

Regulation and Forward Markets

Lessons from Enron and the Western Market Crisis of 2000-2001

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The Contemplated Transaction, though questionable on business, political, and social grounds, does not appear to be prohibited under current law. Moreover, even if the Contemplated Transaction is illegal under current law, *it is highly unlikely that any prosecution would be successful, for want of necessary evidence.*

Enron Outside Counsel Review of a Proposed Market Manipulation Scheme³

In 1993, the Commodity Futures Trading Commission (CFTC) determined that it would not regulate over-the-counter futures transactions in energy⁴, a decision later codified by Congress with the passage of the Commodity Futures Modernization Act of 2000.⁵ Combined with the earlier decision by the Securities and Exchange Commission (SEC) to allow mark-to-market accounting in 1991, the stage was set for a Shakespearean drama of financial deceit and market manipulation. Although the maxim, “Good fences make good neighbors” often seems dated, the existence of effective regulation might well have avoided the ensuing bankruptcy and fraud.

The widespread financial deceit that was integral to the Western Market Crisis of 2000 and 2001 has caused difficulties for investigators trying to comprehend the impacts caused by regulatory absence. Although much attention has focused on schemes with evocative names like “Death Star” and “Ricochet,” the shift to mark-to-market accounting meant that the real rewards came from manipulating forward transactions. Even a small spot market manipulation could reap millions in reported corporate earnings and trader bonuses when its impact on mark-to-market calculations was considered.

The 1993 decision to exempt energy transactions from CFTC oversight meant that only the relatively small West Coast New York Mercantile Exchange (NYMEX) markets and the California Power Exchange’s (PX) Block Forwards market were potentially subject to regulatory scrutiny. When these markets ceased functioning during the Western Energy Crisis, only unregulated over-the-counter forward markets and electronic trading platforms remained, where EnronOnline had established itself as a market leader. The evidence accumulated in investigations initiated in the aftermath of the crisis led federal regulators to conclude that “the relationship between financial and physical energy products and the relatively thinner and less liquid physical markets

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³ Legality of Proposed Energy Purchase-Sale Plan, Rocio Olivencia and Brian Trackman, July 29, 1999. (emphasis added) This memorandum discusses the legal status of a proposed large scale Ricochet scheme to be performed on Enron’s behalf by PGE. The scheme was ultimately rejected by PGE.

⁴ Exemption for Certain Contracts Involving Energy Products, 58 FR 21286, April 20, 1993.

⁵ P.L. 106-554.

provides opportunities to manipulate the physical markets and profit in the financial markets....”⁶ In fact, the evidence shows that EnronOnline’s financial trading in natural gas—primarily generated by just one trader-- accounted for 21 % of Enron North America’s total profits in 2001.⁷

Enron’s complaint against the insiders and bankers who implemented the many financial frauds establishes that Enron was insolvent on or before 1999.⁸ If Enron had been forced to place its forward transactions through a regulated exchange, the company’s fragile financial position would have been revealed earlier. Perhaps the temptation to engage in large-scale market manipulations could have been curbed, and the energy crisis avoided altogether.

Enron remains the energy industry’s poster child for corporate fraud and market manipulation. However, the environment of ineffective regulation and weak financial oversight, in which Enron’s deceit flourished, was not an isolated incident at the time of the crisis. Since then, market manipulation fines and settlements have been levied on many participants, and additional investigations have identified other electric and gas market manipulation schemes in the U.S. and Canada.⁹

Yet almost five years after Enron’s collapse, significant questions remain about the federal government’s response to the Western crisis and the lessons that should be drawn from it.

The Incomplete Trail of Enron Evidence

These questions began with the evidentiary trail which is scattered between a Houston storage facility and the Enron recording machines overlooked by the FBI in its initial seizure of evidence; to wrangling among federal agencies over access to information; disappearing or deteriorating data files made public—redacted—and made public again; to the ongoing efforts of Enron’s attorneys to keep these materials under seal, potentially in perpetuity.

In its capacity as a consultant to various victims of Enron’s schemes, McCullough Research has painstakingly analyzed and reconstructed databases of Enron’s internal files. A major breakthrough was achieved when our client, Snohomish Public Utility District (PUD), was granted access by the Department of Justice (DoJ) to a subset of Enron trader tapes. This allowed us to further decipher various transactions and manipulation schemes that until that time appeared simply as notations such as “Death Star” or “Ricochet” on power schedules. Previously, these audiotapes had not been processed by federal authorities. While we have been successful in including a portion of this evidence in ongoing proceedings at the Federal Energy Regulatory Commission (FERC), it is worth noting that our efforts have focused primarily on Pacific Northwest markets and Enron’s Portland, Oregon trading desk. In October 2004, we found an additional set of tapes at Enron’s headquarters that had not been turned over to the DoJ. In our

⁶ *Final Report on Price Manipulation in Western Markets, Fact-Finding Investigation of Potential Manipulation of Electric and Natural Gas Prices, Docket No. PA02-2-000*; Prepared by the Staff of the Federal Energy Regulatory Commission, March 2003, pp. IX-1.

⁷ John Arnold--the lead Enron financial desk trader--generated 21 % of Enron North America’s (ENA) profits in 2001. Arnold’s profits, however, were partially offset by the trading losses of other Enron financial desk traders, leaving the total portion of ENA profits for 2001 generated by the financial gas desk at 15 %. The ENA profit totals have been adjusted to account for a fraudulent \$595 million reserve adjustment to ENA’s 2001 profit and loss statement. Reserve adjustments were frequently used by Enron to create the appearance of additional profits.

⁸ See Reorganized Debtors’ Fourth Amended Complaint For The Avoidance And Return Of Preferential Payments And Fraudulent Transfers, Equitable Subordination, And Damages, Together With Objections And Counterclaims To Creditor Defendants’ Claims, January 10, 2005 for an extensive discussion of Enron’s insolvency and its causes.

⁹ Even today, documents concerning the Western Market Crisis are difficult to find. All documents cited in this report are at <http://www.mresearch.com/reports.html>. Appendix C provides a basic chronology of the Western Market Crisis. Appendix D provides a short glossary of Enron’s market manipulation schemes.

review of discovery we found additional Enron-like schemes in Alberta, Texas, Louisiana, and New York. To date, it remains unclear what portion of the remaining tapes processed by the DoJ, FERC, or the CFTC, particularly as they might relate to EnronOnline, might reveal more about the natural gas trading volumes and profits noted above¹⁰.

In the intervening years since the Western crisis, there has been a resurgence of trading activity, and billions of dollars are now pouring into unregulated energy commodity markets operations, which have expanded to offer a host of new products including crude oil and gasoline futures. With media reports detailing the rising fortunes of individuals involved in the Western crisis, perhaps the first key question for policymakers is whether a more thorough accounting of this evidence is warranted, thus providing a lens through which to view the sufficiency of federal enforcement actions to date.

Sufficiency of Coordination and Oversight in Detecting Manipulation:

There is no doubt that one key factor that allowed Enron to succeed in its schemes was that no single state or federal regulatory entity had a holistic view of market operations, nor were there plans to share information among entities charged with monitoring specific sectors. This is particularly true as it relates to Enron's efforts to make profits by playing off positions in both the financial and physical commodity markets. First, California state entities, including the PX and ISO, had insufficient visibility within the Western Systems Coordinating Council (WSCC) to detect the false schedules and other machinations Enron and other entities employed to feign congestion and power shortages, and withhold physical generation from the system under the pretense of maintenance outages. The same was true of FERC, which concluded on at least two occasions in 2000 and 2001 that no manipulation was occurring in the West.

Meanwhile, Enron's financial trading in energy commodities—where it would log a majority of its trading profits—occurred beyond the view of federal regulators. EnronOnline was the topic of a FERC staff inquiry begun in May 2001, which ultimately (and erroneously) found “no reason for concern about EOL at this time.”¹¹ These trading activities also remained beyond the view of the CFTC, due to the exemption included in the Commodity Futures Modernization Act of 2000. But as FERC's post-hoc analysis in 2003 would conclude, “[T]he direct and indirect relationships between financial derivatives and physical transactions provide the linkage needed to exercise particular manipulation strategies.”¹² In evidence we have uncovered since that time, it is likely that EnronOnline had a 60% market share among the electronic trading platforms in 2001.¹³

In applying the lessons of the Western energy crisis to current concerns over speculation and trading in unregulated commodity markets, it is perhaps instructive to inquire whether federal authorities still suffer from this veritable information blackout. When it comes to oil and gasoline markets, the critical questions include:

¹⁰ FERC trial staff have indicated that market manipulation on EnronOnline was coordinated over recorded phone lines. FERC Final Staff Report, page VII-2.

¹¹ *Inquiry into EnronOnline*, Staff Memorandum, Federal Energy Regulatory Commission, August 16, 2001

¹² *Final Report on Price Manipulation in Western Markets, Fact-Finding Investigation of Potential Manipulation of Electric and Natural Gas Prices, Docket No. PA02-2-000*; Prepared by the Staff of the Federal Energy Regulatory Commission, March 2003, pp. IX-5.

¹³ For electric power products and physical gas products, the majority of trading on electronic platforms in 2001 was carried out on EnronOnline and ICE. EnronOnline accounted for more than 60% of volumes traded on electronic platforms for these products, and was particularly dominant in next-day Henry Hub gas. For gas derivatives, the great majority of electronic trading took place on EnronOnline and on the NYMEX platform. A third of gas derivative volumes were traded on EnronOnline. While a detailed breakdown of EnronOnline's share of volumes traded on electronic platforms is not available for 2000, Enron internal trading activity reports and press statements indicate that the majority of EnronOnline's growth took place in 2000, with a peak in December of 2000.

- Do federal authorities have sufficient information to track and verify the cause of disruptions and outages in physical supply?
- Do federal authorities have the information they need to assess the positions taken in financial commodity markets by entities with controlling interests in physical supply?

If the answer to one or both of these questions is 'no,' then the second concern for policymakers is whether and how to require more transparency in these markets, a significant proportion of which remain beyond the CFTC's regulatory purview.

Trading Strategies in Unregulated Energy Commodity Markets:

While FERC has now concluded that a number of the more notorious Enron schemes related to physical electricity and natural gas markets constituted violations of our nation's energy laws, lingering questions remain about the CFTC's ability to root out a strategy used by Enron and others in financial markets, known as "wash trading"—the practice of buying and selling the same commodity almost simultaneously, for purposes of inflating a trading entity's revenues. Our report further details evidence that Enron and other market participants engaged in wash trading in energy commodities on platforms including ICE and Bloomberg, which are currently exempt from CFTC transparency requirements. While these trades were ultimately detected as part of the multiple investigations and prosecutions related to the Western Energy Crisis, it is not certain they would have come to light but for the grandiose scale of bankruptcy and fraud.

In view of inflated trading volumes in oil and gasoline commodities, a third issue for policymakers is to determine how and whether to ensure that transparency and reporting requirements are sufficient to stamp out wash trading in all energy markets. Under current federal law, it appears that the CFTC lacks the ongoing authority to require traders to retain records related to transactions on the exchanges that executed wash trades. As this report noted at the outset, Enron's counsel advised its client during the summer of 1999 that "even if the Contemplated Transaction is illegal under current law, it is highly unlikely that any prosecution would be successful, for want of necessary evidence."¹⁴ It does not appear there are safeguards in current law to prohibit today's traders from employing these same legal and trading strategies.

Transparency of Regulatory Institutions:

Finally, the Western crisis taught us to be rather cynical about the impacts the energy and trading industries may have on the very institutions charged by Congress with their regulation. Several stories in the media have detailed the origins of the CFTC's original exemption of online energy trading, ushered in by a CFTC chief who would later become a board member of Enron Corporation, and whose spouse ranked among the top three Senate beneficiaries of Enron's financial contributions. Similarly, Congressional investigations and our own research confirmed Enron's efforts to influence FERC's decision-making in the midst of the crisis.

In an era when the public's attention has been focused on the peddling of influence in our nation's capital and the legislative initiatives to reduce the lobbyists' sway over Congress and state governments, policymakers must debate the influence of corporations over the agencies charged with their regulation.

¹⁴ Legality of Proposed Energy Purchase-Sale Plan, Rocio Olivencia and Brian Trackman, July 29, 1999, page 1.

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To understand the importance of regulation, we provide a framework for the U.S. energy markets. Although restructuring advocates tend to focus on very short term markets, supplying gas and electricity to businesses and ratepayers is considerably more complex. For example, we now know that the vast majority of Enron’s profits were booked in forward markets, not spot markets.¹⁵

A Brief Overview of Gas and Electric Markets

Natural gas and oil are close substitutes; oil is primarily used to fuel cars and light trucks, while electricity and natural gas are supplied to end consumers. In addition, electricity is the single largest use for natural gas. In practice, companies that operate in natural gas and electric markets are often deeply involved in both forms of energy.

Absent major changes in technology or new construction, gas and electric use in the United States has remained relatively stable over long periods. The major exception is electric and gas heating and cooling. These uses can vary sharply on a daily, or even hourly, basis.

Most energy trades take the form of forward contracts. Traditionally, utilities and end users contracted with an eye to the future. Contracts for twenty and even fifty years were not uncommon between power plant owners, utilities, and end users. State and federal regulators provided long-term price stability to the utilities by encouraging long-term resource purchases. A utility fortunate enough to be granted a monopoly was assured stability of demand in its service territory. Thus, it could calibrate long-term supplies with the needs of its customers.

¹⁵ Enron West Desk Trader Performance Reports, 1999-2001.

In a perfect world, large users of energy prefer to contract for fuel based on the life expectancy of their facilities. Since energy is an inextricable part of the capital decisions for steel mills, chemical plants, and paper mills, such users determine their energy costs at the same time they make major equipment purchases. Even homeowners would prefer the price stability of longer term contracts when making major investment decisions in home heating and cooling equipment.

In 1981, the Bonneville Power Administration (BPA) introduced bulk power competition into the electric industry by deciding to sell a 2,000 megawatt block of non-firm hydro-electric energy on the open market. This energy was sold at a floating price to utilities and industries throughout the West Coast of the U.S. and Canada. Since the energy was non-firm – supply was dependent on the flows of the Columbia River – the primary use of the energy was to displace existing thermal generation.

By the late 1980s, this market was well enough established that the Federal Energy Regulatory Commission (FERC) accepted an experimental filing to allow the formation of Western Systems Power Pool (WSPP). WSPP facilitated market price transactions throughout the western U.S. and Canada. This experiment became permanent in 1991.

The success of the WSPP experiment also encouraged interest in longer term market price contracts. Overbuilding during the 1980s had left several Pacific Northwest utilities with significant surpluses. Thus, long term contracts between BPA, Portland General Electric, PacifiCorp, and Washington Water Power and other utilities and end user industries throughout the West created the first forward market for electricity. By the late 1990s, the forward market was so vibrant that BPA saw many of its wholesale industrial and utility customers accept long term contracts from the open market.

FERC facilitated this process in two ways: it issued market price licenses allowing market participants to transact business at market prices; and it adopted Order 888 in 1992. For the first time, open access to transmission was possible throughout the U.S.

In 1996, NYMEX announced two forward markets in electricity on the West Coast – one at the Mid-Columbia dams and one at Palo Verde. While these forward markets had a useful location, their contract design did not mesh well with trading practice and their use was limited. In 1998, the California PX established a California-based forward market called the Block Forward Market. Both NYMEX markets and the PX market were potentially subject to CFTC regulation, although the PX received a no action letter in December 1999 exempting the market from CFTC regulation in exchange for minor reporting requirements.

If there had been no Western Market Crisis, it is likely that the efficiency of these organized exchanges would have replaced the bilateral forward market on the West Coast. In reality, market volatility eliminated the three exchanges by the spring of 2001. At the height of the crisis, only unregulated markets – bilateral arrangements and electronic trading platforms were available. At the point where a robust mechanism to handle risk was required, effective regulation of forward markets had been reduced to zero.

The West Coast has never had an organized market for natural gas. Instead, NYMEX's Henry Hub market provides forward pricing for the entire U.S. Forward contracts for the West Coast are priced by "basis swaps" between Henry Hub and various western locations. Since the CFTC regulated Henry Hub, some protections were available against unreasonable market behavior during the Western Market Crisis, but the major price swings occurred in the unregulated markets providing basis swaps.

Regulation at the Start of the Western Market Crisis

In 2000, consumers were protected from market manipulation and financial fraud by an ineffective pastiche of overlapping state and federal regulations. These different agencies had little understanding of the market and even less of their relative responsibilities.

At the top of the regulatory regime stood the Federal Energy Regulatory Commission. FERC had provided licenses to hundreds of market participants. Each license extended the privilege of selling at market prices with only a few minor reporting requirements. In theory, each bearer of the market pricing privilege provided a quarterly report to FERC detailing its transactions by location, counterparty, quantity, and price. However, many participants determined their own reporting arrangements. These ranged from honest efforts to report actual transactions in considerable detail to reports that contained little or no information. In many instances, market participants submitted no reports.

While FERC asserted its jurisdiction over western markets, there was little information available to exercise such powers. When a mid-level staffer pointed this out in a memo in the summer of 2000, he was shunted aside for the next five years.¹⁶

Beneath FERC was the state of California, which had a wealth of regulatory agencies with different powers and responsibilities. A market surveillance group in the California (PX), a FERC-regulated agency, focused on transactions within its market. Its companion, the California Independent System Operator (ISO), also regulated by FERC, contained a market surveillance group. Both agencies had limited perspectives. The PX only reviewed transactions within its market. The ISO only reviewed transactions within its system responsibilities – a portion of dispatch and transmission for a portion of California.

The state had three other agencies providing a larger set of responsibilities: the Electric Oversight Board, the California Energy Commission, and the California Public Utilities Commission. Like FERC, these state agencies had limited access to market data.

Beyond California, BPA's ability to control a transmission system covering Oregon, Washington, Idaho, and Montana made it a "de facto" regulator, and enabled the utility to control market schemes more effectively than the California ISO.

The PX and ISO had adopted highly restrictive policies on providing market information, apparently in an attempt to discourage market manipulation. In practice, transactions in California at the time constituted a "black box".¹⁷ The ISO provided dispatch information to market participants at the Western States Coordination Council (WSCC) where it was combined with dispatch data from several, but not all, of the other systems in the west. This data was not available to regulators.¹⁸

A single market manipulation scheme, such as the infamous "Death Star" could easily operate within the thicket of competing jurisdictions and inadequate market data.¹⁹ The ISO could not

¹⁶ OPEN MEMORANDUM, Ron Rattey to FERC Staff, June 2, 2000.

¹⁷ Cracking the California Code: Improving California Market Efficiency through Simpler Models and More Information, Presentation by Tim Belden, October 12, 2000, page 2.

¹⁸ Officials Probe Rising Cost of Electricity, authored by Rob Eure, Wall Street Journal, July 28, 2000.

¹⁹ The term "Death Star" related to a scheme where schedules were filed with the California ISO purporting to import energy in a fashion that would alleviate congestion on its transmission system. Simultaneously, a schedule was filed in the opposite direction. Since the schedules cancelled each other, no energy was

detect the non-existent flows on transmission owned by municipal utilities in California outside of its jurisdiction.²⁰ FERC clearly had jurisdiction, but had no method to detect the scheme since it lacked access to data from any of the participants. Likewise, the three statewide agencies had no data and, arguably, no jurisdiction.

Amazingly, the only agency that did exercise regulatory powers to curb Death Stars was BPA. It once proposed surcharging PGE, one of Enron's facilitating parties, for the uncustomary use of its transmission system to implement the scheme.²¹

Time and again, as the regulatory agencies failed to protect western electricity markets from abuse, mainly due to the absence of market information, even Enron's lawyers recognized that evidence, not law, would be the determining constraint on regulation:

The Contemplated Transaction, though questionable on business, political, and social grounds, does not appear to be prohibited under current law. Moreover, even if the Contemplated Transaction is illegal under current law, it is highly unlikely that any prosecution would be successful, for want of necessary evidence.²²

At the beginning of the Western Market Crisis it can safely be said that there was no regulatory agency where enforcement was possible, in Enron's own words, "for want of necessary evidence."

