supplier would lose \$75,000 (gross revenue, which would translate into significantly less on lost profits after reduction of the out-of-pocket costs) for a 10-hour period; but if that supplier had 4,000 MW already in the market dispatched based on bids that would be rational for the second-price theory, the additional amount that it would gain for the output of those units already running if a market-clearing price at the \$1,075 level were established would be \$4 million per hour, or \$40, million for the 10-hour period. *Id.* at 16; see also,

“Roundtable Dialogue,” *supra* note 240. (noting how participants clearly care a great deal about the average price and believe that the very high rents available on all sales at peak times has dissuaded sellers from offering reasonable prices for longer terms). Similarly, Florida Municipal Electric Association, which represents consumers, show substantial rents. See Energy 2020 Study Commission Wholesale Deregulation Proposal Will Raise Electric Rates and Maximize Profits of Private

industry that is just dripping with scarcity (ground) rents.<sup>241</sup> It failed to impose a reserve requirement.<sup>242</sup> Different rules between the PX and the ISO resulted in considerable underscheduling and drove up prices.<sup>243</sup> The Market Surveillance Committee immediately and repeatedly found market power in its general studies,<sup>244</sup> but the ISO never sought to discipline those responsible.<sup>245</sup>

The California Public Utilities Commission (CPUC) adopted a prohibition on long-term contracts, which forced utilities into spot markets.<sup>246</sup> The ISO suggests that a large part of the responsibility for the failure of the demand side to respond in the short and long term rests with the CPUC and or the legislature.<sup>247</sup>

The manner in which California escaped from the clutches of

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Utility Shareholders. Woychik does not accept this point of view. "Testimony of Eric Charles Woychik, on behalf of TURN and UCAN, San Diego Gas & Electric, et al., Docket No. EL00-95-000, November 22, 2000 (hereafter Turn).

<sup>241</sup> Rosen, Richard, Freyr Sverrisson and John Stutz, Can Electric Utility Restructuring Meet the Challenges it Has Created (Tellus Institute, November 2000). stress the importance of rents in the industry..

<sup>242</sup> Wolak, *supra* note 216; TURN, *supra* note 241, stresses this problem

<sup>243</sup> Wolak, *supra* note 216.

<sup>244</sup> See Market Surveillance Committee, Analysis of Order Proposing Remedies for California Wholesale Electric Markets, Federal Energy Regulatory Commission, (Dec. 4, 2000), <http://www.caiso.com/docs/2000/12/01/2000120116120227219ex.html>; see also Wolak, *supra* note 216; Bushnell, *supra* note 222; Borenstein, *supra* note 219; Bohn, *supra* note 212.

<sup>245</sup> Department of Market Analysis, Report on Real Time Supply Costs Above Single Price Auction Threshold: December 8, 2000 – January 31, 2001, (Feb.28, 2001) (finally asking for refunds of over \$.5 billion of unjust and unreasonable charges).

<sup>246</sup> The ISO responded to selected portions of Kahn and Lynch, *supra* note 213, as noted in California Energy Markets, "Priorities, August 21, 2000; Wolak, *supra* note 216; TURN, *supra* note 240, questions the importance of the lack of long term contracts; see also Scott M. Harvey & William Hogan, California Electricity Prices and Forward Market Hedging (Oct. 17, 2000), <http://ksghome.harvard.edu/~whogan/mschedg1017.pdf>.

<sup>247</sup> ISO Response, *supra* note 246, at 5.

Indeed, planners of deregulation recognized that much of the success of the markets depend on work to be implemented and/or regulated by state policymakers. This work included development of demand responsiveness products, implementation of hedging instruments for entities that serve load, development of real time rates and installation of real time meters, promotion of consumer education on issues of price responsiveness and conservation, and facilitation of review of transmission lines and/or substations at critical junctions in the transmission system. Most of this work remains to be done.

manipulators is instructive. Just as it took a powerful combination of events to create the storm, it took a combination to break up its eye. The key factor was a combination of good management, responsible exercise of authority, and good luck that undermined the ability of the merchant generators to abuse their market power.

