UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Demand Response Compensation in Organized Wholesale Energy Markets	))	Docket No. RM10-17-000

COMMENT OF THE FEDERAL TRADE COMMISSION
May 13, 2010

I. Introduction and Summary

The Federal Trade Commission (FTC) appreciates this opportunity to comment on the Federal Energy Regulatory Commission's (FERC's) Notice of Proposed Rulemaking (NOPR) regarding demand response compensation in organized wholesale energy markets.[1]

Demand response programs traditionally are viewed as mechanisms to pay customers to reduce their use of power below a normal ("baseline") level during periods when power grows scarcer. It is useful to consider such programs as giving customers the rights to power and then allowing customers to decide between using that power and reselling it to the wholesale market. FERC's NOPR takes that view, stating that the NOPR's "focus . . . is on customers providing – through bids – demand response that acts as a resource [*i.e.*, as an energy seller] in organized wholesale energy markets."[2]

FERC then proposes standards for compensating these sellers. FERC reviews the variety of approaches to demand response compensation in the areas operated by regional transmission organizations (RTOs) and independent system operators (ISOs); discusses the need for reform in demand response compensation; and concludes that there is inadequate compensation for retail customers that supply demand response while paying time-invariant (*i.e.*, flat) retail rates. To remedy this inadequacy, FERC proposes that demand response be compensated at the level of the locational marginal price (LMP) applicable to each such customer providing demand response.[3] This comment demonstrates that policies to give electricity customers the right

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[1] 75 Fed. Reg. 15362 (Mar. 29, 2010), *available at* http://frwebgate5.access.gpo.gov/cgi-bin/PDFgate.cgi?WAISdocID=483338499308+1+2+0&WAISaction=retrieve. Under demand response programs, participants can either exercise their rights to consume power or sell that power back to the grid.

[2] NOPR P 3.

[3] *Id*. PP 7-19.

incentives to provide demand response will (1) allow demand response providers to sell power at an LMP that accurately represents social cost and (2) require firms to pay the same amount for their power, regardless of whether they use it or sell it to a demand response program. Stated differently, policies that give the wrong incentives may make it more profitable for demand response providers to sell power rather than consume it to produce socially desirable goods or services.

We question the soundness of a policy that would pay companies the proceeds from the sale of power that they never bought in the first place. Such a policy would create situations in which a demand response provider would find it more profitable to sell its power rights (*i.e.*, provide demand response) than to consume that power, even though the value to society of consuming that power exceeds the power's cost to society. Our comment addresses FERC's question about how to compensate demand response provided by a retail electricity customer that pays a flat retail price for power. An efficient demand response compensation scheme allows the customer to sell power to which it has rights – at an LMP that captures the full social cost of the marginal unit of power – and to pay the usual retail price to acquire the power that it resells.[4] One way to implement this compensation scheme is to consider demand response to be a single buy-sell transaction that determines the compensation level by subtracting the retail price from the LMP.

Although there are reasons to conclude, as FERC does, that current compensation for demand response is insufficient to elicit efficient levels of demand response, this insufficiency does not stem entirely from the formulas that RTOs and ISOs use (or propose to use) to compensate retail demand response providers. It also arises in significant part from a system that fails to set LMPs encompassing all of the social costs of electricity. Distortions of wholesale pricing – such as those stemming from the exercise of market power, from market power mitigation measures, or from the omission of other social costs – may cause the LMP to diverge from the efficient price. LMPs that internalize the full social costs of power are a necessary component of efficient compensation for demand response. The inclusion of full social costs in LMPs also has the added benefit of setting more efficient prices to guide decisions by all participants in wholesale electricity markets. To the extent that it is impractical to swiftly correct market flaws that make LMPs inaccurate, the efficient short-term response is unlikely to involve treating power as a free good. Rather, FERC should take direct action to adjust the

[4] This is an implication of a more general principle that underlies, for example, hedging strategies that firms use to mitigate the risk of future price fluctuations. These strategies buy rights to a commodity on the futures market at the expected future price and then, when the futures contract matures, give the firm an efficient incentive to adjust its consumption by buying or selling at the spot market price. A discussion and an example appear in Section III and the Appendix to this comment.

compensation of demand response providers and articulate the conditions under which such interventions would be phased out.

The inaccuracy of current LMPs is a separate issue from the need to charge end-users the same price for power that they consume and for power that they sell. A policy approach that separates these issues and directly addresses each issue will be easier to design in the near term and to revise as necessary in the long term.

