
**Demonstrating PriceLight Technology to Improve Household
Energy Efficiency in Central and Southern Illinois**

Final Report



CNT Energy, at the Center for Neighborhood Technology
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Demonstrating PriceLight Technology to Improve Household Energy Efficiency in Central and Southern Illinois

ICECF Reference: Piloting Energy-Smart/Real Time Pricing in Ameren Service Territory

1. Introduction

CNT Energy administered the *PriceLight Demonstration Project* for Ameren Illinois Utilities residential customers from May 2007 to October 2008. CNT Energy¹ manages Power Smart Pricing (PSP), a real-time pricing program for Ameren, whose electricity service territory covers southern and central Illinois. Participants who enroll in PSP use tools to manage their electricity use, including daily electricity price updates, phone or e-mail notification when prices rise above a certain threshold, and personal reports on energy usage and costs. While these tools have proven to be effective, CNT Energy is investigating newer generations of technology; specifically, devices that display information in the home. Although the PSP program does not require participants to actively monitor electricity prices, information does improve the participants' ability to make informed energy choices. To address this need, CNT Energy developed the Energy PriceLight using an existing hardware solution. The "PriceLight"—an orb that glows different colors based on the current estimated price of electricity – is a tool for providing this data.

The PriceLight is a small lamp, or "orb," that plugs into a standard electrical outlet. It receives information through a pager signal and changes color to reflect this data. The hardware was designed by Ambient Devices, and the signal has been configured to indicate real-time changes in information (in this case, the electricity market). The current price of electricity (the price PSP participants pay on the real-time pricing rate) is indicated by glowing different colors based on the price in effect that hour. By simplifying hourly prices to a "glance-able" color spectrum, customers receive information and can learn to understand the relatively consistent hourly price patterns easily. Therefore, this technology may motivate behavior change, increasing energy efficiency and lowering electricity usage.

CNT Energy is in a unique position to demonstrate how visual technology can enhance the energy efficiency behavior of households on real-time pricing electricity rates. The initial 2006 PriceLight pilot study indicated that this technology enhances understanding of energy usage and costs. This grant enabled CNT Energy to provide this technology to a new population of customers and track their progress over the course of a larger-scale, longer-term program. The results of this study demonstrate how visual technology enhances the energy efficiency behavior of households on real-time pricing electric rates.

2. Work Plan

This ICECF grant funded the purchase and distribution of PriceLights to 115 PSP participants. CNT Energy monitored the experience of PriceLight recipients for eighteen months, and

¹ CNT Energy (formerly the Community Energy Cooperative) is a division of the Center for Neighborhood Technology.

evaluated their abilities to improve their households' energy efficiency with statistical analysis of the participants' electricity usage data and survey results.

Solicitation

In order to solicit participation in the PriceLight program, CNT Energy contacted all eligible PSP participants in July 2007 and January 2008 by mail. The solicitation letter (Attachment 1) gave a brief description of the technology, and an explanation of what we were testing, with an invitation for those interested to respond. Participants were required to pay a small portion of the cost of the technology in order to demonstrate their commitment to using the device. This fee was \$35.00, \$10.00 plus a \$25.00 deposit, refundable with the return of the PriceLight at the end of the study. Based on replies to this mailing, the PriceLights were distributed to a randomly selected sample of those interested recipients.

Selection and Distribution

CNT Energy originally planned to extend the offer of a PriceLight to all PSP customers on a first-come, first-serve basis. However, we encountered unforeseen problems with the technology which limited the distribution pool. The PriceLight uses a pager signal that has a restricted range, and a comparison of that range with southern and central Illinois customer addresses showed that customers in some rural areas would not be able to utilize the PriceLight. Correspondingly, solicitation letters are being sent only to those customers that could receive the pager signal.

In addition, while the PSP program has had a steady growth during the last year, full-scale marketing was postponed until the end of 2007 and the resolution of pending rate cases that had potential impacts on the real-time pricing program. Consequently, the distribution schedule of PriceLights to participants has been adjusted. Only a small number of participants (63) were enrolled in PSP for summer 2007, and of these participants; only 39 were within the coverage map eligibility area. As a result of this solicitation, eight participants requested and were issued a Pricelight in July 2007.

The second solicitation occurred in January 2008. Out of 444 current PSP participants, only 280 (63%) were located within the coverage map eligibility area. Of those who received the solicitation letter, 74 respondents (26%) expressed interest in the PriceLight. From this group, 49 participants were randomly selected and notified that they could be issued PriceLights. The random distribution was assigned to the pool of 74 respondents in order to identify a treatment and control group for comparing demand response and conservation practices. Of the 49 selected respondents, 35 people returned the required deposit check and were issued a PriceLight.

The third solicitation occurred in May 2008. Out of 1200 current PSP participants, only 640 were located within the coverage map eligibility area. An additional 300 solicitation letters were sent to determine if they showed interest in the PriceLight. Of those who received the solicitation letter, 175 respondents (58%) requested the PriceLight. From this group, a randomly selected sample of 81 participants was notified that they could be issued PriceLights. Of the 81 selected respondents, 72 people have returned the required deposit check and were issued PriceLights.

The deployment of the PriceLights was also hindered by ongoing hardware and software failures, described in the Technology section below. Due to these difficulties, CNT Energy retained ten

PriceLights in the office as a service inventory, in order to always have operating PriceLights available for participants who experienced problems and required a replacement. A total of 115 PriceLights were distributed to our PSP participants. A copy of the documentation included with the PriceLight shipment is included (Attachment 2).

