



Strategic Consulting

2215 Bridgepointe Parkway | Suite 300 | San Mateo, CA 94404 | ph 650.227.7770 | fx 650.227.7771

October 30, 2008

VIA OVERNIGHT MAIL

James J. McNulty
Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street
Harrisburg, Pennsylvania 17120

RECEIVED

OCT 30 2008

PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

Re: *Energy Efficiency and Conservation Program and EDC Plans*
PaPUC Docket No. M-2008-2069887

Dear Mr. McNulty:

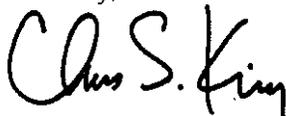
As a member of the Demand Side Resources Working Group, eMeter Strategic Consulting is responding to the solicitation of comments addressing the Commission's obligation to adopt an energy efficiency and conservation program by January 15, 2009. Our comments are limited to the procedures referred to regarding additional energy efficiency and conservation measures under section 2806.1(a)(6). In short, we respectfully urge the Commission to:

- Recognize the importance of consumer feedback programs as a means to influence behavior and reduce consumer energy consumption, and
- Allow, but not require, that the electric distribution companies include consumer feedback programs in their energy efficiency and conservation plans to be submitted by July 1, 2009.

The literature and numerous utility pilot programs have shown that consumer feedback using detailed metered usage information causes reductions in total consumption that typically range from 5 to 15 percent. Details are provided in the attached comments.

Please contact me with any questions regarding the attached comments.

Sincerely,



Chris King
President, eMeter Strategic Consulting

Attachments:

- (1) Print copy of comments
- (1) Electronic version on disk

Hard and electronic copies have been provided to:

- Bureau of Fixed Utility Services (FUS)
- Bureau of Conservation, Economics, and Energy Planning (CEEP)
- Law Bureau (Law)

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Energy Efficiency and Conservation Program
and EDC Plans

Docket No. M-2008-2069887

COMMENTS OF EMETER STRATEGIC CONSULTING
ON THE ENERGY EFFICIENCY AND CONSERVATION (EE&C) PROGRAM
REQUIRED UNDER THE AMENDED SECTION 2806.1(A)(1)-(11)

Summary

As a member of the Demand Side Resources Working Group, eMeter Strategic Consulting is responding to the solicitation of comments as part of the first phase of the above-referenced proceeding (addressing the Commission's obligation to adopt an energy efficiency and conservation program by January 15, 2009). Our comments are limited to the procedures regarding additional energy efficiency and conservation measures under section 2806.1(a)(6). In short, we respectfully urge the Commission to:

- Recognize the importance of consumer feedback programs as a means to influence behavior and reduce consumer energy consumption, and
- Allow, but not require, that the electric distribution companies include consumer feedback programs in their energy efficiency and conservation plans to be submitted by July 1, 2009.

The process of giving feedback on consumption motivates consumers to save energy through reduced waste. There is ample literature on the effectiveness of two basic types of feedback to electricity users: direct feedback in the home or business via a device or the Internet or indirect feedback via billing and periodic usage reports. Clear, immediate, and user-specific information is most effective in lowering energy usage. The literature shows that feedback has a significant role to play in raising energy awareness and in bringing about reduced consumption on the order of 5 to 15 percent.

Feedback Methods

Direct feedback methods include the following:

- In-home/in-building display devices that can show current rate of consumption, current cost of consumption per hour, etc.;
- Internet usage displays that show detailed energy usage information typically on a next-day basis;

- Smart meters operated by smart cards and two-way communications systems that, in conjunction with another device, can show consumption and cost information;
- Prepayment meters that provide direct feedback to use in electricity bill management; and
- Device monitors that are inserted between the plug and wall socket on appliances and show information such as current rate of consumption and current cost of consumption per hour.

Indirect feedback consists of data processed by the utility, then sent to customers. Such feedback includes the following:

- Actual bills based on metered usage rather than estimates, and possibly measured in intervals;
- More frequent bills, e.g., monthly rather than bimonthly basis;
- Comparison data on a year-to-year basis or normalized for weather; and
- Usage disaggregation, where use is estimated at the appliance level based on analysis of meter reads in association with customer-provided data such as appliance and housing stock.

