Consumer Federation of America

ISSUE BRIEF

AN ECONOMIC EXPLANATION OF WHY THE WEST AND SOUTH WANT TO AVOID BEING INFECTED BY FERC'S SMD AND WHY MARKET MONITORING IS NOT AN EFFECTIVE CURE FOR THE DISEASE

Statement of Dr. Mark N. Cooper
to the
SMD Market Metrics Conference
October 2, 2002

In spite of the attention devoted by the Federal Energy Regulatory Commission (FERC) to market power mitigation and market monitoring, the release of the Standard Market Design (SMD) has unleashed a storm of criticism from members of congress, state regulators, consumer representatives, prominent conservatives, and large industrial consumers. Much of this criticism has come from the states of the South and West. Although these states represent about two-thirds of the jurisdictions that are affected by the FERC order, some dismiss this opposition as an effort to horde low cost power for themselves, shield local monopoly utilities, or protect native load customers at the expense of interstate commerce.

It is certainly true that the states that have chosen not to restructure their markets for electricity have lower rates and have done a much better job of protecting the interests of their citizens (see Exhibit 1). However, the resistance in the South and West to FERC's efforts to force their utilities into generation and transmission markets should not be seen as an anti-social exercise of parochial self-interests; it can and should be recognized as a rational assessment of the risks and rewards of relying on markets for electricity services.

In these states, markets are most likely to fail or shift substantial resources from consumers to facility owners even where they succeed. Monopoly rents and scarcity rents are likely to be largest in these states and policymakers have chosen to leave them in consumers' pockets. FERC's own studies show that there is little to be gained from reliance on market-based regional transmission organizations.[1] This paper shows that in the South and West, there is a lot to be lost and proposed FERC monitoring to prevent the abuse of market power is not the solution.[2]

THE SOUTH – INELASTICITY OF SUPPLY CREATES EXCESS SCARCITY RENTS AND THE THREAT OF THE ABUSE OF MARKET POWER UNDER THE SMD

It is well recognized in the economic literature that markets are most likely to be subject to abusive pricing where supply and demand elasticities are low.[3] Since demand elasticities are extremely low, and the Commission has no idea how responsive the demand side can become, attention must focus on the supply side.[4]

There are two sources of concern to consumer advocates and policymakers charged with protecting the public interest in this region of supply. Excessive scarcity rents and abuse of market power, which creates monopoly rents. A policymaker evaluating the option of relying on the market might reasonably enquire into how risky it is that consumers will be caught on the problematic portion of the supply curve.

As the Commission well knows, when demand elasticities are low, market power becomes a substantial problem. In fact, the measure of market power that the FERC uses, the mark-up of price above marginal cost or Lerner Index[5] "comes apart" if the elasticity of demand is less than one.[6] The formula "comes apart" because real world markets with elasticities this low cannot work well. Firms raise prices to increase their profits because they do not lose enough sales to competitors, or because consumers lack alternatives.

The inelasticity of supply gives rise to a deviation from a typical competitive market; excessive scarcity rents. An economic rent is "a payment to a factor in excess of what is necessary to keep it at its present occupation."[7] More importantly, "in perfect competition, no rents are made by any factor, because changes in supply bid prices of inputs and labor down to the level just necessary to keep them employed."[8] In economic theory, these sources of overcharges could be competed away if supply and demand elasticities were high and electricity markets worked well. In reality, because of the economic characteristics and social impacts of the electricity industry supply and demand do not respond. The results are elevated prices and a transfer of wealth from consumers to producers that achieves little or no real costs savings or efficiency gains.

Scarcity rents accrue where changes in supply as a response to changes in price are slow or nonexistent (see Exhibit 2, which uses the actual supply curve for Florida). [9] Supply cannot respond to price signals, so the owners of existing facilities just collect windfall profits.

Market power also becomes a problem firms withhold supply or raise prices to increase their profits because they do not lose many sales to competitors, or because consumers lack alternatives (see Exhibit 3). The ability of producers to withhold supply or to hold out for high prices gives them an incentive to drive prices as far above costs as possible, and to keep them there in order to maximize profits. As

discussed below, FERC's proposal is ill equipped to deal with the distinction between scarcity rents and monopoly rents.

It turns out, largely because of climate and resource differences that the risk is small in the Northeast (see Exhibit 4). In that region, the supply curve becomes problematic at 110 to 115 percent of the peak. This does not mean that there have not been problems in this region. There certainly have been, especially in load pockets like New York City. Nevertheless, on average, and given the load curves, the amount of time consumers are forced to live on the problematic section of the supply curve is relatively limited. As one moves down South, the supply curve becomes problematic at a much lower level of supply relative to peak. In Florida (FRCC), the supply curve becomes problematic at 85 percent of the peak. Consumers in Florida are likely to be at risk a lot more.

Analysis of the Florida market shows that both scarcity rents and monopoly rents are a severe problem, that the supply curve becomes problematic at a much lower level of supply relative to peak. In Florida (FRCC), the supply curve becomes problematic at 85 percent of the peak. If the market in Florida cleared in a "perfect" fashion under the FERC model (i.e. at the marginal cost without any exercise of market power) in every hour of every day the price of wholesale electricity would rise by 50 percent. The sum would be $2 billion. This huge sum of excess scarcity rents is created in just 10 percent of the hours. Florida is the extreme, but the rest of the south would suffer large increases as well.

This sum does not include any impacts resulting from market power. Any withholding would drive prices much higher. Monopoly rents in California were several times the size of scarcity rents. Moreover, in Florida, the largest supplier controls almost 40 percent of generation capacity. This means that the threat of withholding is present for a very significant part of the time. In the SERC region, the pivotal supplier has about a 20 percent share of capacity. In the South, consumers are likely to be at risk a substantial part of the time – as much as 30 to 50 percent.

The exercise of market power would drive prices even higher. Our simulation of the Florida market shows that a single firm, acting alone but knowing that a substantial part of its capacity will be needed in many hours of the year, would have the ability to raise prices substantially. Substantial markups can be expected in virtually every hour in which the pivotal supplier is called upon. In the dominant firm case, prices would rise to in excess of $500 per MWh for a few hours and would be above $100 per MWh for about 2 percent of the hours. In the dominant firm case, the average price would rise to almost $46 per MWh from the regulated price of $25.5 and the competitive price of $39. In the cartel case, prices would hit the $1,000 cap almost 10 percent of the time and prices would be above $100 about a third of the time. The average price would rise to over $370 per MWh. Before the meltdown in California, we would never have considered such a possibility, but that is the price that was sustained in California

for almost half a year, during the off-peak period. The result of withholding and excessive scarcity rents to drive prices far above costs is supranormal profits.[10]

The $1,000 price cap used in this analysis is the cap FERC relies on in its SMD proposal. These results do not give us great confidence that the cap will do consumers much good.

Exhibit 5 shows the results of a number of analyses of markets. It includes simulations and actual results. The most extensive problem occurred in California, [11] but virtually all markets, even those like PJM and the upper Mid-west, that are well endowed with transmission capacity and excess generation, have been beset by the problem. The CAL-ISO analysis shows that by February 2001, the costs of a new plant brought on line in California when the restructured market commenced in May 1998 would have been fully recovered in just three years.[12] Excessive returns have not escaped the attention of the analysts dealing with the situation in the UK, although that market has not exhibited the extreme dysfunction of the California market. As Wolak and Patrick put it, "the return to capital in this industry is increased by 25% as a result of this strategy.[13]

Under the FERC scheme, consumers and regulators are forced to continually struggle to prevent the transfer of billions of dollars of scarcity rents and monopoly rents from consumers to generators and transmission owners. FERC invites utilities to try to avoid these price increases by entering into bilateral contracts, but there is no reason to believe that sellers in these contracts would not be able to capture at least part of these rents and consumers will end up worse off. FERC offers a series of complex allocations and auctions of rights and market monitoring to help consumers, but they will be vastly inferior to the approach taken by policymakers in these states – simply prevent the rents from being generated in the first place.