3. Analysis

Statistical analysis

A quantitative measure of the effectiveness of the PriceLight is the elasticity of demand, or response to hourly electricity prices. On average, real-time pricing customers have shown price responses that vary from -0.047 to -0.082. Our analysis of the PriceLight program participants' elasticities showed a statistically significant average of -0.1068, or 10%.² This compares favorably to the elasticity observed in the PriceLight pilot study, which found that households with PriceLights had an additional 2.4% elasticity. These findings indicate that the PriceLight is effective in assisting customers in responding to hourly energy prices.

Two groups have been identified for additional study: the baseline group (which did not request or receive a PriceLight) and the control group (those that requested but did not receive a PriceLight). The statistical analysis of the first two groups will be completed as part of the larger evaluation of PSP, which will be conducted by a third party evaluator. Ameren Illinois Utilities is in the process of evaluating proposals for this contract. The results of this analysis will be compared to our analysis of the treatment group (those households that were issued a PriceLight) and reported in an upcoming publication.

Survey analysis results

The qualitative analysis of the effect of the PriceLight on households' awareness of energy usage and costs was based on a survey distributed to PriceLight recipients after the summer, the season of highest electrical usage and prices. In addition, an annual PSP customer satisfaction survey was fielded to all participants in Fall 2008. The PriceLight survey was designed to assess participant satisfaction with the technology and to elicit specific information about the participants' experiences and opinions. A total of 115 surveys were distributed and 95 were returned, an 83% response rate. A copy of the survey and a summary of the results are included in Attachments 3&4. The findings are discussed below.

The survey consisted of six multiple choice questions and one open-ended request for comments. Overall, participants expressed great enthusiasm for the technology. Some representative examples of the testimonials are below:

"I look at my ball and adjust everything. I love my orb."

"No improvements suggested. Does make a great nightlight. Also great conversation piece- I like the beauty of the orb."

² CNT Analysis using the methodology for estimating elasticity of demand described in the 2005 ESPP Evaluation report.

“All I can say is I’ve saved a bundle. I faithfully check my PriceLight before I do any thing.”

“We really use the PriceLight for using our appliances, especially the washer and dryer.”

“I think if you use the light for a year you kind of learn the pattern of the day and seasons so it becomes part of your life. Life always needs reminders to keep us from going back to our old ways.”

“PriceLight is a part of all my daily activities when it comes to electricity.”

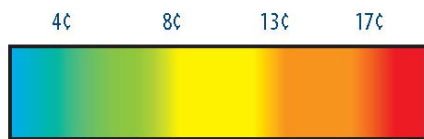
These comments also reference a primary attribute of the PriceLight, one that distinguishes the PriceLight from other more technical information devices. These devices, which usually feature a digital display screen with numerical or graphical values, are also often limited in their siting; for example, they may need to be connected to a computer network or are built into equipment such as thermostats. A majority of participants keep the PriceLight displayed in their living room (49%), with the kitchen (23%) as the second-most popular location. This siting reflects the PriceLight’s aesthetic qualities (the glowing orb is an “object d’art” and conversation piece) and helps assure that it will be located in a prominent, highly visible area. Consequently, information about electricity prices can be subtly and persistently communicated.

As described above, all PSP participants have access to actual hourly energy prices, which can be checked by two methods, online or by phone. One of the questions on our standard customer satisfaction survey (distributed to all of our Power Smart Pricing participants) was “Do you check the electricity prices online or by phone?”. The majority of participants (80%) reported they did check prices, while 18% reported they did not. However, when queried about how often this monitoring occurred, only 32% reported checking “every day or almost every day”. In comparison, most PriceLight participants check the prices (via the color of the PriceLight) “several times a day” (49%), while 35% check the color “before engaging in high-electricity-using activities, such as doing the laundry or running the dishwasher”. Only 20% of the PriceLight participants check the online references (which provide more detailed and precise price information), and 58% of these respondents refer to these references less often than they did before they received the PriceLights. The benefits of the PriceLight as an always-accessible, “glance-able” technology, are apparent in the stronger elasticity observed in these participants.

Question #3 asked participants to identify the PriceLight colors that prompted them to change their energy consumption. The following table cites the number of times each color was referenced (multiple choice answers were permitted). Yellow and orange were the most commonly cited colors. The “high price alert” signal for PSP participants without PriceLights is \$0.13/kWh. PriceLight participants’ reported tendency to respond (by reducing electricity use) at the lower-priced yellow signal is consistent with the stronger elasticity found among these participants.

Table 1. PriceLight color which prompts respondents’ changes in energy consumption

The current hourly electricity price range in ¢ per kWh



 Slow red pulse indicates prices above 20¢
Faster red pulse indicates prices above 50¢

| | | | | |
|--------|----|-----|----------------|-----------------|
| Blue | 10 | 5% | Very low | \$0.04/kWh |
| Green | 21 | 11% | Low | \$0.04-0.08/kWh |
| Yellow | 56 | 29% | Moderate/High | \$0.08-.13/kWh |
| Orange | 55 | 29% | High | >= \$0.13/kWh |
| Red | 48 | 25% | High/Very high | >= \$0.17/kWh |

The PriceLights’ signals were periodically interrupted due to technical difficulties. When this occurred, the PriceLight either stopped changing colors or glowed purple, a color not present on the hourly pricing spectrum. Question 5 addressed this issue, asking how many times (if any) participants noticed a service interruption. Most respondents (65%) noticed one or more interruptions, with 28% of these respondents noticing an interruption “more than 5 times”. This is consistent with the nine instances of system-wide service interruptions documented by CNT Energy. However, 29% of respondents reported not noticing disruptions at all. These respondents may not have been watching their PriceLights (and electricity prices) as consistently as they reported. Other impacts of the technical disruptions are discussed below.