Conservation Effect of Direct and Indirect Feedback Programs

There is an extensive body of experience with utility programs that influence behavior by providing feedback; EPRI Solutions' March 2006 meta-review sums it up well:

Numerous studies have demonstrated that customers do indeed respond to feedback on their energy use. ... A review of literature from the past three decades ... found savings ranging from 1 to 20 percent when customers were given real-time feedback. Most of the studies, however, found savings in the 4 to 15 percent range. ... Direct feedback is what makes the link between cause and effect obvious for electric consumers.¹

In fact, the more direct the feedback is (that is, provided in real time) and the more it is offered with the provision of other influences (such as energy-saving information or dynamic prices), the better it influences behavior.

¹ - "Direct Energy Feedback Technology Assessment for Southern California Edison Company," prepared by Lynn Fryer Stein and Nadav Enbar, EPRI Solutions, March 2006. It should also be noted that there is a risk of self-selection bias toward those more interested in conservation.

Sarah Darby of Oxford University conducted a review of 38 feedback studies, going back to 1975.² Of these, 21 studies were from 1987 to 2000. The results show a clear conservation effect of feedback.

Darby discusses these results:

While it is not possible here to go into the detail of each study, it appears that direct feedback, alone or in combination with other factors, is the most promising single type, with almost all of the projects involving direct feedback producing savings of 5 percent or more. The highest savings-in the region of 20 percent-was achieved by using a table-top interactive cost and power display unit; a smartcard meter for prepayment of electricity (coinciding with a change from group to individual metering); and an indicator showing the cumulative cost of operating an electric cooker. In the absence of a special display or a PC display, the feedback was supplied by the reading of standard household meters, sometimes accompanied by the keeping of a chart or diary of energy use. The implication that this meter-reading was a factor in reducing consumption demonstrates how seldom people normally consult their meters (probably hidden away) and/or convert their readings into useful information.

Direct feedback in conjunction with some form of advice or information gave savings in the region of 10 percent in four programs aimed at low-income households (with constant or improved levels of comfort), indicating the potential for feedback to be incorporated into advice programs on a regular basis.

Providing direct financial incentives for consumers to save energy (a method tested during the late 1970s) made little lasting impact: consumption reverted to what it had been once the incentive was removed. Cost signals need to be long-term to have a durable effect.

The implication is that all those studies which demonstrated some effectiveness had enough of a common element (or elements) to succeed; or that they compensated for lack of one element with another. It could be, as a minimal explanation, that any intervention helps if it triggers householders into examining their consumption. It could also be that the personal attention of the experimenters motivated the householders into action. However, the

² - Darby, S., "Making It Obvious: Designing Feedback into Energy Consumption," in Energy Efficiency in Household Appliances and Lighting, edited by Bertoldi et. al., Springer, 2001.

documentation of these feedback projects points strongly to other factors at work, of which immediacy or accessibility of feedback data-allowing the householder to be in control-are highly important, accompanied by clear information that is specific to the household in question. Provision of such data is coming well within reach in terms of the technical possibilities for metering, appliance and heating system design.

Conservation Effects of Frequent Feedback

Monthly feedback on electric usage is generally insufficient to enable customers to manage usage effectively. In a dated but still likely valid study of 14 utility and government programs carried out in the United States, residential customers provided with daily feedback on electricity usage reduced total consumption by an average of 11 percent.³

Internet Data Display – Residential Consumers

Many utilities now offer customers energy usage information via the Internet. The data vary from simple monthly data to estimated usage by appliance for residential customers to detailed quarter-hourly usage data provided on a next-day basis. Customers are slowly but steadily taking advantage of their ability to access such data, typically beginning with a few percent of customers in the first year and growing by a few percent per year. In some cases, such as Ameren-UE, more than 20 percent of customers are actively using the utility Web site to obtain data and carry out customer service inquiries.