California took the state out of the spot market. In the colorful language that has developed in the electricity literature of spot markets, it drained the (power) pool.<sup>248</sup> It signed more long-term contracts than anticipated.<sup>249</sup> The state brought other source of electricity on line more quickly than expected, including qualifying facilities and generators that had been restricted by environmental constraints.<sup>250</sup> These generally small electricity producers were important because they are likely not as able to game the market as the large merchant generators tend to. The combination of a public-spirited conservation campaign and a recession reduced demand.<sup>251</sup>

With weak demand and a "flood" of supply, the state created demand uncertainty for the merchant-generators. Uncertainty is critically necessary to make bidders behave honestly in these markets, because it undermines the ability of merchant generators to withhold capacity or demand high prices that drive the spot market to higher levels.<sup>252</sup> Thus, much as the deep recession of 2002 was the key to driving margins and gas prices down to historical levels, so too it was the massive shift in supply-demand balance that alleviated the pressures on California.

The FERC finally accepted some responsibility by sending a signal that there might actually be negative consequences for the abuse of market power.<sup>253</sup> It imposed some price controls and

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<sup>248</sup> Richard Green, *Draining the Pool: The Reform of Electricity Trading in England and Wales*, *Energy Journal*, 2000; Michael H. Rothkopf, *Control of Market Power in Electricity Auctions*, January 13, 2001.

<sup>249</sup> Between April and June, 2001, the state added approximately 1,200 MW to its long term contract portfolio (see "California Agency's Power Costs to Drop Sharply," *Energy Daily*, June 13, 2001).

<sup>250</sup> Cooper, *Recognizing*, *supra* note 208, at 445-447.

<sup>251</sup> Rene Sanchez, *California Residents Answer State's Call to Cut Power Use*, *Wash. Post*, June 5, 2001 (discussing how conservation, adjusted for weather, has been put at 5 to 10 percent); Anjali Sheffrin, *Market Analysis Report for May 2001*, California ISO (June 15, 2001) (noting that the reduction in peak use is between 2,000 and 4,000 MW).

<sup>252</sup> Summing up the "unexpected" shift in the supply demand balance we find 7,000 MW more resources available in a system that typically peaks at around 48,000 MW.

<sup>253</sup> *San Diego Gas & Elec. Co.*, 95 F.E.R.C. 61115 (2001); *San Diego Gas &*

opened an investigation into past overcharges. It created an obligation to sell electricity, shifting the responsibility for offering power into the market onto the generators, and gave the ISO more authority to enforce this obligation. It banned the practice of megawatt laundering, which transferred ownership of electricity to out-of-state brokers who would then sell the power back into the state at inflated prices. It got serious about tackling the abuse of market power in the natural gas transportation market.<sup>254</sup> The contract that El Paso Corporation used to control a large part of natural gas pipeline capacity coming into the state expired.<sup>255</sup>

Luck helped too. The weather was cool in the summer.

### **C. The Incredible Shrinking Benefits of Restructuring and Deregulation**

California may be an extreme example of the failure of restructuring, but it is not unique.<sup>256</sup> Empirical studies show that strong economies are achieved by coordinating electricity supply and demand.<sup>257</sup> Before restructuring, the electricity industry was a rea-

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Elec. Co., 94 F.E.R.C. 61245 (2001); San Diego Gas & Elec. Co., 93 F.E.R.C. 61294 (2000).

<sup>254</sup> Jeff Beattie, FERC Judge Takes Swing at El Paso on California Gas Market Manipulation, *Energy Daily*, Aug. 7, 2001; Jeff Beattie, FERC to Investigate Enron California Pipeline Deals, *Energy Daily*, July 26, 2001

<sup>255</sup> Richard, A. Opel, California Gets a Reprieve as Natural Gas Prices Drop, *N.Y. Times*, June 11, 2001, at C2.

<sup>256</sup> In addition to the price spikes of 1998, see Federal Energy Regulatory Commission, Staff Report, *The Causes of the Pricing Abnormalities in the Midwest During June 1998* (Sept. 22, 1998) [hereinafter FERC Staff Report]; Public Utilities Commission of Ohio Report, *Ohio's Electric Market* (June 22-26, 1998); Public Utilities Commission of Ohio, *What Happened and Why: A Report to the Ohio General Assembly* (1998); Kenneth Rose, *The California Electric Meltdown*, presentation to the NRRI Board of Directors Meeting (Sept. 14, 2000) [hereinafter, Rose, *Meltdown*]; Joseph Bowring et. al., *Monitoring the PJM Market: Summer 1999*, UCEI Power Conference (Mar. 17, 2000) and supply outages (Department of Energy, Interim Report of the U.S. Department of Energy's Power Outage Supply Study Team, (Washington, January 1999); and the summer of 2000 also exhibited sharp run ups in New York and New England (Rose, *Meltdown*)...

