Real-Time Pricing Is the Real Deal: An Analysis of the Energy Impacts of Residential Real-Time Pricing

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ABSTRACT

Over the past three years of operation, the Community Energy Cooperative's residential real-time pricing program, the Energy-Smart Pricing Plan[SM] (ESPP), has proven itself as a viable model that links retail and wholesale markets and, through that link, increases price sensitivity of customers. This can lead to more efficient use of resources, energy and capacity.

Despite hot weather and high prices, the results from the summer of 2005 were very encouraging and reinforce the results of previous summers. The Cooperative found that rather than customers losing their sensitivity to price, the price elasticities found in previous years held up. The participants weathered a tough year and could provide system benefits through their changed energy usage.

While real-time pricing exposes customers to greater market volatility than other pricing products such as critical peak pricing, the results of the Energy-Smart Pricing Plan indicate that it provides additional benefits to consumers and to the system. In Illinois optional real-time pricing will be available to residential customers starting in 2007. For other states where restructuring is being implemented, policy makers should actively consider including real-time pricing among the rate options that are available for residential customers to choose.

Introduction

As the dust settles from the California energy crisis, the Enron scandal, the East Coast blackout of 2004, and the gas supply disruptions of fall 2005, it remains clear that many challenges remain in building a better, more efficient, and more reliable electricity industry. A critical challenge involves determining how to link retail and wholesale markets, and how increased customer price sensitivity can lead to more efficient use of resources, energy and capacity. This need is being increasingly recognized at a variety of levels (McKinsey 2001; IEA 2003; GAO 2005; DOE 2006), but no clear consensus has emerged regarding the best model, especially for residential consumers. While they are only a portion of the total load, they represent that vast majority of customers, and in summer peaking areas residential air conditioning load is the driving contributor to the growth in peak demand. Embedded in this debate is a tension between the desire to promote broad energy efficiency and the more targeted interests in peak load management (York & Kushler 2005). Traditional demand side management programs (e.g., air conditioner cycling or appliance rebates) have been well studied and a lot of attention has been focused on pilot programs in California that give customers what is known as critical peak pricing. In Chicago, the Community Energy Cooperative, in cooperation with local investor owned utility ComEd, has pursued a different path. The Energy-Smart Pricing Plan (ESPP) is the first residential real-time pricing (RTP) program that directly links customers' retail costs to the hourly wholesale market while at the same time making their energy consumption more efficient.

After more than three years of operation, this residential real-time pricing program has proven that it is a viable model. It has produced a number of exciting findings including:

- Strong demand response
- Increased awareness and action on energy efficiency
- High participant satisfaction
- Increased value for lower income households
- Demonstrated results in recruiting participants through traditional and innovative marketing methods
- Realization by local consumer advocates of the value of creating customer choice and system efficiency
- Program structure that can easily and cost-effectively be integrated into restructured energy markets

As policy makers, regulators and utilities consider what types of rate structures, metering technologies, load control programs, and efficiency offerings should be available to residential consumers, it is important that they consider true residential real-time pricing as an option to deliver value to customers and to the electric system. It can provide a platform from which other energy efficiency and conservation programs could be launched.

This paper explores some of the finding listed above, in particular, the results of several quantitative analyses of the hourly energy use of the more than 1,400 residential households that have participated in this program over a three-year period, from 2003-2005. There is a particular emphasis on the results of the very hot summer of 2005. The results of this paper are largely drawn from three years of third-party evaluations conducted by Summit Blue Consulting, with additional data compiled and calculated by staff of the Community Energy Cooperative. Additional exploration of the behavioral responses of participants in this program is considered in a companion paper, *Changing How People Think About Energy* (Isaacson et al. 2006). The Cooperative continues to research and evaluate the program, and is currently working to develop means to quantify the system benefits of this type of program if implemented at a large scale.