Interestingly, if we correlate the level of risk and the extent of restructuring, we find a pretty strong relationship between the risk of abuse and rent transfers and the refusal to restructure electricity markets (see Exhibit 6). Almost all of the states in the Northeast and near Mid-west have restructured, virtually none in the South have. Ironically, the states that should have had the easiest task of protecting consumers did the worst job.

One final and obvious point that distinguishes the South from the rest of the nation is that it has a great deal more at stake on the demand side from the consumer point of view (see Exhibit 7). The average household in the South consumes about 35 percent more electricity than the national average, 60 percent more for air conditioning. The average household in the South spends about 25 percent more on electricity, about 40 percent more on air conditioning.

The West is an anomaly in this analysis, but that is easily explained by an examination of the nature of its dominant source of electricity and its geography.

THE WEST – RELIANCE ON HYDRO AND LONG DISTANCE TRANSMISSION EXPOSE CONSUMERS TO UNIQUE RISKS UNDER THE SMD

The SMD Notice of Proposed Rulemaking recognizes that hydro does not fit well within its regulatory framework. The problem is partly that hydro has virtually zero running costs (i.e. a horizontal supply curve), which means it will be a voracious rent collector in any single price auction. More important for FERC's scheme, is that most hydro is a multi-purpose undertaking. Hydro is not, and cannot be operated to maximize profits from the sale of electrons. Irrigation, flood control, and wildlife concerns dictate when the water and the electrons flow. This "irrational" economic actor mucks up FERC's pretty theoretical scheme.

The other key problem with hydropower is that rain does not respond to price signals. A draught can send hydropower generation into a tailspin and markets that are dependent on it into a panic. If the amount of electricity from this resource is small, one could probably ignore it, but in the West it accounts for over one-third of the total capacity (see Exhibit 8). The Bonneville Power Administration is the largest pivotal supplier in the nation.

Fossil fuel plants that cannot run at full capacity because of environmental concerns are a similar anomaly. Thus, about forty percent of the power in the West does not fit easily into the FERC scheme.

FERC's throws it hands in the air with respect to these resources. It tells the West to do what it wants with the hydropower – just tell the FERC what the plans are. It will then "model" the rest of network for market power. This is a very big pig in a poke for the people in the West to buy.

The nature of hydro and the geography of the West interact to compound the problem. Dams can only be built on streams and rivers and transmission lines must run to the load. Similarly, it is economical to do the same with mine-mouth, coal-fired plants in the West. Because distances are extremely large in the West, transmission plays a much larger role there than in the rest of the nation. Hydro and mine-mouth coal plants were optimized with transmission. Separation of transmission and generation and forcing them into separate markets threaten to do a great deal more damage to the underlying economics of the way the network was built in the West. Scarcity pricing of transmission in the West could have severe and disruptive effects on consumers.

Thus, although the supply curve in the West may look friendly in terms of when consumers are at risk of being caught on the problematic portion of the supply curve, a couple of dry years can dramatically change the situation. The lack of rain certainly played a part in the California crisis. It should not come as a surprise that policymakers in the West are risk averse, when the only two states that tried to rely on the market, Montana and California, have been badly burned. This risk aversion is

perfectly rational, from the consumer point of view. The fact that every state in the West that tried restructuring is slowing down or turning back reflects this rational choice.

The West is dependent on an electricity source that does not fit into the FERC's theoretical scheme and transmission assets whose pricing FERC wants to radically transform are critical there. Even though FERC offers a series of safe harbors, short and mid-term rights, and invites negotiations, policymakers in the West properly feel that prices will rise and it will be much more difficult to protect consumers. The reluctance of the West to sign up for the FERC program, is even more rational when one considers FERC's abysmal performance in handling the market manipulation that cost Westerners tens of billions of dollars.

There is one characteristic that the South and West share that should heighten their concerns about the SMD. They are both rapidly growing regions. The handling of growth in the SMD is ill-defined. The new, untried transmission organizations have responsibility for planning and ensuring expansion of the grid. New load is likely to be forced into the market for transmission services. Bargaining for power in markets where rents are rampant threatens to increase prices.

THE SOUTH AND WEST HAVE NO REASON TO TRUST FERC'S ABILITY TO POLICE MARKET POWER, EVEN IF THAT WERE THE MAIN PROBLEM

With the people of the South and West at great risk with little reward, the FERC needs to have an ironclad mechanism for preventing abuse. To do so, it needs a sharp and clear definition of what is illegal, strong penalties to deter such conduct, and a vigorous enforcement mechanism to catch wrong doers should they try. The SMD fails miserably on the first two points, while the FERC itself has performed miserably at the third.

In theory FERC knows what it wants to make illegal, but in practice it has no clear idea of how to identify such activity. FERC has proposed market-monitoring metrics that are a complex array of indices that invite ambiguity and argument. It would be almost impossible to find market problems across the array of measures FERC has proffered. Market manipulators will find some measure, somewhere that sends an inconsistent signal and FERC will fall to squabbling.

Because the entire framework is based on the concept of scarcity rents (i.e. FERC requires a single price auction under the assumption that people bid their marginal costs and that all inframarginal bidder collect rents to cover their fixed costs), the FERC is hesitant to find monopoly rents. It has no clear measure of where scarcity rents end and monopoly rents begin.

Worse still, whenever it gets in the vicinity of the line between scarcity and monopoly, it errs in favor of scarcity. As a result, the market-monitoring proposal is thoroughly biased against consumers. The best benchmark for the exercise of market power has been polluted by the FERC. Instead of a rigorous estimation of actual costs, the FERC includes hypothetical costs in its calculation or self-referential bidding patterns.

An equally critical problem is that the very indices on which the calculation of marginal cost is based have come into question. It has now come to light that the reporting of natural gas costs in California was fraudulent. Market monitoring is useless under these circumstances, since the abuse becomes embedded in the benchmark. As long as firms can play in both the natural gas market and the electricity market, this is an endemic problem that the FERC must address.

FERC makes the monitoring of market power more difficult by abolishing capacity markets. Some who advocate markets believe that such a capacity market is necessary to prevent abuse and to plan for long-term capacity, even as they struggle to prevent manipulation in those markets. Given that FERC's weak point is the analysis of capital costs – since all fixed cost recovery under its scheme must come in the form of scarcity rents – a capacity market serves to make capital costs more transparent.

The penalty scheme in the SMD is also ill-defined. FERC invites the transmission organizations to impose penalties on both market manipulators and load serving entities. The former are to be punished for bad acts, the latter are to be punished for mistakes (getting caught short). The magnitude and frequency of the penalties is unknown at present, although it is notable that the ITP [Independent Transmission Providers] will have the power to turn the lights out. The transmission organization might try to protect consumers, but FERC's running battle with the California Independent System Operator, and the clear language of the SMD suggests that its primary purpose is to protect merchant generators. It will not tolerate ITPs that are too consumer-friendly.

The problem of penalties may be exacerbated in a single-priced auction. Penalizing the transgressor leaves all the windfall of ill-gotten gains in the pockets of the non-manipulators. If you fine the perpetrator for the entire abuse, he will go bankrupt and never make the consumer whole. It is hard to fine people who have done nothing wrong, but were paid an abusive price.

As an enforcement agency, FERC has no credentials whatsoever. FERC has shown no ability to implement consumer protection aggressively. It has failed to unravel the California debacle, including the recent revelations that the price of gas was manipulated. It is over a year-and-a-half since we flagged this issue to the FERC. It has been trying to hide the details of abuse in secret settlements that are sealed. It

has failed to find the money that was illegally earned or make restitution to exploited consumers in the West.

The problem of physical withholding deserves particular attention. It is extremely difficult to demonstrate that plants were taken off line for strategic reasons. FERC's initial conclusion that no such action took place in California has been thoroughly discredited. There is no indication that its institutional capabilities to police such practices have improved.

Even if FERC were to dramatically improve its monitoring of markets at their peak and include pivotal supplier analysis, the empirical evidence indicates strategic bidding across a much wider range of hours. In other words, it would be leaving a substantial part of the problem unaddressed. Exhibits 9 and 10 show bidding patterns in California in 1998-2000, before the big meltdown. Exhibits 11 and 12 show bidding patterns in the UK, which ultimately led it to abandon the approach to markets advocated in the SMD. FERC does not want to devote its attention to these off peak hours, but a significant amount of abuse could be heaped on consumers by strategic behaviors in these periods.

