ORAL ARGUMENT HAS NOT BEEN SCHEDULED

Nos. 11-1486, *et al.*

IN THE

United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA CIRCUIT

ELECTRIC POWER SUPPLY ASSOCIATION, *ET AL.*,
Petitioners,

v.

FEDERAL ENERGY REGULATORY COMMISSION, *ET AL.*,
Respondents.

On Petition for Review from the
Federal Energy Regulatory Commission

BRIEF OF ROBERT L. BORLICK, JOSEPH BOWRING, JAMES BUSHNELL, AND 18 OTHER LEADING ECONOMISTS AS *AMICI CURIAE* IN SUPPORT OF PETITIONERS

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CERTIFICATE AS TO PARTIES, RULINGS, AND RELATED CASES

Pursuant to Circuit Rule 28(a)(1), *amici curiae* state as follows:

Parties and *Amici*. Except for *amici curiae* listed on this brief, all parties, intervenors, and *amici* appearing before the agency and this Court are listed in the Opening Brief of Petitioners Electric Power Supply Association, *et al.*

Rulings Under Review. The rulings under review are listed in the Opening Brief of Petitioners.

Related Cases. There are no related cases of which *amici* are aware.

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OTHER AUTHORITIES

GLOSSARY

Commission	Federal Energy Regulatory Commission
FERC	Federal Energy Regulatory Commission
FTC	Federal Trade Commission
ISO	Independent System Operator
LMP	Locational marginal price
NOPR	Notice of Proposed Rulemaking
RTO	Regional Transmission Organization

INTEREST OF *AMICI CURIAE*

Amici curiae (listed in Addendum A) are leading economists and educators who have designed, studied, taught, and written about the electricity markets affected by the Federal Energy Regulatory Commission Final Rule under review here, *Demand Response Compensation in Organized Wholesale Energy Markets*, Order No. 745, 76 Fed. Reg. 16,658 (Mar. 24, 2011), FERC Stats. & Regs. ¶31,322 (2011), *reh'g denied*, Order No. 745-A, 137 FERC ¶61,215 (Dec. 15, 2011).[1] That Rule establishes the rate wholesale market participants must pay retail customers for ***reducing*** purchases of electric energy during peak-demand periods. In particular, FERC now requires market participants to pay the full "locational marginal price" ("LMP") for electricity that is not consumed, treating

[1] Pursuant to F.R.A.P. 29(c)(5), *amici* certify that no counsel for any party authored this brief in whole or in part and that no counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No *amici* were compensated for their participation in this brief. Robert Borlick, William Hogan, and Roy Shanker were compensated experts in the proceedings below. James Bushnell, Scott Harvey, and Benjamin Hobbs were compensated as members of the Market Surveillance Committee of the California Independent System Operator, Inc., which filed comments in proceedings below. Paul Centolella was a Commissioner on the Public Utilities Commission of Ohio and as part of his official duties participated in the submission of comments in the proceedings below. Counsel's fees and expenses incurred to prepare this brief were paid by the Independent Power Producers of New York, Inc. and the New England Power Generators Association, Inc. No other person or entity made a monetary contribution intended to fund the preparation or submission of this brief.

non-consumption of energy as the equivalent of costlessly producing energy. *See* Pet. Br. 45-61.

Although the views of *amici* may diverge on market-design issues in other contexts, they all agree that FERC's Rule creates a counterproductive demand-response mechanism that produces economically undesirable behavior and wasteful outcomes that will injure consumers and society in the long run. Although FERC invokes economics to justify its course, the Final Rule is economically irrational. Retail customers that reduce their consumption should not be paid as if they generated the electricity they merely declined to buy. Instead, retail customers should be compensated as if they had entered into a long-term contract to purchase electricity at their retail rate but instead, during a peak-demand period, resold the electricity to others at the market rate (LMP). In other words, they should be paid "LMP-minus-G," where G is the rate at which the retail customer would have purchased the electricity. Simply put, the customer must be treated as if it had first purchased the power it wishes to resell to the market.

FERC never adequately explains its decision to adopt its contrary approach. Nor could it. By overcompensating reductions in retail purchases, the Final Rule encourages retail customers to reduce demand even when society would be better off if they continued purchasing electricity needed to engage in productive activity. It encourages inefficient self-supply of electricity. And it leaves market

participants paying for the delivered electricity more than once—first to the generator that created it and then to the user who provided the demand reduction. That overpayment harms both suppliers and non-demand-response consumers, to whom the cost of the subsidy ultimately will be passed on.

INTRODUCTION AND SUMMARY OF ARGUMENT

I. In most markets, the price of a good serves to ensure equilibrium between supply and demand, while efficiently allocating goods among purchasers. If demand increases when supply does not, prices rise and purchasers respond: Those who value the good most highly continue to buy it, while those who value it less do not. Price increases also send an important signal to create additional supply. FERC has repeatedly recognized the critical importance of efficient price signals in competitive markets.