Question #6 addressed the issue of how much consumers were willing to spend for in-home display technology. The majority of respondents (43%) stated they would be willing to pay \$25.00. This amount is consistent with the amount participants in the pilot study selected as the PriceLight’s value. These participants were consistently reminded that the payment they made for the PriceLight accounted for only a small portion of the tool’s total costs; and the PriceLights were subsidized. The table below summarizes the responses.

Table 2: Response to Question 6: The current cost of the PriceLight is subsidized by a grant. How much would you willing to pay for a similar device?”

| Price selected | Number of responses | Percentage of responses |
|----------------|---------------------|-------------------------|
| \$25 | 43 | 46% |
| \$50 | 18 | 19% |
| \$75 | 3 | 3% |
| \$100 | 1 | 1% |
| Other* | 16 | 17% |
| Blank | 12 | 13% |

* “Other” responses included \$10, “what ever I could afford”, “Hard to say as some of our retirement income is being reduced and cost are increasing”, “Would hate to give it up”, “nothing”, \$0, and “don’t see the need for PriceLight”. The remaining respondents selected “other” but did not provide a dollar amount.

The final question was an open-ended query: “Do you have any comments about how you are using the PriceLight, or how the display technology might be improved?” A majority of

respondents (66%) took advantage of this opportunity to provide compliments and suggestions, and the range of responses provided valuable insight into topics relevant to future technology development. The verbatim responses are listed in Attachment 5. All questions and complaints reported in these surveys have been addressed by follow-up communications with participants.

It is also worth noting that the strong popular appeal of the PriceLight was manifested in the standard customer satisfaction survey as well. Participants who had seen or heard about the PriceLight and did not receive one, even though the reasons (e.g, their geographic inaccessibility to the pager signal or the limitations of supply) were repeatedly justified, used the survey as an opportunity to reiterate their disappointment. Two responses to the question “How could this program be improved” were representative of complaints that echoed by numerous other participants, in phone conversations, emails, and at workshops.

“Reinstate orbs used to tell cost of energy”

“I feel that every subscriber should be able to receive a price-subsidized orb. I have wanted one since I joined the program and have never made the cut. Frankly, I'm suspicious of how the choice is made...I think you need to know someone.”

Another theme that emerged in response to the open-ended question was complaints about the accuracy of the PriceLight. For example, one customer returned the globe, with the explanation “*We no longer have the globe- it wasn't as accurate as the list on the internet*”. This statement is accurate; the orb colors only reflect the approximate range of prices, via a color spectrum. But this emphasis on accuracy does not reflect the overall utility of the PriceLight, which is to provide a relatively constant reminder of electricity prices, keeping energy issues “front-of-mind”. These findings suggest that there is no one best technology for providing information to customers, but rather that a variety of tools would better serve the variety of consumers’ needs.

Technical limitations of the PriceLight Technology

At the time this project was proposed, Ambient Devices’s Orb represented “cutting edge” technology. Now, two years later, the use of Ambient Orbs to signal electrical prices has increased, particularly in California, where PG&E have distributed more than 8,000 orbs to commercial and residential customers.

However, CNT Energy’s work has demonstrated real limitations in the orb technology. The most significant drawback is the pager technology used to broadcast the orb’s signals. Signal coverage outside of urban areas was very limited, and results from our deployments from the field indicated that even areas that were reportedly in the coverage area were actually out of range.

During the course of this program, the pager signal was disrupted for various periods of time on nine occasions. Sometimes this disruption was related to the CNT Energy internet server, which maintained the feed of hourly electricity prices. At other times, the interruption in the signal was a result of a system failure at Ambient Devices (the supply company who was actually sending the paging signal). While these disruptions represented only a small portion of time compared to the total amount of uninterrupted hours of service, any failure can be troubling to customers.

Ambient is currently working on a more robust computer interface, while CNT has transferred their feed delivery to an offsite server.

Additional problems with the orb were related to actual hardware deficiencies with the devices themselves. Hardware failures required CNT Energy to replace 12 orbs. The quality of the orbs (the devices are not UL approved) also was inconsistent, and fixing these problems required considerable troubleshooting; requiring CNT Energy to develop a fact sheet to assist PriceLight owners. These exchanges were costly in terms of shipping and staff time, and also frustrated the customers.

4. Summary Conclusions

One goal of this grant was to provide households in Illinois with new opportunities to reduce their electricity costs and increase their energy efficiency. The PriceLight has proven to be a successful tool for RTP customers. The reduction of demand for electricity at peak (higher priced) hours is greater in households with PriceLights than those without this tool.

As a result of this project, we have learned that the PriceLight, in its current state, has drawbacks that limit its effectiveness and suitability for large scale deployment. The restrictions on coverage area are a significant disadvantage, as are the hardware inadequacies of the orbs. As a communicating technology, pager service itself is being phased out, with wireless web access, local area networking and broadcasting via low frequency FM signals being tested.

While some of these problems can be avoided in the future, the orb is no longer “cutting edge” technology. The topic of providing information to consumers is a subject of widespread interest in the energy industry, and a variety of newer technologies are being developed and tested. Whether any of these represent the “killer app” is debatable; and our experience indicates that a single solution will not serve the variety of consumers’ needs.