Precursors to the Western Market Crisis

The term "Western Market Crisis" reflects the fact that the West Coast is a single integrated market for gas and electricity. While the manipulations in gas and electricity focused on California, the market impact was region wide. Enron's documents, for example, make it clear that significantly more profits were extracted from states outside of California during the crisis than those from California itself.²³

California's vulnerability to market schemes made it a suitable victim. Manipulated prices in California quickly changed market prices from Edmonton, Alberta to El Paso, Texas. In fact, after the ISO implemented its secretive C66 program in December 2000, prices were actually higher outside of California than they were within the state, even though the apparent shortage of capacity was occurring within California.²⁴

While the Western Market Crisis started on May 22, 2000, market abuses were not new to the West Coast energy markets. Enron had implemented two large scale schemes as early as May

actually present in the Death Star, and the schedules created and relieved phantom congestion. The result was a congestion relief payment by the ISO to the party filing the Death Star schedules.

²⁰ FERC's PA02-2-000 web site does contain evidence that the California ISO knew about Death Stars, which it referred to as "Circular Schedules", but it is not clear that it felt it had jurisdiction. November 16 & November 21, 2000 Email from Pete Gains to Robert Sullivan et al, subject reads: RE: Congestion Scam.

²¹ Responses Of Portland General Electric Company To Commission Staff Data Request No. 114, October 28, 2002.

²² Legality of Proposed Energy Purchase-Sale Plan, Rocio Olivencia and Brian Trackman, July 29, 1999. This memorandum discusses the legal status of a proposed large scale Ricochet scheme to be performed on Enron's behalf by PGE. The scheme was ultimately rejected by PGE.

²³ Enron West Desk Trader Performance Reports, 1999-2001.

²⁴ In December 2000, the ISO added imaginary transmission schedules to fill available transmission leaving California. This "beggar my neighbor" policy meant that demand for wholesale supplies outside of California included all regional users, but the supply of wholesale power only included non-California supplies.

1999. Project Stanley in Alberta and Silver Peak in California were designed to test market manipulation techniques that Enron and other market manipulators would later employ during the crisis.

Silver Peak was illustrative of a central feature in many Enron schemes. The basic manipulation was so simple that it received frequent mention in speeches by a consultant named George Backus during the inauguration of the ISO.²⁵ He had noticed that there were no protections at the ISO against filing a large imaginary schedule. He chose the line from Silver Peak, Nevada, a ghost town slightly outside California, since the line had very little capacity. The ISO's preliminary markets would use the imaginary power resulting in low prices at the PX and the ISO. When the ISO's computer systems corrected the problem, prices would increase sharply.

Enron needed to cover its short forward position at the California Oregon Border, and the simple scheme allowed it to manipulate forward prices while making long term purchases. Mary Hain, attorney to Enron's trading floor, West Desk, in Portland, Oregon, described the situation at the time:

On May 24, 1999, the West Desk was "short" June at the California Oregon border (COB). So, they figured out a way to sell a lot of power into the PX and then back out. Specifically, they scheduled 2900 MW (in the day ahead market for May 25) with no supply to back it into the California PX at the Silver Peak tie, a tie with only 15 MW of transmission capacity was available. The PX determined that the price was \$27. EPMI scheduled 2900 MW at a \$26.99 decrement. Sierra Pacific had scheduled 12 MW at a 26.99 decrement. The ISO saw 2912 MW scheduled where 15 MW of transmission capacity was available. They called EPMI and we verified the schedule. The ISO determined that 2897 MW would be curtailed because EPMI had the higher adjustment bid. It accepted 3 MW, which we bought from Sierra Pacific and sold into the PX.²⁶

Much later, the PX market surveillance group puzzled over this scheme. While the "disappearing" 2900 megawatts posed enormous problems for the California market, investigators could not detect any profit for Enron from this manipulation. In the end, the PX fined Enron \$25,000 and made it agree to desist from such schemes.²⁷ Ironically, the agreement to discontinue such schemes was signed just before the start of the Western Market Crisis.

As mentioned, Silver Peak was designed to use spot market manipulations in order to manipulate forward markets. Since Enron's purchases occurred at an unregulated forward market (the over the counter transactions at the California Oregon Border), CFTC, the agency that should have caught the manipulation, was not involved. The ISO and PX "saw" the manipulation, but did not have the market data or the knowledge of regional markets to know why it had occurred.

Silver Peak demonstrated that manipulations of the spot market created lucrative opportunities for the manipulation of forward markets. Enron, and other market participants, used this technique to accumulate vast profits in the course of the crisis.

Almost simultaneously with Silver Peak, John Lavorato (later Belden's superior at Enron North America) imitated a scheme to raise prices in Alberta. His scheme involved purchasing a small block of energy from Powerex and bidding it at unreasonably high prices - \$990/MWh. When this had set the prices in the Alberta Pool, Enron and Powerex would share the proceeds. This scheme was discovered in 1999 and Enron was concerned about a criminal prosecution. Jeffrey

²⁵ January 13, 1998 Presentation, Profit Maximization Under UK and US Deregulation, by Dr. George Backus.

²⁶ May 25, 1999 DRAFT FACT SUMMARY.

²⁷ April 27, 2000 Silver Peak Settlement Agreement between Enron and the California Power Exchange.

Skilling, himself, took the helm in the subsequent cover-up.²⁸ The scheme frequently shows up today up in the Texas market, where a single trader sets market prices to \$990/MWh using a similar mechanism.

A scheme similar to Enron's successful 2001 manipulation of Henry Hub futures was undertaken by Avista in 1998, when a group of energy traders used fraudulent transactions to manipulate forward markets at the NYMEX Mid-Columbia and Palo Verde markets.²⁹ These markets were subject to CFTC regulation. Knowledge of the scheme derives from one of the few successful regulatory responses before or during the Western Market Crisis.

The Western Market Crisis

On May 22, 2000 at 12:30 P.M., the ISO issued the first of 125 Stage 1, 2, and 3 System Emergency declarations that define the duration of the crisis. The ISO's first response to the Stage 2 Emergency it declared was to blame the problem on a computer error. Enron, among others, took the position that the cause of the crisis was a capacity shortage. Indeed, the ISO's lack of credible operating and planning data made this a very believable argument.

With actual operating and transaction data now available, we know that the real story was very different. The ISO determined its level of capacity reserves on a daily basis. Emergency declarations were triggered when the reserves fell below 7%, regardless of the actual availability of resources within the region.

As early as 1999, Enron had recognized the benefit of withdrawing resources from the California ISO, "storing" them out of California and returning them when an emergency had been declared. A second memo written by LeBoeuf Lamb concerning a proposed Ricochet arrangement states:

Whenever this happens, there is created an imbalance in the system because the ISO was planning for this 400MW to be input into the system at the source (somewhere in California) and to be taken out of the system at COB by the sink, [sic] Affiliate and had arranged to balance the system accordingly. When a relatively small amount of power is involved, it is easy for the ISO to obtain the ancillary services necessary to manage this imbalance. However, if a very large amount is involved, such as our 400MW, it is more difficult for the ISO to obtain the ancillary services, especially at times of peak usage, because all of the generators are already committed and running full tilt and there is very little time in which to act. At such times, the laws of supply and demand operate to give a party that has power available a premium price. EPMI plans to have power available to take advantage of this opportunity which it will in effect, to some degree have created. The result will be that the ultimate parties buying power in California to balance their systems and serve their end users (the utilities) will pay the ISO more for each power than they otherwise might have done had the 400MW not been scheduled and withdrawn.³⁰

The Ricochet scheme was often used to foster the issuance of emergency declarations by the California ISO. On May 22, 2000, Enron underscheduled loads in southern California, transported the energy to COB, and then resold the energy to the ISO after the emergency was

²⁸ Project Stanley, email from David Delainey to Rob Milnthorpe and Peter Keohane, June 6, 2000.

²⁹ August 21, 2001 Complaint filed by Avista before the Commodity Futures Trading Commission.

³⁰ August 2, 1999 memo RE: Power Transaction, by John Mass.

declared.³¹ Enron was not alone in this practice. Utilities with transmission rights at the California Oregon Border frequently facilitated such Ricochet transactions. Nor were the Ricochets small. On at least one occasion PacifiCorp provided “hosting” services for a 600 MW Ricochet by Sempra.³²

After four years of investigation, only Enron’s files have been seriously reviewed. Even this review has been hampered by an aggressive resistance to discovery. Critical information has been withheld from civil litigants, the DoJ, and FERC.³³ A major part of the investigations into Enron’s trading practices has been led by the proverbial underdog, Snohomish Public Utility District Number 1 of Everett, Washington.³⁴

The pivotal moment in the Western Market Crisis investigation came with the discovery of memos written by Enron’s litigation team in the winter of 2000. These memos, apparently initiated at the request of Timothy Belden and Mary Hain, provided a list of Enron trading schemes with provocative names like Ricochet, Death Star, and Fat Boy. Further discovery has unearthed additional schemes with names like “Donkey Punch” and “Ping Pong.”

Other schemes also reduced the apparent supply of energy to the ISO. On May 23, 2000, Tim Belden wrote an email to the senior officers of the California ISO complaining about the level of his revenues during the May 22, emergency:

What would you charge us to do this? Call me with any questions you have.

----- Forwarded by Mary Hain/HOU/ECT on 05/23/2000 04:23 PM -----

To: Mary Hain/HOU/ECT@ECT, Susan J Mara/SFO/EES@EES

cc:

Subject: Out of Market

I sent this message earlier today. Sue suggested filing a discriminatory pricing complaint at FERC. If that is the proper channel to go through I am all for that. Especially while we are on a roll. Let me know your thoughts.

----- Forwarded by Tim Belden/HOU/ECT on 05/23/2000 12:30 PM -----

From: Tim Belden on 05/23/2000 10:34 AM

To: kfluckiger@caiso.com, zlazic@caiso.com, twinter@caiso.com

cc: kalmeida@caiso.com, David Parquet/SF/ECT@ECT, Susan J Mara/SFO/EES@EES

³¹ Enpower database. The Enpower database can be ordered from Aspen Systems Corporation, fercrequest@aspensys.com

³² This information is available through FERC’s Short Term Database. The database is publicly available at: http://ferc.aspensys.com/FercData/EnronDataExtracts/DO4_25_WSCC_Sellers_Data_Monthly/DO4-25%20Short%20Term%20Master.mdb

³³ Enron’s initial resistance to discovery resulted in the threat of a million dollar per day fine by the California Senate in early 2002. Although FERC requested all correspondence pertaining to the Yoder/Hall memo in 2002, Enron did not provide materials referencing its “Inc Sheets” – the secret accounting materials on a scheme-by-scheme basis until Snohomish forced its discovery in 2004. Snohomish discovered a large amount of trader tapes at Enron’s headquarters in October 2004, and forced Enron to turn over its documents inventory list and the contents of its computer servers from its trading floor in Oregon in late 2004 and early 2005.

³⁴ Snohomish has become identified in the mind of the public by the transcriptions it made of Enron trader conversations, which included disparaging comments about Snohomish’s clients and discussions of the application of various schemes.

Subject: Out of Market

I just finished talking with Zora about the Out of Market activities yesterday and thought that it would be a good idea to put my thoughts into an e-mail. It appears as though the MW that you procure out of market end up suppressing the ex post price. For example, Enron sold the ISO 100 MW for \$750/MWh during hours 17, 18, and 19. It was our impression that the ISO was procuring large volumes of energy out of market during these hours. Yet the ex post price for these hours settled at \$379.29, \$300.00, and \$119.77 respectively. Every MW that you purchase out of market reduces the number of MW that must be procured through the BEEP stack. Reducing the number of MW procured through the BEEP stack naturally puts downward pressure on the ten-minute and ex post price. Yesterday's prices support this theory. We saw this happen in the summer of 1998 as well. The result is that you harm providers of energy in-state. This could be instructed or un-instructed deviations. **Yesterday we had nearly 800 MW of uninstructed generation in the state (in the form of over-scheduled load). Your out of market calls, coupled with the way that you perform ex post pricing, hurt us and everyone else who provided energy within the state to you in real time.**

If you value power at \$750/MWh in the bilateral market, then your BEEP price should be \$750 as well. This is the proper price signal as the marginal resource in the state is \$750. Because of timing issues and software inflexibility I understand that your BEEP stack can't reflect this. In essence, you are taking \$750/MWh power and pricing it into the BEEP stack at \$0. There is a simple fix here. You could simply set the Target Price to \$750/MWh in any hour that you procure energy out of market for reliability reasons. You have proven before that the Target Price can be changed quickly and unilaterally.

We know that you have to place reliability first on critical days. I have no problem with the ISO procuring MW's out of market when the need is there. There is a simple way to send the proper price signal to the entire market through the Target Price. I recognize that this is politically challenging. But these prices are real and are driven by scarcity. Your reliability problems over the next couple of years will be a direct result of too little investment in new generation. Prices need to reflect market conditions in order to incent new generation. I encourage you to stand up to your slogan "Reliability through markets" and adjust your target price methodology or your ex post pricing so that in the hours of the greatest scarcity the ISO pays generators the proper marginal price.

Thanks for your consideration of this matter. Call me at 503-464-3820 if you would like to discuss.³⁵

The passage emphasized in boldface indicates that Enron also had purchased 800 MW of energy on-peak and then scheduled it to a non-existent load, a scheme it called "Fat Boy." What he did not say was that the purchase removed 800 MW from the markets run by the PX, contributing to a shortfall that had to be covered by the ISO's ancillary services.

³⁵ May 23, 2000 Email from Tim Belden to Mary Hain et al Subject line reads: Out of Market.

While the schemes that Enron pioneered were profitable in and of themselves, they were far more valuable because of their impact on forward markets. As noted above, the largest part of the market for electricity involved forward purchases. Enron had begun to position itself in December 1999 in anticipation of the onset of the Western Market Crisis. Jeffrey Skilling referred to Enron's decision to go long in testimony during his criminal trial on April 12, 2006:

Q. Can you answer Mr. Berkowitz -

A. I believe it was in January of 2000. And Mr. Lavorato was there from Canada. I believe he was still in Canada at the time. Mr. Whalley was there and a number of other people.

Q. Now, I'd like you to explain what this chart is with respect to Mr. Belden's open position on the West Power desk.

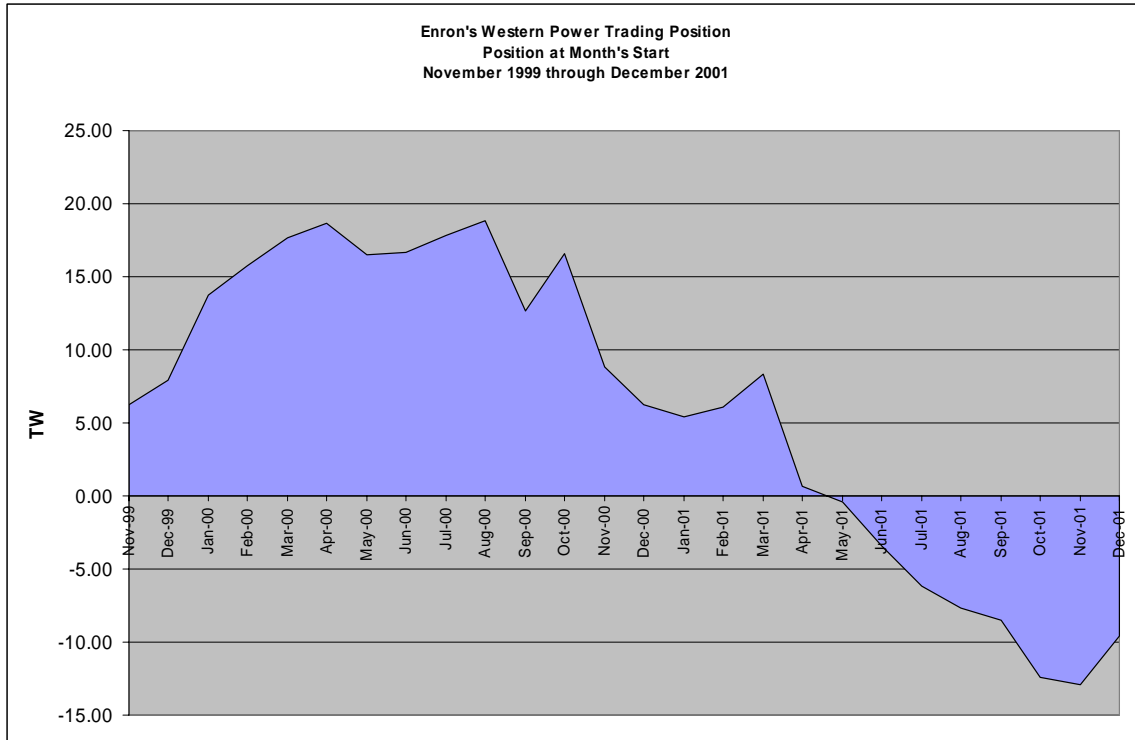
Q. Now, I'd like you to explain what this chart is with respect to Mr. Belden's open position on the West Power desk.

A. Yeah. What -- that orange shading is really the -- the increase in position that we talked about. In other words, they had normally been running around a 5 or 6 million megawatt hour position, historically. And when we talked about increasing that position, we talked about increasing it from the 5 to 8 million megawatt hours up to something closer to 20 megawatt hours.

So, in that period of time there was about a 20 million megawatt hour long position. And we were trying here to give some perspective about how big that is. Because I think the impression is that these were giant speculative bids -- bets that were taken. That 20 million megawatt hour position is essentially equivalent to about 100 megawatt power plant.³⁶

In reality, Mr. Skilling understated Enron's forward position by an order of magnitude. As of the end of April 2000, Enron had increased its long position for July by 500 MW and by 1,000 MW for October 2000. In sum, Enron had taken a 1,000 MW long position at West Power trading from May 2000 through October 2000 by the end of April.

³⁶ <http://www.reallegal.com/ExemplarisEnronResource.htm> April 12, 2006 Transcript of Jury Trial Before the Honorable Sim Lake United States District Judge, Volume 39, pages 12489-12490.



A different approach to taking a long position and raising spot prices was the practice of physical withholding. Although the availability of thermal units to meet load is generally higher than 80%, the units of marketers who had purchased base load thermal units from California's utilities was very low during the crisis. On average, these units were only available to meet load 50% during the many ISO emergencies. While the owners, AES/Williams, Duke, Dynegy, Mirant, and Reliant claimed that the plants were too old to be reliable, the facts show that these plants were actually less reliable than identical units in service elsewhere in the United States.

Reliant is currently under indictment for removing plants from service to raise the prices of its forward transactions. One Reliant trader "Joe Joe" Knauth has achieved the dubious honor of being implicated in both wash trading (and fined by the CFTC) and physical withholding. The case of Mr. Knauth appears later in this report's discussion of the interrelationship of market manipulation in spot and forward markets.

An important component of the Western Market Crisis was also caused by a sudden shift in the cost of basis swaps between California and natural gas supplies elsewhere in the U.S. and Canada. El Paso Gas and Enron had commanding roles in the basis swap market. El Paso Gas's control of the major pipeline into California from the east created the opportunity to charge extortionate prices for gas in California and the Pacific Northwest. At the height of the crisis, oil used for electric generation actually cost less than natural gas.

While Enron's schemes were short term, the majority of its profits from electricity came from forward transactions. In 2000, West Power Trading posted \$512,032,036 in profits, 73% from long term transactions.³⁷ In 2001, West Power trading posted \$1,036,231,738 in profits, with 82% from forward transactions.³⁸ Enron also profited significantly from "financial" natural gas transactions³⁹.

³⁷ December 31, 2000 Daily Position Report.

³⁸ December 31, 2001 Daily Position report. The testimony of David Delainey in the Skilling/Lay criminal trial indicates that these figures may contain several hundred million in hidden Enron Energy Services

One of the ironies of large scale market manipulation is that the cost to the market can be far higher than the malefactor profits. FERC has calculated a set of just and reasonable prices known as the Mitigated Market Clearing Prices (MMCPs). It is possible to compare these prices to the prices paid by market participants in the short term and monthly markets during the crisis. The additional cost to short term markets throughout the West Coast was \$13,827,468,847. The additional cost in monthly markets was \$8,431,044,408.