Few observers of electricity markets, however, would dispute that those markets often feature a disconnect that prevents price signals from operating effectively. ***Wholesale*** prices for electricity in competitive organized markets reflect the minute-to-minute fluctuations in demand and supply. By requiring the use of "locational marginal pricing" or "LMP" in wholesale markets, FERC has tried to ensure that wholesale market participants see—and respond to—appropriate price signals.

But the ***retail*** rates paid by consumers are often fixed in advance and do not fluctuate during peak periods. As a result, real-time price signals are not transmitted to electricity consumers. Even when the market price (and the cost) of generating an additional megawatt of electricity during a peak-usage period is relatively high, retail customers (who typically have unlimited access to supply at a fixed rate) do not curtail demand in response to the price signal.

II. For that reason, many economists agree that it may be useful to provide retail consumers with an incentive to avoid using electricity, *i.e.*, to stimulate "demand response," during peak periods. FERC came to that same conclusion. But the incentive FERC chose is impossible to reconcile with the basic principles of economics the Commission invoked. FERC now requires market participants to compensate purchasers for not using electricity by paying them the full market price (LMP) of that electricity—the same amount the purchaser would earn if it costlessly obtained electricity and resold it into the wholesale market. But full LMP is not the price signal that retail consumers would see if the wholesale/retail price disconnect were eliminated, and it promises to create undesirable incentives that harm economic welfare. Indeed, that is precisely why FERC had to superimpose ***another*** mechanism—the so-called "net-benefits" test—to try to correct for full LMP being overcompensatory and producing excess demand response. As Commissioner Moeller warned, "[t]he Commission's recent

progress in promoting competitive wholesale energy markets has the potential to be undone as a result of this well-meaning, but misguided Rule." Order 745 at 31,271-72 (Moeller, Comm'r, dissenting) (JA__).

In competitive markets, purchasers who reduce their consumption in response to price, reselling the input to others, earn the difference between the existing market price and the price at which they are entitled to buy. For example, if a retail customer has signed a long-term contract at $.10/kWh and the wholesale price rises to $.15, the customer can sell electricity at a profit of $.05—the difference between the $.10 he paid under the long-term contract and the wholesale market price. FERC's chosen demand-response mechanism, however, forces Independent System Operators (ISOs) and Regional Transmission Organizations (RTOs) to pay retail customers the full market price for reducing retail consumption, without offsetting the purchase price the customer avoided (*i.e.*, to pay the full $.15 in the above example).

That cannot be reconciled with basic economics. FERC erred by assuming that ***not using*** a megawatt-hour of electricity is economically equivalent to ***producing*** a megawatt-hour. And FERC's apparent assumption that more demand response is always better, regardless of the effect it has on other market participants, is false. FERC's chosen mechanism leads to distortions and social welfare losses it nowhere justified. By overcompensating purchasers for not consuming energy,

FERC will cause them to forgo otherwise economically beneficial activities when neither true costs nor competitive prices would lead them to do so.

The defects in FERC's mechanism are particularly clear if one considers a large purchaser who can self-supply electricity. FERC's method would not merely provide excessive incentives for the purchaser to reduce demand from the interstate grid by producing electricity for its own use ("behind-the-meter" generation). It would also reward such electricity generation more richly if the purchaser keeps the electricity solely for its own use rather than selling the same electricity into the grid. Nowhere has FERC explained why electricity should be more valuable if kept for self-consumption rather than being sold into the markets.

III. FERC's error is magnified because the Commission was presented with a demand-response mechanism that would replicate a retail market with real-time pricing. Under that mechanism, customers that reduce demand would be paid the difference between the market price and the retail rate they were entitled to pay for electricity. That alternative would avoid the market distortion caused by the Final Rule.

The Commission offered a hodgepodge of reasons for rejecting that commonsense approach. None withstands scrutiny. FERC claimed that, because a generator receives LMP when it sells electricity, so too should a demand-response provider. But not consuming power is different from creating power. And a

generator's profit is not the LMP it receives. It is the LMP it receives ***minus*** the costs it incurred to produce and deliver power. Nor can overcompensating demand response be justified as a means of reducing the externalities of electricity use (*e.g.*, pollution). The Final Rule is not calibrated to any externality and encourages consumers to move energy behind the meter—even when it is inefficient and could make externalities like pollution worse.

Although FERC claimed that an LMP-minus-G mechanism would be difficult to administer, that mechanism is already in use. By contrast, it is FERC's chosen mechanism that is practically impossible to implement. Recognizing that its compensation method will produce too much demand response, FERC attempted to mitigate that impact by creating an exceedingly complex net-benefits test that would require ISOs and RTOs to develop intricate equations to determine when demand response is permissible. But that test is necessary only because FERC's chosen demand-response compensation is excessive. And that test cannot replicate the efficiency produced by proper price signals, which allow ***individual*** customers to determine when to curtail demand. FERC's test, moreover, does nothing to mitigate the subsidy to demand-response providers that must be borne by other market participants, especially small customers.

