

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Discussion Draft of Possible Elements of a)
National Action Plan on Demand Response)

Docket No. AD09-10-000

COMMENT OF THE FEDERAL TRADE COMMISSION

December 11, 2009

I. Introduction

The Federal Trade Commission (FTC) appreciates this opportunity to comment on the *Possible Elements of a National Action Plan on Demand Response: A Discussion Draft* (“Action Plan”).¹ This Action Plan discusses programs that empower consumers to reduce the cost of operating the electricity system and share in the savings. The Action Plan proposes constructive action in important areas.

We applaud the Action Plan for its even-handed treatment of price-based and administrative approaches; its emphasis on consumer research; and its recognition that renewable, weather-sensitive generation technologies create new roles and challenges for demand-side programs. We also believe, however, that the Federal Energy Regulatory Commission (FERC) should consider expanding each of these approaches and offer additional concrete plans to support dynamic pricing. We recommend that the Action Plan focus on understanding end-users (consumers) and how their needs change the optimal design of the demand response programs in which they will be key players. We also recommend that the Action Plan support creation of infrastructure and processes that will support beneficial competition, entry, learning, and innovation.²

A. Demand response programs should be designed to address consumer needs and provide benefits to consumers

FERC plans extensive, carefully considered efforts to meet the needs of stakeholders such as utilities, state regulators, and regional independent system operators (ISOs).³ FERC’s

¹ FERC Docket No. AD09-10 (issued Oct. 28, 2009), *available at* <http://www.ferc.gov/EventCalendar/Files/20091028124306-AD09-10-000-Discussion.pdf>; *see also* 74 Fed. Reg. 57165 (Nov. 4, 2009).

² In an Appendix that follows the body of this comment, we briefly discuss a number of secondary issues arising from the Action Plan that we believe deserve careful consideration.

³ Throughout this comment, we use the terms “ISO” and “ISOs” to encompass not only independent system operators but also regional transmission organizations (RTOs).

outreach efforts aim to help these stakeholders develop programs to better manage demand and to support marketing that encourages consumers to participate. Yet it is end-users – consumers and businesses – who create and control demand, and who ultimately will choose whether to participate in demand response programs. Thus, the Action Plan should place greater emphasis on designing programs that consumers find convenient and attractive. A deep understanding of consumers’ preferences and motives, decision-making patterns, ability to deal with technology, and willingness to pay attention to energy use should inform the design of demand response programs. Such well designed programs can deliver benefits, including reduced bills, a greater sense of control over power bills, and increased electric system reliability. The best programs not only are attractive to participating consumers, but also benefit utilities and all ratepayers by helping to solve the engineering challenge of matching the quantity of power generated to the quantity consumed minute-by-minute.

The Action Plan proposes constructive consumer research regarding how best to explain demand response to consumers. We think that consumer research that sharpens one’s understanding of consumers’ needs, perceptions, and preferences also has a crucial role to play in designing demand response programs. For example, a better understanding of consumers’ concerns could inform choices about tradeoffs between electric pricing accuracy and simplicity; between the costs and benefits of installing “enabling” technology that allows consumers to program their thermostats to reduce air conditioner operations automatically when power is scarce; and between the simplicity and “customizability” of that enabling technology. A better understanding of consumers informs the development of programs that customers perceive as attractive, fair, and low-risk, and as contributing to their communities. Such an understanding can enable the development of effective demand response programs that end-users perceive as an attractive way to save money and better manage their consumption.

B. The Action Plan should support competition, entry, and innovation in the electricity industry

The Action Plan often implies that existing utilities, on their own, will provide demand response programs and that the “planners” will know these programs’ full potential benefits before they are deployed. This may be true for some important programs, such as those that let utilities temporarily shut down air conditioners during scarcity periods and similar direct load control programs. The Action Plan, however, should do more to support innovation and facilitate competition.

- The Action Plan should recommend building an infrastructure to allow a variety of firms to compete to provide demand response programs (or the technology to support demand response). Important FERC policies create infrastructure for energy market competition by requiring information disclosure and non-discriminatory treatment of participants.

- The Action Plan should recognize that learning and equipment upgrades will improve customers' ability to respond over time to programs such as dynamic pricing. The Action Plan should foster learning and should inform decision-makers about each program's potential to support learning. It should acknowledge that, all else equal, demand response programs that encourage continuous performance improvements are better than direct load control programs that offer no incentives for end-users to improve their performance.

II. Interest of the FTC

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.⁴ The FTC's competition advocacy program has produced two staff reports on electric power industry restructuring issues at the wholesale and retail levels.⁵ 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 2007.⁶ In

⁴ 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](http://www.ftc.gov/speeches/majoras/070410energyconferencereemarks.pdf). FTC merger cases involving electric power markets have included the *DTE Energy/MCN Energy* (2001) (consent order), available at <http://www.ftc.gov/os/2001/05/dtemendo.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.)

⁵ 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).

