ELECTRICITY RESTRUCTURING AND THE PRICE SPIKES OF 1998
A NEED FOR MORE VIGOROUS EFFORTS TO PROTECT CONSUMERS

CONSUMER FEDERATION OF AMERICA

AND

CONSUMERS UNION

JUNE 21, 1999

FOR IMMEDIATE RELEASE

CONTACT: MARK COOPER
(301) 384-2204

MARKET FAILURES PLAGUE ELECTRICITY RESTRUCTURING:
CONSUMER GROUPS CALL FOR NEW POLICIES TO PROMOTE COMPETITION AND PREVENT CONSUMER ABUSE

Washington D.C., June 21, 1999 – Wild price spikes in 1998 indicate structural flaws and institutional failures in restructured electricity markets that require vigorous policies to promote competition and protect consumers form abuse, a study released today by the Consumer Federation of America (CFA) and Consumers Union (CU) concluded.

"Last year's price spikes indicate that the electricity markets created by recent restructuring are not effectively competitive," Dr. Mark Cooper, CFA's Director of Research, said.

With more than half the electricity in the country being consumed in states that have enacted restructuring plans, the report stresses structural problems that must be addressed by public policy to improve the performance of these markets.

- The breakdown of coordination as restructuring takes place eliminates the incentive for market participants to cooperate and makes it difficult for system operators to manage the electricity network.
- Inadequate transmission capacity and restrictions on access to transmission limit the ability of power to flow.
- A lack of incentives for utilities to keep capacity on line or to discipline their bidding for power overheats the market.
- Outdated demand-side mechanisms fail to give consumers adequate options to either adjust their demand as prices rise or to have assurances of stable prices that will not expose them to wild price volatility.
- A complete absence of objective, public information about prices and market conditions prevents buyers from making sound decisions.
- Highly concentrated, local markets enable large generators to drive up prices by withholding supplies.
- Bogus financial transactions, like daisy chains, fuel price spirals.

"Uncontrollable factors, like weather and outages, that some claim were the cause of the price spikes, do not begin to account for 20 to 300-fold increases in price," said Cooper. "The price spikes were not accidents or aberrations; they are exactly the behavior one would

expect when rational economic actors take advantage of market imperfections and institutional weaknesses."

The report recommends policies in four broad areas – basic conditions, competitive structures, conduct and market performance.

- The electricity market simply cannot function without open access to transmission and policies to prevent affiliate abuse and excessive market concentration.
- Transactions must be based on transparent pricing and enforceable terms and conditions. This requires registration and certification of traders and controls on trading practices including short selling, margin requirements, credit requirements and option rules.
- Sellers who take actions that tighten electricity markets, and then seek to exploit that situation through sales at inflated levels, should be presumed to have engaged in market manipulation. They should bear the burden of proving that they are not guilty of profiteering, and the penalty for market manipulation should be severe.
- Circuit breakers should be available to prevent markets from spinning out of control. These include suspension of trading, suspension of market-based pricing, or price ceilings.

"Before they unleash market forces, policy makers must ensure that the basic conditions are adequate to support competition and that state and local regulators have authority to monitor market conditions," concluded Janee Breisemeister, Senior Policy Analyst in the Southwest Regional Office of Consumers Union. "It is irresponsible to create markets that suffer from problems like inadequate generation or transmission capacity, or to let markets run wild as the result of abusive transactions or manipulative tactics."

The report entitled *Electricity Restructuring and the Price Spikes of 1998: A Need for More Vigorous Effort to Protect Consumers* is available at

http://www.consumerfed.org/spike.pdf

# # #

The *Consumer Federation of America* is a non-profit association of some 240 pro-consumer groups, with a combined membership of 50 million that was founded in 1968 to advance the consumer interest through advocacy and education.

Consumers Union, publisher of *Consumer Reports*, is an independent, nonprofit testing and information organization serving only the consumer. We are a comprehensive source of unbiased advice about products and services, personal finance, health nutrition, and other consumer concerns. Since 1936, our mission has been to test products, inform the public, and protect consumers.

ELECTRICITY RESTRUCTURING AND THE PRICE SPIKES OF 1998:
A NEED FOR MORE VIGOROUS EFFORTS TO PROTECT CONSUMERS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ELECTRICITY RESTRUCTURING AND THE PRICE SPIKES OF 1998
A NEED FOR MORE VIGOROUS EFFORTS TO PROTECT CONSUMERS

EXECUTIVE SUMMARY

I. TUMULT AT THE OUTSET OF RESTRUCTURING

During 1998 electricity markets on the West Coast and in the Midwest experienced repeated episodes when prices increased at least ten fold and as much as 300 fold. Hundreds of millions of dollars changed hands in a matter of days. Bankruptcies of over a quarter of a billion dollars resulted. One estimate places utility losses during the air conditioning season alone at over half a billion dollars. In spite of these unsettling events, by mid-1999 restructuring had been enacted in states in which more than half the electricity in the U.S. is consumed.

This paper draws lessons from these chaotic events by embedding the "facts" in a well-known analytic framework – the structure-conduct-performance paradigm (See Exhibit ES-1). As the title of the paper suggests, we conclude that the market problems of 1998 indicate that much more vigorous consumer protection is necessary, if the restructured electricity market is to benefit all consumers. These are not accidents or aberrations; they are exactly the behaviors one would expect to occur when rational economic actors take advantage of market imperfections and institutional weaknesses. The issue is no longer whether to restructure; it is now how to implement restructuring in a manner that prevents these abuses.

II. A CONSUMER VIEW OF THE PRICE SPIKES OF 1998: MARKET DISRUPTIONS REFLECT STRUCTURAL PROBLEMS

A. THE UNCONTROLLABLES DO NOT EXPLAIN THE PRICE SPIKES

Technology prone to outages in the supply of a commodity that is impossible to store creates significant potential for supply problems. Consumption is significantly influenced by weather. Pricing structures and capital equipment give little incentive or ability to alter demand in the short-term. These are the uncontrollables that some claim are the causes of the price spikes. However, the evidence we reviewed suggests that these factors were not sufficiently more powerful in 1998 than earlier years to account for the huge jump in the price of peak power.

Arguments that the weather and outages were unique factors underlying the price spikes are undermined by the fact that 1997 experienced similar factors with less drastic results. The difference in weather was not that great. "Accidents" affected a variety of technologies in a number of markets at different times. The problem is pervasive. Several major categories of baseload plant – nuclear, fossil, and hydro – have contributed to one or another of the unplanned outages. This was true of the summer price spikes in both California

EXHIBIT ES-1
PRICE SPIKE ISSUES AND POLICY RESPONSES IDENTIFIED IN THE
STRUCTURE CONDUCT PERFORMANCE PARADIGM

KEY VARIABLES IN THE PARADIGM	ISSUES RAISED IN ELECTRICITY PRICE SPIKES OF 1998	POLICY RESPONSES
BASIC CONDITIONS		
SUPPLY		
Raw material	Natural gas fails to track electricity prices	
Technology	Outages	Evaluate market first Performance penalties
Product durability	Inability to store electricity	
Legal framework	Breakdown of coordination	Establish strong system operator
	Partial regulation	Establish information mechanisms, Commodity exchanges
DEMAND		
Price elasticity	Extremely low short run	Modify incentives
Substitutes	Lack of substitutes	New Choice options
Rate of growth	Demand exceeds supply	Balance before dereg
Cyclical and seasonal	Weather-related demand	
Purchase method	Obligation to serve, utility as agent	Allow flexibility
Marketing type	Lack of incentive to cut back	New interruption policy
STRUCTURE		
Number of sellers	Few sellers	Divestiture/open access, moratorium on mergers
Number of buyers	Constrained demand by utilities	Allow flexibility
	Limited end-user choice	New choice options
Barriers to entry	Transmission constraints, emergencies	New relief policy
Cost structures	High fixed	
Vertical integration	Affiliate relations distort market	Enforce codes of conduct
Diversification	Utilities add brokerage	Divestiture/codes of conduct
CONDUCT		
Pricing behavior	Complaints of gouging	Establish benchmark policy
Legal tactics	Defaults, abrogation of contracts	Establish credit policy
PERFORMANCE		
Production and efficiency	Huge price spikes	Explicit anti-gouging policy, Establish circuit breakers
Equity	Big winners and losers	
POLICY		
Regulation	Transmission rules create problems	New relief policy
Price Controls	Allowed in California, requested elsewhere	Establish circuit breakers
Antitrust	Hoarding, daisy chains, two-way deals	Divestiture/open access
Information provision	Lack of timely, objective information	Ensure information

and the Midwest.

Weather and outages may tighten supplies within a given region; transmission constraints limit the ability of power to come from outside of the region to alleviate the local imbalance. There is no doubt that constraints on the transmission system played an important role in both the Midwest and West Coast price spikes. Once again, however, there does not appear to have been a great deal of difference in transmission capacity available between 1997 and 1998. Moreover, the transmission supply problem is pervasive and widespread. This long-term problem requires a response.

With prices hitting levels that were several orders of magnitude higher in 1998 than 1997, it is unlikely that weather or outages alone could account for the difference. In some respects 1998 was no worse than 1997. The physical difference was not sufficient to account for the financial differences.

B. A NEW MARKET CREATES DISORDER

Accidents do not just happen; controllable conditions and circumstances can make them more or less likely to occur or make their consequences more or less severe. There are ways in which new market institutions and transactions made the likelihood of accidents and their impact greater.

1. BREAKDOWN OF COORDINATION: The market reduced the ability of system managers to coordinate and run the transmission system. The problem stems both from complexity and from a lack of cooperation. Market participants do not have an incentive to cooperate. The number and complexity of transactions compounded the problem of system management. The number of traders increased over 50 fold; the quantity traded increased several hundred times. There were also complications of financial and ownership relationships between entities.

2. TRANSMISSION CONSTRAINTS: The introduction of competition into a capacity constrained system put a severe strain on already stressed facilities. In a competitive market, some entities gain an interest in hoarding this asset. The rules for allocating the scarce transmission resource during times of stress were far from optimum. As a result, markets may have appeared more constrained to buyers than they were in actual physical terms. With a mix of planned and market driven behaviors interacting with genuine concerns about physical shortages, the actual state of the available physical system is difficult to perceive.

3. INFORMATION INADEQUACIES: A new market with a multitude of new complex transactions and physical constraints on how to deliver the services placed a premium on information. Unfortunately, such information was not available. There is no centralized, reliable source of information. Information is much more difficult to gather for system

aggregators. Moreover, the brokers who were the sources of information have interests that would be served by distortion of information.

4. DEFAULTING ON OBLIGATIONS: Given the tense conditions in the market, it is not surprising that defaults played an important role in some of the price spikes of 1998. Although a relatively small amount of power was at issue, confidence in the ability of firms to meet commitments was shaken when important traders could not deliver. The problem was compounded by the numbers of transactions and the structure of deals. Utilities invoked contract clauses that sent additional customers scrambling for replacement power. Even when they bought power, they could not be sure what price they would be charged or whether they would be able to receive the power.

5. INEXPERIENCE: Facing a chaotic and uncertain situation, bidders drove the price of power up. These extreme reactions to the defaults can be attributed in part to inexperience on the part of those who were caught short. Individuals may learn, but they remain vulnerable if they need supplies. Unfortunately, those seeking to manipulate markets may learn too. It is an open question which learning process will proceed most rapidly.

6. THE UTILITY OBLIGATION TO SERVE CREATES SEVERE VULNERABILITY IN A RESTUCTURED MARKET: One of the key factors that drove prices up was the need of utilities to ensure physical availability of supplies. For all the focus on market efficiency, the ultimate test of electricity service is keeping the lights on and some entities still have the obligation to ensure that they do. Consumers have generally supported this fundamental principle of utility service because electricity service is just too important to be unreliable. However, in an unfettered market for supply there are adverse consequences of this behavior. It is difficult for utilities to exercise restraint, as supplies become tight. Restructuring may require much more attention to interruptible rates to facilitate the response to tight markets. Interruptible customers must be prepared to actually be interrupted. New incentives call into question whether utilities will live up to the non-price terms of their interruptible tariffs, given the high price they can fetch for released power or be avoided for purchased power. Interruptible rates based on a regulated system that did not contemplate frequent interruptions may be inadequate. Rewards for releasing power need to reflect the higher prices being paid at peak. Given the greater frequency and higher prices occurring in the marketplace, new rules on who is cut back and who is not and how customers are compensated are needed.

C. MARKETS FAILED ON THE SUPPLY-SIDE

The above factors are "innocent," if not benign, "inept," if not illegal – a constellation of events, obligations and frailties that tightened the marketplace and drove participants to pay high prices without a purposeful intent to do so. If these were all the factors that created the price spikes there would be still considerable room for public policy intervention to reduce tensions, but there is more to the story.

There is also considerable evidence that structural flaws in the marketplace led to breakdowns in conduct – purposeful actions taken to increase the prices paid to market players who would thereby increase their profits. Self-interested behaviors that sought to exploit and reinforce the frenzied behavior in the market were not prevented by market structures or regulatory institutions.

1. EXERCISE OF MARKET POWER: Market power can be exercised in generation and transmission markets because they are thin. With little spare supply available at certain times and few competitors, restriction of supply is feasible. The analysis of bidding behavior indicates that market power was being exercised. Suppliers with market power watch the price rise, well above the level of costs, but do not sell because they are confident that there are not enough other producers who can enter the market. Transmission capacity was taken off the market with the declaration of emergencies. A practice of swapping electricity allowed owners of transmission bottlenecks to raise the price of power that was allowed to flow. Since the same entities that control the bottlenecks also own generation whose price is increased, manipulation of transmission can be highly profitable.

2. MANIPULATION OF TRANSACTIONS: The increase in the number of transactions was compounded by the nature of many of the transactions. Daisy chains passed power through a long line of sequential owners without ever physically being delivered, except by the last owner. This adds no new supply to the market. At least some of the transactions on which the market was built were fabrications – deals in which the buyer and seller were one and the same. This institutional structure was clearly implicated in the price run-up when financial transaction increased apparent demand. In tight markets traders' financial problems add to those of entities bidding for power. Entities with need for physical power compete with entities with financial needs for power, but the underlying physical supply and demand have not changed. Utility entry into the market through affiliates raises separate questions of conflicts of interests. Favoring affiliates with access to transmission is only one potential manner in which incumbents can control the market to their advantage. Industrial customers complained that incumbent utilities had diverted their own supplies to maximize profits.

III. PUBLIC POLICY RESPONSES TO PROMOTE EFFECTIVE COMPETITION AND PROTECT AGAINST ABUSE OF MARKET POWER

The number of suppliers and their ability to bring product to market must be sufficient to deliver workably competitive markets. Highly concentrated markets with bottleneck facilities that lack open access rules make the market prone to the exercise of market power. Market institutions should be developed before, not after trading begins so that conduct is transparent and disciplined by market forces. Undeveloped information and trading mechanisms are prone to manipulation. When abuse occurs under such circumstances, it is no accident; it is the result of bad public policy choices or poor policy implementation.

A. BASIC CONDITIONS MUST BE ADEQUATE TO SUPPORT COMPETITION

Policy makers have an obligation to ensure that the basic conditions are adequate to support competition before they unleash market forces. It is simply irresponsible to create markets that suffer from significant problems like inadequate capacity at the outset.

1. EVALUATING CAPACITY BEFORE MARKETS OPEN: Policymakers should assess and take responsibility for the supply/demand balance as they enter the restructuring process. If conditions are tight, they must address the problem of how to expand capacity or provide consumers with options that protect them from price spikes that are likely in such circumstances.

2. ENSURING ADEQUATE INFRASTRUCTURE: Policymakers should ask whether the infrastructure is adequate to support the competitive market model. If the transmission system is inadequate to support competition, it is irresponsible to introduce competition. Economies of coordination are still strong in the physical marketplace. Therefore, rules of the operation of the grid must be in place to ensure its reliability. To the extent that coordination can lower costs, through lowering reserve requirements, this function too should be preserved.

3. SUPPLY-SIDE PERFORMANCE PENALTIES: One of the areas where incentives have become a problem in the transition to competition is the motivation to prevent blackouts at all costs and then pass the costs through to ratepayers. The consequences of failing to keep capacity on line have increased, but there are no penalties. Changes in this approach may be necessary to ensure consumers are protected from undisciplined bidding behavior.

4. CONFRONTING THE INELASTICITY OF DEMAND: Consumers express a strong commitment to reliability and an aversion to price shocks. It may be difficult to accomplish both goals at historic price levels in unfettered commodity markets. Improved incentives to participate in peak load management programs should be examined. Making interruptible rates more effective for those who are interested, and facilitating aggregation or other forms of participation, may elicit more demand reduction. However, we do not believe that residential consumers want to see their prices tracking the commodity price of electricity or be forced to evaluate and implement complex hedging instruments. For firm residential and small business customers, it may be just as important to develop programs that let them enjoy stable prices without sending utilities plunging into markets to avoid blackouts. Proposals to build peaking reserves at stabilized prices become attractive, if markets are going to be extremely volatile.

B. MARKET STRUCTURE

1. ACCESS TO THE HIGHWAYS OF COMMERCE: As a general proposition, vertical divestiture is the only solution that eliminates the problems of affiliate transactions. Short of divestiture, a truly independent system operator must be established. This system operator should be given the authority to run the system solely for reliability and social efficiency

(lowest total social cost) purposes. Divestiture or an ISO is generally seen as a sufficient response to concentrated markets. That is, if divestiture takes place, the assumption has generally been that the generation market will not be concentrated. Alternatively, if the transmission system is operated in an open manner, enough generators will be able to enter the market to prevent the abuse of local market power.

2. SUPPLY CONCENTRATION: Markets can become very thin very quickly for a variety of reasons, and prices can rise very rapidly. Market power can be exercised for short periods of time in specific markets and result in substantial sums being transferred. It may be useful to put a halt to increasing concentration through large mergers until we have a better idea of how market structures and institutions will function under the unique conditions of the electricity industry. It is also important to monitor closely the supply, bidding and pricing behavior of generation entities even in markets where divestiture and/or open access have taken place. The basic supply and demand conditions in electricity markets may be so severe that market structures traditionally defined as competitive will break down situationally.

3. TRADING: Trading institutions must also be more highly developed quickly. The overheating of the market in 1998 reflected a fundamental lack of institutions to convey information and ensure the soundness of transactions. Measures to ensure openness and confidence in transactions should be taken. Securities and commodity exchanges impose rules to protect the public and ensure an orderly market. Power exchanges should impose rules on traders that seek to ensure transparent pricing, control the flow of trading, impose memberships criteria, require registration of participants, and manage the types of trades including issues such as short selling, margin requirements, credit requirements and option rules. There is no reason that a physically important and difficult to manage commodity like electricity should not be subject to at least the rules that are routinely found in commodity and financial markets.

C. CONDUCT:

Aggressive policies to discipline abuse of market power should be implemented. Any entity that engages in actions that tend to tighten electricity markets and then seeks to exploit that situation through sales at inflated prices should be presumed to have engaged in market manipulation (see Exhibit ES-2). They should bear the burden of proving that they are not guilty of profiteering and the penalty for market manipulation should be severe. The prohibition could apply to both merchant generators (and brokers) and incumbent utilities. Penalties must be sufficient to dissuade this activity. Financial fines are only a first step. Repeated offenses should lead to suspension of trading rights and ultimately banishment from markets as a trader or broker.

EXHIBIT ES-2

MARKET TIGHTENING ACTIONS THAT SHIFT THE BURDEN OF PROOF
IN THE EVENT OF SUBSEQUENT PROFITEERING

INCUMBENT UTILITIES	MERCHANT GENERATORS
Took plant out of service	Withheld supply
Took transmission out of service	Engaged in a two-way transaction
Declared an emergency	Was part of a daisy chain in default
Participated in a TLR	Violated market rules
Executed a swap	
Interrupted customers	
Appealed for voluntary conservation	

D. PERFORMANCE:

Having experienced repeated spikes policymakers should also implement a series of circuit breakers to prevent the sort of abuse that has occurred. These should remain in place until regulators can affirmatively conclude that market structures are functioning in a manner that is likely to prevent such abuse. The most obvious circuit breaker is a price ceiling or cap that simply does not allow trades to take place at prices above a certain level. This is generally considered the most extreme measure. Other circuit breakers can be utilized before a cap is imposed. For example, trading above a specified price could be suspended for a period (as is the practice with the stock market). Unfortunately, since the physical movement of electricity cannot be suspended, nor is that necessarily desirable, suspension of trading could be tricky. At some point, the FERC could declare that prices above certain levels are not deemed just and reasonable and therefore, market based rates are suspended. The transactions could be allowed to move forward, but the final price would be subject to adjudication.

I. ELECTRICITY RESTRUCTURING: STEAMING INTO UNCHARTED WATERS

A. TUMULT AT THE OUTSET OF RESTRUCTURING

During 1998 electricity markets on the West Coast and in the Midwest experienced repeated episodes when prices increased at least ten fold and as much as 300 fold.[1] Hundreds of millions of dollars changed hands in a matter of days.[2] Bankruptcies of over a quarter of a billion dollars resulted.[3] In fact, one estimate places utility losses in electricity trading during the air conditioning season at over half a billion dollars for the year.[4]

Notwithstanding these dramatic events, restructuring continues to be pushed at the state level. In fact, by mid-1999 states representing about half of all electricity consumption in the U.S. had undertaken extensive restructuring through legislation or regulation.[5]

The price spikes did not go unnoticed. In fact, they attracted a great deal of attention from regulators, market participants and large industrial consumers. Major analyses were conducted or sponsored by representatives of entities that had profited from the spikes, and those that had taken losses. Three regulatory bodies – the Federal Energy Regulatory Commission (FERC),[6] the Public Utility Commission of Ohio (PUCO),[7] and the Market

---

[1] The summer price spikes received a great deal of attention but the California winter price spikes may indicate more about the vulnerability of markets see Bohn, Roger E., Alvin K. Klevorick and Charles G. Stalon, Market Monitoring Committee of the California Power Exchange, *Second Report on Market Issues in the California Power Exchange Energy Markets* (March 9, 1999) (Hereafter Cal, Second Report). p. 20.