It is not possible to disaggregate Enron's role in the crisis from that of other market manipulators. For example, the cumulative impacts of Ricochet schemes cannot be broken out by firm, because when several firms simultaneously filed Ricochet schedules, other manipulators at the same time failed to submit capacity bids to the California ISO.

The cost in long term markets is more problematic. Unlike short term and monthly markets, many of the long term contracts have durations that can extend out past 2010. Although most of these contracts were terminated with Enron's demise, it has not stopped Enron from litigating for recovery of net revenues under these contracts.

Many contract disputes have now been settled. Enron's victims have paid a broad range of values to Enron, even though, on credit terms alone, it is obvious that the contracts were fraudulently entered into. On some occasions, where the review has occurred outside of FERC, Enron has chosen to accept small recoveries rather than test its claims in open court.

Regulatory Effectiveness during the California Crisis

Regulatory response to the prices spikes on the West Coast was slow and halting. FERC had the primary regulatory responsibility, but its slow reaction very likely contributed to the severity of the crisis. Eventually, in April and June 2001, FERC implemented effective rules and the crisis quickly abated.

FERC's early response was minimal. In summer 2000, FERC undertook some fact finding activities. These remain poorly documented and would appear to have had been opportunities for market participants to lobby FERC to remain inactive:

Mary Hain@ECT

08/29/2000 08:17 PM

To: Steven J Kean/NA/Enron@Enron

cc:

Subject: FERC Presentation on California/West Wholesale Market

Forwarded by Mary Hain/HDU/ECT on 08/29/2000 06:23 PM

Mary Hain

08/29/2000 06:11 PM

To: James D Steffes/HOU/EES@EES, David W Delainay/HDU/ECT@ECT, John J Lavorato/Corp/Enron@Enron, Christopher F Calger/PDX/ECT@ECT, Tim Belden/HOU/ECT@ECT, Joe Hartsoe@Enron, Paul Kaufman/PDX/KCT@ECT,

losses. <http://www.reallegal.com/ExemplarisEnronResource.htm> March 1, 2006 Transcript of Jury Trial before the Honorable Sim Lake United States District Judge, Volume 18, page 5600.

³⁹ Profits to Enron from EOL Market Making in Five Key Products, March 2003 FERC Final Staff Report Page VIII-9.

Sarah Novosel/Corp/Enron@ENRON, David Parquet/SF/ECT@ECT, jdasovic@ees.enron.com, Mona Petrochko, Kevin M Presto/HOU/ECT@ECT, Richard Shapiro, Steve Kean, Chris H Foster/HOU/ECT@ECT, Robert Badeer/HOU/ECT@ECT, Jeff Richter/HOU/ECT@ECT,

Susan J Mara/SFO/EES@EES

cc: Christi Nicolay

Subject: FERC Presentation on California/West Wholesale Market

Last Thursday, I made the first attached presentation to the FERC Staff at the power marketer's meeting on the FERC's investigation of the wholesale market in the West (and in particular California). Allen Wolf (of Tabors Caramanis) and I created this presentation building on previous presentations by Tim Belden and Dave Parquet. In the presentation and the meeting we made the following points:

There isn't much FERC can do because the cause of the price spikes is not in the wholesale market. We discouraged FERC from taking any action that would hurt the vibrant wholesale market in the California and the rest of the West as well.

High prices logically resulted from scarcity and if the Commission does anything it should (1) investigate whether market power was being exercised by any party and, (2) if necessary to protect the market (while still incenting needed generation) establish a price cap at a scarcity rent level equal to the price at which loads were willing to interrupt.

The IOUs have not properly prepared for the risk of high prices caused by scarcity. They have failed to hedge and have underscheduled their load, therefore having to fill a large percentage of their load at ISO real time prices. My analogy was that this was like day trading your retirement fund as an asset allocation scheme.

The market would function better if more information was provided to the market. The Commission should do whatever it can to incent participation by load. To see the presentation, detach, save, and view in Powerpoint. When you do, you will find there are many "hidden" slides that were not part of the oral presentation but were provided to Staff in hard copy for additional information.

According to the head of the investigation (Scott Miller), the staff got a lot more out of this meeting than Staff's previous meetings with the IOUs and the generators. Based on the numerous phone calls I've been getting, the Staff is looking into the data we provided.

I have also attached a revised version of the presentation that Tim sent to Scott Miller on Friday. Tim's version conveys the same message but takes a different approach to conveying the message. On Friday, Tim talked to Scott and answered some additional questions. Tim said that Enron is in favor of eliminating the mandatory PX buying requirement and would like the IOUs to be able to buy from EnronOnline. He also explained more fully the existence of scarcity.⁴⁰

While Ms. Hain was briefing FERC on her version of the Western Market Crisis, her colleagues, at the same desk in Portland racked up the following criminal schemes:

⁴⁰ October 5, 2000 Email from Tim Belden, subject line reads: FERC Presentation on California/West Wholesale Market.

8/22/2000	7 Death Stars
8/23/2000	13 Load Shift transactions
	2 Death Stars
8/25/2000	11 Load Shift transactions. ⁴¹

In February 2001, FERC issued a report apparently ruling out the possibility of physical withholding:

Staff did not discover any evidence suggesting that the audited companies were scheduling maintenance or incurring outages in an effort to influence prices. Rather, the companies appeared to have taken whatever steps were necessary to bring the generating facilities back on-line as soon as possible by accelerating maintenance and incurring additional expenses. Also, the outages did not necessarily correlate to the movement of prices on a given day.⁴²

As we now know, both Enron and Reliant were simply misleading FERC about their market activities. FERC's legal approach – asking felons about their felonious behavior – was an ineffective approach to the problem.

FERC also proposed a variety of intricate fixes to the California crisis. The most significant of these fixes took place on December 15, 2000. Its December 15th order proposed several solutions ranging from firing the stakeholder boards of the PX and the ISO to setting a complex "soft price cap." In addition, the order contained two other rule changes. The first effectively eliminated the last organized forward exchange on the West Coast by releasing the California utilities from purchasing from the PX; and the second, it required the utilities to fully cover their loads on a scheduled basis. The first substantive change was a blow to the market since it meant that further supplies to California had to be purchased on a "fire sale" basis through the bi-lateral market. FERC has subsequently argued that it lacked regulatory jurisdiction over these transactions. It can be argued that FERC pushed the utilities outside and firmly shut the door behind them. The second rule change was long overdue. It eliminated the practice of presenting the ISO with a daily shortfall of energy to be met in real time.

Overall, the first effective measure adopted by FERC was the announcement of a firm enforceable price cap on April 16, 2001. The extension of this price cap region wide was a useful addition, but with the existence of the April 16 order, prices had already collapsed below the cap.

The CFTC was largely inactive during the California energy crisis.

After the Fact Regulation

After the end of the Western Market Crisis, a leading role in discovery of the facts was taken by the California Select Committee To Investigate Price Manipulation of the Wholesale Energy Market. The primary discovery in spring 2002 took place after the Committee had pursued a million dollar per day sanction against Enron for failing to turn over subpoenaed materials.

FERC initiated the PA02-2-000 investigation after severe questioning during the January 29, 2002 hearing of the Senate Energy and Natural Resources Committee. FERC's initial PA02-2-000 discovery requests were also useful, although FERC did not become active until Enron turned over the Yoder/Hall memos in April of 2002.

⁴¹ Source: Inc Sheets and Real Time Reconciliation Reports from Enron's, Oregon's trading floor.

⁴² February 1, 2001 Report on Plant Outages in the State of California.

In sum, effective regulation of the Western Market Crisis only began a year after the crisis ended and only after pressure from the U.S. Senate and the California Senate forced FERC into action.

Since then, both FERC and the CFTC have cited a large number of participants including AES/Williams, Reliant, Duke, Dynegy and Aquila. (The list of settlements and sanctions is found in Appendix B to this report.)

Probably the most important measure taken was the indictment of four Enron traders from Portland, Oregon. These included Tim Belden and Chris Calger, who headed Enron's West Coast operations, Jeff Richter, who was responsible for California, and John Forney, the developer of some of the more picturesque schemes.

While the largest body of schemes and manipulations has involved Enron and EnronOnline, substantial evidence has uncovered the manipulation of other platforms and pricing publications. The Intercontinental Exchange is a trading platform owned by the consortium of: American Electric Power, Aquila Energy, Duke Energy, El Paso Energy, Mirant and Reliant Energy, among others. The 2004 CFTC complaint against "Joe Joe" Knauth, for example, involved wash trades on Bloomberg.

ICE was also home to other wash trades. Memos have surfaced concerning trades designed to change the ownership shares of ICE. The following passage is taken from a memo by Zack Starbird, a lawyer for Mirant:

As you know, the six gas and power companies that joined ICE as founding members, Mirant, AEP, Aquila, Duke, El Paso, and Reliant, entered into a contract whereby each of the six stands to gain or lose equity in ICE, at the expense of the others, based on the relative volume of gas and power products each transacts on ICE. As a result, there have been a number of questions about the appropriateness of entering into pre-arranged trades, wash trades, or affiliate trades in order to artificially increase the apparent volume of a company's business transacted through ICE. It is Mirant's view that **it is both unlawful, and a breach of the original contract, to engage in these or any other trading activities that have no independent market justification, solely for the purpose of inflating reported trade volumes.** You are therefore directed to refrain from engaging in pre-arranged trades, wash trades, affiliate trades, and similar gimmicks. If a trader from AEP, Aquila, Duke, El Paso or Reliant appears to be asking you (however discreetly) to participate in this kind of conduct, please make sure they understand Mirant's position. If you suspect that one or more of these companies are using these gimmicks or are otherwise contriving trades, please inform Laetitia Casanova, so that Mirant may take steps to protect its investment in ICE.

If you are concerned about whether anything you might have done on behalf of Mirant crosses the line, please let me know. If you direct this type of communication to me, as an attorney, Mirant should be able to shield whatever you say from discovery by our competitors under the attorney-client privilege. If you send an email, letter, or memo, please do not cc: anyone else. After speaking with you, I will take responsibility for informing anyone else who needs to know. Our interest in speaking with you is primarily to determine what Mirant's potential liability is and to learn how to monitor our competitors' conduct going forward.⁴³

⁴³ ICE Trading - Pre-arranged trades, wash trades, affiliate trades, and other nonsense, Zack Starbird, June 4, 2001.

Such behavior was not simply threatened. An email a few days later from “smalik” at Reliant notes an actual occurrence:

To All ICE Consortium Members,

We also noticed huge volumes being transacted, apparently between two consortium members. This is contrary to what we agreed to. In summary: On Tuesday, June 5, 2001, there were ten very large trades done on ICE under the description 'NG Firm Phys, ID, GDD - TCO - Custom (Apr 01,2002 Oct 31, 2002) Q 0.0000" which totalled 203,300,000 MMBtus. These transactions were unusual and out of the course of ordinary business for several reasons:

The trades were done in a very short period of time.

The bulk of these trades (171,200,000 MMBtus or 84%) were done in a total of 26 minutes between 2:15 pm and 2:41pm CST. All of the trades were transacted after the close of the exchange when business is typically slow between 2:15 pm and 4:04 pm CST.

From the movement of rankings, the trades were transacted primarily between two parties. Both are members of the consortium.

3. The deals were transacted under "choice" markets 0.0000 bid/ 0.0000 offer 100,000/d up on either side.

4. Several members of the consortium were blocked from these transactions due to credit restrictions (adequate number of days) set by other members.

Clearly this was not what was intended under the arrangement of the Call Agreement which set out to provide liquidity on the platform. Reliant proposes that the above referenced transactions be tagged, reviewed and pulled from the Call Agreement as soon as possible so that the integrity of the agreement remains intact. Furthermore, this kind of activity has to stop - please look into this and we await your comments.⁴⁴

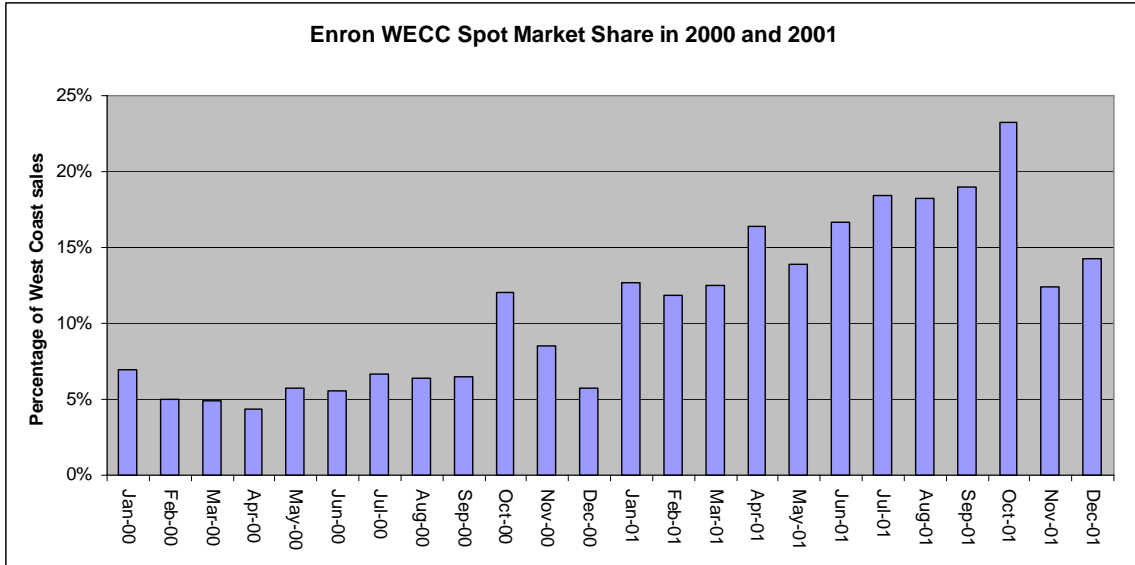
Behaviors of this type would be illegal if the exchange had been subject to CFTC regulation. While these wash trades were “victimless” – only large institutions who themselves were later implicated in market manipulations appear to have been involved – it is disquieting to learn that even exchange owners indulged in fraudulent conduct.

Enron’s Market Share

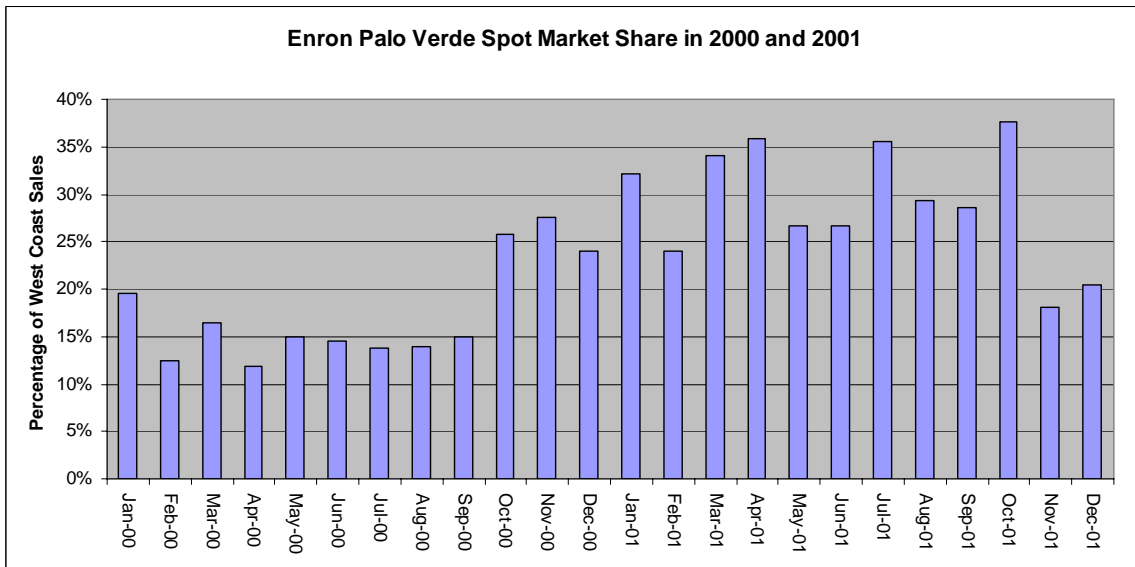
Enron’s market share on the West Coast during the crisis fluctuated from a low of 10% to a high of 40% depending on the month and the market. In general, Enron can be considered a “pivotal supplier” – a market participant able to create shortage by changing its decision whether to supply the market.

In the short term market, Enron’s market share throughout the West Coast peaked in October 2001 with over 23% of total sales:

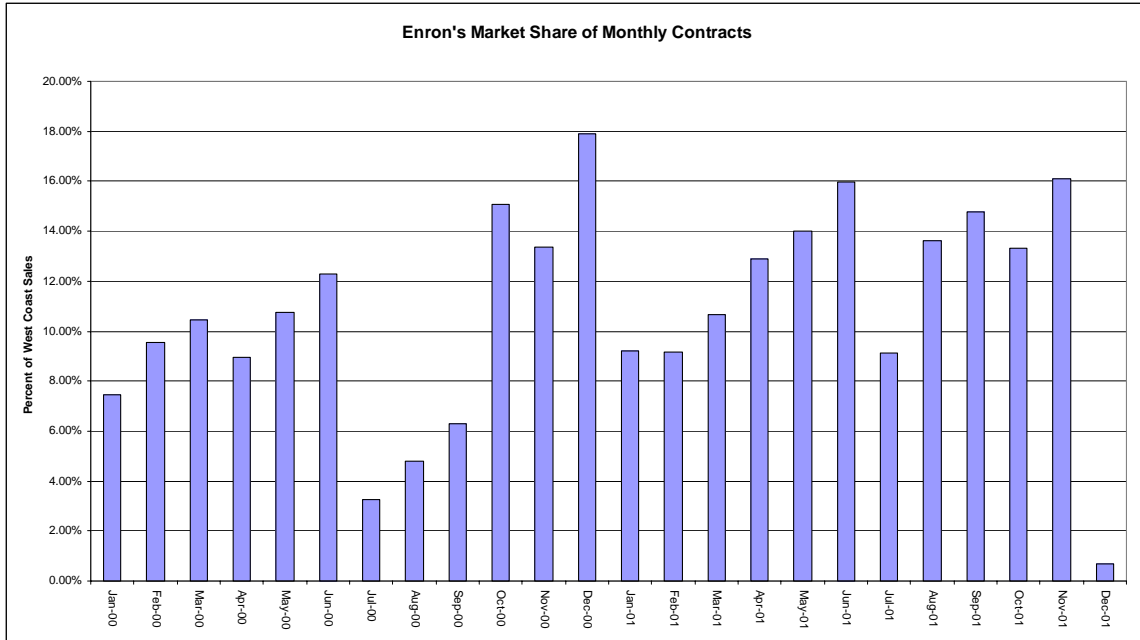
⁴⁴ GAS DAILY TRADE VOLUME, smalik@reliant.com, June 6, 2001.