⁶ See <http://www.ferc.gov/legal/fed-sta/ene-pol-act/epact-fina-rpt.pdf>.

addition, the FTC has held public conferences on energy topics, including *Energy Markets in the 21st Century* (April 10-12, 2007)⁷ and *Carbon Offsets & Renewable Energy Certificates* (January 8, 2008).⁸

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 (FPA) Section 203 (Docket No. AD07-2-000). The FTC submitted comments in July 2004 and January 2006 in FERC's proceeding on its FPA Section 205 standards for market-based rates (Docket No. RM04-7-000). 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.⁹

III. Several Elements of the Action Plan Should Be Strengthened

A. Commendable aspects of the Action Plan

The Action Plan includes several appealing implementation strategies and activities that warrant emphasis and further refinement, including:

- its even-handed treatment of pricing approaches (vis-à-vis administrative approaches) to demand response;
- its acknowledgment that end-user diversity has important implications for designing an appropriate portfolio of programs;

⁷ Conference materials available at <http://www.ftc.gov/bcp/workshops/energymarkets/index.shtml>.

⁸ 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.shtml>); and the Department of Justice and FTC workshop on *Electricity Policy*, held on April 23, 1996.

⁹ See, e.g., Federal Trade Commission, Comment before the Federal Energy Regulatory Commission on Wholesale Competition in Regions with Organized Electric Markets (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.shtml.

- its recognition of the importance of consumer research for the design of demand response programs; and
- its view that demand response can be useful in both a traditional peak-load shaving role and an emerging role in managing potential imbalances between the quantity supplied and the quantity demanded stemming from volatility in intermittent renewable generation output.

We encourage FERC to expand its efforts in each of these respects. We provide several specific suggestions regarding implementation strategies below.

B. The Action Plan should increase its support of dynamic pricing

FERC’s own National Assessment of Demand Response Potential foresees dynamic pricing and enabling technology as key parts of strategies that have the potential to offer up to three times the level of demand response as the “business as usual” scenario.¹⁰ This suggests that the Action Plan might expand upon its existing plans to research, refine, and support dynamic pricing programs.

The Action Plan’s discussion of issues such as baselines, valuation, measurement, and verification recognizes that demand response programs use two basic mechanisms:

- “Administrative” programs, which pay customers on status-quo requirements contracts¹¹ to reduce their usage during critical periods.
- Dynamic pricing programs, which charge customers based on how much power they use and when they use it.

Administrative programs create incentives for consumption reduction to address some of the adverse impacts of flaws in time-invariant rates by encouraging end-users to reduce use when time-invariant prices are far below the cost of power. By contrast, dynamic pricing programs address these flaws directly by making retail prices more closely reflect wholesale prices. Programs designed to create incentives to reduce power consumption can create thorny measurement, verification, and valuation questions, because they require quantifying not only how much power customers actually used, but also how much customers *would have used* absent the incentives. The programs often pay customers to reduce load from an original baseline usage level. Baselines, however, are at best imprecise. Moreover, they often reward people who game

¹⁰ See page 20, Figure 2.

¹¹ Requirements contracts offer customers unlimited amounts of power at pre-set prices. These pre-set prices are below cost during scarcity conditions.

the system by exploiting the baseline's own counterproductive incentives. In practice, customers often can alter their use patterns in ways that exploit the baseline-setting formulas in order to increase their rebates, without changing their critical period use. Idiosyncratic factors can lead baselines to differ widely from the amount the customer would have used in the absence of incentives to conserve. These factors include differences in weather between the baseline-setting and critical periods, in the number of people present, and in the equipment in use. As a result, sometimes administrative programs are beset with intractable problems.

Conversely, one virtue of dynamic pricing programs is that they require only metering data about actual usage and thus simplify measurement and verification, eliminating some of the problems described above. Dynamic pricing programs' incentives typically are fairly transparent and generally do not allow idiosyncratic or strategic choices to lead to unintended changes in incentives to conserve.¹²

C. Improving the section on dynamic pricing

Although Section 2.3.4 ("Provide Guidelines on Rate Design for Dynamic Pricing") makes a variety of points that we believe should be implemented, it also should acknowledge that the appropriate dynamic rate for a customer is a function of the customer's sophistication, size of use, tolerance for risk, and preferences, as well as of the available enabling technology.

Similarly, the "simplicity" discussion focuses on the simplicity of the rate component rather than the overall simplicity of customer participation. We recommend that FERC expand its discussion of simplicity to encompass the simplicity of participation, and discuss rate simplicity as a facet of that larger picture. The Pacific Northwest National Lab GridWise pilot used enabling technology to make it easy to participate in a program that set prices every 5 minutes (*i.e.*, 100,000 times a year). Under the "Simplicity" rubric, the Action Plan asserts: "Dynamic pricing rates should be easy for the customer to understand. If the customer does not understand how the pricing works, or is overburdened with information, then he or she will not be able to appropriately respond to the price signals and shift load." That language seems counterproductive, in that it precludes the possibility that technology could make it simple to respond to complex rates that closely track current electricity market conditions. Research could assess this possibility by exploring customers' enthusiasm for "set it and forget it" technology that automates response to rates in accordance with consumers' preferences. This technology allows immediate demand response to frequently changing prices, without requiring end-users continuously to monitor prices and manually adjust their air conditioners and other equipment.