[2] Federal Energy Regulatory Commission, Staff Report to the Federal Energy Regulatory Commission on the Causes of the Pricing Abnormalities in the Midwest during June 1998 (Washington, D.C.; 1998) (hereafter, FERC, Staff Report). P. 3-19, estimates a net transfer of revenues (net losses by some, net gains by others) of approximately $300 million. Five entities accounted for almost three-quarters of the losses ($215 million).

[3] "Marketer Bankruptcy Filing Lists Claims of $236 Million from Tumult," *Electric Utility Week*, September 7, 1998.

[4] "Everen Study Cited Pacificorp, Cinergy and Firstenergy for High Risk Marketing," *Electric Utility Week*, September 28, 1998.

[5] Although only 20 states have acted, they represent about 48 percent of total sales by quantity and 55 percent of total sales by revenue (see Energy Information Administration, *Electricity Power Annual: 1997* (Washington, D.C., July 1998), Table 23.

[6] FERC, Staff Report.

Monitoring Committee of the California Power Exchange (MMC)[8] – have taken a detailed look at the market problems in the past year, seeking to determine their meaning for future restructuring. All three of the regulatory agencies concluded that at least some mid-course corrections are necessary. For those who have struggled to accomplish restructuring and weary policymakers who have grappled to enact legislation it now appears that the initial opening of markets is only a small first step in a long journey to effectively competitive markets. Whether this has been a misstep or one taken in the right direction is still subject to doubt.

For all the attention devoted to the market problems of 1998, little has been written about the effect on low volume residential and small business consumers. The main purpose of this paper is to add this new perspective to the understanding of some very dramatic events.

The analysis of the price spikes to date has also lacked a solid conceptual framework. Many of the analyses are natural histories that give day-by-day accounts. Even those that seek to draw conclusions about causes and consequences have not placed the various factors in a framework that allows one to ascertain the importance of specific causes.

This paper seeks to solve that problem by embedding the "facts" in a well-known analytic framework – the structure-conduct-performance paradigm. It does not attempt to recount the details of the price spike events, nor does it produce any new data about them. Rather, the paper seeks to understand the role of various factors and their implications for public policy.

As the title of the paper suggests, the market problems of 1998 indicate that much more vigorous consumer protection is necessary if the restructured electricity market is to operate to benefit all consumers. As the observation on the spread of restructuring suggests, however, there is also no chance of reversing the process. Even if not one more jurisdiction restructured the industry, restructuring is a fact of life for half the nation. Public policymakers now need to make sure restructuring works. This paper seeks to further that goal by analyzing what has <u>not</u> worked in the first year.

B. OUTLINE OF THE PAPER

Chapter II presents the analytic framework.

---

[7] Public Utilities Commission of Ohio Report, Ohio's Electric Market: June 22-26, 1998, *What Happened and Why: A Report to the Ohio General Assembly* (Columbus, Oh; 1998) (Hereafter, Ohio Report).

[8] Bohn, Roger E., Alvin K. Klevorick and Charles G. Stalon, Market Monitoring Committee of the California Power Exchange, *Report on Market Issues in the California Power Exchange Energy Markets* (August 17, 1998) (Hereafter Cal, Report).

Chapter III presents a brief review of the conclusions and recommendations of previous analysis. The divergence of views underscores how uncharted the path to competitive markets in electricity remains.

Chapter IV looks in detail at factors that caused the price spikes. It starts with basic conditions in the industry – the factors that are deemed to be "uncontrollable" by some analysts. It asks whether the transition to competition made matters worse. It concludes that while these were important factors in the price spikes, they were not the sole cause by any means. It also argues that the transition to competition made matters worse.

Chapter V addresses the question of market failures that stem from the structure of the market and the conduct of its participants. It identifies a number of characteristics of the market that suggest problems will persist if policy makers do not take action.

Chapter VI provides a structural interpretation of events from the consumer point of view and the policy recommendations that flow from that analysis.

II. A FRAMEWORK FOR MAPPING THE UNKNOWN

A. THE STRUCTURE, CONDUCT, PERFORMANCE PARADIGM

About a year ago the Consumer Federation of America and Consumers Union (CFA/CU) published a report that identified a number of problems facing residential ratepayers in the restructuring of the electric utility industry.[9] That analysis relied on the structure, conduct performance (SCP) view of economic activity.[10] The SCP approach has been the dominant public policy paradigm in the United States for the better part of this century.[11] The elements of the approach can be described as follows (see Table II-1).

Our central concern is with market performance, since that is the outcome that affects consumers most directly. The concept of performance is multifaceted. It includes, among other factors, efficiency, and fairness. The measures of performance to which we traditionally look are pricing and profits. They are the most direct measure of how society's wealth is being

---

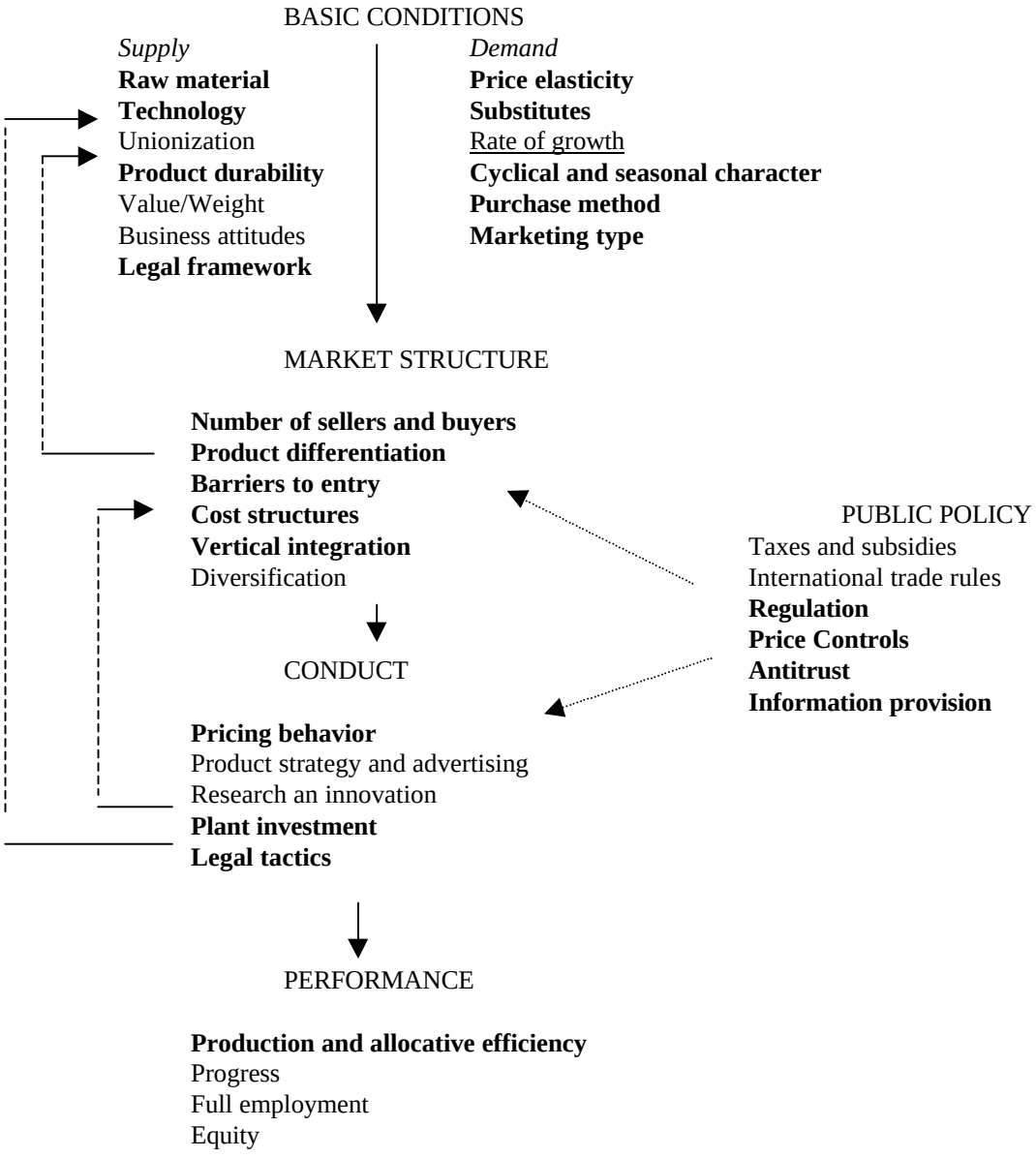
[9] Consumer Federation of America and Consumers Union, *Residential Ratepayer Economics of Electric Utility Restructuring: Balancing All the Costs and Benefits* (Washington, D.C., July 1998) (hereafter, CFA/CU).

[10] The Consumer Federation of America has applied a similar analysis to a variety of "network" industries including "Freeing Public Policy from the Deregulation Debate: The Airline Industry Comes of Age [and Should be Accountable for Its Anticompetitive Behavior," *Air and Space* Lawyer, 13:4, Spring 1999; *The Consumer Case Against the Microsoft Monopoly* (Consumer Federation of America and the Media Access Project, October 1998*) Stonewalling Local Competition: The Baby Bell Strategy to Subvert the Telecommunications Act of 1996* (Consumer Federation of America, January 1998*); Open Skies Closed Airports* (Consumer Federation of America, February, 1997; *Economic Concentration and Diversity in Broadcast Media* (Consumer Federation of America, November 1995*); The Economics of Deregulation and Reregulation in the Cable Industry: A Consumer View* (Consumer Federation of America, September 1992).

[11] F. M Scherer and David Ross, *Industrial Market Structure and Economic Performance* (Houghton Mifling: Boston, 1990) (hereafter Scherer and Ross), p. 4.

> We seek to identify sets of attributes or variables that influence economic performance and to build theories detailing the nature of the links between these attributes and end performance. The broad descriptive model of these relationships used in most industrial organization studies was conceived by Edward S. Mason at Harvard during the 1930s and extended by numerous scholars.

TABLE II-1
THE STRUCTURE-CONDUCT-PERFORMANCE PARADIGM



allocated and distributed. [12]

The performance of industries is determined by a number of factors, most directly the conduct of market participants. Do they compete? What legal (or illegal) tactics do they employ? How do they advertise and price their products? [13] The fact that conduct is only part of the overall analytic paradigm is important to keep in mind.

Conduct is primarily a product of other factors. Conduct is affected and circumscribed by market structure. Here we look at the number and size of the firms in the industry, their cost characteristics and barriers to entry, as well as the basic conditions of supply and demand.[14]

---

[12] Scherer and Ross, p. 4.

> We begin with the fundamental proposition that what society wants from producers of goods and services is good performance. Good performance is multidimensional… Decisions as to what, how much and how to produce should be efficient in two respects: Scarce resources should not be wasted, and production decisions should be responsive qualitatively and quantitatively to consumer demands.
>
> The operations of producers should be progressive, taking advantage of opportunities opened up by science and technology to increase output per unit of input and to provide consumers with superior new products, in both ways contributing to the long-run growth of real income per person. The operation of producers should facilitate stable full employment of resources… The distribution of income should be equitable. Equity is notoriously difficult to define, but it implies at least that producers do not secure rewards in excess of what is needed to call forth the amount of services supplied.

[13] Scherer and Ross, p. 4.

> Performance in particular industries or markets is said to depend upon the conduct of sellers and buyers in such matters as pricing policies and practices, overt and taciturn interfirm cooperation, product line and advertising strategies, research and development commitments, investment in production facilities, legal tactics (e. g. enforcing patent rights), and so on

[14] Scherer and Ross, p. 5.

> Conduct depends in turn upon the structure of the relevant market, embracing such features as the number and size distribution of buyers and sellers, the degree of physical or subjective differentiation prevailing among competing seller's products, the presence or absence of barriers to entry of new firms, the ratio of fixed to total costs in the short run for a typical firm, the degree to which firms are vertically integrated from raw material production to retail distribution and the amount of diversity or conglomerateness characterizing individual firms' product lines.
>
> Market structure and conduct are also influenced by various basic conditions. For example, on the supply side, basic conditions include the location and ownership of essential raw materials; the characteristics of the available technology (e.g. batch versus continuous process

Regardless of how much weight one gives to the causal assumptions of the paradigm, the list of variables is important. These are the factors that taken together determine whether markets work or fail.[15]

Table II-1 presents the factors identified as playing an important role in the paradigm. The elements in bold in the Table have been identified as playing a role in the price spikes of 1998 and will be discussed in this paper. It is interesting to see the large number of factors that play a role in the transformation of the electricity industry from a franchise monopoly to a competitive market. This paper identifies about a dozen key variables in the paradigm that have influenced the price spikes of 1998. Needless to say, this makes the analysis complex.

Also note that the paradigm contemplates the possibility that structure and behaviors affect basic conditions. [16] This is an important point in a period in which markets are being created.

The role of policy will also be larger in the formative stages of a market.[17] Certainly public policy is in the process of reworking the legal framework of the industry to a greater

---

> productions or high versus low elasticity of input substitution); the degree of work force unionization; the durability of the product; the time pattern of production (e.g. whether goods are produced to order or delivered from inventory); the value/weight characteristics of the product an so on. A list of significant basic conditions on the demand side must include at least the price elasticity of demand at various prices; the availability of (and cross elasticity of demand for) substitute products; the rate of growth and variability over time of demand; the method employed by buyers in purchasing (e.g. acceptance of list prices as given versus solicitation of sealed bids versus haggling); and the marketing characteristics of the product sold (e.g. specialty versus convenience shopping method).

[15] Scherer and Ross, p. 6,

[16] Scherer and Ross, p. 6.

> As the solid arrows of Figure 1.1 suggest, we shall be concerned mainly with causal flows running from market structure and/or basic conditions to conduct and performance. That is, we seek theories that permit us to predict ultimate market performance from market structure, basic conditions, and conduct…
>
> There are also important feedback effects (dashed arrows in Figure 1.1). For instance, vigorous research and development efforts can alter an industry's technology, and hence it cost conditions and/or the degree of physical productions differentiation. Or sellers' pricing policies may either encourage or discourage entry or drive firms out of the marker, thereby transforming the dimension of market structure. In this sense, both basic conditions and market structure variables are *endogenous,* that is determined within the whole system of relationships and not fixed by outside forces

[17] Scherer and Ross, p. 7.

extent than public policy typically affects this aspect of industrial organization. The shift from franchise monopoly to competitive commodity affects the purchase method and marketing practices that will be applied in the industry. Public policy will determine a host of other basic conditions such as licensure of brokers, rules for trading, etc.

B. CONSUMER CONCERNS ABOUT RESTRUCTURING

In analyzing the basic market structure of the electric utility industry, CFA/CU concluded that it would be difficult for residential consumers to derive significant benefits from restructuring. The CFA/CU report identified a number of characteristics of the industry that indicated that consumer costs might rise, rather than fall. There were three general areas of concern that CFA/CU identified in its report on restructuring. These are relevant to the analysis of the price spikes of 1998.

1. TRANSACTION COSTS AND PRICE DISCRIMINATION

Above all, there are certain coordination and integration functions performed by vertically integrated, non-competitive firms that are essential to the economic and efficient operation of the electricity grid. These functions could be undermined by breaking the industry into competing component parts.

> With respect to the electric utility industry, the most obvious potential new transaction cost is the potential loss of economies of load balancing. One of the central activities of electric utility monopolies is to balance load -- to aggregate customers who use electricity at different times of the day or year. By bringing together customers with dissimilar load patterns utilities are able to use their facilities more fully -- to balance periods when some customers are off line with other customers who are on line. Empirical studies show strong economies are achieved by coordinating supply and demand. [18]

> Ideally, good economic performance should flow automatically from proper market structure and the conduct to which it gives rise. But for a variety of reasons, markets may fail, yielding performance that falls below the norms considered acceptable. Then government agencies may choose to intervene and attempt to improve performance by applying policy measures that affect either market structure or conduct, as shown by the dotted lines in Figure 1.1.

[18] CFA/CU, p. 7. References cited in the original as supporting this observation include Gegax, Douglas and Kenneth Nowotny, "Competition and the Electric Utility Industry," *Yale Journal on Regulation*, 10:63, 1997; Gilsdorf, Keith, "Testing for Subadditivity of Vertically-Integrated Electric Utilities," *Southern Economic Journal*, 18:12, 1995: Henderson, J. Stephen, "Cost Estimation for Vertically Integrated Firms: the Cost of Electricity," M. A. Crew (Ed.), *Analyzing the Impact of Regulatory Change in Public Utilities* (Lexington, MA, Lexington Books, 1985); Hirst, Erick and Brenda Kirby, "Dynamic Scheduling: The Forgotten Issue," *Public Utilities Fortnightly*, April 15, 1997; Kaserman, David L. and John W. Mayo, "The Measurement of Vertical Economies and the Efficient Structure of the Electric Utility Industry," Journal of Industrial Economics, 29:5, 1991; Kwoka, John E. Jr., *Power Structure: Ownership, Integration, and Competition in the*

Second, creation of markets for electricity services requires a huge growth in transactions. These transactions create heavy administrative requirement.

> In a deregulated environment, economic costs may go up because of transaction costs—new costs associated with moving from a single provider to a multiple provider system. For the past several decades a great deal of economic thinking has focused on transactions costs -- the costs of making and completing deals in the marketplace to acquire inputs and dispose of outputs. Much of the theoretical and empirical research has shown that firms minimize costs by internalizing transactions. Restructuring in the electric utility industry does exactly the opposite. Through unbundling of the monopoly, one-stop shopping electricity market each transaction is externalized.
>
> There will also be a system operator, who must coordinate the transaction over the grid to ensure reliability. Managing those transactions is turning out to be a difficult and costly task. A system operator requires significant resources and the total cost of operating the system will almost certainly go up, as those costs are included in the cost of each transaction. The complexity of scheduling power delivery for multiple generators and retailers also adds costs to the system. California's start date for full retail competition was delayed by three months due to network software problems—a delay that cost tens of millions of dollars.[19]

There are also physical demands of a restructured market that could raise costs to consumers.

> Directly related to the transaction costs and managerial functions are facilities costs. Demands on network facilities are likely to increase as a result of the wide range of transactions taking place. The physical facilities to support these transactions will have to be constructed and maintained. An increase in the number of transactions may require costly improvements to the transmission system in order to ensure reliability.[20]

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*, 62:4, 1986.

[19] CFA/CU, p. 7.

[20] CFA/CU, p. 8. References cited in the test in support of this proposition include Mistr, Alfred E. Jr., "Incremental-cost Pricing: What Efficiency Requires," *Public Utilities Fortnightly*, January 1, 1996; Oren, Shmuel, S., "Economic Inefficiency of Passive Transmission Rights in Congested Electricity Systems with Competitive Generation," *The Energy Journal*, 18:1, 1997, "Passive Transmission Rights Will Not Do the Job," *The Electricity Journal*, 10:5, 1997; Ostroski, Gerald B., "Embedded-cost Pricing: What Fairness

Third, competitive markets allow price discrimination between market segments. The costs and benefits are distributed according to bargaining power.[21] Residential ratepayers have little such power. Therefore, they may suffer greater price discrimination.

> Residential and commercial customers are likely to have far fewer opportunities available in a deregulated market than large customers. They are small volume customers who tend to consume in uneven patterns (spikes at the peak hours and very low levels of consumption at other times). They are less able to cut back their consumption (they have inelastic demand). [22]

2. MARKET POWER

Second, because of the economic characteristics of the electric utility industry, CFA/CU concluded that the restructured electricity market is vulnerable to a number of market failures.

Given the nature of the industry, supply and demand elasticities are low, especially in the short and mid term. Capital stock is long lived and significantly determines supply and demand responses. While the lead times for smaller, peaking generation units is not long, larger baseload facilities still have substantial lead times, and transmission facilities are especially difficult to bring on line. As a result there are significant constraints in some areas on the ability to expand supply.

> Compared to the other industries, the prospect of electric utility restructuring is probably more complex and more problematic from the residential ratepayer point of view on several counts.

Demands," *Public Utilities Fortnightly*, January 1, 1996; Radford, Bruce W., "Electric Transmission: An Overview, *Public Utilities Fortnightly*, January 1, 1996: Volpe, Mark J., "Let's Not Socialize Transmission Rates," *Public Utility Fortnightly*, February 15, 1997. Bohi, Douglas and Karen Palmer; "The Efficiency of Wholesale vs. Retail Competition in Electricity, *The Electricity Journal*, October 1996; Gegax, Douglas and Kenneth Nowotny, "Competition and the Electric Utility Industry, *Yale Journal on Regulation*, 10:63, 1997, Cornelli, Steve, "Will Customer Choice Always Lower Costs?", *The Electricity Journal*, October, 1996.

