

**Testimony of Robert McCullough  
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**U.S. Senate Committee on Commerce, Science and Transportation**

**April 11, 2002**

Thank you for your invitation to testify today.

The year 2001 witnessed two surprising events. First, California, the leading example of electricity deregulation, experienced rolling blackouts during the winter (2000-2001) – a season when electric loads are normally at their lowest. Second, Enron, the leading proponent of electricity deregulation, in a matter of months shifted from exponential growth to massive collapse. We now know that California’s electricity market was deeply flawed. A complex and secretive structure provided the ideal framework for the exercise of market power. Contrary to the extensive public affairs campaign waged by the beneficiaries of the California energy crisis, actual data shows neither a resource shortage nor the presence of underlying cost changes. We now understand that Enron itself was a paper tiger. Its impressive show of trading strength masked more than a decade of bad business decisions and accounting legerdemain.

It is natural to sense a connection between these two events and to conclude that Enron used its considerable clout to manipulate Western electricity prices. As Hal Bernton of the Seattle Times has asked, “How far down in Enron do you have to go to find ethical behavior?”

However, the institutional structure and opacity that made the California market easy to manipulate also makes tracing Enron’s activities difficult. Certainly, Enron had the means, motive, and opportunity. Twenty-three months after the onset of the California crisis and ten months after it suddenly ended, we still have little access to the relevant data. Two of the California investigations have only recently received access to basic discovery. FERC finally began its investigation into the broader implications just two months ago.

Our public policy response to these two events has been slow and faltering. FERC still finds it difficult to apply its rate-making powers. Recent requests for Federal Power Act 206 review of long term contracts forced upon purchasers during the crisis have not been granted.<sup>1</sup> The onslaught by marketers who continue to argue for the withdrawal of data from the public eye continues.<sup>2</sup> And despite substantial questions about the theories that underlie centralized markets administered by

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<sup>1</sup>In addition to California, a number of utilities in the Western U.S. have asked FERC to review one sided contracts forced upon them during the crisis. FERC has not yet responded to these requests.

<sup>2</sup>Moves are still underway at FERC, the Energy Information Administration, and the North American Electric Reliability Council to restrict market information from the press, public, and policy makers. Ironically, the participants, themselves, now have access to almost all “market” data through FERC cases and ongoing litigation.

the California ISO, FERC continues to support the development of similar institutions throughout the U.S. and Canada.<sup>3</sup> At the current rate, the commodity market in electricity will continue to be both the most troubled and the most secretive for years to come.

Moreover, the analysis of the issues posed by the California crisis and Enron's collapse has been drawn into a deeper debate about the appropriateness of consumer choice in electricity. This debate is often confused with how to maintain the currently uneasy balance between business and consumer interests.

While the costs borne by California's residential ratepayers were high, even higher costs to the economy have been shouldered by major industrial customers throughout the western U.S. and Canada. Outside of California many, if not most, large industrial customers have enjoyed open market access to electricity, based upon the natural gas model of simple bilateral trading arrangements. When prices suddenly increased without notice in California, it directly raised prices throughout the region, shutting down major industries from Washington to Utah. Even ten months after the California crisis, many of these industrial facilities remain padlocked. Some of these industries will never reopen.

The debate about the lessons of California and Enron is really about protecting our economy against the exercise of market power. As Theodore Roosevelt said:

"Combinations in industry are the result of an imperative economic law which cannot be repealed by political legislation. The effort at prohibiting all combination has substantially failed. The way out lies, not in attempting to prevent such combinations, but in completely controlling them in the interest of the public welfare."<sup>4</sup>

We should not abandon our efforts to create a wholesale electricity market. Nor should we ignore our responsibility to both consumers and business. However, if the goal of equitable restructuring is to be realized, FERC must vastly improve its record of monitoring, preventing, remedying, and punishing market power abuse.

The facts are this simple. At the onset of the crisis in California, if FERC had implemented its order of May 16, and its June follow up a year sooner, industries throughout the Western U.S. would not be closed today. If FERC had exercised its review powers on long term contracts that are priced at two and three times the cost of the new resources required to serve them, the lingering effects of California would soon fade away.

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<sup>3</sup>The California ISO operates a number of centralized markets for capacity and energy. This same basic model has been adopted in the regional transmission organizations mandated by FERC across the continent. The contradiction in terms - open competition only within highly centralized and opaque administered markets - has seemingly been lost on FERC and the advocates of these schemes, despite problems in California, New England, Pennsylvania and Alberta.

<sup>4</sup>Theodore Roosevelt at Ossawatomie, Kansas, August 31, 1910

This isn't a partisan issue. When the events of 2000 destroyed paper mills in Washington, as well as other paper, chemical, and metals industries throughout the West, our country took its first steps into the current recession. Like regulation of the market power of railroad trusts at the turn of the century, the question is efficient pricing, not the elimination of a customer's right to choose.

## The California Crisis

Twenty-three months ago the California market erupted in a fourteen-month long series of emergencies, price spikes, and financial crises. For a short while, a well-fueled public relations campaign had much of the world convinced that the state had run out of electric generating capacity as a result of its own unrealistic environmentalism.<sup>5</sup> Now that the storm has seemingly passed, the more dispassionate view that this was market failure rather than resource shortage is gradually gaining the upper hand.

From the beginning, the electric industry was poorly prepared to handle a major market failure. The Western Systems Coordinating Council (WSCC), the body tasked with the electric reliability of the West Coast of Canada, the U.S., and Northern Mexico, never did take an effective role in the crisis. Indeed, most of the debaters never even noticed that the West Coast had a reliability council that had been studying electric reliability issues since 1967.

The crisis in California ended with a whimper, not a bang. Although predictions for the summer of 2001 were catastrophic, the last California emergency took place soon after the implementation of a regional price cap. Simply stated, the crisis turned out to be a problem in institutions and not resources.

California's restructuring was characterized by six words—"bad design, bad incentives, bad results."

AB-1890, the law that launched California on this path, was complex and difficult to understand. Its unanimous passage was evidence that every interest group had gotten its every desire. When every party to a negotiation leaves the table happy, there is a strong implication that they have been promised far more than can be delivered. It is useful to remember the optimistic language of the law:

It is the intent of the Legislature that a cumulative rate reduction of at least 20 percent be achieved not later than April 1, 2002, for residential and small commercial customers, from the rates in effect on June 10, 1996. In determining that the April 1, 2002, rate reduction has been met, the commission shall exclude the costs of the

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<sup>5</sup>The phrase, "Ten years of rapid load growth without new resources," was a hallmark of an excellent public affairs campaign waged by marketers and generators in the California crisis. Interestingly, both parts of the phrase were strikingly untrue. The West Coast had a better load resource balance in 2000 than in previous years and peak loads actually were lower in the ISO's control area than they had been since 1997.

competitively procured electricity and the costs associated with the rate reduction bonds, as defined in Section 840.<sup>6</sup>

Reality proved far more complex.

The basic design involved turning all power decisions over to an hourly market. This decision was so audacious and so mis-informed, that regional utilities and industries are still having to explain to FERC that the hourly market has little to do with the industry years after the design failed. Further, reliability, the historical strength of the North American supply system, was only considered as an afterthought.

The crisis started with the announcement of a Stage 1 and Stage 2 emergency on May 22, 2000.<sup>7</sup> The crisis ended on July 3, 2001 with the final emergency declarations. The catastrophic summer of 2001 actually saw declining prices and increased thermal generation. Every warning that price controls would reduce generation and contribute to the crisis turned out to be wrong.