¹² Our views about the advantages of dynamic pricing over administrative baseline programs are similar to those articulated by leading electricity scholars James Bushnell, Ben Hobbs, and Frank Wolak in "When It Comes to Demand Response, Is FERC its Own Worst Enemy?," 22:8 *Electricity J.* 9 (2009).

Real-time pricing yields the greatest social benefits when consumer prices reflect the social cost of the marginal unit of power. FERC’s efforts to support dynamic pricing might benefit from an effort to identify facets of ISO energy markets, capacity markets, and operating procedures that may cause real-time prices not to capture accurately the social costs of supplying electric power.¹³ The Action Plan would benefit from the inclusion of a plan for transitioning to a system that relies on significant demand elasticity as a primary way to manage power scarcity – a departure from the status quo, which attempts to compensate for an extreme lack of demand elasticity by using market power mitigation and resource adequacy measures.

IV. The Action Plan Should Put the “Demand” Back into “Demand Response”

The final Action Plan needs to emphasize the paramount importance of demanders (*i.e.*, consumers) in demand response. The current draft often overlooks the fact that the *end-users* who create demand are central actors in demand response programs, and it gives too little attention to understanding and addressing their needs. The draft sometimes implies that regulators and utilities alone will decide how end-users will modify their usage to ensure low-cost, equitably billed, highly reliable power, after which marketing professionals will convince end-users to play the role chosen for them by regulators, ISOs, and utilities.

In our view, the Action Plan should assess consumers’ interests, perceptions, and preferences as a first step, to support the design of programs that both consumers and utilities will find to be attractive, “win-win” propositions. The Action Plan is correct that regulators, ISOs, marketers, and utilities are crucial intermediaries that need to cooperate to strike win-win deals with consumers. Thus, the Action Plan takes a comprehensive approach to understanding demand response issues from the perspective of those entities. It should recognize the crucial role of end-users and devote similar attention to them.

The FTC focuses on maintaining the consumer benefits of market activities in both of its primary missions – maintaining competition and protecting consumers. We study consumer perception and behavior, assess the impacts of policies on consumer welfare, and use the results of that analysis in policymaking. We recommend that the Action Plan do so as well.

Dynamic pricing and demand response will succeed if they can empower end-users to address costly and important power system problems in a way that delivers benefits such as bill savings, convenience, and control that consumers find attractive. The Action Plan’s consumer research proposal in Section 2.2.1.2 is important and constructive. It proposes research aimed at “develop[ing] a nationally consistent messaging framework . . . [that] could facilitate customers’

¹³ Commissioner Elliott of the Illinois Commerce Commission spoke about this concern at the FERC Technical Conference on November 19, 2009.

understanding of demand response as well as its benefits.”¹⁴ This analysis is particularly important in light of considerable evidence that many demand response programs fall short of their potential or fail altogether because marketing program designs and marketing efforts did not reflect a clear understanding of customer needs.¹⁵

In sum, the Action Plan's consumer research proposal focuses on research to understand “[w]hat messages are most effective to help consumers understand what demand response is.” Consumer research, however, should be used not only to inform the important inquiry that FERC frames, but also to inform discussions about what demand response *should be* in order to maximize effective consumer participation in programs that increase electrical system efficiency.

In work written when he was a doctoral student affiliated with the University of California Energy Institute, Robert Letzler illustrated how consumer research might inform rate design. Customers who received considerable payments to participate in a California Critical Peak Pricing (CPP) pilot used less power on peak, saved money, and reported satisfaction with the program.¹⁶ A majority chose to pay to continue on CPP after the conclusion of the experiment. Only about 1 percent of consumers, however, chose to participate in similar residential dynamic pricing programs when given the opportunity, absent experience with the program. Considerable research on consumer decision-making suggests that the rare, high “critical” prices found in conventional CPP repel consumers. Letzler’s work suggests modifying the rate with “Incentive Preserving Rebates” that change the presentation of CPP to work around decision patterns that overweight the high prices and are likely to generate counterproductive resistance by consumers. Incentive Preserving Rebates keep total annual bills and marginal incentives the same. An offer of rebates to consumers to reduce their usage below a target level recasts their voluntary alteration of consumption as an opportunity to gain rather than as a threat that they could face higher power bills. Incentive Preserving Rebates maintain incentives by selling customers efficiently priced rights to use critical-period power at the former price. Customers earn rebates equal to the value of the rights they leave unused. Selling each customer efficiently priced rights avoids the usual design issues described above regarding baselines.

¹⁴ The communications elements of the Action Plan might be strengthened with additional efforts to understand how to explain to consumers the pace of the rollout of advanced meters and the likely large regional differences in demand response programs.