<sup>257</sup> Gegaux, Douglas and Kenneth Nowotny, "Competition and the Electric Utility Industry," *Yale Journal on Regulation*, 10 no. 63, 1997; Gilsdorf, Keith, "Testing for Subadditivity of Vertically-Integrated Electric Utilities," *Southern Economic Journal*, 18 no. 12 (1995); Henderson, J. Stephen, "Cost Estimation for Vertically Integrated Firms: the Cost of Electricity," in M. A. Crew (Ed.), *Analyzing the Impact of Regulatory Change in Public Utilities* (Lexington, Mass., Lexington Books, 1985); Hirst, Erick and Brenda Kirby, "Dynamic Scheduling: The Forgotten Issue," *Public Utilities Fortnightly*, April 15, 1997; Kaserman, David L. and

sonably well-run, complex, integrated network that was under some stress.<sup>258</sup> Creation of markets for electricity services leads to a huge growth in the number of transactions conducted every day and creates heavy administrative requirements. An entity that once maintained real-time balance as an insulated operation that could oversee its own supply, demand, and delivery, must now contract to achieve real-time balance simultaneously in five, six, or seven different markets over broad geographic areas.<sup>259</sup> This has proven a daunting task<sup>260</sup> that consumes substantial resources.<sup>261</sup>

When the debate over restructuring of electric utilities began, proponents made a number of claims predicting that restructuring and deregulation of the retail electric market would bring both price and service benefits to consumers.<sup>262</sup> Projected price reductions were

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John W. Mayo, "The Measurement of Vertical Economies and the Efficient Structure of the Electric Utility Industry," *Journal of Industrial Economics*, 29 no. 5 (1991); Kwoka, John E. Jr., *Power Structure: Ownership, Integration, and Competition in the U.S. Electricity Industry* (Dordrecht, Boston: 1996); Roberts, Mark J., "Economies of Density and Size in the Production and Delivery of Electric Power," *Land Economics*, 62 no. 4 (1986).

<sup>258</sup> Alfred E. Mistr, Jr., *Incremental-Cost Pricing: What Efficiency Requires*, *Pub. Util. Fort.*, Jan. 1, 1996, at 33; Samuel S. Oren, *Economic Inefficiency of Passive Transmission Rights in Congested Electricity Systems with Competitive Generation*, 18 *Energy J.* 63 (1997), Samuel S. Oren, *Passive Transmission Rights Will Not Do the Job*, *Electricity J.* (June 1997); Gerald B. Ostroski, *Embedded-Cost Pricing: What Fairness Demands*, *Pub. Util. Fort.*, Jan. 1, 1996, at 32; Bruce W. Radford, *Electric Transmission: An Overview*, *Pub. Util. Fort.*, Jan. 1, 1996, at 32; Mark J. Volpe, *Let's Not Socialize Transmission Rates*, *Pub. Util. Fort.*, Feb. 15, 1997, at 48; Douglas Bohi & Karen Palmer, *The Efficiency of Wholesale vs. Retail Competition in Electricity*, *Electricity J.*, Oct. 1996; Steve Cornelli, *Will Customer Choice Always Lower Costs?* *Electricity J.*, Oct., 1996.

<sup>259</sup> Geographic scope is needed to achieve what network economists call "pool effects" in network industries. Charles B. Stabell & Oysteing D. Fjeldstad, *Configuring Value Chains for Competitive Advantage: On Chains, Shops and Networks*, 19 *Strategic Mgmt J.*, 413 (1998); See also Cooper, *Residential Consumer Economics* (discussing...or load balancing in the electric utility industry.).

<sup>260</sup> Robert L. Earle et al., *Lessons from the First Year of Competition in the California Electricity Market*, *Electricity J.*, Oct. 1999 (describing the process in a context that finds the potential for market power and inefficiency).

<sup>261</sup> FERC Staff Report, *supra* note 256; Public Utilities Commission of Ohio, *supra* note 256; E. Kiah, *Thoughts on Wild Prices*, July 1998; Power Outage Study Team, Department of Energy, *Interim Report of the U.S. Department of Energy's Power Outage Supply Study Team*, (Jan. 2000) [hereinafter *Outages*].