Politically, the response to the onset of the crisis was like a scene from a frontier bar in an old western. Once the first punch was thrown, every interest group leaped into the fray with its own two fisted agenda. Generators launched preemptive attacks on air pollution agencies, the California governor accused marketers and generators of price fixing, Secretary Richardson moved to seize scarce Pacific Northwest reservoirs, and municipals like L.A. and federal agencies like the Bonneville Power Administration were accused of profiteering. Within minutes, the bar was a roiling mass of punching, kicking, and screaming special interests. Policy responses were especially hopeless. The ISO spent months tinkering with price controls that always contained fatal loopholes. FERC dithered in appalled indecision for seven months, only to gun down one of the victims of the crisis – the California Power Exchange – on December 15<sup>th</sup>. Governor Davis's contribution was to negotiate deals with the marketers and generators that effectively fixed the unfair prices for years to come while simultaneously assailing them for price fixing. Only after the composition of FERC was changed, were substantive steps taken – the adoption of a must offer rule and WSCC- wide price caps.

While pundits from San Diego to Maine opined daily during the crisis, the truth is that under the California ISO's rules, no one was certain exactly where the region stood. The WSCC had published, as they had done for the preceding thirty-three years, a summer load/resource appreciation that indicated that while California supplies for the summer might be tight, that there was no immediate cause for alarm if 1,642 megawatts were available for import during June.<sup>8</sup> In May, for example, they projected a reserve margin of 29.2% for California.

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<sup>6</sup>Section 220(a) of AB 1890.

<sup>7</sup>The ISO issues emergency notices when its forecasted hourly reserves fall below set levels –7% for Stage 1, 5% for Stage 2, and 1.5% for Stage 3. In practice, this mechanism has never worked. Emergency declarations have tended to reflect the need for additional operational rights for the ISO rather than hard and fast standards.

<sup>8</sup>Assessment of the Summer 2000 Operating Period, Western Systems Coordinating Council, Spring 2000, page 3.

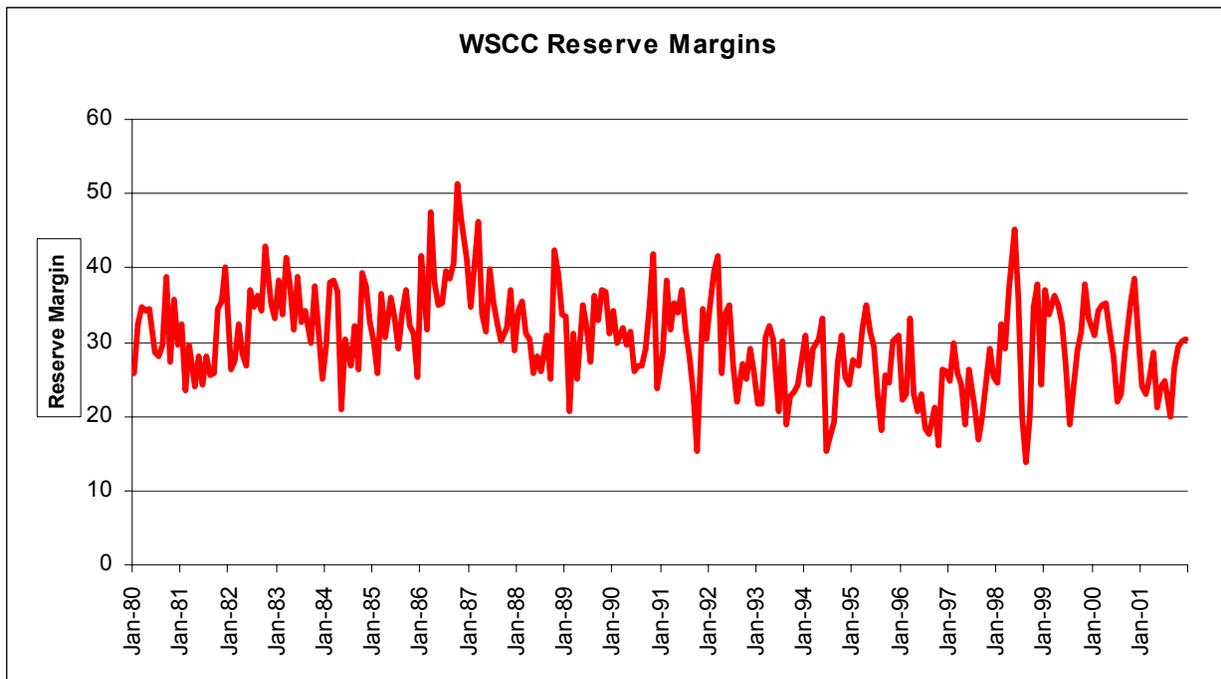
When the California ISO announced its first emergency on May 22<sup>nd</sup>, the industry was completely taken off guard. Under the complex structure of the California system, an emergency did not require a true shortage. The definition of an emergency is when the capacity offered the previous day in the computerized markets of the Power Exchange and Independent System Operator was less than 107% of forecasted demand. At the time, the ISO had no mechanism in place to determine if they were actually facing an emergency, or whether the phone had just stopped ringing.

For some time the WSCC had been constructing a real time generator data base. The data from the WSCC (supplied to them from the ISO) did not support the hypothesis that California plants were out of service. Instead, the data showed that the plants tended to be operating during the ISO system emergencies, but were not being fully dispatched – even during the hours when actual emergency operating conditions were in place.

We were very surprised to learn that overall thermal operations in the California ISO’s control area were running at levels far below the levels of comparable plants elsewhere in the WSCC. Comparing the dispatch rates with price data, our preliminary conclusion was that the California PX and ISO had suffered a one time supply curve shift of 8,000 megawatts leftwards towards the origin. In simpler words, the crisis looked like 8,000 megawatts had simply been removed from service. Eighteen months later, this is still our conclusion.

Enough time has passed that we now know that the WSCC was not facing a capacity shortage at the time. On an annual basis the WSCC publishes a ten year forecast of resource sufficiency. This forecast is usually named the “10-Year Coordinated Plan Summary.” One important part of the report describes the ratio between resources and loads for the previous year.

The following chart shows this data from the WSCC reports from 1980 to 2001.<sup>9</sup>



In describing this chart to the House Energy and Commerce Committee, I used the metaphor of assuring a happy household by ensuring that the ratio of snacks to teenagers always stayed high. In the utility industry, this ratio is called the reserve margin. A reserve margin of 15% means that the area has 15% more resources than requirements. This level – 15% – is generally regarded as an acceptable margin, since one power in plant in six would have to fail for an interruption in service to take place.

As the chart shows, the WSCC has fallen near to this level frequently in the past decade. From 1991 through 1998 reserve margins routinely fell below 20% during the summer. In each case actual interruptions of service were unnecessary, since we always had enough resources to meet load.

The situation in 2000 was far better than the situation that the WSCC faced from 1991 through 1998. In 2000 it was able to get through the summer with a reserve margin above 20%.

Pundits have identified the real problem in 2000 and 2001 as the serious drought that afflicted the Pacific Northwest during this period. As it turns out, this argument is wrong theoretically (reserve

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<sup>9</sup>Since the 2002 report isn't available, we have used the forecasted levels from last years report for 2001.

