The Brattle Group

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May 13, 2010

Kimberly D. Bose
Secretary, Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Re: Docket Nos. RM10-17-000 and EL09-68-00

Dear Secretary Bose:

Enclosed are our comments in response to the March 18, 2010 Notice of Public Rulemaking regarding the wholesale compensation of demand response providers.

If you have any questions, please feel free to contact us.

Respectfully Submitted,

Samuel Newell Kathleen Spees Philip Q Hanser

44 Brattle Street Cambridge, MA 02138-3736
Voice 617.864.7900 Facsimile 617.864.1576 email office@brattle.com

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Demand Response Compensation	**)**	**Docket Nos.**	**RM10-17-000**
In Organized Wholesale Energy	**)**		**EL09-68-000**
Markets	**)**		

COMMENTS OF SAMUEL NEWELL, KATHLEEN SPEES AND PHILIP Q HANSER[1]

We are pleased to submit comments in the relation to the Federal Energy Regulatory Commission (FERC) March 18, 2010 Notice of Public Rulemaking (NOPR) on the compensation of demand response in wholesale energy markets. These comments represent only the undersigned and are not he views of *The Brattle Group*, its clients, or any other organizations with whom we are associated.

I. INTRODUCTION AND SUMMARY

In its March 18, 2010 NOPR, the Commission proposed ruling that wholesale providers of Demand Response (DR) will be compensated at the locational marginal price (LMP) during all hours for demand reductions.[2]

We present comments explaining that the best incentive for demand response is a dynamic retail rate that "automatically" reflects the value of used or saved energy. However, when such dynamic retail rates are unavailable, appropriate wholesale incentives for DR can be used to create an efficient incentive for curtailment. At a wholesale level, the economically

[1] Dr. Samuel Newell and Philip Q Hanser are Principals, and Dr. Kathleen Spees is an Associate of *The Brattle Group* (www.Brattle.com). The views expressed herein are the authors' own.

efficient level of compensation for load reductions (not load shifts) is the LMP minus the avoidable generation portion of the retail rate, resulting in a net savings equal to the LMP. The efficient compensation for any load that shifts from one hour to another is the LMP difference between the two hours. Providing more would distort incentives and lead to inefficient system dispatch. We further explain that the avoidable retail generation rate can best be determined through agreements between the load serving entity (LSE) and the curtailment service provider under the oversight of the relevant retail regulating authority.[3]

Any compensation above the LMP minus the retail generation rate, or the LMP differential in the case of load shifting, represents a higher payment to DR than is appropriate given generation prices. Such DR compensation may or may not be justified by public policy objectives, for example, to enhance market competitiveness by promoting faster development of new DR resources. However, the benefits should be weighed against the costs and compared to other, less distortionary options for stimulating demand responsiveness, such as encouraging states to subsidize investments in smart grid infrastructure and develop dynamic retail rates. Moreover, such benefits and costs should be weighed against other options for promoting broad energy policy objectives and market efficiency.

II. THE EFFICIENT PRICE SIGNAL FOR LOAD REDUCTIONS (NO SHIFTING)

One MWh of energy from DR provides the same wholesale service as one MWh of generation and thus should earn the same incentive as generation, *i.e.*, the LMP. More or less compensation would result in inefficient behavior.

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[2] See ¶ 11, FERC. "Demand Response Compensation in Organized Wholesale Energy Markets," March 18, 2010. Docket Nos. RM10-17-000, EL09-68-000.

[3] The "avoidable retail generation rate" is the generation portion of the DR customer's retail power costs that it saves by permitting its consumption to be curtailed by the DR provider. The customer may also save incremental T&D charges from curtailment, but these should not be subtracted from the DR payment. The remainder of our comments will ignore T&D charges.

Many advocates for DR raise this point and conclude that DR providers should receive the LMP from the wholesale market. This common-sense logic is flawed however, because the total incentive for DR to curtail includes *both* a wholesale payment for the response *and* the retail savings from curtailment. These additional avoided retail rate savings to DR are not available to supply-side resources.

Compensating a customer for DR at the LMP would make sense only if customers paid their retail providers for the energy before re-selling it into the wholesale market instead of consuming it. While such "must-take" retail contracts are possible, nearly all retail customers pay only for their metered load, meaning that they do not own (and have never paid for) the energy that they appear to be selling back to the market through DR.[4] When customers reduce their load, they pay less to their LSE. In total, the retail customer's marginal incentive to curtail is composed of these retail savings *plus* any payment the customer or a curtailment service provider receives from the wholesale market. In order for the customer's *total incentive* (including retail bill savings) to be equal to the full LMP, the payment from the wholesale market must equal the LMP *minus* the avoidable retail generation rate.