<sup>262</sup> See, e.g., Michael Maloney, et. al, *Customer Choice, Consumer Value: An Analysis of Retail Competition in America's Electric Industry*, Citizens for a Sound Economy (1996); Michael T. Maloney, Robert E. McCormick, Robert D. Sauer & Jerry Ellig, *Economic Deregulation and Customer Choice: Lessons for the Electric*

placed in the range of forty percent. Without close scrutiny, these claims gained considerable prominence. As the debate has unfolded, however, it has become clear that the initial claims and promises are likely to far exceed the reality.<sup>263</sup> It is now clear that early analyses, which claimed so much benefit for consumers, had little basis in reality because they were primarily theoretical discussions of the benefits of competition without thorough analysis of the economics of the electric utility industry. Their projections were based on unrealistic assumptions about economic and political behavior; and the analogies they drew between electricity and other industries ignored market fundamentals and the fate of captive customers.

Once public scrutiny was brought to bear on these unsubstantiated claims, official estimates became much more subdued (see Exhibit IV-1). In the late 1990s the Energy Information Administration (EIA) estimated short-term price declines in a competitive electric market in the range of six to thirteen percent, before stranded cost recovery is added back in. EIA did not believe that even a twenty percent reduction was sustainable.<sup>264</sup>

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utility Industry, Center for Market Process, 1999.

<sup>263</sup> Dale Pharris, Who Really Benefits From Retail Competition?, National Rural Electric Cooperative Association (Sept. 1996); Matthew I. Kahal, The CSEF Electric Deregulation Study: Economic Miracle or the Economists' Cold Fusion, Electric Consumers' Alliance (Dec. 1996); Ronald J. Binz, et. al., Navigating A Course to Competition: A Consumer Perspective on Electric Restructuring, Competition Policy Institute (1997)

<sup>264</sup> Energy Information Administration, Department of Energy, Electricity Prices in a Competitive Environment: Marginal Cost Pricing of Generation Services and Financial Status of Electric Utilities 44-61 (1997). The EIA focused on much smaller net reductions in electricity costs of 10 percent. In the cases considered to be most likely to occur (all of which exclude the recovery of stranded costs through prices), electricity prices would be as much as 0.7 cents lower than the price projected in [Annual Energy Outlook 1997] AEO97 Reference Case nationally in 1998 – a 10 percent reduction based on an average price of 6.9 cents per kilowatt hour – and by as much as 0.7 cents per kilowatt hour in 2015 – an 11-percent reduction based on the average price of 6.3 cents per kilowatt hour (EIA, p. 62).



### Exhibit IV-1: Declining Projects of Efficiency Gains From Restructuring and Deregulation<sup>265</sup>

DATE OF CLAIM	PERCENTAGE PRICE REDUCTION PROJECTED
1995 <sup>a/</sup>	40+
1998 <sup>b/</sup>	6 ≤ 20
2002 <sup>c/</sup>	3-5

Not only did these estimates exclude stranded costs, but they also did not allow for transaction costs, cost shifting, or the exercise of market power. The EIA also recognized that actual price declines will vary by region.

The FERC's analysis in 2002 projected a base case efficiency gain of about 4 percent over almost two years.<sup>266</sup> Once again, trans-

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<sup>265</sup> <sup>a/</sup> See, for example, Maloney, Michael, et al. al, *Customer Choice, Consumer Value: An Analysis of Retail Competition in America's Electric Industry* (Citizens for a Sound Economy, 1996); Maloney, Michael T., Robert E. McCormick and Robert D. Sauer, and Jerry Ellig, *Economic Deregulation and Customer Choice: Lessons for the Electric utility Industry* (Center for Market Process, 1999)

<sup>b/</sup> Energy Information Administration, *Electricity Prices in a Competitive Environment: Marginal Cost Pricing of Generation Services and Financial Status of Electric utilities, A Preliminary Analysis Through 2015*, (U.S. Department of Energy, August 1997.-

<sup>c/</sup> ICF Consulting, *Economic Assessment of RTO Policy*, Prepared for the Federal energy Regulatory Commission, February 26, 2002, Tables ES-1, ES-2. Casazza, John, A., "Electricity Choice: Pick Your Poison: A. Errant Economics? B. Lousy Law? C. Market Manipulation? D. All Three?," *Public Utilities Fortnightly*, 2001 (March 1), identifies efficiency gains in generation of 3 percent. Newbery, David M. And Michael G. Pollitt, "The Restructuring and Privatisation of Britain's CEBG—Was It Worth It?" *The Journal of Industrial Economics*, 45:3, 1997, places pure efficiency gains at the 5% level for the U.K. (Newberry and Pollitt, pp. 297-298).