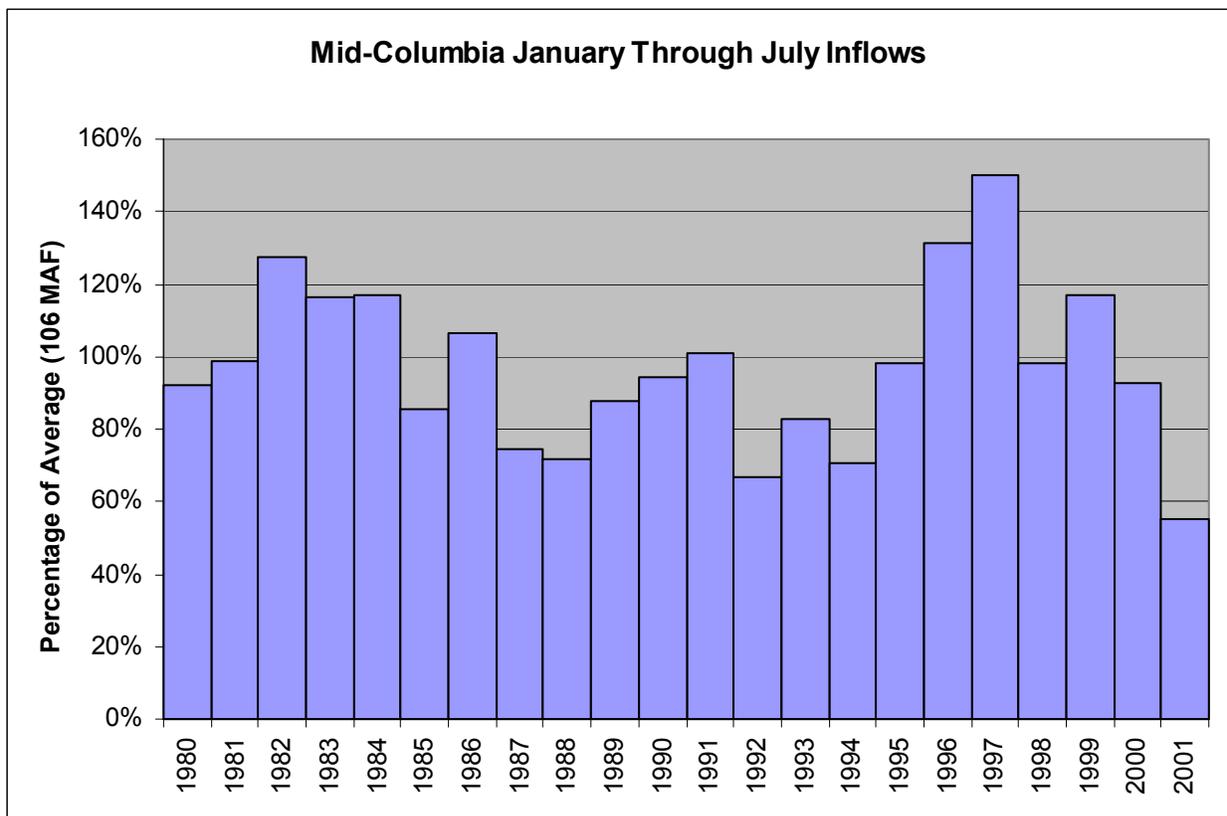
margins are always calculated assuming drought conditions) and factually (the serious drought started in 2001, not 2000.)

It would not be prudent to announce an ability to meet load that could not be delivered during a drought year. In 1974, the WSCC recognized this fact by issuing instructions that the capacity of hydro-electric projects should always be calculated assuming drought conditions.<sup>10</sup>

Thus, the reserve numbers reported above have always assumed drought conditions. Even if the flows on the Columbia River were only at 92% of normal, this would not have affected its ability to meet peak loads.

As it happens, Columbia River flows during 2000 did not represent a drought. Flows in 2001, did. The emergencies within 2000 took place during a period of roughly average water. Put succinctly, there was a drought, but it started after the first summer of the California crisis. When the California crisis ended, the WSCC was in the grip of a major drought.

The following chart shows the January through July flows on the Columbia since 1980.



<sup>10</sup>Criteria for Uniform Reporting Of Generator Ratings, Western Systems Coordinating Council, June 20, 1974.

The very straightforward conclusion that comes from the reserve margin chart when combined with the Columbia River flows is that 2000 was both a better year in terms of resources – 22.9% reserve margin compared with 15.4% in June 1994 – and Columbia River inflows – 92% of normal compared to 71% in 1994. If these facts explained the emergencies in 2000, how did the lights stay on in 1994? The answer is that the organization of the industry rewarded meeting load in 1994. In California’s complex structures, this incentive had been changed in 2000 and 2001.

The major difference between the relatively stable conditions we experienced in 1994 and the emergencies in 2000 was in large part the difference in the operations of traditional utilities and the structure of the California market. In 1994, the generating plants belonged to the utilities. In 2000, the generating plants were dispatched according to the complex incentives hidden in the rules of AB-1890.

Starting in 2000, the WSCC had established a database showing the hourly plant operations of many of the plants on the West Coast. The California ISO provided plant data to the WSCC which, in turn, provided it to any interested WSCC member. While secrecy of operating data is a cornerstone of the California market design, the practice of secrecy at the ISO was unusual. The ISO provided this secret data in contravention of its FERC-filed tariff throughout the summer and fall of 2000.<sup>11</sup> Any market participant equipped with this data would be able to easily adjust its operations to accentuate the California ISO’s problems during an hour when demand was high. Curiously, Portland General Electric, Enron’s subsidiary, did not contribute data to the database. Enron had access to the data of others, but did not welcome access to its own plant operations.

The California ISO has provided numerous charts that show that as its system approached peak, supplies offered to the California PX would begin to drop off. The resulting deficit would become an operating problem at the ISO. Once emergency conditions were declared, prices would skyrocket and supplies would reappear.

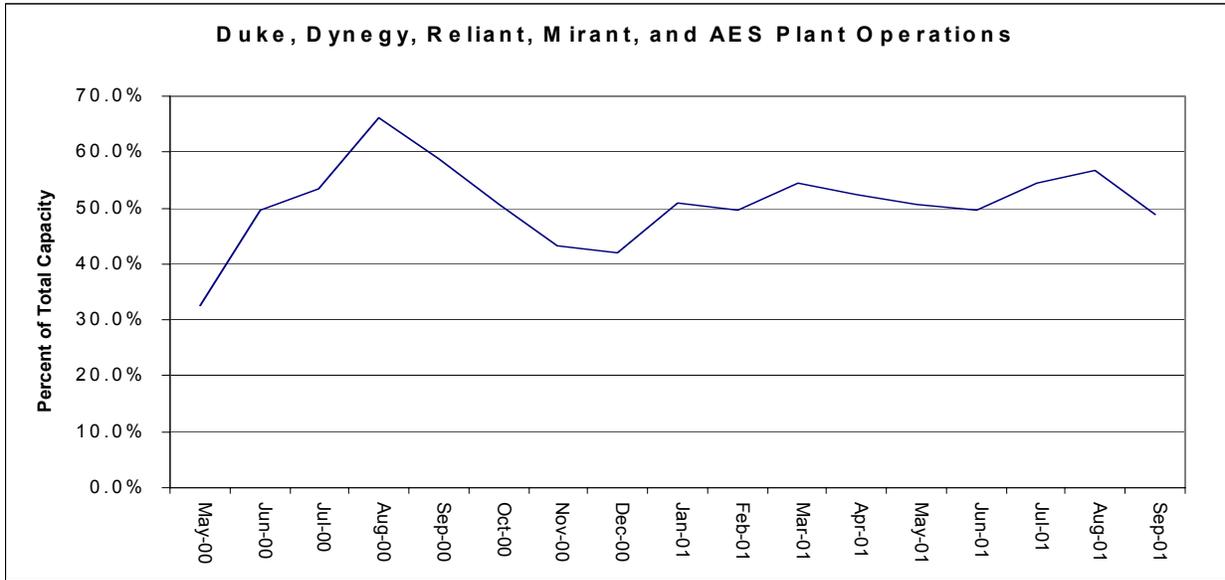
Ironically, the hourly data is public outside of California – even today – as part of the EPA’s emissions database. Unfortunately for consumers and policymakers in California, access to this data is usually delayed from three to five months.