II. Interest of the Federal Trade Commission

The FTC is an independent agency of the United States Government responsible for maintaining competition and safeguarding the interests of consumers, both through enforcement of the antitrust and consumer protection laws and through competition policy research and advocacy. The FTC often analyzes regulatory or legislative proposals that may affect competition or allocative efficiency in the electric power industry. The FTC also reviews proposed mergers that involve electric and natural gas utility companies, as well as other parts of the energy industry. In the course of this work, as well as in antitrust and consumer protection research, investigation, and litigation, the FTC applies established legal and economic principles and recent developments in economic theory and empirical analysis. The energy sector, including electric power, has been an important focus of the FTC's antitrust enforcement and competition advocacy.[5] The FTC's competition advocacy program has produced two staff reports on electric power industry restructuring issues at the wholesale and retail levels.[6] The FTC staff also contributed (as did FERC staff) to the work of the Electric Energy Market Competition Task Force, which issued a *Report to Congress* in 2007.[7] In addition, the FTC has

[5] *See, e.g.* Opening Remarks at the FTC Conference on *Energy Markets in the 21st Century: Competition Policy in Perspective* (Apr. 10, 2007), *available at* http://www.ftc.gov/speeches/majoras/070410energyconferenceremarks.pdf. FTC merger cases involving electric power markets have included the *DTE Energy/MCN Energy* (2001) (consent order), *available at* http://wwwftc.gov/os/2001/05/dtemcndo.pdf; and *PacifiCorp/Peabody Holding* (1998) (consent agreement), *available at* http://www.ftc.gov/os/1998/02/9710091.agr.htm. (The FTC subsequently withdrew the *PacifiCorp* settlement when the seller accepted an alternative acquisition offer that did not pose a threat to competition.)

[6] FTC Staff Report, *Competition and Consumer Protection Perspectives on Electric Power Regulatory Reform: Focus on Retail Competition* (Sept. 2001), *available at* http://www.ftc.gov/reports/elec/electricityreport.pdf; FTC Staff Report, *Competition and Consumer Protection Perspective on Electric Power Regulatory Reform* (July 2000), *available at* http://www.ftc.gov/be/v000009.htm (compiling previous comments from the FTC staff provided to various state and federal agencies).

[7] *See* http://www.ferc.gov/legal/fed-sta/ene-pol-act/epact-fina-rpt.pdf.

held public conferences on energy topics, including *Energy Markets in the 21st Century* (April 10-12, 2007)[8] and *Carbon Offsets & Renewable Energy Certificates* (January 8, 2008).[9]

The FTC and its staff have filed numerous competition advocacy comments with FERC and participated in FERC technical conferences on market power issues. For example, in March 2007, the Deputy Director for Antitrust in the FTC's Bureau of Economics served as a panelist for a technical conference on FERC's merger and acquisition review standards under Federal Power Act Section 203 (Docket No. AD07-2-000). Similarly, the FTC submitted comments in December 2009 in FERC's proceedings on possible elements of a National Action Plan on Demand Response (Docket No. AD09-10-000)[10] and on transmission planning processes (Docket No. AD09-8-000).[11] In March 2010, the FTC filed a comment on performance metrics for RTOs and ISOs (Docket No. AD10-5-000),[12] and last month the FTC commented in response to FERC's Notice of Inquiry concerning integration of variable energy resources (Docket No. RM10-11-000).[13] The FTC also has commented on FERC's initiatives to promote wholesale electricity competition and on various state issues associated with restructuring the electric power industry.[14]

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[8] Conference materials *available at* http://www.ftc.gov/bcp/workshops/energymarkets/index.shtml.

[9] Conference materials *available at* http://www.ftc.gov/bcp/workshops/carbonoffsets/index.shtml. Other programs have included the FTC's public workshop on *Market Power and Consumer Protection Issues Involved with Encouraging Competition in the U.S. Electric Industry*, held on September 13-14, 1999 (workshop materials *available at* http://www/ftc.gov/bcp/elecworks/index.shtm); and the Department of Justice and FTC workshop on *Electricity Policy*, held on April 23, 1996.

[10] This comment is available at http://www.ftc.gov/os/2009/12/V100002ferc.pdf.

[11] This comment is available at http://www.ftc.gov/os/2009/12/V100001ferc.pdf.