Background

The Community Energy Cooperative is a Chicago-based non-profit membership organization founded by the Center for Neighborhood Technology (CNT) in 2000. CNT's mission over the past twenty-five years has been to invent and implement new tools and methods that create livable, sustainable urban communities. This has been fostered through a unique combination of research, advocacy, and program implementation across the sectors of energy, transportation, economic development and smart growth. The Community Energy Cooperative grew out of CNT's work with the local electric utility ComEd. The early work explored the place-based value of peak demand reduction and the potential for community-based efficiency programs to capture the value of avoided infrastructure and energy costs associated with restructured energy markets. In its first few years of operation, the Cooperative focused on a model of calculating the per kW value of avoided energy use, ran programs to replace inefficient air conditioning and lighting, and created industrial and municipal load curtailment cooperatives. However, achieving a consistent, measurable value for the avoided energy proved extremely complex and was not sustainable as a business model.

As a result of that work on reducing peak demand, Cooperative staff began to appreciate the value of avoided energy costs in the emerging wholesale markets and began to explore what sort of pricing programs could produce similar results. The goal was to create a market-based system in which price signals would educate and motivate consumers to change their energy use and become more efficient. Real-time pricing of electricity was emerging as a model for large industrial customers (IEA 2003; Neenan 2005), but the conventional wisdom was that it would be too complex and full of risk for residential customers.

However, internal analyses conducted by the Cooperative of actual residential loads and the prices in the local energy market suggested otherwise. In 2002 the Cooperative negotiated an agreement with ComEd to develop and implement a pilot program to test the concept of residential real-time pricing. Unlike most pilot programs that are either proposed by a utility, or ordered by a regulatory body, this program resulted from the efforts of the Cooperative, a membership organization with an interest in developing community capital and protecting the environment. The Cooperative proposed an idea to a utility and to regulators and worked with them to develop and implement the program. This pilot was approved by the Illinois Commerce Commission in the fall of 2002 for a three year period (later extended for an additional year to coincide with the end of Illinois' transition to a deregulated marketplace). The pilot utilizes a ComEd rate known as Rate RHEP -- Residential Hourly Energy Pricing (Experimental), and is branded by the Cooperative under the name "Energy-Smart Pricing Plan." The Cooperative received grant funding from the Illinois Department of Commerce and Economic Opportunity to pay for the incremental cost of metering and some other expenses including evaluation. Program costs were supported by ComEd. More recently the Cooperative received funding from the Illinois Clean Energy Community Foundation for additional research on consumer behavior and on the interest in the potential for expansion of the program. The Cooperative is participating in discussions of how cost recovery will be handled for that future program.

ESPP is the first residential program of any scale that is based on real wholesale prices. In comparison, most other studies of real-time pricing have either been focused on the large customer segment and examined more complex two-part RTP tariffs (Neenan 2005), or in addition were based upon simulations of market responses rather than real behavioral results data from customers (e.g., Borenstein 2005). The results of the first two years of ESPP have been fairly widely disseminated (Tholin 2004; Summit Blue 2004; Summit Blue 2005; Restructuring Today 2005; Kiesling and Kleit 2006). As described below, the summer of 2005 was a quite different summer. It tested the limits of the program and provided a valuable new set of data from which to learn more about price signal impacts.

Meanwhile, another form of price signals to create incentives for changed consumer behavior during peak times began to emerge out of the southern United States led by Gulf Power. Critical Peak Pricing (CPP) is a time-of-use rate with an on-peak and off-peak price, and the added component of a callable peak period. In this model, the utility (or system operator) can select certain days (on a day-ahead basis) when a super-high peak price can be invoked. Typically CPP plans include enabling technology with which central air conditioning systems are controlled during those super peak times. The CPP model has been extensively studied in California as policy makers consider the potential for making it the default residential rate.

