

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

PJM Interconnection, L.L.C.)	Docket No. ER07-508-000
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**AFFIDAVIT OF JOSEPH E. BOWRING
ON BEHALF OF PJM INTERCONNECTION, L.L.C.**

1. My name is Joseph E. Bowring and I am the PJM Market Monitor. My business address is 955 Jefferson Avenue, Valley Forge Corporate Center, Norristown, Pennsylvania 19403. Since March 1999, I have been responsible for the market monitoring activities of PJM, as defined by the PJM Market Monitoring Plan, Attachment M to the PJM Open Access Transmission Tariff. I am a Ph.D. economist and have substantial experience in applied energy and regulatory economics. I have taught economics as a member of the faculty at Bucknell University and at Villanova University. I have served as a senior staff economist for the New Jersey Board of Public Utilities and as Chief Economist for the New Jersey Department of the Public Advocate's Division of Rate Counsel. I have also worked as an independent consulting economist.
2. The Market Monitoring Unit has analyzed the development of demand response in PJM markets and has reported on this issue, e.g., in the 2005 State of the Market Report, in a report to the Commission entitled "Assessment of PJM Load Response Programs and in the 2006 State of the Market Report.¹ The Market Monitoring Unit has concluded the "demand side of wholesale electricity market is underdeveloped" and promoted the development of a "fully functional" demand side.²

Goal of Demand Side Programs

3. Markets require both a supply side and a demand side to function effectively. The demand side of wholesale electricity markets is underdeveloped. It is widely recognized that wholesale electricity markets will work better when a significant level of potential demand-side response is available in the market. The PJM wholesale market demand-side programs should be understood as one relatively small part of a transition to a fully functional demand side for its Energy Market. A fully developed demand side will include retail programs and an active, well-articulated interaction between wholesale and retail markets.

¹ The 2006 State of the Market Report is available at <http://www.pjm.com/markets/market-monitor/som.html>; the Assessment of PJM Load Response Programs (August 29, 2006) can be obtained at <http://www.pjm.com/markets/market-monitor/downloads/mmu-reports/dsr-report-2005-august-29-%202006.pdf>.

² 2005 State of the Market Report at page 70.

4. A functional demand side of the electricity market does not mean that all customers curtail usage at specified levels of price. A fully functional demand side of the electricity market does mean that the default energy price for all customers will be the day-ahead or real-time hourly LMP. Customers will be able to choose to pay the hourly prices or to hedge their exposure to those prices using an intermediary. A fully functional demand side of the electricity market does mean that all or most customers, or their designated intermediaries, will have the ability to see real-time prices in real time, will have the ability to react to real-time prices in real time and will have the ability to receive the direct benefits or costs of changes in real-time energy use, based on real-time energy prices. Or, if customers choose to participate in the day-ahead market, a fully functional demand side means that customers will be able to specify at exactly what price level they wish to curtail some or all of their loads and will be able to receive the associated benefits. If these conditions are met, customers can decide for themselves the relationship between the price of power and the value of particular activities, from operating a production plant to running a commercial building to running a residential air conditioner. The true goal of demand-side programs is to ensure that customers can make informed decisions about energy consumption. Customers can and will make investments in demand-side management technologies based on their own evaluations of the tradeoffs among the price of power, the value of particular activities and the costs of those technologies.
5. A functional demand side of the wholesale energy market does not necessarily mean that prices will be lower than they otherwise would be. A functional demand side of the wholesale energy market does mean, however, that customers will have the ability to make decisions about levels of power consumption based both on the value of the uses of the power and the actual cost of that power.
6. A functional demand side of the wholesale electricity market would also send explicit price signals to suppliers, inducing more competitive behavior among suppliers and providing a market-based limit to suppliers' ability to exercise market power. If customers had the essential tools to respond to prices, then suppliers would have the incentive to deliver power on a cost-effective basis, consistent with their customers' evaluations.

The Structure and Purpose of Demand-Side Incentives

7. The goal of the incentives associated with PJM's Economic Program should be to replicate the price signal to load that would exist if load were exposed to the hourly wholesale price. The day-ahead or real-time hourly LMP is the appropriate price signal as it reflects the incremental value of each MWh consumed.³
8. Incentives associated with the Economic Program are based upon the actual load reduction provided in excess of committed day-ahead load reductions plus the

³ This does not mean that every retail customer should literally be required to pay the real-time LMP. However, it would provide the appropriate price signal if every retail customer were obligated to pay the real-time LMP as a default. That risk could be hedged via a contract with an LSE.

adjustment for losses. The actual payment depends on the level of zonal LMP.⁴ If zonal LMP exceeds \$75 per MWh, customers are paid the full LMP. If zonal LMP is less than \$75 per MWh, customers are paid the LMP less the generation and transmission components of the applicable retail rate.

