Justin Wickett
12/02/08
ENV 130: Energy & The Environment

Real-Time Electricity Pricing: The Time is Now

The Obama administration plans to implement electricity demand-side management programs to reduce loads on the electric grid during peak power consumption hours. As a result, President-elect Barack Obama has pledged to invest in building out a new digital electric grid that incorporates smart meters amongst various other technologies.

But demand-side management is not possible until consumers have an incentive to implement such programs. Electricity currently being sold at fixed-rate prices does nothing to promote effective peak load reductions, a goal stated in the Obama administration's "Energy Plan for America".[1] As a result, Obama must pressure the regulatory agencies that control utilities and electricity markets into adopting real-time electricity pricing plans that can be applied to all customers.

When a customer signs up for a real-time electricity pricing (RTP) plan, they commit to paying prices for electricity set by their utility to cover the costs of supplying power as the demand fluctuates over the course of a day. Real-time electricity costs are generally computed on an hourly basis and vary based on time of day. By tailoring traditional energy consumption patterns, residential customers can take advantage of lower rates at off-peak hours. In short, real-time electricity pricing provides customers with a financial incentive to reduce power consumption during peak hours when the demand for electricity is the greatest. Studies have shown that adopting real-time electricity pricing could reduce consumption of peak power by up to 24.5% if all consumers have a demand elasticity of -0.1.[2]

Despite the support, benefits, and available technology, utilities have been slow to offer real-time electricity pricing plans to residential customers. The electric power industry remains highly regulated, and as a result, moves slowly. Utilities lack the required incentives to introduce real-time electricity pricing plans in fear of potential revenue loss and customer dissatisfaction.[3] Furthermore, customers also remain skeptical of real-time electricity pricing due to increased volatility and unstable prices when it comes to their electric bill.

In 2007, then Senator Obama voted in support of the Energy Independence and Security Act, which requires a program "to investigate the feasibility of a transition to time-of-use and real-time electricity pricing".[4] If Obama is to follow through with his promise to reduce peak electricity loads, he must immediately begin to channel resources into the study and implementation of real-time electricity pricing.

Today's real-time electricity pricing plans exist primarily for large industrial electricity users. In the past, utilities have feared not being able to recover costs associated with building

---

1 The Barack Obama and Joe Biden Campaign, "Barack Obama And Joe Biden: New Energy For America", Available at <http://www.barackobama.com/pdf/factsheet_energy_speech_080308.pdf>.

2 Kathleen Spees and Lester B. Lave, "Demand Response and Electricity Market Efficiency", The Electricity Journal, Volume 20, Issue 3, April 2007, Pages 69-85, Available at <http://www.sciencedirect.com/science/article/B6VSS-4N97BNM-2/2/f61b19152f28e4a7a9f1fd446a941acc>.

3 Ken Costello, "An Observation on Real-Time Pricing: Why Practice Lags Theory", The Electricity Journal, Volume 17, Issue 1, January-February 2004, Pages 21-25, Available at <http://www.sciencedirect.com/science/article/B6VSS-4BDCC89-3/2/a031134510bbf714d35f4ff0288261a1>.

4 GovTrack.us, H.R. 6--110th Congress (2007): "Energy Independence and Security Act of 2007", GovTrack.us (database of federal legislation), Available at <http://www.govtrack.us/congress/bill.xpd?bill=h110-6>.

out a smart meter network. The Obama administration must immediately begin to subsidize smart meters to provide a foundation upon which utilities can commence to build out demand-side management programs for all their customers.

However, supplying customers with smart meters is only the first step in reducing demand during peak power hours. In addition, Obama must require that utilities institute real-time pricing plans to make the information provided by smart meters relevant to end consumers. Demand-side management programs require consumers to leverage their smart meters to reduce stress on the electric grid and lower consumption at peak loads.

To calm any doubts or misconceptions, Obama should force utilities to provide hedging options to the consumers that want to minimize variability in their electric bill. According to the Center for the Study of Energy Markets, "very simple hedging strategies can eliminate more than 80% of the [electricity] bill volatility that would otherwise occur" with real-time electricity pricing.[5] Customers who take advantage of hedging may be unusually high consumers of electricity during peak hours or consumers that suffer from low demand elasticity. By taking advantage of a hedging option provided by local utilities, residential customers will not have to worry about being surprised at the end of the month by a bill that consumes their paycheck.

As a result of signing up for a real-time electricity pricing plan, the customers of Ameren Illinois utilities were able to save on average 16 percent on their electric bills in 2007.[6] Residential customers with ComEd, a competing utility in the same area, that chose the real-time electricity pricing plan saved between 7 to 12 percent in 2007 compared to those paying the fixed rate.[7] By heavily pushing for real-time electricity pricing, President-elect Barack Obama has the potential to ensure that demand for power at peak levels does not rise under his administration while allowing citizens to reduce their monthly electric bill.

---

5 Severin Borenstein, "Customer Risk from Real-Time Retail Electricity Pricing: Bill Volatility and Hedgability", Center for the Study of Energy Markets, July 2006, University of California Energy Institute, Available at <http://www.ucei.berkeley.edu/PDF/csemwp155.pdf>.