¹⁵ Galen Barbose, Charles Goldman, and Bernie Neenan, “A Survey of Utility Experience with Real Time Pricing” (Lawrence Berkeley National Laboratory, 2004), *available at* <http://certs.lbl.gov/pdf/54238.pdf>; Robert Letzler, “Using Incentive Preserving Rebates to Increase Acceptance of Critical Peak Electricity Pricing” (Nov. 3, 2009), *available at* http://www.allorama.org/rl/cpp_ipr_Nov_09.pdf.

¹⁶ Letzler, *supra* note 15.

The best demand response programs incorporate consumer interests and preferences, create efficient incentives, address the nature of scarcity and volatility in the region, and address regulatory and utility concerns. The Action Plan adequately addresses important engineering, stakeholder, and regulatory concerns at the design stage, but needs to incorporate consumer concerns as well. Below are examples of consumer research projects that can inform demand response program design. Some of this consumer research might inform both the technical paper series in Action Plan Section 2.1.5 and the analytical tools discussed in Section 2.3.1.

A. Control

- Which consumers prefer highly automated response to rapidly changing pricing (perhaps augmented with price displays), manual response to simpler pricing models, or direct load control? How are these preferences sensitive to details like user interfaces, the perception of user control, price ceilings, and bill risk? The Pacific Northwest National Lab GridWise trial reported high levels of consumer satisfaction with a program that automated response to 5-minute pricing.¹⁷ California's statewide pricing pilot kept customers satisfied with manual response to simple pricing,¹⁸ while a major residential CPP program gets very high satisfaction rates with a combination of simple pricing and “set it and forget it” automation.¹⁹ All of these options seem technically feasible. Consumer preferences and cost-benefit calculations should be major aspects of the choice.
- Residential CPP program customers reported that increased control over their electricity usage and bills was a major benefit of participation. This raises questions such as: What do customers mean by increased control? How can we build programs and user interfaces to deliver a sense of control, and offer marketing materials to convey that sense? How can those approaches be incorporated into a consumer-friendly design that addresses other consumer and company preferences?
- What kinds of enabling technology interfaces, usage and price displays, and feedback enable customers to respond better? Which display approaches increase satisfaction?

¹⁷ D. J. Hammerstrom, *et al.*, “Pacific Northwest GridWise Testbed Demonstration Projects,” available at http://gridwise.pnl.gov/docs/op_project_final_report_pnnl17167.pdf.

¹⁸ Karen Herter, “Residential implementation of critical-peak pricing of electricity” (Lawrence Berkeley National Laboratory, 2006), available at <http://escholarship.org/uc/item/6tq6c9d4>.

¹⁹ Brian White, “GoodCents *SELECT*: Advanced Energy Management Program” (Gulf Power Co., PowerPoint presentation), available at http://www.ewh.ieee.org/r3/nwflorida/presentations/01_19_06.ppt.

- If consumers want automation to simplify and ensure their response while they lead complex lives, how much control do they want over their response? The user interface could offer a simple continuum between “maximize comfort” and “maximize savings”; or it could let customers express complex preferences about time- and appliance-specific response strategies. For example, such a user interface might allow a consumer to choose to make air conditioning very price-sensitive during the afternoon and modestly sensitive during the evening.

B. Rates and features, risk and distribution

- What features would attract end-user participation by eliminating what end-users view as major problems? Do customers find it important to be able to adjust their home thermostats remotely by mobile phone or Internet, so that they can come home to a comfortable house? How many consumers will refuse to sign up for CPP programs that sometimes expose them to high prices during the dinner hour?
- Customers who use a high percentage of their power on-peak often resist dynamic pricing because it could increase their power bills. Economists have suggested ways to improve customers’ incentives, while roughly preserving each customer’s current bill level. These sometimes complex strategies make participation attractive to more people by allowing more customers to realize bill savings if they respond to prices. It would be quite useful to conduct research into whether these approaches can be modified into something that customers find comprehensible, fair, and attractive. Which consumers would be comfortable with a buy-your-own-baseline approach, implemented either by asking consumers to decide how much to buy or by automatically selling customers a baseline?²⁰
- To what extent do tools such as limits on bill volatility, annual payments, smart appliances, real-time price and consumption display devices, or preannounced, CPP-like price levels²¹ make small, unsophisticated customers willing to sign up for a combination of enabling technology and frequently updated (*e.g.*, hourly or 5-minute) prices?²²

²⁰ For more discussion of these issues, *see* Severin Borenstein, “Wealth Transfers Among Large Customers from Implementing Real-time Retail Electricity Pricing,” 28:2 Energy J. 131 (2007).

²¹ For example, the rate could commit to low, medium, high, and critical price levels and to the number of hours per year each price level would be in effect.

²² Such a program would allow a utility to set a low price during a very windy summer weekday afternoon hour, and then switch to a critical price later the same day if the wind suddenly stopped blowing.