[21] CFA/CU, p. 10,

> Increased transaction costs will not impact prices paid by all customers equally. Residential customer will pay a greater share of costs due to both differences in the supply and demand characteristics that apply to residential and commercial customers and policy decisions that result in cost shifting.

[22] CFA/CU, p. 10. Blumberg, Ben and Jonathan Shaevitz, "Load Aggregation: the Wolf at the Door," *Public Utilities Fortnightly*, January 1, 1997; Guinane, Kay, *Group Buying Power* (Environmental Action, May 1997); Small Business Survival Committee, *Potential Economic Impacts of Restructuring the Electric Utility Industry* (Washington, D.C.: November 1997).

> Elasticities of demand are lower, conveying greater market power to suppliers and a greater ability to price discriminate.
>
> Transmission constraints may create severe bottlenecks (known as load pockets).
>
> Distribution is an even more entrenched bottleneck than telephone wires or airport slots and gates so the residual monopoly status of distribution creates severe problems of non-discriminatory access to bottleneck facilities for potential entrants.
>
> Consumers were not forced to pay for stranded costs in the deregulation of other industries.
>
> The electric industry is already characterized by increased concentration of ownership.
>
> Further, the incumbent electric utilities are vertically integrated (owning distribution, transmission and generation) which is akin to cable operators controlling both programming and distribution systems.
> Restructuring that cannot ensure competition can unleash market power that is disciplined by neither regulation nor competition.
>
> Thus, the actual problems experienced in other industries may be magnified in the electric utility industry. Moreover, the industry is much larger than any that has been restructured and much more central to economic activity and daily life. The fact that potential problems are at least as large as potential benefits only underscores the importance of requiring public policy to specifically address these problem and prevent them from afflicting residential ratepayers. [23]

Large entities tend to gain regionally dominant positions and because geographic markets are small, market power can be exercised in specific markets.[24] There has also been a strong trend toward concentration of generation assets. Vertical integration between generation, transmission and distribution make entry more difficult and create an ongoing problem about codes of conduct to govern the treatment of non-affiliated entities.

> The previous analysis assumes that the market for generation is effectively competitive. However, it is anticipated that in different regions of the country a

---

[23] CFA/CU, p. 36

[24] Cal, First Report, p. 21.

few, large utilities will be in the position to exercise market power unless restructuring legislation specifically addresses the problem.

One of the great dangers in restructuring is that the marketplace will not be effectively competitive. A recent analysis of the generation market in Texas determined that the state's two largest utilities would be able to exercise market power, selling power at a substantial mark-up over marginal cost. Most restructuring proposals do not require full divestiture of generation assets from companies that will remain involved in monopoly segments of the industry. Affiliation of regulated and non-regulated companies could result in either preferential treatment between these companies or in the shifting of costs from the non-regulated to the regulated side. An energy company that owns both generation and distribution facilities has an incentive to raise prices for captive customers while competing more vigorously for large business customers. Restructuring policies cannot realistically ensure that effective competition will develop in the deregulated market segments, yet lawmakers often remove regulatory control before competition is proven.[25]

3. POLICY IMPASSES

Third, because of the intense debate over restructuring, policy advocates are prone to take extreme positions.

At one end of the spectrum, advocates of deregulation refuse to accept the fact that problems do arise, for fear that such an admission will be used to convince policymakers that reregulation should be tried. At the other end of the spectrum, the advocates of regulation refuse to acknowledge that efficiency improvements flow from deregulation, for fear that such an admission will be used to prevent policy makers from addressing the specific problems that arise.

The purpose of this paper is to make the point, with reference the actual experience and rigorous analysis of the electric utility and other industries, that the reality tends to lie between the two extremes. Recognizing this before the

---

[25] CFA/CU, p. 13, References cited in the original paper in support of this argument include Comnes, G. Alan, Edward P. Kahn and Time N. Belden, "The Performance of the U.S. Market for Independent Electricity Generation," *The Energy Journal*, 17:3, 1996; Green, R.J. and D. M. Newbery, "Competition in the British Electricity Spot Market," *Journal of Political Economy*, 100:5, 1992; Kennedy J. and Associates, *Electric Utility Restructuring Issues for ERCOT: Prices, Market Power and Market Structure*, (Office of Public utility Counsel of Texas, 1996); 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.

> fact of deregulation should enable policymakers to craft policies that capture the positives of competitive restructuring, while minimizing the negatives.[26]

Buffeted by ideologues, who hesitate to admit problems, policy makers are less likely to reach practical solutions. Advocates of deregulation downplay the importance of initial problems. Opponents of deregulation declare the initial difficulties to be proof that competitive markets will not work in this industry. Sound policy gets lost in between.[27]

---

[26] CFA/CU, p. 35.

[27] Harris, Kiah, E., *Thoughts on Wild Prices*, July 1998, p. 1.

> The aftermath has voices calling for total deregulation or tighter controls of the industry. "Retail choice is the answer," some say. "Cap the price and regulate it more" is the other extreme.

III. PRIOR ANALYSIS OF THE PRICE SPIKES: ACCIDENTS OR A CALL FOR ACTION

A. CONFLICTING VIEWS OF MARKET PARTICIPANTS

The divergence of views on the causes, consequences and policy implications of these events is extreme. Power marketers, who clearly stand to profit from the price spikes, took the position that the price increases were part of the normal functioning of the market.[28] Supplies were tight, conditions were adverse and transmission constraints prevented supply from readily reaching markets. Under these circumstances, it was natural for prices to rise in a commodity market. Indeed, these merchant generators take the view that without the price spike and resulting market responses, blackouts would have occurred.

> Evidence that the Midwestern market functioned efficiently lies in the fact that the high prices caused by these factors quickly returned to predictable levels. Further, with the possible exception of weather, the major causes of the unprecedented volatility in late June appear to have been institutional and regulatory rules, and not the transition to competition and open access…
>
> In summary, price volatility was orders of magnitude greater in 1998 than 1997. We suspect that the magnitude of this difference is attributable to the fact that more trading in 1998 was conducted by marketers and utilities at market-based prices, whereas in 1997 commerce as more inter-utility at regulated, cost-based prices. Because prices were able to rise in response to generation shortages and record levels of demand, additional supplies were attracted into the region and firm services were not required to be curtailed. Were the same events to have occurred in 1997, it is unlikely that curtailments could have been avoided.[29]

Captive wholesale customers (e.g. municipal and cooperatively owned utilities) and many large industrial consumers (hereafter referred to as captive customers), who do not have power to sell into the tight market and feel the brunt of price increases or interruptions of service most directly, take the opposite view.[30] The level to which prices rose were not natural, but the result of the exercise of market power. Excessive prices do not elicit efficient responses; they simply exploit captive customers who cannot respond.

---

[28] Michaels, Robert J. and Jerry Ellig, *Electricity Passes the Market Test* (Mercatus Center, October 1998).

[29] Enron Power Marketing, Inc., Analysis of the Midwestern Electricity Price Spikes of Late June 1998, (Enron), p. 2.

[30] A letter from Rederick H. Ritts, Attorney for Steel Dynamics Inc., a large industrial consumer of electricity to Alan Richardson of the American Public Power Association and Roy Thilly of Wisconsin Public Power, Inc., dated August 19, 1998, points our that they "have similar views."

> The astronomical prices charged and paid by some participants in the Midwest wholesale bulk power market in June constitute plainly unjust and unreasonable rates. They are a clear sign that at least during certain conditions and certain time periods the market is not working, thereby invalidating the assumption underlying the Commission's market rate authorizations. Prices of $3000-7000/MWh (as compared with maximum production costs for even the most inefficient generator in the $100/MWh ballpark), with prices jumps of thousands of dollars per MWH in a matter of minutes, are not prices that would occur in a truly competitive market. Nor do these markets provide any reasonable or valuable price signal to potential market entrants. No potential entrant will risk capital to build new peaking capacity on the assumption that the cost of construction can be recovered solely in a few (10-25) hours per year – an assumption that may evaporate if hot weather fails to materialize on a weekday, or if the market structure is modified so that here can be an effective real-time demand response to a price change.
>
> Anecdotal evidence as to the behavior of market participants in the Midwest at the time of the late June 1998 price spikes suggests that manipulative forces were at work.
>
> No one has seriously contended that the extreme price spikes bore any relation to real supply and demand. Such price spikes seem unlikely to operate as effective price signals to induce new construction. Nor do price spikes result in an immediate and dramatic market response (i.e., reduction in demand) where demand is largely inelastic because of load serving entities' legal obligation to serve and absence of real-time price signals to retail users.[31]

Although representatives of captive customers did not believe that one could offer a serious defense of the extremely high prices on economic grounds, some marketers attempted to do so. They attempted to justify the huge price increases by putting forward an analysis that involved the concept of essentially disposable power plants – capital intensive facilities that were used for a few hours and then abandoned. These parties argued that it was reasonable to build power plants that would be expected to run just ten hours over their useful life.[32] In order to justify building such a power plant, investors would have to project market prices for those very short periods of $10,000 to $25,000 per MW. Since this was above the market-

---

[31] "Comments of the Transmission Access Policy Study Group," *Cincinnati Gas & Electric Company*, before the Federal Energy Regulatory Commission, Docket No. EL98-53-000, September 14, 1998 (hereafter TAPS), pp. 4, 5, 6.

[32] Enron, p. 7.

clearing price observed during the height of the spike, abuse was not necessarily the cause of high prices even though the previous year the market clearing price had not broken above the $400 level.

Observing the pandemonium in the marketplace and (perhaps) being aware of the economic analysis that was being put forward to justify the very high prices, some utilities immediately suggested that they would build more capacity under the regulatory model (i.e. rate base facilities).[33] They could make two plausible arguments for such actions. There is a good chance that the cost of such plant would be lower, on average, than the price spike driven plants. There was an even better chance that prices would be less volatile.

The economic assumptions underlying this debate will be analyzed in Chapter V. The huge gap in the estimation of what is a reasonable market-clearing price is astounding and it underscores the problem facing policymakers. On the one side, captive customers view a price of a few hundred dollars per MW at the most as reasonable; on the other side merchant generators see prices of several thousand dollars, twenty to thirty times as high as reasonable.[34] In the middle are the incumbent utilities who respond that if the market is going to produce prices in the range of thousands of dollars per megawatt, they can offer ratebase options that are much more attractive to consumers.

Thus, a three-way debate is joined – merchant generators, captive customers, and incumbent utilities. The debate pervades all issues placed before policymakers as a result of the price spikes.

There are shifting points of agreement and disagreement among the parties. For example, notwithstanding the merchant generator defense of very high prices, they also argue that better operation of the transmission system would have prevented the huge price spikes. They complain that emergency procedures to ensure transmission reliability (Transmission Load Relief or TLR) were abused by incumbents and interrupted the market flows of electricity.

> What does appear to be clear, however, is that the TLR procedure as applied during the week of June 22 is an exceedingly blunt instrument. TLR was applied under conditions when a minimal amount of fine tuning – primarily redispatch – could well have allowed additional energy to be traded/supplied at prices far below those that actually resulted.[35]

---

[33] Both investor owned (e.g. Virginia Power) and public power (Lincoln Nebraska) indicated they would consider adding more peaking capacity.

[34] Enron.

[35] Enron, p. 5.

Leaving aside the obvious contradiction in the merchant generator argument, it is important to note that there is agreement between price spike winners and losers that the capacity and management of the transmission system is a critical problem and will remain so. Captive customers also believe that the manipulation of the transmission system undermines the market.

> There certainly were market imperfections at the time, some associated with this Commission's acceptance of the NERC Transmission Load Relief (TLR) filing, which some participants interpreted as a license to cut off firm transmission for others, thus creating the phenomenon of "price islanding" rather analogous to the phenomenon of reliability islanding that occurs when the electrical system fails catastrophically. Others have raised concerns that he market may have been distorted by efforts of some participants to corner the market.[36]

Transmission owners – primarily vertically integrated investor owned utilities – have a different view. While they would never demand (or admit they have) the power to disadvantage competitors through control of the grid, they do insist that their needs should take precedence in certain circumstances. As the entities with the obligation to serve, they believe service to firm native load should be the ultimate objective.[37] They also maintain that giving them precedence in access to the transmission network saves consumers money by lowering generation reserve requirements.

> When Wisconsin Public Service claimed to have withheld available transmission capacity from another supplier because of its capacity benefit margin (CBM) – an intertie set-aside for a transmission owner to ensure it own system reliability needs without having to build new generation – FERC was skeptical and asked WPS to back up its claims with computations and explanations…
>
> WPS counters that it would have to build 1,275 MW of generation at an annual fixed charge cost of $53.4-million to provide for its designated reliability standards without being able to claim CBM, and that cost would be borne by ratepayers…
>
> PJM argued that the continued use of CBM allows the system to achieve high levels of reliability at the lowest feasible cost. Without it, PJM's minimum

---

[36] TAPS, p. 5.

[37] This view has prevailed in a recent court decision, which will make efforts to restructure the electricity market even more difficult under current legal authorities (see *NSP v. FERC*, 8TH Cir., No. 98-3000, May 14, 1999.

> reserve requirement would increase by 6%, requiring the companies to build almost 3,000 MW of new generation.[38]

In the three-way debate between merchants, captives, and incumbents there is almost never agreement among all three parties. Apparent agreement between parties frequently breaks down when probing questions are asked. For example, although all agree that outages made the market tight in the Midwest, there is vast disagreement over the cause.. Were the outages simple accidents (utilities),[39] a failure of utility management (merchants),[40] or a market failure due to the breakdown of coordination (captives)? [41]

Even when there is agreement about what happened and why, there are differences of opinion about what should be done about it. For example, having agreed that the management of the transmission system is crucial, ELCON advocates full deregulation immediately, arguing that "any repeat of this situation can be solved by opening the market to retail customers and deregulating generation."[42] Captive customers argue that transmission markets must be placed on an orderly basis before retail customers plow into the market.

> The consumer is still dependent on transmission lines and cheap baseload generation for low rates until new technology comes along to supplant them. Moving to retail choice is not going to solve the lack of capacity in the transmission system or in generation. If we cannot have the system functioning properly at the wholesale level, where the transactions are relatively limited, retail choice will be a disaster. [43]

---

[38] "Protestors Tell FERC 'CBM' Should Stand for Crafted by Monopolists," *Electric Utility Week*, August 31, 1998.

[39] "As Might be Expected, Any Lesson to be Learned from the June Power Crisis and Price Spikes Depend Upon Whom You Ask," *Foster Electric Report*, No 145, August 5, 1998, (Foster), quoting, AEP, p. 15

[40] Foster (p. 14) quotes John Anderson of ELCON as follows

> There is no shortage of capacity in the Midwest. There is a severe shortage of utility expertise for keeping units operating during the peaking season. Utilities have no more fundamental responsibility than this, and they have failed.

[41] Harris, p. 2.

[42]Foster, p. 14.

[43] Harris, p. 3.

Table III-1 summarizes the above disputes and adds several other key points of difference between the parties. This debate is important as the context for policy discussion, but this paper does not attempt to give an account of all the details, rather it presents an interpretation of the debate that is driven by the analytic frameworks described in the next chapter.

TABLE III-1:
EXAMPLES OF CONFLICTING VIEWS OF
CRUCIAL PRICE SPIKE EVENTS, CAUSES AND OUTCOMES

ISSUE	MERCHANT GENERATORS	CAPTIVE CUSTOMERS	INCUMBENT UTILITIES
PRICE	Market price was right; price signals create efficiency	Only market power could create such high price/cost margins; distorted price signals undermine efficiency	At these prices, rate base plant is cheaper and less volatile
GENERATION OUTAGES	Utilities failed in their basic management functions	Markets destroyed coordination compounding the outage problem	Accidents happen
TRANSMISSION	Manipulation of access prevented power from flowing into the tight market	Manipulation of access prevented power from flowing into the tight market	Meeting native load must take precedence, preferred access lowers total cost
FINANCIAL TRANSACTIONS	Deals create liquidity	Manipulation of transactions drives up prices	
DEFAULTS	Buyers and sellers will gain experience and learn to manage risk	Regulators should institute certification (including credit checks)	
BIDDING BEHAVIOR	Manipulation of transmission foreclosed markets	Hoarding and price gouging drove prices up	Hoarding and price gouging drove prices up
DEREGULATION	Immediate retail access and complete wholesale deregulation is the answer	Retail access before the wholesale market is functioning would be a disaster	

B. REGULATORS' VIEWS OF DRAMATIC EVENTS

Regulators were quickly inundated by this flood of conflicting views. All three regulatory agencies that reviewed the events strongly reaffirmed their commitment to creating a competitive electricity marketplace, but they differed widely on whether the problems observed in the first year could recur and what short-term measures might be necessary to cope with them.

After considerable prodding,[44] the Federal Energy Regulatory Commission undertook a study. Unfortunately, by its own admission, the study was not designed to discover whether the abuse of market power had occurred.[45] FERC concluded that the price spikes were an aberration, unlikely to be repeated.

> The combination of these factors was an extraordinary event. A number of market participants interviewed by the team compared the events of the week of June 22-26 to the "1 day in 10 years" in which there is a probability for losing load in planning models used by some utilities to assess the costs of serving future load. This comparison suggests that an operational situation leading to price spikes of the magnitude of June 1998 is unlikely to recur. Nevertheless, some of the operational conditions that led to the price spike causes are likely to be present during the next several years.[46]

Given FERC's decision not to conduct a study that could uncover abuse and its finding that uncontrollable factors were the root cause of the problem, it is not surprising to find that the agency did not recommend any specific or vigorous policy response to the events.

---

[44] "Wild Midwest Prices Spur Calls for a Price Cap," *Public Power Weekly*, July 6, 1998; "The Beat Goes On Over Midwest: FERC Slammed, Retail Access Debated," *Inside F.E.R.C.*, July 27, 1998.

[45] FERC, Staff Report, p. 3-18.

> The information from responses to the data request provides an important background to the June event, because it provides estimates of the overall weekly impact of market prices. Without this context, it is difficult to weigh the meaning of reported high prices that may have been for limited quantities of power and for a short number of hours. The data provide a more accurate picture of when high prices occurred, and which parties paid and received those prices. However, the data do not permit us to make definitive judgments of wrongdoing or price manipulation, nor was their collection designed with that purpose in mind. Such judgments would require the collection of substantial case specific information, an effort which is beyond the scope of this study.

[46] FERC, Staff Report, p. 4-13.

In contrast, the PUCO expressed greater concern about a recurrence of market problems. This reflected the belief recognition that markets could remain tight in its region for significant period of time for a variety of structural and policy reasons.

> Although the FERC concluded in its Report on the Causes of the Pricing Abnormalities in the Midwest during June 1998 that chances for a re-occurrence of the events of late June are remote, the PUCO is somewhat less optimistic. Weather conditions are unpredictable; the extent to which generating stations are out-of-service as a result of unscheduled maintenance is unpredictable; and transmission system performance is less predictable than in past years, in view of burgeoning wholesale power transactions and the prospect of retail wheeling. In fact, the balance of generation supply and customer demand may become even more precarious as a result of federal environmental rules limiting electric utilities' release of nitrogen oxide emissions. With the implementation of those rules, generating facilities serving Ohio and the region would need to be retrofitted or may be rendered uneconomic, depending on the costs of controlling emissions[47]

Given this market tightness, the PUCO felt that the potential for the exercise of market power remains a serious concern.

> The manner in which retail wheeling is implemented will also affect the extent to which the supply and demand of electricity is balanced. Without the implementation of public policy that encourages effective competitive entry into the generation market, assures coordinated operation of the transmission system, facilitates access to price information, and encourages utilization of financial hedging instruments, events may conspire again to disrupt electricity supplies and drive prices up. If competitively induced downward pressures on prices are not present, Ohio's major electric utilities will be in a position to exercise market power. [48]

California authorities are both more vigorous in their statement of the workability of competition and the need for active policy to smooth the transition to a competitive market. On the one hand, as the first major market to implement the full range of restructuring institutions (ISO and PX), there was a strong commitment to competition.

> Based on the information gathered and the study undertaken to date, the Committee has a number of concluding observations to offer, some of which

---

[47] Ohio, Report, p. ii.

[48] Ohio Report, p. ii.

> carry implications for policy. Before we present them, however, we wish to emphasize the Committee's strong belief that competitive markets can establish efficient prices and determine efficient quantities for electricity in California. Although market experience to date indicates the desirability of adjusting some current structures and procedures, this does not weaken our belief that properly designed and functioning markets can do the job. The main goal should be to make long-term changes that will remedy the current deficiencies. But the market effects of some problems may be so severe that temporary interventions are required. It is important, however, to take all steps possible to ensure that short-term actions do not impede the long-term effectiveness of the markets.[49]

On the other hand, there was all a clear recognition that problems had arisen in the functioning of the marketplace.

> To summarize our empirical results, we found that during some hours there was considerable potential for generators to exercise market power in the PX market. For example, there were about 100 hours during which offered supply was below predicted end-use demand. At these and other times, some NGOs [New Generation Organizations] bid in a way that is consistent with an attempt to exercise market power, and prices were high at these times. For various reasons this may have had little financial impact on buyers during 1998, but in the long run it would be problematic if it continues.[50]

Most importantly, it was possible to project circumstances in which the problem would persist. If it did, consumers could pay higher prices. As a result, California authorities were willing to take much more vigorous policy.