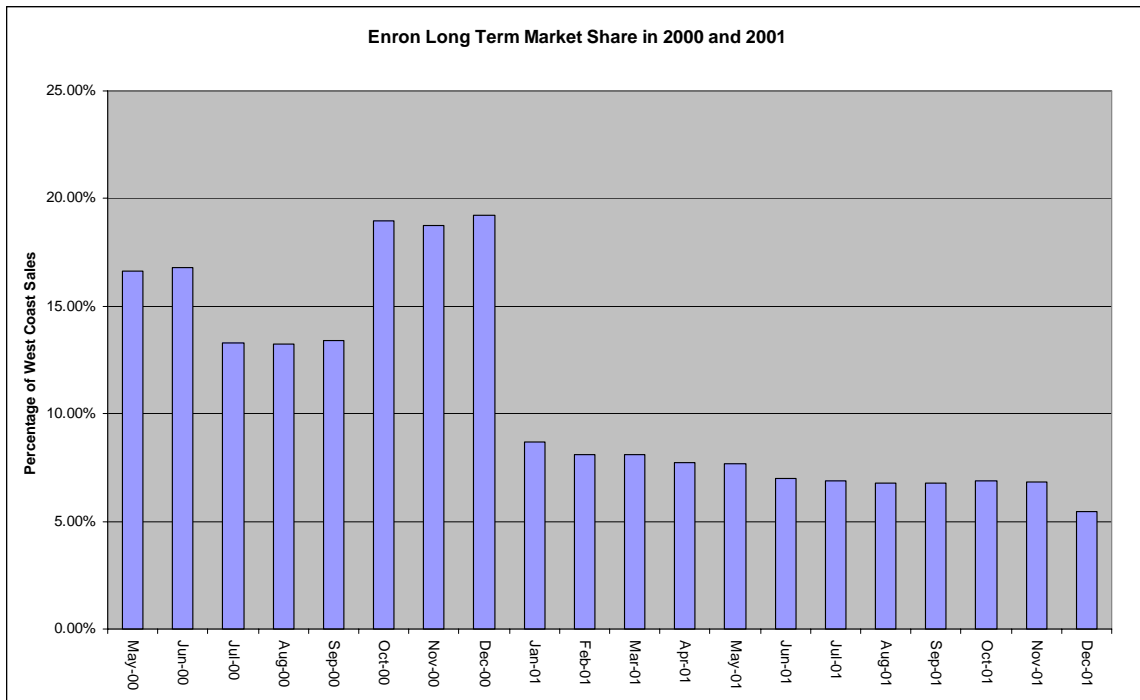
Enron's shares of specific spot markets were considerably higher. In the Palo Verde market, for example, Enron regularly had more than 30% of the total spot market:



While these markets were influential in allowing Enron to affect spot markets, they were less important to Enron's profits than monthly and long term transactions. Enron's regional share of monthly transactions was as high as 18% of the total in December 2000:



The most important market for customers (as well as Enron's profits) was the market for long term supplies.



If Enron's forward transactions had been subject to CFTC regulation during the crisis, it would have had to comply with CFTC's limits on speculative positions and reporting under the Large Trader Reporting system.

EnronOnline

EnronOnline began operations in November 1999. Although several other electronic trading platforms already existed, market response had been lackluster. EnronOnline solved the problem of liquidity – availability of bid and ask quantities – by taking a pivotal role. All transactions on EnronOnline were made directly with Enron energy traders.

Unlike other sophisticated electronic trading platforms, Enron's platform was simply a Graphical User Interface between the customer and a human trader. Enron traders could determine the bid and ask prices, quantities, and simply remove offers at will. The EnronOnline instructional manual stated:

The Enron trader maintains a Stack, so that if a transaction is completed by the customer, the next bid or offer in the Stack list will immediately appear to take its place. Different techniques can be used in building the Stack, depending on market objectives. It is possible, for instance, to have an entire Stack in which all of the prices and quantities are the same. Therefore, the "market" will not move, regardless of whether or not a customer "takes out" the entire bid or offer which is visible on their screen at any one time. An alternate strategy might be to build the stack with the same volume entries, but with prices moving up or down in defined increments. With this kind of stack, as customers complete transactions, the market will appear to move up or down, as appropriate.⁴⁵

This passage reflects the largely illusory nature of EnronOnline. While the client believed it was participating in the market, Enron's instructions reveal that its employees knew the client was being misled. In 1920, the Horn and Hardart Company introduced the "Automat" – a modernistic cafeteria where the food appeared automatically behind a wall of glass doors. The concept was so seductive that Horn and Hardart (today's Burger King) became the nation's largest restaurant chain. But behind the wall of gleaming doors was a normal kitchen whose unseen workers inserted the food into the boxes.

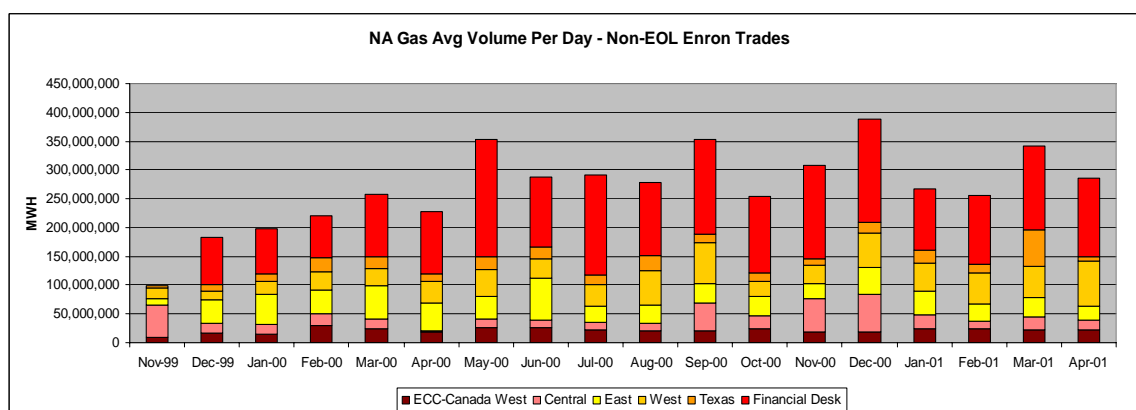
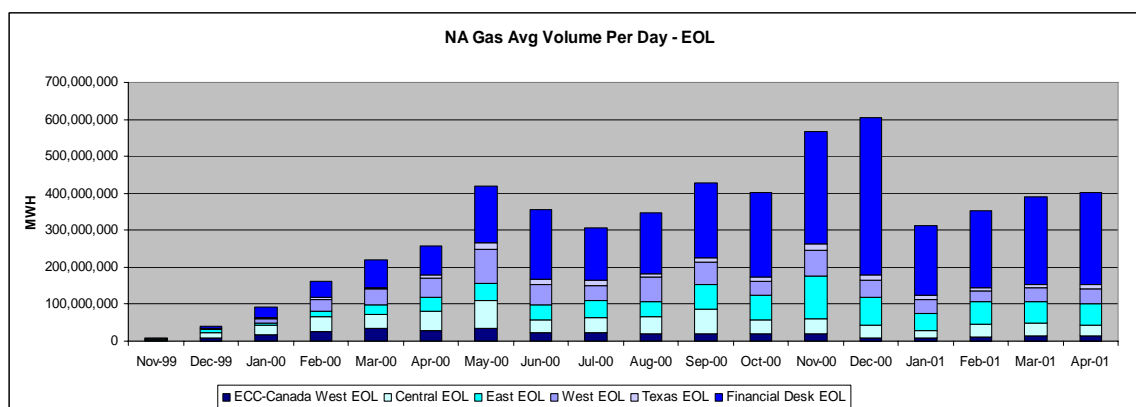
EnronOnline held a similar fascination for some clients. In September 2001, Enron added the ability for customers to place stop orders, similar to the maximum price information used by eBay. Unlike eBay, Enron was the only counterparty, so this feature effectively placed the critical "hole card" information directly into Enron's hands. FERC's staff addressed this one-sided feature in its Final Staff Report:

The limit orders offered by outside traders provided to Enron an option to meet demands for immediate execution by others using these limit orders as a source of liquidity. The EOL market maker could also step ahead of the limit orders and trade from his own account, with the comfort that the additional demand to trade reflected in the limit orders would potentially move the price in a favorable direction. This would allow the EOL market maker to profit by positioning in the market prior to the impact on prices that the limit orders would generate when executed. These EOL customers, who provided limit orders to EOL, were not able to trade directly with one another using the platform. When matching buy and sell limit orders were provided to EOL, EOL would act as the counterparty to both.⁴⁶

⁴⁵ EnronOnline Trader Manual, as submitted by Enron in response to FERC's March 15, April 23, and April 25, 2002 Requests.

⁴⁶ Information concerning EOL's platform, March 2003 FERC Final Staff Report, Page IX-28.

While Enron proclaimed exponential growth for EnronOnline, investigation has indicated that growth leveled off in 2001. In gas, for example, December 2000 was followed by a much quieter set of months in 2001.



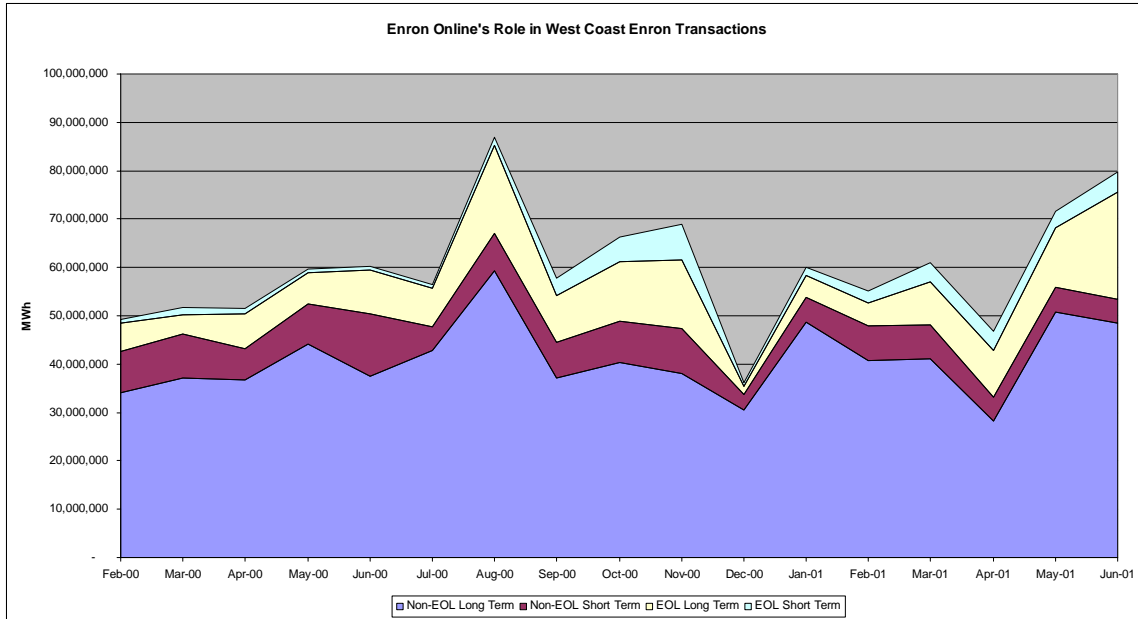
The significance of the chart is that just one desk (John Arnold's financial gas desk) generated all of Enron's financial gas desk profits in 2001, single-handedly accounting for 21% of Enron North America's profits for that year.⁴⁷

Natural Gas Profit and Loss by Desk			
Desk	Year 2000	Year 2001	Total
EAST	148,059,812	(148,897,286)	(837,474)
CENTRAL	229,034,539	893,044,879	1,122,079,418
TEXAS	219,921,508	269,030,469	488,951,977
WEST	867,925,856	(4,178,453)	863,747,402
FINANCIAL	42,269,150	616,246,072	658,515,222
OTHER GAS TRADING	(28,015,543)	255,000,000	226,984,457
CANADA	9,335,621	(48,027,041)	(38,691,420)
STRUCTURED ADJUSTMENTS		(9,118,693)	(9,118,693)
ORIGINATIONS	29,538,196	31,129,885	60,668,082
Total	\$1,518,069,140	\$1,854,229,832	\$3,372,298,972

⁴⁷ John Arnold has not been indicted, although he has taken the Fifth Amendment on at least one occasion concerning financial gas transactions. A second Enron gas trader, Hunter Shively, has faced prosecution at the CFTC for manipulation of the NYMEX forward markets in 2001 resulting in a 35 million dollar settlement from Enron.

Enron's rapid dominance of the electronic trading platform market demonstrates the power of its marketing. While Enron trumpeted the rapid growth of the platform, it is unclear how many real trades occurred. It is not difficult to find entries in Enron's trading records indicating that EnronOnline transactions were taking place between Enron traders. In fact, it was common for Enron traders to have user names on EnronOnline so that they could log in as a customer and transact on the trading platform. The use of EnronOnline for trades completely within Enron constituted a form of "wash" trading whose impact is little understood. Obviously, such transactions increased the reported numbers of EnronOnline transactions. They may have also increased the appearance of liquidity on the platform.

EnronOnline had a significant, although less dominant, role in West Coast power markets:



Overall, only 18.6% of West Coast electric forward transactions were initiated on EnronOnline for the period February 2000 through June 2001.

Completely unregulated, EnronOnline contained several specious features. Chapter VII of the FERC Final Staff Report focuses on a practice known as "Choice Markets." In "Choice Markets" the bid and ask for a specific commodity would be set to the same price.

Table VII-6 reports delivery locations for wash trades. Some (34 % of gas and 17 % of power) wash trades were for financial products without physical delivery locations. Henry Hub was by far the most common delivery point for gas wash trades (31 % of the total), while Mid-Columbia (24 %), Cinergy (17 %), and the California-Oregon Border (14 %) were the most frequent delivery points for power wash trades.⁴⁸

"Choice Market" practice appears to have allowed only Enron itself to create the illusion of transactions at a given price. (A supermarket offering to buy or sell groceries at the same price would quickly go out of business.) If the posted prices were used for another purpose – setting

⁴⁸ Table Titled Wash Trades Completed During Choice Markets, by Counterparty, March 2003 FERC Final Staff Report, Page VII-8.

prices reported in the media, for example, it might well be useful to maintain such a market presence for the profits available elsewhere.

FERC staff were deeply concerned about EnronOnline's activities:

The Trade Press has reported that, like a casino, Enron had the "house" advantage by trading on EOL in energy markets. Based on our analysis of the archived EOL database, Staff concludes that this is a flawed analogy. For example, a card game in a casino has set rules and all players can clearly see who they are competing against. On EOL, Enron had access to trading histories, limit orders, and volumes of trades, and therefore understood the liquidity of the market. In contrast, an unaffiliated trader on EOL was only able to see the activity that was posted electronically on the EOL screen. More significantly, when bid and ask prices were changed, the trader was unable to know if it was due to a legitimate trade or if prices were being manipulated. Unlike a casino game, this lack of transparency prevented the trader from knowing with whom he was competing. Moreover, because the EOL platform was wholly controlled by Enron, there were no fixed rules. The EOL operator had an infinite ability to manipulate what was posted in any of the ways described above. Simply put, the use of EOL enabled Enron to post any price it wanted.⁴⁹

There is unsubstantiated anecdotal evidence that some of EnronOnline's components were not documented, including a possible "Spyware" capability.⁵⁰ Given Enron's overall capabilities such features are possible, but they do not show up in the internal documentation for Enron traders. A review of EnronOnline's documentation by William Babcock, the owner of Babcock and Jenkins, a respected firm specializing in Internet marketing, confirmed that such features are relatively easy to implement.

We do know that Enron had plans to expand industrial espionage capabilities for EnronOnline. Three days after Greg Whalley's elevation to president of Enron, following Jeffrey Skilling's sudden departure, Vince Kaminski wrote:

Jay,

I have to add another item to a long list of your headaches.

Greg Whalley gave us marching orders to treat the development of quantitative models for data mining of EOL trade records as the top priority. I shall be providing Greg bi-weekly updates on the project.

FYI only. I am flying with Greg next week to a meeting with a third party that may be involved in some aspects of this project. I shall tell you more when we meet.

I know that we, as well as Greg, can count on full support and cooperation from you.

I shall ask my assistant, Shirley Crenshaw, to set up a meeting with you next week after I come back from the trip.

Vince⁵¹

⁴⁹ Ibid., page VII-14.

⁵⁰ See, for example, the "blog" at http://www.dailyspeculations.com/vic/software_bugs.html which describes apparent price changes caused by simply moving the mouse during an EnronOnline session.

⁵¹ Email FW: EOL Data Mining, Vince Kaminski to Jay Webb, August 31, 2001.

The scale of the proposed data mining project was described in the executive summary of the project:

EOL is a principal based trading platform, meaning Enron is the buyer (seller) when there is seller (buyer) who wants to transact on EOL. EOL provides market liquidity by making the bid-ask spread. However making the spread is not the only revenue source for running EOL. There is certain information asymmetry beneficial to Enron as the market maker:

- Enron owns EOL trading database that contains detailed information about each transactions; trades can be aggregated according to different categories, for example, by commodity, by contract maturity, by counter party, by trading time interval, just to name a few. The informational advantage will allow us to explore market inefficiency and arbitrage across different products.
- The time series recorded in EOL database contains valuable information about supply-demand balance, market directions and volatilities, market correlations and cross-market correlations, trading habits and patterns.

The EOL Data Mining project is aimed at taking the advantage of the information asymmetry and market inefficiency so as to predict the market conditions. The benefit of predictability is obvious, especially in the following aspects:

- Predictability means profit. The ability to predict (even in a statistical sense) will give us an edge in trading and risk management.
- Predictability will enable us to control and reduce the risk of market making.⁵²

The proposed project raises many concerns. Clearly, Enron was contemplating the potential violation of a host of Internet privacy laws in the U.S., Canada, and the European Union. More important, Enron was planning to systematically exploit market information that would enable it to “control and reduce the risk of market making” – a clear statement of market power.

The executive summary closed on a particularly sinister note:

In the EOL Data Mining project, we will exploit both type approaches to build our ultimate Enron Perdition Models.⁵³

The word perdition means “entire loss; utter destruction; or ruin.” One might safely posit that this plan was not meant to benefit EnronOnline’s clients.

In 2004, the CFTC charged that EnronOnline had been an illegal trading platform after September 2001 when it had allowed users to post bids and offers.

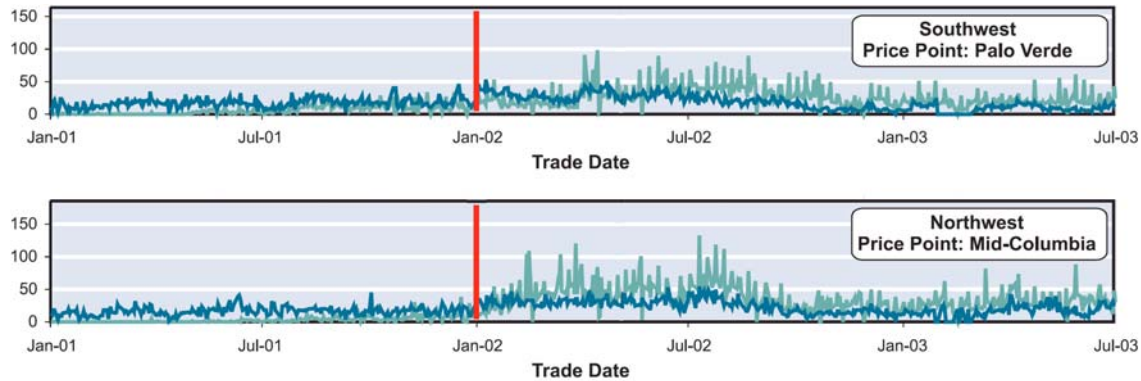
Overall, it is clear that the unregulated EnronOnline represented a larger concern than regulated NYMEX. By allowing a market participant to evade regulation simply by establishing its own unregulated electronic trading platform combined with the anomalous decline in forward market prices upon Enron’s bankruptcy strongly implies that this regulatory lapse was costly.

FERC’s 2004 State of the Markets Report indicates that most of EnronOnline’s market was picked up by ICE.⁵⁴ The following chart shows transactions in 1000 megawatt-hours.

⁵² Executive Summary: EOL Data Mining Project, September 17, 2001.

⁵³ Ibid, page 1.

⁵⁴ January 2004, State of the Markets Report by the OMOI Staff to FERC, page 47.



FERC's Final Staff Report estimated that quantities roughly doubled after Enron's bankruptcy.⁵⁵

UBS Warburg, the Swiss bank that purchased Enron's trading activities finally closed EnronOnline at the end of 2002.

The Relationship of Market Manipulation Schemes in Spot and Forward Markets

The most detailed description of a spot to forward manipulation scheme concerns Enron's successful attempt to manipulate the NYMEX Henry Hub market for natural gas on July 19, 2001. On that date, Enron traders led by Hunter Shively made dramatic transactions in the spot market:

A number of traders entered relatively large short positions in the financial markets through OTC swaps and *Gas Daily* financial swaps. These traders continued to increase the short positions throughout the initial phase of the manipulation, which was the period when the EOL market maker (who was, at times, the desk manager) quickly and steadily raised prices on EOL, resulting in the purchase of a very large amount of next-day physical gas. This purchasing caused prices in the financial markets to rise, but by a lesser amount.