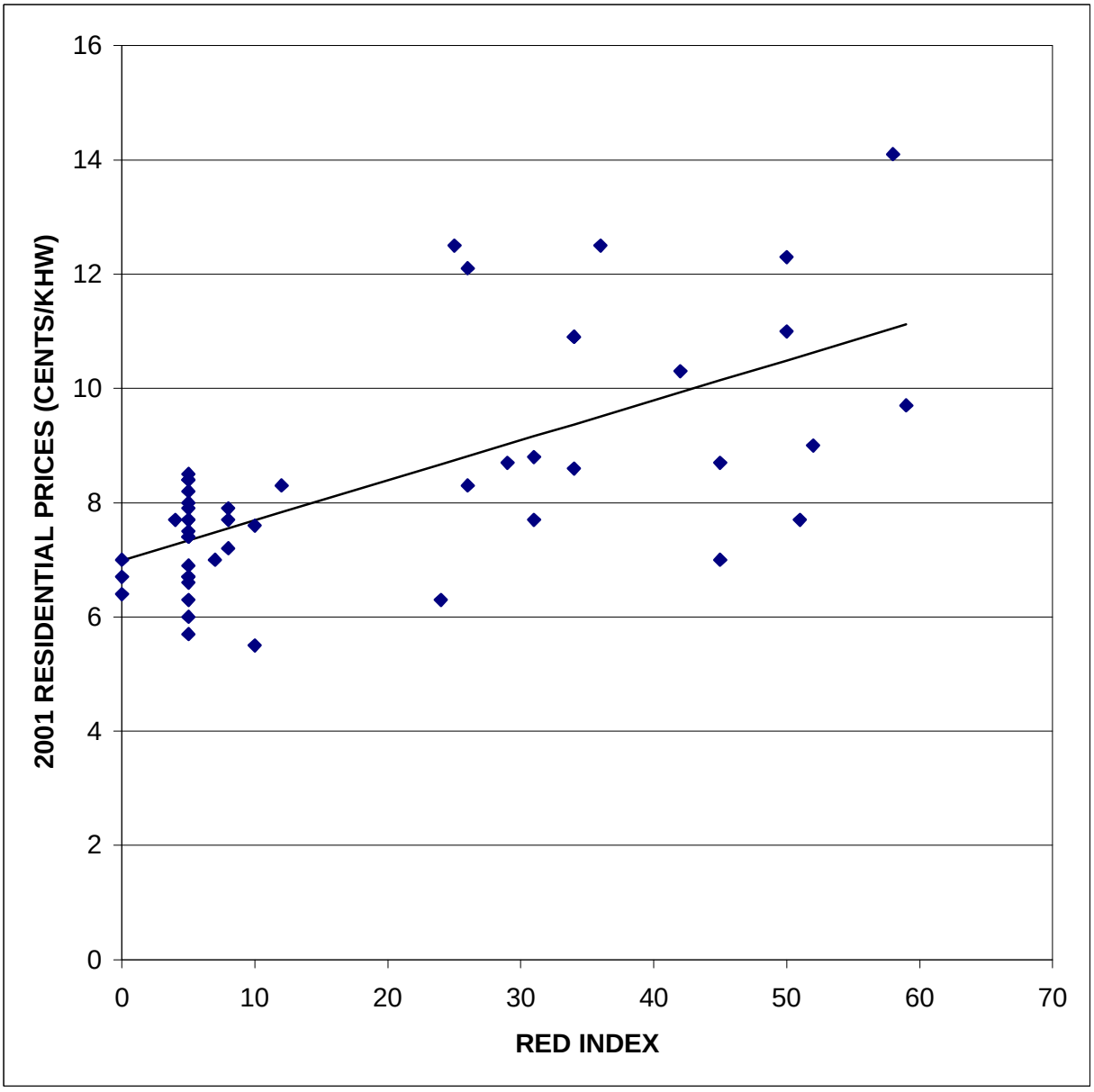
CONCLUSION: FERC'S CART IS WELL BEFORE ITS HORSE

The push to radically restructure the electricity market has come down to an effort by the FERC to impose a system that might work in one-third of the country on the other two-thirds in spite of the fact that there are good reasons to believe that it exposes consumers in those parts of the country to much greater risk of abuse and overcharges. Market monitoring and market power mitigation are not the solution.

FERC needs to go back to the drawing boards. It needs to restore its credibility as a regulatory agency by unraveling and revealing to the public the mind-boggling manipulation that took place in the West.

FERC needs to demonstrate that a set of regional institutions can be created to administer the interstate transmission system. Operating, planning, expanding and improving the grid are a sufficient challenge for these new organizations. They should not be challenged to simultaneously create half-a-dozen markets. The role model that FERC has chosen, PJM, has over fifty years of experience as a tight power pool and even it will be challenged to perform that tasks that FERC has laid out for it. Independent transmission organizations should be given the opportunity to run an administrative regime of non-discriminatory access.

EXHIBIT 1:
RESTRUCTURING AND RESIDENTIAL PRICE LEVELS



Sources: Energy Information Administration, *Electric Power Monthly: March 2002*, Table 53; Center for the Advancement of Energy Markets, RED Index