The following chart shows the monthly operations of the units owned by Duke, Dynegy, Mirant, Reliant, and AES over this period. While plant operations in the rest of WSCC reached 100%, plant operations for the groups who have primarily profited from the crisis averaged 50.3% from May 2000-June 2001. Interestingly, plant operations were actually slightly higher for the three months that followed price controls, even though market prices were significantly lower.<sup>12</sup>

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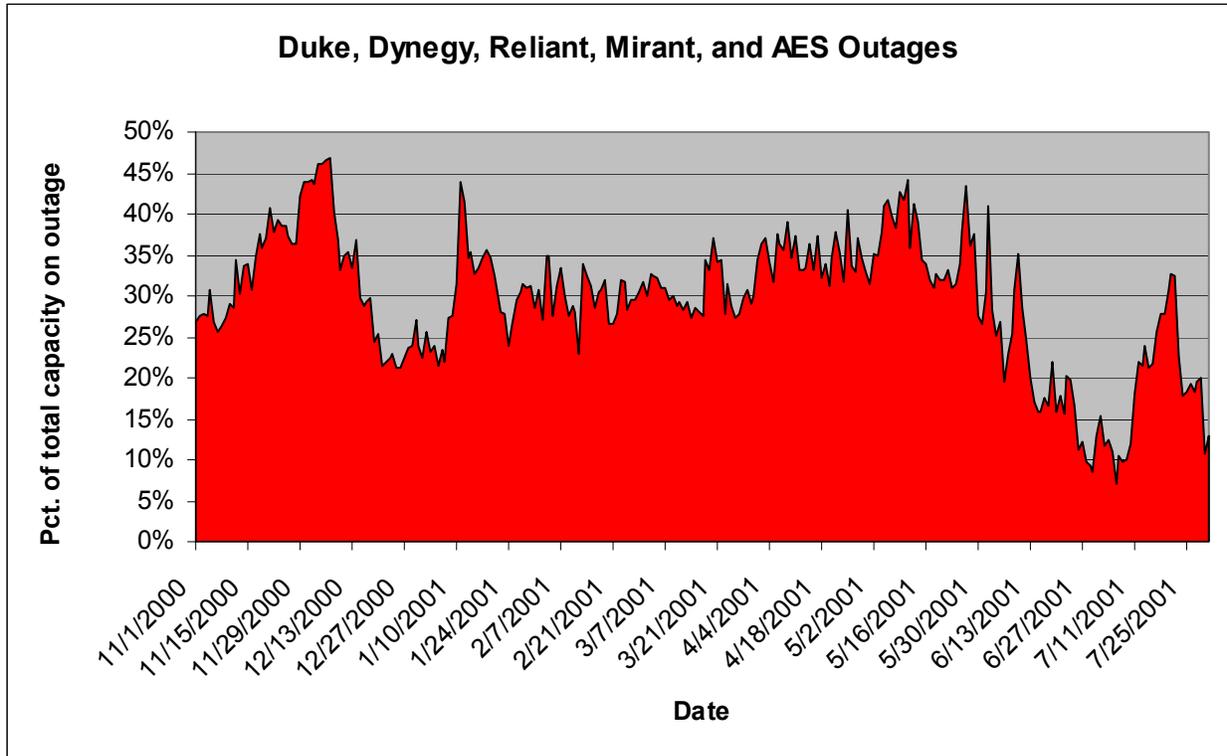
<sup>11</sup>California ISO Information Availability Policy, originally dated October 22, 1998, modified November 1, 2001.

<sup>12</sup>This chart was based on data provided by the EIA. The EIA has faced substantial pressure to reduce the amount of such data available to public, as has FERC, the WSCC, and the North American Electric Reliability Council.



We have been unable to explain the hourly operations of these five generators even after enormous effort. Frequently, plants went undispached during system peaks and even during ISO declared emergencies. Whistleblowers from the plant operations staff have indicated that their directions from management were inexplicable. Operations at plants outside of California have shown none of these problems. In fact, outside of the plants in the chart above, operations have been as close to 100% of capacity as the owners could reach.

Many analysts break the California crisis into two periods. The first, economic withholding, represents the period when generators either did not bid resources into the PX and ISO or made bids at unrealistic prices. A second period – physical withholding – took place from November through June. While it is possible that the decision to take 50% of California’s thermal units down simultaneously for planned outages was simply coincidental, an alternative explanation is also possible. After the ISO stopped providing operating data to the WSCC, generators may have simply switched to communicating their operating levels through planned and forced outage announcements. Regardless of the explanation, operations in the second part of the crisis roughly mirrored operations during the first portion.



From November until the onset of price controls, the five generators reported massive plant outages. The ISO did not reliably solicit or record plant outage data until 2001, so it is difficult to compare the outages in November 2000-May 2001 with previous years for the same plants. Detailed historical data on the performance of similar plants – by age, size, technology, and fuel – are accumulated by the North American Electric Reliability Council. Its data shows vastly lower outage rates on similar equipment.<sup>13</sup>

While predictions of widespread blackouts were common through the spring of 2001, FERC’s decision to implement a WSCC-wide price cap appears to have had a significant impact on plant outages, short-term prices, and long-term prices in the late spring.

As always, shifts in long-term prices are the most interesting, since they are not affected by weather or other operating problems.

