

STOEL RIVES LLP

MEMORANDUM

December 6, 2000

TO: RICHARD SANDERS
FROM: CHRISTIAN YODER AND STEPHEN HALL
RE: Traders' Strategies in the California Wholesale Power Markets/ ISO Sanctions

CONFIDENTIAL: ATTORNEY/CLIENT PRIVILEGE/ATTORNEY WORK PRODUCT

This memorandum analyzes certain trading strategies that Enron's traders are using in the California wholesale energy markets. Section A explains two popular strategies used by the traders, "inc-ing" load and relieving congestion. Section B describes and analyzes other strategies used by Enron's traders, some of which are variations on "inc-ing" load or relieving congestion. Section C discusses the sanction provisions of the California Independent System Operator ("ISO") tariff.

A. The Big Picture

1. "Inc-ing" Load Into The Real Time Market

One of the most fundamental strategies used by the traders is referred to as "'inc-ing' load into the real time market." According to one trader, this is the 'oldest trick in the book' and, according to several of the traders, it is now being used by other market participants.

To understand this strategy, it is important to understand a little about the ISO's real-time market.¹ One responsibility of the ISO is to balance generation (supply) and loads (demand) on the California transmission system. During its real-time energy balancing function the ISO pays/charges market participants for increasing/decreasing their generation. The ISO pays/charges market participants under two schemes: "instructed deviations" and "uninstructed deviations." Instructed deviations occur when the ISO selects supplemental energy bids from generators offering to supply energy to the market in real time in response to ISO instructions. Market participants that increase their generation in response to instructions ("instructed deviation") from the ISO are paid the "inc" price. Market participants that increase their

¹ The "real-time" energy market is also known as the imbalance energy market. The imbalance energy market can be further subdivided into the (1) supplemental energy or instructed deviation market and (2) the ex post market or uninstructed deviation market.

generation without an instruction from the ISO (an "uninstructed deviation") are paid the ex post "dec" price. In real-time, the ISO issues instructions and publishes ex post prices at ten-minute intervals.

"Inc-ing load' into the real-time market" is a strategy that enables Enron to send excess generation to the imbalance energy market as an uninstructed deviation. To participate in the imbalance energy market it is necessary to have at least 1 MW of load. The reason for this is that a generator cannot schedule energy onto the grid without having a corresponding load. The ISO requires scheduling coordinators to submit balanced schedules; i.e., generation must equal load. So, if load must equal generation, how can Enron end up with excess generation in the real-time market?

The answer is to artificially increase ("inc") the load on the schedule submitted to the ISO. Then, in real-time, Enron sends the generation it scheduled, but does not take as much load as scheduled. The ISO's meters record that Enron did not draw as much load, leaving it with an excess amount of generation. The ISO gives Enron credit for the excess generation and pays Enron the dec price multiplied by the number of excess megawatts. An example will demonstrate this. Enron will submit a day-ahead schedule showing 1000 MW of generation scheduled for delivery to Enron Energy Services ("EES"). The ISO receives the schedule, which says "1000 MW of generation" and "1000 MW of load." The ISO sees that the schedule balances and, assuming there is no congestion, schedules transmission for this transaction. In real-time, Enron sends 1000 MW of generation, but Enron Energy Services only draws 500 MW. The ISO's meters show that Enron made a net contribution to the grid of 500 MW, and so the ISO pays Enron 500 times the dec price.

The traders are able to anticipate when the dec price will be favorable by comparing the ISO's forecasts with their own. When the traders believe that the ISO's forecast underestimates the expected load, they will inc load into the real time market because they know that the market will be short, causing a favorable movement in real-time ex post prices. Of course, the much-criticized strategy of California's investor-owned utilities ("IOUs") of underscheduling load in the day-ahead market has contributed to the real-time market being short. The traders have learned to build such underscheduling into their models, as well.

Two other points bear mentioning. Although Enron may have been the first to use this strategy, others have picked up on it, too. I am told this can be shown by looking at the ISO's real-time metering, which shows that an excess amount of generation, over and above Enron's contribution, is making it to the imbalance market as an uninstructed deviation. Second, Enron has performed this service for certain other customers for which it acts as scheduling coordinator. The customers using this service are companies such as Powerex and Puget Sound Energy ("PSE"), that have generation to sell, but no native California load. Because Enron has native California load through EES, it is able to submit a schedule incorporating the generation of a generator like Powerex or PSE and balance the schedule with "dummied-up" load from EES.

