Statement of David Hunger

In the Matter of PJM Up-to Congestion Transactions

Federal Energy Regulatory Commission

Docket No. IN10-5-000

Qualifications

My name is David Hunger. I have a PhD in Economics from the University of Oregon and nearly 15 years of experience working as an economist on matters related to the functioning of wholesale markets at the Federal Energy Regulatory Commission (FERC). While at FERC, I led analyses involving mergers and other corporate transactions, market power in market-based rates cases, demand response compensation, compliance cases for Regional Transmission Organizations and competition issues in electricity markets. I was also involved in large investigations of energy trading practices that involved wash trades, price index manipulation, and manipulation of FERC-jurisdictional organized wholesale electricity markets. While at FERC, I was a recipient of FERC's Awards for Quality Service in the Public Interest numerous times in 14 years of service.[1]

Of particular relevance here, I was the lead economist in FERC's Investigation of Price Manipulation of Western Markets and Enron's impact on energy markets. That case involved many instances of wash trading as well as attempts (often successful) of manipulating prices in a FERC-regulated regional transmission organization (RTO) market. I worked on the staff reports about this investigation. One of these reports is titled "Final Report on Price Manipulation in Western Markets: Fact-Finding Investigation of Potential Manipulation of Electric and Natural Gas Prices" which was the FERC Staff Report to the US Congress.

I left FERC in June of 2013 and now work as a Vice President at Charles River Associates International, Inc. (CRA). My business address is 1201 F Street, N.W., Suite 700, Washington, DC 20004.

Since 2001, I have also worked as a professor at the Georgetown Public Policy Institute where I teach classes on microeconomic theory, energy policy and public finance. My research interests include the effect of environmental regulations on international trade, market power in energy markets and energy policy. I frequently speak on energy market issues and publish articles on energy economics and policy.

[1] December 2000; July 2001; September 2001; September 2002; May 2003; July 2003; September 2003; April 2004; July 2004, September 2004; June 2005; August 2005; January 2006; March 2006; August 2006; May 2007; August 2007; April 2008; July 2008; January 2009; July 2009; February 2010; August 2011; August 2012.

Background

I have been engaged by Powhatan Energy Fund LLC (Powhatan) and its counsel, Drinker Biddle & Reath LLP (Drinker Biddle), to review the record in the above referenced investigation and assess the trading behavior of Dr. Houlian (Alan) Chen on behalf of Powhatan in the PJM Up-to Congestion product during the period between February and August, 2010. In particular, I researched the FERC Office of Enforcement claim that the trades constituted wash trades, which could be a form of market manipulation. I will go into more detail below, but first and foremost, the trades in question were not wash trades. A wash trade involves no risk and no legitimate business purpose. These trades did have risk associated with them and did have a legitimate business purpose.

I have familiarized myself with the details of this investigation through conversations with Kevin Gates, an investor in Powhatan, and Drinker Biddle, and by reviewing various materials, including the Written Submission to Commission Investigation Staff on Behalf of Dr. Chen, dated December 13, 2010; Dr. Craig Pirrong's Affidavit, dated December 8, 2010; the *Written Submission to Commission Investigation Staff on Behalf of Powhatan Energy Fund LLC*, dated October 21, 2011; the Affidavit of Richard G. Wallace, dated October 21, 2011; the Affidavit and Appendices of Richard D. Tabors, Ph.D., dated October 21, 2011; the response of William M. McSwain to *In Re PJM Up-to Congestion Transaction*, Docket No. IN-5-10-000, dated August 24, 2012; *Re: Preliminary Findings of Enforcement Staff's Investigation of Up To Congestion Transactions by Dr. Houlian Chen on Behalf of Himself and the Principals of Huntrise Energy Fund LLC and Powhatan Energy Fund LLC*, Docket No. IN10-5, dated August 9, 2013; various FERC decisions and rulemakings related to Up-to Congestion Transactions, transmission loss credits, and manipulation standards, as well as publicly-available materials regarding the PJM market.