To illustrate this point, consider a retail customer who can offer demand response from a behind-the-meter generator with a variable cost of $250/MWh. Assume also that the avoidable retail generation rate is $110/MWh. The customer can either: 1) purchase power at its retail generation rate of $110/MWh, or 2) run its backup generator at a net cost of $250/MWh minus the wholesale DR payment. To minimize cost by choosing between these two options, the customer would purchase retail power if the DR payment were below $140/MWh, and would run its generator if the DR payment were above $140/MWh.

[4] The exceptions are some large customers that may have must-take contracts. In a must-take contract, the customer pays for the power whether they use it or not. Under a must-take contract the *avoidable* retail generation rate would be zero and the DR provider would be compensated at the full LMP under the LMP minus retail formula.

If the LMP were $145/MWh and the consumer were entitled to receive the full LMP for responding, the customer would have an incentive to run its generator despite the unit's dispatch cost of $250/MWh exceeding the LMP substantially.[5] The effect would be to replace $145/MWh marginal generation in the wholesale market with $250/MWh generation, which would be economically inefficient and a waste of resources.[6] If the customer were instead entitled to receive only the LMP minus the retail rate, or $35/MWh, it would not run its behind-the-meter generation. Its load would be served by more efficient resources from the wholesale market.[7] Appropriately, LMPs would have to increase to $250/MWh or more before the customer would have an incentive to dispatch the behind-the-meter generator. These same arguments apply to a customer without backup generation, but whose reservation value for consuming energy is $250/MWh.

Just as the customer needs to receive the proper price signal to induce efficient behavior, the Regional Transmission Organization (RTO) also needs to use a consistent dispatch price that does not favor or disfavor DR relative to an equivalent generator. The efficient dispatch price is $250/MWh in the example above, composed of the DR resource's required payment to respond ($140/MWh in the example) plus the avoidable retail generation rate ($110/MWh in the example).

This approach is consistent with the Midwest ISO's proposed settlement mechanism. Under Midwest ISO's proposal, the LSE *pays* LMP minus retail while the DR provider *receives*

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5 Put another way, if the customer would be compensated at the full LMP, the customer's two choices would be: 1) pay $110/MWh for power, or 2) run the backup generator, receiving $145/MWh payment and paying $250/MWh in fuel costs, amounting to a net cost of $250-$145 = $105/MWh. The second option of running the backup generator makes the customer better off even though the cost of the backup generator is much greater than the marginal cost of supply from the wholesale market.

6 An additional potential problem is that the behind-the-meter generator providing DR may have less stringent environmental controls than the market-based generation.

7 For a more detailed discussion of the distortionary effects of inefficient DR compensation see Chao, Hung-po (2009). "An Economic Framework of Demand Response in Restructured Electricity Markets", February 8, 2009, Retrieved from

LMP minus retail.[8] As long as the customer baseline is calculated correctly, this structure makes the LSE financially indifferent to whether the DR responds or not.[9] This arrangement also achieves the same financial outcome as if: 1) the LSE had purchased energy from the RTO and then re-sold it to the retail DR customer at the avoidable retail rate (as would be the case without any DR), and 2) instead of using the energy, the retail DR customer curtailed its consumption and sold the energy back to the RTO. Note also, that Midwest ISO's DR payments are fully funded by the LSE's payments; if the payments to the DR provider were any higher, then the RTO would have to recover this incremental subsidy via uplift charges imposed on other market participants.[10]

IV. THE EFFICIENT PRICE SIGNAL WHEN THERE IS SHIFTING

Compensating DR at LMP minus the retail generation rate provides an efficient signal for reductions but not for load shifts. For example, consider a DR customer that shifts consumption between two high-priced hours both with an LMP of $600/MWh. It is clear that there is no value in shifting consumption between these two equally-priced hours, so the RTO should not make any payments to customers that shift between these two hours. However, under the RTOs' wholesale compensation mechanisms for DR, the customer *would* receive a payment and no debit. The DR customer would be compensated for curtailing below baseline in the first hour,

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http://www.hks.harvard.edu/hepg/Papers/2009/Demand%20Response%20in%20Restructured%20Markets%2002-08-09.pdf.

8 Midwest Independent System Operator "Filing Regarding Aggregators of Retail Customers," Filed before the Federal Energy Regulatory Commission, October 2, 2009. Docket ER10-26-000.

9 The wholesale DR payment of LMP minus retail rate is not, and should not be, affected by the fraction of that payment that goes to the curtailment service provider as opposed to the end user. The curtailment service provider's share of the payment reflects a real cost of doing business and should reduce the profit margin achieved by the DR customer, just like variable operations and maintenance costs reduce the profit margins achieved by generators.