The financial traders stopped increasing their short positions near the end of the EOL market maker's buying streak at a point when the EOL market maker stopped raising prices and began to hold prices steady at the high levels. Once the EOL market maker leveled out prices, the OTC swap began to fall. The EOL market maker then began to lower the prices and sold a very large amount of gas at rapidly falling prices. The falling of the physical price then further pushed down the OTC swap price, generating significant profits for the financial traders. These profits greatly exceeded the losses that were generated from the impatient buying and selling of the physical gas.⁵⁶

The CFTC filed a complaint against Enron and Shively on March 11, 2003. The complaint stated:

23. On or about July 19, 2001, Shively, with the assistance of at least one other Enron natural gas trader, engaged in a scheme which manipulated prices in the HH Spot Market, and had a direct and adverse affect on NYMEX Henry Hub

⁵⁵ The Basic Structure of the Electric Markets, March 2003 FERC Final Staff Report. Page IX-32.

⁵⁶ The July 19, 2001 Manipulation, March 2003 FERC Final Staff Report. Page IX-17.

August 2001 Futures, including causing prices in NYMEX Henry Hub Futures to become artificial.

24. Defendants' manipulative scheme involved a plan among Enron traders to purchase an extraordinarily large amount of HM Spot Market natural gas within a short period of time (the "Manipulative Scheme").

25. Defendants effectuated their Manipulative Scheme through a variety of acts and practices that were intended to, and did, manipulate prices in the HH Spot Market. NYMEX August 2001 Henry Hub Futures were affected by Defendants' Manipulative Scheme as well, including causing NYMEX Henry Hub Futures prices to become artificial.

26. Enlisting the assistance of the East Desk Enron trader who managed the HH Spot Market on EOL, Defendants bought a very large amount of natural gas in the HH Spot Market in a very short period of time, approximately fifteen minutes, in the morning of July 19, 2001, causing prices to rise artificially.

27. Immediately following the pre-arranged buying spree, Enron began unwinding its HH Spot Market position and prices declined in that market. Prices in the HH Spot Market declined in the first ten minutes while Enron unwound its position.

28. Before Shively implemented the scheme, other Central Desk traders learned that Shively was going over to the East Desk to bid up the HH Spot Market. The head of Enron's NYMEX desk was also informed of Shively's plan. Later, at some point during Enron's HH Spot Market trading, an Enron trader indicated to the Central Desk that the East Desk was "bidding up" the HH Spot Market. Shortly thereafter, a trader at the Central Desk stated that the East Desk was going to sell the HH Spot Market.

29. To ensure the participation of the Enron East Desk trader who managed the HH Spot Market on EOL, Shively agreed to cover any trading losses that trader incurred by participating in the Manipulative Scheme.

30. On or about July 19, 2001, to cover the losses of that East Desk trader, Shively directed that over \$80,000 be transferred from an administrative trading account he controlled to the trading account of the Enron East Desk trader who agreed to participate in the Manipulative Scheme.

31. Shively acted in the scope of his employment in carrying out and directing the conduct of other Enron employees in furtherance of the Manipulative Scheme.⁵⁷

Efforts by Reliant to create profits in forward markets by withholding generation in the California PX's spot market was the subject of a January 31, 2003 settlement at FERC. The description of the Reliant scheme makes clear both the spot and forward nature of the manipulation:

5. According to Reliant, on June 19, 2000, it had a long position for the third quarter of 2001, and an unexpected drop for the forward prices used to value this caused a loss in its existing forward position. Reliant's Vice President of Power Trading (who is no longer with the company) directed Reliant's west desk traders to respond to this loss. Accordingly, on Monday, June 20, Reliant reduced the capacity it bid into the CalPX for delivery on June 21 by approximately 1,000 MW to see if PX prices would increase and thus also raise forward prices. Reliant increased only slightly the amount of capacity it bid into the CalPX on June 21 for delivery on June 22. Reliant elected to perform discretionary maintenance on

⁵⁷ U.S. CFTC v. Enron Corporation and Hunter Shively, Complaint for Injunctive and Other Equitable Relief and Civil Monetary Penalties Under the Commodity Exchange Act, March 11, 2003, pages 5 and 6.

generating units whose output otherwise would have been offered to the CalPX for those days.⁵⁸

Reliant traders left a broad trail of their actions on their recorded lines. The trader "Joe-Joe" Knauth even bragged to competitors about the feat:

Knauth: I mean, this will prove if we have affected the market or not.

No. 2: Well, I think you have.

Knauth: Yeah.

No.2: I think indeed you have, and it showed up yesterday afternoon.

Knauth: Yeah. I got about \$400,000 (grand) in my pocket today.

No. 2: What's that?

Knauth: I got \$400,000 (grand) from the expost that say we did.

No 2. Exactly. And then y'all cranked up your units?

Knauth: I don't know.

No. 2: Yeah.

Knauth: As far as you know.⁵⁹

Given the low level of surveillance in forward markets during the California crisis, the costs of these often bizarre short term transactions – Ricochets from California to Oregon and then back to California, for example – were more than recompensed by the impacts on long term prices.

It is also possible to put pressure on short term markets by taking extreme positions in forward markets. The best example occurred during the Midwestern price spike of 1997 when a small energy marketing firm promised to provide supplies it had no capability of meeting. Some anecdotal evidence suggests this may also have occurred during the Western Market Crisis, but since the vast majority of forward transactions were not regulated, it is difficult to assess the validity of the anecdotes.

The easiest way to change long term market perceptions is to provide inaccurate trading information to industry newsletters and electronic trading platforms. Reliant's Knauth was also recorded facilitating a wash trade with BP:

For example, on one occasion, the counterparty trader telephoned Knauth and asked "If I put an offer on [the Trading Platform] will you lift me and we'll trade right out of it?" Knauth responded, "Yeah, I'm sure." The counterparty trader later confirmed "[s]o let's see, I sell on [the Trading Platform] and I buy back -- over the counter - for nothing."⁶⁰

Posting this erroneous trading information on Bloomberg required little more than a phone call. The only disadvantage was that the many participants in the market would have observed that

⁵⁸ FERC, PA02-2-000 Order Approving Stipulation and Consent Agreement, January 31, 2003, page 2.

⁵⁹ Transcript between Joseph Knauth and other trader, June 22, 2000.

⁶⁰ Order Instituting Proceedings Pursuant To Sections 6(C) And 6(D) Of The Commodity Exchange Act, Making Findings and Imposing Remedial Sanctions, before the Commodity Futures Trading Commission, May 10, 2004, page 3.

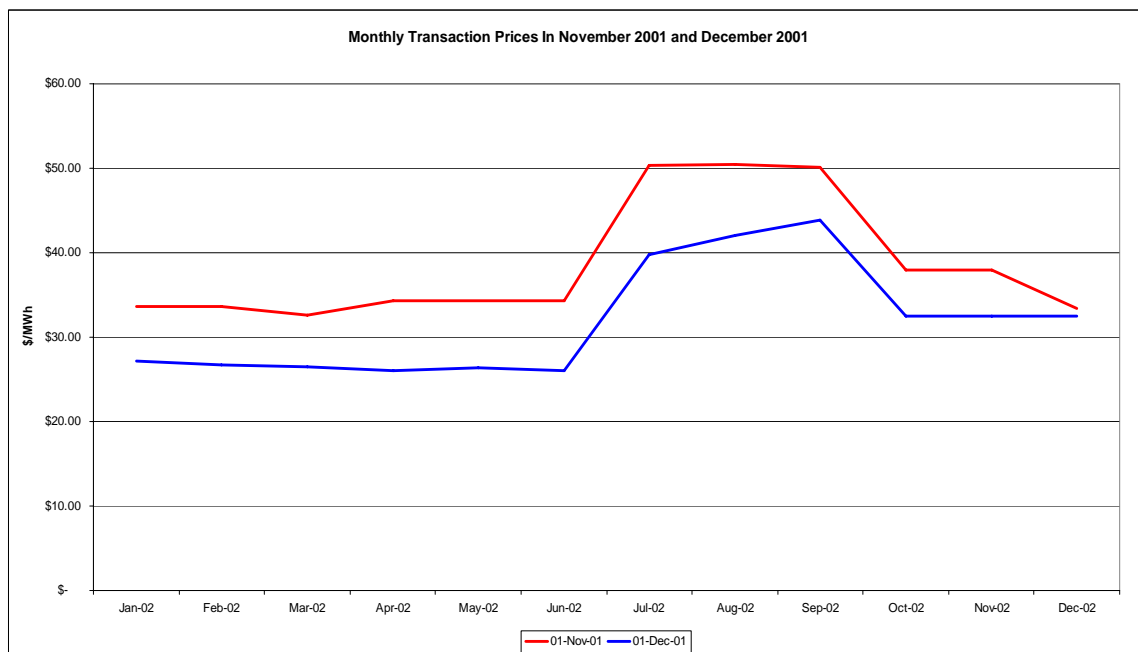
the trades were inconsistent with other transactions. Post-crisis CFTC enforcement efforts revealed that erroneous postings by phone were flagrant.

Enron Bankruptcy Impacts on Futures Trading

In early December 2001, market information received at McCullough Research implied that prices had declined significantly. However, market information for 2003 and 2004 offered no explanation for the price differentials.

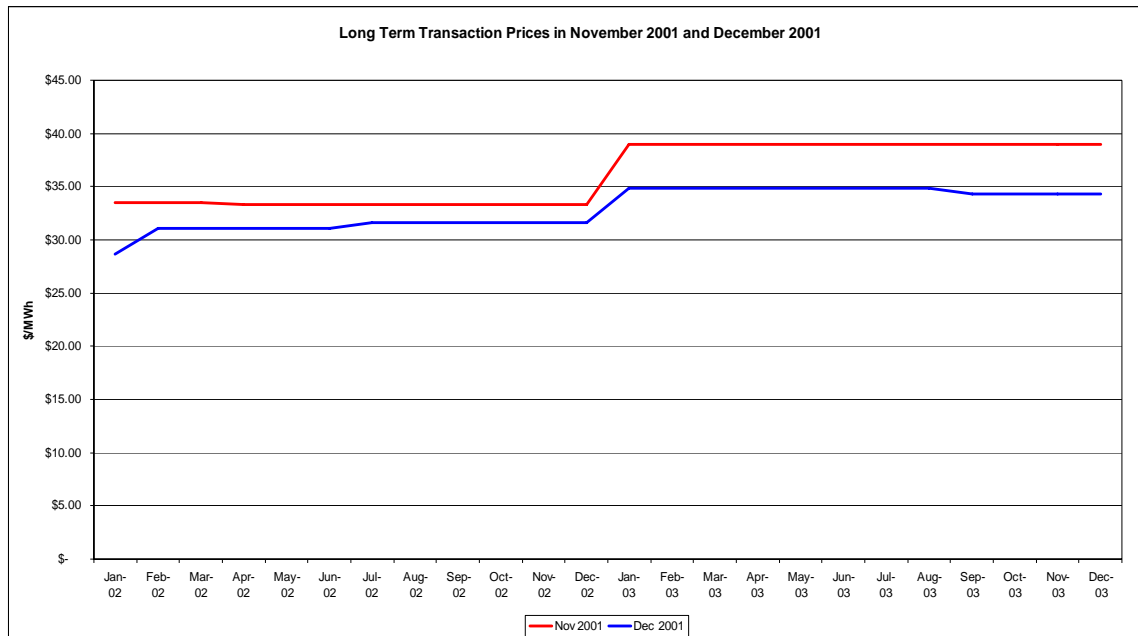
FERC market discovery performed in early 2002 was made public in 2003. Although the long term data was used extensively in Chapter 5 of the Final Staff Report, FERC staff did not use the monthly data determine whether the prices decreases reported in industry newsletters reflected real transactions.

In November 2001, 507 monthly transactions were signed for deliveries taking place on and after January 1, 2002. In December 2001, 664 monthly transactions were signed for the same period. The majority of these transactions reflected 2002. No one has yet determined the origin of the prices reported by industry given the lack of transactions for 2003.



The actual transaction prices agreed with McCullough Research's observation that a major decrease in prices occurred after Enron declared bankruptcy. On average, 2002 monthly prices in December were 82% of those for contracts signed in November.

Interpreting data on longer term transactions is considerably more difficult. Several firms reporting longer term transactions made errors or chose to interpret the instructions for reporting in an inconsistent fashion. For example, firms that reported no quantities for their sales or reported products that were impossible to codify were removed from the calculation.



Average transaction prices for contracts signed in December were 91% of the prices for contracts signed in November.

Coinciding with Enron's departure from the market, market participants could have had information concerning 2002's stream flows in advance of the Northwest River Forecast Center's "Early Bird" forecast. However, a lack of independent evidence of forecasts that would occur early in December does not support this theory. Moreover, prices for calendar 2003 energy were 89% of the price for contracts signed in December as compared to November, thus contradicting the argument for foreknowledge since 2003 was considerably better than 2002.

Moreover, prices for calendar 2003 energy were 89% of the price for contracts signed in December as compared to November – which would contradict the argument for foreknowledge since 2003 was considerably better than 2002.

In summer 2002, FERC staff released a report hypothesizing that prices were always lower in November than December. In other words, an observant energy broker could always profit handsomely by selling energy each November and then meet the sale with energy purchased in December. However, FERC's hypothesis was incorrect.

Lessons from the Western Market Crisis

The primary lesson of the Western Market Crisis is that overlapping and incomplete regulation is effectively equivalent to no regulation at all. FERC's inability to understand the forward market implications of schemes like Ricochet and Load Shift caused the Commission to narrow its focus to a search for symptoms, rather than identifying causes. The secondary lesson was the regulators' lack of information.

Following the 1993 determination that it did not regulate energy transactions, CFTC removed itself from the regulatory picture. Even when the exchanges it did regulate were destroyed by the crisis, CFTC failed to see itself as a leading actor given Congress' codification of this exemption in the Commodity Futures Modernization Act of 2000.

State regulatory agencies, including California, had little data and even less understanding of the big picture. Even today, the California ISO tends to consider its capacity auction as unconnected to larger forward markets.

The ISO's decision to classify the majority of market information as "protected," a flaw that continues to exist, means that only insiders gain a full appreciation of market activities. Today, the best source of information is the FERC Electric Quarterly Report, not the ISO's own Web site.

Ongoing Implications for Energy Pricing

Regulation of forward market abuses after the Western Market Crisis is largely anecdotal. The major prosecutions of Enron traders Belden, Richter, and Forney reflected information released in the course of the California Select Committee to Investigate Price Manipulation of the Wholesale Energy Market. The current prosecution of Reliant for withholding during the crisis is based upon recordings discovered by FERC during its PA02-2-000 investigation. Knowledge of Enron's successful manipulation of the Henry Hub natural gas market in July 2001 arose from Chapter IX of the Final Staff Report.

Independent market surveillance efforts have been less successful. A review of the Office of Market Oversight and Investigations does not reveal any major activities undertaken since the Show Cause cases arising from the PA02-2-000 investigation.

FERC has taken little interest in the periodic disturbances in markets in Texas because the state continues to operate outside of FERC's jurisdiction. Any investigations of Enron traders who participated in market manipulation at Enron's Portland office and who have figured in market manipulations in Texas fall between the cracks since neither FERC nor the Texas Public Utilities Commission has the authority to track manipulations that move between their jurisdictions.

CFTC has been slightly more active nationally, but appears to have restricted its activities to following up previous leads.

A disquieting development at the CFTC concerns the settlement of wash trading charges against Knauth. Knauth's recordings admitting physical withholding in the California market were provided by the California Attorney General to FERC as part of the PA02-2-000 investigation. The recordings are part of the ongoing U.S. Department of Justice's prosecution of Reliant for market manipulation. In addition, Knauth was identified as a participant in a wash trading scheme with a British Petroleum trader. The settlement order states:

On at least five occasions between April and June 2000, Knauth, then a power trader at a major energy and power marketing company ("the Company"), executed or offered to enter into and facilitated the execution of non-competitive, prearranged wash sales during his off-exchange trading of electricity (power) contracts. The trades were for the same contract, delivery point, quantity and price, executed with the same counterparty company ("counterparty company") and counterparty trader ("counterparty trader"). The trades were prearranged and designed to produce a wash financial result, with neither party making nor taking, nor intending to make or take, delivery or a *bona fide* position in the market or market risk. Knauth and the counterparty trader agreed to execute a buy and a sell on an electronic trading platform ("Trading Platform"), and then to immediately reverse or offset the first trade by bilaterally executing over the telephone an equal and opposite buy and sell, in violation of Section 4c(a)(A) of the Act, 7 U.S.C. § 6c(a)(A)(1994), which prohibits wash trading. These wash sales caused prices to be recorded on the Trading Platform that were not true

and *bona fide*, in violation of Section 4c(a)(B) of the Act, 7 U.S.C. § 6c(a)(B) (1994).⁶¹

CFTC's settlement is notable for the lack of information it provides. For example, Knauth's employer at the time (Reliant), his counterparty (BP), and the electronic trading platform (Bloomberg) do not appear. Perhaps the CFTC was more interested in exacting a small penalty from Knauth than in protecting consumers. Identifying companies engaged in manipulation is a powerful inducement to avoid wrongdoing. It is also crucial for market participants to know which companies have been identified as malefactors. The identity of the trading platform is relevant since the selection of a market price for indexed transactions is a serious matter for market participants.

The decision made by the PX market surveillance officials to minimize the significance of the Silver Peak incident in 1999 contributed to the Western Market Crisis. If market participants had known the extent of the problem, it is likely they would have taken steps to protect themselves from the abuses in the following year.

The decision by the market surveillance officials in the California Power Exchange to minimize the significance of the Silver Peak incident in 1999 contributed to the Western Market Crisis. If market participants had known the extent of the problem, it is likely they would have taken steps to protect themselves from the abuses of the following year.

The patchwork nature of regulation and transaction reporting currently makes discovery of market schemes quite difficult. It is easy to find examples where a wily trader can evade market surveillance simply by selecting transaction locations and trading platforms.

For example, if Timothy Belden returns to trading after prison, his original Silver Peak scheme is still likely to evade existing regulatory safeguards.

The first step was to overschedule a small transmission line so that the ISO's congestion management system would reduce his schedule. This part of the scheme would be visible to the California ISO. (It is not normally visible to FERC which relies on its Quarterly Electric Report for market information. Since the schedule will be corrected by the ISO's congestion system long before the quarterly reports, the Silver Peak transaction is invisible at the FERC level.)

The profitable part of Silver Peak resulted from using incorrect preliminary market data to make forward purchases at the California Oregon Border. Since no CFTC-regulated market exists at that trading location, the CFTC would have been unable to discern the portion of the scheme that affects forward markets. Because California market surveillance authorities do not regulate forward markets, the scheme would have evaded their surveillance as well.

Potential Market Abuses after the Western Market Crisis

It is also relevant to review forward markets for anomalies similar to the fall in forward prices coinciding with Enron's bankruptcy. A central concern to electric utilities and generators is the run up in natural gas prices in response to the increase in world oil prices.

Natural gas is a very close substitute for oil. Both fuels are used to generate electricity, provide steam for industrial facilities, and used to heat homes and commercial facilities. As a general rule, the price of spot oil and gas are quite similar on a BTU (British Thermal Unit) basis.