ARGUMENT

The Commission's Final Rule defies the basic economic principles upon which the organized electricity markets were established. Declaring that it "is not limited to textbook economic analysis," FERC urged that it "may account for the practical realities of how [electricity] markets operate." Order 745 at P46 (JA__). But the Final Rule both violates textbook economic analysis and ignores the practical realities of how electricity markets operate. Having "chosen basic economic and competition principles as the guide" for its decision to stimulate demand response through the Final Rule, "the agency must adhere to those principles." *Mobile Pipeline Co. v. FERC*, 676 F.3d 1098, No. 11-1021, slip op. at 13 (D.C. Cir. Apr. 17, 2012). But here, FERC "jumped the rails" of fundamental economics and market reality, *id.*, imposing a formula for compensating reductions in retail consumption that exceeds what a competitive market would provide; pays those who decline to consume electricity more than those who actually generate it; and thereby creates perverse incentives that will injure consumers in the long run.

I. Efforts To Stimulate Demand Response Seek To Replicate the Vital Function of Price in Properly Functioning Markets

A. Price Serves a Vital Signaling Function To Regulate Supply and Demand

"Price is the central nervous system of the economy." *Nat'l Soc'y of Prof'l Eng'rs v. United States*, 435 U.S. 679, 692 (1978). "[T]he influence of prices on the behavior of consumers and producers is crucial for how a market economy

allocates scarce resources." Mankiw, *Principles of Economics* 7 (5th ed. 2008). "If an invisible hand guides market economies . . . then the price system is the baton that the invisible hand uses to conduct the economic orchestra." *Id.* at 85.

Price informs sellers when to produce: A market price higher than the marginal cost of production signals that another unit should be produced. And price informs consumers when to purchase: A market price below the value the consumer places on a product signals that the product should be purchased.

In an efficient market, rising prices signal the need to increase production (or decrease consumption), while falling prices signal the need to decrease production (or increase consumption). The resulting actions of buyers and sellers "naturally move markets toward the equilibrium of supply and demand." Mankiw, *supra*, at 77. For example, if widget-makers are not producing enough widgets to meet demand, the price will increase and production may increase; conversely, if purchasers confront higher prices, those that value the widgets less will curtail purchases. No one has to tell the widget-maker or its customers to alter their behavior; they just respond to the signals reflected in price.

B. Demand Response and Imperfect Electricity Markets

1. Electricity Markets Are Governed by the Same Principles of Supply, Demand, and Price

Those general principles apply to electricity markets. On the demand side, "[p]rice changes signal to customers in wholesale and retail markets that they

should change their decisions about how much and when to consume electric power." Electric Energy Market Competition Task Force, *Report to Congress on Competition in Wholesale and Retail Markets for Electric Energy* 47 (2007). Suppliers respond to price signals too. "If the cost of increasing production is small, a relatively small price increase may be enough to encourage producers to increase production in response to increased demand." *Id.* at 50. But if the cost is high, "suppliers will not increase production unless the price increases enough to cover the higher costs." *Id.*

FERC has long recognized the importance of price signals to balance supply and demand. It has recognized the importance of accurate price signals in auction mechanisms. *See Md. Pub. Serv. Comm'n v. PJM Interconnection, L.L.C.*, 127 FERC ¶61,274 (2009). And it has restructured organized wholesale electricity markets to ensure accurate price signals. *See Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Services by Public Utilities*, Order No. 888, FERC Stats. & Regs. ¶31,036 (1996).

2. The Special Challenges Created by Different Electric Regulatory and Pricing Regimes Impede the Signaling Function of Price

Although electricity markets are subject to the principles of supply and demand, they are imperfect, owing in large part to differences in how wholesale

and retail electricity are priced. Those differences impede the critical signaling function of price—an impediment that the Final Rule was supposed to overcome.

Wholesale rates are generally efficient. Most wholesale electricity in organized markets in the United States is priced according to "locational marginal pricing," or "LMP." Under LMP, "prices are designed to reflect the least-cost of meeting an incremental megawatt-hour of demand at each location on the grid, and thus prices vary based on location and time." *Sacramento Mun. Util. Dist. v. FERC*, 616 F.3d 520, 524 (D.C. Cir. 2010). LMP "communicate[s] the true market value of electricity at each location"; "create[s] financial incentives to dispatch the lowest cost energy"; and "encourage[s] transmission and generation investment at appropriate locations." *Id.* And LMP is dynamic: Because it "reflect[s] the supply-demand interaction," it "varies constantly." Borenstein, *Time-Varying Retail Electricity Prices: Theory and Practice*, in *Electricity Deregulation: Choices and Challenges* 317, 317 (Griffin & Puller eds., 2005). Wholesale market participants thus have an incentive to respond to increased prices during peak-demand periods by reducing purchases if possible.