EXHIBIT 2: SCARCITY RENTS

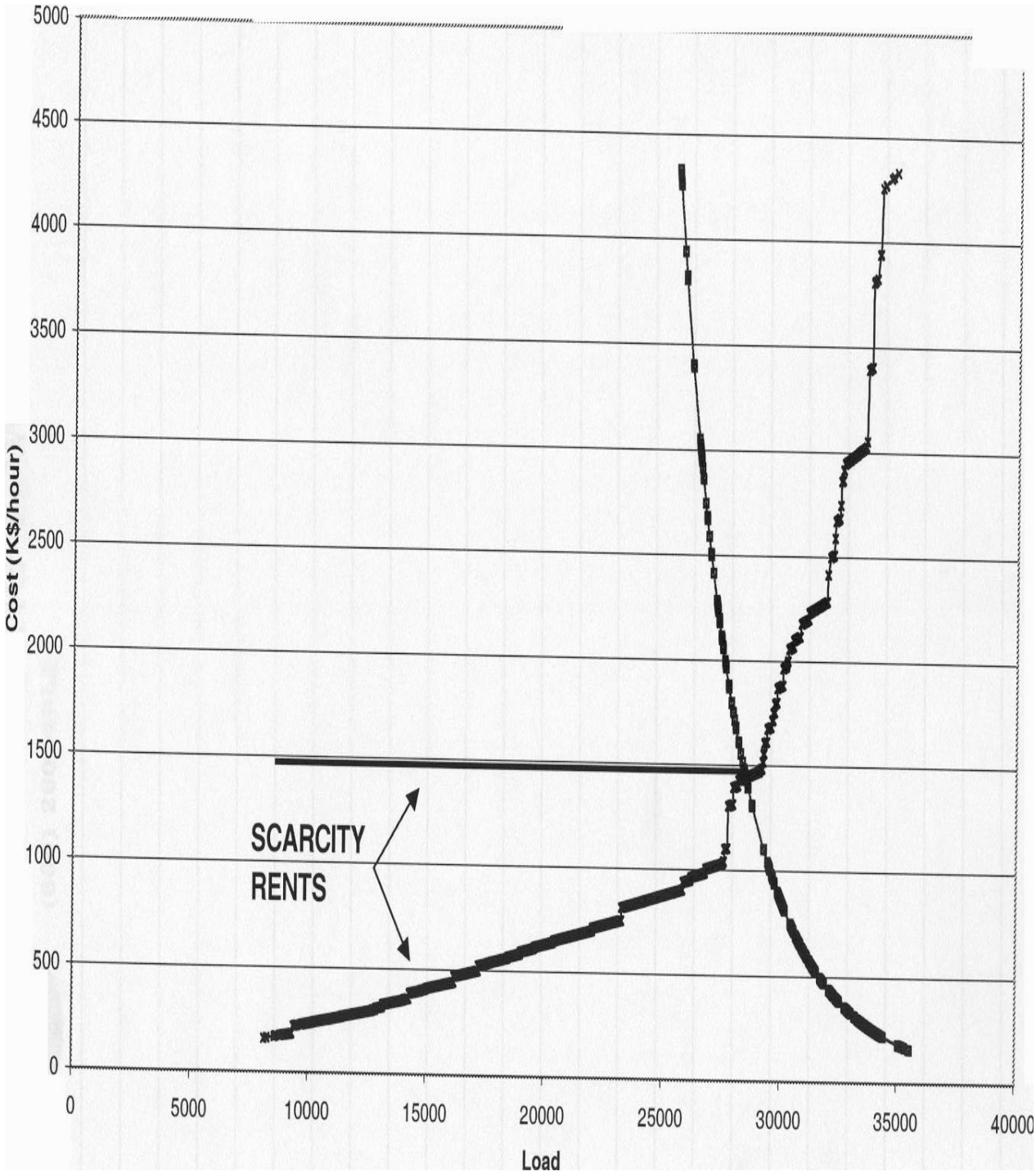


EXHIBIT 3: MONOPOLY RENTS ON TOP OF SCARCITY RENTS

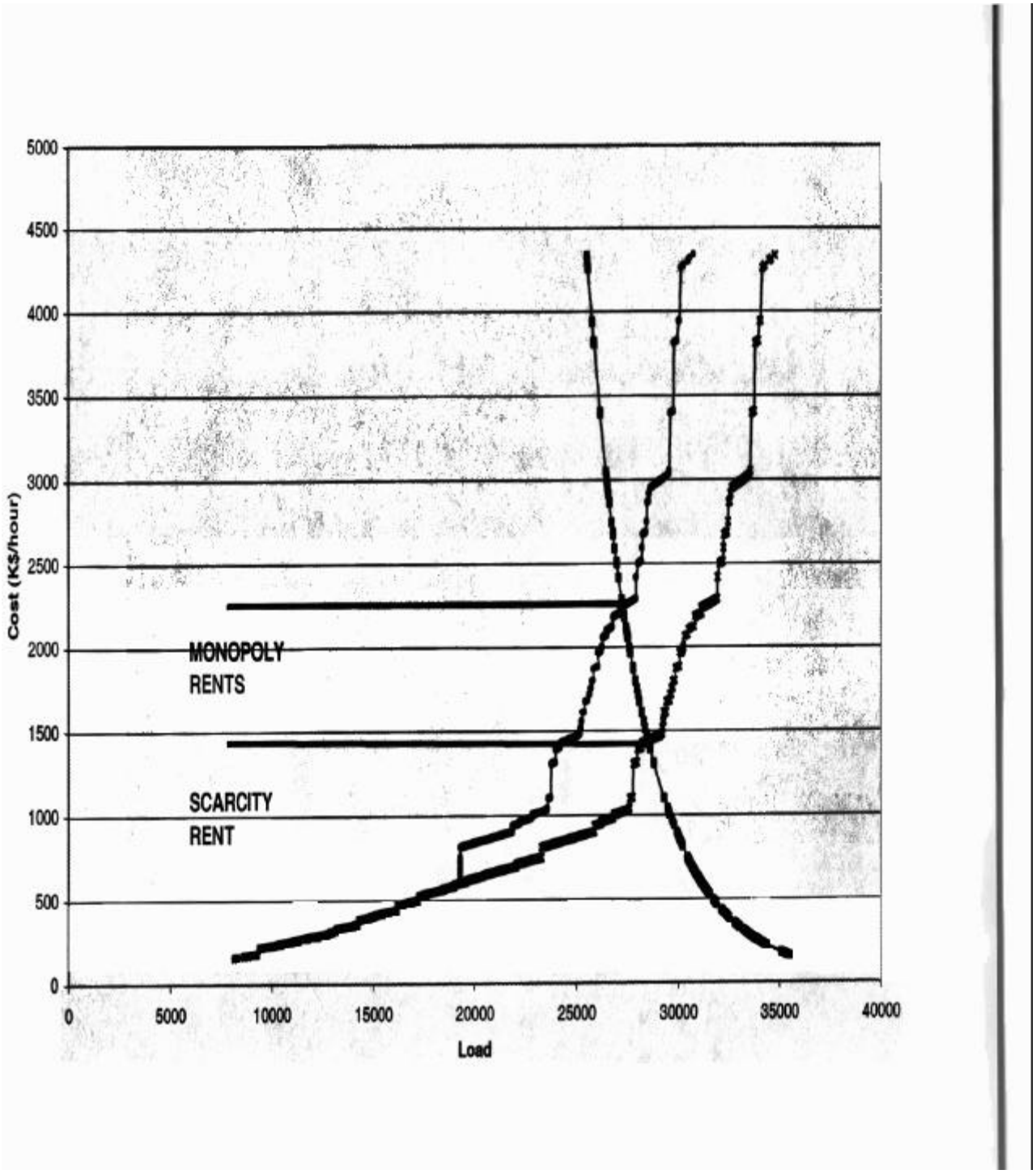
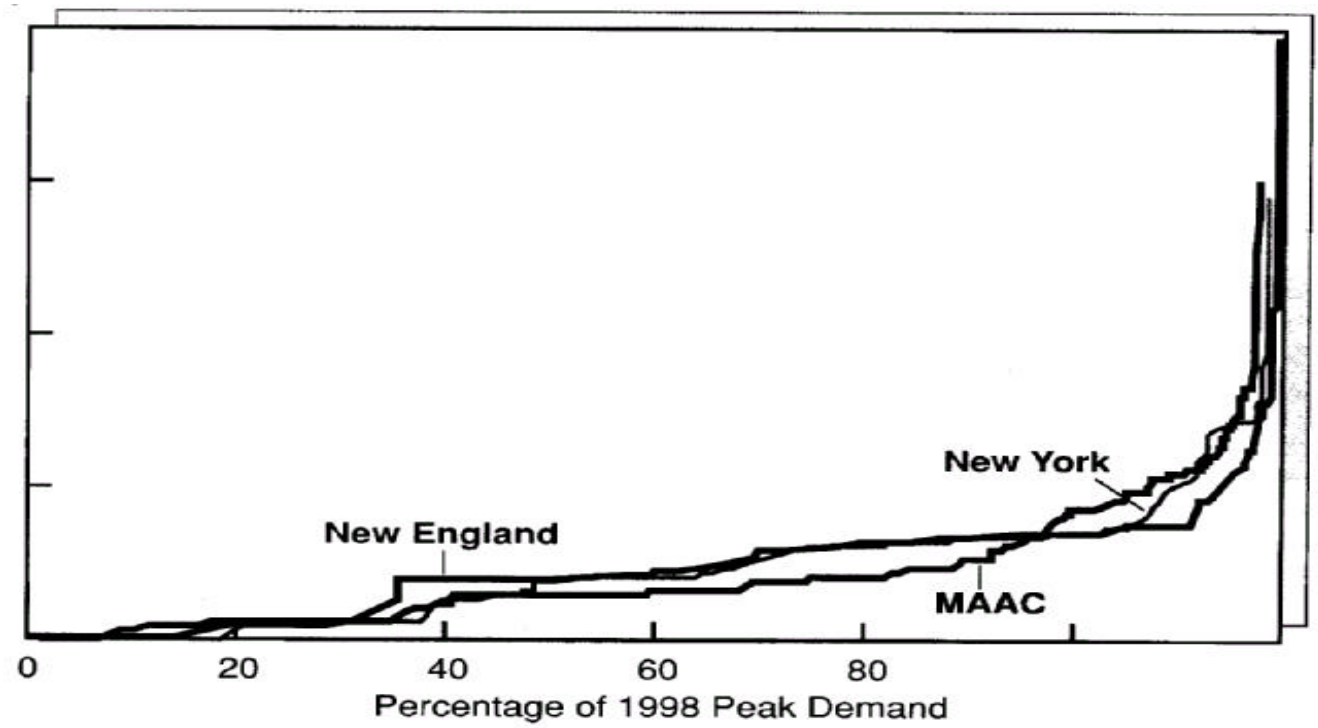
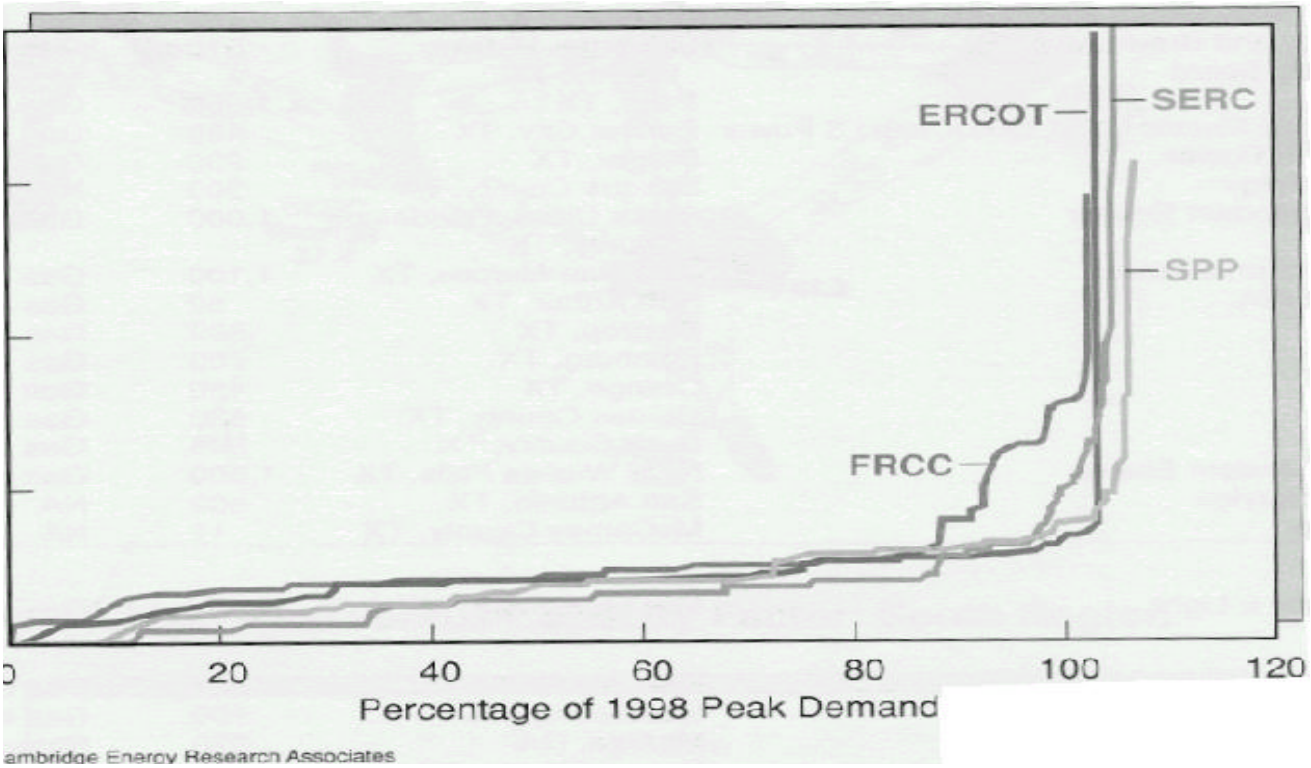