[12] This comment is available at http://www.ftc.gov/os/2010/03/100319performancemetrics.pdf.

[13] This comment is available at http://www.ftc.gov/os/2010/04/V100009ferccomment.pdf.

[14] *See*, *e.g.*, Federal Trade Commission, Comment before the Federal Energy Regulatory Commission on Wholesale Competition in Regions with Organized Electric Markets, FERC Docket Nos. RM07-19-000 and AD07-7-000 (Apr. 17, 2008), *available at* http://www.ftc.gov/be/v070014b.pdf. A listing of FTC and FTC staff competition advocacy comments to federal and state regulatory agencies (in reverse chronological order) is available at http://www.ftc.gov/opp/advocacy_date.shtm.

III. The Case for Making Demand Response Providers Pay the Retail Price for the Power They Resell at LMP

Demand response programs often assign each customer a baseline consumption level that attempts to capture the amount of power the customer would have used in the absence of the demand response program. Demand response programs then offer the customer a price per kilowatt-hour (kWh) of the baseline quantity that the customer does not use.

An example at the retail levels is the Peak Time Rebate program run by San Diego Gas & Electric. That program declares scarcity days on which it pays a customer 75 cents for each kWh that the customer's consumption is below a baseline calculated from average consumption in the days before the event.[15] It is clear that SDG&E, like many similar firms, does not charge customers extra during baseline-setting periods, when the company bundles valuable baseline rights with the power that customers use during the baseline-setting period. It is implicitly giving away valuable rights and should expect customers to consume too many of them.[16] SDG&E both sells the customer power[17] and runs the rebate program that implicitly buys the power back. Thus, the 75-cent payment could be the resale proceeds net of the retail price at which the customer bought the power.[18]

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[15] Specifically, SDG&E defines the baseline for a "weekday event" as "the total consumption for the hours of 11 a.m.-6 p.m. averaged over the three (3) highest days from within the immediately preceding five (5) similar non-holiday week days prior to the event." *See* http://www.sdge.com/tm2/pdf/ELEC_ELEC-SCHEDS_PTR.pdf.

[16] For evidence that customers increase consumption to raise their baselines and get extra rebates in a very similar program, *see* Frank A. Wolak, "Residential Customer Response to Real-Time Pricing: The Anaheim Critical-Peak Pricing Experiment" (working paper, Stanford University, 2006), *available at* ftp://zia.stanford.edu/pub/papers/anaheim_cpp.pdf. We return to questions about pricing baseline rights in Section IV, *infra*.

[17] Like most utilities, SDG&E sells power to residential customers under a "requirement" contract that obligates it to sell the customer as much power as the customer wants at a predetermined price. Thus, SDG&E loses money on every kWh of power that it sells during periods of increased scarcity, when power is unusually expensive.

[18] SDG&E does not compensate customers at the wholesale price less the retail price from its increasing block residential retail rates. In other words, San Diego customers who use a lot of power pay more for their last unit of power than do customers who use only a little power. But the customer's consumption level does not affect the 75 cents/kWh payment. Thus, SDG&E's pricing is at best an approximation of the net demand response compensation that would arise if the customer bought power at the applicable retail price and resold it.

In some wholesale markets, however, the "curtailment service provider" that administers the demand response program and pays the customer to reduce load is different from the firm that sells customers power at retail. Retail providers that simply bill customers for the power they use will typically have no reason to bill a customer for power that the customer resold before it passed through the customer's meter. Further, many entities conceive of demand response as programs that involve paying customers to reduce consumption rather than paying them to resell power. For example, ISO New England's demand response program website says that "[d]emand response programs compensate large electricity users for reducing consumption when market prices are high or demand is high and system reliability is at risk."[19] Such a view makes it seem natural not to charge customers for the power they were paid not to use. We show below that this "natural" approach creates poor incentives. Thus, the central points of this section are that FERC is correct to conceive of demand response as the resale of power, and that FERC policy should ensure that customers pay for the power regardless of whether they use it or resell it.

FERC observes that some RTOs and ISOs favor compensating demand response at the level of LMP minus the retail power price if the retail price of power is fixed (time-invariant). The PJM market, which runs a wholesale electricity system covering the Mid-Atlantic region and extending west to Chicago, has been doing so for several years. Advocates of this position maintain that paying LMP without any such subtraction or purchase requirement will overcompensate demand response. Stated slightly differently, the concern is that demand response providers already receive a benefit because they do not pay their retail suppliers for power they would have consumed had they not provided demand response.