By contrast, retail rates typically do not correspond to real-time price fluctuations. Borenstein, *supra*, at 317. Rather, the retail price "typically is constant for months at a time." *Id.* As a result, moment-to-moment or even day-to-day price signals are not transmitted to the actual consumers of electricity. Even

though the wholesale market price of electricity during a peak-usage period may increase dramatically, consumers paying a fixed rate have no economic incentive to decrease their consumption in response. *See* Order 745 at P57 (JA__). Indeed, that disconnect between the competitive price and the price paid by consumers—and the resulting lack of incentives to reduce demand during peak periods—was one of the "most obvious culprit[s]" for the 2000-2001 California energy crisis. Hilke & Wise, *Who Turned Out the Lights? Competition and California's Power Crisis*, 15 Antitrust 76, 76 (2001).

One way to align electricity-consumption practices with supply is dynamic pricing—charging retail customers "the relevant real-time or day-ahead LMP" of the consumed electricity. Motion for Leave to Answer and Answer of EPSA and White Paper by Professor William W. Hogan, Dkt. No. EL09-68, Attach. A, at 12 (Oct. 30, 2009), http://www.epsa.org/forms/uploadFiles/1227200000027.filename.FINALEPSAAnswertoDRS.pdf. By exposing electricity consumers to market-price fluctuations, real-time pricing ensures consumption decisions reflect the real-time cost of consumption—encouraging consumption during low-demand periods, and discouraging it during peak-demand periods. *See* Borlick, *Pricing Negawatts*, 148 Pub. Utils. Fortnightly 14, 16 (2010). But real-time pricing is not always feasible for all retail customers (because of customer resistance, legislative resistance, and the costs of installing real-time metering equipment). Griffin &

Puller, *Introduction* to *Electricity Deregulation*, *supra*, at 26. As a result, wholesale and retail prices typically do not converge in real time.

3. Compensating Demand Response Can Introduce Appropriate Pricing Signals to Electricity Consumers *If* Compensation Is Properly Calculated

Because few retail consumers receive a wholesale price signal to decrease usage during periods when power is scarcer and more expensive, *see* R.58 at 8 (FTC) (JA__), regulators have attempted to create price signals through "demand-response" policies—usually incentive payments to reduce consumption during peak demand. "Demand response means a reduction in the consumption of electric energy by customers from their expected consumption in response to an increase in the price of electric energy" or "incentive payments designed to induce lower consumption of electric energy." 18 C.F.R. § 35.28(b)(4).

Properly structured incentives can provide appropriate price signals to curtail usage when it is economically efficient—even if retail rates are otherwise constant. Excessive incentive payments, however, are deeply problematic. They damage society by overpaying businesses not to produce goods or services when it would be more efficient for them to continue production. They also deter investment in generation by denying generators sufficient compensation for the electricity they produce. And skewed incentives cause large consumers to self-supply electricity

to obtain overly generous demand-response payments even when their self-generated electricity is more costly to society.

The key demand-response question thus asks ***how much*** to pay a retail customer to forgo purchasing electricity at a fixed price when wholesale prices climb. The most obvious answer is to replicate market forces by asking what would happen if a fixed-price customer resold energy at the prevailing wholesale market price (*i.e.*, LMP). In that case, the customer's profit would be the difference between the sale price and the contract price. That difference provides an incentive to forgo energy consumption only when doing so is more profitable than using the electricity to produce goods and services (*i.e.*, when non-production is more efficient than production). Here, FERC chose instead to require ISOs and RTOs to pay retail customers the market price for wholesale electricity—the full LMP—***without*** subtracting the price the customer would have paid to buy it. *See* Order 745 at P61 (JA__); Order 745-A at P54 (JA__). The customer is thus compensated as if it had acquired or generated electricity ***for free*** and made it available to the market. As explained below, that result is neither justified nor justifiable.

II. Even Though the Commission Purported To Justify Its Decision on Economic Principles, Its Analysis and Justifications Defy Those Principles

Throughout the rulemaking process, FERC claimed that paying full LMP for demand response was justified by economic efficiency. In the NOPR (at P12) (JA__), FERC stated that "we believe paying demand response resources the LMP in all hours will compensate those resources in a manner that reflects the marginal value of the resource to each RTO and ISO, comparable to treatment of generation resources." Doing so, FERC concluded, "will improve the competitiveness of the organized wholesale energy markets and, in turn, help to ensure that energy prices in those markets are just and reasonable." *Id.*

The Final Rule maintained that focus, stating that "paying demand response resources the LMP will compensate those resources in a manner that reflects the marginal value of the resource to each RTO and ISO." Order 745 at P47 (JA__). According to FERC, "demand response can balance supply and demand." *Id.* at P55 (JA__). And in its order denying rehearing, FERC stated that "more demand-side participation will cause wholesale and retail prices to converge on a price level reflecting demand's ability to respond to the marginal cost of energy." Order 745-A at P61 (JA__). Notwithstanding FERC's effort to justify its decision as promoting economic efficiency, however, the Final Rule cannot be reconciled with fundamental economic principles.