- How much bill volatility are large commercial and industrial customers willing to experience, and how do they feel about the inclusion of a default hedge in their rate?²³ What bill shock management approaches do small customers want and find comprehensible and comforting?
- It would be useful to understand consumer responses to existing and novel methods of financing investments to reduce energy bills. These investments might enable demand response, provide distributed generation, or increase energy efficiency. How many consumers would make an energy investment that would save them \$15 a month by paying \$300 upfront? How many more would make this investment if they could pay a monthly charge of \$10 on their utility bills for the next 30 months instead of making an upfront payment? What if payment could be through a \$10-per-month increase in their mortgage payments? These results could inform the design of demand response programs and identify supportive legislation, regulations, or links to financial institutions.

C. Do end-users want energy efficiency and demand response in the same package? Should there be a demand response certification program separate from broader “energy smart” certification?

- In what situations do customers want equipment that is both demand-response-ready and energy efficient? Do many small to medium-sized customers express a strong preference for grid-friendly products without also voicing a strong preference for energy efficiency? How many customers are interested in products that are energy efficient but not grid-friendly? Do these preferences for product characteristics change when customers are told that demand-response-enabled products help integrate wind generation? Would these customers prefer unified certification of both energy efficiency and demand response capabilities? Can unified certification accurately inform consumers and avoid creating misperceptions and false expectations? Unified certification might backfire if consumers get a false impression that certified appliances are always more efficient or cheaper to run than uncertified appliances. This is an instance in which the demand response education program for small customers likely will need to be accurate and unambiguous, yet simpler than the educational materials and contacts with large customers or with the electricity policy community.
- Appliances already come with a plethora of certification logos and labels describing their safety, energy efficiency, and standards compliance. Most of these certifications are obscure. Well recognized, respected labels such as “Energy Star” are the exception, not

²³ See Severin Borenstein, “Customer Risk from Real-Time Retail Electricity Pricing: Bill Volatility and Hedgability,” 28:2 Energy J. 131 (2007).

the rule. Would a logo certifying grid friendliness or demand-response-readiness be likely to get lost among the other certifications?

- Wisner and Pickle present evidence that many customers would prefer mandatory green power programs to voluntary ones.²⁴ This suggests that consumers do not always prefer more individual choice when they decide about energy services that have both private and shared effects. Choosing appliances is already complex for time-strapped consumers. In addition, grid-friendly circuitry might be inexpensive, and the benefits of a single grid-friendly appliance are likely to justify only modest monetary incentives to choose a grid-friendly model. In view of these considerations, would consumers prefer that grid-friendliness be required?²⁵ Would many people choose a grid-friendly appliance over a similar, slightly cheaper model that lacked the grid-friendly technology if that feature were optional? How many grid-friendly appliances likely would be sold in the absence of a mandate? Will manufacturers voluntarily include grid-friendly circuitry?
- Which kinds of large industrial and commercial customers want to make demand response and energy efficiency investments in a single package, from a single vendor? Which are in position to benefit from a package that delivers significant benefits on both fronts? Can such customized packages be made available to consumers in areas where retail competition is not allowed?

E. Learning

- What is the learning curve of consumers, and how is it affected by particular circumstances? How can the Action Plan foster end-user learning?

F. Offering expertise to individual end-users or associations of end-users

²⁴ Ryan Wisner and Steven Pickle, “Green Marketing, Renewables, and Free Riders: Increasing Customer Demand for a Public Good” (Lawrence Berkeley National Laboratory 1997), *available at* <http://eande.lbl.gov/ea/emp/reports/40632.pdf>.

²⁵ Grid-friendly appliances have the potential to confer both private benefits on their owners and public benefits on society by preventing socially costly voltage collapses and by reducing the need for costly public investment in plants that adjust their output minute-by-minute to prevent brownouts and surges. These public goods might justify making grid-friendly circuitry mandatory. Automobile headlights are mandatory and provide an analogous mix of benefits because they reduce the private cost of crashes and the need for public investment in street lights.

The Action Plan might consider assessing and addressing end-users' needs for technical assistance to select and participate effectively in demand response programs. Section 2.1 of the Action Plan already appears to go beyond its mandate to propose assisting local officials: "Local officials governing publicly-owned and cooperatively-owned utilities face challenges similar to those of state governing officials, and FERC staff proposes that the National Action Plan identify requirements for technical assistance to them . . ." End-users are largely absent from the Action Plan's extensive discussion of technical assistance and consultation. It is worth considering similar technical assistance to and interaction with end-users, either individually or through the non-profit trade or community associations that represent them.²⁶

V. **Creating Process and Institutions that Support Learning, Innovation, Entry, and Competition**

A. **Conceptualizing demand response as an ongoing process rather than a one-time decision**

The Action Plan should recognize that responding to dynamic pricing is as much a process as it is an investment. Sophisticated commercial and industrial customers will improve their ability to respond to price changes and demand response events with experience. Section 2.3.1 seems to conceptualize demand response projects as if they were, like windows or insulation, a one-time investment with known, predictable benefits. Table 3 of the Action Plan proposes to develop, *inter alia*, "[t]ools for retail electricity consumers, especially commercial and industrial consumers, which help them assess the likely net financial benefits of participating in demand response programs" and "[t]ools for utilities . . . that can help them determine the cost-effectiveness of implementing demand response programs . . ." FERC's plans make sense because cost-benefit estimates that reflect demonstrated performance yield conservative, credible assessments of who should participate and what they should expect, and existing plans to support them are appropriate. The Action Plan, however, should acknowledge that these analyses have shortcomings and should include steps to augment them with other analysis (including the likely effects of consumer learning and technical advances).