This concern about overcompensation is well founded. It is useful to view demand response as a provision that allows end-users to decide between consuming power themselves and reselling it. End-users have the appropriate incentives[20] if they pay the same price for power that they consume and for power that they sell. If customers have to pay the retail price for power that they use but pay nothing for power that they resell, then they will have incentives to resell power in situations in which it would be more beneficial to society for them to consume it.

The example in the Appendix illustrates this reasoning. It observes that efficient demand response compensation creates incentives for the customer to consume power from the grid whenever the marginal social benefit (MB) of consumption exceeds the marginal social cost (MC) of power, as approximated by the LMP. Formally, this is written as MB>MC. Note that subtracting the same number from both sides of the inequality – for example, the fixed cost of

[19] *See* http://www.iso-ne.com/genrtion_resrcs/dr/index.html.

[20] Here, "appropriate" means efficient if the LMP equals marginal social cost.

retail power under traditional rate regulation – does not alter the inequality, and firms that had a correct incentive to provide demand response before the subtraction retain that incentive after the subtraction. But if the retail customer is charged only for power that is consumed but not for power that is resold, then the inequality may not hold. Whenever the inequality is reversed, the retail customer has an incentive to resell power even when it would be socially more efficient to consume it.

Customers who pay for the power they consume, but not the power that they sell back to the grid, will have an incentive to consume power not when the marginal benefit exceeds the marginal cost, but when the marginal benefit exceeds the sum of the marginal cost and the retail price. Simple algebra shows that buying when the difference between the marginal benefit and the retail price exceeds the marginal cost is equivalent to buying when the marginal benefit exceeds the sum of the retail price and the marginal cost.[21] Thus, giving away for free the power that customers resell implicitly raises the price of consuming power above the efficient level. This will lead firms to provide too much demand response.

IV. Good Demand Response Compensation Schemes Facilitate a Transition Toward Better Rate Structures

Several FTC comments have emphasized the benefits of moving consumers away from traditional time-invariant and time-of-use pricing schemes that do not expose them to hour-by-hour fluctuations in the cost of power.[22] Demand response programs are a pragmatic, incremental step toward this goal. They can expose customers to the LMP during periods of increased scarcity, when time-invariant prices are least accurate and create the largest cross-subsidies. Demand response programs can be added to existing rates and regulatory infrastructure. Nevertheless, they should be considered an interim approach. Desirable demand response compensation should facilitate movement toward rate structures that correct all of the major flaws in the existing, legacy rate structure.[23]

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[21] If we charge the retail price P for just the power that firms consume, but not the power that they resell at the system marginal cost (MC), then firms will have an incentive to consume power whenever their marginal benefit less the price exceeds the marginal cost. Formally, that becomes MB-P>MC. If we add the retail price to both sides, we see that this is equivalent to saying that they will consume when MB>MC+P.

[22] *See*, *e.g.*, Comment of the Federal Trade Commission on Possible Elements of a National Action Plan on Demand Response, *supra* note 10; FTC Staff Report, *Competition and Consumer Protection Perspectives on Electric Power Regulatory Reform: Focus on Retail Competition*, *supra* note 6, Ch. III.

[23] For further discussion of reasons why demand response programs should be considered only an interim step, *see* James Bushnell, Benjamin F. Hobbs, and Frank A. Wolak, "When It Comes to Demand Response, Is FERC its Own Worst Enemy?," 22:8 Electricity J. 9 (2009).

Demand response programs do not fully correct these flaws when they fail to correctly define and price valuable rights to use power when it is scarce. Demand response programs implicitly buy those rights back from power consumers. An important, unresolved challenge in electricity policy is the efficient allocation of the right to use power at a predetermined price during periods when power is scarcer.[24] Example 2 in the Appendix illustrates how forcing flexible firms to pay for the option to buy power at the average cost during such periods can distort decisions. FERC staff acknowledges the challenges of allocating property rights ("baselines"): "The measurement of demand reductions associated with incentive-based demand response programs has proven to be a difficult and controversial problem . . . The key measurement issue is how to calculate the level of consumption that would have occurred if the participant had not curtailed consumption – *i.e.*, the customer baseline level. Once the customer baseline is determined, the level of reduction is calculated by subtracting the actual demand from the estimated baseline normal demand. . . . A key problem with most estimation methods is the potential for gaming – participants may bid into the market or state that they will curtail when they would already be shut down for the day."[25] We agree that bundling free baseline rights with power is fraught with difficulties, and we encourage movement toward approaches that sell these rights at appropriate prices.