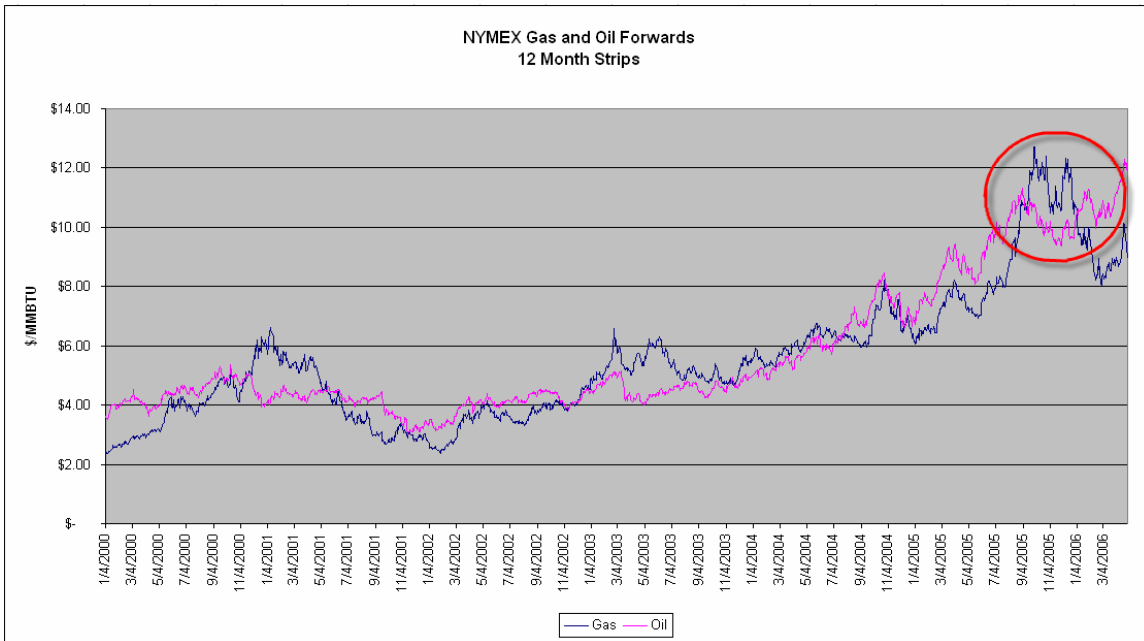
⁶¹ Order Instituting Proceedings Pursuant To Sections 6(C) And 6(D) Of The Commodity Exchange Act, Making Findings And Imposing Remedial Sanctions, May 10, 2004, page 2.

When natural gas prices spiked on the West Coast during the Western Market Crisis, a number of generators switched to oil. Fuel switching is relatively common in gas fueled generators and industrial facilities. The ability to switch also brings the two markets into balance, since price deviations will reduce demand for the higher price fuel.

NYMEX markets dominate forward trades in oil and gas in North America. The NYMEX Henry Hub market is the foundation for forward pricing throughout the electric industry.

Logically, the forward prices for the two commodities on NYMEX markets should closely aligned. This was the case until last winter, when the twelve month strip for natural gas peaked while the similar strip for oil decreased. It is not usual for spot prices to diverge, since specific events, such as problems at a pipeline, might cause short term shortages in one commodity but not the other. FERC recognized the threat for gaming, but did not spot the divergence between forward markets.⁶² A twelve month strip represents forward prices for the following year – a period in which the usual adjustment dynamics are likely to take place.

The chart below shows how the movements in twelve month strips mirror the two commodities. However, for a three-month period this winter, forward prices diverged markedly, with differentials over \$2.00/MMBTU in December 2005.



Although a single chart does not prove market manipulation, this example should invite the type of regulatory scrutiny that could have avoided the economic losses of the Western Market Crisis. While FERC had noticed the cost of natural gas, it could not review the forward markets for signs of possible manipulation.

⁶² “FERC, aware that tight natural gas supplies may encourage market gaming, vows vigilance: Federal Energy Regulatory Commission Chairman Joseph Kelliher on Wednesday said tight natural gas supplies in the United States going into the winter heating season ‘could create temptations for improper behavior by some market participants,’ and promised that his agency ‘will act to prevent prices from going even higher because of manipulation.’” Platt’s Energy Trader, November 13, 2005.

Recommendations

Transaction reporting on regulated exchanges must match the specificity and breadth of reporting in the Electric Quarterly Reports required by FERC. Reporting only half of the nation's energy markets is not likely to forestall market manipulation or to enable detection once the manipulation has occurred. The CFTC's Large Trader Reporting is a good first step; however, smaller market participants can also engage in manipulations.

The CFTC and Congress must recognize that electronic trading platforms, as markets, require registration and regulation. Without consistent regulation, malefactors will pursue trades on unregulated platforms, thus eliminating the protections that market participants require. Regulating some, but not all, electronic trading platforms is like allowing some travelers to choose security checks.

A transparent marketplace in which all participants are regulated equally remains our best insurance against manipulation and fraud. All evidence to date indicates that regulatory enforcement following the revelations in PA02-2-000 and the subsequent FERC cases was largely anecdotal. "Open" information will enable regulators to identify schemes early on and implement the appropriate enforcement. Refunds and penalties from the Western Market Crisis are still not forthcoming six years after the crisis began. This is a poor model for efficient energy markets.

Appendix A: Electronic Trading Platforms

With the end of EnronOnline and Dynegy, wholesale energy services shifted towards robust, higher quality services that included the New York Mercantile Exchange (NYMEX) and the Intercontinental Exchange (ICE). As noted earlier in this report, EnronOnline and Dynegy were not actual exchanges but extensions of each parent company's marketing efforts. Thus, they were vulnerable to the credit weaknesses of their owners, in contrast to NYMEX, ICE, and Bloomberg, which consistently demonstrated enhanced approaches to handling credit risks.

In 2005, trading volume in energy futures and options grew almost 14% to 229.9 million contracts, according to the Futures Industry Association. As trading has increased over the years, local utility companies and large industrials, the two groups that purchase the bulk of electricity and natural gas for consumption, have sought ways to streamline their energy procurement.

A result of the increased activity is the expansion in electronic energy trading platforms. Since 1999, more than 50 new platforms have been launched or proposed. However, volatility has also caused large players such as Altra to consolidate.

The list below, a sampling of the largest players in the electronic energy trading field, consists of only those exchanges that are active in the US. Other national and international trading exchanges exist throughout the world.

Intercontinental Exchange (ICE)

The Intercontinental Exchange (ICE) was launched in May 2000, and boasts 8,500 users worldwide and trades 600 commodity and derivative contract types, including crude oil and refined products, natural gas, power, coal, precious metals, weather derivatives, and emissions allowances. ICE's founding partners include BP Amoco, Deutsche Bank, Goldman Sachs, Morgan Stanley, Royal Dutch/Shell Group, Société Generale, Totalfina Elf Group, and Continental Power Exchange. Other partners who came on board in November 2000 include American Electric Power, Aquila Energy, Duke Energy, El Paso Energy, Mirant and Reliant Energy.

Bloomberg

Launched in 1996, Bloomberg Tradebook is an electronic consolidator of global liquidity. Since its inception, the number of shares traded daily has risen to more than 150 million in the U.S. alone. Bloomberg Tradebook offers its global customer the ability to trade on 65 markets in 54 countries and also offers access to the Chicago Board of Trade and Chicago Mercantile Exchange.

Bloomberg Tradebook is home to Bloomberg Power Match. Launched in September 1998, it allows traders to trade over-the-counter products, emission allowances, and natural gas products anonymously and quickly with international counterparties.

TradeSpark

TradeSpark, another neutral and anonymous energy trading platform, began live trading in October 2000. Despite suffering a tremendous blow on 9-11, when the collapse of the World Trade Center buildings destroyed the headquarters of Cantor Fitzgerald, its parent company, TradeSpark reported a double-digit increase in the volume of trading conducted on its exchange in 2001. The total transaction volume in the fourth quarter that year increased 81% compared to the same period the year before, while the number of electronic trades rose by a stunning 295%.

TradeSpark is a neutral, 'many-to-many' energy marketplace, powered by eSpeed technology that has over 230 companies and more than 3,500 users in the marketplace. Tradespark's investors include Coral Energy, X Dominion, Entergy-Koch LP, TXU Energy Trading, and

Williams Energy Marketing and Trading Company. A sixth partner, Dynegy, is the Houston-based company that sought to acquire Enron before the latter's improprieties came to light. Commodities traded include gas, power, emissions, off-peak power, and hourly power.

New York Mercantile Exchange (NYMEX)

NYMEX has been trading energy futures since the 1970s and has seen an increase in trading activity since EnronOnline went dark, primarily in its natural gas futures and options on futures.

NYMEX, which conducts most of its trading through the traditional "open outcry" method, created ACCESS to post gas swaps contracts on its electronic trading platform. NYMEX has also extended its EFS facility (exchange of futures for swaps) to include natural gas futures, and made its products easier to use by large traders.

ACCESS and ClearPort are interactive data networks for bidding, offering and trading commodity future, future contracts and options offered by NYMEX. Users can trade crude oil, heating oil, gasoline, natural gas, propane, power, propane, coal and the Palo Verde and COB electricity futures and options contracts after hours. Terminals are available in the U.S., London, the Sydney Futures Exchange, and the Hong Kong Futures Exchange.

In the first quarter of 2006, upon offering credit clearing ability to specific over the counter natural gas and electricity trades, NYMEX reported clearing more than \$1.1 billion in transactions.

DynegyDirect

DynegyDirect, launched in November 2000, offered customers a real-time deal entry environment for online transactions that delivered a complete up-to-the-moment picture of Dynegy position and exposure through a tight integration with its risk management and internal trading systems. DynegyDirect provided direct access to more than 750 products and services, including trading in power, natural gas and coal. A proprietary system, it was a "one to many" trading platform. There were approximately 2,300 users before its demise. According to Dynegy, it pulled the plug in 2002 due to market developments and the poor credit environment in the energy industry. This claim seems dubious considering DynegyDirect went dark the day after Dynegy announced the firing of its CFO and a restructuring plan that would lay off 16% of its staff.

Appendix B: FERC, CFTC and U.S. DoJ Settlements and Sanctions 2001-2006

“Addressing the 2000–2001 Western Energy Crisis: Settlements” is the title of the Web site listing the actions taken by FERC.⁶³ Excluding 2002 (when the Commission made no settlements), the following chronology provides a brief description of its actions. Material in quotations (omitting original footnotes) was extracted from the Commission’s orders or in a few instances, its press releases. This chronology also lists settlements from the Commodity Futures Trading Commission (CFTC), taken from its “Enforcement Press Release” web site.⁶⁴ Finally, several energy traders were indicted by the U.S. Department of Justice and they are available on the McCullough Research Web site.⁶⁵

2006

Order on Settlement Agreement, January 25: \$129 million

Resolved “myriad legal disputes between the Nevada companies and Enron that are the outgrowth of commercial dealings between the companies during the Settlement Period. From 1997 to May 7, 2002, Enron sold power to the Nevada Companies in both spot and forward market transactions. Under the terms of the Settlement, Enron will allow, in favor of the Nevada Companies, a Class 6 general unsecured claim under the Enron Debtors’ Plan of Reorganization of \$126.5 million in the bankruptcy proceeding of Enron Power Marketing Inc. The Nevada Companies will pay Enron \$129 million as termination payments arising from Enron’s termination of certain forward power contracts with Nevada Power and Sierra Pacific Power in May 2002. The Settlement provides that Nevada Power’s payment allocation of this total will be \$89.784 million and Sierra Pacific Power’s payment allocation will be \$39.216 million.”

2005

Order on Settlement Agreement, December 22: \$512 million

Resolved and approved (with conditions) “matters and claims” “arising from events in the California Independent System Operator (CAISO) and California Power Exchange (CalPX) energy and ancillary services markets during the period of January 1, 2000 through June 20, 2001 as they relate to Reliant. In addition, the Settlement contains mutual releases of claims between Reliant and certain class action parties and certain local governmental parties.” It stipulated “that Reliant will provide at least \$512,000,000 in monetary consideration.”

Order on Settlement Agreement, November 15: \$1.5 billion

Resolved “claims by the California Parties and other Settling Participants against the Enron Debtors for refunds, disgorgement of profits, and other monetary and non-monetary remedies in the following Commission proceedings: the Refund Proceeding in Commission Docket Nos. EL00-95-000 and EL00-98-000, the Partnership/Gaming Proceeding in Docket Nos. EL03-180-000, EL03-154-000, EL02-114-007, EL02-115-008, and EL02-113-000, and the Refund Related Proceedings, including Docket Nos. PA02-2-000 and IN03-10-000 for the Settlement Period. The Parties also have agreed to mutual releases of past, existing and future claims arising at the Commission and/or under the Federal Power Act with respect to rates, prices, and terms or conditions for energy, ancillary services, or transmission congestion in the western electricity or western natural gas markets during the settlement period.” It also provided “for cash payments totaling up to \$47.4 million from accounts that are currently held by the CAISO and the CalPX.

⁶³ <http://www.ferc.gov/industries/electric/indus-act/wec/settlements.asp>

⁶⁴ <http://www.cftc.gov/opa/opaenf2006.htm>

⁶⁵ <http://www.MResearch.com>

The Settlement provides a Class 6 unsecured claim of \$875 million against EPMI in Enron's bankruptcy proceeding in accordance with the Enron Debtors' Plan of Reorganization (Plan). Enron has also agreed to a \$600 million civil penalty in the form of a subordinated Class 380 penalty claim allowed against EPMI in accordance with the Plan in favor of the Attorneys General of California, Oregon and Washington, the CPUC and the CEOB."

Order of Chief Judge Designating Settlement Judge and Scheduling Conference, September 6

Approved the selection of the settlement judge sought by "counsel for Nevada Power Company and Sierra Pacific Power Company; Public Utility District No. 1 of Snohomish County, Washington; the City of Santa Clara, California; Valley Electric Association, Metropolitan Water District of Southern California; Enron Power Marketing, Inc., Enron Energy Services Inc., and Enron North America Corp.; and the Commission Trial Staff" and set September 15, 2005 for settlement negotiations.

Joint Offer of Settlement, August 24

"Enron, the California Parties, the Additional Claimants, and the Federal Energy Regulatory Commission's ('FERC' or Commission') Office of Market Oversight and Investigations ("OMOI") (collectively the 'Parties') asked "to resolve matters and claims raised in the above-captioned proceedings ("FERC Proceedings") arising from events and transactions in western energy markets – including especially the markets of the California Independent System Operator Corporation ("ISO") and the California Power Exchange Corporation ('PX') – during the period January 16, 1997 through June 25, 2003 (the 'Settlement Period') as they relate to Enron (the 'Settlement'); that "the Commission receive comments and review the Settlement without prior certification by an Administrative Law Judge;" and requested approval by the Commission.

"Agreement reached with Reliant Energy; last of 'big five' generators to pay \$460 million to settle California claims," August 15

Prior to an expected September filing, the Commission trumpeted the news that "parties will forego all claims relating to monetary damages for Reliant's sale of electricity during January 2000 through June 2001." "In addition to a \$460 million cash payment, the agreement calls for Reliant to allow an independent audit of outages for 12 months following FERC approval of the agreement, and to continue its 'must offer' obligations under provisions of a 2003 settlement for an additional two years."

Statement of FERC Chairman Joseph T. Kelliher on the announcement of a settlement agreement between Enron, California parties and FERC staff, July 15:

This settlement agreement is a result of FERC's strong enforcement actions. With today's announcement, the tally of settlements stemming from the 2000-2001 Western energy crisis that has either accepted or helped realize is now nearly \$6 billion." And, "The dark cloud of litigation and regulatory uncertainty has been hanging over California for five years now. That's too long. It's time for all of us to step up to the plate and resolve these remaining issues.

Plea Agreement in United States of America vs. Christopher Calger, July 14

"Defendant will waive indictment and plead guilty to an Information to be filed in this district charging a violation of 18 U.S.C. 5 371, conspiracy to commit wire fraud. Defendant agrees that he is pleading guilty because he is guilty and that the facts contained in Exhibit A (attached and incorporated herein) are true and supply a factual basis for his plea." Mr. Calger's sentence consisted of the following: maximum term of imprisonment for pleading guilty to one-count Information 5 years, followed by supervised release (for any length of imprisonment), and a maximum fine of \$250,000.

Order on Settlement Agreement, April 13: \$500 million

Resolved “matters and claims” against Mirant “raised in proceedings that were initiated with respect to events in the California Independent System Operator Corporation (CAISO) and California Power Exchange (CalPX) energy and ancillary services markets during the period from January 1, 2000 through June 20, 2001 as they relate to Mirant” and also addressed “a number of other dockets pending before the Commission.” The settlement “consisted of: a Joint Offer of Settlement; a Joint Explanatory Statement; a Settlement and Release of Claims Agreement; two ‘wraparound’ Power Purchase and Sale Agreements; an Offer of Settlement involving two Reliability Must-Run Service Agreements (RMR Agreements) affecting certain Mirant Delta and Mirant Potrero generating units; and, numerous supporting documents. It “authorized and directed” CalPX and CAISO “to implement the Settlement.” “Mirant will assign to the California Parties approximately \$283 million in receivables claimed by Mirant to be due to it from the CAISO and CalPX, plus an additional \$37 million associated with the reversal of the CalPX soft cap adjustment, for a total assignment by Mirant of approximately \$320 million. Mirant will also assign to the California Parties any interest due on these assigned funds.”

2004

Order on Settlement Agreement, December 7: \$207,500,000

Resolved “matters and claims” “arising from events in the California Independent System Operator (CAISO) and California Power Exchange (CalPX) energy and ancillary services markets during the period of January 1, 2000 through June 23, 2001 as they relate to Duke.” Duke agreed to provide “\$207,500,000 in monetary consideration.”

Order Approving Uncontested Settlement, October 27: \$996,145

Resolved “charges” against the Colorado River Commission of Nevada “that were set for hearing in the Partnership Order. In this regard, CRC will be returning \$996,145, the total revenues (and not merely the profits – and thus more than would be achieved in litigation) from CRC’s alleged participation in gaming practices.”

Order on Settlement Agreement, October 25: \$281 million

Resolved “claims against the Dynegy Parties for refunds, price adjustments or other remedies for actions arising out of the Dynegy Parties’ sale of electricity and natural gas into California during the period defined in the Settlement Agreement. Approval will avoid further costly litigation, eliminate regulatory uncertainty and bring to a close a number of disputes stemming from the California market disruptions during 2000 and 2001 as they relate to the Dynegy Parties.”

Order Granting Request for Partial Waiver and Modification of Stipulation and Consent Agreement, September 22: up to \$30 million

Granted a “request for partial waiver and modification of Article IV, section 4 of the Agreement” to Reliant Energy Services, Inc., Reliant Energy Coolwater, Inc., Reliant Energy Ellwood, Inc., Reliant Energy Etiwanda, Inc., Reliant Energy Mandalay, Inc., and Reliant Energy Ormond Beach, Inc. (collectively, Reliant). Reliant explained “that the partial waiver is necessary because it cannot commit the capacity from the Etiwanda Units to SCE while still obligated to auction the same capacity over the same period of time pursuant to the Agreement. In support of its request, Reliant states that the consideration contained in the contract with SCE will enable Reliant to pay into the Deposit Fund up to \$25 million in Net Value, contemplated under the Agreement. Further, it claims that granting the partial waiver will ensure that the output of the Etiwanda Units is not contracted to an out-of-state purchaser, thus helping to ensure reliability in California. The requested modification of the Agreement to postpone the auction for the Mandalay and Ellwood Units would provide Reliant the opportunity to secure a bilateral contract and avoid the risk of having another auction with no bidders.”

Order Approving Contested Settlement, September 21: \$14,034

“Reasonably” addressed and resolved charges against Modesto Irrigation District “that were set for hearing in the Gaming Order. In this regard, Modesto will be returning \$14,304, the total

revenues (and not merely the profits – and thus more than would be achieved in litigation) from Modesto’s alleged participation in gaming practices.”

Order Approving Contested Settlement, September 21: \$549,973

“Reasonably” addressed and resolved charges against Duke Energy Trading and Marketing Company (Duke) that were set for hearing in the Gaming and Partnership Orders. In this regard, Duke will be returning \$549,973, the total revenues (and not merely the profits – and thus more than would be achieved in litigation) from Duke’s participation in alleged gaming practices. Furthermore, given our determination in our order on rehearing not to expand the scope of this proceeding, the release provisions in Articles IV and V, sections 4.5 and 5.2, of the Settlement Agreement, releasing Duke from further scrutiny of its trading activities in California during the period January 1, 2000 through June 20, 2001 (with the exception of the ongoing proceedings in Docket Nos. IN03-10- 000 and EL00-95-000, et al.) is reasonable.”