Interestingly, this strategy appears to benefit the reliability of the ISO's grid. It is well known the California IOUs have systematically underscheduled their load in the PX's Day-

Ahead market. By underscheduling their load into the Day-Ahead market, the IOUs have caused the ISO to have to call on energy in real time in order to keep the transmission system in balance. In other words, the transmission grid is short energy. By deliberately overscheduling load, Enron has been offsetting the ISO's real time energy deficit by supplying extra energy that the ISO needs. Also, it should be noted that in the ex post market Enron is a "price taker," meaning that they are not submitting bids or offers, but are just being paid the value of the energy that the ISO needs. If the ISO did not need the energy, the dec price would quickly drop to \$0. So, the fact that Enron was getting paid for this energy shows that the ISO needed the energy to balance the transmission system and offset the IOU's underscheduling (if those parties own Firm Transmission Rights ("FTR") over the path).

2. Relieving Congestion

The second strategy used by Enron's traders is to relieve system-wide congestion in the real-time market, which congestion was created by Enron's traders in the PX's Day Ahead Market. In order to relieve transmission congestion (i.e., the energy scheduled for delivery exceeds the capacity of the transmission path), the ISO makes payments to parties that either schedule transmission in the opposite direction ("counterflow payments") or that simply reduce their generation/load schedule.

Many of the strategies used by the traders involve structuring trades so that Enron gets paid the congestion charge. Because the congestion charges have been as high as \$750/MW, it can often be profitable to sell power at a loss simply to be able to collect the congestion payment.

B. Representative Trading Strategies

The strategies listed below are examples of actual strategies used by the traders, many of which utilize the two basic principles described above. In some cases, the strategies are identified by the nicknames that the traders have assigned to them. In some cases, i.e., "Fat Boy," Enron's traders have used these nicknames with traders from other companies to identify these strategies.

1. Export of California Power

- a. As a result of the price caps in the PX and ISO (currently \$250), Enron has been able to take advantage of arbitrage opportunities by buying energy at the PX for export outside California. For example, yesterday (December 5, 2000), prices at Mid-C peaked at \$1200, while California was capped at \$250. Thus, traders could buy power at \$250 and sell it for \$1200.
- b. This strategy appears not to present any problems, other than a public relations risk arising from the fact that such exports may have contributed to California's declaration of a Stage 2 Emergency yesterday.

2. "Non-firm Export"

- a. The goal is to get paid for sending energy in the opposite direction as the constrained path (counterflow congestion payment). Under the ISO's tariff, scheduling coordinators that schedule energy in the opposite direction of the congestion on a constrained path get paid the congestion charges, which are charged to scheduling coordinators scheduling energy in the direction of the constraint. At times, the value of the congestion payments can be greater than the value of the energy itself.
- b. This strategy is accomplished by scheduling non-firm energy for delivery from SP-15 or NP-15 to a control area outside California. This energy must be scheduled three hours before delivery. After two hours, Enron gets paid the counterflow charges. A trader then cuts the non-firm power. Once the non-firm power is cut, the congestion resumes.
- c. The ISO posted notice in early August prohibiting this practice. Enron's traders stopped this practice immediately following the ISO's posting.
- d. The ISO objected to the fact that the generators were cutting the non-firm energy. The ISO would not object to this transaction if the energy was eventually exported.

Apparently, the ISO has heavily documented Enron's use of this strategy. Therefore, this strategy is the more likely than most to receive attention from the ISO.

2. "Death Star"

- a. This strategy earns money by scheduling transmission in the opposite direction of congestion; i.e., schedule transmission north in the summertime and south in the winter, and then collecting the congestion payments. No energy, however, is actually put onto the grid or taken off.
- b. For example, Enron would first import non-firm energy at Lake Mead for export to the California-Oregon border ("COB"). Because the energy is traveling in the opposite direction of a constrained line, Enron gets paid for the counterflow. Enron also avoids paying ancillary service charges for this export because the energy is non-firm, and the ISO tariff does not require the purchase of ancillary services for non-firm energy.
- c. Second, Enron buys transmission from COB to Lake Mead at tariff rates to serve the import. The transmission line from COB to Lake Mead is outside of the ISO's control area, so the ISO is unaware that the same energy being exported from Lake Mead is simultaneously being imported into Lake Mead. Similarly, because the COB to Lake Mead line is outside the ISO's control area, Enron is not subject to payment of congestion charges because transmission charges for the COB to Lake Mead line are assessed based on imbedded costs.