PJM's Up-to Congestion Market

PJM uses a nodal pricing system for both day-ahead and real-time energy, with the price at each node being the Locational Marginal Price (LMP). The LMP consists of three components – energy, losses, and congestion. The energy component is the same for all locations. The loss component reflects the marginal cost of system losses specific to each location, while the congestion component represents the individual location's marginal transmission congestion cost. The congestion charge works out to be the difference in price between any two trading nodes. In PJM, the Up-to Congestion product allows virtual traders to arbitrage the difference between the day-ahead and real-time congestion charges between nodes. Like other financial products in the RTO markets, it also allows buyers and sellers to hedge risk associated with the spread between day-ahead and real-time prices, which can be very large if an unforeseen demand or supply-side event occurs in the market.

Traders bid a price quantity pair day-ahead for the specified node pair. If the bid price is greater than the day-ahead spread between the two nodes, the bid will clear. The bid price has a floor of -$50 per MWh and a ceiling of $50 per MWh. For each individual leg of the

trade, if the real-time spread at those nodes increases relative to day-ahead price spread, the trader is paid the difference between the spreads. The trader must pay the difference when the spread change decreases. If the trader holds a day-ahead counter flow position (opposite of the direction of the congestion) then he earns a profit when the real-time spread at the nodes decreases relative to the day-ahead spread. Even though the trades are purely financial and there is no flow of electricity associated with the trades, at the time in question, PJM required Up-to Congestion transactions to pay for transmission charges and included them in its calculation and refund of its over collection of transmission loss charges.

Dr. Chen's Trading Strategies

One of Dr. Chen's trading strategies in the PJM Up-to Congestion market was to buy day-ahead energy in MISO and sell it at a point in PJM (A-to-B) under an Up-to Congestion contract, and simultaneously buy day-ahead energy at the same point in PJM, and sell it into MISO (B-to-A). He often submitted the bids at or near the ceiling of $50 per MWh. Because there wasn't significant day-ahead congestion between the nodes he often selected, both bids would clear and his net profit would be the difference between his transaction costs and the transmission loss credits, although there was always the risk that the Transmission Loss Credits would be less than the transaction costs of the trades. However, if the difference in day-ahead prices at the point of the trade exceeded the bid price, then Dr. Chen would only have one bid clear (the side with a negative congestion price) and would be exposed the risk of that price difference.

The bid that would clear would be the counter flow spread. Therefore, if he was on the right side of that difference and the real-time congestion price was less than the day-ahead congestion price (convergence), then he could reap large profits. If not, however, and the real-time congestion price were greater than the day-ahead congestion price (divergence), he could suffer large losses.

The risk of one of the bids clearing and the other not clearing is one important factor that differentiates Dr. Chen's trades from wash trades. Assuming Dr. Chen bid $50 per MWh, if either the A-to-B or the B-to-A congestion charge were more than $50 per MWh, then Dr. Chen would be holding one side of the trade going in to the real-time market and thus exposed to the risk of the difference in real-time exceeding the day-ahead difference. For example, if the A-to-B congestion price were $80 per MWh in the day-ahead, then, by definition the B-to-A price would be -$80 per MWh. In that case, Dr. Chen's A-to-B bid would not clear, but his B-to-A bid would clear. At that point his profit or loss would depend on the size of the real-time spread between A and B.

As noted by Dr. Pirrong, the Up-to Congestion contracts that Dr. Chen was trading were essentially forward contracts for the spread between day-ahead and real-time congestion, with an embedded option. The forward contracts cancelled each other out when he placed both the A-to-B and the B-to-A bids. However, the option part of the transactions did not cancel each other out. For example, assuming the PJM-to-MISO leg of the trade cleared, Dr.

Chen faced the inherent risk that the expected real-time congestion for the PJM-to-MISO transactions could be higher than the day-ahead congestion for the PJM-to-MISO transactions, and his trade would return a loss. Wash trades carry no such inherent risk.

Also, as described by Dr. Tabors, the Transmission Loss Credit provided an incentive for traders to increase the volume of trades by reducing the net transaction costs of trading in the Up-to Congestion market. This allowed Dr. Chen to engage in more trades which had the potential to earn small profits due to the TLC exceeding the transmission charges, as well as large profits if one leg of his A-to-B or B-to-A trades cleared. Of course, he faced the possibility of incurring losses if the TLC was less than the transmission charges or if one leg of his trade cleared in the day-ahead market and prices diverged in the real-time market.