9. LSEs pay load-reducing customers LMP less the generation and transmission components of the retail rate. When LMP is greater than or equal to \$75 per MWh, customers are paid the full LMP and the amount not paid by the LSE, equal to the generation and transmission components of the applicable retail rate, is charged to all the LSEs in the zone of the load reduction (called “recoverable charges”).
10. In the absence of an Economic Program, for an individual customer on a standard fixed retail rate, the savings that result from a load reduction equal the applicable retail rate. If the customer pays a total retail rate of \$150 per MWh, the customer saves exactly \$150 when consumption is reduced by 1 MWh. If the customer paid the LMP for each MWh used, rather than the generation component of retail rates, from a wholesale market perspective, the savings to the customer would equal the LMP. This is the appropriate price signal and this is the price signal that the Economic Program, or any demand-side incentive program, should be designed to replicate.
11. The situation is somewhat different, from a wholesale market perspective, if the LSE pays the LMP to purchase the energy required to serve the customer at a fixed retail rate. In this case, the savings to the LSE from a reduction of 1 MWh by the customer equal the difference between the avoided cost to the LSE, or the LMP, and the generation component of the retail rate.
12. The design of the Economic Program reflects a compromise between the benefits that would be received by a customer paying LMP plus a fixed retail rate covering transmission and distribution charges and the benefits received by an LSE serving a retail customer under a fixed retail rate covering generation, transmission and distribution. That compromise reflects the non-wholesale market related revenue losses by an LSE and the non-wholesale market related savings when a customer curtails.
13. When the LMP is greater than \$75 per MWh, customers that reduce load under the Economic Program receive a payment from the program equal to the LMP. This is in addition to the direct savings that the customer achieves by reducing consumption and avoiding payment of the generation component of the retail rate plus the other components of the retail rate. Thus, when the LMP is greater than \$75 per MWh, for a customer paying a fixed retail rate, the actual wholesale related benefits associated with reducing load equal the LMP plus the generation component of the retail rate. Total benefits, including retail rate savings, also include the avoided transmission and distribution related components of retail rates.
14. The goal of the Economic Program incentives is to ensure that customers on retail rates with an embedded generation component that is not linked to the market LMP see the appropriate price signal. The Economic Program provides an accounting

⁴ Relevant aggregate LMPs may also be used in some cases.

mechanism, managed by PJM, that requires the payment of the real savings that result from load reductions, or a share of them under a contract, to the load reducing customer. Such a mechanism is required because of the complex interaction between the wholesale market and the incentive and regulatory structures faced by LSEs and customers. The broader goal of the Economic Program is to transition to a structure where customers do not require mandated payments but where customers see and react to hourly wholesale market signals or enter into contracts with intermediaries to provide a hedge against hourly price signals.

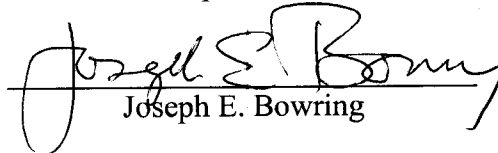
PJM's Proposal and Related Objections

15. The issue raised by PJM's filing and the related objections is whether customers who directly pay the hourly day-ahead LMP should also be allowed to participate in the day-ahead economic load response program (ELRP) along with customers who pay a retail tariff rate and do not directly pay the hourly day-ahead or real-time LMP.
16. Given that the goal of the ELRP is to provide to customers on a retail tariff rate a price signal which is equal to the LMP, there is no reason for customers who pay the LMP directly to participate in the program. Those customers already meet the objectives associated with creating a demand side of the market.
17. Wholesale power markets must have a demand side in order to function effectively. But having a demand side of the market means that customers have the ability to see actual prices, to react to those prices as appropriate for them and to bear the consequences of those reactions.
18. The goal of having a fully developed demand side of the market is not to have lower prices nor is it to have higher prices. The goal is to have prices that reflect the willingness of customers to pay for electricity based on their individual cost-benefit calculations (demand side) and the costs of providing that electricity (supply side).
19. When there is a fully developed demand side of the market, all customers will be in a position comparable to that of customers with day-ahead or real-time LMP contracts and no customers will require an ELRP to provide the competitive price signal.
20. Price reductions that are the result of customers choosing to consume less power based on a market price signal and the customers' economic interests are an appropriate goal. Providing an incentive for price reductions in the energy market regardless of the competitive price level is not an appropriate goal. Prices provide a signal to load which results in short term decisions to consume or not consume and long term decisions about energy using investments. Prices provide a signal to generation which results in short term decisions to produce or not produce and long term decisions about whether to invest. Prices that are too high result in bad decisions by customers and generators. Prices that are too low also result in bad decisions by customers and generators.
21. For customers who pay day-ahead LMP directly, payments under the ELRP result in overpayment for demand-side response to price. The result is an inaccurate and inefficient price signal to such customers. The costs of such overpayments are borne by other customers.