10 If the LSE pays for only its actual metered load rather than the customer baseline, the RTO would not have enough money to pay the DR providers as well as the generators. ISO-NE and PJM charge LSEs only for their metered load and recover payments to DR providers through uplift charges assessed on all load in the system or zone, respectively. Nevertheless, the efficient payment to DR providers is still the LMP minus

and could increase consumption above baseline in the second hour by paying only the much lower retail rate on the increment. In fact, the shifting customer is totally indifferent as to whether the consumption is shifted to another hour with an LMP of $20/MWh or $1000/MWh.

To avoid overcompensating load shifts, any shifting DR should be compensated at the difference in the LMP between the hour shifted from and the hour shifted to. Equivalently, the customer could be compensated *or* charged (at LMP minus the retail generation rate) for all deviations above *and* below the customer baseline. To our knowledge no RTO's wholesale DR program does this.

The best solution is to rely on dynamic retail rates rather than wholesale compensation for DR. Dynamic retail rates can be designed so the customer receives appropriate incentives to curtail as well as appropriate disincentives to increase consumption during all hours, including appropriate incentives for shifting. Furthermore, most kinds of dynamic retail rates do not require a customer baseline, while accurately establishing a baseline is one of the most contentious aspects of many wholesale DR mechanisms.

V. IDENTIFYING THE "AVOIDABLE RETAIL GENERATION RATE"

Identifying the avoidable retail generation rate savings can be challenging. In the simplest case, the customer pays a flat per-kWh generation rate for power, making the calculation simple. However, in other cases the avoidable retail generation rate in a particular hour may be an on-peak price, a function of the LMP, or even a tiered block rate with increasing cost at higher consumption levels.

Accounting for these complexities in calculating the appropriate avoidable retail generation rate is best done through agreements between the LSE and the curtailment service

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the avoidable retail rate, and the RTO should still dispatch the resource as if it were being paid the full LMP.

provider under the oversight of the relevant retail regulating authority.[11] This approach to determining the avoidable retail rate avoids requiring the RTO to sort through potentially complicated retail rate structures.

VI. POLICY CONSIDERATIONS

Assuming generation prices themselves are set properly, the economically efficient level of compensation for non-shifting DR providers is the LMP minus the customer's retail generation rate. The efficient incentive for shifting DR is the LMP differential between the hours shifted from and shifted to (equivalently calculated as credits and charges at LMP minus the retail generation rate for any deviations above or below the customer baseline).

Any higher compensation, including compensation at the full LMP, represents a subsidy for DR that could distort market incentives, resulting in inefficient load management and inefficient dispatch of behind-the-meter generation. This incentive distortion could be particularly problematic if instituted in markets with mature DR penetration. Wholesale DR subsidies could also potentially crowd out the development of dynamic retail rates and price-responsive demand, which have several advantages over negawatt-based DR payment programs, but which would not be eligible for the wholesale subsidy.[12]

In the near term, there may be valid public policy objectives supported by subsidizing DR because increasing active DR participation can increase market efficiency. In particular, subsidizing DR may help to attract new DR into markets with historically low participation or substantial barriers to entry. It is unproductive, however, to obscure such subsidies or implement them with incomplete analysis.

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[11] It may also be useful for the RTO to institute a default method for determining the avoidable retail rate if the curtailment service provider and the LSE cannot come to an agreement.

[12] See, for example, the arguments presented in Bushnell, J., B. Hobbs, and F. Wolak. "When it Comes to Demand Response, is FERC its Own Worst Enemy?" *The Electricity Journal.* August 2009. Retrieved from http://www.ucei.berkeley.edu/PDF/csemwp191.pdf.

Importantly, the Commission needs to determine, with the Department of Energy, whether promoting DR penetration in this way creates benefits greater than costs and greater than other forms of policy support. Even in cases where a subsidy for DR is warranted, other subsidy structures may be preferable to the additional "per-event" payments based on full LMP compensation. For example, subsidizing smart grid investments is likely to be a more effective means of stimulating demand response without introducing inefficiencies into the wholesale electric markets. Similarly, if the argument against the avoided retail generation rate offset is that LMPs are understated during emergency hours and do not correctly reflect the true marginal value of supplying power, a better solution is to correct how LMPs are determined.

Commenter's Certification

We hereby certify that we have read the filing signed and know its contents are true as stated to the best of our knowledge and belief. We possess full power and authority to sign this filing.

Respectfully Submitted,

Samuel Newell
The Brattle Group
44 Brattle Street
Cambridge, MA 02136
617.234.5725
sam.newell@brattle.com

Kathleen Spees
The Brattle Group
44 Brattle Street
Cambridge, MA 02136
617.234.5783
kathleen.spees@brattle.com

Philip Q Hanser
The Brattle Group
44 Brattle Street
Cambridge, MA 02136
617.234.5678
phil.hanser@brattle.com

Dated May 13, 2010.