²⁶ This comment recommends that the Action Plan tailor its efforts to meet its audiences' needs. Although this comment focuses on understanding and addressing end-users' needs, the Action Plan also should tailor its services to the audience of state regulators and utilities. The current draft proposes an extensive series of research papers meant to speak to regulators and utilities broadly, together with modest, highly tailored consulting. Specifically, Section 2.1.5 lists 24 examples of research projects. Section 2.1.6 suggests modest, short, client-driven technical support site visits and consulting efforts. The Action Plan might offer more consulting to help state agencies design response programs. Client-driven consulting likely would identify pressing general interest issues that technical papers could address.

If program participants learn by doing, then static cost-benefit calculations based on initial performance are likely to understate benefits to both utilities and end-users. Better technology – for instance, smart thermostats and ice-storage air conditioners – will gradually become available to increase the magnitude, speed, and reliability of dynamic pricing customers' responses. These products likely will come to market only when enough customers participate in dynamic pricing programs. An assumption that participants will use only existing, first-generation technology is likely to understate benefits.

The best demand response programs give customers incentives to make better choices and then reward them for increasing their ability to synchronize their operations with the availability of cheap power. The potential for learning is one of dynamic pricing programs' many advantages over direct load control programs and interruptible tariffs. Similarly, dynamic pricing programs can manage modest scarcities by using the smallest price increase that will prompt enough flexible firms to reduce or reschedule use. Dynamic pricing programs that set prices hourly or every 5 minutes to reflect current system conditions offer customers a greater potential to learn to solve more of the grid's problems.

The Action Plan should:

- Update its static estimation tools periodically as performance improves.
- Help entities assess program participants' potential for learning.
- Support participants' learning by making information about actual usage, business implications, and costs available to participants. End-users would also benefit from tools to estimate the usage and cost implications of other operating decisions. For example, a tool for an office building might estimate the implications for usage and conditions inside the building of raising air conditioning set points, pre-cooling, or temporarily shutting down compressors altogether.
- Disseminate lessons learned by utilities and early-adopting end-users in the form of case studies and documentation (or improved documentation) of smart practices and of the operating qualities of common equipment. This documentation can help convince risk-averse decision-makers to try an approach that has succeeded elsewhere.
- Consider whether it can support the creation and dissemination of expertise about recent discoveries and the application of that knowledge to decisions about particular facilities.

B. The Action Plan should build an institutional infrastructure to support innovation, entry, and competition in the electricity industry

The Action Plan should conceptualize demand response as an infrastructure that allows not only utilities, but also end-users and new providers of demand response, to capture the value of managing consumption so as to help the grid balance the quantity supplied and the quantity demanded on a minute-by-minute basis. Regulators should ensure that the demand response infrastructure allows entrants and end-users to participate.

For example, there may be room for FERC to require that ISOs offer a standardized real-time pricing product and communications protocol to large commercial and industrial customers or energy service providers. This would allow corporations whose operations span several ISOs (*e.g.*, “big box” stores) to use the same demand response hardware and procedures nationwide. Standardized protocols will offer economies of scale to hardware vendors and curtailment service providers, because a single product can serve a larger region. This is a logical extension of FERC's significant efforts to create infrastructure for competition in wholesale markets, by, for example, requiring transmission providers to offer an Open Access Same-Time Information System. Similarly, if FERC required utilities and ISOs to use standardized communication protocols and to grant service providers access to utility customers’ price and metering data, such action would allow energy management firms to compete to serve customers. We recommend that Point 6 in Table 4 of the Action Plan be augmented to describe these benefits.

C. The Action Plan should eliminate the counterproductive distinction between “dispatchable” interruptible load programs and “callable” price programs

Good communications standards and infrastructure also might allow the elimination of the needless distinction between “dispatchable” direct load control and “callable” price-responsive demand. Sidebar 2 of the Action Plan describes this distinction: “Demand response can be both dispatchable and non-dispatchable. Dispatchable demand response refers to planned changes in a customer’s consumption in a response to direction from someone besides the customer. It includes direct load control of customer appliances such as those for air conditioning and water heating [and] directed reductions in return for lower rates (called curtailable or interruptible rates). . . . Non-dispatchable demand response refers to programs and products in which the customer decides whether and when to reduce consumption based on a [dynamic] retail rate . . . that charge[s] higher prices during high-demand hours and lower prices at other times.”

Conventional dispatchable programs have significant limitations because end-users want to limit the degree to which grid operators can interrupt power and how often they can do so.