- d. The ISO probably cannot readily detect this practice because the ISO only sees what is happening inside its control area, so it only sees half of the picture.
- e. The net effect of these transactions is that Enron gets paid for moving energy to relieve congestion without actually moving any energy or relieving any congestion.

3. "Load Shift"

- a. This strategy is applied to the Day-Ahead and the real-time markets.
- b. Enron shifts load from a congested zone to a less congested zone, thereby earning payments for reducing congestion, i.e., not using our FTRs on a constrained path.
- c. This strategy requires that Enron have FTRs connecting the two zones.
- d. A trader will overschedule load in one zone, i.e., SP-15, and underschedule load in another zone, i.e., NP-15.

Such scheduling will often raise the congestion price in the zone where load was overscheduled.

The trader will then "shift" the overscheduled "load" to the other zone, and get paid for the unused FTRs. The ISO pays the congestion charge (if there is one) to market participants that do not use their FTRs. The effect of this action is to create the appearance of congestion through the deliberate overstatement of loads, which causes the ISO to charge congestion charges to supply scheduled for delivery in the congested zone. Then, by reverting back to its true load in the respective zones, Enron is deemed to have relieved congestion, and gets paid by the ISO for so doing.

- e. One concern here is that by knowingly increasing the congestion costs, Enron is effectively increasing the costs to all market participants in the real time market.
- f. Following this strategy has produced profits of approximately \$30 million for FY 2000.

4. "Get Shorty"

- a. Under this strategy, Enron sells ancillary services in the Day-ahead market.
- b. Then, the next day, in the real-time market, a trader "zeroes out" the ancillary services, i.e., cancels the commitment and buys ancillary services in the real-time market to cover its position.

- c. The profit is made by shorting the ancillary services, i.e., sell high and buy back at a lower price.
- d. One concern here is that the traders are applying this strategy without having the ancillary services on standby. The traders are careful, however, to be sure to buy services right at 9:00 a.m. so that Enron is not actually called upon to provide ancillary services. However, once, by accident, a trader inadvertently failed to cover, and the ISO called on those ancillary services.
- e. This strategy might be characterized as "paper trading," because the seller does not actually have the ancillary services to sell. FERC recently denied Morgan Stanley's request to paper trade on the New York ISO.

The ISO tariff does provide for situations where a scheduling coordinator sells ancillary services in the day ahead market, and then reduces them in the day-of market. Under these circumstances, the tariff simply requires that the scheduling coordinator replace the capacity in the hour-ahead market. ISO Tariff, SBP 5.3, *Buy Back of Ancillary Services*.

- f. The ISO tariff requires that schedules and bids for ancillary services identify the specific generating unit or system unit, or in the case of external imports, the selling entity. As a consequence, in order to short the ancillary services it is necessary to submit false information that purports to identify the source of the ancillary services.
5. "Wheel Out"
- a. This strategy is used when the interties are set to zero, i.e., completely constrained.
 - b. First, knowing that the intertie is completely constrained, Enron schedules a transmission flow through the system. By so doing, Enron earns the congestion charge. Second, because the line's capacity is set to "0," the traders know that any power scheduled to go through the inter-tie will, in fact be cut. Therefore, Enron earns the congestion counterflow payment without having to actually send energy through the intertie.
 - c. As a rule, the traders have learned that money can be made through congestion charges when a transmission line is out of service because the ISO will never schedule an energy delivery because the intertie is constrained.
6. "Fat Boy"
- a. This strategy is described above in section A (1).
7. "Ricochet"