In terms of reducing peak demand, RTP and CPP seem to have roughly similar impacts. In 2003, the Cooperative found participants in RTP cutting demand at peak hours by about 20% (Star 2004), while in 2004 California CPP estimates ranged from 13 to 27 percent depending upon the rate structure and enabling technologies (Charles River Associates 2005). Another way to understand how participants respond to price is to measure the price elasticity, which is the relative amount by which consumers cut electric use as prices rise. A recent DOE report to Congress concluded that, "The Residential RTP study (Illinois) reported similar price elasticities as the California residential CPP study (i.e., 0.08 to 0.09); both studies were conducted during a comparable time period (2004) but in different markets." (DOE 2006, 33).

What is the added value of RTP compared to CPP? CPP is arguably simpler for the consumer. There is price variability, but prices are set for a period of many months or even a year and cannot fully connect retail prices to the wholesale markets. RTP passes on the hourly wholesale prices to the consumer, with only the added standard costs for distribution, transmission and ancillary services. If power is cheap in wholesale markets, it is cheap for RTP customers. If it rises, so do their costs. In this way, RTP blends the value of providing price signals to cut peak demand (as also seen in CPP) with the connection between wholesale and retail markets that economists advocate. (Caves, Eakin & Faruqui 2000; Smith 2002). There is an additional cost saving value to RTP customers, because, as Hirst and Kirby note, there are two parts of all electricity prices. First, the power itself. And second, a risk premium that suppliers need to add to cover their own price and volume uncertainty. As a result, "customers willing to accept the quantity and price risks would, in the end, pay less for electricity. These customers would do so by buying only the electricity commodity and by providing the insurance [themselves]. In addition, customers who face hourly prices can modify their loads in response to those prices and further lower their electricity costs" (Hirst and Kirby, 2006, 9).

Illinois is leading the way in residential real-time pricing. In April, 2006, the Illinois General Assembly unanimously passed SB1705 which mandates real-time pricing as an option for residential customers starting in January, 2007. It provides for the inclusion of some meter and program costs in the overall residential rate base if the Illinois Commerce Commission finds there would be net benefits to residential consumers from a large-scale program. Meanwhile, the two largest utilities, ComEd and Ameren, have already filed distribution rate cases that include the option of residential real-time pricing to start in 2007. These rates hold other charges (except metering) the same as would be paid by a residential customer taking a flat price determined by a New Jersey-style reverse auction. Negotiations in those rate cases are underway at the time of the writing of this paper to reduce the incremental metering and program costs for participants.[1]

The Energy-Smart Pricing Plan

The Energy-Smart Pricing Plan was developed as a very pure real-time pricing rate. As described above, while critical peak pricing has a real-time element (the ability to call a high price period) it does not actually let wholesale prices flow through to the consumer, and most of the time, CPP is basically a time-of-use rate. Likewise, a number of C&I RTP programs are based on two part tariffs in which the customers' baseline usage is priced at a set rate, and variations (above or below) are priced using real-time prices (Neenan 2005). ESPP simply passes on the wholesale energy prices. Customers pay for what they use at the going rate. There are no payments for curtailment (as in emergency demand response programs) or other types of reconciliations or true-ups.

[1]The scale of these costs continues to change. During the ESPP pilot they were somewhat high due to the lack of economies of scale. As part of the current ComEd Rate Case, an estimate of $5/month for metering and $2/month for program costs has been proposed for the initial start-up years. Those costs are likely to continue to go down over time as meter costs decline and technical standards change, operational efficiencies are gained, etc.

At the time ESPP was developed, ComEd only had a bundled residential rate that did not distinguish the various cost components of the price (generation, transmission, distribution). In addition, that rate was the result of a legislatively mandated schedule of rate reductions. In order to create a real-time rate during the era of a rate freeze, the Cooperative and ComEd developed a methodology of calculating an Access Charge and a Participation Incentive Charge, which netted out be a proxy for the distribution and transmission costs in a post rate freeze environment. The customer charge and other fixed costs remained the same as in the current flat rate. As mentioned earlier, the cost of metering for this program was supported by grants so participants did not have to pay an additional meter charge.