EXHIBIT 4:
NORTHEASTERN AND SOUTHEASTERN SUPPLY CURVES



Cambridge Energy Research Associates



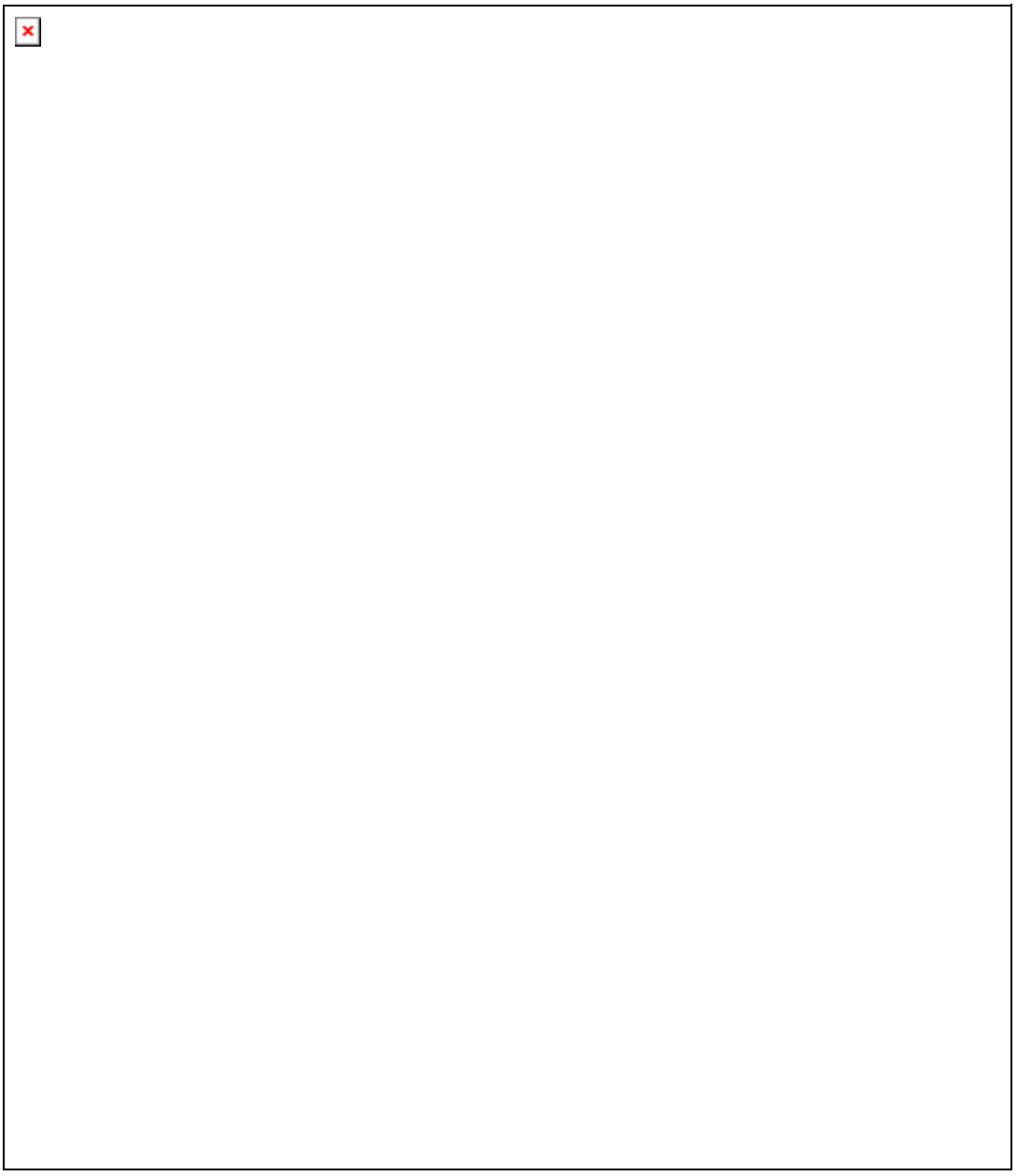
ambridge Energy Research Associates

EXHIBIT 5:
MARKET POWER INDICATOR CHARACTERISTICS

STATE	CONCENTRATION		ESTIMATED MARK-UP		
	HHI	LEADING FIRM SHARE INDEX	LERNER	MODEL	YEAR
COLORADO	2813	38	52	DOMINANT FIRM	2002
WISCONSIN	2761	47	300+	COURNOT	2000
PENNSYLVANIA	2000	20	9 - 19	COURNOT	1995
PJM	1150	16	29	ACTUAL	
U. K.	1962	31	21	ACTUAL	1994
FLORIDA	1940	38	80	Dominant Firm	1997
			1000+	Cartel	
CALIFORNIA	1537	10	22-29	COURNOT	1998
			30	ACTUAL	2000
NEW ENGLAND			4-11	ACTUAL Market Power Constrained	