For example, air conditioner direct load control programs can be activated only during certain seasons. Dispatchable programs have been in use for decades, which means that they are well proven but also that their basic design and implementation reflect the technology available in an earlier era. Direct load control cannot make subtle operational changes such as pre-cooling buildings. Conventional dynamic pricing programs offer larger potential response – because they leave more control in users’ hands – and better incentives for participants to educate themselves regarding the timely operation of all of their electrical equipment. Reportedly they do not offer the kind of speed, control, and predictability preferred by the engineers who operate grids. Technology makes it possible, however, to develop programs that capture the best qualities of both approaches in dynamic pricing programs that yield known, dispatchable response to price signals that can be sent on short notice. Such programs package excellent economic incentives in the kind of predictable, dispatchable system that makes grid operators comfortable.²⁷

Pacific Northwest National Laboratory's GridWise pilot has already demonstrated “smart” thermostats that submit bid curves for electricity based on the user’s willingness to pay for comfort and the current temperature in their house.²⁸ This system gives users the kind of control typical of “callable” price systems, while also providing grid operators the ability to dispatch precise changes in load in precise places. In practice, these systems are likely to be a hybrid of automated and manual response. A homeowner or business manager would have his or her computerized thermostat bid in the climate control system’s dispatchable, automated response to price signals. He or she could also modify the use of manually controlled electrical equipment (such as stoves and lights) in response to predictable price patterns or extreme weather. Programs that harness bid curves from users’ power control systems require appropriate two-way communication protocols. If this hybrid product has large benefits, creation of the right protocol infrastructure likely will enable innovative firms to offer it and share its benefits with consumers.

VI. Conclusion

There are numerous commendable aspects to the Action Plan, and we applaud FERC’s development of it. We recommend, however, that the Action Plan also:

- Attempt to better understand consumers’ preferences.

²⁷ See Mani Vadari, Battelle Energy Technologies, “Active Demand Management,” 147:11 Pub. Util. Fortnightly 42, 46 (Nov. 2009).

²⁸ D. J. Hammerstrom, *et al.*, “Pacific Northwest GridWise Testbed Demonstration Projects,” *supra* note 17.

- Design demand response programs to reflect consumers' preferences. Demand response programs should be developed from the ground up to address not only the needs of the grid, but also those of the consumers who create the demand and who will likely need to volunteer to participate in demand response programs.
- Foster positive processes such as learning, innovation, and competition.
- Increase analysis and consulting to support dynamic pricing.

Appendix: Additional Opportunities

I. Strategic Vision and Goals

FERC circulated an earlier discussion draft of the Action Plan in February 2009. Both that earlier version and the current one have a good general direction. We appreciated the February draft's invitation to address the question "[w]hat should be the strategic vision and goals of the National Action Plan?"²⁹ FERC's initial view that a strategic vision would help organize and focus the Action Plan strikes us as correct. A clearly articulated set of goals, benefits, and criteria can help make the case to the public and steer supportive policy development by state regulators and legislators.

FERC may want to use a nuanced strategic vision to guide and revise the Action Plan, but use a simpler vision to guide communications about demand response to the general public. Thus, we offer comments about a vision to guide the Action Plan's development. The Action Plan might see demand response as a toolkit of cost-effective approaches to empower end-users to address costly grid problems and to let them share in the savings. Such an approach would consider the Congressionally mandated communication plan, tools, and support to states as building blocks. The Action Plan would use these building blocks to address barriers to demand response, such as those identified in FERC's June 2009 Staff Report entitled "A National Assessment of Demand Response Potential."³⁰

Demand response programs need to be a compelling solution not only for utilities, ISOs, and regulators but also for the end-users who will typically have to choose to participate. Demand response can (1) manage peak demand periods in a cost-effective way and (2) handle emerging challenges posed by increased reliance on intermittent, renewable generation sources. Demand response providers and end-users work together to better manage the grid. Policies should allow both kinds of participants to capture some of the value that their efforts create.

This approach should recognize that programs work best when they:

²⁹ "FERC Staff Discussion Draft on Possible Elements of a National Action Plan on Demand Response," at 1 (Feb. 2009).

³⁰ See <http://www.ferc.gov/legal/staff-reports/06-09-demand-response.pdf>.

- offer customers “good” incentives³¹ to reduce consumption when power is scarce and expensive, and to shift consumption to periods when power is plentiful and cheap;
- keep volatility in energy bills within the range acceptable to target customers;³²
- require a level of customer involvement in understanding, tracking, and responding to energy market conditions that potential participants find acceptable and commensurate with the benefits the program offers³³; and
- present the incentives in ways that are compatible with the ways in which customers think about risks and bill changes.³⁴

We suggest this emphasis because:

- **Utilities support only those dynamic pricing and demand response programs that will not diminish their profitability.** Utilities believe that dynamic pricing programs

³¹ We use the term “good incentives” to describe incentives that are significantly better than status quo, time-invariant electricity pricing. Time-invariant retail prices do not change from hour to hour. Wholesale power, however, costs less than \$100 per megawatt-hour most of the time, but it can cost \$1,000 during scarcity periods. Creating perfect incentives requires real-time prices that capture the marginal cost of generation, environmental externalities, and scarcity rents. We encourage policymakers to aspire to price at social marginal cost, although we recognize a variety of political and practical barriers to doing so. It may not be practical to offer perfect incentives soon, but it is practical to offer good incentives.