<sup>266</sup> ICF Consulting, Report for the Federal Energy Regulatory Commission, *Economic Assessment of RTO Policy*, Feb. 26, 2002, at tables ES-1, ES-2. John A. Casazza, *Electricity Choice: Pick Your Poison: A. Errant Economics? B. Lousy Law? C. Market Manipulation? D. All Three?*, Pub. Util. Fort., Mar. 1, 2001 (identifying efficiency gains in generation of 3 percent). This latter figure is consistent with the actual experience in the U.K., which began phasing in a competitive retail electric market in 1990, suggests caution is necessary in the estimation of benefits. Efficiency gains have not been very large and the exercise of market power is a constant threat to consumer gains from restructuring, resulting in the gains not being passed through to consumers. See David M. Newberry & Michael G. Pollitt, *The Restructuring and Privatisation of Britain's CEBG -- Was It Worth It?*, 45 J. Indus. Econ. 297, 297-98 (1997).

action costs, market imperfections and market power are not taken into account. Even these small gains have been challenged as being too large.<sup>267</sup>

As the wild claims of benefits were beaten back, a solid body of evidence came into place to show how pervasive and difficult the problem of market power is in the electricity market. Market power is also a persistent problem. Exhibit IV-2 shows the results of a number of analyses of markets. It includes simulations and actual results. The most extensive problem occurred in California,<sup>268</sup> but virtually all markets, even those like PJM and the upper Mid-west that are well endowed with transmission capacity and excess generation, have been beset by the problem. The estimated impact on prices of the exercise of market power exceeds the estimated efficiency gains by a substantial margin.

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Our preferred case is pro-privatization allowing for the expansion of nuclear power under the CEBG, ignoring environmental gains (whose cash value is hard to measure), and discounting at the public sector discount rate of 6%, for which case the net present value of benefits is L9.6 billion, equivalent to a permanent cost savings of about 0.16p/kWh, compared to an average 1994/95 price of about 2.8p/kWh, or a cost savings of 5% forever...

In any exercise of this kind, a systematic attempt to understand the workings of the industry raises yet further questions for further analysis and discussion. First, who benefited from the cost reductions that we found – was it taxpayers and shareholders..., rather than consumers? Our rather tentative answer is yes, given the large increase in profits and the relatively small decline in real final prices, and we have attempted to quantify these redistributive impacts, though they are subject to larger error margins than the simple efficiency gains

<sup>267</sup> New Mexico Office of the Attorney General et. al. before the Federal Energy Regulatory Commission, Comments on the RTO Cost Benefit Analysis Report (May 3, 2002).

<sup>268</sup> Eric Hildebrandt, Further Analysis of the Exercise and Cost Impacts of Market Power in California's Wholesale Energy Markets, Department of Market Analysis, California Independent System Operator (ISO) (March 2001); Eric Hildebrandt, Impacts of Market Power in California's Wholesale Energy Market: More Detailed Analysis Based on Individual Seller Schedules and Transactions in the ISO and PX Markets, Department of Market Analysis, California ISO (Apr. 2001); Anjali Sheffrin, Empirical Evidence of Strategic Bidding in California ISO Real Time Market, Department of Market Analysis, California ISO (Mar. 21, 2001).

**Exhibit IV-2: Market Power Indicator Characteristics**

Location	CONCENTRATION ESTIMATED MARK-UP				
	HHI	Leading Firm Share	Lerner Index	Model	Year
Colorado	2813	38	52	Dominant Firm	2002
Wisconsin	2761	47	300+	Cournot	2000
Pennsylvania	2000	20	9 - 19	Cournot	1995
PJM	1150	16	29	Actual	
U.K.	1962	31	21	Actual	1994
Florida	1940	38	80	Dominant Firm	1997
California	1537	10	1000+	Cartel	1998
			22-29	Cournot	
			30	Actual	
New England			4 - 11	Actual (Market Power Constrained)	2000