SOURCE: Market shares of Generation = Energy Information Administration, *State Electricity Profiles* (U.S. Department of Energy, March 1999); Import capacity for HHI calculation = Cambridge Energy Research Associates (CERA), *Electric Power Trends: 2001* (2000); *High Tension: The Future of Power Transmission in North America* (August 2000) (hereafter, CERA, *High Tension)*; U.S. Census Bureau, *Statistical Abstract of the United States: 2000* (U.S. Department of Commerce), Population growth =Table 20, Cooling degree days and urban population = Table 39, 414: HHI and markups = Wisconsin = Bushnell, James, Christopher Knittel and Frank Wolak, *Estimating the Opportunities for Market Power in Deregulated Wisconsin Electricity Market* (Consumers First, ND); Colorado = Sweetser, Al, *An Empirical Analysis of a Dominant Firm's Market Power in a Restructured Electricity Market: A Case Study of Colorado* (April 1, 1998); Pennsylvania = Rudkevich, Alesandr, Max Duckworth, and Richard Rosen, "Modeling Electricity Pricing in a Deregulated Generation Industry: The Potential for Oligopoly Pricing in a Poolco," *The Energy Journal,* 1998 (19); PJM = .Mansur, Erin, T., *Pricing Behavior in the Initial Summer of the Restructured PJM Wholesale Electricity Market* (University of California Energy Institute, Program on Workable Energy Regulation, April 2001; UK = Wolak, Frank A. and Robert H. Patrick, *Impact of Market Rules and Market Structure on the Price Determination Process in the England and Wales Electricity Market* (POWER, February 1997), Wolfram, Catherine, "Measuring Duopoly Power in the British Spot Market," *American Economic Review,* 89: 1999, p. 812, California =);.Hildebrandt, Eric, *Impacts of Market Power in California's Wholesale Energy Market: More Detailed Analysis Based on Individual Seller Schedules and Transactions in the ISO and PX Markets* (Department of Market Analysis, California Independent System Operator, April 9, 2001), Klein, Michael and Loretta Lynch, *California's Electricity Options and Challenges* (August, 2000).

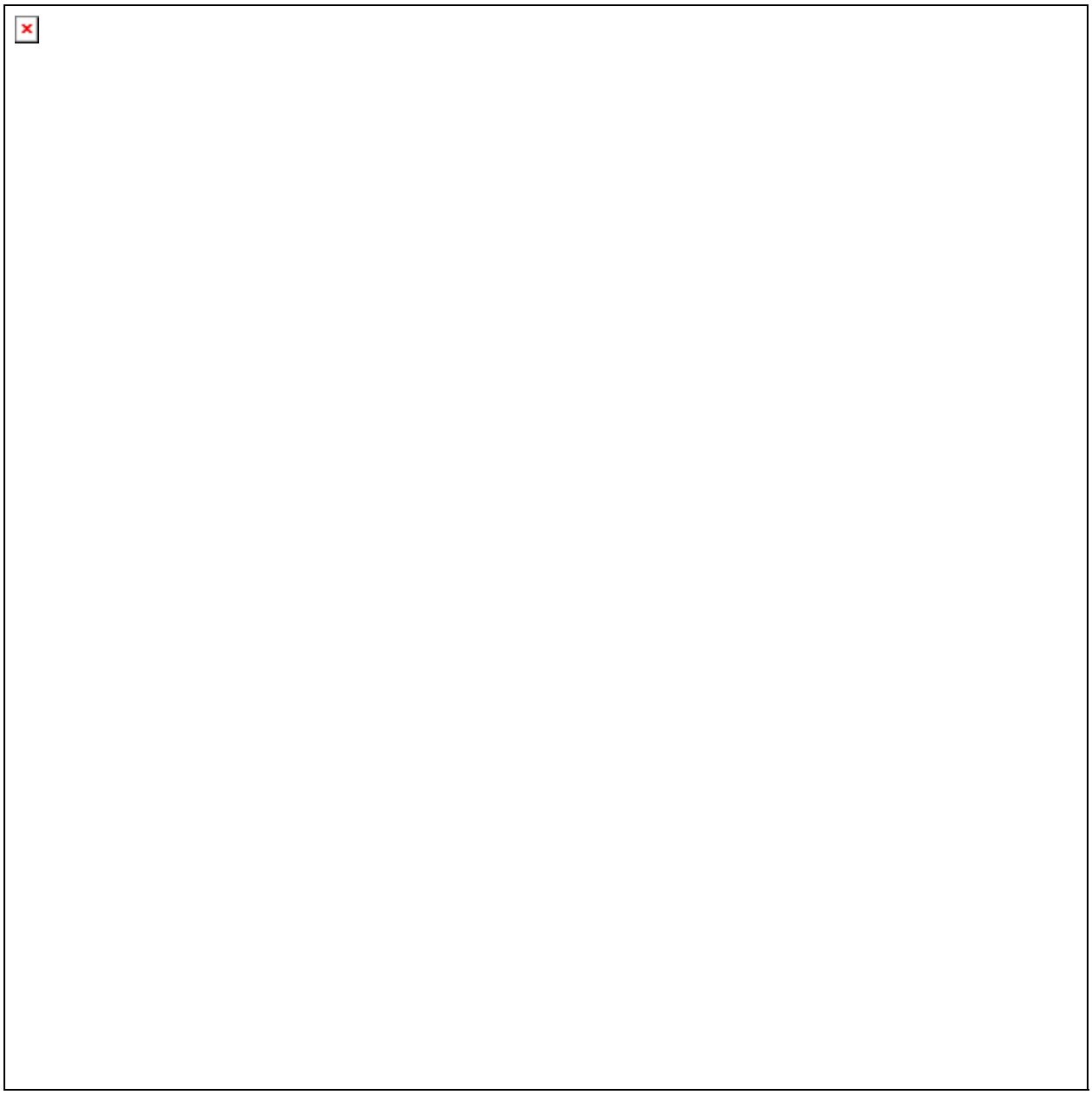
EXHIBIT 6:
INFLECTION POINTS WHERE SUPPLY ELASTICITY IS LESS THAN ONE AND THE DECISION TO RESTRUCTURE RESIDENTIAL MARKETS



S=South; W=West, WNC=West North Central

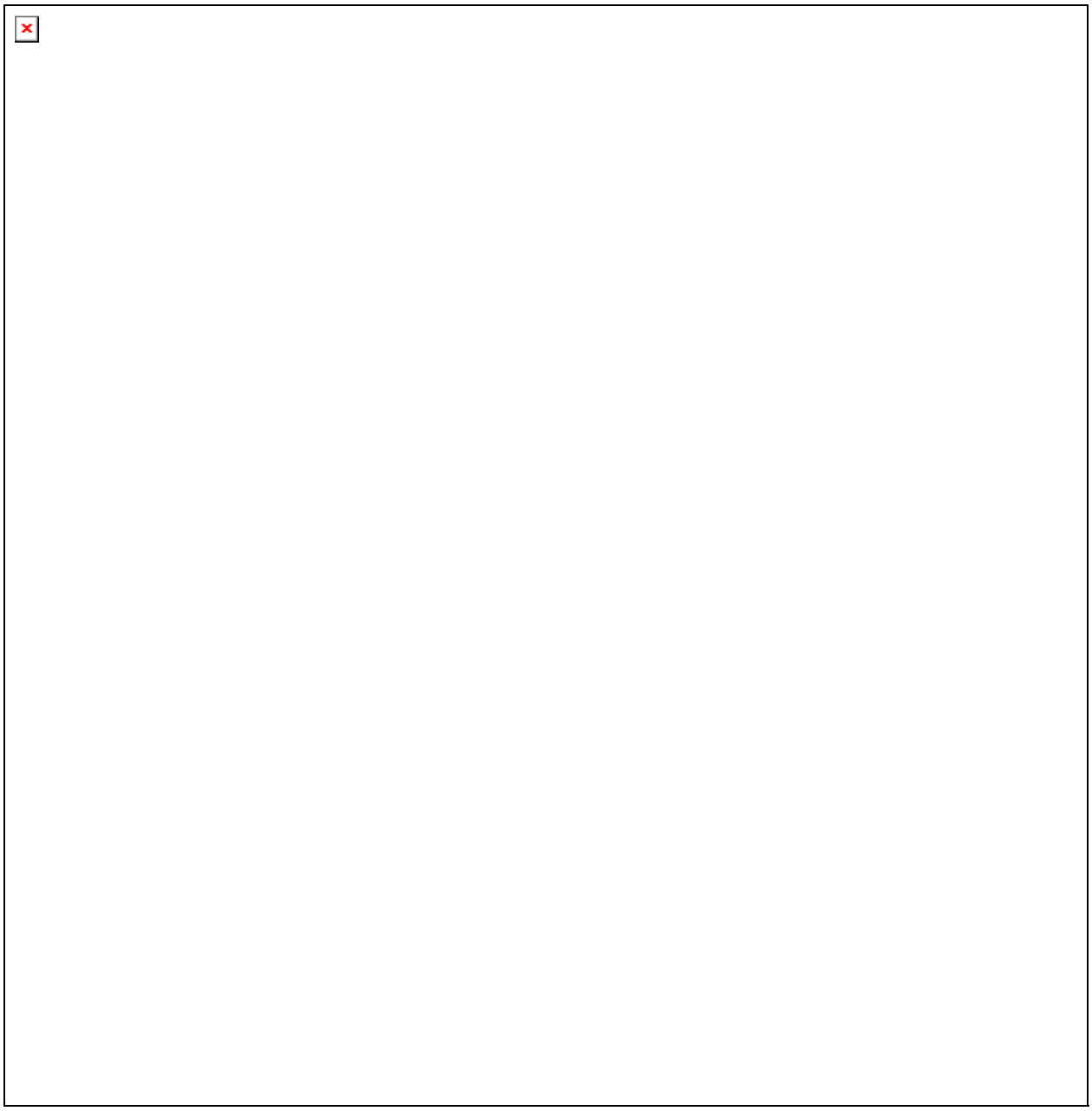
Sources: Supply curves from CERA, *Electric Power Trends: 2001* (Cambridge Energy Research Associates, 2001). Residential retail competition from