A. Paying Full LMP Is Inconsistent with Basic Economics

Any demand-response mechanism must account for the costs the consumer avoids by not purchasing electricity—just as a competitive market would. *See* pp. 10-13, *supra*. In a competitive market, a consumer who resells electricity when market prices exceed the value he places on it cannot sell electricity he has not purchased; he thus receives only the difference between the price at which he can sell electricity and the price at which he bought it. The Commission here instead provided demand-response compensation by paying customers as if they resold electricity they obtained for free. That effort rests on two flawed assumptions.

First, and most fundamentally, FERC assumes that ***not using*** a megawatt-hour of electricity (the so-called "***n***egawatt-hour") is economically equivalent to ***producing*** one megawatt-hour of electricity. *See* Borlick, *Pricing Negawatts*, *supra*, at 14. But that "assumption is wrong." *Id.* "The characteristics of a megawatt and a 'negawatt' are different, both in terms of physics and in economic impact." Order 745 at 31,268 (Moeller, Comm'r, dissenting) (JA__). In terms of physics, a megawatt exists and can be measured; a "negawatt" is an imputed quantity calculated against a counterfactual baseline. In terms of economics, a megawatt and a negawatt are not equivalent, because a negawatt does not include the costs the consumer ***avoided*** by not purchasing the electricity. Equivalence should include "***all*** of the elements that enter into the economic evaluation." R.77,

at 4 (Hogan, *Demand Response Pricing in Organized Wholesale Markets*) (emphasis added) (JA__).

To offer an analogy, consider a manufacturer that produces an automobile it can sell to a dealer for $20,000; the dealer has agreed to then sell the automobile to a customer at cost ($20,000), but cars are in high demand and another customer wants to buy the car for $30,000. No one would say that the first customer should be paid $30,000 for ***not*** buying the car (this could be called a "***naught***omobile") just because another customer wants it or cars are in short supply. If one customer has a right to buy the car at $20,000, while another is willing to pay $30,000—and lack of supply means that both cannot purchase cars—the dealer could, in theory, sell the car to the second customer and give the first customer the $10,000 difference between the market price and the price at which she has the right to purchase. That would allocate the car to the customer who values it more, while giving the first customer an incentive to allow the second customer to have it. We would never, however, say that the dealer must: (1) pay the manufacturer $30,000; (2) pay the first customer $30,000 (the car's LMP) for not buying the car; and (3) sell the car at $30,000 (again its LMP) for a loss. But that is what FERC effectively has done: It provides the first customer with a windfall while requiring ISOs and RTOs to pay twice (to the electricity producer and the non-buyer) for a unit of electricity that they may only sell once for less than the total price paid.

Second, FERC "appears to assume that more demand response is always better," regardless of the amount. *See* R.199 at 2 (PJM Power Providers Group) (JA__). It then equates lower prices with efficiency, asserting that "the more demand response that sees and responds to higher market prices, the greater the competition, and the more downward pressure it places on generator bidding strategies by increasing the risk to a supplier that it will not be dispatched if it bids a price that is too high." Order 745 at P10 (JA__). But that is incorrect. To use an extreme example, beef consumers would prefer that an agency require that sirloin steak be sold for ten cents a pound. Such a mandate might (initially) benefit the consumer, but it bears no relation whatsoever to whether supply and demand are in equilibrium. And it is harmful in the long run because steak supply will decrease as farmers, unable to recover their costs, decline to maintain or replace their herds.

B. The Commission's Rule Is Uneconomic and Irrational

The obvious economic irrationality and pernicious consequences of FERC's decision to require payment of full LMP for demand response are illustrated by a few examples.

1. Excess Demand Response Causes Customers To Forgo Socially Valuable Activity

Paying full LMP will overcompensate demand-response providers, causing them to forgo other productive economic activity. For example, assume that it costs a widget-maker 30 cents per unit in fixed, retail electricity costs and 10 cents

in other production costs to produce one widget. The widgets have a market price of $1. The widget-maker's ordinary profit is thus 60 cents per widget. Society gains handsomely when the widget-maker converts 40 cents in inputs into a product consumers value at $1.

Nonetheless, society is better off if the widget-maker stops production once the LMP for electricity reaches 91 cents. At that point, the real cost of making a widget (labor and materials at 10 cents per widget plus the 91-cent per-widget electricity cost) exceeds the ($1) market price. If the demand-response payment is equal to LMP, however, the widget-maker will stop production at a lower price—when LMP reaches 61 cents. At that point, the widget-maker can earn more by doing nothing: It avoids its costs (30 cents in electricity at its contract rate and 10 cents per widget in production costs, assuming production costs fall to zero when production ceases), and it collects 61 cents in demand-response payments, more than the net profit of 60 cents from making widgets.[2]

That result clearly makes society worse off. Society would benefit from production—making widgets worth $1 from inputs costing 71 cents (61 cents in electricity and 10 cents in other costs)—yet the Final Rule would cause the widget

[2] In this example, we assume the price of the widget does not vary based on the temporary increases or decreases in electricity costs that demand-response policies are designed to address. The fact that electricity usage and wholesale prices peak in Peoria where one widget is located is unlikely to affect the global market price of widgets, since factories elsewhere will be unaffected.

maker to stop production nonetheless. *See* R.18, Attach. 1, at 5 (Hogan, *Implications for Consumers of the NOPR's Proposal to Pay the LMP for All Demand Response*) (JA__). The consumer-protective FTC made precisely that point, stating that paying full LMP would "give the wrong incentives" by "creat[ing] 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." FTC, *supra*, at 2 (JA__).