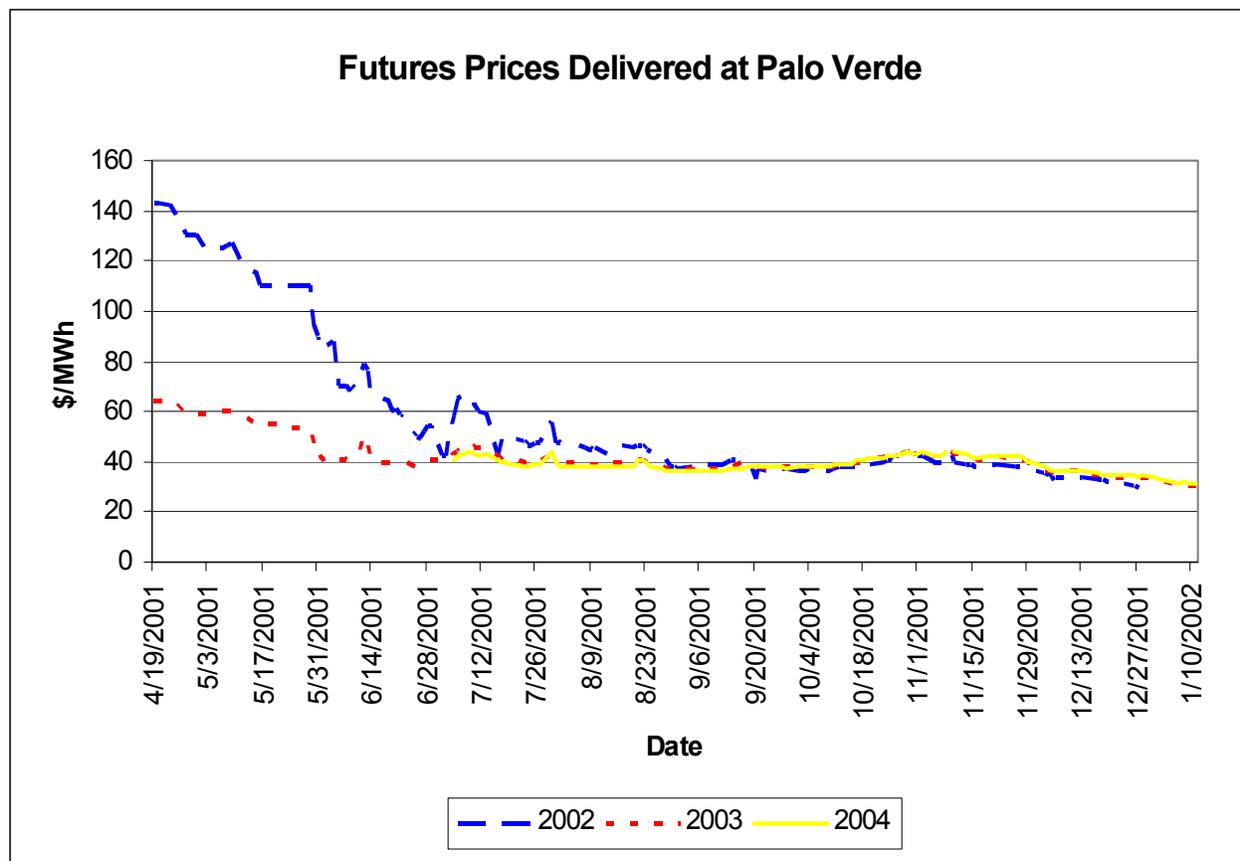
The onset of price caps in June led to the larger of the West Coast’s two long-term price reductions in 2001. The second major price reduction – in percentage terms – took place over the weekend Enron declared bankruptcy.

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<sup>13</sup>NERC’s Generation Availability Data System (GADS) can be used to review the history for any type of plant. It is available on NERC’s web site.

The success of the price caps can be seen immediately. The presence of a counterweight to California's fragile power markets almost immediately returned long-term prices to the levels we have seen for the past twenty years. As FERC's recent report notes, "the average price (both simple and weighted) at which the Western utilities sold power in the daily spot market was significantly below the price cap of \$92/MWh."<sup>14</sup> This is quite an understatement – by the end of June, prices had fallen to \$43/MWh at Palo Verde.

While price caps are unlikely to work in a competitive market, the California market was hardly competitive. The incentives under AB-1890 rewarded shortages. Once the ISO entered an



emergency, it offered prices five to thirty times higher than normal levels for emergency supplies. Once FERC eliminated the ISO's ability to pay such distorted prices, generators in California were rewarded by producing more rather than less electricity. All of the data indicates that once the incentives were repaired, plant operations improved and prices fell.

The shift in generator behavior is even more significant when each plant's operations are modeled on an hour-by-hour basis from January 1, 1997 through December 31, 2001. The following table

<sup>14</sup>The Economic Impacts on Western Utilities and Ratepayers of Price Caps on Spot Market Sales, January 31, 2002, page 4.

shows the forecasted operations of the plants based on market prices for energy, natural gas, and NOx RECLAIM credits.<sup>15</sup>

	<b>Northern California</b>	<b>Southern California (Outside of SCAQMD)</b>	<b>SCAQMD</b>	<b>Total</b>
<b>Forecasted</b>				
Jan-97 to Mar-98	125.63	467.31	486.69	1,079.63
Apr-98 to Apr-00	2,097.07	2,145.22	2152.96	6,395.24
May-00 to Jul-01	4,055.36	4,623.28	4812.76	13,491.40
Aug-01 to Dec-01	2,504.16	2,524.25	1202.37	6,230.78
<b>Actual</b>				
Jan-97 to Mar-98	973.99	1,157.25	1060.72	3,191.96
Apr-98 to Apr-00	1,250.30	1,349.55	952.43	3,552.28
May-00 to Jul-01	2,603.83	2,665.89	2408.84	7,678.57
Aug-01 to Dec-01	2,351.52	2,031.62	2163.14	6,546.27
<b>Difference</b>				
Jan-97 to Mar-98	848.37	689.93	574.03	2,112.33
Apr-98 to Apr-00	(846.77)	(795.67)	(1,200.52)	(2,842.97)
May-00 to Jul-01	(1,451.53)	(1,957.38)	(2,403.92)	(5,812.83)
Aug-01 to Dec-01	(152.64)	(492.63)	960.77	315.50

Actuals are significantly lower than forecasted levels from May 2000 through July 2001 – the duration of the California crisis. After FERC’s intervention in the market the deviation between actual operations and forecasted operations changed from an under-generation of 5,813 megawatts to a slightly higher than predicted production of 315 megawatts.

Overall, the standard model of economic dispatch of these plants fits very well before the crisis and after the crisis. During the crisis, the plants generated 5,813 megawatts less than a market model would have predicted.

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<sup>15</sup>The model uses heat rates derived from EPA hourly generation and fuel use data, MWh/Nox data from the same source, and market natural gas and electric prices. RECLAIM prices are the monthly average for coastal and inland markets.

## Motive, Means, and Opportunity: Enron's Role in the Market

From its inception, Enron, the combination of the Houston Natural Gas and the InterNorth pipeline companies, was a turbulent and troubled entity. While the public relations skill of Ken Lay and the financial skills of Jeff Skilling portrayed the company as a surging force in energy markets, the revelations of the past year indicate that it had lurched from failure to failure. The cycle of Enron triumphs – optimistic announcements followed by accounting adjustments, temporary boosts by artificial valuations, and finally closure or sale – was repeated time and time again. After each cycle, the deadweight loss of previous disasters placed a heavier burden on the next announced triumph to overcome.

Year	Enterprise	Outcome
1988	Oil trading	Large scale embezzlement caused the abandonment of the business
1990	Long Term Natural Gas Contracts	Shifts in natural gas pricing made many early transactions uneconomic
1994	Brazil	A variety of Brazilian projects including the pipeline from Bolivia to Brazil and associated power plants were delayed, cancelled, or eventually devalued by Brazil's economic problems and a persistent drought.
1995	Dabhol	Enron's one sided contracts faced every possible obstacle from the state of Maharashtra.
1997	PGE	While PGE has retained its value, Enron's high purchase price depended upon proposals to free valuable assets from Oregon regulation. None of these were approved by the Oregon PUC.
1998	California Retail Markets	Enron withdrew from the retail market after a month at a cost of hundreds of millions of dollars in startup costs
	Azurix	Enron's troubled investment in England is followed by failed water investments throughout the world
	Elektro	Enron purchases a Brazilian distribution utility now troubled by drought, devaluation of the Brazilian currency, accounting investigations, and devaluation
2000	Broadband	Enron's broadband revenues prove largely illusory
2001	EnronOnline	Enron's business to business web site achieves \$195 million dollars in notional transactions in its final quarter – roughly four times Enron's total revenues. No impact on actual revenues, earnings, or cashflows is apparent.
	TNPC	Enron spins out a troubled retail operation and profits through the complex mechanics of Raptor 3. Actual revenues are low and earnings are non-existent.