Initial results from analysis of the effects of these programs on total consumption indicate that access to, and use of, the data cause electricity consumers to become more efficient and use less energy. Many utilities have gone beyond just providing monthly consumption, both current and historical, and provide online energy analyses or even more detailed consumption information. For example, over 120 U.S. utilities offer their residential customers an online bill disaggregation tool that evaluates energy use to show how much each appliance or end use is consuming, and also makes recommendations on where to cut energy use, and by how much.

Internet Data Display – Large Commercial Consumers

For commercial customers, one of the largest and most comprehensive programs in place today is in California. Between 2001 and 2003, California utilities provided smart meters to all customers with peak demands above 200 kW. These meters contain electronic components enabling the utility to read them remotely and then communicate the collected energy-use data

³ - Farhar, B. et. al. "Effects of Feedback on Residential Electricity Consumption: A Literature Review," Solar Energy Research Institute, January 1989.

to a utility's billing system. The program provided approximately 23,300 real-time meters and associated electronic communications equipment, enabling customers to view their hourly load profile and energy use either over the Internet or on a real-time basis. The program included all of California's major utilities and was designed to motivate at least 500 MW of peak-demand reduction during its first year of operation.

The utilities provide customer access to usage information via the Internet using an integrated software package, including supporting hardware and software and professional services. Meter data from the previous day is sent to these systems for display to the customer the next morning. Customers have a variety of preformatted reports from which to choose and may also develop custom reports. These reports can be generated for specific time frames, such as the last 24 hours, the last month, and the last year. Customers can view charts comparing two different time frames for a single facility (such as July 2008 vs. July 2007) or two different facilities in the same time frame.

Southern California Edison (SCE) reported on customer usage of the system in October 2003.⁴ At SCE, the system is known to customers as SCE Energy Manager. Following the meter installation and confirmation that the Web site is reliably receiving data, the customer is sent a user ID and password along with sign-on instructions and fact sheets of the various energy rates and load-management programs available from the utility. One of the main objectives of the implementation was to make it easy for the customer to use the system with little or no training. However, for customers to maximize the use of the system, SCE conducted hands-on training sessions throughout its service territory. In addition, SCE staffs a program management office during business hours to assist customers with the Web site.

The California Energy Commission reports that 39 percent of Energy Manager users reduced total consumption as a result of using the system.⁵ The survey also found that 48 percent of users were able to reduce their energy costs, and 39 percent reduced peak load. With respect to accessing the data, 44 percent reported access at least once a week, with 54 percent reporting monthly or as needed access.

⁴ - Wood, K., "SCE's C&I Customers Manage Load in Real Time," *Transmission & Distribution World*, Oct. 1, 2003.

⁵ - Braithwait, Steven. "Peak Demand Impacts of TOU Rates and Customer Access to Usage Data," California Energy Commission Demand Response Workshop, June 8, 2004.

Conclusion

The Commonwealth of Pennsylvania has set forth ambitious goals affecting all electricity consumers. Electricity Distribution Companies will have the responsibility of delivering a 3% reduction in overall electricity consumption and a 4.5% reduction in peak demand by 2013 in order to avoid penalties. EDCs must deliver these conservation measures in a manner that is cost-effective and beneficial to all classes of ratepayers. Experimentation with new or unproven technologies and solutions is limited, per the language of the amendment. Thus, the EDCs would benefit by leveraging one of the best resources they have in hand: their trusted relationship with each of their customers.

As we have discussed above, consumer energy usage feedback is a solution that can reach every electricity customer. Feedback can be as simple as a chart on a printed electricity bill, or as sophisticated as an energy management web portal accessed by customers. Feedback motivates adoption of technological efficiencies. Feedback is necessary to engage people in peak demand reduction. Perhaps more importantly and most directly, feedback can elicit further conservation simply by inspiring customers to change their energy consumption behavior. The literature and numerous utility pilot programs have shown that consumer feedback using detailed metered usage information causes reductions in total consumption that typically range from 5 to 15 percent. Given the simplicity and far-reaching effect of feedback solutions, we recommend that the PUC:

- Recognize the importance of consumer feedback programs as a means to influence behavior and reduce consumer energy consumption, and
- Allow, but not require, that the electric distribution companies include consumer feedback programs in their energy efficiency and conservation plans to be submitted by July 1, 2009.