**SOURCE:** Market shares of Generation = Energy Information Administration, *State Electricity Profiles* (U.S. Department of Energy, March 1999); Import capacity for HHI calculation = Cambridge Energy Research Associates (CERA), *Electric Power Trends: 2001* (2000); *High Tension: The Future of Power Transmission in North America* (August 2000) (hereafter, CERA, *High Tension*); U.S. Census Bureau, *Statistical Abstract of the United States: 2000* (U.S. Department of Commerce), Population growth = Table 20, Cooling degree days and urban population = Table 39, 414; HHI and markups = Wisconsin = Bushnell, James, Christopher Knittel and Frank Wolak, *Estimating the Opportunities for Market Power in Deregulated Wisconsin Electricity Market* (Consumers First, ND); Colorado = Sweetser, Al, *An Empirical Analysis of a Dominant Firm's Market Power in a Restructured Electricity Market: A Case Study of Colorado* (April 1, 1998); Pennsylvania = Rudkevich, Alesandr, Max Duckworth, and Richard Rosen, "Modeling Electricity Pricing in a Deregulated Generation Industry: The Potential for Oligopoly Pricing

in a Poolco," *The Energy Journal*, 1998 (19); PJM = .Mansur, Erin, T., *Pricing Behavior in the Initial Summer of the Restructured PJM Wholesale Electricity Market* (University of California Energy Institute, Program on Workable Energy Regulation, April 2001; UK = Wolak, Frank A. and Robert H. Patrick, *Impact of Market Rules and Market Structure on the Price Determination Process in the England and Wales Electricity Market* (POWER, February 1997), Wolfram, Catherine, "Measuring Duopoly Power in the British Spot Market," *American Economic Review*, 89: 1999, p. 812, California = ); Hildebrandt, Eric, *Impacts of Market Power in California's Wholesale Energy Market: More Detailed Analysis Based on Individual Seller Schedules and Transactions in the ISO and PX Markets* (Department of Market Analysis, California Independent System Operator, April 9, 2001), Klein, Michael and Loretta Lynch, *California's Electricity Options and Challenges* (August, 2000).

For the first year of the reliance on the spot market in California, the exercise of market power has been estimated to have increased costs by 22 to 30 percent, driving prices up by \$400 million to \$600 million.<sup>269</sup> From 1998 to the summer of 2000, well over a billion dollars in rent was collected in California.<sup>270</sup> In California in 2000, excessive rents were in the range of 40 to 50 percent.<sup>271</sup> The CAL-ISO analysis shows that by February 2001, the costs of a new plant brought on line in California when the restructured market commenced in May 1998 would have been fully recovered in just three years.<sup>272</sup>

The abuse of market power and the impact of tight markets that was so much in evidence in California are not limited to that market. PJM, the poster child for deregulation, has suffered similarly near-vertical supply and the exercise of market power that parallels

<sup>269</sup> Borenstein, et. al, *supra* note 219, at 32-33 (2000)..

<sup>270</sup> Cooper, Recognizing, *supra* note 208, at 430. .

<sup>271</sup> Bornstein, Bushnell and Wolak, *supra* note 219 .

<sup>272</sup> Combining the results of Hildebrandt, Further Analysis, *supra* note 267, at tables 3-1, B-1 and B-2, we calculate annual recovery of capital costs under actual prices in effect in California in 1999-2001 as follows:

#### ANNUALS RETURN ON INVESTMENT

	NP15	SP15
Low Cost plant (\$500/MWh@ 14%ROI)	46	32
High cost plant (\$600/MWH@16%ROI)	39	26

the problem in California in its early days.<sup>273</sup> In the PJM pool, the markup in the first year was estimated at 29 percent, increasing prices by \$400 to \$600 million.<sup>274</sup> In one week in 1998 in the Midwest, \$500 million changed hands,<sup>275</sup> \$70 million was collected in New York in one day.<sup>276</sup> The New England power pool experienced price run-ups.<sup>277</sup> In the United Kingdom, the markup of price over cost has been sustained at the 25 percent level over a long period of time.<sup>278</sup>

#### D. Recognizing Reality

There is simply no credible, real world evidence that the leap to markets in electricity services is good for consumers, even where circumstances are ideal. The problems of restructuring became so

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<sup>273</sup> Joseph Bowring, et al., Presentation at the UCEI Power Conference: Monitoring the PJM Market: Summer 1999 (Mar. 17, 2000); Rose, Other States, *supra* note 256; Steven Stoft, PJM's Capacity Market in a Price-Spike World, University of California Energy Institute, Program on Workable Energy Regulation, Working Paper PWP-077 (2000); Alexander Rudkevich, Max Duckworth, and Richard Rosen, "Modeling Electricity Pricing in a Deregulated Generation Industry: The Potential for Oligopoly Pricing in a Poolco," *The Energy Journal*, 1998 (19).