We are concerned that it will be difficult to change obsolete, inefficient retail rates if demand response is viewed as a single transaction that assumes that the customer buys power under the traditional rate structure. FERC should consider whether it is feasible to compensate demand response at the LMP and to have demand response providers pay for the power they resell to the demand response program under the terms of the retail contract they choose. This would allow demand response programs to succeed without creating new institutional constituencies for flawed, obsolete pricing and raising obstacles to the adoption of improved (dynamic) retail pricing and of better-defined property rights.

V. Efficient Compensation for Demand Response Requires Adjustments to LMP

Even if a demand response program defines property rights correctly and charges the same price for the power that retail customers consume and the power that they resell, using LMPs that misstate the true marginal social cost of power will still lead to socially inefficient

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[24] *See*, *e.g.*, Severin Borenstein, "Customer Risk from Real-Time Retail Electricity Pricing: Bill Volatility and Hedgability," 28:2 Energy J. 111 (2007).

[25] FERC Staff Report, *Assessment of Demand Response & Advanced Metering*, at 73, Docket No. AD06-2-000 (2006), *available at* http://www.ferc.gov/legal/staff-reports/demand-response.pdf.

results. Social marginal cost prices include the marginal cost both to the producer and to the rest of society. Costs to the rest of society include, for example, the cost of pollution. Pricing at the social marginal cost gives firms an incentive to generate power only when its benefits to society outweigh its costs to society, yielding maximum welfare.

Nevertheless, if LMPs omit important social costs (such as environmental degradation), then LMPs understate social marginal cost. This is currently the case with LMP calculations. For example, if power prices do not include the costs of the generator's pollutants, the LMP will fall short of the social marginal cost of power generation.[26] Similarly, market power can inflate prices and market mitigation measures (such as offer caps) can suppress price changes, both of which cause LMPs to diverge above or below the efficient price.

Thus, current LMPs may understate the social cost of power during greater scarcity periods. Giving demand response program participants an extra incentive equal to the retail cost of power attempts to correct for this through the use of a blunt, interim policy instrument. A program that allows customers to resell power that they did not pay for fails to calibrate the adjustment to demand response incentives in a way that corresponds to the magnitude of the distortions in wholesale power prices. Several potential effects of such a program are problematic. The program:

- could create the largest extra incentive to provide demand response in places where the most aggressive environmental interventions have created the highest retail rates but also have internalized most pollution costs;

- does not provide a way to phase out this interim, imprecise effort to increase compensation for demand response as improved policies correct flaws that distort LMPs;

- does not compensate other actions that reduce emissions, such as energy efficiency programs or pollution controls; and

- does not accommodate any natural ways to adjust the benefits of giving away retail power as the emissions profile of the marginal producer or the level of scarcity in the system changes.

[26] Environmental policies that put prices on sulfur dioxide emissions from power plants nationwide and on nitrogen oxides in certain regions are an important step toward making LMPs reflect social costs. Other important pollutants remain unpriced.

If FERC needs an interim solution, it should not implement a program allowing demand response providers to pay nothing for the power they resell. Rather, FERC should take direct action to adjust LMPs (or, if necessary, the compensation of demand response providers), and should articulate the conditions under which such interventions would be phased out.

In the longer term, policy makers can provide more efficient compensation for demand response by taking steps to improve market operations and make LMPs more accurate. These steps include (1) adjusting LMPs to better reflect the full social costs of electricity, (2) improving the accuracy of retail pricing and otherwise facilitating greater demand elasticity (to curtail potential market power), and (3) reducing dependence on offer caps and capacity markets.