> First, generators offered large amounts of capacity to non-PX markets for reserves, due to high prices and high demands in those markets. Second, there is evidence that some generators were successfully exercising their market power during high-demand hours to raise prices substantially above the level that would have resulted from a fully competitive market. In over 100 hours, the quantity of supply offered in the PX market was less than forecast end-use demand, and during such hours the New Generation Owners have, and appear often to have exercised, substantial power to raise prices…
>
> Whatever the effect of high prices on end-users so far, in the future high average prices will be harmful to them. There are several forces that, if not

---

[49] Cal Second Report, p. 69.

[50] Cal Second Report, p. 66

countered, may lead to more frequent and more severe episodes of high prices in the future. If this happens it will raise average prices.[51]

C. POLICY PRESCRIPTIONS

With interpretations of events differing so, it is not surprising to find policy recommendations all over the map. The recommendations run the gamut from "the market worked, but needs some tweaking" to "the market will work, just give it time," to "the market suffered a major failure and needs extensive overhaul before it operate effectively." The regulators alone cover almost the full range of recommendations.

1. FERC

On one side we find the FERC with very modest policy recommendations. These are a combination of cheerleading and finger wagging.

- The industry is urged to engage in coordination of generation outages to avoid shortages.[52]

- The industry is encouraged to establish voluntary creditworthiness criteria.[53]

---

[51] Cal, Second Report, p. 67.

[52] FERC, Staff Report, p. 5-2.

> The team also notes that the scheduling of maintenance on generating plants can affect whether sufficient generation is available to meet demand in "shoulder" months, such as May and June, when the price spikes took place this year. The team suggests that the industry should consider whether changes in maintenance schedules would increase available generation in shoulder months without degrading reliability at other times.

[53] FERC, Staff Report, 5-2)

> Market participants with whom the team talked acknowledged that traders who are thinly capitalized or improperly hedged have a higher risk of defaulting on contract obligations, and that such defaults would likely occur while prices rise, when a trader cannot cover options to sell at a price lower than the market. Such defaults could tend to increase prices by further increasing demand and by undermining confidence in the remaining market players. Nevertheless, the majority of participants suggested that the market, not the Commission, should police creditworthiness. They noted that the Commission has not imposed any creditworthiness standards on gas marketers, and that there have been no suggestions that such requirements are necessary. The participants who advocated a Commission role in directly regulating creditworthiness of power marketers tended to be those who had directly or indirectly dealt with a defaulting marketer.

- Market participants are told that the price spikes are a wake-up call to learn how to manage risk better.[54]

- FERC does suggest that certain types of transactions are ill considered, although it does not take or recommend specific action to prevent these

---

> It is difficult for the team to assess whether other marketers will default in the future, because the Commission and its staff generally do not track the financial condition of entities that sell power at market-based rates. However, participants in the electric power industry have been put on notice that defaults can occur. In light of the financial risks entailed by the default of a counterparty, market participants told the team that they are actively reviewing the creditworthiness of their counterparties and asking for increased assurances of performance in appropriate cases. In addition, as discussed above, a number of risk management tools are available to help buyers and sellers of power increase coverage of the risks of counterparty default. We anticipate that as the electric power market matures, parties will find ways to limit the risk of default to acceptable levels. At that point, we do not expect that the possibility of default will significantly increase the chance for future price spikes.

FERC, Staff Report, p. 5-5.

> While the team believes that good credit practices are essential to a well functioning market, it does not support proposals suggesting the Commission undertake the responsibility for ensuring creditworthiness of market participants. In competitive markets, market participants must take responsibility for determining the creditworthiness of their counterparties. The team believes that industry credit practices are best addressed by market participants. The team therefore suggests that the industry establish a working group to develop a uniform set of credit requirements to assure the creditworthiness of the market participants. The team also suggests that the industry consider creditworthiness standards used by transmission providers for their tariff customers as models for such requirements.

[54] FERC, Staff Report, p. 5-3.

> As the market continues to mature, market participants will likely undertake new and innovative risk management measures to minimize their risks of being financially harmed in the future as a result of price fluctuations and counterparty defaults.
>
> In this regard, the team believes that the June event was a wake up call to those market participants who were not as prepared as they should have been. Based on the information obtained through this study, the team concludes that many of the market participants have already begun to heed the call and have undertaken a variety of measures to minimize their risks in the event of any future price fluctuations.
>
> For these reasons, the team does not believe the Commission ought to play a major role in addressing risk management other than (1) to encourage all market participants to plan for the uncertainty inherent in competitive markets and (2) to address the prudence of risk management as it affects cost-based wholesale and transmission rates. However, generally speaking, the states have the primary regulatory role in addressing risk management, because they determine the prudence of actions that load-serving utilities take to provide service.

from taking place.[55]

For its part the FERC discovers some things need to be done by federal regulators.

- It recognizes that it needs rules for declaring transmission emergencies, which may have been used to foreclose entry of outside supply into tight markets.[56]

---

[55] FERC, Staff Report, pp. 4-4,4-5.

> The June price spike provided a wake-up call to many market participants on the issue of creditworthiness. Companies that did not have credit checking practices were among those hurt the worst during the price spike. In a competitive market, market participants must take responsibility for inquiring into the creditworthiness of their counterparties to ensure contract performance. A number of firms reportedly stopped dealing with Federal Energy Sales long before the price spike because of questions about its ability to cover its obligations. Prior to the price spike a number of market participants, including Federal Energy Sales and Springfield, engaged in trading practices known as "sleeves." In one type of sleeve transaction, a firm acts as an intermediary between two other firms when one of them does not meet the other's credit requirements. The intermediary would take title to the power on behalf of the two firms, or otherwise guarantee the performance of the contract, for a fee. One firm interviewed by the team described this type of sleeve as "paying a commission to hide bad credit."
>
> Another firm described it as "an administrative accommodation." However it is defined, this type of sleeving appears to provide creditworthiness to those who would not otherwise have it. To the extent that this kind of transaction supports marketers that otherwise would not be able to enter into contracts, it increases the potential risk of default and adds to instability in the market.

[56] FERC, Staff Report, p. 4-10.

> Under Order 889, the Commission requires transmission providers to follow standards of conduct. The standards are intended to prevent wholesale merchants affiliated with a transmission provider from obtaining better, faster or greater access to information about the transmission provider's wholesale transmission operations than persons who are not affiliated with the transmission provider. Transmission providers must show that they are complying with the standards, and violations of them are subject to the Commission's remedial authority under the Federal Power Act.
>
> The Commission does not intend the standards to compromise the reliability of electric systems. In emergency circumstances affecting system reliability, transmission providers may take whatever steps are necessary to keep the system in operation, notwithstanding any standard of conduct, according to Commission regulations. The Commission expects transmission providers to be able to justify why they have deviated from the standards of conduct in particular circumstances. If a transmission provider's deviations from the standards are not necessary to deal with reliability concerns under emergency conditions, the transmission provider has violated the standards.

- FERC declared its intention to monitor potentially abuse transactions.[57]

- FERC discovered it needs to collect better data, although it has not made a commitment to collect data that would be adequate to uncover market abuses,[58] nor did it propose actions to make pricing data publicly available.[59]

---

[57] FERC, Staff Report, p. 5-7.

> With respect to the wholesale power market, the use of two-way transactions in deals made through brokers may be of limited concern unless certain conditions are present. If a buyer deals with only one broker and the market is thin, there may be problems with two-way transactions. Otherwise, these two-way schemes would seem likely to have little influence on market prices seen by buyers. The team feels that staff should remain knowledgeable about this and similar practices and look into allegations the Commission may receive about this type of activity.

[58] FERC, Staff Report, p. 5-3.

> In a largely deregulated market, the types and price of transactions undertaken are primarily the responsibility of the market participants. In this type of market, the Commission must have sufficient data available to it to ensure that the market is operating properly, e.g., that reliability is maintained, the wholesale price of electricity continues to be reasonable and no anticompetitive activity is taking place.
>
> The team reached a number of conclusions about the type of data necessary for market monitoring in a competitive marketplace as a result of its investigation into the Midwest price spike. The team's primary conclusion is that future monitoring activities could be improved by having more real time market data readily available to the Commission. The team believes that availability of this type of data can greatly facilitate the examination of significant market events with greater accuracy.

[59] FERC, Staff Report, p. 5-3.

> More broadly, the market itself could benefit if more information about electric power transactions were publicly available on a real-time basis (with appropriate safeguards against public disclosure of proprietary information about specific transactions). Information on the general availability of transmission and specific offers and acceptances for some types of transmission capacity is now available on OASIS. In addition, the industry is continuing to develop standards for expanding the amount and accuracy of information available on OASIS.
>
> However, there are currently no clearinghouses for real-time reporting of information on market-based sales. No one has available accurate and timely information on current markets -- neither the market participants, who want to more accurately send and receive market information, nor the Commission, which needs this information to keep abreast of the market. These difficulties would be reduced if the electric industry were to develop real-time sources of information on electric sales as well as transmission offers and deals.

- It has also come to the conclusion that all transmission should be coordinated through regional organizations, although it still hesitates to simply order compliance.[60]

2. OHIO

Starting from a more pessimistic (some would say more realistic) view of current conditions in the industry, the PUCO sees a larger role for public policy to actively protect the public and improve the working of the marketplace.

> Public policymakers can mitigate the circumstances that led to the power interruptions and price dislocations by ensuring that there is effective competition at the outset of any retail wheeling environment, and ensuring that tools are available for rapid response to demonstrated anti-competitive behavior that could lead to price manipulation or supply shortages. Specifically, public policymakers should: 1) take unambiguous action to require coordination of transmission system operations by region-wide Independent System Operators, 2) facilitate the development of power exchanges providing access to information on availability and prices of electricity, and 3) encourage that the benefits of risk management tools, including futures and forward contracts as well as financial hedging instruments, be made available to all customer classes in a restructured electricity market.[61]

In this regard, the team found that while the wholesale power market data currently collected by the Commission are valuable, much more value could be extracted if marketers reported pricing data for purchases and sales with greater consistency and frequency and, perhaps, identified specific transactions. In addition, it would be helpful if traders were to retain transaction-specific information. The Commission then could request it if unusual market events like the June price spike occur. This concept is similar to NERC's information-gathering procedure for reviewing unusual reliability events. NERC asks for information on what transmission control operators and security coordinators actually do in the event of a major electric system disturbance. Some regional reliability councils also have information-gathering policies similar to NERC's. With due regard for the treatment of proprietary information, the availability of transaction specific information may speed up the Commission's analysis of unusual market conditions and allow it to predict future market developments

[60] *Energy Daily,* May 14, 1998.

[61] Ohio Report, p. iii.

Specific actions embraced by the PUCO include a call for mandatory institutions that provide much more orderly trading functions[62] including the provision of information, evaluation of creditworthiness, and conduct of business.[63] There are also recommendations for activities that can be considered network management -- coordination of the development of the infrastructure necessary to support smooth market operations. Without the necessary institutions the PUCO questions whether an orderly market can be created.[64]

---

[62] Ohio, Report, p. 46

> While FERC Order 888A encourages the development of regional independent transmission system operators (ISOs), such entities are not required. Without market coordination mechanisms such as an ISO in place, the incentive for electric utilities to coordinate and cooperate is effectively undercut. In conjunction with an appropriately structured ISO, an additional market coordination mechanism such as a power exchange (PX) would provide access to the communication of clear, current and reliable wholesale price signals to counter uncertainty and inexperience that may constrain rational trading behavior, otherwise conducted ad hoc and exclusively bilaterally.

[63] Ohio Report, p. 41.

> It is impossible for market participants to make rational decisions without complete and accurate market information. Unfortunately, the Midwest spot market currently relies on information gleaned through telephone canvassing, which is an inefficient and unsophisticated means of gathering market information. Market participants need real-time market information to make economic decisions in running their facilities. Power exchanges (PXs) could fill this need, by providing day-ahead and hour-ahead markets for energy and ancillary services. PXs may be structured so as to be independent of ISOs and market participants. In addition, they can for the most part operate as self-regulating entities similar to the New York Stock Exchange or the Chicago Board of Trade. A PX provides centralized, timely and complete market information to spot market participants. Power exchange information is provided on a real-time basis. Accordingly, spot market participants can use the information to avoid the pitfalls of market psychology. A power exchange spreads risk among all market participants, thereby minimizing the impact of an individual market participant default. In the absence of a power exchange, trades are exclusively bilateral, i.e. made between individual spot market participants; these participants assume the risk of power delivery default by the counter party to a bilateral transaction. A power exchange has stringent credit requirements that mitigate the possibility of market failures. Market participants must post security deposits to be used in the event of default. Furthermore, a power exchange could monitor the trading activities to ensure fair market trading practices

[64] Ohio, Report, p. 46

> The absence of such market coordination mechanisms has resulted in an "immature" electricity market in the Midwest, in which it is nearly impossible to distinguish between attempts at direct market manipulation and legitimate transmission line relief actions necessary to protect continued reliable service to native load customers. The PUCO notes that dual motive actions could conceivably occur in such an environment: a utility could invoke transmission line relief rules, decreasing the available wholesale supply across interconnection points thereby causing wholesale prices to rise to that utility's advantage.

The PUCO also identified a series of policies that are necessary to better align economic incentives with the new market structures. These include failure of utilities to perform their supply function[65] and new pricing policies that enhance both the supply-side and the demand-side responsiveness.[66]

3. CALIFORNIA

The California conclusions are most notable for their firm belief that transitional measures to allow the market to develop are important but should not detract from the general proposition and belief that markets can work. Vigorous short-term measures were necessary to accomplish long term goals. As a result of the recognition of initial problems and an appreciation of their seriousness in California, vigorous short-term actions were embraced.

---

[65] Ohio Report, p. 45.

> The PUCO can try to insulate the state's customers against power outages by creating a system of penalties (and rewards) based on or benchmarked against outage indices to provide local distribution utilities with a clear incentive to enter into contracts that are backed with reliable sources of power. The PUCO has established just such a system in its Minimum Telephone Service Standards, which replaced a regulatorily-driven system with a customer-driven system of credits for periods of time without service. If the electric utility does not meet its benchmark, then predetermined credits would kick in to compensate the customer based on the degree of interruptibility previously agreed to by the customer. Large customers already have this opportunity, but the option could be extended in a retail wheeling environment using the Minimum Telephone Service Standards as a model. Those standards were developed after extensive consultation with incumbent suppliers, new entrants, and customer representatives.

[66] Ohio Report, p. 46.

> On the demand side, the PUCO can make available to retail customers who want it, market-responsive pricing. In addition to interruptible contracts with wholesale buy-through provisions, real-time pricing might be made available for customers who can shift load. In addition, reliability differentiated pricing might allow discounts for those customers who are willing to receive lower quality of power and greater power interruptions. Only customers demanding uninterrupted high quality power would then pay a premium during periods of shortage.
>
> On the supply and delivery side, public policy could actively encourage the entry of new generators. Without strengthening the transmission system, such generators would likely be distributed generators or combined-cycle gas turbine generators located in or near load centers. Easing transmission siting requirements might ease transmission constraints within Ohio. However, this action does little good if the major transmission constraints are located in other states. In that event, the PUCO might need to put mandatory utility curtailment plans into operation to prioritize customer distribution circuits in case of brownouts or outages.

> [T]he current market problems are sufficiently severe that they call for short-term intervention in the market, such as price caps. This will reduce deleterious market outcomes and provide "breathing room" for the development and introduction of long-term improvements. While we expect that prices would eventually equilibrate on average in the different markets, they would do so only with considerable distortion among the various markets. Unit commitments and other decisions would be distorted by the inaccurate price signals. Furthermore, allowing the exercise of unbridled market power could lead to substantial wealth transfers and cause political pressure for re-regulation, thereby undermining the possibility of having successful markets in the long term. In short, the Committee is persuaded of the need for short-term market interventions, perhaps in the form of price caps, to cope with serious, market-impairing structural problems. [67]

By asking for a price cap, California regulators had mobilized what is considered the most aggressive intervention in the marketplace.

> Over the next few years, market problems at times of high demand may be sufficiently severe that they call for short-term intervention in the market, such as price caps. Such interventions could mitigate deleterious market outcomes and provide "breathing room" for the development and introduction of long-term improvements. Since generators in the Power Exchange market, and probably in other markets, sometimes have and exercise considerable market power, price caps and other mitigating measures have the potential to reduce inefficient behavior and inappropriate wealth transfers. Furthermore, allowing the exercise of unbridled market power could lead to substantial wealth transfers and cause political pressure for re-regulation, thereby undermining the possibility of having successful markets in the long term. In short, the Committee is persuaded of the need for the availability of short-term market interventions, including price caps, to cope with serious, market-impairing structural problems.[68]

Ironically, in California, the institutions that the Ohio regulators were asking for are already in place, yet the regulators there recognize the need for further development. They stress the need to have better incentives on the demand-side.[69]

---

[67] Cal Report, p. 27

[68] Cal Second Report, p. 71.

[69] Cal Report, pp. 26-27.

4. MARKET PARTICIPANTS

Most of the measures that the regulators recommended in their analyses had been put forward by market participants. Market participants move a little farther off in either direction (more or less vigorous responses), but the underlying philosophy is obvious.

Merchant generators focused exclusively on the transmission system questions, insisting that making it easier to physically move power was all that was required. Other interventions in the marketplace would only make matters worse. Moreover, once the uncertainties were removed, additional supplies would be forthcoming.

> While supply-side development is essential to the long-term success of the Ancillary Services markets, it is also important that the ISO's demand for Ancillary Services be rational and responsive to economic incentives, while staying within the bounds of regulatory constraints and reliability objectives. The overall level and composition of ancillary services bought by the ISO should be determined in an integrated and economic way. System security constraints should be met by procuring the least-cost mix of the several ancillary services. For example, the ISO should be able to substitute among types of reserves when a more flexible type is available at a lower price. When energy prices are below reserves prices, energy too should be considered in the mix. Furthermore when some Ancillary Services' prices are very high, the ISO should continue to make the judgment to purchase less of them, as it apparently did for Replacement Reserves when the price would have reached $10,000 per MW.

Cal, Second Report, p. 68.

> Customers should be able to provide a response to price not only in the PX energy market, but in some Ancillary Services markets as well. Rapid reduction of load corresponds to a reserve. The end-use customer could receive the Ancillary Services payment for being available to curtail plus the real-time price for any amount by which it is actually curtailed. Allowing demand-side bidding for Ancillary Services will relieve some of the pressure on these markets, reduce the amount of generating capacity tied up in providing reserves, and thus reduce prices in the PX. At present, there are not good mechanisms for allowing end-users to bid into the Ancillary Services markets, and we welcome moves by the ISO in this direction. Traditionally, power systems have viewed end-users as less reliable sources of reserves, for example, "How do we know they will curtail when ordered to do so?" The MMC acknowledges that this is an issue, but it has apparently also turned out to be an issue for generators, who reputedly do not always follow ISO instructions. This problem should be met by treating Ancillary Services sales as more than financial contracts, by adding meaningful penalties for noncompliance. This approach can cope with the unreliability problem on the end-user side as well.
>
> The key customers for enhancing demand response, at least initially, are large ones. Their electricity bills are high, and many employ professional energy managers and automated control systems. They are already familiar with issues of buying and selling in markets where prices vary rapidly, such as gas markets, and with investing in energy-efficient equipment to reduce costs.

> What should be done to prevent such an occurrence again? PECO urges the Commission and other regulators and legislators to resist the temptation to do anything because the market does not need additional regulatory protection. Indeed, the June price spike should be looked upon as a necessary learning experience as the wholesale energy market continues to move toward deregulation. There is no need to protect unsophisticated market players…
>
> What can be done is to continue to assure continued and better transmission access and to maintain and even accelerate deregulation, particularly at the wholesale level…
>
> When the entire market goes to a market-based rate, the right market signals will be sent to encourage the development not only of new generation but also new transmission. As increased demand for economy transfers will provide incentives for transmission enhancement to support additional power transfers, regional transfer capabilities will improve as the transmission grid is strengthened… In this case reliability and economics are perfectly aligned… Less uncertainty will result in lower hurdle rates and thus greater investment. The result will be a more efficient market and a more reliable electric supply and use of the transmission grid.[70]

There does appear to be agreement between merchant generators and captive customers that orderly markets would enhance supply because uncertainty has been retarding entry.

> Right now, the future of the electric utility industry in Indiana is in limbo. Regulated utilities are reluctant to commit to the construction of new generating capacity because of uncertainty over future customer base and the ability to recover costs if retail choice legislation is enacted. At the same time investors are unwilling to commit to the construction of merchant plants in Indiana because they do not yet know if or when the market will open to competition. [71]

---

[70] PECO Power Team, *Observations on the June Price Spike.*

[71] Indiana Municipal Power Agency, Letter to William D. McCarty, July 22, 1998.

Harris, p. 3.

> The development of capacity is being primarily provided by merchant plants. However, merchant plants require an independent transmission structure, such as an independent system operator (ISO), and a power market sufficient to allow the plant to dispatch against the long-run marginal cost. The areas where numerous merchant plants are being proposed

The question is how to create an orderly market. The captives argue that a lack of confidence in the fairness of market mechanisms and volatility will result in substantial costs and inefficiencies.

> Market abuse will not only undermine the market itself, but it will raise costs to consumers. If market participants must expend significant resources to protect themselves against the extremely high cost of even limited market imperfections (e.g., transmission congestion caused by scheduled and unscheduled generation outages or other unexpected occurrences) or sudden price spikes from whatever cause, consumers will be burdened with unnecessarily high electric costs. Retention of arguably excess generation by cautions load service entities concerned about the potentially immense cost of short term price spikes can remove alternative sources of supply from the market and reduce competition. A market participant will be unlikely to make firm sales of surplus capacity if it risks losing its entire annual earnings in an hour if it happens to experience a forced outage at the wrong moment.[72]

In short, what caused the problem, how to fix it, and whether more or less regulation would help are still in dispute.