Instead of the flat rate for energy, ESPP participants pay a price that varies hour by hour and is set by the wholesale market on a day-ahead basis (prices are set the previous late afternoon for the following day). Initially this price was set by an algorithm that used a day ahead hourly block price and load shapes from the PJM West Hub to create a set of 24 hourly prices. In spring 2005, as a result of ComEd's integration into the PJM system, the rate was modified to flow through the PJM day-ahead hourly locational marginal price for the ComEd zone, with a few adders for transmission, ancillary services, etc.

Participants in ESPP were acquired through a variety of marketing methods, and represent a broad range of urban and suburban households. Half of the first year participants came to the program from their membership in the Cooperative as a result of previous programs. As a result of the targeting of some of those programs, low-income and Latino households were very well represented. The other half were new to the Cooperative and learned about the program through a variety of sources, including media coverage. In the second and third years of the program, almost all participants joined because of responding to traditional marketing efforts rather than because of any prior relationship with the Cooperative. Participation in the program was limited by the availability of funding for outreach and for meters, but the results of the marketing efforts suggested strong interest in it, and a sizeable potential audience. (See Isaacson, 2006 for more discussion of outreach efforts.) Table 1 illustrates some of the demographics of the approximately 1,400 participants.

Table 1. Selected Demographics

Housing Type	Single Family	85%	Multi Family	15%
Central Air Conditioning	Yes	52%	No	48%
Window Air Conditioning	Yes	40%	No	60%
Location	Chicago	38%	Suburban	62%

The Cooperative handled all aspects of participant acquisition, while ComEd replaced traditional watt-hour meters with interval demand recording meters that could track hourly energy usage. These meters were read by standard meter readers on the regular monthly meter reading cycle. To reduce costs, automatic meter reading was not used, and it appears that not having access to information in real time was not a barrier to participation. ComEd issues the bills because participants remain ComEd customers.

In addition to taking electric service under ComEd's Rate RHEP, the participants receive a variety of services from the Cooperative. These include:

- Information about hourly energy prices, including education about general price shapes by season, and access to each day's prices via a website or phone call-in number. The prices are available on a day-ahead basis.

- Notification of high price days of over ten cents/kWh. (Either by telephone or email.) These notifications are issued the previous evening.
- Access to web-based tools to view charts and graphs of energy use, price and cost down to the hourly level.
- Online and printed summaries of energy use, costs and comparable flat rate bills.
- Educational materials on energy efficiency and how to reduce usage during peak times.
- A hedged price cap of 50 cents/kWh to protect against the most extreme price spikes such as seen in 1999 (but never seen since then). The price of providing this cap has been nominal, and it is likely unnecessary in the future because of price caps at the wholesale level that provide the comparable protection against unlimited upside volatility.
- 60 participants have received central air conditioning cycling switches that are cycled for economic reasons to correlate with the high price notifications.

Results

Bill Impacts

Overall, participants have saved money on ESPP, but the amounts have declined each year, with 2005 actually showing a net loss for all participants, although 19% of participants still saved money on their individual bills in 2005 despite increased usage and prices (Table 2). The rate freeze in effect in Illinois from 1997 through the end of 2006 has distorted these results because the "price to beat" has not changed as the wholesale market has changed. While there is a mechanism in the pilot program rate to try to address the rate freeze, it has proven to be fairly imprecise. When the rate freeze in Illinois expires at the end of 2006, this issue will become moot. Price volatility in early 2006 returned to more normal levels, and participants have begun to realize savings again.

Table 2. Energy-Smart Pricing Plan Participant Costs

Year	Average Bill	Average Monthly kWh	Savings/Loss
2003	$51.10	630	20.1%
2004	$56.99	648	11.3%
2005	$77.82	758	-6.3%

Despite the losses in 2005, when given a choice to drop out of the program at the end of the year, 87% chose to stay. In the previous years, over 99% chose to stay. The only other attrition in the program has been due to participants who have moved and either not reapplied, or reapplied but were not eligible (funding for meters had run out, not in the right service territory, etc.). 2005 was a very hot year in Chicago, and all customers increased usage, so some of the perception of losses may have been mitigated by the perception that people expected to pay more, as did their non-participant neighbors.