Meanwhile, the appeal and effectiveness of the PriceLight continue to make it a viable tool. Numerous participants have requested orbs, as shown in these survey comments:

“I find that anyone who comes to our home notices it and thinks it is a really "cool" light. When I explain the purpose, they always ask how they can get one also. It invariably leads to a discussion of responsible energy use and of ways to reduce our usage [and costs!].”

“We keep it in our living room so it is visible all the time. We love it. It makes us much more aware of pricing and helps us conserve. Since June we have used 20% fewer KWhrs and saved 21% on our bill compared to same period in 2007. We have recommended PLight to friends but they were unable to get one. Please keep the PriceLight! thanks...”

“My Brother is on a similar program in the Chicago area and he is extremely jealous of my PriceLight because it would make it easier for his family to learn more about saving energy by watching the price of power in color! Thanks for PriceLight. It is fantastic.”

Not only did the demand for PriceLights far exceed the supply we had available, but orbs were not available to individual consumers at any costs. Participants who were willing to pay the full cost for an orb (\$90.00) found that Ambient Devices no longer sells to the public. Ambient now works exclusively with utilities and other entities that will purchase the orbs and their services in larger volumes. These next-generation orbs are also factory-configured to the relevant signal, which improves their reliability.

The cost-effectiveness of the PriceLight must also be considered when evaluating the technology. How much the consumer is willing to pay out-of-pocket is one factor, however, this is a very limited measure of evaluation. Because households with PriceLights use less energy at higher priced times, their costs are likely to be offset by lower bills. For example, the orbs used in the PG&E program are distributed at no cost to the customer, based on the understanding that the demand response these orbs elicit has a monetary value that is sufficient to offset the expenditures. In addition, due to economies of scale, the costs of these programs are lower than CNT Energy's costs have been with this program.

CNT Energy received many more requests for PriceLights than could be provided with funding from this grant. This already high response rate was made slightly more manageable when some customers who requested an orb were not issued one because they did not provide the required deposit fee. This barrier to participation was commented on by several participants. One respondent summarized the situation as follows:

I think the government should make these devices available to each electric consumer, and it should be mandatory that all electric utilities be required to cooperate with a national program such as this.

5. Next Steps

Due to the success of the PriceLight program, CNT Energy plans to continue to provide service to those PSP customers who currently have PriceLights. This will allow us to continue to monitor the electricity use of these households. One research question that can be explored is whether the positive impacts of the PriceLight persist, or if long-term exposure results in less responsiveness. Ambient Devices has extended our contract for an additional year, although they will not commit to providing service after 2009.

As discussed above, the topic of home energy displays is a subject of widespread interest in the energy industry. CNT Energy is well-positioned to continue to contribute to the research and discussion around this topic. In addition to watching the development of other in-home energy displays, we will continue to research how in-home energy displays and on-going communication can motivate energy efficiency behaviors.

Due to their visual appeal, PriceLights have been a popular education tool. Additional PriceLights (not funded by this grant) have been distributed to the Illinois Commerce

Commission (in the lobby and Commissioner Box's office) and with representatives at ComEd and Ameren Illinois Utility.

CNT Energy has already published one article on the PriceLight program (Home Energy: March/April 2008) and also reported on the PriceLight at the American Council for an Energy Efficient Economy in September 2008. We will be publishing these results following the third party evaluation of the Power Smart Pricing Program. Ameren Illinois Utilities is in the process of evaluating proposals for this contract; and the results of this analysis will be compared to our analysis of the treatment group (those households that were issued a PriceLight).

The PriceLight program has shown that by giving consumers ready access to the information they need to make smart energy investments, they will respond. This respondent expressed it well:

I was very much looking forward to the "glow ball" that was in the lottery, but not enough were available. Why not make that available to everyone? Why not make energy audits available (for a fee) to us? Let's really go at this wholeheartedly, not just in little pieces.

Illinois consumers are ready to take the steps necessary to increase their energy efficiency.

Attachments

1. PriceLight solicitation letter
2. Documentation included with the PriceLight shipment
3. PriceLight survey
4. Summary of survey results
5. Verbatim responses to Survey question 6

Budget

<<Date>>

Dear Power Smart Pricing Participant,

As you know, the best way to save money with PSP is to reduce your electricity use during hours when prices are high. **This winter, a limited number of PSP participants will have the opportunity to try out the “Energy PriceLight”—a small, attractive orb that makes it easy to estimate prices at a glance.**

The PriceLight is simple, fun, and unobtrusive. It plugs into a standard wall outlet and changes color as advisory hourly electricity prices change throughout the day. Data is transmitted to the lamp via radio signal, so no additional equipment is needed for operation. Just by looking at the PriceLight, everyone in your household will know when estimated electricity prices are high or low and can manage their electricity use accordingly



The PriceLight

This exciting new technology was developed by Ambient Devices, a company that produces a variety of consumer products that provide quick, easy access to data

We are providing this offer so that we can test ways to improve Power Smart Pricing. **Only a limited number of PriceLights will be distributed. If you would like to apply to receive a PriceLight, please contact CNT Energy by Friday, February 1 at info@powersmartpricing.org or (877) 655-6028.** In your message, please provide the following information:

- Include your name, e-mail address, and phone number.
- Please include who in your household, if anyone, is home during weekdays in the summer.

The PriceLights are funded in part by a grant from the Illinois Clean Energy Community Foundation. Participants who receive a PriceLight will be required to complete two short surveys to help in our research on this technology. In addition, a **\$35 deposit** is required. This payment represents a portion of the cost of the PriceLight program. After one year, participants can return their PriceLights for a \$25 refund.

CNT Energy will get back to you by February 15 regarding availability. PriceLights will be shipped to the selected participants immediately.