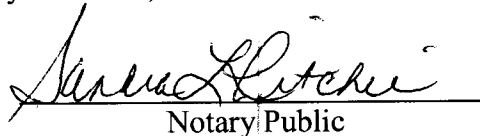
22. To illustrate, a customer paying day-ahead LMP makes a demand bid to buy 100 MW in the hour ending 1800 in the day-ahead market at any price up to \$200 per MWh (a standard form of demand bid). The same customer offers to curtail usage under the ELRP at any price in excess of \$100 per MWh for hour ending 1800, as would be permitted under the approach proposed by Gerdau Steel and opposed by PJM. The actual day-ahead price for hour ending 1800 is \$150 per MWh. In this case, the customer would buy 100 MWh under their demand bid because the actual price is less than their bid of \$200 per MWh. In addition, the customer would be paid to not use 100 MW because the price is greater than the ELRP curtailment offer of \$100 per MWh. The customer would be paid the generation and transmission component of retail rates for the 100 MW, which in this case is \$150 per MWh, the day-ahead LMP.
23. The result is that the customer has purchased 100 MWh at the day-ahead LMP and can sell that 100 MWh in the real-time market. In addition, the customer curtails in real time and is paid the day-ahead price for the 100 MWh. The customer is paid for selling the power it purchased but did not use and is also paid for its curtailment. The customer is paid twice for the same action of not consuming the same 100 MWh. There is no reason to pay the customer the day-ahead LMP under the ELRP for curtailing. If the customer believes that it is economic to curtail at a \$150 LMP, the customer will avoid paying the day-ahead LMP, which is the appropriate price signal.
24. The practical result of the program, as stated by Gerdau Steel, is that the customer reduces their curtailment offer to reflect the incentive payments. So the result in the illustration is that the curtailment offer might have been decreased from \$200 per MWh to \$100 per MWh. That is precisely the issue. The customer is willing to curtail output at a price less than what would actually be compensatory as a result of the ELRP payment.
25. The point of the ELRP is to ensure that customers on fixed tariff rates respond to the actual LMP. Customers paying the actual LMP need no further payments to ensure the appropriate incentive.
26. From the perspective of efficient markets, the customer has the appropriate hourly price signal in the day-ahead market, has the ability to determine the maximum price it is willing to pay and therefore receives the benefits of using energy or curtailing, as a direct consequence of that decision. That is the optimum situation and does not require an intervention into the market to obtain a better or more efficient outcome.
27. The goal of the demand-side program is not to encourage more demand-side response than is consistent with the economic choices of customers and market prices. The goal of the demand-side program is to ensure that customers face the market price.
28. The assertion by Gerdau Steel that the payment of an incentive under the ELRP lowers their strike price does not support their argument but rather illustrates the exact issue. It is to be expected that if a customer is paid an incentive to reduce load, the customer will reduce load at a lower price than would occur in the absence of the incentive. This is not the goal of the DSR programs. Gerdau Steel is stating explicitly that, when paid incentives, they reduce load when it is not otherwise economic to do so. That is not a desired outcome. In fact, such an outcome runs counter to the goals of the DSR programs and counter to the basic logic of competitive markets.

29. The position of Gerdau Steel also relies on the assertion that “system benefits” justify the payment of an incentive to end users to curtail load when it is not otherwise economic to do so. The asserted benefits do not exist. It is not a benefit to lower prices below the competitive level. Prices are paid by loads to generators and both loads and generators benefit from prices that reflect competitive market outcomes. The market price reflects the short run marginal cost of the marginal generator and also the willingness of load to pay the price. If all customers faced the hourly day-ahead and/or real-time LMP, DSR incentive programs would not be necessary because both generators and loads would face the appropriate price signal and could react consistent with their own economic interests. It is no more appropriate to pay loads to reduce demand when it is not otherwise economic than it would be to pay generators an incentive to operate when it is not otherwise economic.
30. The PJM proposal to eliminate the ability of customers who already pay the hourly day-ahead LMP to receive an incentive payment is entirely consistent with the structure of the real-time incentives for customers who pay the hourly real-time LMP. The real-time incentives are paid only when PJM dispatches a curtailable load in real time based on forecast LMP and the actual LMP does not justify the curtailment. In that case, PJM pays the customer an operating reserve or uplift payment based on the difference between the actual and forecasted LMP. That real-time program is also available to Gerdau Steel. No such uncertainty exists in the day-ahead market. LMP customers can determine what price they are willing to pay directly via a demand bid and will be curtailed in that hour if it is economic to do so and not curtailed in that hour if it is not economic to do so.
31. It has never been the stated position of the PJM Market Monitoring Unit that incentives should be paid to LMP customers when they already face actual hourly prices. It is the position of the MMU that more needs to be done to ensure that all customers face the actual hourly prices as a default in order to ensure that loads of all types have the ability to respond to prices and to send market signals based on their individual economic interests. Customers who face the actual hourly prices in PJM already have that ability and represent the goal to which other customers aspire and the goal that the DSR incentive programs are designed to reach. If all customers in PJM had the hourly LMP as a default, and the Gerdau Steel proposal were in place, payments to customers to reduce loads at arbitrarily low prices would be very large and would represent an extraordinary intervention into competitive markets.

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Joseph E. Bowring

Subscribed and sworn to before me this 12th day of March, 2007.


Notary Public

My commission expires: Nov 3, 2009