2. The Rule Creates Arbitrary and Uneconomic Incentives That Vary Based on Where One Puts the Meter

Under a properly calculated demand-response mechanism, the incentive to build new generation capacity "should be the same with respect to placing the generator on the consumer side of the [electricity] meter versus [the] RTO side of the meter." Hogan, *Demand Response Pricing*, *supra*, at 5 (JA__). But the Final Rule arbitrarily compensates large users more for generating electricity solely for their own behind-the-meter use than for putting it into the grid. The resulting incentives are perverse.

Assume our widget-maker can avoid dependence on the public grid because he owns or could build his own generator. In an efficient market, he would self-supply only when it costs less than purchasing electricity. Thus, if self-generation costs 60 cents per widget, we would not want him to self-supply until LMP hit 60.

But under FERC's approach, he would self-supply far sooner. For example, if his retail electricity rate is 30 cents per widget, the widget-maker will self-supply when LMP hits 31 cents per widget. His profit from self-supplying is the 30 cents per widget saved by not buying electricity from the grid, plus the 31 cents per widget (LMP) he receives as a demand-response incentive for not buying the electricity from the grid—1 cent more than the 60 cents it costs to self-supply. Thus, even though the economic cost of self-generating electricity is higher—60 cents per widget rather than the LMP cost of 31—the widget-maker will still self-supply. And that self-supply would appear as a "reduction in electricity consumption" even though the demand-response payment "has merely moved the consumption somewhere it is not visible to the RTO." Hogan, *Implications for Consumers*, *supra*, at 7 (JA__).

The absurdity of that result is made especially clear by comparing what would happen if the widget-maker were to offer the output of his generator into the market. If we assume that self-generation costs are 60 cents per widget and LMP is 60 cents per widget, he makes no money selling the electricity he generates into the grid: It costs him 60 cents per widget to generate the electricity, he gets paid 60 cents per widget to generate it, and he still pays for any electricity he uses from the grid (at his preset retail rate of 30 cents). But if he moves the generator behind the meter and keeps it for his own use, he does better. He gets paid 60 cents per

widget for not using electricity from the grid (instead generating himself), and he saves the 30 cents per widget he would otherwise have paid for the electricity he now generates for himself—even though he is self-generating and total consumption remains the same. The Final Rule thus provides a subsidy for self-supply and for refusing to share generated electricity with others. Indeed, "whether full LMP constitutes a subsidy isn't a serious economic question." Newell, *DR Distortion*, 148 Pub. Utils. Fortnightly 36, 41 (2010).

That behind-the-meter problem provides "the seeds of [the Final Rule's] own demise." Hogan, *Implications for Consumers*, *supra*, at 8 (JA__). Inefficient demand-response payments that do not account for avoided costs "must be recouped somewhere." *Id.* RTOs will need to raise prices for the remaining customers. But that increase will, in turn, "induce others to leave the system" and go behind the meter, creating an unsustainable inefficiency spiral. *Id.* And that spiral will disproportionately affect "residential and small commercial consumers whose operations are not of sufficient size and scope" to generate behind-the-meter electricity. *Id.* at 10. Rather than addressing that concern, FERC "assum[ed] that consumers would not respond to these incentives to move generators behind the meter or operate inefficient backup equipment." *Id.* at 11. But large, industrial consumers often have that option, and most behind-the-meter generators "are diesel units that lack emissions controls and that have a heat rate substantially

higher than the system average." R.240 at 18 n.58 (Competitive Power Supplier Ass'ns) (JA__). FERC "has not provided any evidence to support [its contrary] assumption." Hogan, *Implications for Consumers*, *supra*, at 11 (JA__).

III. Efficient Demand Response Mechanisms Replicate the Market

A. Demand Response Should Be Calculated by Subtracting the Retail Rate from the LMP

The Commission's irrational choice of LMP as the demand-response price is particularly aggravated given that an efficient alternative exists. In an efficient market, real-time pricing forces consumers to pay for their marginal consumption. *See* Hogan, *Demand Response Pricing*, *supra*, at 3 (JA__). If our widget-maker were required to pay LMP, he would have made widgets until the LMP rose above 90 cents per unit (when the electricity costs and production costs exceed the $1 market price). He would not have needed any demand-response payment because he would stop once his profits fell to zero.