We hope you will share our excitement about this program and the opportunity to bring PSP participants new tools and information to manage their energy use.

Sincerely,
The Power Smart Pricing Team

P.S. Remember, availability is limited, so please respond no later than February 1.

<<Date>>

Dear Power Smart Pricing Participant,

Welcome to the **Energy PriceLight** Program! Before installing your PriceLight, please review this letter, which includes some simple set-up instructions, and the enclosed page with answers to frequently asked questions.

As reflected by the packaging, the PriceLight Program uses Ambient Devices' "Stock Orb" to display energy prices. While the Ambient Orb can be configured to track other real-time data such as stock market prices, this particular orb is configured to receive only the PriceLight channel, which reflects the current price of electricity for Power Smart Pricing customers.

Aside from the Orb itself, this package contains two other tools that will aid your participation in this pilot. First, we have included the *Ambient Orb Guide*, a small booklet from Ambient that includes information on set-up and troubleshooting. You can ignore the pages that relate to customizing your orb, or choosing other information channels. CNT Energy has already registered this Orb, and it has been configured to the PriceLight channel. Second, we have included a *PriceLight Scale* card (with clear plastic holder) to be used as a quick guide indicating how display colors correspond to electricity prices.

Please review the "frequently asked questions" enclosed and then follow the instructions below to set up your PriceLight.

Set-Up Instructions:

1. Attach the cord to the bottom of the Orb, and plug the other end into an electrical outlet. Your Orb will pulse red while it connects to the wireless Ambient Information Network.
2. Once it is connected, the Orb will automatically cycle through its full range of colors while it synchronizes.
3. Within 20 minutes, the Orb will glow a single color to reflect the current market price of electricity, the price you are paying on Power Smart Pricing. (Please see the *PriceLight Scale* to see how the different colors correspond to the price.) The PriceLight will now remain up to date with the latest price information.

If you have any questions related to setting up your PriceLight, you may refer to the Ambient Orb Guide, or call Power Smart Pricing at (877) 655-6028.

Your opinions on how the PriceLight works for helping you manage your energy use are important, so we'll be contacting you with a survey later in the year. Thanks again for your interest in trying out this new tool for managing your electricity use!

Sincerely,



Amanda Escobar Gramigna
PriceLight Project Manager

*The PriceLight program is made possible by a grant from
The Illinois Clean Energy Community Foundation.*

Energy PriceLight: Frequently Asked Questions

Q: What is the Energy PriceLight Program?

A: The Energy PriceLight Program is a special offering for participants in the Power Smart Pricing (PSP) program. Selected participants receive a “PriceLight”—a small orb that glows different colors based on the current estimated price of electricity. Thanks to a grant from the Illinois Clean Energy Community Foundation, the PriceLight has been made accessible and affordable for PSP participants. This program runs for one year.

Q: Do I need to customize my PriceLight?

A: No, CNT Energy customized the PriceLight to the Ameren energy channel. All you have to do is plug it in.

Q: How does the PriceLight work?

A: When the Orb is plugged in, it receives a wireless radio signal and glows different colors to reflect the day-ahead prices. The Orb was designed by Ambient Devices and is a visual tool to help Power Smart Pricing participants know the approximate current prices of electricity. You do not need a computer or any special software to use this device.

Q: Where should I keep my PriceLight plugged in?

A: If possible keep the Orb near a window, if your home receives a strong signal, the location where you choose to keep it in is entirely up to you. Many people prefer to place the PriceLight in a common area, where everyone in the household can benefit from its signals. Since the PriceLight is fragile, you may want to keep it in a place where it will not be disturbed.

Q: Where is the on/off switch? Should I turn my PriceLight off when not in use?

A: The PriceLight uses very little electricity—about as much power as the clock on your VCR, so you can (and should) leave it on at all times. There is a yellow button on the bottom of the PriceLight that dims the light. To activate a different setting of brightness, you may gently push down on the top of the orb while it is set on top of a flat surface. Each time you unplug and plug in the PriceLight, the colors will cycle for about 15 minutes until it stabilizes on the signal again.

Q: Can my PriceLight break?

A: The electronics inside are pretty sturdy, but the Orb globe is made of frosted glass and may break if you drop it. If your Orb breaks, you will need to purchase a replacement glass globe for \$35. Please be careful in handling the PriceLight and keep it in a place where it will not be disturbed.

Q: What do each of the colors mean?

A: The PriceLight has a color spectrum that ranges from blue to green to yellow to orange, and finally red. The color spectrum does not indicate an exact price, but the color spectrum will indicate changes in the market. When electricity prices are very low, the PriceLight will glow blue, and it will glow red when prices are very high. The color **orange** corresponds with CNT Energy’s set point for High-Price Notifications (meaning that the PriceLight will glow orange when prices are above 13¢ per kWh, and will glow red when prices are even higher—close to 17¢ per kWh). Please remember that the PriceLight should not be viewed as a precise reporting instrument – the variation in colors are a guide to trends. For exact prices, consult the website or phone recording on 877-655-6028. In general, keep in mind that it is a good time to use electricity

when the PriceLight displays cooler colors (like blue and green). Warmer colors (orange and red) are meant to remind participants that prices are high to use their energy efficiently. Please refer to the *PriceLight Scale* card for additional details.

Q: How can I check the accuracy of the PriceLight?

A: Print out a copy of the prices for a 24 hour period and compare the day-ahead prices to the color spectrum. Every hour the Orb should reflect that price color. Remember that the color spectrum does not indicate an exact price. Day-ahead prices can be viewed at www.powersmartpricing.org or calling 1-877-655-6028 (Press option 1).