> have such a structure. It is not necessary to have full deregulation, but it is necessary to have an orderly wholesale market with an independently operated transmission system.
>
> Transmission planning is being done, but he current confusion on ISOs, ITCs (or transcos); etc. is preventing the construction of any meaningful capacity.

[72] TAPS, pp. 6, 7.

IV. UNCONTROLLABLE FACTORS AND TRANSITION ISSUES: WHY WAS 1998 SO BAD?

How could prices rise to such remarkable levels? All parties agree that there was an underlying tightness in the market caused by weather and outages. The important public policy question is, were these circumstances unique? Do they alone account for the spikes?

A. THE UNCONTROLLABLES

1. WEATHER AND OUTAGES

Arguments that the weather and outages were unique factors underlying the price spike are undermined to some extent by the fact that 1997 experienced similar factors with less drastic results. While there was a price jump in 1997, it was far smaller. Even the FERC account recognizes this difference.

> During the summer of 1997, wholesale power markets experienced a price spike similar to the June 1998 spike, although maximum price levels were much lower and operating conditions were less severe. In July 1997, scorching temperatures swept through the Midwest and East, driving up prices to then-unprecedented levels. Day-ahead prices into Cinergy reached an all-time high of $325 per MWh, with index prices in MAIN over $180 per MWh and prices in MAPP of $90 per MWh. PJM index prices rose to $110 per MWh. [73]

The PUCO report also notes that there were both heat and outages operating without such a dramatic effect in the Mid-West in 1997.

> During the week ending June 27, 1997, the increase in the ECAR day-ahead price was attributed to intense heat and the forced outage of a 1,300 MW Gavin unit and a 1,300 MW Rockport unit, both owned by AEP operating companies. During July 1997, day-ahead prices soared as a result of a three-day heat wave and, according to Power Markets Week, an influx of power marketers into the market. Day-ahead bulk power prices on July 17, 1997 were $238/MWh, the highest reported for the entire year. By comparison, day-ahead prices leapt from $588/MWh the previous day to $2,013/MWh on June 23, 1998, the highest day-ahead price reported for the year, to date. Day-ahead market prices soared again, on July 21, 1998, to $1,493/MWh. [74]

---

[73] FERC, Staff Report, p. 3-8.

[74] Ohio Report, p. 23-24

With prices hitting levels that were ten to 20 times as high in 1998 as in 1997, it is unlikely that weather or outages alone could account for the difference. In some respects 1998 was no worse than 1997. Most systems in the Mid-West did not hit all time peaks in either year.[75] While reserve margins were at or near historic lows, the decline in reserve margins was not all that great between 1997 and 1998. The physical differences were not sufficient to account for the financial differences.

2. UNIQUE TECHNOLOGY OUTAGES

Similarly, arguments that a unique set of outages affected a specific market fail to recognize fundamental market conditions that typify these markets.

First, the underlying conditions are tight in a number of markets and they are not likely to change anytime soon.[76] Second, "accidents" affected a variety of technologies in a number of markets at different times. The problem is pervasive and comprehensive. Several major categories of baseload plant – nuclear, fossil, and hydro – have contributed to one or another of the unplanned outages. This was true of the summer price spikes in both California and the Midwest.

> During late July, however, hydroelectric generation concerns in the Northwest, coupled with Pacific Intertie curtailments limiting the flow of power to California in July, contributed to upward price pressures. From late July to the beginning of September, extreme temperatures in the southwest and northwest

---

[75] Ohio Report, p. 5; FERC Staff Report, p. 2-5.

[76] Harris, p. 4.

> We are quickly running out of low-cost excess energy to trade without real assets to back it up. (Oddly enough, this low cost energy was the primary reason the advantages of deregulation could be "proven." As it disappears, the new entrants will be forced to the long-run marginal cost of new generation). Phantom capacity is a thing of the past. Those marketers who trade "financially firm" learned how much that could cost with no real asset behind them.
>
> We are seeing utilities divest generation assets to independent power producers, who will operate them as merchant facilities. These assets are being sold at multiples of book value. If these entities are to make a return on the asset – and we assume that is the intent – then electric prices will have to increase. The result of the deregulation movement has yet to be felt. However, it is interesting that instead of using depreciated assets of utilities, which keep rates low, the industry is going to turn over its assets at a multiple of book, thereby increase costs to the consumer.

combined with forced outages at key plants, led to voluntary load curtailments in several hours.[77]

The data on plant availability show that the principal reasons why more capacity was not available in the Midwest (ECAR and MAIN) at the time of the price spike were a high level of outages at nuclear plants, including forced outages caused by weather, and a high level of forced outage rates early in the week at fossil generating plants in ECAR. While scheduled outages at non-nuclear plants in MAIN may have played a role, it appears to have been a very minor one.[78]

3. TRANSMISSION

Weather and outages may tighten supplies within a given region. Transmission constraints limit the ability of power to come from outside of the region to alleviate the local imbalance. There is no doubt that constraints on the transmission system played an important role in both the Midwest and West Coast price spikes. Once again, however, there does not appear to have been a great deal of difference in transmission capacity available between 1997 and 1998.[79] Moreover, the transmission supply problem is pervasive and widespread.[80] If this is a permanent problem, it requires a response.

---

[77] Cal Second Report, p. 15.

[78] FERC, Staff Report, p. 2-11, 2-12

[79] FERC Staff Report, p. 2-15, 2-16.

> The predominant line loading relief (LLR) procedure used in managing the transmission system of the Eastern Interconnection since the summer of 1997 has been NERC's Transmission Loading Relief (TLR) procedure. The evolution of this procedure can be traced to efforts by various utilities seeking solutions to inadvertent or loop flows in the transmission system—most notably the GAPP Agreement participants — and the Commission's functional unbundling of transmission and generation in Order Nos. 888 and 889. Prior to these Orders, transmission system overloads were typically handled by the affected control areas first curtailing their wheeling services for third parties and, if that was inadequate, re-dispatching their generation to mitigate the problems.
>
> Generally, past practices can be distinguished from NERC's TLR procedures by two significant differences. First, overloads were handled primarily by local procedures whereas the TLR procedures are regional. The affected control area attempted to mitigate the overloading problem largely by its own actions before asking neighboring utilities for assistance. NERC's TLR procedures rely on multi-control area regional security coordinators curtailing transmission flows over a much wider area (based on model-generated measures of their impacts on the constrained facilities). Second, the TLR approach is a flow-based approach that curtails transactions based on actual power flows over the transmission system and their estimated impacts on the overloaded facilities. Past practices instituted curtailments

Thus, in the Midwest an imbalance of physical supply and demand were not all that different in 1997 and 1998. The magnitude of the price spike was vastly different. A similar conclusion is reached by looking at the data on the West Coast. Hence, while tight markets were a factor in the price run up, they do not explain the drastic nature of the price increases. We must look for other causes.

B. A NEW MARKET CREATES DISORDER

Even if one can conclude that these markets were tighter in 1998 than 1997, a case can be made that to some extent this was the result of the creation of the competitive electricity market. Underlying conditions were tighter in 1998, but not radically more so than in earlier years. To some extent the introduction of a competitive market into the electric utility industry may have contributed to any increased severity of underlying conditions in 1998.

1. BREAKDOWN OF COORDINATION

One of the most important changes in behavior that affected the market during the price spikes is to reduce the ability of system managers to coordinate and run the transmission system. The problem stems both from complexity and from a lack of cooperation. Market participants do not have an incentive to cooperate.

> Prior to the deregulation of the wholesale electricity market with the implementation of FERC Orders 888 and 889, electric utilities coordinated operations in order to assure mutual reliability of supply. In a deregulated wholesale market, operational coordination is subordinate to profit motivation; the traditional institutional practices underlying reliability lose their validity. Without replacement coordination mechanisms, the market is subject to excessive volatility and supply/demand dislocations. FERC Orders 888 and 889 require structural separation between the generation and transmission service operations of the electric utility for wholesale electric sales. Where in the past a utility might redispatch its own generation to attempt to accommodate power transfers by others that are necessary to assure supply reliability for a

---

based on contract path flows. According to NERC, the past practices (when local utilities attempted to handle overloads) have proven inadequate to deal with the nature and increased volume of transactions on the transmission grid in recent years.

[80] Harris, p. 5.

> Also, if some private utilities have their way with their proposals for "independent" transcos, the same thing will happen. Consumers will unfairly pay more of grossed-up transmission assets that have already been paid for and depreciated.

> neighboring utility, today such redispatch would likely not occur for at least two reasons. First, in accordance with the structural separations policy established by the FERC Orders, the transmission system personnel and the generation operations personnel within the same utility are not allowed to communicate with each other, except through OASIS, a same-time transmission system information disclosure system. Second, the profit-maximizing incentive in an essentially deregulated wholesale power market would not favor redispatch of one's own generation to solve "someone else's problem." Rather, it is rational to favor one's own generation during periods of tight supply. [81]

The number and complexity of transactions compounded the problem of system management. The number of traders increased over 50 fold; the quantity traded increased several hundred times.

> There are more market participants than ever before. In the first quarter of 1995, there were eight marketers actively trading in wholesale power markets. By the second quarter of 1998, there were 108 actively trading power marketers. While a large number of marketers are active in wholesale markets, there are many that have received market-based rates but have not conducted transactions. A total of 337 independent power marketers and 123 affiliated marketers have been granted market-based rates by the Commission. In addition, the Commission has granted market-based rate authority to 73 investor-owned utilities.
>
> The volume of transactions has increased dramatically. Power marketer quarterly filings show significant increases in wholesale transactions since 1995. In the first quarter of 1995, marketer sales totaled 1.8 million MWh. By the second quarter 1998, sales escalated to 513 million MWh[82]

There were also complications of financial and ownership relationships between entities.[83]

---

[81] Ohio Report, p. 38

[82] FERC, 3-1, 3-2.

[83] Ohio Report, p. 28.

> Ohio electric utilities have participated in energy trading through subsidiaries as well as through the regulated utility entity. Subsidiary companies are run separately from the regulated parent utility, and thus can engage in speculative trading with the independents. Nationally, the volume of sales has increased significantly over the past two years.
>
> Trading transactions may be entered into within the market in which the regulated or unregulated entity normally conducts its traditional business, or they may be entered into

> American Energy Systems believes that the Commission must investigate fully whether undue preferential treatment was accorded to the marketing affiliates of these transmission-owning companies, and whether independent third-party marketers should have been afforded the opportunity to provide alternatives, and perhaps less costly, solutions to the reliability problems being experienced at this time.[84]

Whatever the mix of accident and unintended consequences in the underlying conditions, a much more powerful set of factors influencing the price spikes was the introduction of numerous financial transactions. Tight supplies during hot weather have historically sent utilities scrambling for supplies. Utilities scrambling for supplies in the marketplace added a new element to the equation. Not only are electric utilities chasing real power, but marketers and deal makers are chasing power on paper for a variety of reasons, some good and some not so good. It is generally recognized that these financial transactions contributed to the heightened problem because a host of financial transactions reinforced the upward spiral of prices.

2. TRANSMISSION CONSTRAINTS

The area where this impact of increasing transactions and loss of coordination is felt most is in the transmission function. We have noted that there is a general shortage of capacity. This is reflected in both the ability to move power between regions and the existence of load pockets within regions. In the near term, there is little that can be done about these constraints. This condition has existed for some time.[85] However, it is clear that the introduction of competition has put a strain on an already stressed asset.[86]

> through markets outside of the traditional service territory. Transactions may result in forward purchase and sale commitments far in excess of normal capacity. The characteristics of the contracts themselves may differ in terms of the settlement requirements. Contracts may permit net settlement, cash settlement, or some may require physical settlement by the utility or a third party. In addition, the markets in which these transactions are entered into may provide a mechanism for settlement other than physical settlement. Normal supply and demand forecasts and subsequent variations in forecasts may dictate the timing of some transactions, while the timing of other transactions is motivated strictly by speculation on movements in the market.

[84] Foster, p. 14.

[85] Ohio Report, p. 19.

> In the past, a control area would typically mitigate an overload on its system by first curtailing those interchange transactions for which the control area was providing wheeling service. If the overload continued due to parallel flows from transactions being wheeled by other control areas, the control area with the overload had little choice but to redispatch its

Moreover, the rules for allocating the scarce transmission resource during times of stress were far from optimum.[87] In a competitive market, some entities gain an interest in

---

generation to mitigate the overloads on its system. The redispatch costs were considered part of operating the electric system and would be passed on to its customers. On rare occasions, redispatch could not mitigate the overload, and the affected control area had to shed firm load. During the last decade, regional procedures were developed to spread the cost of redispatch or to coordinate interchange transaction curtailment over a wider area. As transactions in the Eastern Interconnection have become more pervasive and widespread, even regional procedures have sometimes been ineffective. The NERC TLR procedure was developed to coordinate curtailment over as wide an area as possible (i.e., the entire Eastern Interconnection).

[86] Ohio Report, pp. 20-21.

It is important to note that all transactions that cross control area boundaries (including purchases of energy to serve native load) are subject to the NERC TLR procedure on a comparable basis. The NERC TLR procedure calls for the reduction on a pro-rata basis, or the curtailment, of all interchange transactions if five percent of more of the transaction flows across the overloaded facility. NERC considers the 5 percent threshold to be a reasonable limit for invoking TLR curtailments.

As noted previously, all transactions which cross control area boundaries (including purchases of energy to serve native load) are subject to the NERC TLR procedure on a comparable basis. But in supplemental comments submitted to FERC, STAFF REPORT by Electric Clearinghouse Inc. ("ECI"), ECI points out that NERC's own survey information shows that many transactions are not input into the interim Interchange Distribution Calculator. If the ILDC has incomplete data, then it is hardly possible to curtail in an equitable and non-discriminatory manner those power transactions most directly contributing to a transmission overload.

As also noted previously, the NERC TLR procedure calls for the reduction on a pro-rata basis or the curtailment of all interchange transactions if five percent of more of the transaction flows across the overloaded facility. However, there is some concern that the size of the transaction should be taken into account. For example, under the current procedure, a 100 MW transaction with 5 MW (i.e., 5 percent) flowing across the overloaded facility would be curtailed, but a 500 MW transaction with 20 MW (i.e., 4 percent) flowing across the overloaded facility would not be curtailed. This seems to be a perverse outcome.

[87] FERC Report, p. 5-6.

The Commission has not yet defined whether any particular situations are “emergency circumstances affecting system reliability” in which deviations from the standards of conduct may be justified. Nor has it identified specific emergency responses by transmission providers that would be inconsistent with the standards. Under these circumstances, it is possible that some transmission providers did not make appropriate EY filings for events that took place during the price spike. 52 The team suggests that the Commission consider providing guidance on what constitutes an emergency situation affecting system reliability and what actions are reasonable in such situations.

hoarding this asset.[88] As a result, markets may have appeared more constrained to buyers than they were in actual physical terms.[89] With a mix of planned and market driven behaviors interacting with genuine concerns about physical shortages, the actual state of the available physical system is difficult to perceive.[90]

---

[88] Thilly.

[89] Cal Second Report, p. 24

> Second, the presence of Existing Transmission Contracts (ETC) can cause "paper congestion." Many holders of existing transmission rights obtain them through contracts that include the right to schedule the use of the capacity after the closing of the Day-Ahead and Hour-Ahead markets. The ISO withholds the ETC transmission capacity during these markets in case the holder of contract rights decides to exercise its right to use the capacity as late as 20 minutes before the delivery hour and, in some cases, during the hour. Thus, when the Initial Preferred Schedule demand for transmission exceeds total transmission capacity less the capacity the ISO withheld during the forward market, congestion appears and congestion rents are collected. If the transmission rights holder does not use its capacity, there can be idle capacity in real time on transmission paths for which congestion charges were levied in the forward market. Until the ETC contracts expire or are modified so that the scheduling rights conform to the ISO's time-lines, these contract scheduling rights will continue to reduce overall efficiency in the market.

Ohio Report, p. 17.

> After the fact and in the course of the PUCO's investigation, Ohio's electric utilities, with the exception of Allegheny Power, reported no thermally overloaded facilities or unacceptably low voltage conditions impacting the continuity of electrical service to firm customers during the period in question.

[90] Cal Second Report, p. 24.

> First, prior to restructuring, when the three individual IOUs made operating plans to deploy their resources to meet the loads in their service areas, they took transmission availability into account. They knew how much transmission was available for their use and would not enter into purchase arrangements or schedule their generation in a way that would overload their network. They also considered generator and load ramp rates, and generator minimum-load constraints when producing their schedules. Transmission availability was also taken into consideration for inter-utility trades.
>
> The PX auction and resulting Initial Preferred Schedules, by contrast, do not take transmission, minimum-load, or ramp-rate constraints into account; the auction reflects only resource bids in the Initial Preferred Schedules. Hence, there is a greater chance that there will be transmission congestion when initial schedules are aggregated and compared with the transmission availability. In addition, minimum-load and ramp-rate constraints on generators that were previously internalized in the IOU resource-operating schedules, but which are not included in the Initial Preferred Schedules deriving from the PX auction, can result in infeasible schedules. Because a generator must comply with the requirement that it provide a

3. INFORMATION INADEQUACIES

Thus we have a new market with a multitude of complex transactions. One of the most important requirements for coping with this new market situation would be good information. Unfortunately, such information was not available. There is simply no centralized, reliable source of information.[91] Information is much more difficult to gather for system aggregators. Moreover, the brokers who were the sources of information may well have had interests that would be served by skewing information in one direction or another.

> Many buyers apparently did not have good information about what other buyers were paying for hourly power other than by asking sellers or brokers. While sellers can determine prices for forward, weekly and day-ahead prices through brokers, hourly markets are less developed and hourly price information is not available on a systematic basis. During the week of June 22, some market participants were thrust into hourly markets on very short notice. Without sufficient time to find the going price for power, many utilities appeared to purchase whatever power they could find for whatever price was offered. This may have led them to pay more than they needed to obtain power.
>
> Centralized trading institutions such as power exchanges and futures markets could have provided better price signals to the market and helped to reduce price volatility. Natural gas markets have shown futures contracts to be a valuable source of price discovery. For example, NYMEX's Henry Hub futures

---

> schedule for production consistent with its sales in the PX auction, the generators may find it necessary to submit schedules that they know are not physically feasible because of ramp-rate and minimum-load constraints. Therefore, because some of the generators will not operate according to their final schedules, some of the transmission congestion that appears in the Day-Ahead and Hour-Ahead markets may not actually occur in real time when these constraints take effect.

[91] FERC, Staff Report, p. 3-2.

> Although electricity markets have advanced considerably, market participants still use old-fashioned methods of price discovery. For example, most traders continue to rely on telephone conversations or faxes with counterparties to discover prices. Many traders also contact brokers for price information. Brokers are market makers who bring together buyers and sellers, and receive a fee for their services. Brokers do not take title to power and therefore are not regulated by the Commission. While brokers help with price discovery, there is not a single, centralized mechanism for price discovery in electricity markets. Institutions such as power exchanges and futures markets will help in making prices more transparent but they only indicate prices on a daily basis or for longer periods and will not provide price discovery in hourly markets.

> contract provides a reference point for prices in natural gas markets. Natural gas sales prices are often based on the Henry Hub price.
>
> Eventually, electricity markets need to move toward electronic trading. Fast-paced hourly power markets require resources for determining prices on an up-to-the-minute basis. Accurate and timely information is key to well-functioning markets.[92]

4. DEFAULTING ON OBLIGATIONS

One of the areas in which consumers have urged regulators to be active has been in certifying new entrants into the marketplace. The concern is that unreliable suppliers could hurt consumers or disrupt supply. Not surprisingly, defaults played an important role in some of the price spikes of 1998.[93] Although a relatively small amount of power was at issue, confidence in the ability of firms to meet commitments was shaken. The problem was compounded by the number of transactions and the structure of deals, as discussed above.

> In this regard, some persons interviewed by the team believed that defaults by marketers during the week of June 22 were a major factor in the price spike. These persons suggested that, by generally decreasing confidence that counterparties would perform, the defaults led to higher demand than would have been expected for hourly power in the latter part of the week. This higher demand was said to have stimulated higher prices, and contributed to the price spike.[94]

---

[92] FERC, Staff Report, pp. 4-3, 4-4.

[93] FERC, Staff Report, p. 4-2.

> The default of Federal Energy Sales on June 23 added to uneasiness in the market and caused traders to worry about the solvency of their counterparties. Federal Energy Sales had conducted business with a number of utilities and marketers, although some believed that Federal Energy Sales was engaged in questionable practices and had ceased to trade directly with the company. The default led to widespread uncertainty about the creditworthiness of counterparties and their ability to deliver.
>
> In addition to the general nervousness in the market, Federal Energy Sales's default contributed to the price run-up because its cascading effect left others in these "daisy chains" holding unfilled positions. As a result of Federal Energy Sales's default on call options contracts, the municipal utility of Springfield, Illinois (Springfield) defaulted on its options contracts with four large utilities. Power Company of America, a larger marketer, also defaulted as a result of contracts not honored by Federal Energy Sale.

[94] FERC, Staff Report, p. 4-16.