Absent real-time pricing, however, demand response can provide a second-best solution so long as one avoids the Final Rule's mistake of creating behavior-distorting subsidies. "Payments based on the LMP minus retail rate structure eliminate these subsidies." R.163 at 6 (Dr. Roy Shanker) (JA__). That mechanism, "LMP-minus-G" (where "G" is the retail rate the consumer would have paid for the electricity), would make demand-response providers motivated by FERC-

imposed incentives behave like real demand-response providers responding to changes in wholesale market prices.[3]

For example, if a consumer has a right to purchase electricity at a particular rate, it might sell that electricity to another consumer at the existing LMP. If our widget-maker contracted to purchase electricity at 30 cents per unit and LMP rose to 91 cents per unit, he could stop production, exercise the implicit option to buy electricity for 30, sell it at 91, and net a profit of 61 cents per unit. "The net transaction for the customer would be the LMP minus the fixed price of the contract." Hogan, *White Paper*, *supra*, at 13.

LMP-minus-G mimics that result. *See* Shanker, *supra*, at 2 (JA__); Newell, *supra*, at 37. It does so by recognizing that "[e]conomic demand response isn't a sale of energy; rather it's a sale of a ***call option*** on energy." Borlick, *Pricing Negawatts*, *supra*, at 14 (emphasis added). Like other call options, the amount the demand-response provider receives must be offset by the strike price (here, the retail rate). Failing to subtract the retail rate, by contrast, allows the consumer to sell its electricity at full rates without ever having bought it. And that induces

[3] Use of real-time metering equipment is expanding rapidly; this "technical barrier to dynamic pricing should be lifted in the next five to 10 years." Faruqui & Palmer, *Dynamic Pricing and Its Discontents*, 34 Regulation 16, 17 (2011). But the Final Rule could impede the development of real-time pricing because overcompensated demand-response providers have little incentive to change to a pricing model that does not provide inefficient subsidies.

consumers to sell load reductions even when it is more efficient for them to purchase electricity. *See* pp. 18-20, *supra*.

The Commission previously recognized that paying LMP-minus-G is the economically appropriate demand-response mechanism. Rejecting the view that "payment of the full LMP is required," FERC stated that, "in a market where the retail rate is less than the LMP, PJM should compensate the customer by paying the difference between the LMP and what the customer would save by not using power (the retail price it didn't have to pay)." *PJM Interconnection, L.L.C.*, 99 FERC ¶61,227 at 61,941 (2002). And FERC has accurately labeled full LMP as a "subsidy" that "could lead [consumers] to curtail cost-effective production." *PJM Indus. Customer Coal. v. PJM Interconnection L.L.C.*, 121 FERC ¶61,315 at P26 & n.20 (2007). Yet the Final Rule imposes that subsidy nationwide.

B. Contrary Arguments Defy Economic Reason

1. FERC seems to have adopted a submission by Professor Alfred Kahn, *see* Order 745 at P57, P61 (JA__); Order 745-A at P58, P64 (JA__), which posits that demand response "is in all essential respects economically equivalent to supply response" (*i.e.*, increased production) and should be compensated equally. *See* R.149, Attach. A, at 2 (Dr. Alfred Kahn) (JA__). Professor Kahn argued that, because generators receive the market-clearing LMP as remuneration for the energy they produce, demand-response providers should also receive LMP for

reductions in demand. *Id.* Under that theory, full LMP payments to demand-response providers "are no more subsidies than the remunerations of generators for the power they actually sell." *Id.* at 15.

Although the late Professor Kahn was one of the most influential economists of his time, the argument does not withstand scrutiny. Professor Kahn ignored the fact that retail customers who curtail consumption ***both*** receive LMP ***and*** avoid the cost of purchasing electricity—a benefit electricity generators do not receive. *See* pp. 15-18, *supra*. And Professor Kahn ignored the crucial fact that a generator's profit is not the LMP it receives. It is the LMP it receives minus the costs it incurred to deliver power. "There is no need to deduct costs from the LMP payments made to generators, because generators actually incur those costs to deliver power. When they receive LMP, they earn the net amount equal to LMP minus their costs." R.99 at 4 (New England Power Generators Association, Inc.) (JA__). FERC nowhere explained why it should create greater incentives for demand-response providers to produce nothing than for generators to produce valuable electricity—forcing ISOs and RTOs to "dispatch excessive and inefficient amounts" of demand response instead of generated electricity. Borlick, *Pricing Negawatts*, *supra*, at 17.

2. FERC's purported concerns about "practical difficulties" with subtracting retail rates from LMP are unfounded (even FERC conceded it was

"perhaps feasible," Order 745 at P63 (JA__)). Not one ISO or RTO—the entities that would implement this supposedly "difficult[]" mechanism—suggested that LMP-minus-G would be problematic. Indeed, PJM and the Midwest ISO ***already*** offset avoided costs with little practical difficulty. R.240 at 35 n.117 (Competitive Power Supplier Ass'ns) (JA__). The New York State Public Utility Commission stated that subtracting retail rates would be "an administrative burden" that could engender "undue confusion," Order 745 at P28 (JA__), but other state commissions rejected those conclusory assertions. *See, e.g.*, Notice of Intervention, Comments, and Request for Settlement and Hearing, Indiana Utility Regulatory Commission, Dkt. No. EL09-68, at 3 (Sept. 16, 2009). And the New York Independent System Operator supported LMP-minus-G precisely because it "avoids the need for [the] complicated and contentious net-benefits test and cost allocation rules" FERC eventually adopted as an alternative. R.185 at 1 (JA__).