Q: What if my PriceLight is not reflecting the correct price range or is cycling thru the color spectrum (1 hour or longer)?

A: The first step is to unplug and plug it in again in another part of the home (preferably closer to a window). Observe for the next couple of hours. If the problem continues please contact CNT Energy. Once we are notified of the problem we will work with you to diagnose the problem.

Q: Does the PriceLight show day-ahead or real-time prices?

A: The PriceLight displays day-ahead prices. Day-ahead prices are the prices that are used by CNT Energy and Ameren for high price notifications and billing to Rider Power Smart Pricing Customers. The day-ahead prices are predicted by MISO (Midwest Independent System Operators, the regional electricity transmission organization). Notifications are sent out the evening before when there is one or more hours the following day when the day-ahead prices are expected to exceed 13 cents/kilowatt hour. These are also the prices available on the Ameren.com website.

Q: I would like to have another PriceLight. Can we buy another one?

A: The \$35.00 you paid for the PriceLight was not to purchase the orb, it represents only a portion of the price of this equipment and the subscription for the information signal. A grant from the Illinois Clean Energy Community Foundation subsidizes the majority of the cost of the PriceLights. So the maximum number of people can take advantage of this opportunity, PriceLights are limited to one per household and a one-year subscription period.

PriceLight Scale

The current hourly electricity price range in ¢ per kWh

4¢

8¢

13¢

17¢



Slow red pulse indicates prices above 20¢

Faster red pulse indicates prices above 50¢

Power Smart Pricing
CNTenergy

www.powersmartpricing.org

Funding for the PriceLight provided by the Illinois
Clean Energy Community Energy Foundation

Energy PriceLight Survey – Fall 2008

1. Where do you keep your PriceLight?
 - Living room or common area
 - Bedroom
 - Home office
 - Kitchen
 - Laundry room
 - Other _____
2. How often do you check the color of the PriceLight?
 - Once a day
 - Several times a day
 - I check the PriceLight color before engaging in high-electricity using activities (such as doing laundry or running the dishwasher).
 - I don't notice/pay attention to the PriceLight colors.
 - Other _____
3. At what PriceLight color(s) do you alter your energy consumption? Please check all that apply.
 - Blue
 - Green
 - Yellow
 - Orange
 - Red
 - Other: _____
4. Now that you have a PriceLight, do you find that you check daily prices on the internet or by phone.
 - Less often
 - More often
 - Just as often
 - Does not apply
5. Over the course of the summer, approximately how many times did you notice an interruption in service? (Your Orb did not show the correct price-block color.)
 - Once or twice
 - Three to five times
 - More than five times
 - I did not notice a service interruption in service
6. The current cost of the PriceLight is subsidized by a grant. How much would you willing to pay for a similar device?
 - \$25
 - \$50
 - \$75
 - \$100
 - Other
7. Do you have any comments about how you are using the PriceLight, or how the display technology might be improved?

Thank you for completing this survey!

ID #, First name Last name

Final report to the Illinois Clean Energy Community Foundation

Attachment 4 - Results of 2008 PriceLight Survey

1 Where do you keep your PriceLight?

| | | |
|----------------------------|----|-----|
| Bedroom | 1 | 1% |
| Home Office | 7 | 7% |
| Kitchen | 22 | 23% |
| Laundry Room | 5 | 5% |
| Living room or common area | 47 | 49% |
| Other | 8 | 8% |
| Blank | 5 | 5% |
| Total | 95 | |

2 How often do you check the color of the PriceLight?

| | | |
|---|----|-----|
| I check the PriceLight color before engaging in high-electricity using activities (such as doing laundry or running the dishwasher) | 34 | 37% |
| I dont notice/pay attention to the PriceLight colors | 0 | 0% |
| Once a day | 4 | 4% |
| Other | 4 | 4% |
| Several times a day | 47 | 51% |
| Blank | 3 | 3% |
| Total | 92 | |

3 At what PriceLight color(s) do you alter your energy consumption? Please check all that apply.

| | | |
|-------------------------------|----|-----|
| Blue; | 3 | 3% |
| Blue;Green; | 3 | 3% |
| Blue;Green;Yellow;Orange;Red; | 2 | 2% |
| Blue;Orange;Red; | 1 | 1% |
| Blue;Red; | 1 | 1% |
| Green; | 4 | 4% |
| Green;Yellow; | 1 | 1% |
| Green;Yellow;Orange;Red; | 10 | 11% |
| Green;Yellow;Other; | 1 | 1% |
| Orange; | 8 | 8% |
| Orange;Red; | 9 | 9% |
| Other; | 4 | 4% |
| Red; | 2 | 2% |
| Yellow; | 17 | 18% |
| Yellow;Orange; | 2 | 2% |
| Yellow;Orange;Red; | 22 | 23% |
| Yellow;Orange;Red;Other; | 1 | 1% |
| Blank | 4 | 4% |
| Total | 95 | |

4 Now that you have a PriceLight, do you find that you check daily prices on the internet or by phone.

| | | |
|----------------|----|-----|
| Does not apply | 16 | 17% |
| Just as often | 13 | 14% |
| Less often | 56 | 59% |
| More Often | 6 | 6% |
| Blank | 4 | 4% |

Total 95

- 5 Over the course of the summer, approximately how many times did you notice an interruption in service?
(Your Orb did not show the correct price-block color.)

| | | |
|--|----|-----|
| I did not notice a service interruption in service | 28 | 29% |
| More than five times | 27 | 28% |
| Once or twice | 22 | 23% |
| Three to five times | 13 | 14% |
| Blank | 5 | 5% |
| Total | 95 | |

- 6 The current cost of the PriceLight is subsidized by a grant.
How much would you willing to pay for a similar device?

| | | |
|--------------|----|-----|
| \$100; | 1 | 1% |
| \$100;Other; | 1 | 1% |
| \$25; | 43 | 46% |
| \$50; | 18 | 19% |
| \$50;Other; | 2 | 2% |
| \$75; | 3 | 3% |
| Other; | 13 | 14% |
| blank | 12 | 13% |
| Total | 93 | |

Attachment 5.