While attention has been focused on the default of electricity brokers, it appears that other institutions invoked contract clauses that sent some utilities scrambling for replacement power.[95] Moreover, given the chaotic and emergency situation under which transactions were being conducted, and because rules had not been clearly defined by authorities, even when they bought power, they could not be sure what price they would be charged.[96]

5. INEXPERIENCE

We find a market in which there is a frenzy to find reliable sources of power. Facing a chaotic and uncertain situation, bidders drove the price of power up.[97] These extreme

---

[95] FERC, Staff Report, p. 4-1.

> Several utilities interviewed by the team reported that generation outages and curtailments of scheduled power deliveries were also factors that forced them into hourly markets in search of power to serve native load. The experience of one utility demonstrates how utilities were thrust into hourly markets at the last moment. Months in advance of the summer, the utility had contracted for a large amount of firm power from a nearby utility. On the morning of June 25, the utility was notified that the neighboring utility would be unable to deliver the power because of a demand surge in its service territory. The utility was forced to go into the hourly markets in search of power.

[96] FERC, p. 4-5.

> During the price spike, disagreements arose about the price of emergency power. There does not appear to be a generally understood definition of what emergency power is and under what conditions it is sold. Some firms complained that they provided emergency power to utilities only to learn that the situation did not meet the specifications of an emergency. One utility that bought emergency power complained that it was quoted a price for the power at the time of the sale and later billed for an amount ten times as large. It seems that, in some cases, both those who bought emergency power and some of those who sold it may have taken advantage of the emergency designation. Especially in emergency circumstances, it is important that counterparties ensure that the terms of their agreements are clearly written and understood.

[97] Ohio Report, p. 25

> Market psychology may have an impact on prices in circumstances in which market participants overreact to emerging market events. Market psychology may unnecessarily drive the price of bulk power up, resulting in severe price spikes. During the final week of June, the default of two power marketers, Federal Energy Sales and Power Company of America, panicked many market players. Companies which held contracts with either of the two power marketers were forced to find alternative power supplies at excessively high market prices. In addition, due to the prevalence of "sleeving" in the market, market psychology reacted to a concern that other companies might also default. "Sleeving" occurs when a larger and more reputable market player acts as a middleman between a smaller, undercapitalized, company and another buyer or seller.

reactions to the defaults can be attributed in part to inexperience on the part of those who were caught short.[98] Individuals may learn, but they remain vulnerable if they need supplies.[99] Unfortunately, those seeking to manipulate markets may learn too. It is an open question which learning process will proceed most rapidly.

> There is some evidence that NGOs changed their behavior over time and in ways that led to higher prices at times of intermediate demand. We noted and discussed earlier the existence of a leftward shift in the scatter plot of Market-Clearing Price-Quantity pairs from August to September. But the causes of this shift require investigation and explanation.
>
> When we investigated in more detail, however, a pattern emerged suggesting that the bidding strategies of some participants became more sophisticated over time, and better directed to exercise market power. Using the BMI, we examined when bids were high and when they were low. Theory predicts that profit-maximizers will raise their bids when they expect to have more market power and lower them when they expect to have less. In the PX Market, the possibility of substantial market power arises during periods where demand is high. Hence, we examined the correlation between the Bid-Markup Index and the forecast of demand. For a profit maximizer this correlation will be positive; the firm will bid higher prices when it expects demand to be higher.[100]

---

[98] FERC, STAFF REPORT, p. 4-4.

> Lack of experience by market participants in commodity markets may have led some traders to pay higher prices than necessary. Some utilities believed that they could rely on the spot market for the summer rather than making forward commitments or long-term supply deals. Some had sold power forward for the summer earlier in the year when supplies seemed ample but then were caught short during the price spike. Were it not for those commitments, the utilities might have been able to avoid the high prices they paid. Utilities that do not normally depend upon hourly trading were thrust into hourly markets to buy replacement power after supplies were curtailed because of TLRs and generation emergencies.

[99] FERC, Staff Report, p. 4-4.

> Some companies reported to the team that they found it difficult to avoid paying high prices during the worst of the crisis on June 25 because of the short time required to decide on buying hourly power and their lack of experience in hourly markets. By June 26, some utility traders reported that they had already learned a few lessons, setting upper limits in advance on their hourly purchase prices. Although they learned quickly, the utilities' lack of trading experience cost them money.

[100] Cal Second Report, pp. 61-62.

Market participants had discovered that they could not count on firm financial transactions and that they were subject to what they perceived to be arbitrary declarations of emergencies or contractually correct, but extremely disconcerting cancellation of contracts. Facing an obligation to serve in such a hostile environment, aggressive bidding for supplies may not have been all that much of an over reaction, as discussed in the next section.

C. THE UTILITY OBLIGATION TO SERVE

The analysis of the factors considered thus far places a great deal of emphasis on the behavior of the purchasers of power. In a simple sense, if consumers will not pay the price, then it will not prevail in the market. It is obvious that utilities were willing, even desperate to buy power. This behavior was induced by a specific set of requirements that render the demand-side of the market vulnerable, at least under current conditions and obligations. These requirements and behaviors on the part of utility derive, in turn, from basic conditions of electricity as a commodity.

> Given the economic consequences to consumers and the threat to health and safety of interruptions of service in hot weather, utilities that experience a sudden shortage have little choice but to buy whatever power is available on the market at whatever prices are demanded. The essential nature of electricity service and the lack of storage make electricity a unique product that requires special regulatory oversight to prevent monopoly.[101]

1. FIRM SALES CUSTOMERS

Virtually all demand, certainly for residential customers, is still met by a utility obligation to serve. The obligation to serve becomes a virtual edict to avoid blackouts at all costs.[102] Consumers have generally supported this continuation of the fundamental principle of utility service. Electricity service is just too important to be unreliable.

---

[101] Wisconsin Public Power Inc., p. 3.

[102] FERC, Staff Report, p. 4-1.

> Aside from the fundamental factors such as weather, generation shortages and transmission constraints, a number of behavioral factors appeared to affect the market and contributed to the surge in prices.
>
> Utilities that were experiencing peak loads were trying to fulfill native load obligations, and marketers were trying to secure power to avoid defaulting on contracts. With more demand than supply, prices increased drastically.
>
> The desire by utilities to avoid blackouts at all costs fueled their determination to secure supplies. When prices reached thousands of dollars per MWh, utilities questioned whether

However, in an unfettered market for supply there are adverse consequences of this behavior. It is difficult for utilities to exercise restraint as supplies become tight.[103] Utilities need physical supply to meet their load. Marketers can default and negotiate or litigate damages.[104]

One obvious solution to the perverse incentive that the obligation to serve creates would be to release utilities from that obligation, thereby allowing them to reduce demand and place downward pressures on prices. However, unless the end-use customers also cut back, the result will be a shortfall of supply. Thus, on the demand-side one encounters the fundamental problem of the short-term elasticity of the demand and difficulties in demand-side management.[105]

> they should purchase power or shed load. At that point, several utilities reported senior management instructed trading personnel to pay whatever price was necessary to avoid blackouts. Discussions with various utilities indicated that, aside from their obligation to provide service, perceived pressure from state regulators and politicians was a significant factor in their decision to pay the prices they did for electricity…

[103] Cal Second Report, p. 48.

> Therefore, the "structurally induced" demand curves of the IOUs undoubtedly helped them and their customers. Yet, paradoxically, the IOUs might have reduced their payments considerably further, without incurring a penalty in terms of lower quantities… One conclusion, however, seems clear: the IOUs have not fully exercised their power to influence prices. Note that although the IOUs could have tried to affect prices in the PX market, they are constrained by regulators and by the ability of suppliers to shift between the day-ahead and real-time markets. The regulators require the IOUs to meet their customers' requirements and hence to buy the entire 33GW (adjusted for actual realization of end-use demand) in some market; the IOUs therefore have no control over their total purchases.

[104] Ohio Report, p. 39.

> The situation is further complicated because traditional retail regulatory policies and practices have relied on the concept of the obligation to serve. As a general rule, electric utilities obligated to serve their retail customers have sized their generation and transmission systems with that obligation in mind. Generation and transmission facilities that are built to meet the retail obligation to serve are placed in retail rate base so long as the underlying expenditures were prudently incurred and the plant remains used and useful. With these adequate assurances, electric utilities have over the decades built enough plant to serve their retail customers.
>
> At the wholesale level, however, there is no obligation to serve beyond the terms of the wholesale contract. As the Report establishes, the failure of several power marketers to deliver power pursuant even to contractual obligations contributed to the price spikes in the June market.

[105] Ohio Report, p. 24-25.

One issue is the fact that firm customers, who account for the majority of the increase in demand at peak, do not see real time prices.[106] Although the price impact is not immediate, there may still be an impact, although there is a disconnect between the market price and the consumer price.[107] There may be real constraints on the ability to respond, however, because

---

> Demand may remain unchanged (i.e., inelastic) because the end-user of the electricity is either unaware of the increase in price, is indifferent that the price has increased, or is not able to respond to a price signal by lowering consumption of electricity. Bilateral trades between market participants characterize the Midwest wholesale power spot market; consequently prevailing market rates are not readily accessible on a real-time basis. During the period in question, Ohio's industrial customers with interruptible buy-through contracts were the only end-users motivated to determine what the prevailing spot market prices were. Demand by the majority of Ohio's end-use customers remained unchanged because activities in the competitive wholesale power market were not directly relevant, let alone available to the state's firm retail consumers.

[106] FERC, Staff Report, p. 4-6.

> The fact that retail customers had no incentive to adjust their usage based on price contributed to the price spike. Retail competition, coupled with the ability to respond in real time, could allow customers to see the price of the power they use and react accordingly. Current demand side management (DSM) measures, such as requests for voluntary cutbacks in electricity use, can help in times of crisis, but generally do not provide an incentive for customers to respond effectively to price signals.
>
> When loads reach critical levels, utilities can implement certain DSM measures to help reduce loads. Utilities can issue public appeals to reduce consumption and interrupt customers in accordance with contractual arrangements. On Thursday, June 25, ComEd and public officials in Illinois issued public appeals for conservation. These appeals were effective in the sense that voluntary cooperation reduced peak demand when the price spike was at its height. However, if customers could have curtailed their usage in response to rising prices, the situation might not have become so critical as to require appeals for voluntary action. After the June price spike subsided, some utilities proposed mechanisms to promote a greater demand response by large retail customers. The proposed tariffs would allow certain industrial customers to sell their firm power entitlements back to their local utility when loads are at their peak or when other factors affect system reliability. These initiatives would help reduce the amount of power utilities would need to purchase on those days and would allow greater choice for customers.

[107] Ohio Report, p. 27.

> Staff has advised the PUCO that recent Mid-Year Adjustment (MYA) EFC filings of the AEP companies include unusually high includable cost rates for purchased power on form ER-18-S (Case Nos. 98-101-EL-EFC and 98-102-EL-EFC, filed August 21 and September 11, 1998, respectively). In Staff's view, the filings reflected the intention of those companies to include the unusually high costs associated with the June power purchases in the development of the EFC rates being proposed in these proceedings. Staff has taken steps with each of the AEP companies to remove such costs from their proposed MYA EFC rates. The PUCO will

of the capital stock.[108] Consumers have a preference for stable prices.[109] The prospect of being hit with a large bill – $30 or more – to cool a house on a hot summer afternoon is troubling. The may prefer stable prices that are slightly higher than extremely volatile prices.

There are other effects of price spikes that impose a cost on the public, however. The effort to maintain reliability with interruptions and cutbacks on usage impose a cost on the public. The public does suffer the inconvenience of cutbacks, without compensation. Firm customers are not compensated for their inconvenience, other than avoiding more severe disruptions.[110]

> establish MYA EFC rates by the end of November 1998, and will address the issue of the appropriateness of recovery of these costs in the companies' annual EFC proceedings in the Spring of 1999.

[108] Cal, Second Report, p. 69.

> We have spoken informally with various participants in California markets about demand-side response to prices. Many agree in principle that it is a good idea, but they cite various obstacles. The Power Exchange is working on some ways of breaking the logjam. More cynical participants suggest that the best way to get serious progress on demand-side response is to raise the real-time price cap and thereby the effective PX price cap, but this argument is speculative. We suggest that the FERC, STAFF REPORT, or the CPUC, organize a conference to bring interested parties together to discuss fruitful approaches to demand-side bidding, which surely will be an important issue in other deregulated electricity markets as well.

[109] One interesting indication of consumer preferences for stable monthly bills is their preference for flat rate telephone service. Given the option, consumers prefer flat rate service to measured service, even where it can be shown that they would have a lower bill with measured service.

[110] Ohio Report, p. 30.

> On June 25, Governor Voinovich issued a general request for voluntary conservation, and the request was reinforced by the state's electric utilities, consistent with established protocols. AEP, Cinergy, and FirstEnergy continued to request voluntary conservation efforts on June 26. Utility estimates suggest that voluntary conservation efforts resulted in peak shaving of 739 MW and 723 MW, respectively, on June 24 and June 25. No service curtailments were necessary due to capacity constraints that disrupted service to entire distribution circuits, though in isolated instances overloading of individual distribution transformers resulted in outages for individual customers.

FERC, Staff Report, p. 2-7.

> The fact that record loads were not reached in all cases may be partly a result of concerns over demands exceeding capacities, and the related curtailment of interruptible load and conservation actions taken in response. Curtailment of interruptible load and public appeals for conservation were necessary because loads were expected to exceed available power supplies that could be brought on line. The actions that were taken to balance supply and

2. INTERRUPTIBLE CUSTOMERS

Most demand-side analyses focus on interruptible customers who are believed to be more responsive to price signals. Interruptible customers are compensated for their inconvenience through the lower rates they pay for their power. They have nothing to complain about, unless the entity delivering power has failed to live up to the non-price terms of the tariff. There has been at least some concern expressed in this regard. The changing marketplace has altered the risks and rewards and there may be legitimate complaints about interruptible tariffs.

Interruptible rates are based on a regulated system that did not contemplate frequent interruptions.[111] Interruptible customers have received very favorable treatment (i.e. rates that are too low) given that they have rarely been interrupted. Moreover, they have generally complained and tried to avoid interruptions when markets were tight. They wanted to be treated like firm customers, even though they paid interruptible rates. If interruptible rates are to be effective, these customers must be prepared to actually be interrupted.

It may also be the case, however, that in much more volatile markets interruptible rates need to be redesigned because of the increasing frequency of interruptions. Rewards for releasing power need to reflect the higher prices being paid at peak.[112] There are also concerns

---

> demand and to maintain the reliability of the transmission system appear to have succeeded in maintaining system reliability without the need for the drastic action of rolling blackouts. However, some interruptible loads could not be served and considerable efforts were needed to rearrange transmission schedules at the last minute… these actions led to significant costs.

[111] Ohio Report, pp. 33, 34.

> In general, interruptible customers, while aware of the supply constraints affecting Ohio's electric utility systems, were dissatisfied with the situation confronting them. However, the PUCO's investigation discovered no circumstances in which electric utility actions affecting interruptible customers were inconsistent with the terms and conditions of interruptible tariffs or contracts in effect. Customers indicated that they had been receiving calls for interruptions much more frequently this Summer than in the past. While interruptible customers interviewed stated that diminishing reserve margins could, to a certain extent, account for increased numbers of interruptions, there remained significant concern about the number of interruptions being called for. Most of the customers pointed out that the Interruptible Buy-Through program provided them limited ability to protect themselves against high prices during periods of market volatility. From the customers' perspective, the Buy-Through program provides little protection against market volatility because it provides a limited window of opportunity to access economically priced power, e.g., day-ahead or in real time. Interruptible customers expressed an interest in having more options available to them to reduce some of their exposure during times of market volatility.

[112] Ohio Report, p. 34.

about the effort of utilities to meet their obligations,[113] given the high price they can fetch for released power or avoided for purchased power.[114] Indeed there are reported incidents of utilities interrupting some customers and then making off-system sales at high prices. Given the greater frequency and higher prices occurring in the marketplace, new rules on who is cut back and who is not and how customers are compensated may be needed.

> The customer also believed that other non-essential business customers were receiving service during the called emergency period. It was determined in the course of the investigation that the "non-essential" business customer in question was being provided firm, rather than interruptible service, so was not required to cut back load. The same firm customer, however, did voluntarily reduce load by about 15 MW at the request of the utility. This firm customer expressed dissatisfaction because it had heard that other customers with back-up generators were being paid $.50/kw for generating electricity during the curtailment period, while the disgruntled firm customer received no direct compensation for reducing load.

[113] Ohio Report, p. 35.

> The customer complained that the host utility arranging for the delivery of buy-through power was not applying its "best efforts" to acquire lower cost power. The utility in question made an after-the-fact arrangement with the customer to adjust the hourly buy-through price downward to $785/MWH in order to reflect the market price that day for an hour "slice" of a 16-hour block of power (16- hour blocks are routinely traded in the wholesale market). The average of the hourly buy-through prices on June 25 was approximately $1500/MWH.

[114] "Corporate Customers Demand Probe into Electric Utility Practices," *Wichita Eagle*, Mar 14, 1999.

V. MARKET FAILURE ON THE SUPPLY-SIDE

Thus far we have identified a series of factors that contributed to the price spike that are "innocent," if not benign, "inept," if not illegal. The constellation of events, obligations and frailties tightened the marketplace and drove participants to pay high prices without a purposeful intent to do so. If these were all the factors that created the price spikes there would be considerable room for public policy intervention. As noted, market participants and regulators have argued, and we agree, that there are institutional and structural problems that can be addressed to prevent future problems.

A. EXERCISE OF MARKET POWER

The broad concept of market power involves the ability of producers to increase price above cost and earn excessive profits.

> Market power is likely to be exercisable when a utility (or small group of utilities) control significant generating resources within the same area, a problem endemic to the highly concentrated utility industry. Abuses can also occur when only particular generators can be run to solve a voltage problem or must be run due to transmission constraints during certain seasons or time periods.[115]
>
> In a perfectly competitive market with six identical participants, we would expect that each participant would provide approximately 17% of the incremental energy. We interpret a disproportionate share of one firm as meaning that it had a larger opportunity to influence prices. Whether such firms used that opportunity is a separate matter…
>
> We conclude from these share numbers that at certain levels in the aggregate supply curve, a very small number of firms had the effective ability to determine the prices. In essence they dominate a horizontal slice of the aggregate supply curve, and other firms have vertical supply curves in those price regions, or bid all their capacity at lower prices. At other levels, many firms are bidding with sloped supply curves, and no one firm dominates. The Market Monitoring Committee is concerned about market concentration issues, and will monitor it closely in the future.[116]

---

[115] TAPS, p. 5.

[116] Cal, First Report, p. 21.

In order to be profitable, price increases must not cause a loss of so much market share as to render them unprofitable. Market share can be lost if either consumers can cut back or other suppliers respond to the price increase by expanding their output at lower prices.[117] Ironically, the price increases were so violent that suppliers did not have to sustain the high levels for very long to make substantial profits. Hundreds of millions of dollars changed hands quickly.[118]

This brings us back to the question of whether a $7,500 per MW price is reasonable. As noted above, marketers justify the price by assuming that people are building plants to run between 10 and 25 hours. Such extreme assumptions would be hard to sell on Wall Street, so the analysts also considered a somewhat more plausible case. They considered the assumptions that investors might build plants that were expected to run between 10 and 25 hours for a period of five years.[119] Instead of 10-hour plants, they assumed that plants would be built to run for 50- 125 hours. The estimated "economic" price declines to $1,000 to $5,000 per MW.

> It is important to recognize peaking capacity is just that, capacity and not energy. Its value lies in its availability for a very few hours over its lifetime. The values shown in the example below are representative of the capital costs of simple cycle gas turbines, which are the standard for peaking capacity in the Midwest.
>
> - A single-cycle gas turbine (peaker) costs roughly $250,000 per MW to install
>
> - The turbine is built to support only the hours that experience high prices in June 1998, i.e. 10 top 25 hours of high prices.

---

[117] Ohio Report, pp. 44-45.

> The Department of Justice and Federal Trade Commission define market power as "the ability of a seller profitably to raise prices above competitive levels for a significant period of time." These examples of anti-competitive behavior with respect to transmission constraints are, in reality, examples of market power abuse, which the new institutional structure of an ISO would seek to prevent. An ISO's planning directives are also sought as a structural reduction in the barriers to entry of new rivals into the market by identifying opportunities to facilitate merchant investments in transmission and generation to alleviate the system constraints that decrease reliability of economically priced power.

[118] "Marketer Bankruptcy."

[119] Enron.

- The cost per MWH of the peaking capacity would be $10,000 to $25,000.

The $7,000 per MWh price – the highest reported for June 1998 in the popular press – is clearly less than this. If we assume that the units will be used over 5 to 10 years, then a reasonable fixed charge rate for capital would bring the cost to $50,000 per MW, which if operated for 10 to 25 hours per year, would reduce the cost to between $2,000 and $5,000 per MWh. Again, this is not out of line with the values recorded on June 24 and 25.

Others find these assumptions to be absurd for a number of reasons.[120]

- Actual recovery periods are longer than assumed and rate base plant would use much longer periods. The useful life of the plants is a lot longer than five years. The capital equipment lasts for twenty to thirty years. Gas contracts, which are necessary to make the plants operable, run for longer periods as well.