<sup>274</sup> Erin T. Mansur, Pricing Behavior in the Initial Summer of the Restructured PJM Wholesale Electricity Market, University of California Energy Institute, Program on Workable Energy Regulation, Working Paper PWP-083 (2001).

<sup>275</sup> Cooper, Spike, *supra* note 228; Robert L. Earle, et al., *supra* note Lessons from the First Year of Competition in the California Electricity Market, *Electricity J.* (1999).

<sup>276</sup> Rosen, et al., *supra* note 241.

<sup>277</sup> Dowden, McDiarmid and Huang, *supra* note 221 ; Daniel Allen et. al., Generator Outage Increases: A Preliminary Analysis of Outage Trends in the New England Electricity Market, prepared for the Union of Concerned Scientists (Jan. 7, 2001); Rosen, et al., *supra* note 241.

<sup>278</sup> Catherine D. Wolfram, Electricity Markets: Should the Rest of the World Adopt the United Kingdom's Reforms?, *Regulation*, Winter 1999, at 5, available at <http://www.cato.org/pubs.regulation/regv22n4/reg22n4.html> [hereinafter Reform]

From 1992 to 1994, on average prices were 25 percent above the cost of the last plant needed to generate electricity in a given period. That suggests prices would have been substantially lower had they been set competitively. Since 1994, fuel prices have come down but electricity prices have not fallen accordingly. That suggests profits have risen and provides further evidence that prices are not responding to competitive forces.

Frank A. Wolak & Robert H. Patrick, Impact of Market Rules and Market Structure on the Price Determination Process in the England and Wales Electricity Market, University of California Energy Institute, Program on Workable Energy Regulation, Working Paper PWP-047 (1997).

evident, that even the staunchly conservative and free market-oriented Cato Institute threw in the towel. In a paper entitled *Rethinking Electricity Restructuring*.<sup>279</sup> Cato has discovered that this is a question of empirical economics.

In regulated markets, it is usually quite easy for economists to demonstrate that consumers do not benefit from regulation, but unlike many other markets, electricity markets have characteristics that are difficult to manage through property rights and contracts. Accordingly, regulation has at least the possibility of a plausible rationale.<sup>280</sup>

Cato has discovered that the grid is a public good. In economic jargon, it provides the stage for a comedy of the commons. For example, the alternating current (AC) grid is a “commons.”

Power added by any generator on an AC transmission system follows all paths but favors those with least resistance rather than the shortest distance between generator and customer. Thus, bilateral contracts between any willing seller and buyer of electricity affect all other buyers and sellers within each interconnected system in ways that are not captured by prices—the textbook definition of externality.

Moreover, transmission additions confer benefits across all generators and consumers on the grid and thus have public good characteristics. The development of property rights and prices that internalize those characteristics is very difficult.<sup>281</sup>

Demand elasticity is extremely low.

Market forces, it was hoped, would introduce marginal-cost pricing and as a result reduce peak demand, increase off-peak demand, and reduce the needless political fighting (most notably, the eternal fight over more supply versus less demand) that inevitably arises in electricity markets because of the absence of prices as a signaling device.

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<sup>279</sup> Jerry Taylor & Peter Van Doren, *Rethinking Electricity Restructuring*. Policy Analysis, Nov. 30, 2004.

<sup>280</sup> *Id.* at 6.

<sup>281</sup> *Id.*

Prices in San Diego were free of all control from July 1999 though August 2000: a doubling of prices resulted in a demand reduction of 2.3 percent, an extremely disappointing response.

Even though demand does respond to price, many observers have concluded that demand responsiveness is too low, and, therefore, price spikes would be too high for too long in a truly deregulated environment with tight supplies.<sup>282</sup>

Cato has discovered the problem that utility assets create because of their long-term fixed nature. The problem that results is one that frequently afflicts common pool resources, a tragedy of the anti-commons:

[I]n an unregulated world, the relations between electric firms and consumers would likely be governed by long term contracts because the dedicated nature of electricity assets implies that each side can “hold up” the other.

In short, the weakness of the private solution is the inability of investors to capture the full benefits of their investment.<sup>283</sup>

Administrative challenges strain the grid:

Although the blackout was not caused by market forces, it is likely that the increased loads and flows across a transmission grid that has experienced little new investment is causing greater stress upon the hardware, software, and human beings that are critical components of the system.<sup>284</sup>

Supply-side scarcity rents are extreme in this industry:

In unregulated electricity markets, then, marginal sources of electricity – such as high cost generators typically in operation only during the peak-demand periods – would need to earn at least a normal return. That implies that those facilities with lower marginal costs whose supply is limited. . . would receive payments in excess of marginal cost (and a normal return) in an unregulated market.<sup>285</sup>

If we are correct, this implies that gains to trade not occurring

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<sup>282</sup> *Id.*

<sup>283</sup> *Id.* at 7.