Responses to the survey question: Do you have any comments about how you are using the PriceLight, or how the display technology might be improved?

NOTE: All questions and complaints reported in these surveys have been addressed by follow-up communications with participants.

All I can say is I've saved a bundle. I faithfully check my pricelight before I do any thing.

having the pricelight has allowed us to change some usage habits to reduce consumption!
I has come problems with my PriceLight not working properly (no picking up signals) but it was replaced and everything is working fine now. I heat or cool the house while it is blue or green and close window dressings and doors.

I Like it and use it alot. It works great as long as the service is not interrupted

I love the space age technology. Thanks you so very much. I enjoy saving electricity. If everyone saved a little maybe our country would be in better shape.
I really like this light.

In summer the PriceLight is a reminder reflecting energy cost or consumption change. There is little change in cool weather. Changes usually take place a few minutes past the hour. Have not noticed any additional or intermediate changes.

It has been a very interseting project and very helpful in energy savings.

It has definitely helped us recognize costlier periods and help us avoid using energy during those times.

It made me more aware of how to save more money by just being "more" aware of how to save money- shutting the lights when leaving a room, do wash at night and set ACto higher tempeature at night.

it makes a good night light in our living area. The different shades of color durin the day

My Orb is very valuable to me. When the color changes from green it is a signal to take notice and use electricity carefully. I think the government should make these devices available to each electric consumer, and it should be mandatory that all electric utilities be required to cooperate with a national program such as this..

NO IMPROVEMENT SUGGESTIONS DOES MAKE A GREAT NIGHT LIGHT ALSO GREAT CONVERSATION PIECE - I LIKE THE BEAUTY OF THE ORB

Not really, keep up the good work.

Pricelight is a part of all my daily activities when it comes to electricity.

Quite a few visitors have asked about the Price Light - wanting to obtain one for themselves. Can you suggest what I might tell them?

The PriceLight is excellent. At first it was only me referring to it all the time, but after I mentioned several times that I was going to wait and dry the clothes when the light was blue, Jerry has not been looking at it sometimes as well. I would think it is an integral part of the program when you have more than 1 person in the household. My Brother is on a similar program in the Chicago area and he is extremely jealous of my PriceLight because it would make it easier for his family to learn more about saving energy by watching the price of power in color! Thanks for PriceLight. It is fantastic.

The PriceLight is great. It is in my kitchen where I see it all the time. I have changed the times when I use more electricity so much. Everyone who come to my house sees it and I have explained it and what I have learned by participating to so many people. Many have not been aware of the times of high usage. I have even changed my menu in the summer so that I don't use my oven. I really don't have any comments on how to improve the technology. It works great for me the way it is. I am so thrilled to have the PriceLight.

The pricelight keeps me alert to my usage of power.
This is a very good idea, easy to use and efficient.

We keep it in our living room so it is visible all the time. We love it. It makes us much more aware of pricing and helps us conserve. Since June we have used 20% fewer kWhrs and saved 21% on our bill compared to same period in 2007. We have recommended PLight to friends but they were unable to get one. Please keep the PriceLight! thanks...

We love our pricelight. It is essential for us to manage our electric usage. You cannot disable this aspect of psp. I set the pricelight on the brightest setting... it makes a kick-ass nightlight glowing blue in the livingroom

We really use the PriceLight for using our appliances, especially the washer and dryer.
with the light I see no need to check the daily energy prices
Works perfect as is

I enjoy having the light - it makes me aware of times when I should not use appliances. I am not a frequent computer user - have not taken advantage of (nor will I) of all you offer by that source. Because of your warnings, I am careful to have my computer turned off for the majority of the day.

i look at my ball and adjust everything. i love my orb.

It works fine. We have saved about \$90 so far YTD compared to last year. We love the PriceLight... makes the whole experience more fun and more effective.

The PriceLight has allowed us to change our habits to reduce consumption.

I have had to have it reset three time. I would like it to be more reliable in this sense. I find that anyone who comes to our home notices it and thinks it is a really "cool" light. When I explain the purpose, they always ask how they can get one also. It invariably leads to a discussion of responsible energy use and of ways to reduce our usage [and costs!].

It makes a nifty nightlight and an interesting conversation piece. I wish it was a little more accurate, but I suppose there are only so many different colors it can replicate.

It was great while it worked

The program is great, although we no longer have the globe- it wasn't as accurate as the list on the internet.

We loved it at first, and then realized that it wasn't at all accurate. The past few weeks it has become accurate, and changes color based on the day ahead price list. Because it wasn't accurate, I got in the habit of printing the day ahead prices each day. I have come to depend on that chart more than the color of the orb.

You didn't survey use of the colored orb, which we have used with great regularity and amusement. I reference it more often than checking prices online and highly recommend it. There have been a few problems with signal reception, but my husband's a techie and has been able to fix the problem.

Price light is very effective. Would like to see something on my PC as well to help monitor things.