- The periods of tight markets appear to be longer than 10 to 25 hours per year. The capital cost of a merchant peaking facility is more likely to be recovered at over 1,000 "peak/peak" hours rather than 100 peak hours.[121]

- The evidence suggests that recovery of capital costs (margins above incremental, variable or operating costs) takes place in shoulder and perhaps even off-peak periods. The California data found 100 hours per year when prices were high and much longer period when contribution to fixed costs would be realized.

Long lives for facilities and more peak/peak hours would dramatically reduce the estimated cost per MW that is justifiable in economic terms. Figure V-1 shows the relative cost per MWh of the various approaches over time. The economically preferred choice depends upon the expectations about the number of hours in which costs will be recovered and the aversion to price spikes.

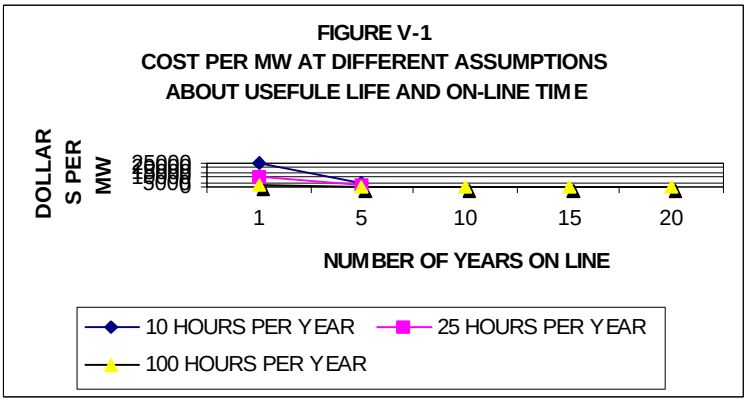
The price spike necessary to pay for the merchant approach could occur at any moment. The rate base costs are incurred over the full recovery period. If consumers are forced to pay the full price spike costs in real-time, as the defenders of the merchant approach advocate, consumers may have be willing to pay for level, but slightly higher prices. The

---

[120] TAPS.

[121] Cal Second Report, p. 66.

FIGURE V-1
COST PER MW AT DIFFERENT ASSUMPTIONS ABOUT USEFULE LIFE AND ON-LINE TIME



prospect of paying $30 to run a central air conditioner for on a hot summer afternoon, exactly the time the consumer wants it most imposes a psychological and budgeting costs that consumers may want to avoid.

1. WITHHOLDING SUPPLY TO INCREASE PRICES

The analysis of the market structure leads to the conclusion that market power can be exercised in these markets because they are thin.[122] With little supply available at certain times and few competitors, there is no need to identify or assume collusion, since supply is so restricted.[123] The analysis of bidding behavior indicates that market power was being exercised.

---

[122] Cal First Report, p. 20-21.

> Our limited examination of bidding behavior, however, does provide considerable suggestive evidence that the energy markets are at times thin and not fully competitive. Therefore, any actions taken by the ISO to improve the Ancillary Services markets should be carefully scrutinized to be sure they do not adversely affect the energy markets. This is especially important since the volumes of the energy markets are about ten times larger than the volumes in the Ancillary Services markets.

[123] Cal Second Report, p.56.

> These calculations are made for a hypothetical generator; they are not based on any actual generator. Nevertheless, some implications of the model are interesting. Even with absolutely no collusion among them, generators the size of the NGOs have a strong incentive to bid above marginal costs, to drive up prices and profits.26 Therefore, high prices during periods when PX offered supply is less than "true" PX demand are likely to continue. There are two plausible ways to ameliorate this. One is to enhance supply to the PX by encouraging efficient entry, reducing the amount taken in Ancillary Services and other markets, and possibly by other methods. The other route is to increase the responsiveness of demand to price by creating programs for true demand reduction when prices exceed say $100.

Cal Second Report, p. 49-50.

> We conclude that while the incremental set of firms is often large and varying in composition, there are certain segments of the aggregate supply curve, corresponding to very high-load conditions, in which a very small number of firms had the effective ability to determine the prices. In essence they dominate a horizontal slice of the aggregate supply curve, and other firms have vertical supply curves in those price regions, or bid all their capacity at lower prices. In other segments of the aggregate supply schedule, many firms are bidding with sloped supply curves, and no firm dominates. In our analysis of individual behavior we focus on the key participants, the generators who often comprise the incremental set.

> The high volume of zero-price bids implies that the supply side of the energy market is "thinner" than it first appears. For example, suppose energy demand is 30,000 MW, zero bids are 20,000 MW, and one firm controls 3,000 MW of gas-fired capacity. It is more accurate to view this firm as having capacity equal to 30% of the price-setting portion of the supply base, rather than 10% of the overall market.[124]
>
> Ironically, although some hope that market participants may learn how to better protect their interests and reduce their exposure to risk and rising prices, others may learn how to manipulate or tighten the market.[125]

The most blatant exercise of market power is the withholding of supply. A supplier with market power watches the price rise, well above it level of costs, but does not sell because he is confident that there are not enough other producers who can enter the market.[126]

---

[124] Cal Second Report, p. 18.

[125] Cal Second Report, p. 22.

> [T]here is a noticeable decrease in quantity at a given price as one moves from the July-mid-August period to the mid-August –September period. In addition, at the lower load of about 20,000 MWh, prices are higher during mid-August – September than during July – mid-August. During the later summer months not only were prices high and volatile, but also for a given market-clearing price, the market-clearing quantity was lower than it was earlier in the summer.
>
> the relationship between market-clearing prices and quantities for the period of October 1 through December 31, 1998. During these months, market-clearing quantities exceeded 25,000 MWh for only a few hours. Similarly, market-clearing prices rose above $40/MWh sporadically for a relatively few hours, those which reflected the cold weather and high loads at Christmas time. A comparison of Figures 5 and 7 reveals, however, that although the range of market-clearing quantities was similar in the April-June and October-December periods, the market-clearing prices for comparable loads were higher later in the year. A reduction in hydroelectric generation was a cause of part, but not all, of this shift.

Cal Second Report, p. 64.

> We have not constructed a precise model of actual versus profit-maximizing behavior by firm. Rather, we view these results as indicating principally that the behavior of some participants did evolve, in the direction of more strongly profit-maximizing behavior. This provides a partial explanation for higher prices' being observed in September as compared with the prices for similar market-clearing quantities in August.

[126] FERC, Staff Report, p. 3-15.

> While the amount of hourly trading and hourly prices increased on June 25, day-ahead trading volumes for June 26 decreased. In light of the huge increases in hourly prices on June

The problem of manipulation of bidding is not one that is likely to just go away. Nor is it limited to conditions where markets are extremely tight. The electricity market in the United Kingdom, which has been cited in the course of the restructuring debate in the U.S., has exhibited repeated problems with bidding and supply behavior.[127]

2. FORECLOSING ENTRY OF SUPPLY

Withholding supplies is one strategy that can drive prices up and increase profits. To the extent that such a strategy is dependent upon the inability of competitors to offer supplies, the success of the exercise of market power can be enhanced if competitors can be prevented from entering the market.

> 25, sellers were said to discourage daily deals in hopes of being able to obtain high hourly prices again on June 26. Moreover, utilities reportedly did not want to enter into daily transactions for June 26 because they feared that such deals might endanger their ability to serve native load.
>
> Day-ahead prices for June 26 reflected these developments: they were reported to reach unprecedented levels, but were lower than the highest hourly prices on June 25. Day-ahead prices per MWh climbed to maximums of $500 in MAPP, $1,300 in Southern, $2,000 into Entergy, $2,800 into ComEd, $3,600 into Cinergy and $4,900 into TVA. In contrast, the maximum reported per-MWh day-ahead prices for June 26 were stable for north MAIN, Ameren and north ECAR, as compared to the maximum day-ahead prices for June 25 for these areas.

[127] Newberry, David, "Viewpoint: Freer Electricity Markets in the UK: A Progress Report," *Energy Policy*, 26:10, 1998, pp. 746-747;

> In short, the overall cost reductions were not huge – at 5% for ever – but then the industry was moderately well operated before privatization. All the gains were reaped by share-holders, and the reason is that the price of electricity did not fall anything like as much as the cost of fuel or the reduction in other non-fuel costs, which also fell significantly.
>
> Could we have avoided these adverse distirbutional outcomes? Almost certainly, though it would have been politically difficult. The most obvious criticism is that he industry was not made sufficiently competitive at privatisation. Richard Green and I published an article in the JPE in 1992 arguing that dividing the fossil plant among five generating companies would have eliminated most market power, lowered prices, and delayed some of the entry of gas generation…
>
> More competition in the pool might have avoided criticism of manipulation, though it would probably not have led to less volatile prices, which are as much of a feature of competitive markets as manipulated markets. If there had been more generators, and if the supply business had been separated from the wires business, as is now proposed, there would have been less objection to vertical integration between supply and generation…

"Interview – UK Power Pool Says Reduces Price Surges," *Reuters*, April 16, 1999.

> In addition, I believe that there is a tremendous incentive for transmission owners to hoard transmission capacity as insurance, given
> of us believe that hoarding has been prevalent up to this point. This new incentive can only make matters worse.[128]
>
> Possible manipulation of the transmission market using swaps or similar transactions in the manner described in Chapter 4 was mentioned by several respondents to the team's data request. There are clearly powerful incentives to manipulate transmission capacities to take advantage of the value of transmission when it is congested. The team does not have any direct evidence that these kinds of transactions occurred around the time of the price spike. However, given the incentives for transmission providers to engage in swaps, the team suggests that staff improve its methods for detecting and monitoring them, and for determining whether they are unduly discriminatory or preferential.[129]

In the overview of the debate we highlighted the intensity of exchanges over transmission capacity. Even the FERC has concerns about the declarations of emergencies that shut down the flow of electricity[130] This underscores the importance of transmission capacity constraints and the advantage that can be gained by declaring an emergence and favoring one's own power over that of a competitor. There were at least two avenues that can be used to exploit the transmission system to the advantage of an entity with this source of market power.

---

[128] Thilly, p. 4.

[129] FERC, Staff Report, p. 5-7.

[130] FERC, Staff Report, P. 5-6.

> The EY filings the Commission received that concern the June price spike, as well as the operational conditions set forth elsewhere in this report, leave no doubt that emergencies existed that adversely affected system reliability during the price spike. Moreover, the EY filings reveal that some transmission providers took actions that were inconsistent with the standards of conduct.
>
> Inquiries into the particular EY filings listed in Table 4-1 were beyond the scope of the present report. However, the team believes that further investigation of the filings is appropriate. Some of the EY filings do not include enough information to enable the team to determine whether particular transmission providers' actions could have affected the price spike or unduly favored wholesale merchant affiliates. Although it is important to ensure that transmission providers can protect reliability in emergency situations, it is also important to ensure that transmission providers take only those actions that are needed to protect reliability. The team believes that investigation of the circumstances of the EY filings for this summer is warranted.

As discussed earlier, transmission capacity can be taken off the market with the declaration of emergencies, which prevents entry of supply.

> The alternative is to use bottlenecks to extract monopoly rents.
> Swaps are essentially exchanges of positions in time and/or space. For example, delivery of power at one destination in the present may be exchanged for delivery of power at another destination at some point in the future. These types of swaps are common transactions in both electricity and natural gas, and normally facilitate trading. But, they can also be used to circumvent regulations in some cases. The team heard several allegations that swaps were being used to circumvent maximum tariff rates. [131]

The power moves, but the price is too high. The transmission owner captures excess profits. Such pricing is illegal, but there are ways to avoid the constraints on pricing.[132]

---

[131] FERC, Staff Report, p. 4-7.

[132] FERC, Staff Report, p. 4-7.

> [A]ssume one company owns transmission facilities that are essential for moving power from Area 1 to Area 3. A shipper asks for transmission from Area 1 to Area 3, where the shipper has a customer willing to buy power. Assume the customer in Area 3 is willing to pay $40 for power, and that the shipper can acquire power in Area 1 for $25. Assume further that the maximum transmission rate across Area 2 is $5. Several parties have claimed that a transmission owner at Area 2 will refuse to move power across their system (Area 2), but offer to accept power at Area 1 and, at the same time, move an equal amount of power to Area 3. As one respondent put it, the transmission owner said, "If you can get the power to us, we can get the power to your customer." At the same time, the transmission owner was allegedly claiming that no transmission was available to ship power from Area 1 to Area 3. This type of swap might be done for several reasons, including:
>
> • To collect charges above the maximum tariff rate…
>
> • To charge congestion-related prices in an unapproved form…
>
> The team found no reason to believe that using swaps in the manner described here was any more of a problem during the June event than at any other time, and found no direct evidence linking the practice to the high prices that occurred. However, the problem was mentioned by several respondents, and there are clearly powerful incentives to manipulate transmission capacities to take advantage of the value of transmission when the transmission grid becomes congested, so the lack of evidence does not demonstrate the practice does not exist.

B. MANIPULATION OF TRANSACTIONS

1. UNNECESSARY TRANSACTIONS FLOOD THE MARKET: DAISY CHAINS

Earlier, the increase in the number of transactions was noted as a factor that created pressures on the market. The nature of the many of the transactions was also problematic. At least some of the transactions appear to be less than kosher. FERC refers to them as Daisy Chains.

> Daisy chains are responsible for much of the increase in volume. While marketer sales have undeniably grown a significant portion of the sales are part of extended "daisy chains." Daisy chains involve the re-trading of power by a number of different market participants, primarily marketers, many of whom have no intention of physically delivering the power. These deals represent multiple resales of the same generation that used to flow directly from vertically integrated utilities to their ultimate customers or to other distribution utilities for resale to ultimate customers. Market participants have reported that, in some cases, marketers take title to power for the sole purpose of increasing their total volumes traded.[133]

Power passing through a long line of sequential owners without ever physically being delivered, except by the last owner, adds no new supply to the market. This pattern of ownership serves no apparent purpose but to increase the price. The prevalence of these daisy chains is striking, running as high as 80[134] to 90 percent.[135]

---

[133] FERC, Staff Report, p. 3-2.

[134] American Public Power Association, *Electricity Prices and Volatility in Transition to Competitive Market (*Washington, D.C, May 1998). FERC, Staff Report, p. 4-9.

> According to market participants, approximately 80 percent of power marketer transactions are "financially firm" transactions that do not involve the physical transfer of power. Sellers of financially firm products do not control actual physical generation but promise to pay the necessary price to procure supply if the buyer needs the power. The entrance of new marketers, many of whom deal only in financial transactions, has helped to increase liquidity—the ability to get into and out of financial positions—in power markets. However, since many of these transactions are not backed by the ability to physically deliver power, they add to the volatility of prices under peak conditions, as seen in the June event.

[135] FERC, Staff Report, p. 4-10.

> These two-way transactions involve the use of brokers and their role in attempts to manipulate prices by sending false signals about the state of the market. As trade volumes

This institutional structure was clearly implicated in the price run-up when financial transaction increased apparent demand. In tight markets traders financial problems add to the bidding for power.[136] Entities with needs for physical power compete with entities with financial needs for power, but the underlying physical supply and demand have not changed.[137]

> have escalated and daisy chains have lengthened, brokers are being used as sources of information and independent facilitators of trade. Even large marketers often feel they have insufficient knowledge of the deals being made in the market, and use brokers is a way of knowing "where the market is." Large marketers also use brokers as a way of dealing with each other without revealing their positions. It is difficult to get evidence of the level of brokered transactions, because the brokers never take title to the power and are not entities jurisdictional to the Commission. By one estimate given to the team, however, brokers are involved in up to 90 percent of the deals…
>
> The team has not received any direct evidence linking the use of two-way transactions and the specific conditions of the June event. Further examination of these allegations may be warranted.

[136] FERC, Staff Report, p. 3-20.

> These high demands included any demand that arose because traders who were concerned about defaults were searching out sources of physical power in lieu of facing potential liquidated damage claims from other parties in a chain of defaults. Under normal circumstances, these traders would not be in the market for physical power. Instead, they would have "booked out" these transactions and these transactions would have been purely "financial." However, because the transactions were still in a financial title chain, they were still potentially subject to liquidated damage claims. Traders did not know whether they might be in a chain of transactions that included a default. They did not want to be subject to damage claims from others who were seeking only to pass on their own costs and may have had no interest in minimizing the amount of a claim for liquidated damages.

[137] FERC, Staff Report, p. 3-20.

> Traders with such concerns were looking for physical power. This demand did not represent new, ultimate sources of needs for physical power during the day. No loads were added by the actions of traders looking for physical power. But the demands did add to the total demand, by adding to the number of parties looking for physical supplies. Since there was no way for buyers to know whether the prices reflected responses to real power needs or only responses to needs to cover financial positions pursuant to a default, prices rose in response to this financially-driven demand without the usual connection to the underlying physical needs. Utilities with an obligation to serve were in a position where they needed to make sure their system was reliable and that as much of their load as possible was served, and their responses also contributed to the rapid rise in prices.

The following description of the frantic bidding brought out by the Daisy Chains, offered by a merchant generator, underscores that even without manipulation the pattern of deals created problems.

> Financial deals are usually traded among numerous parties, and booked out by other financial deals. In this case, after a few partied defaulted in the financial market, those parties down the default chain went dipping into the hourly physical market to try t purchase energy in order to mitigate the heavy liquidated damages penalty they would otherwise incur. Thus, for example, ten parties may have pursued the same 50 megawatts to meet the same single obligation, actually outbidding each other and forcing the price of energy to skyrocket. Some load serving entities already buying in the hourly market had to increase their reliance on that market significantly because they got caught short relying on the financial market and had obligations to their native load and other third parties.[138]

2. TWO WAY DEALS

As odd as daisy chains may seem, there are other transactions that are even more suspect. At least some of the transactions on which the market was built were fabrications – deals in which the buyer and seller were one and the same. A broker sells to himself at an elevated price to send the impression to others that the price is rising.

> Although market participants expressed many concerns about manipulation of the market that were not very specific, others described specific practices that they believed were questionable. Two specific practices identified during interviews with market participants were the use of swaps to circumvent maximum tariff rates and the use of brokers to create false impressions of the current price in the market. Neither of the practices appears to be a direct cause of the price spike, but both diminish confidence that market institutions are working in a fair and nondiscriminatory manner and appear to be potentially questionable.
>
> Brokers and "Two-Way" Transactions. A marketer complained to the team that other market participants had manipulated options and forwards contracts to increase the prices for power beyond levels that could be forecast by fundamental factors such as weather, the availability of generation, and transmission constraints. Among the manipulative schemes alleged by the marketer was the use of simultaneous bids to buy and sell power that had the effect of raising forward prices to levels at which marketers with generation

[138] PECO, p. 3.

> capacity could be assured of profitable power sales. The scheme is sometimes called a " two-way" transaction.[139]

The defaults that fueled the frantic bidding had been caused in part by the nature of trading. As prices mounted, so too did the cost of failing to meet financially firms contracts.

> The defaults resulted because firms sold call options without the ability to fulfill them if the options were exercised. A number of market participants sold call options because they were seen as a profitable endeavor. Before June 1998, it was rare for options with strike prices higher than $50.00 per MWh to be exercised, and unexercised options allowed the seller to simply pocket the premium. However, when prices began to climb and traders tried to exercise their calls, sellers who had not covered the calls could not honor them and were forced to pay liquidated damages or default.

3. CONFLICTS OF INTERESTS

Daisy chains and two-way transaction are suspect trading activities of new power brokers. Utilities are not beyond suspicion. Their entry into the market through affiliates raises questions of conflicts of interests. FERC recognizes that these conflicts may have contributed to the run up in prices.[140] The PUCO was more definitive in its concerns.

> In the course of the investigation, it became apparent that Ohio's electric utilities are engaged in a variety of arrangements whereby wholesale power transactions are consummated. In some instances, electric utilities act exclusively through subsidiary trading arms to effectuate wholesale trading on behalf of the affiliated regulated entity as well as on behalf of the parent corporation's stockholders. In other instances, for example the case of AEP, a trading group under the service corporation umbrella uses the trading licenses

---

[139] FERC, Staff Report, pp. 4-7, 4-8, 4-9.

[140] FERC, Staff Report p. 3-1.

> The transition from tight regulation to a market orientation has created two conflicting regimes in the electric power industry. In the unbundled environment of Order 888, investor-owned utilities offer open access transmission service to wholesale customers. However, utilities continue to provide cost-based bundled services on behalf of their native load customers. This circumstance forces utilities to perform an awkward balancing act between the two regimes. It also permits utilities to "forum shop" for the regime that better suits their needs and may provide the opportunity for discrimination. The existence of these two regimes has created a degree of uncertainty for market participants and may have been a factor in the June event.

> of the regulated operating companies to effect trades, for the benefit of operating company customers as well as for the benefit of stockholders. The investigation revealed that the respective accounting practices of Ohio's electric utilities as regards wholesale power trading are not uniform. These complications and irregularities will require significant attention in EFC proceedings before the PUCO, to assure that jurisdictional customers are not unduly subject to costs imposed by speculative trading.[141]

Favoring affiliates with access to transmission is only one potential manner in which incumbents can control the market to their advantage. Industrial customers complained that incumbent utilities had diverted their own supplies as profit maximizers. There are even reports of customers being interrupted to free power to be sold into the extremely tight market.

> The industrial customers were angered early on when they discovered Western and KGE had firm contracts to supply power to other utility companies. KGE delivered power to those utilities when it was cutting back power to its own business customers.
>
> The new documents show that KGE had plenty of power to take of all its regular customers, including outside utilities, if it had not been sending large amounts of power to KPL.
>
> Now, Zakoura says, the industrial customers are asking whether Western may have been shifting KGE power to KPL, then selling it to other utilities at highly profitable, spot market prices.
>
> Western also had an incentive to use the cheapest power available. Most of its contracts preclude the utility from passing on to customers the added cost of buying higher-priced power. So the added costs of buying power from other sources could have come out of the company's profits.[142]

---

[141] Ohio Report, p. 29.