Energy Prices

An electricity bill is made up of the combination of usage, price and fixed costs. The bills described above for participants in RTP are heavily impacted by the changing patterns of wholesale energy prices. The 2005 non-load weighted average price was 5.705 cents compared to 3.837 cents in 2004 and 3.217 cents in 2003.(For perspective, the non-load weighted average prices for prior to the start of the program were 3.093 cents in 2000 and 3.068 cents in 2001. It was the unusual and unexpected increase in average price in 2005, and not the maximum high price, that led to the losses in 2005.) In contrast, the standard rate other residential customers paid did not change.

As the average price crept up, the highest prices also increased. Prices reached just over 20 cents in 2005. For ESPP customers (2003 through 2005) it was the first time, but ComEd's Rate HEP for C&I customers had hours over 20 cents in 2000 (six hours with a 22.670 cents max) and in 2001 (19 hours with a 38.113 cents max), so such high prices were not without precedent. And back in 1999, prices hit seven dollars. Overall the maximum prices seen over the three years of ESPP were lower than were forecast during the modeling of the program's original design. In contrast, the average price has risen dramatically. The best explanation of these changes is that high peaks come from times of shortage and there is currently adequate capacity in the Northern Illinois market. On the other hand since ComEd has joined PJM, prices are set on the marginal cost of generation, and due to the overall fuel mix in PJM's spot markets, that marginal cost is being set more and more frequently by natural gas (PJM Market Monitoring Unit 2005). Natural gas prices over the past several years, and particularly since spring 2005, have risen dramatically leading to a related increase in the spot prices for electricity.

Weather

The Energy-Smart Pricing Plan began in early 2003. Three years worth of data are now available and have been analyzed. Because weather is a critical driver of summer electrical use, especially on peak use, as well as of wholesale energy prices, the naturally occurring volatility of summer weather in Chicago has been very important for this analysis.

Summer 2003 was a bit cooler than average, but did include some periods of hot weather and mildly elevated prices. Summer 2004 was the fourth coolest summer in the previous twenty-five years. The weather never got really hot, with only three days hitting 90 degrees. Summer of 2005 went the opposite way, with long stretches of consistently warm weather. There were 30 days over 90 degrees (compared to the average of 17 days), three days over 95 degrees, and one day over 100 degrees, reaching 102 degrees on July 24th. Despite the consistently warm/hot weather, there were no true sustained extreme heat waves, so the levels of discomfort did not really reach the levels of 1995[2], 1998, or 1999 (when power prices hit over $7/kWh and later Chicago's Loop was blacked out). However, the consistently above average temperatures that summer, combined with rising natural gas prices (even before Hurricane Katrina) led to high power prices, and high consumption of electricity by all sectors (Pioneer Press 2005).

As mentioned above, the Cooperative notifies participants when there is a day where prices will rise above ten cents for one or more hours.[3] 2005 saw a level and rate of notifications that was completely different from previous summers (Table 3). There was some concern that this might lead to price response fatigue among participants. But, the statistical analysis below

[2]The death tolls of the summer of 1995 led to major changes in how Chicago dealt with providing cooling assistance and support to the elderly and isolated. It is the subject of the compelling study *Heat Wave* (Klinenberg, 2002) which explored how social structures breakdown and fail to provide relief to at-risk populations

[3]In January 2006, this notification level was changed to thirteen cents.

suggests this was not the case, and the Cooperative found that participant satisfaction with the program did not erode significantly (Isaacson 2006).