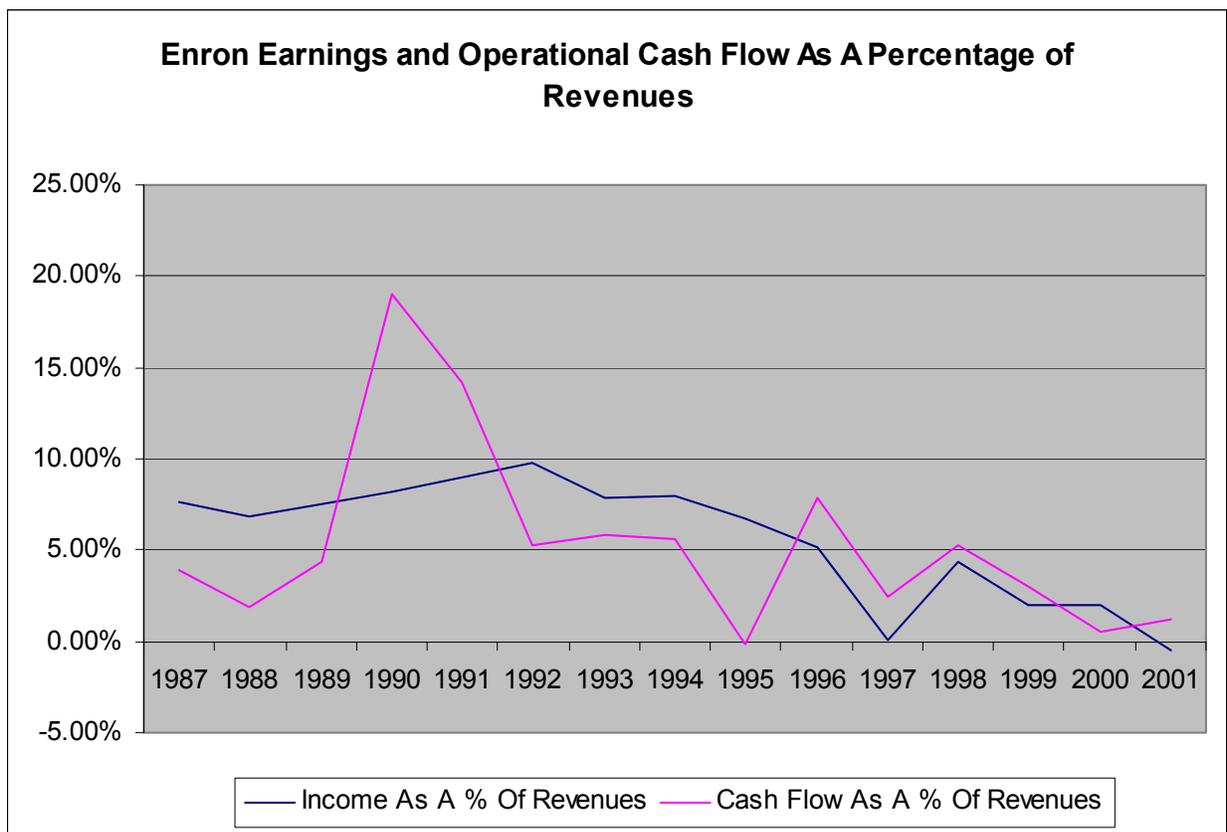
The central theme in Enron's growth was its desperate search for purchasers in its schemes. Each cycle promised enormous growth. Each cycle faltered on the absence of realistic markets. Each cycle fell to creating buyers where none really existed. We now know that many of Enron's past

failures involved – in one way or another – the creation of artificial demand for their commodities and assets.

From the beginning of the decade when Enron began to treat asset sales as “merchant investments” to the mid-1990s when an increasing proportion of Enron’s earnings began to be based on questionable “mark to market” estimates, the actual quality of Enron’s earnings have faltered badly.

Since 1994, Enron has always obscured its frequent market setbacks with affiliated entity transactions. From 1994 through 1997 the major buyer for many of these troubled assets was Enron Global Power and Pipelines. In 1997, the buyer was Nighthawk. Nighthawk evolved into Whitewing in December 1997. As Enron’s problems expanded, the affiliated entities also expanded in number. By 1999, Whitewing was joined by a variety of structures including Sundance, Hawaii, LJM1 and LJM2, not to mention the infamous Raptors.<sup>16</sup>

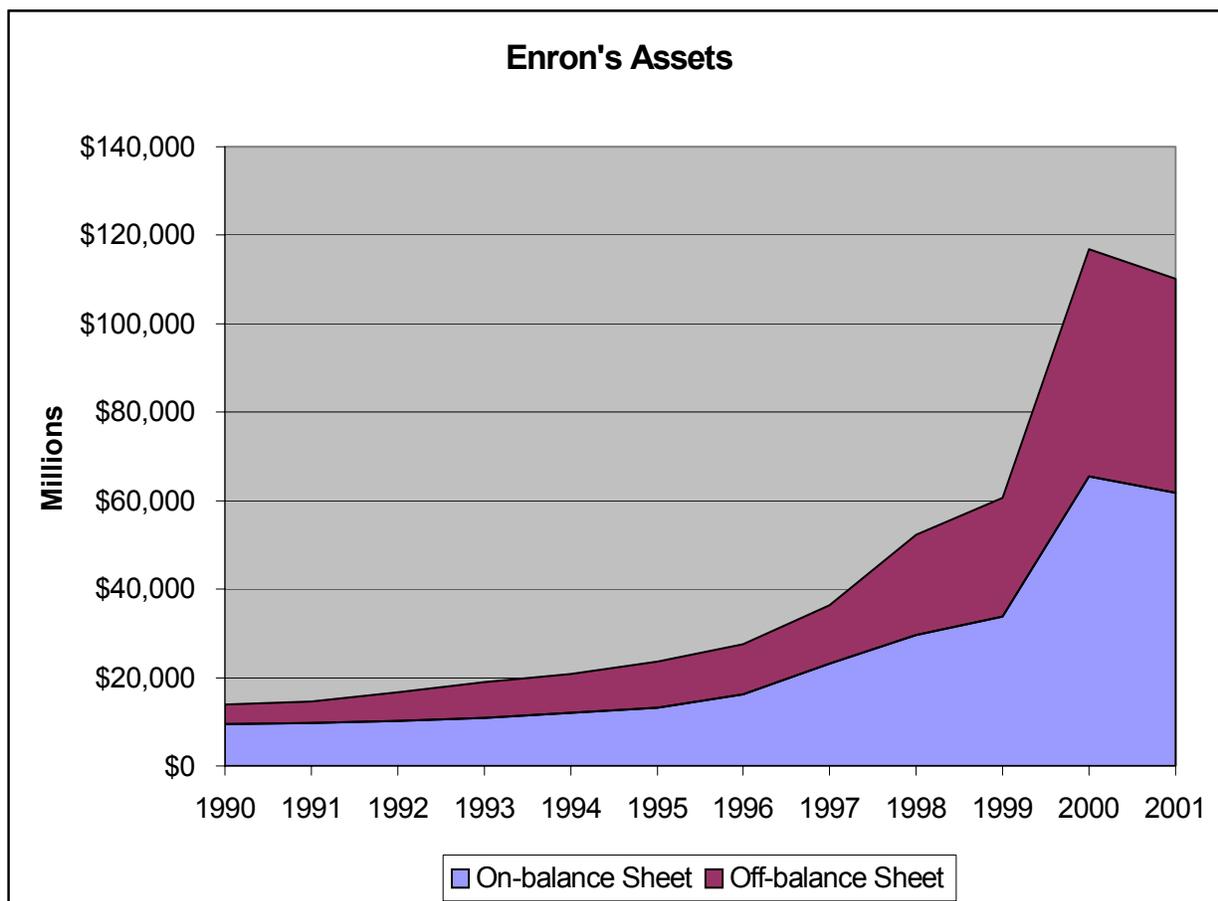
The chart below summarizes fifteen years of Enron’s announced earnings and operational cashflows as a proportion of announced earnings.