3. All but conceding the inefficiency and distortions its pricing rule creates, FERC attempted to mitigate those impacts by imposing a net-benefits test. The test requires each RTO or ISO to use "historical data" as well as an indeterminate list of factors bearing on supply conditions (such as fuel prices and generator unit availability) to calculate the point at which benefits from reduced LMP caused by demand response exceed the cost of paying LMP to demand-response providers. Order 745 at P4 (JA__). But the necessity of a net-benefits

test (which Professor Kahn did not endorse) itself illustrates the defect of the Final Rule: If paying full LMP produced appropriate pricing signals, FERC would not need to superimpose ***another*** test as a precondition to its demand payment mechanism. As the FTC explained, "there is no need for a net benefits test so long as [the Commission] utilizes efficient prices in compensating demand response providers"; "[t]he proposal to implement a net benefits test . . . arises as a policy issue only if [the Commission] sets inefficiently high compensation for demand response." R.204 at 1 (FTC). The FTC is not alone: "A clear majority of the witnesses (representing a spectrum of interests that included demand response advocates, economists, generators, and the RTOs and ISOs)" opposed the test, characterizing it as unnecessary as well as exceedingly complicated and difficult to administer. Order 745 at 31,270 (Moeller, Comm'r, dissenting) (JA__). FERC's reliance on unsubstantiated "practical difficulties" to reject LMP-minus-G, while simultaneously imposing a significantly more difficult net-benefits test to mitigate the impact of its erroneous rule, is not reasoned decisionmaking.

The net-benefits test, moreover, is deeply flawed. It assumes an omniscient regulator can accurately predict when demand response is appropriate, rather than allowing rational price signals to achieve that result. Worse, to replicate the effects of price signals, regulators would have to apply the net-benefits test for ***each*** proposed demand-response provider. It is far from clear that could be achieved. A

net-benefits test, moreover, fails to address the misallocation of compensation that occurs when participants end up paying twice for electricity they can sell only once.

Finally, under the net-benefits test, "every dollar of benefit gained by the wholesale buyers is expropriated from the generators." Borlick, *Paying for Demand-Side Response at the Wholesale Level: The Small Consumers' Perspective*, 24 Elec. J. 8, 16 (2011). In effect, FERC has "sanctioned the exercise of market power by the demand side (*i.e.*, monopsony power), which is discriminatory and anticompetitive." *Id.* at 17. "[M]ost of the parties advocating such a net benefits calculation explicitly base it on the 'benefits' of such price suppression." Shanker, *supra*, at 4-5 (JA__). But artificially suppressing price effectively creates a "buyers' cartel," Order 745 at P26 (quoting comments by Professor Hogan) (JA__), benefiting demand-response providers while "discriminat[ing] against generators." Borlick, *Paying for Demand-Side Response*, *supra*, at 8.

"[I]n the long run," the burden of the net-benefits test will not be borne by generators; it is a cost that will be passed along to "residential and small business consumers," which cannot provide demand response, as they subsidize "large industrial and commercial consumers," which can. Borlick, *Paying for Demand-Side Response*, *supra*, at 8. That "is inefficient for the economy as a whole,

distorts production and consumption decisions, and raises prices in the long run." Shanker, *supra*, at 5 (JA__); *see* Newell, *supra*, at 38. FERC offers no answer.

4. Nor is it any answer to urge that overcompensating demand reduction helps internalize (and therefore decrease) externalities, like pollution, associated with energy consumption. *See* R.216 (Environmental Defense Fund), at 2-3 (JA__). Paying too much for demand response is not calibrated to address any particular externality (unlike carbon taxes, for example). *See* Borlick, *Paying for Demand-Side Response*, *supra*, at 11. It "do[es] nothing to induce electricity suppliers to reduce the environmental externalities they impose on others." Hogan, *White Paper*, *supra*, at 7. And overcompensating demand response in fact creates externalities like pollution: Among other defects, the Final Rule will encourage inefficient behind-the-meter self-generation, which tends to pollute more.

CONCLUSION

The petition for review should be granted and the Final Rule should be vacated.

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CERTIFICATE OF COMPLIANCE

1. This brief complies with the type-volume limitations of Fed. R. App. P. 29(d), because this brief contains 6,907 words, excluding the parts of the brief exempted by Fed. R. App. P. 32(a)(7)(B)(iii).

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Pursuant to Rule 25 of the Federal Rules of Appellate Procedure, I hereby certify that I have this 13th day of June 2012, served a copy of the foregoing brief electronically through the Court's CM/ECF system. Participants in the case registered as CM/ECF users will be served by the appellate CM/ECF system. In addition, two copies of the brief were served by first-class mail on the following:

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