6 CNT Energy, "Power Smart Pricing", Available at <http://www.powersmartpricing.org/>.

7 PRNewswire, "ComEd Pioneers Real-Time Pricing Program for Residential Customers", Reuters, January 31, 2007, Available at <http://www.reuters.com/article/pressRelease/idUS274507+31-Jan-2008+PRN20080131>.

Bibliography

1. The Barack Obama and Joe Biden Campaign. “Barack Obama And Joe Biden: New Energy For America”. Available at <http://www.barackobama.com/pdf/factsheet_energy_speech_080308.pdf>.
2. Borenstein, Severin. “The Long-Run Effects of Real-Time Electricity Pricing”. Center for the Study of Energy Markets. June 2004. University of California Energy Institute. Available at <http://www.ucei.berkeley.edu/PDF/csemwp133.pdf>.
3. Borenstein, Severin. “Customer Risk from Real-Time Retail Electricity Pricing: Bill Volatility and Hedgability”. Center for the Study of Energy Markets. July 2006. University of California Energy Institute. Available at <http://www.ucei.berkeley.edu/PDF/csemwp155.pdf>.
4. CNT Energy. “Power Smart Pricing”. Available at <http://www.powersmartpricing.org/>.
5. Costello, Ken. “An Observation on Real-Time Pricing: Why Practice Lags Theory”. The Electricity Journal. Volume 17, Issue 1. January-February 2004. Pages 21-25. Available at <http://www.sciencedirect.com/science/article/B6VSS-4BDCC89-3/2/a031134510bbf714d35f4ff0288261a1>.
6. Eggers, Kathryn. “Real-Time Electricity Pricing in Illinois”. CNT Energy. Available at <http://www.standingupforillinois.org/uploads/SCS2008Eggers.pdf>.
7. GovTrack.us. H.R. 6--110th Congress (2007): “Energy Independence and Security Act of 2007”. GovTrack.us (database of federal legislation). Available at <http://www.govtrack.us/congress/bill.xpd?bill=h110-6>.
8. PRNewswire. “ComEd Pioneers Real-Time Pricing Program for Residential Customers”. Reuters. January 31, 2007. Available at <http://www.reuters.com/article/pressRelease/idUS274507+31-Jan-2008+PRN20080131>.
9. Spees, Kathleen and Lave, Lester B. “Demand Response and Electricity Market Efficiency”. The Electricity Journal. Volume 20, Issue 3. April 2007. Pages 69-85. Available at <http://www.sciencedirect.com/science/article/B6VSS-4N97BNM-2/2/f61b19152f28e4a7a9f1fd446a941acc>.

Images:

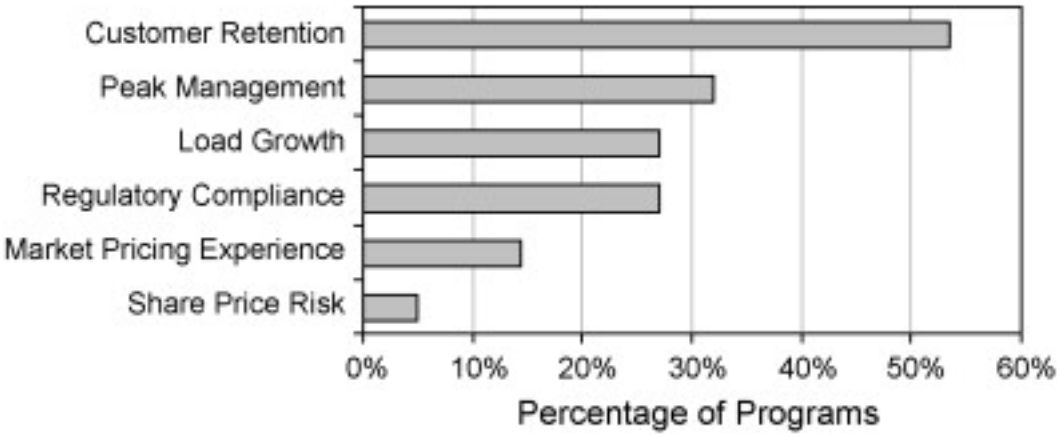

Figure 3. Utility-Reported Motivation for Offering RTPs to Customers

Spees, Kathleen and Lave, Lester B. "Demand Response and Electricity Market Efficiency". The Electricity Journal. Volume 20, Issue 3. April 2007. Pages 69-85. Available at <http://www.sciencedirect.com/science/article/B6VSS-4N97BNM-2/2/f61b19152f28e4a7a9f1fd446a941acc>.

Equilibrium Savings in Switching from Average Price to RTP, Elasticity −0.1[74]

Participating Load	Customer Bills ($)	Energy Consumption (MWh)	Peak Power (MW)
33.3%	3.51%	−0.53%	14.0%
66.7%	5.25%	−0.92%	20.3%
99.9%	6.52%	−1.23%	24.5%

Savings associated with using Real-Time electricity prices.

Spees, Kathleen and Lave, Lester B. "Demand Response and Electricity Market Efficiency". The Electricity Journal. Volume 20, Issue 3. April 2007. Pages 69-85. Available at <http://www.sciencedirect.com/science/article/B6VSS-4N97BNM-2/2/f61b19152f28e4a7a9f1fd446a941acc>.