Plea Agreement in United States of America vs. John M. Forney, August 5

“I agree to plead guilty to count one of the captioned Superseding Indictment charging me with conspiracy to commit wire fraud, in violation of 18 U.S.C. § 371. I agree that the elements of the offense of conspiracy and the maximum penalties are as follows: (1) There was an agreement between two or more persons to commit the crime of wire fraud in violation of 18 U.S.C. § 1343; (2) I became a member of the conspiracy knowing of at least one of its objects and intending to help accomplish it; and (3) One of the members of the conspiracy performed at least one overt act for the purpose of carrying out the conspiracy.” Mr. Forney’s sentence consisted of the following: “a. Maximum prison sentence 5 years; b. Maximum fine \$250,000 or twice the gross gain or loss, whichever is greater; c. Maximum supervised release term 3 years; d. Mandatory special assessment \$100; and e. Restitution As ordered by the Court.”

Order Approving Contested Settlement, August 5: \$3,014,942.59

“Reasonably” addressed and resolved charges against Dynegy Power Marketing, Inc.; Dynegy Power Corp.; El Segundo Power LLC; Long Beach Generation LLC; Cabrillo Power I LLC; and Cabrillo Power II LLC (collectively Dynegy) “that were set for hearing in the Gaming Order. In this regard, Dynegy will be returning \$3,017,416, the total revenues (and not merely the profits – and thus more than would be achieved in litigation) from Dynegy’s alleged participation in gaming practices. Furthermore, given our determination in the Gaming Order on Rehearing not to expand the scope of this proceeding, the release provision in Article IV, section 4.5, of the Settlement Agreement, releasing Dynegy from further scrutiny of its trading activities in California during the period January 1, 2000 through June 20, 2001 (with the exception of the ongoing proceedings in Docket Nos. IN03-10-000 and EL00-95-000, et al. or any investigation regarding physical withholding), is reasonable.”

Order Approving Contested Settlement, August 2: \$7,787,055

“Reasonably” addressed and resolved charges against Coral Power L.L.C. “that were set for hearing in the Gaming and Partnership Orders. In this regard, Coral will be returning \$7,787,055, the total revenues (and not merely the profits -- and thus more than would be achieved in litigation) from Coral’s alleged participation in gaming practices. Furthermore, given our determination in our order on rehearing not to expand the scope of this proceeding, the release provision in Article IV, section 4.8, of the Settlement Agreement, releasing Coral from further scrutiny of its trading activities in California during the period January 1, 2000 through June 20, 2001 (with the exception of the ongoing proceedings in Docket Nos. IN03-10-000 and EL00-95-000, et al.), is reasonable.”

Order Approving Contested Settlement, August 2: \$25,000

“Reasonably” addressed and resolved charges against the City of Glendale, California, “that were set for hearing in the Gaming and Partnership Orders. In this regard, Glendale will be returning \$25,000, more than the total revenues (and more than the profits – and thus more than would be achieved in litigation) from Glendale’s alleged participation in gaming practices.”

Order Approving Contested Settlement, August 2: \$22,448

“Reasonably” addressed and resolved charges against the Northern California Power Agency” that were set for hearing in the Partnership Order. In this regard, NCPA will be returning \$22,448, the total revenues (and not merely the profits – and thus more than would be achieved in litigation) from NCPA’s alleged participation in gaming practices. Furthermore, given our determination in the Partnership Order on Rehearing not to expand the scope of this proceeding, the release provision in Article IV, section 4.3, of the Settlement Agreement, releasing NCPA from further scrutiny of its trading activities in California during the period January 1, 2000 through June 20, 2001 (with the exception of the ongoing proceedings in Docket Nos. IN03-10-000 and EL00-95-000, et al. or any investigation regarding physical withholding), is reasonable.”

Order Approving Contested Settlement, August 2: \$3,014,942.59

“Reasonably” addressed and resolved charges against Sempra Energy Trading Corporation (Sempra) “that were set for hearing in the Gaming and Partnership Orders. In this regard, Sempra will be returning \$7,238,516, the total revenues (and not merely the profits – and thus more than would be achieved in litigation) from Sempra’s participation in alleged gaming practices. Furthermore, given our determination in the Gaming and Partnership Orders on Rehearing not to expand the scope of these proceedings, the release provision in Article IV, section 4.8, of the Settlement Agreement, releasing Sempra from further scrutiny of its trading activities in California during the period January 1, 2000 through June 20, 2001 (with the exception of the ongoing proceedings in Docket Nos. IN03-10-000 and EL00-95-000, et al.), is reasonable.”

Order on Settlement Agreement, July 2: \$1.4 billion

Resolved the issues “concerning Williams in Docket Nos. EL00-95, et al., EL00-98, et al. (the Refund Proceeding) and EL03-179- 000 (the Show Cause Proceeding); all issues as to Williams in Docket Nos. IN01-3-000, IN03-10-000, and PA02-2-000; and, as between Williams and the Commission’s Office of Market Oversight and Investigation (OMOI) staff, all issues under Docket No. PA03-11-000. The Settlement provides an opportunity to other parties to the Refund Proceeding to join or ‘opt into’ the Settlement and become ‘Settling Participants.’ The Settlement also seeks to resolve any other claims and issues that the Settling Parties, and those parties that become Settling Participants, may have against Williams for refunds, price adjustments, or other remedies arising from Williams’ sales of electricity and natural gas into California during the periods defined in the Settlement Agreement. The Settlement is based upon a calculation and allocation of Williams’ total refund amounts associated with its spot sales into markets operated by the California Independent System Operator Corporation (CAISO) and the California Power Exchange (CalPX) for the period from October 2, 2000 to June 20, 2001 (the Refund Period). It also resolves all claims among the Settling Parties against Williams for the May 1, 2000–October 1, 2000 ‘Pre-refund Period.’ “The three payments covered October 2, 2000–January 17, 2001 (\$107.2 million); January 18–June 20, 2001 (\$10.5 million); May 1–October 1, 2000 (\$8 million). The agreement also “provides for the payment of \$11.5 million to PG&E, SCE and SDG&E for the release of certain existing and potential civil and regulatory claims against Williams. Finally, the Settlement Agreement creates a ‘Surplus Account’ of \$10 million funded by Williams and held in escrow until the refund claims of all non-settling participants are finally resolved and refunds to them, if any, are paid, or until such time as the Commission issues an order allowing Williams to terminate the account and withdraw any remaining funds.”

Consent Order of Permanent Injunction and Other Relief against Defendant Enron Corp., May 28: \$35 Million

“Enron is permanently restrained, enjoined and prohibited from directly or indirectly:

1. manipulating or attempting to manipulate the market price of any commodity, in interstate commerce, or for future delivery on or subject to the rules of any registered entity, including any contract market in violation of Sections 6(c), 6(d), and 9(a)(2) of the Act, 7 U.S.C. 5 9, 13b, and 13(a)(2);
2. violating Section 4(a) of the Act, 7 U.S.C. 5 6(a), by offering to enter into, entering into, executing, confirming the execution of any transaction in, or conducting any office or business anywhere in the United States, its territories or possessions, for the purpose of soliciting or accepting any funds from any person in connection with a contract for purchase or sale of a

commodity for future delivery (other than a contract made on or subject to the rules of a board of trade, exchange, or market located outside the United States, its territories, or possessions) unless: a) such transaction is conducted on or subject to the rules of a board of trade which the Commission has designated "a contract market;" b) such contract is executed or consummated by or through a member of such contract market; and c) such contract is evidenced by a written record showing the date, the parties to the contract and their addresses, the property covered and its price, and the delivery terms. C. A civil monetary penalty of \$35 million is hereby imposed on Enron."

Order Instituting Proceeding Pursuant to Sections 6(c) and 6(d) of the Commodity Exchange Act, Making Findings and Imposing Remedial Sanctions, May 10: \$25,000

"1. Knauth shall cease and desist from violating Section 4c(a)(A) and (B) of the Act, 7 U.S.C. §6c(a)(A) and (B) (1 994); 2. Knauth, beginning on the second Monday after the date of the Order accepting this Offer, shall be prohibited for one year from trading for his own account, for any account in which he has a direct or indirect interest, or for any other account, on any registered entity, as that term is defined in Section 1 a(29) of the Act, 7 U.S.C. 5 1a(29), and all registered entities shall refuse Knauth all privileges thereon for that period; 3. Knauth shall liquidate all futures and options positions held by him or on his behalf, or in which he has any beneficial interest, before the commencement of the denial of his trading privileges; 4. Knauth shall pay a civil monetary penalty of Twenty-five Thousand Dollars (\$25,000) within ten (10) days of the date of the Order."

Order Approving Settlement Agreement, May 6: \$60,000

Resolved "the matters at issue related only to Modesto Irrigation District in Enron Power Marketing, Inc. and Enron Energy Services Inc., et al., 103 FERC ¶ 61,346 (2003) (Enron)."

Order Approving Contested Settlement Agreement, April 19

This settlement "represents a reasonable resolution of the proceeding insofar as Avista is concerned and should be approved. The record in this proceeding indicates that: (1) Avista Utilities and Avista Energy did not knowingly engage in or facilitate the improper trading strategies at issue here; (2) there was no evidence that Avista Utilities or Avista Energy engaged in efforts to manipulate Western energy markets during 2000 and 2001; and (3) there was no indication that Avista Utilities or Avista Energy withheld relevant information from the Commission's inquiry into Western energy markets from 2000 and 2001 in Docket No. PA02-2-000. Moreover, the remedies agreed to in the Settlement represent a reasonable resolution of any concerns raised in this proceeding as to Avista's conduct."

Order Approving Contested Settlement Agreement, March 26: \$1,300,000

"Reasonably" addressed and resolved charges against Powerex Corporation (Powerex) "that were set for hearing in the Gaming and Partnership Orders. In this regard, Powerex will be returning \$1,300,000.00, the total revenues (and not merely the profits - - and thus more than could be achieved in litigation) from Powerex's participation in alleged gaming practices."

Order Approving Contested Settlement Agreement, March 8: \$75,975

"Reasonably" addressed and resolved charges against Aquila Merchant Services, Inc. (Aquila) "that were set for hearing in the Gaming and Partnership Orders. In this regard, Aquila will be returning \$75,975.42, the total revenues (and not merely the profits -- and thus more than would be achieved in litigation) from Aquila's participation in alleged gaming practices."

Order Approving Contested Settlement Agreement, March 8: \$857,089

"Reasonably" addressed and resolved charges against Morgan Stanley Capital Group Inc. "that were set for hearing in the Gaming and Partnership Orders. In this regard, MSCG will be returning \$857,089.00, the total revenues (and not merely the profits—and thus more than could be achieved in litigation) pertaining to MSCG's alleged participation in the gaming practices of Cutting Non-Firm and Circular Scheduling.

Order Approving Contested Settlement Agreement, March 8: \$67,745

“Reasonably” addressed and resolved charges against PacifiCorp “that were set for hearing in the Gaming Order. In this regard, PacifiCorp will be returning \$67,745.00, which is the total revenues (and not merely the profits—and thus more than could be achieved in litigation) associated with PacifiCorp’s alleged participation in the gaming practice of Wheel Out. Furthermore, given our determination in our order on rehearing not to expand the scope of this proceeding, the release provision in Article IV, section 4.3, of the Settlement Agreement, releasing PacifiCorp from further scrutiny of its trading activities in California during the period January 1, 2000 through June 20, 2001, is reasonable.”

Order Approving Contested Settlement Agreement, March 8: \$12,730

“Reasonably” addressed and resolved charges against Portland General Electric Company “that were set for hearing in the Gaming Order. In this regard, Portland will be returning \$12,730.00, the total revenues (and not merely the profits—and thus more than could be achieved in litigation) associated with Portland’s alleged participation in the gaming practice of Cutting Non-Firm.”

Order Approving Contested Settlement Agreement, March 4: \$83,373

“Reasonably” addressed and resolved charges against Idaho Power that were set for hearing in the Gaming Order. In this regard, Idaho Power will be returning \$83,373.00, the total revenues (and not merely the profits—and thus more than could be achieved in litigation) associated with Idaho Power’s alleged participation in the gaming practice of Circular Scheduling. Furthermore, given our determination in our order on rehearing not to expand the scope of this proceeding, the release provision in Article IV, section 5, of the Settlement Agreement, releasing Idaho Power from further scrutiny of its trading activities in California during the period January 1, 2000 through June 20, 2001 (with the exception of the ongoing proceedings in Docket Nos. IN03-10-000, EL03-180-000, et al., and EL00-95-000, et al.) is reasonable.”

Order Approving Contested Settlement Agreement, March 4: \$836,000

“Reasonably” addressed and resolved charges against Reliant that were set for hearing in the Gaming Order. In this regard, Reliant will be returning \$836,000.16, the total revenues (and not merely the profits—and thus more than could be achieved in litigation) associated with Reliant’s alleged participation in the gaming practice of Double Selling. Furthermore, given our determination in our order on rehearing not to expand the scope of this proceeding, the release provision in Article IV, section 4.5, of the Settlement Agreement, releasing Reliant from further scrutiny of its trading activities in California during the period January 1, 2000 through June 20, 2001 (with the exception of the ongoing proceeding in Docket No. IN03-10-000) is reasonable.”

Order Approving Contested Settlement Agreement, January 22: \$6,300

“Reasonably” addressed and resolved charges against the City of Redding, California, “that were set for hearing in the Gaming and Partnership Orders. In this regard, Redding will be returning \$6,300.00, the total revenues (and not merely the profits—and thus more than could be achieved in litigation) from Redding’s participation in alleged gaming practices.”

Order Approving Uncontested Settlement, January 22: \$45,240

Resolved “all issues related to AEPSC that were set for hearing in Docket No. EL03-137-000 in the Commission’s Order to Show Cause Concerning Gaming and/or Anomalous Market Behavior.”

Order Approving Contested Settlement Agreement, January 22: \$17,092

“Reasonably” addressed and resolved charges against Puget Sound Energy, Inc. “that were set for hearing in the Show Cause Order. In this regard, Puget will be returning \$17,092, the total revenues (and not merely the profits – and thus more than could be achieved in litigation) from Puget’s participation in alleged gaming practices.”

Order Approving Contested Settlement, January 22: \$45,230

“Reasonably” addressed and resolved charges against Williams Energy Marketing & Trading Company (Williams Power Company, Inc.) “that were set for hearing in the Gaming Order. In this regard, Williams will be returning \$45,230.00, the total revenues (and not merely the profits - - and thus more than could be achieved in litigation) from Williams’s participation in alleged gaming activities.”

Order Approving Uncontested Settlement, January 22: \$27,972

Resolved “the matters at issue” with San Diego Gas & Electric Company in Docket No. EL03-172-000.

Plea Agreement in United States of America vs. Andrew S. Fastow, January 14

“Defendant will plead guilty to count two of the above-captioned Superseding Indictment, charging a violation of 18 U.S.C. § 371, conspiracy to commit wire fraud. Defendant also will plead guilty to count five of the above captioned Superseding Indictment, charging a violation of 18 U.S.C. § 371.” Mr. Fastow’s sentence consisted of the following “a. Maximum term of imprisonment: 5 years (18 U.S.C. § 371); b. Minimum term of imprisonment: 0 years (18 U.S.C. § 371); c. Maximum term of supervised release: 3 years, to follow any term of imprisonment; if a condition of release is violated, Defendant may be sentenced to up to two years without credit for pre-release imprisonment or time previously served on post release supervision (18 U.S.C. §§ 3583 (b) & (e)); and d. Maximum fine: \$250,000 or twice the gain/loss (18 U.S.C. § 3571(b)(3)).”

2003

Order Approving Stipulation and Consent Agreement, December 19: \$2.5 million

Addressed “allegations” with Duke Energy Trading and Marketing, L.L.C. and Duke Energy North America, LLC (collectively, “Duke Energy”) “regarding potentially manipulative bidding practices in the California markets, known as economic withholding, as well as physical withholding of generation supplies. It also terminates and resolves any issues before the Commission involving Duke’s ‘wash’ trading of natural gas.” In addition, OMOI affirmed “its initial finding in August and finds no credible evidence that Duke intentionally withheld generation to influence prices in California’s power market.”

Order Approving Uncontested Partial Settlement, December 18: \$8.5 million

FERC retained “the right to investigate” Portland General Electric’s “rates, terms, and conditions under the just and reasonable and not unduly discriminatory or preferential standard of Section 206 of the Federal Power Act.”

Order on Contested Settlement, November 14: \$1.7 billion

Addressed market power issues raised by the Public Utilities Commission of the State of California which alleged “that El Paso Pipeline and El Paso Merchant, acting individually or in concert, manipulated California energy markets by withholding pipeline transportation capacity to drive up natural gas prices in the periods immediately before and during the California energy crisis of 2000-2001. In addition, the complaint alleged that the award of three transportation contracts (El Paso Contracts) by El Paso Pipeline to its marketing affiliate, El Paso Merchant, was unduly preferential as the result of an intra-corporate sharing of information, in violation of the Commission’s Standards of Conduct for Pipelines With Marketing Affiliates (Standards of Conduct or Affiliate Standards).”

Order Approving Stipulation and Consent Agreement, October 2: “could total \$50 million”

Addressed “allegations regarding potentially manipulative bidding practices in the California markets, including economic withholding, physical withholding of generation, and a FERC staff finding that Reliant attempted to manipulate prices at an electricity trading hub near the California border.” Reliant agreed to pay \$15 million into a deposit fund account established by the United States Treasury on behalf of the Commission for ultimate distribution for the benefit of California and western electricity consumers (“Deposit Fund”); \$5 million into the Deposit Fund on September 30, 2005 and an additional \$5 million into the Deposit Fund on September 30, 2006.”

It agreed to subject its electricity sales “in the United States portion of the Western Electricity Coordinating Council (WECC)” to review. FERC’s press release stated: “The proceeds of the settlement to resolve pending cases stemming from a FERC staff investigation of the West’s energy problems could total \$50 million. The settlement agreement, FERC’s largest ever, addresses allegations regarding potentially manipulative bidding practices in the California markets, including economic withholding, physical withholding of generation, and a FERC staff finding that Reliant attempted to manipulate prices at an electricity trading hub near the California border.”

Order Approving Contested Settlement, July 23: \$15.5 million

Resolved “the contested issue of whether certain parties were improperly excluded from the distribution of the \$15.5 million El Paso Electric has agreed to refund. This order benefits customers because it provides for refunds, and ensures the distribution of the refunds to California ratepayers who on the record before us are entitled to the refunds.”

Order Approving Stipulation and Consent Agreement, July 18: \$3 million

Required “that for a period of six months following the date of issuance of this order, BP Energy’s sales of electricity in the United States portion of the Western Electricity Coordinating Council (WECC) will be subject to review by the Commission and potential refunds. Specifically, BP Energy agrees to provide monthly reports to the Commission’s Office of Market Oversight and Investigation (OMOI), providing data on all completed electricity trades in the WECC on a transaction-by transaction basis. It also agreed that OMOI “may investigate BP Energy’s trading policies.” BP contributed “\$3,000,000 to fund low-income home energy assistance programs for customers in California and Arizona.”

Plea Agreement in United States of America vs. Jeffrey S. Richter, February 4

“I agree to waive indictment and plead guilty to both counts of the above-captioned information, charging me in count one with conspiracy to commit wire fraud in violation of 18 U.S.C. 5 371, and in count two with making a false statement to a government agency in violation of 18 U.S.C. 9 1 001. As to count one, I agree that the elements of the offense and the maximum penalties are as follows: (1) there was an agreement between two or more persons to commit the crime of wire fraud, in violation of 18 U.S.C. 9 1343; (2) I became a member of the conspiracy knowing of at least one of its objects and intending to help accomplish it; and (3) one of the members of the conspiracy performed at least one overt act for the purpose of carrying out the conspiracy.” Mr. Richter’s sentence consisted of the following: “a. Maximum prison sentence 5 years; b. Maximum fine \$250,000; c. Maximum supervised release term 3 years; d. Mandatory special assessment \$100; and e. Restitution Up to the amount of the loss.”

Order Approving Stipulation and Consent Agreement, January 31: \$13.8 million

Reliant Energy agreed “to pay \$13.8 million for limiting the amount of power it offered to the California Power Exchange (CalPX) for delivery on June 21 and 22, 2000. The payment will go directly to CalPX customers for those two days.”