FedEx Express **US Airbill**
 FedEx Tracking Number **8612 5207 48493**

1 From
 Date **Oct. 30, 2008**

Sender's Name **Sharon Talbott** Phone **650 227-7770**

Company **eMeter Corp.**

Address **2215 Bridgepointe Pkwy, Suite 300**
 Dept./Room/Suite/Room

City **San Mateo** State **CA** ZIP **94404**

2 Your Internal Billing Reference **PO Box Comm**

3 To
 Recipient's Name **James McNulty** Phone **717 772-7777**

Company **Pennsylvania PUC**

Recipient's Address **Commwealth Keystone Bldg**
 Dept./Room/Suite/Room

Address **400 North Street**

City **Harrisburg** State **PA** ZIP **17120**



8612 5207 8493

Form ID No. **0200** Recipients Copy

4a Express Package Service

FedEx Priority Overnight
 Next business morning. FedEx shipments will be delivered on Monday unless SATURDAY Delivery is selected.

FedEx 2Day
 Second business day. Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected. FedEx Envelope rate not available. Minimum charge: One pound rate.

FedEx Express Saver
 Third business day. Saturday Delivery NOT available.

FedEx 1Day Freight*
 Next business day. FedEx shipments will be delivered on Monday unless SATURDAY Delivery is selected.

FedEx 2Day Freight
 Second business day. Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

FedEx 3Day Freight
 Third business day. Saturday Delivery NOT available.

FedEx 4Day Freight
 Fourth business day. Saturday Delivery NOT available.

FedEx 5Day Freight
 Fifth business day. Saturday Delivery NOT available.

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 Sixth business day. Saturday Delivery NOT available.

FedEx 7Day Freight
 Seventh business day. Saturday Delivery NOT available.

FedEx 8Day Freight
 Eighth business day. Saturday Delivery NOT available.

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FedEx 10Day Freight
 Tenth business day. Saturday Delivery NOT available.

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 Eleventh business day. Saturday Delivery NOT available.

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 Twelfth business day. Saturday Delivery NOT available.

FedEx 13Day Freight
 Thirteenth business day. Saturday Delivery NOT available.

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 Fourteenth business day. Saturday Delivery NOT available.

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 Sixteenth business day. Saturday Delivery NOT available.

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 Nineteenth business day. Saturday Delivery NOT available.

Packages up to 150 lbs.

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FedEx 2Day. Saturday Delivery NOT available.

FedEx Express Saver. Saturday Delivery NOT available.

FedEx 1Day Freight. Saturday Delivery NOT available.

FedEx 2Day Freight. Saturday Delivery NOT available.

FedEx 3Day Freight. Saturday Delivery NOT available.

FedEx 4Day Freight. Saturday Delivery NOT available.

FedEx 5Day Freight. Saturday Delivery NOT available.

FedEx 6Day Freight. Saturday Delivery NOT available.

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FedEx 8Day Freight. Saturday Delivery NOT available.

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FedEx 12Day Freight. Saturday Delivery NOT available.

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FedEx 14Day Freight. Saturday Delivery NOT available.

FedEx 15Day Freight. Saturday Delivery NOT available.

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FedEx 19Day Freight. Saturday Delivery NOT available.

5 Packaging

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 FedEx Pak*
 FedEx Small Pak
 FedEx Tube*
 FedEx Box
 FedEx Other

6 Special Handling

SATURDAY Delivery
 Not available for FedEx Standard Overnight, FedEx Standard Overnight, FedEx Express Saver, or FedEx 4Day Freight.

HOLD Weekday at FedEx Location
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HOLD Saturday at FedEx Location
 Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

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Cash/Check

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Recipient
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 Credit Card
 Cash/Check

Total Packages

Total Weight

Total Declared Value*

\$ 00

Credit Card Auth.

Your liability is limited to \$100 unless you declare a higher value. See back for details.

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Direct Signature
 Signature address may be left for delivery. Fee applies.

Indirect Signature
 Signature address may be left for delivery. Fee applies.

Signature Required
 Signature address may be left for delivery. Fee applies.

Signature Required
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