<sup>16</sup>Understanding Whitewing, McCullough Research, January 20, 2002, and Understanding LJM, McCullough Research, February 2, 2002.

Even these figures are amenable to manipulation. The relatively strong figures for the early 1990s depended upon the sale of future receivables – another example of borrowing from Peter to pay Paul.

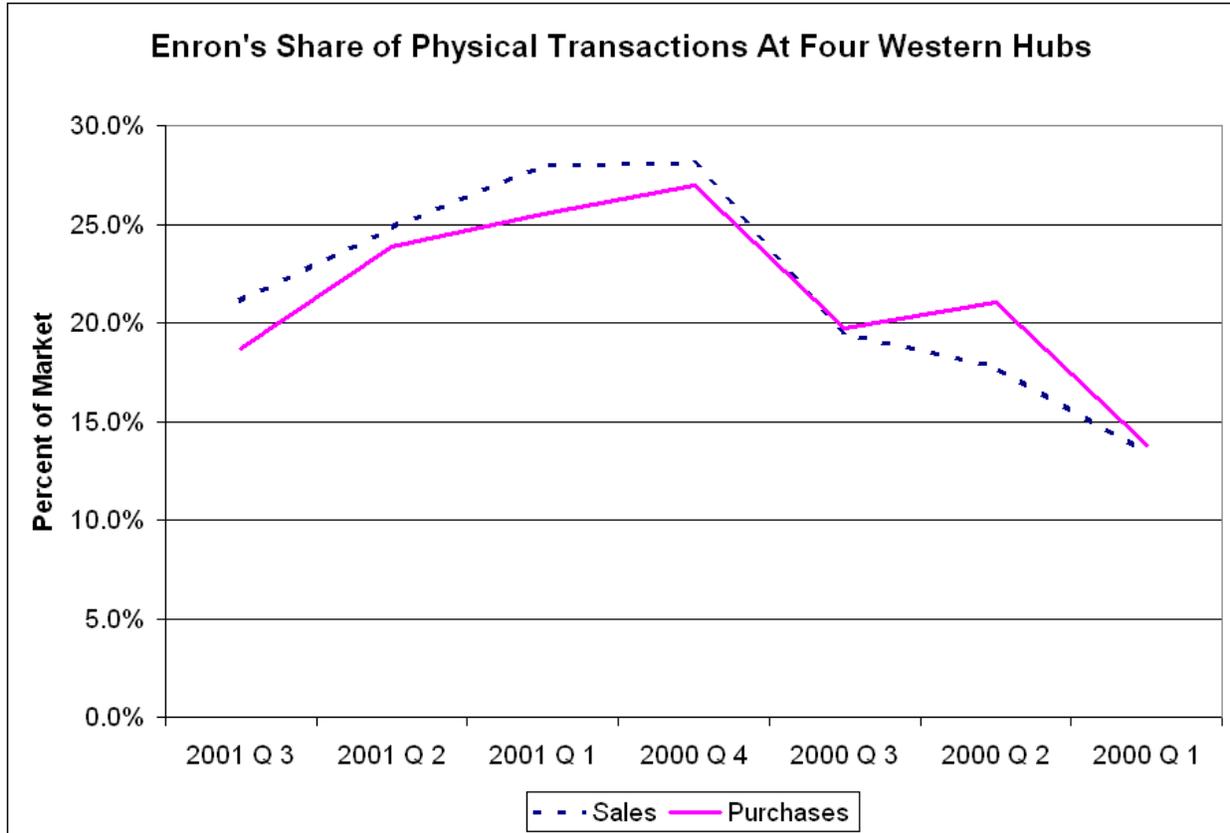
Ironically, some of the most important evidence we have on Enron's deteriorating financial position over time comes from materials only made available to the partners of LJM2. The following chart represents data on off-balance sheet assets provided to select limited partners:



By any standards, Enron entered into 2000 in desperate conditions. We now know that earnings in 2000 and 2001 were primarily taken from financial maneuvers like LJM2's Raptor subsidiaries and comparable affiliated party transactions like Osprey and Sundance

Clearly, enormous concentration in California markets was required for Enron to affect prices. FERC does not accumulate the data necessary to show the degree of concentration on a systematic basis. FERC does require energy marketers to file quarterly reports. Enforcement of this provision is weak. Some marketers fail to file their reports. Others file their reports in illegible or illogical formats. Still others, like Enron, do not specify any detail on the hubs where they bought and sold electricity.

The following chart shows Enron’s share of the major California hubs over time. The data used to generate this chart was taken from sales and purchases of major Enron trading partners who do show where Enron’s transactions take place.



This chart matches our detailed research on Enron’s trading activities.<sup>17</sup> Enron’s market share – for both sales and purchases – increased dramatically in 2000. By the fourth quarter of 2000, the evidence from FERC’s quarterly marketing reports indicated that its sales were nearly 30% of the market. As Enron entered 2001, the growth of its wholesale operations appears to have stalled. Overall statistics indicate that Enron’s physical sales declined after 4<sup>th</sup> quarter 2000.

In almost any other commodity market a 30% market share is clearly sufficient to exercise price leadership. Pacific Gas and Electric’s share of California wholesale markets before April 1, 1998 was similar and its ability to use its scale to affect prices had long been observed.

<sup>17</sup>Deconstructing Enron’s Collapse, McCullough Research, January 10, 2002.

Enron's sales directly to the California ISO were not large. Enron's sales at the hubs were vastly greater than its sales to the ISO. This may simply reflect the fact the market leader need not show up in every transaction. Price leadership sets the prices for all participants. Each transaction would reflect the price leader's price even though the price leader only had 30% of the market.

Enron's transactions with Pacific Northwest generators may have tended to obscure its sales to the ISO. During the California crisis, Enron approached a number of Pacific Northwest utilities offering to purchase ancillary services for sale to the ISO. Disentangling these transaction may be difficult.

Do we know whether Enron exercised its market power in an attempt to increase prices during the market crisis that occurred between May 2000 and July 2001? No.

Publicly available data simply isn't that detailed. And while the California ISO continues to restrict availability of such data through its aggressive use of confidentiality agreements, the public debate will not become much clearer. The irony of the situation is that the ISO, the victim, has restricted market information to the market participants since they must have access to participate in the FERC refund cases and ongoing litigation, but has taken the same data out of the hands of the public, the press, and policy makers.

If arrogance was a clue to the exercise of market power, Enron's behavior during this period was legendary. During one transaction we were involved in, a junior Enron trader simply hung up on a senior executive of a Fortune 500 company because he could not move fast enough. This is market power with a vengeance.