- a. Enron buys energy from the PX in the Day Of market, and schedules it for export. The energy is sent out of California to another party, which charges a small fee per MW, and then Enron buys it back to sell the energy to the ISO real-time market.
 - b. The effect of this strategy on market prices and supply is complex. First, it is clear that Enron's intent under this strategy is solely to arbitrage the spread between the PX and the ISO, and not to serve load or meet contractual obligations. Second, Ricochet may increase the Market Clearing Price by increasing the demand for energy. (Increasing the MCP does not directly benefit Enron because it is *buying* energy from the PX, but it certainly affects other buyers, who must pay the same, higher price.) Third, Ricochet appears to have a neutral effect on supply, because it is returning the exported energy as an import. Fourth, the parties that pay Enron for supplying energy to the real time ex post market are the parties that underscheduled, or underestimated their load, i.e., the IOUs.
8. Selling Non-firm Energy as Firm Energy
- a. The traders commonly sell non-firm energy to the PX as "firm." "Firm energy," in this context, means that the energy includes ancillary services. The result is that the ISO pays EPMI for ancillary services that Enron claims it is providing, but does not in fact provide.
 - b. The traders claim that "everybody does this," especially for imports from the Pacific Northwest into California.
 - c. At least one complaint was filed with the ISO regarding Enron's practice of doing this. Apparently, Arizona Public Service sold non-firm energy to Enron, which turned around and sold the energy to the ISO as firm. APS cut the energy flow, and then called the ISO and told the ISO what Enron had done.
9. Scheduling Energy To Collect the Congestion Charge II
- a. In order to collect the congestion charges, the traders may schedule a counterflow even if they do not have any excess generation. In real time, the ISO will see that Enron did deliver the energy it promised, so it will charge Enron the inc price for each MW Enron was short. The ISO, however, still pays Enron the congestion charge. Obviously a loophole, which the ISO could close by simply failing to pay congestion charges to entities that failed to deliver the energy.
 - b. This strategy is profitable whenever the congestion charge is sufficiently greater than the price cap. In other words, since the ex post is capped at \$250, whenever the congestion charge is greater than \$250 it is profitable to schedule counterflows, collect the congestion charge, pay the ex post, and keep the difference.
- C. ISO Tariff

The ISO tariff prohibits "gaming," which it defines as follows:

"Gaming," or taking unfair advantage of the rules and procedures set forth in the PX or ISO Tariffs, Protocols or Activity Rules, or of transmission constraints in period in which exist substantial Congestion, to the detriment of the efficiency of, and of consumers in, the ISO Markets. "Gaming" may also include taking undue advantage of other conditions that may affect the availability of transmission and generation capacity, such as loop flow, facility outages, level of hydropower output or seasonal limits on energy imports from out-of-state, or actions or behaviors that may otherwise render the system and the ISO Markets vulnerable to price manipulation to the detriment of their efficiency." ISO Market Monitoring and Information Protocol ("MMIP"), Section 2.1.3.

The ISO tariff also prohibits "anomalous market behavior," which includes "unusual trades or transactions"; "pricing and bidding patterns that are inconsistent with prevailing supply and demand conditions"; and "unusual activity or circumstances relating to imports from or exports to other markets or exchanges." MMIP, Section 2.1.1 et seq.

Should it discover such activities, the ISO tariff provides that the ISO may take the following action:

1. Publicize such activities or behavior and its recommendations thereof, "*in whatever medium it believes most appropriate.*" MMIP, Section 2.3.2 (emphasis added).
2. The Market Surveillance Unit may recommend actions, including fines and suspensions, against specific entities in order to deter such activities or behavior. MMIP, Section 2.3.2.
3. With respect to allegations of gaming, the ISO may order ADR procedures to determine if a particular practice is better characterized as improper gaming or "legitimate aggressive competition." MMIP, Section 2.3.3.
4. In cases of "serious abuse requiring expeditious investigation or action" the Market Surveillance Unit shall refer a matter to the appropriate regulatory or antitrust enforcement agency. MMIP, Section 3.3.4.
5. Any Market Participant or interested entity may file a complaint with the Market Surveillance Unit. Following such complaint, the Market Surveillance Unit may "carry out any investigation that it considers appropriate as to the concern raised." MMIP, Section 3.3.5.
6. The ISO Governing Board may impose "such sanctions or penalties as it believes necessary and as are permitted under the ISO Tariff and related protocols approved by FERC; or it may refer the matter to such regulatory or antitrust agency as it sees fit to recommend the imposition of sanctions and penalties." MMIP, Section 7.3.