It is also noteworthy that there was nothing deceptive in Dr. Chen's trading behavior. He submitted all of his bids through the PJM process. In the kind of wash trading that FERC has identified in previous cases, the trades involved deception and ulterior motives, such as traders agreeing to a deal that would be posted on a trading platform, and then immediately unwound over the phone in a bilateral trade, in order to affect an index price.

Mr. Gates' Understanding of Dr. Chen's Trading

Mr. Gates is not an energy trader, so he was unfamiliar with the complexities of RTO rules and the multitude of energy products. He consulted with Dr. Chen to get some understanding of how Dr. Chen was trading. He understood that, for the A-to-B and B-to-A trades, most of his profits were due to the spread between the transaction costs and the Transmission Loss Credits, but that there was risk associated with large spreads between the day-ahead and real-time congestion prices. There was also the risk that the Transmission Loss Credits would be less than the transaction costs of the trades. Like Dr. Chen, he assumed those risks when he invested in Dr. Chen's trading activities.

Mr. Gates is quoted as stating that from what he knew about the structure of the PJM Up-to Congestion market, a monkey could have made trades in the market, and randomly picked nodes to move electricity to and nodes to move electricity from and taken the bet that the marginal loss credit plus other revenues would have exceeded its costs during the summer months. He further stated that he believed a monkey throwing darts at a dartboard would have been net profitable during this time period. While a colorful comment and an amusing mental image, this in no way means that Mr. Gates thought that Dr. Chen's trades were wash trades or any other form of market manipulation. He was simply stating that during this time, the TLC often exceeded the value of the fixed cost of the trade.

Bad Market Rules, not Market Manipulation

At first glance, it seems very odd that Up-to Congestion trades would be eligible for pro rata shares of the refunds for over collecting for transmission line losses, when they have no physical element to them, and therefore never take transmission service. However, there is

a history that explains why virtual traders were receiving these payments. When PJM first implemented Up-to Congestion trading, it required traders to secure a transmission reservation associated with each trade. Given that they had to pay transmission charges, it seemed reasonable that they should also be entitled to receive rebates for their share of the over-collection for transmission line losses. Again, even though they did not actually take transmission service.

Dr. Chen was following the PJM trading rules at the time in question. Trading activities by virtual bidders such as Dr. Chen often expose flawed market rules that can in turn be changed through a tariff filing by the RTO under section 205 of the Federal Power Act (FPA) or by a complaint issued by the Commission or a market participant under section 206 of the FPA. In this sense, the virtual bidders or financial traders serve as the canary in the coal mine, testing the RTO market rules that have been approved by FERC.

In fact, since September 2010, Up-to Congestion trades no longer receive any marginal loss payments. The logic for them being included fell apart when FERC approved PJM's tariff revision that eliminated the requirement that the traders secure transmission service for Up-to Congestion bids. With that, Up-to Congestion transactions were no longer associated with transmission reservations and therefore were no longer eligible to receive rebates for their share of the over-collection for transmission line losses.

Conclusion

Dr. Chen traded in PJM's Up-to Congestion market in the summer 2010 using a strategy that reduced his risk associated with the difference in the spreads between real-time and day-ahead congestion. He made small profits per trade based on the difference between his transaction costs and the PJM rebate for transmission loss charges – obviously a legitimate business purpose on its own. The TLC reduced his transactional friction, but at any time he could have been on the right or the wrong side of a large spread between real-time and day-ahead congestion. He took on that risk, as traders do, with the possibility of large profits (or losses) when system conditions changed greatly in real-time due to unforeseen changes in demand and/or supply conditions. Dr. Chen's trading behavior did not constitute wash trading and was not market manipulation. He followed the rules in PJM's Up-to Congestion market at the time, and made small profits on most trades based on an oddity in the rules that has since been changed, and took the chance that he would make larger profits (or losses) based on the difference between day-ahead and real-time congestion.

Powhatan also did not engage in wash trading or any other form of market manipulation. Powhatan invested in Dr. Chen's trading and took on the same type of risk that Dr. Chen was facing. It made profits in the summer 2010 as it invested in multiples of Dr. Chen's trading. However, Powhatan was subject to the same risk that Dr. Chen faced with the option portion of the contracts that could have been in or out of the money, as well as the possibility of incurring losses if the TLC was less than the transmission charges.