[142] "Corporate Customers Demand Probe into Electric Utility Practices," *Wichita Eagle*, Mar 14, 1999.

VI. PUBLIC POLICY RESPONSES TO THE PRICE SPIKES:

A. A CONSUMER VIEW OF THE PRICE SPIKES OF 1998

Reviewing these events and interpretation from the point of view of the analytic paradigm, it is clear that the transition to competition in electricity creates an institutional structure that embodies a clash of incentives, obligations, market structures, and regulatory paradigms (see Table VI-1). The first year of experience with fully restructured markets not only demonstrates that these long-standing consumer concerns were well founded, but that another major concern must be added to the list – volatility in electric commodity markets must be carefully reviewed and steps taken to prevent manipulation of markets.

Utilities still have an obligation to serve and maintain service. This "structurally induced" demand creates a volatile compound when it interacts with the powerful market forces that have been unleashed by restructuring. Market tightening natural events – weather and accidents – can be reinforced by unnatural events – manipulation of supply and gaming of regulatory structures. Underlying forces of supply and demand are tight and market institutions are undeveloped. The result is a concoction that may become downright explosive.

Are these just growing pains? We conclude they are not. Even if they are, we would ask whether there are ways policymakers could ease the pain with better policy choices or policy implementation?

1. MARKET DISRUPTIONS REFLECT STRUCTURAL PROBLEMS

Repeated price spikes in the Mid-West and on the West Coast cannot be dismissed as one time events that will not be recur. While it is certainly true that the inexperience of market participants and the undeveloped nature of market institutions contributed to the first year problems, the incidents occurred in too many places and times to be brushed off. There is too much evidence of gaming and manipulation of markets to dismiss the problems as minor or transitory missteps of an immature market.

The primary reason these dramatic events cannot be easily dismissed is that the structural weaknesses CFA/CU identified lead directly to the behavioral problems experienced in these markets. These are not accidents or aberrations; they are exactly the behaviors one would expect to occur when rational economic actors take advantage of market imperfections and institutional weaknesses. They should be not tolerated in the short term as the cost of the transition to competition. Under any circumstances they are anti-consumer; in some cases they are unethical and illegal. They will not go away unless policymakers address and solve the underlying institutional problems. Regulators must show that they are willing to enforce rules that will establish an orderly market.

TABLE VI - 1
PRICE SPIKE ELEMENTS WITHIN THE STRUCTURE, CONDUCT PERFORMANCE PARADIGM

BASIC CONDITIONS	
SUPPLY	
Raw material	Natural gas has not been responsive to electricity prices
Technology	Generation Outages, transmission shutdowns
Product durability	Inability to store electricity
Legal framework	Partial regulation, licensing
DEMAND	
Price elasticity	Extremely low short run
Substitutes	Lack of substitutes
Rate of growth	Demand exceeds supply in Midwest
Cyclical and seasonal Character	Weather-related demand
Purchase method	Obligation to serve, induced demand
Marketing type	Lack of incentive to cut back
STRUCTURE	
Number of sellers	Few sellers
Number of buyers	Constrained demand by utilities, limited end-user choice
Barriers to entry	Transmission constraints, emergencies
Cost structures	High fixed
Vertical integration	Affiliate relations distort market
Diversification	Utilities add brokerage
CONDUCT	
Pricing behavior	Complaints of hoarding, gouging
Legal tactics	Defaults, abrogation of contracts, daisy chains, two-way deals,
PERFORMANCE	
Production and allocative efficiency	Huge price spikes
Equity	Big winners and losers
POLICY	
Regulation	Transmission rules create problems
Price Controls	Allowed in California, requested elsewhere
Antitrust	Hoarding, daisy chains, two-way deals
Information provision	Lack of timely, objective information

2. BASIC CONDITIONS

We arrive at this conclusion by examining the natural history of the price spikes of 1998. The analysis starts from the proximate causes of the price spikes that many parties claim are "uncontrollable." These include weather, accidents and the inability to reduce demand.

Generally, these are basic conditions that are long-term, if not permanent. On the supply-side, technology prone to outages in the supply of a commodity that is impossible to store creates significant potential for supply-problems. On the demand-side, we find consumption significantly influenced by weather. Demand is also affected by the stock of capital equipment deployed. Pricing structures also give little incentive to alter demand in the short-term. These pricing and marketing structures can be changed, but they are long-standing and may encounter consumer resistance for a variety of reasons.

While it is clear that these factors are not controllable, the evidence we review also suggests that these factors were not sufficiently more powerful in 1998 than earlier years as to account for a 3000 percent increase in the price of peak power. Therefore, we ask whether there are factors inherent in the transition to a competitive market that can account for the dramatic run-up in prices. Were there new market conditions that made matters worse? We find many potential culprits.

3. RESTRUCTURING PLACES PRESSURES ON EXISTING ARRANGMENTS

The evidence clearly indicates that there are ways in which new market institutions and transactions made the likelihood of accidents greater. Accidents do not just happen; controllable conditions and circumstances can make them more or less likely to occur or make their consequences more or less severe. Impairment of critical functions, like coordination of outages or counterproductive rules for allocation of scarce bottleneck resources can restrict supply. Increasing transaction can place greater demands on the system and create a situation in which it is more likely to break.

One of the key factors that drove prices up was the need of utilities to ensure physical availability of supplies. For all the focus on market efficiency, the ultimate test of electricity service is keeping the lights on and some entities still have the obligation to ensure that they do. The obligations and incentives of these entities drives them to what can be considered extreme behavior from a simple market point of view. They are driven to pay an awful lot to meet demand.

4. STRUCTURAL WEAKNESSES FACILITATE ANTICOMPETITIVE, ANTICONSUMER CONDUCT

Since there is more to the price spikes than these basic conditions, it would be a mistake for policymakers to stop their analysis and their action at this point. There is considerable evidence that structural flaws in the marketplace led to breakdowns in conduct – purposeful actions taken to increase the prices paid to market players who would thereby increase their profits. As one utility put it "these exorbitant prices are the result of market power." [143] In fact, we can find evidence of at least some sinister actions in each of the areas we have identified as contributing to the price increase.

Self-interested behaviors that appear intended to exploit and reinforce the frenzied behavior in the market were not prevented by market structures or institutions. These include the exercise of market power by withholding supply to increase price. Since transmission is a bottleneck to short term supply, it can be abused to foreclose entry by alternative supplies through manipulation of transmission access.

Trading institutions were also inadequate. The shear magnitude of the increase in financial transactions alone may have contributed to an overheated market. We also find that there are a numerous transactions that are complex and some that are shady at best, illegal at worst, which may have purposefully overheated the market. Bogus financial transactions contributed to the overheating of the market.

B. POLICY IMPLICATIONS

While it can be argued that the price spikes of 1998 have not harmed the residential ratepayer, there is little doubt that if the market fails to perform better it will have an impact on ratepayers. This review of the events of 1998 and their underlying causes indicate that the relatively simple approach to electricity restructuring pursued in a number of jurisdictions leaves much to be desired. There were too many structural and behavioral problems implicated in the price spikes to be ignored.

The market will look most orderly where it is needed the least. When capacity is plentiful or transmission is least stressed the chance that accidents will trigger painful events and the opportunity to abuse market power will be least. Policymakers might have hoped that such conditions would smooth the transition to a competitive market, but that has not been the case. Since it is now clear that untoward events can occur, policymakers have an obligation to actively consider whether the underlying conditions are conducive to consumer abuse and to take measures to prevent it. In 1997 it policymakers could get away with the belief that the market would take care of things; in 1999, they cannot.

---

[143] Southern California Edison, *Public Power Weekly*, July 20, 1998.

It is simply impossible to ignore this array of factors and simply state that the market will get the job done. FERC uses the term "eventually" to describe one of the most important functions and requisites of markets, the provision of honest, reliable, clear, timely information. Eventually is not an option. Policymakers have an obligation to provide a much better basis for effective markets for a commodity as vital as electricity.

Policy makers should adopt explicit and vigorous policies to prevent the manipulation of electricity markets.[144] Given the observed behavior of markets, policymaker should be prepared to act in four areas, roughly equivalent to basic conditions, market structure, conduct and performance. We offer the following general principles.

- Policy makers have an obligation to ensure that the basic conditions are adequate to support competition before they unleash market forces. It is simply irresponsible to create markets that suffer from significant problems like inadequate capacity at the outset.

- Market structures must support competition. The number of suppliers and their ability to bring product to market must be sufficient to deliver workably competitive markets. Highly concentrated markets with bottleneck facilities that lack open access rules make the market prone to the exercise of market power.

---

[144] Consumer Federation of America and Consumers Union, *Digital Divide* (Washington, D.C., 1999), p. 10.

> While competition and its fruits may some day develop to serve the mass market, it is clear that at this point in time the Act has been a total failure for most consumers. The reason for this lack of success is straightforward: the fundamental assumptions applied to the industry in the Telecom Act have proven incorrect. Neither the demand-side nor the supply-side of the telecommunications industry has performed anything like Congress anticipated or hoped for.
>
> On the supply-side, the Telecom Act's excessive reliance on undeveloped market forces to replace price and ownership/structural regulation has resulted in industry concentration through merger, rather than an eruption of competition. The urge to merge rather than compete has engulfed virtually all facets of telecommunications, leaving consumers paying inflated prices for the services of monopolies that are becoming more, not less entrenched.
>
> It is time for policymakers to stop pretending that competition is right around the corner. It is unrealistic and possibly duplicitous to pooh-pooh today's price hikes as nothing more than a short-term setback or to blame the failure of competition and the absence of promised price reductions on regulators standing in the way. Policies must be adjusted to reflect the reality that the core telecommunications and TV services that are consumed in modest quantities by average consumers – individually and as a package – are and will be provided under monopolistic conditions for the foreseeable future.

- Market institutions should be developed before, not after trading begins so that conduct is transparent and disciplined by market forces. Undeveloped information and trading mechanisms are prone to manipulation. When abuse occurs under such circumstances, it is no accident; it is the result of bad public policy choices or poor policy implementation.

- Policymakers must monitor market performance. Aggressive policies to discipline abuse of market power should be implemented. Any entity that engages in actions that tend to tighten electricity markets and then seeks to exploit that situation through sales at inflated prices should be presumed to have engaged in market manipulation. They should bear the burden of proving that they are not guilty of profiteering and the penalty for market manipulation should be severe.

Table VI-2 shows the structural and behavioral factors that have been implicated in the reports on the price spikes and policy recommendations to address these problems where appropriate. In identifying these principles for action and discussing details below, we are not suggesting a one size fits all approach. Action should be based upon specific findings of conditions that render a specific market vulnerable to abuse. The goal is an orderly, efficient market; the means should fit the end. We accept the proposition that a specific set of regulatory interventions will not fit every market; we also insist that regulatory do-nothing policy does not fit every market either. There are clearly situations, circumstances and markets in need of repair.

C. BASIC CONDITIONS

1. EVALUATING CAPACITY BEFORE MARKETS OPEN

Policymakers should assess and take responsibility for the supply/demand balance as they enter the restructuring process. If conditions are tight, they must address the problem of how to expand capacity or provide consumers with options that protect them from price spikes that are likely in such circumstances. A formal analysis of the conditions in the market at the start of restructuring would be useful as an information tool alone, but it could also be tied directly to specific remedial measures or market intervention triggers. A competitive impact statement that concluded that the market is tight and likely to remain so would be a basis for (perhaps create an impetus to) identifying responses, if the situation did not improve or became volatile.

TABLE VI-2
PRICE SPIKE ISSUES AND POLICY RESPONSES IDENTIFIED IN THE
STRUCTURE CONDUCT PERFORMANCE PARADIGM

KEY VARIABLES IN THE PARADIGM	ISSUES RAISED IN ELECTRICITY PRICE SPIKES OF 1998	POLICY RESPONSES
BASIC CONDITIONS		
SUPPLY		
Raw material	Natural gas fails to track electricity prices	
Technology	Outages	Evaluate market first Performance penalties
Product durability	Inability to store electricity	
Legal framework	Breakdown of coordination	Establish strong system operator
	Partial regulation	Establish information mechanisms, Commodity exchanges
DEMAND		
Price elasticity	Extremely low short run	Modify incentives
Substitutes	Lack of substitutes	New Choice options
Rate of growth	Demand exceeds supply	Balance before dereg
Cyclical and seasonal	Weather-related demand	
Purchase method	Obligation to serve, utility as agent	Allow flexibility
Marketing type	Lack of incentive to cut back	New interruption policy
STRUCTURE		
Number of sellers	Few sellers	Divestiture/open access, moratorium on mergers
Number of buyers	Constrained demand by utilities	Allow flexibility
	Limited end-user choice	New choice options
Barriers to entry	Transmission constraints, emergencies	New relief policy
Cost structures	High fixed	
Vertical integration	Affiliate relations distort market	Enforce codes of conduct
Diversification	Utilities add brokerage	Divestiture/codes of conduct
CONDUCT		
Pricing behavior	Complaints of gouging	Establish benchmark policy
Legal tactics	Defaults, abrogation of contracts	Establish credit policy
PERFORMANCE		
Production and efficiency	Huge price spikes	Explicit anti-gouging policy, Establish circuit breakers
Equity	Big winners and losers	
POLICY		
Regulation	Transmission rules create problems	New relief policy
Price Controls	Allowed in California, requested elsewhere	Establish circuit breakers
Antitrust	Hoarding, daisy chains, two-way deals	Divestiture/open access
Information provision	Lack of timely, objective information	Ensure information

Simple claims that the market will take care of the problem are not a sufficient answer for several reasons. First, capacity expansions take time. What happens in the near term. Second, at least with respect to transmission, and perhaps with respect to certain types of generation, prices alone are not enough to increase capacity. Siting and environmental concerns may prevent capacity expansion, notwithstanding economic incentives to do so.

In markets where tight supply conditions are expected to be endemic, the potential for abuse is greatest. Specific measures to expand supply or continued oversight of the market are necessary.

2. SUPPLY-SIDE PERFORMANCE PENALTIES

One of the areas where incentives have become a problem in the transition to competition is the motivation to prevent blackouts at all costs and pass the costs through. There is no penalty for failing to keep capacity on line. Many utilities have sought incentive-based regulation to allow them to earn more as more competition is injected into the industry. They do not consider negative incentives, but they may be necessary to ensure consumers are protected from undisciplined bidding behavior.

3. CONFRONTING THE INELASTICITY OF DEMAND

The basic conditions in the market also demand a very hard look at the demand-side. Policymakers should design policies to meet the public's needs. Consumers express a strong commitment to reliability and an aversion to price shocks. It may be difficult to accomplish both goals at historic price levels in unfettered commodity markets.

Expanded and better-designed incentives to participate in peak load management programs are often mentioned possibilities. Making interruptible rates more effective for those who are interested, and facilitating aggregation or other forms of participation, may elicit more demand reduction. Interruptible customers must feel they are getting a fair chance to benefit and fair value from the interruption. However, the allocation of fixed costs, for which interruptible customers are responsible, should not burden firm sales customers unfairly.

However, we do not believe that residential consumers want to see their prices tracking the commodity price of electricity or be forced to evaluate and implement complex hedging instrument alternatives. For firm residential and small business customers, it may be just as important to develop programs that let them enjoy stable prices without sending utilities plunging into markets to avoid blackouts. Proposals to build peaking reserves at stabilized prices become attractive if markets are going to be extremely volatile.[145]

---

[145] The WPS proposal to build a large plant at $42,000 per MW undercuts the merchant generator prices by almost 20 percent. WPS does not intend to build this plant as a speculative merchant venture. It proposes to meet the reserve margin requirement that would result from elimination of CBM. If customers are going to pay

D. MARKET STRUCTURE: DEVELOPMENT OF INSTITUTIONS TO SUPPORT COMPETITION

It is also clear that institutions and structures can make a big difference in the workings of the market. This applies to both the physical operation of the electricity system and the financial operation of its trading markets.

1. TRANSMISSION: ACCESS TO THE HIGHWAYS OF COMMERCE

Now that it has been demonstrated that the lack of transmission capacity can cause significant problems, policy makers should ask themselves is the infrastructure adequate to support the competitive market model that public policy is building. If not, what measures must be taken to render it adequate? Moreover, how should the timing between expanding or regulating the infrastructure to support competition and the introduction of competition be handled. To put a point on it, if the transmission system is inadequate to support competition, is not it irresponsible to introduce competition.

Economies of coordination are still strong in the physical marketplace. Therefore rules of the operation of the grid must be in place to ensure it reliability. To the extent that coordination can lower costs, through lowering reserve requirements, this function too should be preserved. However, the rules must be competitively neutral.

As a general proposition, vertical divestiture is the only solution that eliminates the problems of affiliate transactions. Some smaller utilities have decided to divest voluntarily. Ironically, the motivation appears to be that they are too small to be big players in generation markets (i.e. they have no chance to acquire market power) so they may as well avoid the burden of codes of conduct.

Short of divestiture, a truly independent system operator must be established. This system operator should be given the authority to run the system solely for reliability and social efficiency (lowest total social cost) purposes.

2. SUPPLY CONCENTRATION

Divestiture or an ISO is generally seen as a sufficient response to concentrated markets. That is, if divestiture takes place, the assumption has generally been that the generation market will not be concentrated. Alternatively, if the transmission system is operated in an open

---

for it as a peaking reserve, they would like to ensure that (1) it runs at least 100 hours per year and (2) it dampens any price spike. This type of plant might be considered a “must run at peak” plant. Costs could be recovered on a levelized basis and dispatch could be triggered either by a target reserve margin or a trigger price.

manner, enough generators will be able to enter the market to prevent the abuse of local market power.

Given recent trends of concentration at the national level and the performance of newly restructured markets, those assumptions may no longer be supportable. Markets can become very thin very quickly for a variety of reasons, and prices can rise very rapidly. Market power can be exercised for short periods of time in specific markets and result in substantial sums being transferred. As the number of generation entities declines, the problem may grow worse.

It may be useful, as some have suggested, to put a halt to concentration through mergers until we have a better idea of how market structures and institutions will function under the unique conditions of the electricity industry. It is also important to monitor closely the supply, bidding and pricing behavior of generation entities even in markets where divestiture and/or open access have taken place. The basic supply and demand conditions in electricity markets may be so severe, that market structures that are traditionally defined as competitive will break down situationally.

3. TRADING

Trading institutions must also be more highly developed quickly. The overheating of the market in 1998 reflects a fundamental lack of institutions to convey information and ensure the soundness of transactions. Measures to ensure openness and confidence in transactions should be taken. Securities and commodity exchanges impose rules to protect the public and ensure an orderly market. Power exchanges should too.

Power exchanges should follow the pattern of stock or mercantile exchanges. These impose rules on traders that seek to ensure transparent pricing, control the flow of trading, impose memberships criteria, require registration of participants, and manage the types of trades including issues such as short selling, margin requirements, credit requirements and option rules. There is no reason that a physically important and difficult to manage commodity like electricity should not be subject to similar rules.

E. CONDUCT

The analysis has identified conceptually and practically specific types of behavior that may tighten markets. Entities that have engaged in such activities should not be allowed to then profit from their result. The prohibition could apply to both merchant generators (and brokers) and incumbent utilities. While the specific actions that these entities can take is different the result is the same, driving prices up unnecessarily and increasing profits unfairly (see Table VI-3).

TABLE VI - 3
MARKET TIGHTENING ACTIONS THAT SHIFT THE BURDEN OF PROOF IN THE EVENT OF SUBSEQUENT PROFITEERING

INCUMBENT UTILITIES	MERCHANT GENERATORS
Took plant out of service	Withheld supply
Took transmission out of service	Engaged in a two-way transaction
Declared an emergency	Was part of a daisy chain in default
Participated in a TLR	Violated market rules
Executed a swap	
Interrupted customers	
Appealed for voluntary conservation	

The first element of the regulatory response, as noted above, is to lay the burden of proof on anyone who has engaged in market tightening and subsequently made sales at excessive prices to show why this should not be considered improper market manipulation.

Penalties must be sufficient to dissuade this activity. Financial fines are only a first step. Repeated offenses should lead to suspension of trading rights and ultimately banishment from markets as a trader or broker.

F. PERFORMANCE

Not only do policymakers have an obligation to do a much better job of laying the foundation for competition before they throw the doors open, they have an obligation to monitor market performance closely, so that rapid responses can be offered to abusive events. Having experienced repeated spikes, policymakers they should also implement a series of circuit breakers to prevent the sort of abuse that has occurred. These should remain in place until regulators can affirmatively conclude that market structures are functioning in a manner that is likely to prevent such abuse.

The most obvious circuit breaker is a price ceiling or cap that simply does not allow trades to take place at prices above a certain level. This is generally considered the most extreme measure.

Other circuit breakers can be utilized before a cap is imposed. For example, trading could be suspended for a period (as is the practice with the stock market). Unfortunately, since the physical movement of electricity cannot be suspended, nor is that necessarily desirable, suspension of trading could be tricky.

At some point, the FERC could declare that prices above certain levels are not deemed just and reasonable and therefore, market based rates are suspended. The transactions could be allowed to move forward, but the final price would be subject to adjudication.