What little evidence we can access concerns Enron's "price risk management activities." This typically elliptical phrase was used by Enron to describe its hedging activities. Enron's 2000 Annual Report describes this area of its business as:

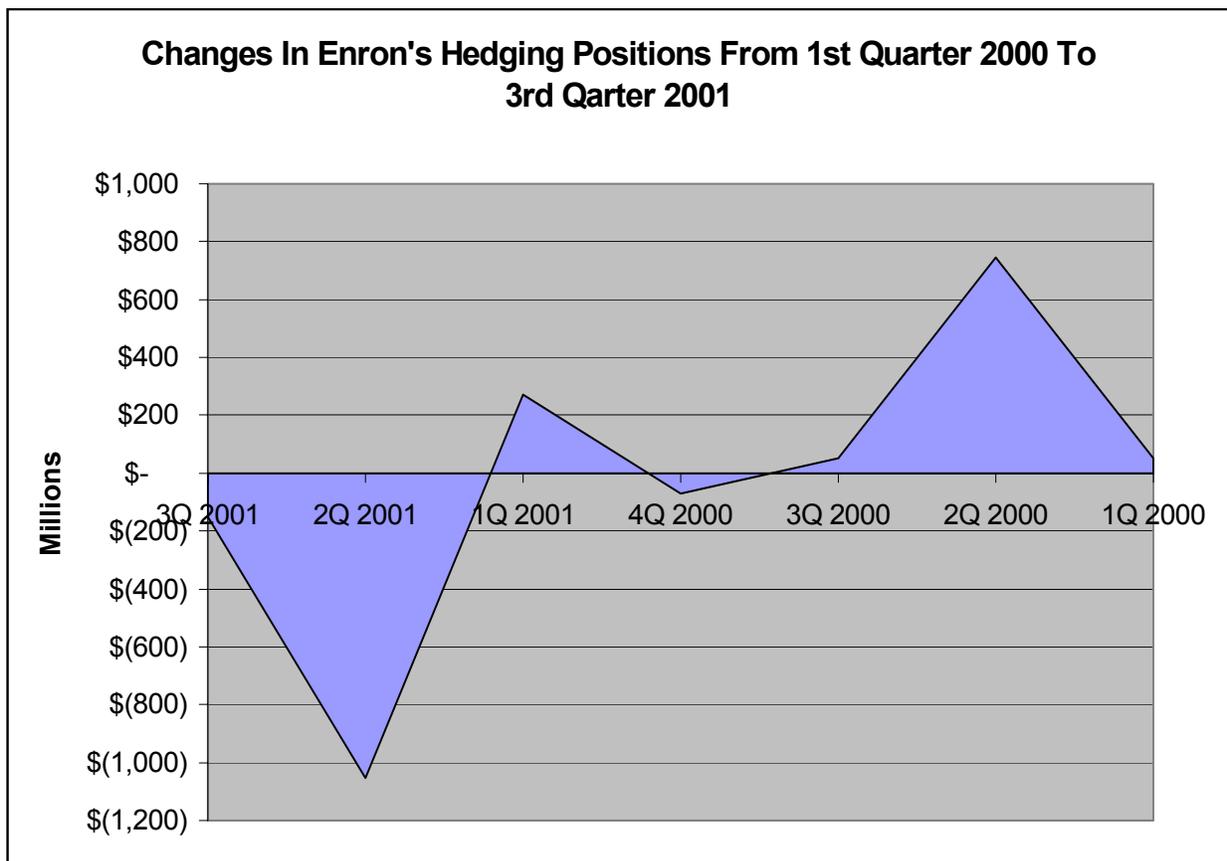
Enron engages in price risk management activities for both trading and non-trading purposes. Instruments utilized in connection with trading activities are accounted for using the mark-to-market method. Under the mark-to-market method of accounting, forwards, swaps, options, energy transportation contracts utilized for trading activities and other instruments with third parties are reflected at fair value and are shown as "Assets and Liabilities from Price Risk Management Activities" in the Consolidated Balance Sheet.<sup>18</sup>

If Enron had knowledge of market power in advance, we would have expected its hedging operations to be quite profitable. If not, the surprising and unanticipated events of May and June 2000 – 2<sup>nd</sup> Quarter 2000 – should have posed a substantial economic risk.

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<sup>18</sup>2000 Enron Annual Report, page 36.

Enron's financials show a dramatic shift in the net value of price management assets in the 2<sup>nd</sup> Quarter of 2000. This would be consistent with foreknowledge of the onset of the California crisis:



This chart also provides ample reason for Enron's energetic attempts to postpone the advent of price controls in the 2<sup>nd</sup> Quarter of 2001. As prices fell, Enron faced enormous losses in the net value of their hedging assets.

On a smaller scale, at least one of the investments of LJM2 shows the same canny prescience on future events. In the winter of 1999, six months before the onset of the California crisis, Enron approached the Oregon Public Utilities Commission with the proposal to sell a minor PGE asset in the market while reserving much of the profit for Enron. PUC staff reviewed the proposal carefully and successfully preserved the majority of the profits from the transaction for Oregon ratepayers.

A number of aspects of the transaction were not known to Oregon regulatory staff at the time. Significantly, LJM2 took a major role in this transaction, receiving a difficult to understand \$3.5

million profit in the transaction.<sup>19</sup> Even more surprisingly, LJM2 planned to take a 50% ownership in asset.<sup>20</sup>

Enron's testimony before the Oregon Public Utilities Commission on August 14, 2000 showed that its market perceptions before the crisis was that such investments would have been unable to earn even a 15% return on the investment.<sup>21</sup> LJM2's internal documents indicated a 22% return on this investment. LJM2 apparently was able to either operate in the same markets with vastly more expertise than Enron, or LJM2's estimate showed foreknowledge of the events to come.

Both sets of evidence – the larger picture of Enron's hedging position and the smaller example of a single plant transaction – seemingly indicate that Enron was prepared for the explosion on May 22, 2000. If so, it was among a very select group. As mentioned above, May was not considered a month in which an emergency was even remotely possible.

## The California Crisis and Enron's Collapse

Were these two events related? Enron had means, motive, and opportunity. Substantial evidence now exists that Enron was able to exercise market power in forward markets. The firm had the means. We now understand the motive very well. Enron stood on the brink of bankruptcy. Jeff Skilling's unanticipated exit from Enron soon after the end of the California crisis is powerful evidence on how dangerous FERC's imposition of price controls were to Enron. Finally, they had opportunity. If the firm's market share was as high as FERC's quarterly market reports indicate, it was in an excellent position to affect hourly markets.

Data also suggests that Enron's management were able to plan ahead for the onset of the crisis. The event they could not predict was a shift in the regulatory climate that brought the crisis to a close years ahead of the schedule the firm had predicted.<sup>22</sup> The FERC orders that ended the California crisis may well have spelled the end to the last gamble to preserve Enron from bankruptcy.

While we know that the California crisis did not reflect market fundamentals, the final word on Enron's role in the crisis will depend on investigations now underway. We can draw lessons from the crisis even before the final word on Enron arrives.

First, secrecy and opacity are simply too expensive. Open markets require open information.

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<sup>19</sup>Powers Report, page 147.

<sup>20</sup>June 14, 2000 letter from Kathy M. Lynn to LJM2's limited partners, page 4.

<sup>21</sup>Understanding Recent Power Prices, August 14, 2000, page 15.

<sup>22</sup>“Tim Belden of Enron, a major energy marketer, predicted that prices would remain high for another two to four years as demand approaches the region's capacity to produce electricity. “ Experts Try To Explain Run-Up In Energy Costs, Associated Press, July 19, 2000.

Second, market power is always a problem in commodity markets. Steps are underway to reverse many of the exemptions that Enron received from regulatory controls.

Third, FERC's role is more important in a deregulated market than it ever was before. Arguments that FERC should surrender its power to review long term contracts and avoid an active regulatory role are as wrong today as they were at the turn of the century when the U.S. faced the same arguments concerning the railroads.

Thank you for this opportunity to appear before you.