EXHIBIT 7:
HOUSEHOLD ELECTRICITY CONSUMPTION ACROSS REGIONS



Source: Energy Information Administration, *A Look at Residential Energy Consumption in 1997*

EXHIBIT 8:
UNIQUE WESTERN DEPENDENCE ON HYDRO AND TRANSMISSION



Sources: Transmission from Eric Hirst and Brendan Kirby, *Transmission Planning for a Restructuring U.S. Electricity Industry*, June 2001. Generation capacity from CERA, *Electric Power Trends: 2001* (Cambridge Energy Research Associates, 2001).

EXHIBIT 9: STRATEGIC BIDDING IN CALIFORNIA, 1998-1999

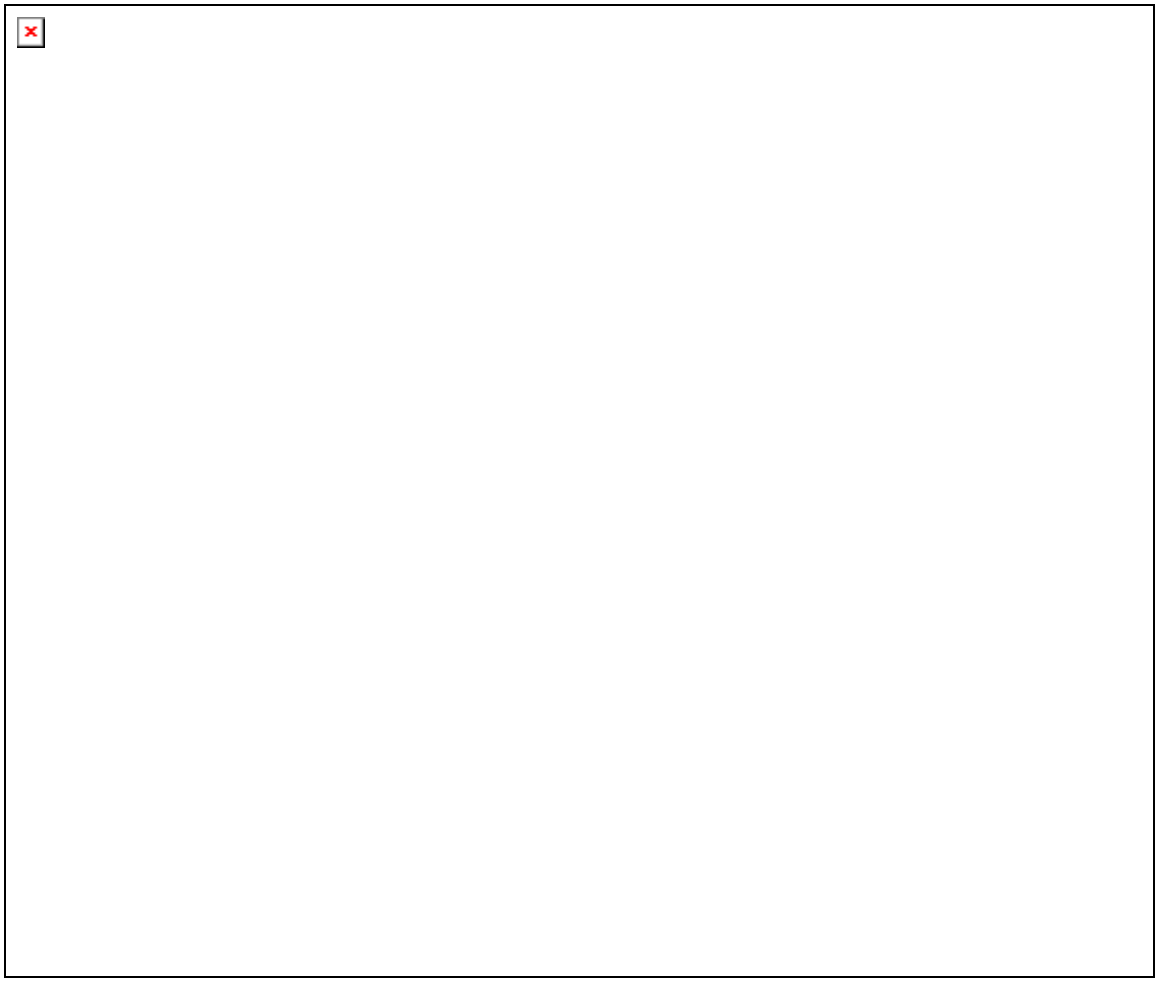


EXHIBIT 10:

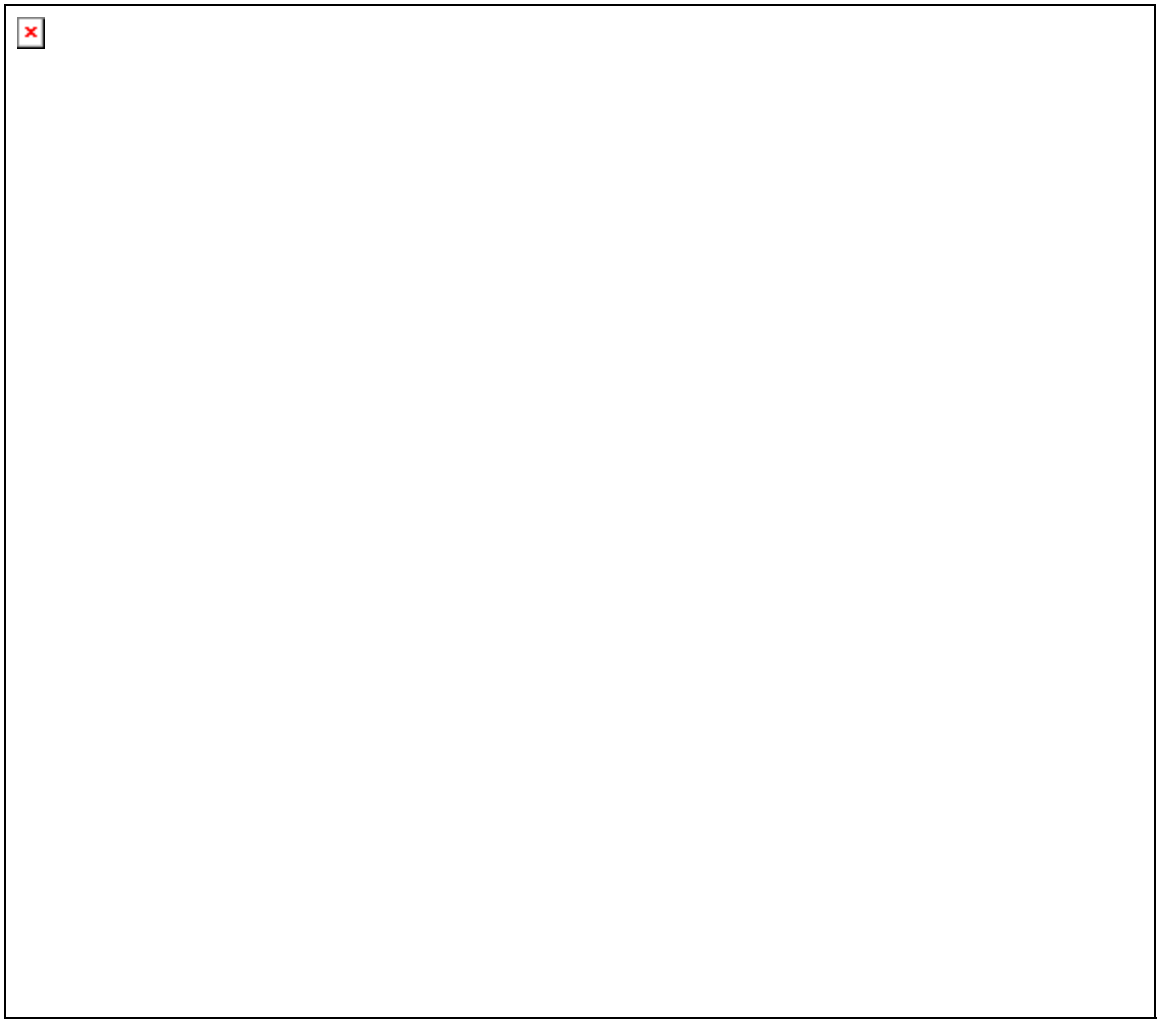


EXHIBIT 11:

STRATEGIC BIDDING AT MODERATE LEVELS OF DEMAND IN THE UK, 1993

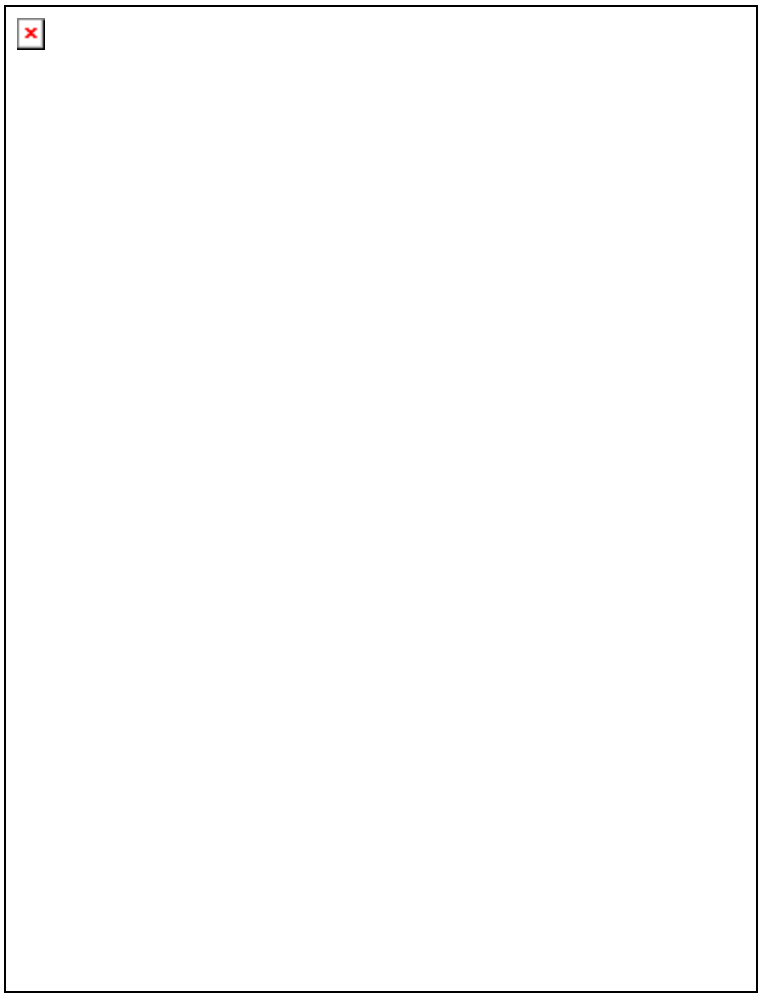
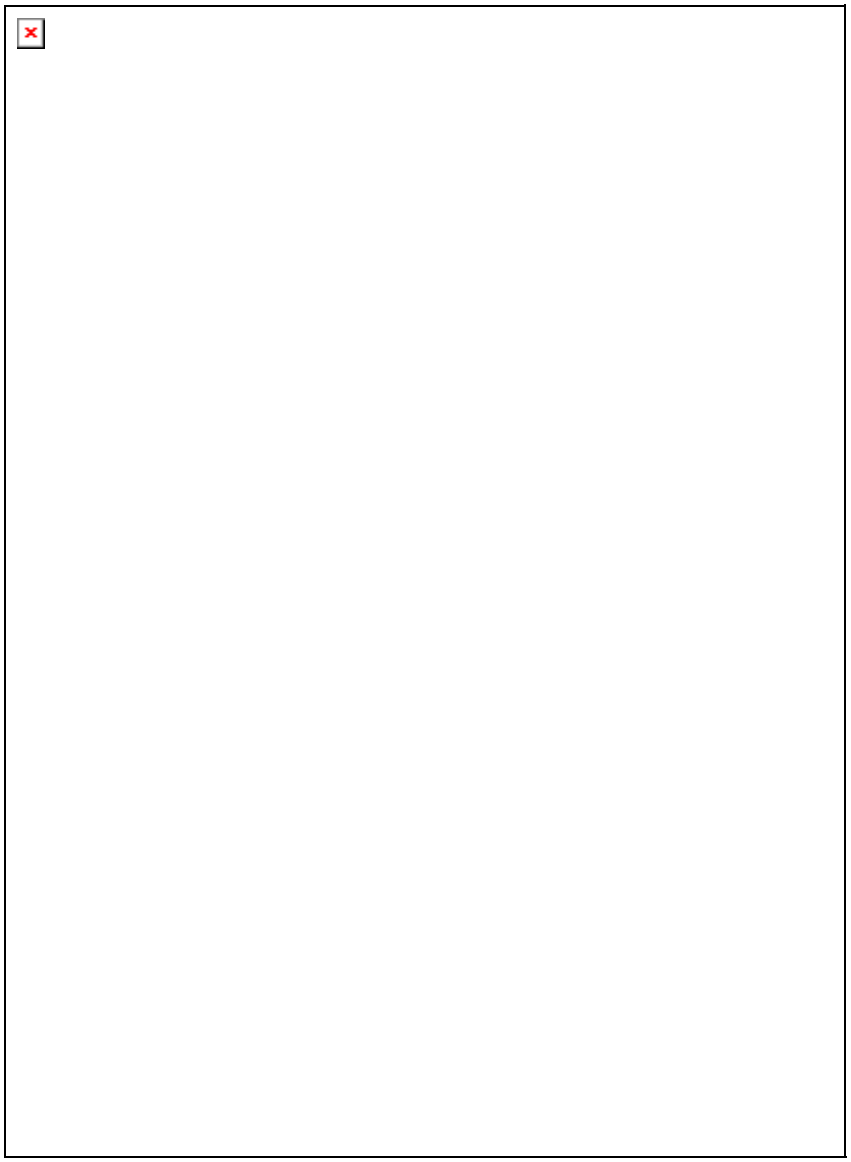


EXHIBIT 12: STRATEGIC BIDDING IN THE UK 1995



NOTES

4