The price light makes it very convenient to check where the rates are throughout the day. It is great to have this feature or something similar vs having to check prices throughout the day online.

The price light is wonderful. It is quicker, and easier than checking prices online. Having a price light (or similar) to tell both price now (today), and tomorrow's price would be helpful....

At first, I found the light very helpful. It allowed me to avoid checking prices online. Eventually, the light gave the wrong color based on the online price. It happened so much that I asked to have it replaced. I received a new one, but the same thing happened. I eventually just unplugged it, because I couldn't trust the price it was indicating.

Did not use it. Too hard to set up.

I have had to move my orb after being in the same place after several months. It wouldn't change colors.

I recommend that you include FAQ's about what to do if the signal is inoperable. My husband, who's IT knowledgeable, suggests that you improve the stability of the motherboard/software and the hardware. Furthermore, I found it very difficult to reach someone to answer my questions: the person I was finally referred to had no understanding of the technology. If you continue this program (I sincerely hope that you will,) please educate your customer service people and publicize their direct phone lines. You are welcome to call us for further information if you desire: 217-356-5392

My kids like the light, but I really don't need it. The computer tells me what I need to know, and I fear the light is just sucking more electricity. Also, I can't keep the light where I'd really like to keep it because it didn't work there.

My light is not working due to three power outages in 2 weeks. I have called for assistance, I assumed of help. It's been over two months and problem is still the same. Honestly I'm not happy with the service.

Not currently working

Our PL has not worked in months. I am very disappointed. When it was working my wife and I checked the color before using any appliances. Thunder and lightning storms interrupted orb for days.

Send an orb that works.

The pricelight was totally wrong at times and while I checked it routinely I also used common sense. We have altered our use of high-electricity to early morning and late evening whenever possible.

We had our Pricelight replaced twice due to inaccurate readings. Your company determined that the signal to our area was insufficient. We are awaiting a UPS pickup order to return the bulb. Too bad! We thought we had a good thing going.

We had trouble keeping a constant signal and have had to send Pricelight in for repair after a thunderstorm. Currently Pricelight will not hold a signal again. We have not contacted anyone for assistance since we assume light will be sent back soon. We have now been prigram almost a year.

We will phone in our complaints

When it quit working, support was difficult. You might try getting a more reliable product with support.

Yes, I have a comment. I have found that the pricelight works only about 20% of the time. When it works, it is very helpful. But most of the time it just cycles endlessly through the colors and tells me nothing. So I rarely bother with it. If I'm doing something wrong, I'd like to know. My email is parsons.4@osu.edu Michael Parsons Michael Parsons

I do like getting the high rate alert emails to use with the PriceLight. For example, this morning the light is red, so I'll check my email for high price hours and change electricity usage, like doing laundry later today when prices go down.

What is the cost of using the light 24/7, I have enrolled people into program and have not recieved credit for this. Also was wondering if he could be alerted to when the dew point is greater than tempeature because that is the point at which he uses more than just fans in the summer time (paraphrase by AG)

I feel that every subscriber should be able to receive a price-subsidized orb. I have wanted one since I joined the program and have never made the cut. Frankly, I'm suspicious of how the choice is made...I think you need to know someone.

i tried to use some of the tools on your website but found them to be cumbersome and not specific enough to accurately reflect my home. Also, I feel the consumer is often left to find out about your resources on his own. I wish my bills were more in-depth with information about high and low prices. How about graphs and charts. How about comparisons to the neighborhood so I can show my neighbors. You could do more to educate us as to what is available. I was very much looking forward to the "glow ball" that was in the lottery, but not enough were available. Why not make that available to everyone? Why not make energy audits available (for a fee)to us? Let's really go at this wholeheartedly, not just in little pieces.

I would like the special lightbulb that we applied for but did not receive.

Reinstate orbs used to tell cost of energy

The alerts were great. I had the lamp but wished it had worked because I think it was a great reminder.

a small numeric indicator-like a refrigerator magnet. Still the light is more convinient than going to the computer regularly, however can be hard to read for color blind individuals in its various shades.

A smaller, thinner, vertical, tubular device/unit would suit us better

colors more defined

Digital display showing actual cost and a graphics of cost (ie like the moon phase on some digital clocks).

Display actual price on LCD instead of a rage, use the internet cable to download real time information.

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Have the orb flash when going to red color, with the ability to deactivate after seeing the flashing light.

I think if you use the light for a year you kind of learn the pattern of the day and seasons so it becomes part of your life. Life always needs reminders to keep us from going back to our old ways. So maybe sending reminders of "mo" would help. (AEG-pricing reminders?)

It would be much more helpful if the device displayed a series of prices and the direction of the price, so that I could anticipate what the price will be in the future. If electricity is currently expensive, but will only get more expensive later in the day, I would use an appliance now rather than later, whereas I currently just hope that the price will go down as it usually does. It would be very nice to have a device with a light bar that has 12 LEDs, one for each of the next 12 hours in the day, each a different color to indicate the prices at those times. Also, some LEDs have started to occasionally flicker in my orb, potentially indicating that this model of orb has quality problems.

It would be nice to know both current cost of electricity and the next day cost by pricelight can the light colors be changed for winter energy pricing? ie the light changes color RELATIVELY to the price so in winter 12 cents might be a red color.

Make updates quicker on light, there were a few days the light alert was not functioning correctly.

I think if the price goes "high" the light should go red and start blinking

Our PL stays blue most of the time so we go by day ahead prices that we view on the computer. Trying to use the lowest times for laundry and dishwasher.

as my ball ages it seems to be green a lot more. is this common in the fall

no

No

No comments or suggestions.