2002

Plea Agreement in United States of America vs. Timothy N. Belden, October 17

“Defendant will plead guilty to count two of the above-captioned Superseding Indictment, charging a violation of 18 U.S.C. § 371, conspiracy to commit wire fraud. Defendant also will plead guilty to count five of the above captioned Superseding Indictment, charging a violation of 18 U.S.C. § 371, conspiracy to commit wire and securities fraud. Defendant agrees that he is pleading guilty because he is guilty, and that the facts contained in Exhibit A (attached and incorporated herein) are true and supply a factual basis for his pleas. Counts two and five each carry the following statutory penalties, which Defendant understands will be imposed consecutively: a. Maximum term of imprisonment: 5 years (18 U.S.C. § 371); b. Minimum term of imprisonment: 0 years (18 U.S.C. § 371); c. Maximum term of supervised release: 3 years, to follow any term of imprisonment; if a condition of release is violated, Defendant may be

sentenced to up to two years without credit for pre-release imprisonment or time previously served on post release supervision (18 U.S.C. §§ 3583 (b) & (e)); and d. Maximum fine: \$250,000 or twice the gain/loss (18 U.S.C. § 3571(b)(3)).”

2001

Order Approving Stipulation and Consent Agreement, April 30: \$8 million

Market Oversight and Enforcement, Williams and AES Southland agreed to this “compromise and settlement of disputed claims” for RMR and Tolling Agreement violations of Section 205 of the Federal Power Act. Williams refunded 8 million dollars to the California ISO.

Appendix C: Chronology of the Western Market Crisis

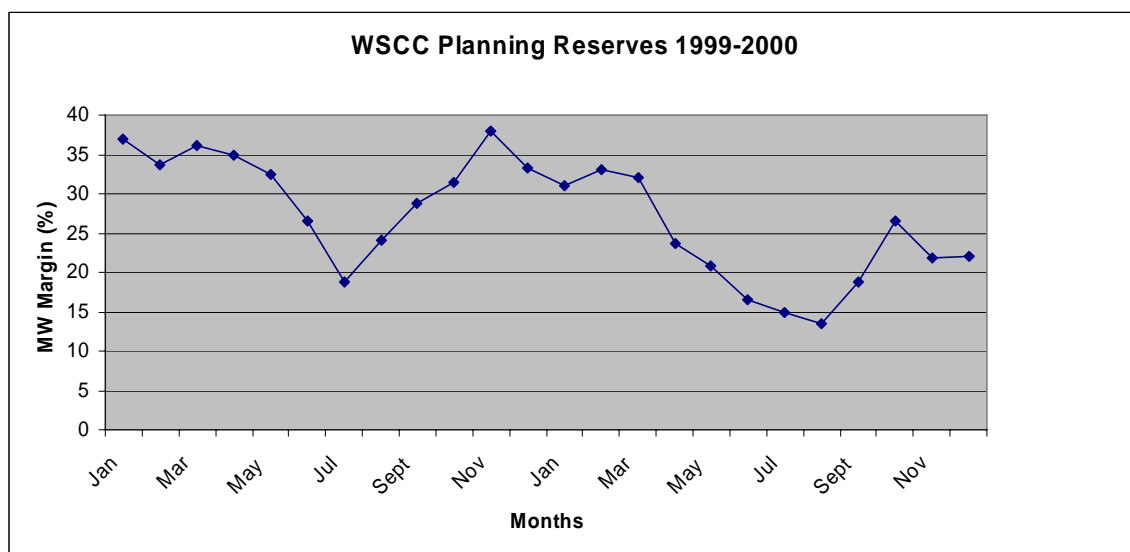
By any standard, 2000-2001 was a complex period. The following month-by-month summary is provided here to give a more complete understanding of the unfolding of events. For the purpose of this chronology, schemes are totaled by day. On many days, Enron ran the schemes multiple times. There is evidence that Enron ran more schemes than have currently been cataloged, but Enron has lost, destroyed, or refused provide a large number of documents. Appendix D contains a listing of known Enron schemes.

May 1999

- A major warning that problems were on the way occurs on May 25, when Tim Belden schedules 2,900 megawatts across a line in central Nevada with a capacity of less than 50 megawatts. This is the Silver Peak scheme. It is a “proof of concept” that shows how fraudulent scheduling can destabilize the California markets. The PX investigation indicates that this single maneuver raised spot prices 71% that day.
- Enron ran Get Shorty and Silver Peak on 1 day during May 1999.

October 1999

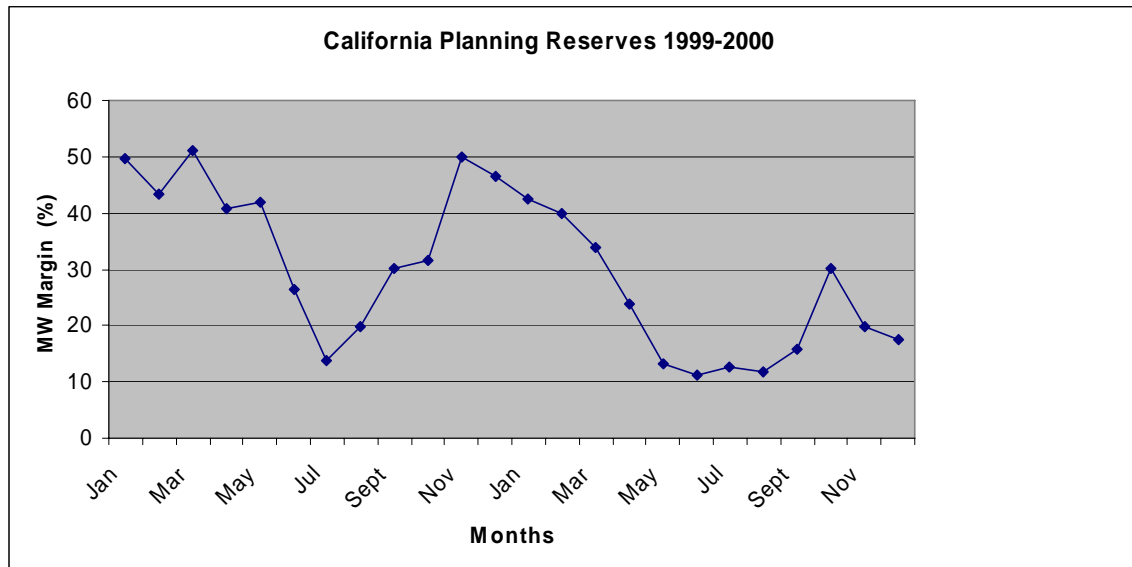
- The Western Systems Coordinating Council’s annual 10 year study shows adequate reserves through 2010.
- Enron ran Get Shorty once during October 1999.



March 2000

- The WSCC summer assessment indicates a reserve margin of 29.2% for May 2000. This report, like the updated report issued in May, indicates confidence for the WSCC as a whole, but it does note that additional imports into California may be required.

- Enron ran Wash Trade on 1 day, Get Shorty on 14 days, and Ricochets on 14 days in March 2000.



April 2000

- Enron’s first “Perpetual Loop,” a fraudulent scheme to earn ISO congestion payments, takes place between Malin and Palo Verde on April 6. On April 11, Enron’s fundamentals group summarizes the WECC market situation. It makes no mention of an impending crisis. Enron goes “long” for the summer and fall of 2000. John Forney initiates the second Perpetual Loop on April 15. Enron makes a profit of \$4,275 on the scheme. Additional Perpetual Loops occur on April 16, April 23, and April 26. Each is hosted by Enron’s subsidiary, PGE. These are some of the PGE “17 days’ transactions” later investigated by FERC.

- Enron ran Death Stars (aka Perpetual Loop) on 7 days, Wash Trades on 1 day, Load Shifts on 4 days, Get Shorty on 16 days, and Ricochets on 28 days in April 2000.

May 2000

- On May 1, Tim Belden sends his presentation on Western Power Markets to John Lavarato, CEO of Enron Americas, with no mention of the impending crisis. Belden’s slides include the phrase “west power is a solvable problem.” A second presentation from Enron’s fundamentals group also does not mention the impending disaster, again implying that the “solvable problem” is a reference to market manipulation. WSCC reserves after load, forced outages, planned outages, and unavailable generation in May are 24,211 MW above load.

- The first mention of “Death Star” in Enron’s Enpower accounting system takes place on May 1. 25 Death Stars are implemented using PGE as a host on May 1-5, 9-12, 16 and 31. Enron’s scheme accounting “Inc Sheets” contain its first entry for “Death Star” on May 15, 2000.

- NYMEX futures on May 1 show no inkling of the storm that is about to break.

- On May 12, 2000, Tim Belden sends an email to his colleague, Greg Piper, with the suggestive message, “We long. Pricing keep going up. So far so good.”

- The market failure starts on May 22. The California ISO issues the first Stage 2 Emergency. The ISO blames the Emergency on computer problems.
- On May 23, Tim Belden emails ISO senior management, complaining that his 800 MW uninstructed generation in California only received \$129.77, \$300.00, and \$379.29 for hours 17, 18, and 19 respectively. Enron's decision to pull 900 MW's out of the ISO and PX markets may well have initiated the May 22 emergency. Seattle City Light and Portland General Electric implement programs to provide incentives for industrial curtailments.
- Enron ran Wash Trades on 3 days, Non-firm Export on 1 day, Death Stars on 14 days, Load Shifts on 9 days, Get Shorty on 17 days, and Ricochets on 28 days in May 2000.

June 2000

- On June 2, BPA informs PGE that it was planning to charge PGE for one of the unusual steps within Death Star. Bill Casey, the PGE manager involved in hosting Death Stars, recommends ending PGE's participation on June 6. The final PGE Death Star occurs on June 6.
- On June 13, the ISO issues its second emergency - a Stage 1 Emergency notice. From May 22 through September 20, the ISO issues Stage 1 and Stage 2 Emergency warnings approximately every third day.
- Death Stars, Load Shifts, Ricochets, and Fat Boys become daily occurrences.
- Enron ran Wash Trades on 5 days, Non-firm Exports on 2 days, Death Stars on 7 days, Load Shifts on 21 days, Get Shorty on 11 days, and Ricochets on 30 days in June 2000.

August 2000

- The Oregon PUC holds an open meeting on August 14, to discuss events. Tim Belden blames the crisis on market events, while his staff simultaneously implements market manipulation schemes at his office.
- On August 25, Mary Hain, legal counsel for Enron's trading floor, makes an undocumented presentation to FERC explaining that the crisis is due to fundamentals. Throughout the fall, Tim Belden and others popularize the view that the crisis will work out in two to four years even though Enron's own fundamentals group shows no evidence of the crisis.
- On August 28, Tim Belden suspends further "Get Shorty" transactions until "someone who knows almost nothing about ISO scheduling can implement the procedure." An additional reason is that the California Attorney General is in search of a "smoking gun."
- Enron ran Wash Trades on 1 day, Death Stars on 18 days, Load Shifts on 21 days, and Ricochets on 27 days in August 2000.

September 2000

- Plant operations within the California ISO control area are poor. Over the entire period of market failure, thermal operations from the steam units owned by Reliant, DynegyDirect, Mirant, Duke, and AES/Williams average only 55.6% of capacity during Stage 1 Emergencies and 54.3% of capacity during Stage 2 Emergencies.

- Enron ran Wash Trades on 2 days, Death Stars on 1 day, Ricochets on 28 days and Ping-Pong on 1 day in September 2000.

October 2000

- On October 11, Robert McCullough's presentation before the Price Spikes Symposium on the causes of the California market failure traces the crisis to physical and economic withholding by the California merchant generators. As with an August presentation, McCullough speculates that megawatt laundering was taking place at COB. The presentation also reveals that the California ISO has been providing operating data to the generators through the Electric High Voltage (EHV) database in contravention of its own secrecy tariff.
- On October 12, the ISO withdraws from the EHV database.
- Enron ran Wash Trades on 5 days, Load Shifts on 29 days, and Ricochets on 26 days in October 2000.

November 2000

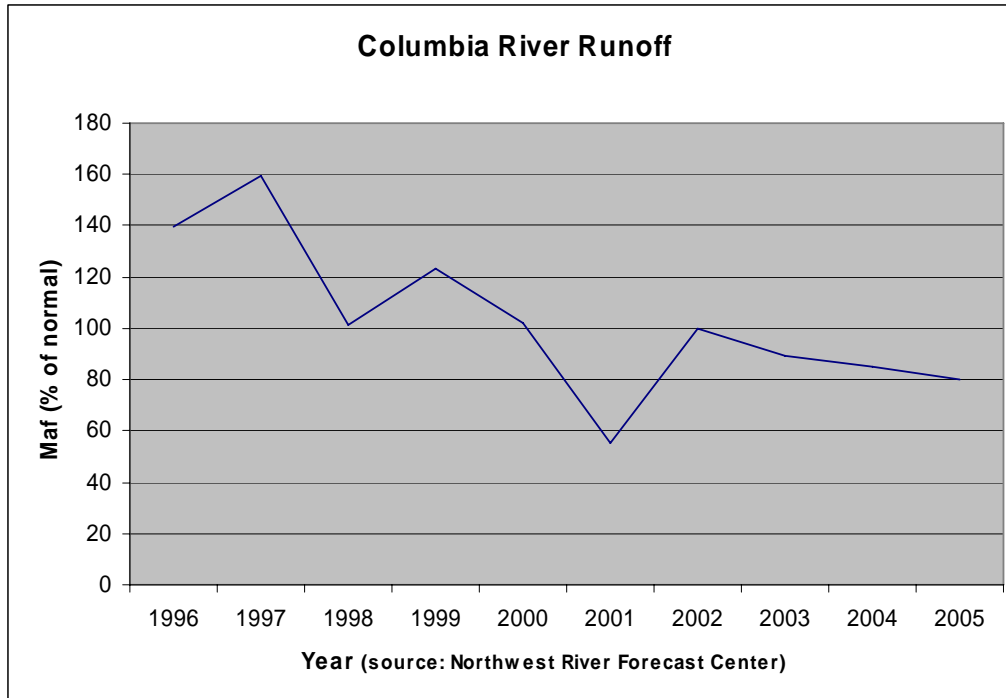
- On November 13, the ISO declares a Stage 2 Emergency. The WSCC reserve margin is 21.9% with 23,906 MW of resources above load. This news is even more astounding than the emergency in May. Forward prices begin a steady climb. Forward markets again fail to predict the dramatic change. NOX prices increase at the SCAQMD. The basis between natural gas prices in California and the rest of the United States increases dramatically. Numerous plants owned by Reliant, DynegyDirect, Duke, AES, and Mirant are taken down simultaneously for extended periods. Volatility and lack of market transparency gradually eliminate activity on the "open cry" forward markets.
- In November, NYMEX's Mid-Columbia market falls below 100 open contracts.
- Enron ran Wash Trades on 5 days, Load Shifts on 24 days, Ricochets on 17 days, and Ping-Pong on 1 day in November 2000.

December 2000

- On December 7, the ISO announces its first Stage 3 Emergency.
- On December 11, the Dow COB index reaches \$3,200.
- On December 15, FERC removes tariff approval for the California PX.
- Enron ran Wash Trades on 3 days, Load Shifts on 4 days, Ricochets on 13 days, and Ping-Pongs on 1 day in December 2000.

January 2001

- In January, the Columbia River runoff is estimated at 76% by the "early bird" forecast. On January 4, 2001, the CPUC approves first emergency rate increase.



- On January 5, the U.S. Secretary of Energy issues an emergency order to aid the California ISO. It allows the ISO to take surplus energy from other control areas in the WSCC.
- Starting on January 16, the ISO issues the first of 32 Stage 3 Emergencies. The WSCC operational reserve margin is 17.5% in January, 22.2% in February, 25.7% in March, and 21.7% in April.
- Enron ran Wash Trades on 15 days, Load Shifts on 2 days, and Ricochets on 9 days in January 2001.

February 2001

- On February 28, Enron's new generation report forecasts 4,000 MW online in 2001.
- Enron ran Wash Trades on 10 days, Load Shifts on 5 days, and Ricochets on 9 days in February 2001.

March 2001

- On March 7, Enron staff schedules a meeting to discuss the legal issues from the "pending summer melt down." On March 25, Tim Belden again predicts that "[t]hings will get worse before they get better."
- Enron ran Wash Trades on 14 days, Load Shifts on 13 days and Ricochets on 18 days in March 2001.

April 2001

- The April 3 Enron new generation report predicts 5,118 MW of new resources in the summer of 2001. Forward prices in April stand at their highest level in the crisis. Spot prices begin to fall.
- On April 25, FERC issues its order for limited price caps and a “must offer” rule. Forward markets again miss the turning point.
- Enron ran Wash Trades on 10 days, Load Shifts on 18 days, and Ricochets on 17 days in April 2001.

May 2001

- On May 8, the last ISO Stage 3 Emergency occurs.
- On May 29, FERC’s price mitigation order takes effect.
- Average spot prices at COB diminish by 75%. Average forward strip prices at COB diminish by 59%. The WSCC reserve margin stands at 21.0%, less than the reserve margin in February through April.
- Enron ran Wash Trades on 11 days, Load Shifts on 26 days, Ricochets on 16 days and Non-firm as Firm on 8 days in May 2001.

June 2001

- FERC extends the price mitigation mechanism throughout the WSCC on June 19.
- Enron ran Wash Trades on 13 days and Load Shifts on 19 days in June 2001.

July 2001

- In July, WSCC reserve margins fall to 16.1%. Spot prices fall an additional 16% in July, while one year forward strips fall 33%.
- On July 10, the ISO’s last Stage 1 and 2 Emergencies occurs. The 2000-2001 California crisis ends.
- Enron ran Wash Trades on 9 days and Load Shifts on 25 days in July 2001.

August 2001

- In August, the reserve margin stands at 18.4%, spot prices fall 25% and long term prices fall 36%.
- Enron ran Wash Trades on 9 days and Load Shifts on 21 days in August 2001.

Appendix D: Glossary of Scheme Names

Cutting Non-Firm: Schedule delivery of Non-firm (not guaranteed for delivery) energy for several hours in advance. The seller receives payment for relieving congestion and cancels the scheduled energy before the delivery time. Also known as Non-Firm Export.

Death Star: Scheduling energy in a loop, same origination and destination. No energy is physically moved. Usually profit is made by scheduling energy into congested areas and receiving congestion relief payment. Also known as Circular Scheduling, Black Widow, Big Tuna, The Loop, Perpetual Loop, and Forney Loop.

Donkey Punch: Disrupting electric schedules without warning, causing several problems, and providing opportunities for gaining from market instability.

Fat Boy: Scheduling large amounts of energy to imaginary loads.

Get Shorty: Scheduling non-existent capacity at the California ISO. The capacity was then purchased back on the hour ahead market to avoid discovery. Also known as Paper Trading and Double Selling.

Load Shift: Filing imaginary loads and resources in order to trick California ISO computer systems into imputing congestion on Path 15. Use to raise prices in the Los Angeles area (SP-15.)

Non-Firm as Firm: This practice involved fraud, deception or misrepresentation in connection with purchases of non-firm energy from outside California and sales of the same energy to the ISO as firm energy. As the name implies, non-firm energy was sold as firm energy to the ISO.

Physical Withholding: Not providing energy from power plants in times of crisis and other times when the withholding of energy may lead to increased profits.

Ping Pong: Another name for Ricochet, although it can refer to slight variations.

Project Stanley: A scheme implemented by John Lavorato to place hockey stick bids in the Alberta market during periods when demand was high. Lavorato's criminal exposure was so great that Skilling himself took an active role in Enron's legal defense.

Ricochet: Energy scheduled to leave the California System is then immediately returned. No energy is physically moved. Profit is usually made by the increase in prices due to perceived shortages in California. Also known as Boomerang, Ping-Pong (see Ping-Pong), Flip-Flop False Import, Megawatt Laundering, and Flip.

Silver Peak: Arranging for an apparent fall in spot markets to reap profit by purchasing forward markets at advantageous prices.

Wash Trade: Trading large amounts of energy with the same counterparty at the same time for roughly the same amount. The two trades cancel each other and no physical energy is exchanged, but market prices may increase and sales are shown as inflated.