<sup>284</sup> *Id.* at 4.

<sup>285</sup> *Id.* at 5.

under the current balkanized system are much smaller than many observers believe. Accordingly, the fight between the old regime and a restructured regime (that is, the case for a transmission-intense versus balkanized system) is a fight about wealth rather than efficiency.<sup>286</sup>

The authors also discover political economy.

This is why low-cost states vigorously resist a national integrated electricity market – it would allow their electricity to go to the highest bidder rather than to those who happen to reside within an electric utility's current service territory. State decision makers understandably resist using ratepayer dollars to pay for investments that will primarily help parties outside the state.<sup>287</sup>

## CONCLUSION

Electricity may be the most extreme case of the energy sectors, but there are substantial similarities between them all. All of the long distance transport pipelines in the United States are either monopolies or close to it, as is the distribution of natural gas. The premium on integration and coordination is high in all three sectors. Assets are capital intensive, long lived and sunk. The existence of large scarcity rents and the high levels of concentration are evident across all of these markets, as is the low elasticity of supply and demand. The commodities are expensive to store and excess capacity is extremely short where it is not required by regulators. Federal authorities have failed to properly take these factors into account in their oversight of these industries, and American energy consumers have suffered mightily as a result.

The severe problems in these energy markets have given rise to numerous congressional hearing and investigations. The FTC and the CFTC have defended their actions and resisted greater oversight.<sup>288</sup> The FERC, presented with the obvious disaster in Western electricity markets, dragged its feet, tried to downplay the extent of the problem and issued new rules to push electricity deregulation forward, an effort that was stopped by the Congress.<sup>289</sup> When the FERC was granted greater authority over commodity trading, it simply adopted the case law and approach of the CFTC, thereby gutting the Congressional effort to impose greater oversight.<sup>290</sup>

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<sup>286</sup> Taylor, *supra* note 278, at 6

<sup>287</sup> *Id.* at 4.

<sup>288</sup> *Supra*, notes 198, 199.

<sup>289</sup> PL 109-58, Title XII-Subtitle c.

<sup>290</sup> *Supra*, note 206.



Detailed policy alternatives have been offered in each of these sectors, but in keeping with the broad cross-sector approach of this paper, the central policy conclusion that should be drawn is that weak market forces in the energy sector require policymakers to change their mind set about energy markets. The general approach in the U.S. in the past quarter century was to assume that markets work and restrict the extent of regulation and oversight of them. In energy markets we need to flip the presumptions around. We need to assume that market failure and market power will be a prominent and permanent feature of the markets and implement policies to prevent abuse. In oil and natural gas, this means lowering the threshold for merger review and escalating the oversight of abusive behaviors. In electricity, this means carefully assessing where competition might work and making sure that competition exists before markets are deregulated.

For more information about the Consumer Federation of America, please visit: [www.consumerfed.org](http://www.consumerfed.org).

“CFA is an advocacy, research, education, and service organization. As an advocacy group, it works to advance pro-consumer policy on a variety of issues before Congress, the White House, federal and state regulatory agencies, state legislatures, and the courts. Its staff works with public officials to promote beneficial policies, to oppose harmful policies, and to ensure a balanced debate on important issues in which consumers have a stake.

As a research organization, CFA investigates consumer issues, behavior, and attitudes using surveys, polling, focus groups, and literatures reviews. The findings of such projects are published in reports that assist consumer advocates and policymakers as well as individual consumers. This research also provides the basis for new consumer initiatives, public service advertising, and consumer information and education efforts.

As an education organization, CFA disseminates information on consumer issues to the public and the media, as well as to policymakers and other public interest advocates. Conferences, reports, books, brochures, news releases, a newsletter, and a website all contribute to CFA's education program.

Finally, as a service organization, CFA provides support to national, state, and local organizations committed to the goals of consumer advocacy, research, and education. Some of these organizations are consumer advocacy, education, or cooperative organizations that belong to the federation.”<sup>291</sup>

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<sup>291</sup> Consumer Federation of America, located at <http://www.consumerfed.org/about.cfm> (last visited June 3, 2007).