Table 3. High Price Notifications

Year	Days over 10 cents	Hours over 10 cents
2005	140 (74 with a/c cycling)*	876 (499 with a/c cycling)*
2004	7	19
2003	20	77

*Because of the strange price patterns in 2005, there were many high priced periods outside summer months, especially in December, therefore the participants in the central air conditioner cycling program were not cycled during those periods.

While the results of the analysis of energy use for 2003 and 2004 described below were interesting and positive findings, 2005 set the stage for a real test of residential real-time pricing. The results showed that the price elasticities found during the previous summers held up.

Summer 2003

In its first year of operation, the impact evaluation of the ESPP for the summer of 2003 found the following:

- "Residential customers responded to hourly prices (over and above the 'high price' notification) with a price elasticity of -4.2%, which can result in significant changes in electricity demand. There was a very strong response to notification of high prices, but this response tapered off both (1) over the length of the high price period, and (2) as the number of successive days of notifications increased.
- Single-family homes with central air conditioning tended to 'snap back' the fastest. They reduced demand in the first hour of a high-price period and then in the next hours increased consumption.
- Participants were more likely than non-participants to have a higher income, to have recently added insulation to keep cool, and were more likely not to have changed any major appliances in the last year. Participants were less likely to have a lot of household members and also were less likely to use fans for cooling to save energy.
- The participation model was used to correct for self-selection bias in the models, and it was found that it did not change the results discussed above.
- High responders tended to turn down their air conditioners, turn off lights, and turn up the air conditioner thermostat more than other participants. Higher income and older households were less likely to be high responders to high-price notifications."
  (Summit Blue 2004, Section 2, 9-10)

Summer 2004

The impact evaluation for the summer of 2004, which was very mild, found:

- "Residential customers responded to hourly prices (over and above the 'high price' notification) with a price elasticity of -8.0%, which can result in significant changes in electricity demand because of the large variability in hourly electricity prices.

- Individuals who faced hourly responses in 2003 and 2004 respond similarly to customers who only recently have been exposed to hourly prices. This suggests that participants do not become unresponsive over time due to the effort involved.
- The extreme mildness of the 2004 summer resulted in limited responses to high-price periods. The weather conditions caused few participants to extensively use their air conditioning units, thus there was little opportunity for participants to significantly decrease their energy use during high-price periods. In addition, any budget for cooling was non-binding, suggesting that there was little incentive not to use their air conditioner during those few high temperature days.
- The response to high price periods by the air conditioner cycling customers was also muted due to the cool summer. These customers were found to have a relatively small reduction (10% to 20%) reduction, suggesting that their air conditioners were not experiencing constant use.

While it is true there was no significant response to high-price notifications during the summer of 2004, this result does not diminish the attractiveness of ESPP for responding to critical peak demand periods. Even during this mild summer, participants were able to respond appropriately to hour-to-hour price changes. The mild summer implies that the high-price periods were by no means critical peak days, so it is still unknown how ESPP participants will behave during extremely high price conditions. Therefore, the impacts of ESPP should continue to be tracked until more meaningful market conditions develop, and estimates of the impacts of ESPP during a hot summer can be developed." (Summit Blue, 2005, 12-13)

Summer 2005

Given the positive results found in 2003 and 2004, coupled with the more extreme weather and prices of 2005, the Cooperative wanted to explore some additional questions in 2005 to better understand the nuances of the price elasticities of participants. Meanwhile, the evaluator, Summit Blue Consulting, had developed new analytical models as part of evaluations they had conducted of large commercial and industrial pricing pilot programs in California (Quantum Consulting and Summit Blue Consulting 2004). These new models significantly increased the ability to understand individual participant's energy use behavior. Summit Blue used both this new model and the model from previous summers for their analysis of 2005. Using those tools, the evaluation addressed the following key questions:

- Will residential customers respond to hourly market-based electricity prices?
- What is the magnitude of the effect, i.e., to what degree is electricity consumption affected by prices?
- How have the customers' responses changed over time (2003 to 2005)?