Appendix: Examples

Example 1: Charging for Power Consumed, but Giving Away Power That Is Resold, Can Create Flawed Incentives

Consider a firm that can convert a megawatt-hour (MWh) of electricity into a product worth $100. For simplicity, assume that the firm has no costs other than the cost of the electricity it uses. This example uses the phrase "operate" to mean "consume exactly one MWh." Thus, $100 is the marginal benefit of the firm's operating and consuming one MWh of power. The firm has a contract that charges it $60/MWh for power on any afternoon. Consider an afternoon when the LMP is $90/MWh. We reach an efficient allocation if the firm operates whenever the marginal benefits of its operation exceed the marginal cost (which is the LMP). Because the marginal benefit ($100/MWh) exceeds the marginal cost (*i.e.*, the LMP of $90/MWh), the firm should operate. If the firm has to pay $60 for each MWh it consumes or provides as demand response, the $40/MWh it can earn from operating outweighs the $30/MWh it can earn from providing demand response. In that case, the firm will operate, which is the choice that yields the greatest benefit to society.[27] But if the firm pays nothing for the power that it resells as demand response, then it will earn $90/MWh from providing demand response, which is far more attractive than the $40/MWh it can earn from operating. It would be more efficient for society, however, if the firm operated instead of reselling the power. Charging this firm nothing for the power that it resells as demand response gives it an inefficient incentive to provide demand response whenever the LMP is greater than $50/MWh and less than $100/MWh.

Example 2: The Importance of Defining Property Rights Appropriately

Demand response programs often are added on top of existing rate structures that do a poor job of defining and pricing the property right to use power during periods when wholesale power is expensive. These poorly defined property rights are typical of rates that are time-invariant or otherwise prevent customers from experiencing day-to-day, hour-to-hour variations in costs.[28] By contrast, this problem does not exist when retail customers pay real-time prices, nor does it arise when they can decide whether to buy price insurance.[29]

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[27] This assertion holds for any fixed price "P": the firm will make the right choice to operate if it earns $100-P for operating and $90-P for providing demand response, because it will operate whenever (100-P)>(90-P) – which in turn can be simplified by subtracting 90 from both sides and adding P to both sides to yield a condition that is always true, namely, 10>0.

[28] Traditional time-of-use pricing – which offers the same peak and off-peak prices every day within a season – exhibits a muted version of the same flaws.

[29] Borenstein, *supra* note 24, discusses the effectiveness of appropriate rights definitions.

Time-invariant retail pricing forces customers to buy a bundle of two products – electric power and mandatory insurance against price variability. The insurance bestows on customers a valuable, unlimited right to use high-cost power at an averaged-out price during high-cost periods. The costs of this ill-defined, ill-priced right are spread across all the customers on the rate, regardless of whether they want that right or the responsibility to pay for it. The cost of insurance reflects costs of building and operating a system that can handle overconsumption of power during high-cost periods that occur only because customers do not have to pay the true costs of power.

Demand response programs begin to address this overconsumption. A power system with time-invariant prices subsidizes power consumption during high-cost periods and penalizes consumption during low-cost periods. The example below illustrates how a combination of demand response and time-invariant retail prices can alleviate some, but not all, of the losses to society stemming from time-invariant retail prices. The example does not capture the fact that, if there is enough demand response, then peak-period prices will fall and the cost of price insurance will drop.

Consider the following example: There is an electricity market where the typical customer buys 1 unit on low-demand days when the LMP is $50/MWh and buys 2 units on high-demand days when the LMP is $250/MWh. For this example, we assume that there are 8 low-demand days for every high-demand day. Thus, the time-invariant or average price is $90/MWh.[30]

Consider a firm in that market that can convert 1 MWh of power to a product worth $85. The firm should operate on every low-demand day because that creates $35/MWh of social surplus, and it will have incentives to do so if it buys power under a real-time pricing system that offers it power at the LMP of $50/MWh.

By contrast, if the firm is on time-invariant pricing without demand response, it will never operate and society will never realize any of the social benefit that its operations would have created. The problem arises because time-invariant pricing forces the firm to buy a price hedge bundled with its power. In this example, the cost of power plus the hedge is greater than the benefit to the firm from consuming power.

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[30] [(8 days x 1 unit x $50) + (1 day x 2 units x $250)]/10 total units = $90. For the sake of simplicity, we assume away the distribution utility's costs, so that retail prices are just the average of the appropriate wholesale prices.

If the firm buys power under a time-invariant pricing system, but with the kind of demand response program discussed in this comment, then the firm likely will operate just enough to earn the right to sell back power during the high-demand period. It is thus cashing in the hedge, but flawed rules – such as "you qualify to sell 2 MWh in the demand response program if you consumed 1 MWh on the low-demand day before the high-demand period" – mean that the firm in this example finds that its most profitable strategy is to operate only on low-demand days before high-demand days. Such a program, however, would create efficient incentives for firms that get more benefit from consuming each kWh than the $90/MWh that they pay when they consume power under the flat rate.