³² Shielding consumers from bill volatility (*i.e.*, volatility in total monthly charges) need not shield them from paying volatile prices on the margin. See Severin Borenstein, “Customer Risk from Real-Time Retail Electricity Pricing: Bill Volatility and Hedgability,” *supra* note 23.

³³ Demand response programs range from direct load control programs (which allow the power company to shut down certain equipment during scarcity periods with zero customer awareness or involvement), to consumer dynamic pricing programs (in which automated thermostats do much of the work of responding to price changes, but consumers have the opportunity to make other changes), to real-time pricing programs for large, sophisticated industrial facilities (in which energy managers may monitor hourly prices and adjust plant operations in response to modest, hour-to-hour power price differences).

³⁴ In “Using Incentive Preserving Rebates to Increase Acceptance of Critical Peak Electricity Pricing,” *supra* note 15, Letzler discusses how consumers tend to focus on narrow time periods and on unexpected bill increases. Letzler’s paper suggests that such consumer perception repels customers who would otherwise be happy with dynamic pricing, although it is possible to change the presentation of dynamic pricing so as to avoid these negative perceptions.

could hurt their bottom line and that they have a fiduciary responsibility to protect profits, even at the cost of sacrificing economic efficiency. Allowing utilities to capture some of the benefits of demand response, or protecting them from unexpected enrollment or consumption patterns, may make utilities enthusiastic partners rather than obstacles.

- **Consumers want enough benefits to justify participation:** A Lawrence Berkeley National Laboratory study observed that “[a] number of program managers suggested that the modest participation rates in their RTP [real-time pricing] program were a result of the fact that . . . the vast majority of eligible customers view the risks of RTP as too great and/or the potential benefits as too small.”³⁵
- **Participation rates may increase significantly if incentives are presented in ways that are compatible with how consumers think.** We discussed this at length above.
- **Flawed incentives undermine program effectiveness:** An Anaheim baseline-rebate field experiment found strong consumer reactions not only to the desirable incentive to reduce critical period consumption, but also to the program’s perverse incentive to raise consumption during baseline-setting weekday afternoon hours.³⁶

A portfolio of programs tuned to address specific target audiences and specific grid needs is likely to be the best feasible option.³⁷

Many of these goals already seem to be implicit in the Action Plan, but the Action Plan sometimes reads as if a clearer understanding of its own goals would make it better focused and more comprehensive.

II. Unifying Planning for Analysis: Synergies Between Consumer Research, Technical Paper, and Assessment Tool Agendas

³⁵ Barbose *et al.*, “A Survey of Utility Experience with Real Time Pricing,” *supra* note 15, at 22.

³⁶ Frank A. Wolak, “Residential Customer Response to Real-Time Pricing: The Anaheim Critical-Peak Pricing Experiment” (2006), *available at* ftp://zia.stanford.edu/pub/papers/anaheim_cpp.pdf.

³⁷ The alternative to using a portfolio of programs would be to have one highly automated, extremely flexible program. The Pacific Northwest National Laboratory GridWise demonstration hints at what such a program might look like. Demonstration participants got equipment that automated their response to prices that changed every 5 minutes; they also received appliances that automatically reduced consumption during transient scarcities that led to drops in alternating current frequency.

Several sections of the Action Plan propose analysis to improve demand response programs and to understand what (and where and when) to deploy. The Action Plan discusses these analysis efforts in quite separate consumer research, technical paper, and assessment tool sections. The research agendas of these sections overlap, as they should. Separate treatment may miss opportunities to make coherent plans and to benefit from synergies.

For example, one project might produce both a paper and analysis tools. Other analysis might inform the communications toolkit's marketing messages and a paper on choosing consumer-friendly features. The Action Plan might yield better analysis if a single section identified important questions for analysis and assessed whether each analysis project is best delivered by means of technical assistance, tools, technical papers, and communications materials in some combination.

We encourage the National Demand Response Coalition to collect and distribute existing research, data, and insights and to support research to fill in the significant gaps. Projects such as the California Statewide Pricing Pilot already have addressed many of the questions that the Action Plan raises in its list of "Social Science" research projects.

III. Transition Strategy

FERC's Action Plan addresses the challenge of moving from the status quo – where volatility in electricity demand is managed largely by building costly, rarely used facilities – to a new paradigm in which many electricity consumers will be able to shift demand away from scarcity periods (such as hot summer days). Legislators, regulators, or utilities frequently want convincing, "real-world" evidence before they will endorse programs that mandate participation or will spend money on new approaches. The Action Plan should describe incremental implementation, which might begin with the deployment of voluntary programs in locations where regulators are receptive and where there are large potential benefits. Early successes would create opportunities to launch more programs and to expand existing programs by, for example, switching enrollment from "opt-in" to "opt-out." The Action Plan might support the analysis and diffusion of successful program models and help new programs learn from their predecessors.