This evaluation found that:

- "ESPP participants continued to respond to hourly electricity prices in a manner similar to prior years, with an overall price elasticity of -4.7%. This means that a doubling of electricity prices results in a decrease in their hourly electricity use by nearly 5%. This level of response is strong and is comparable to those found in other programs that use price signals to motivate changes in consumer behavior.

- Participants' response to hourly electricity prices varied by the time of day, with lower responses during the day, and higher responses during the late afternoon/evening.
- Participants continued to show a significant response to the high-price notifications (i.e., when prices exceed $0.10/kWh). Participants reporting successful notifications essentially double their average response to changes in electricity prices. Success in notifying participants correlated to an increase in their price responsiveness during non-high priced hours as well. For example, on July 25th 2005, the day with the highest prices of the summer, participants reduced their peak hour consumption by 15% relative to what their consumption would have been on the standard flat ComEd residential rate.
- Automatic cycling of the central-air conditioners (turning the compressor on and off for short periods of time via remote control) during high-price periods added to a participant's response to electricity prices by as much as 2.2% for a total price response of 6.9%.
- Specific observable variables (or characteristics) that influenced the participant's response to hourly prices were identified. For example, households with numerous individuals at home during the day are likely to be more price-responsive during the day, and customers who receive high-price notifications via e-mail are 2% more responsive (adding to their price response) on high-priced days.
- Customer's response to high-price notifications did decline somewhat as the number of notifications during the summer increases and as the length of a given high-price period increases. However, as the time between high-price periods increased, their response to price notification also increased. Overall, customers continued to respond to high-price notifications throughout the entire summer of 2005 despite repeated notifications. The estimated decline in response was actually less than was observed in 2003.
- ESPP participants' overall monthly summer energy (kWh) usage suggested a conservation effect, that is a reduction in usage of 3% to 4%, relative to what their usage was estimated to be had they not received hourly electricity prices." (Summit Blue, 2006, E1-2)

Implications for the Future

Despite hot weather, high prices, and extensive notifications from the Cooperative, the results of 2005 were encouraging. Rather then customers losing their sensitivity to price, the Cooperative found that the price elasticities found in previous years held up, and that while participants found the program took more effort to participate in, it did not significantly change their satisfaction. The participants weathered a tough year, and provided system benefits from their changed energy usage. The additional analysis of participants' response provides new insights in to the types of households that are likely to be more demand responsive.

The Cooperative is currently undertaking additional research to match these results with survey data from participants and non-participants to further understand the characteristics of households that either can benefit from exposure to real-time pricing, or who, with the right additional educational tools, could change their energy use patterns to become households that could benefit. This research will help to inform new rates and programs in Illinois due to start in 2007. These will be the outgrowth of pending rate cases and recently passed legislation. It is expected that the cost of metering, a current potential barrier to participation will be addressed in those proceedings and allocated between participants and the overall rate base. Over time these costs are likely to go down as meter costs decline and technical standards change.

Unlike California, the energy markets of Illinois aren't broken, but soon face significant transition with the end of the rate freeze. The California investigations into critical peak pricing have been a reaction to the crisis that the state faced. However, for much of the country, especially in states that have restructured and where ISOs provide an independent, transparent wholesale market, the situation is very different. While real-time pricing does expose customers to greater market volatility than critical peak pricing, the results of the Energy-Smart Pricing Plan indicate that it provides additional benefits compared to CPP. While there may be ways to structure residential real-time pricing in a vertically integrated utility environment, those states where restructuring is active and wholesale markets are functioning should strongly consider real-time pricing as a part of the set of rate options that residential customers can choose. Until retail markets are sufficiently competitive and alternative energy suppliers offer and deliver a range of products and services to a robust marketplace, an optional regulated pass-through market-based real-time rate from the distribution company is an effective way to achieve the link between wholesale and retail markets that we need for making our electric system more efficient and reliable.

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