

Evaluating Residential Real-Time Pricing: Connecting Customer Response to Energy Market Impacts

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Presentation Overview

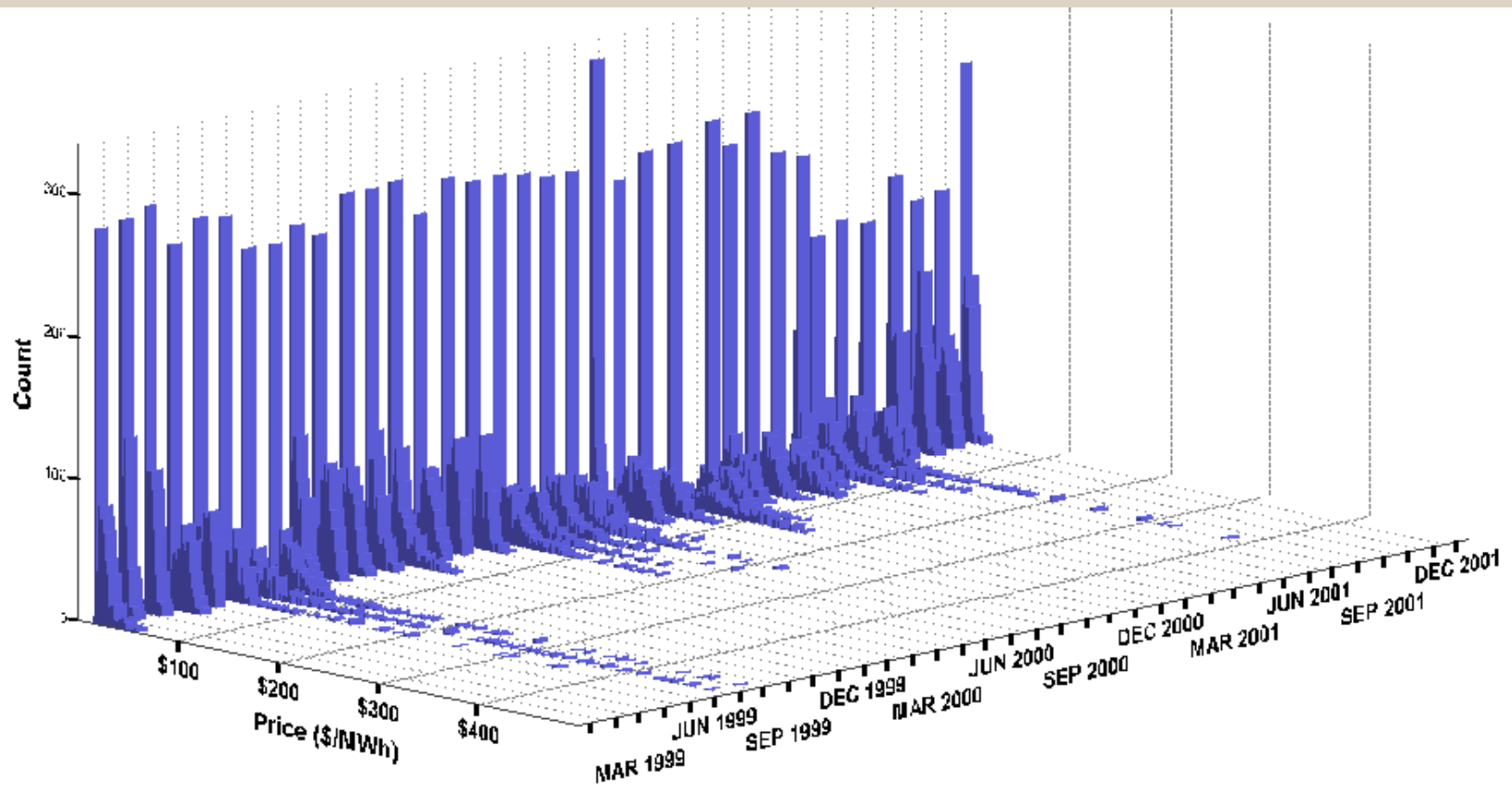
1. The emerging field of evaluation of price-based demand response
2. The Illinois real-time pricing experiment
3. Results so far
4. Implications for the future

Two aspects of evaluation

1. How the customer changes electricity use in response to prices (outcome=elasticity)
2. How these aggregated responses impact the electrical system.
 - reduction in peak demand
 - monetary value of that reduction



Analysis of electricity prices shows relatively few high-priced hours



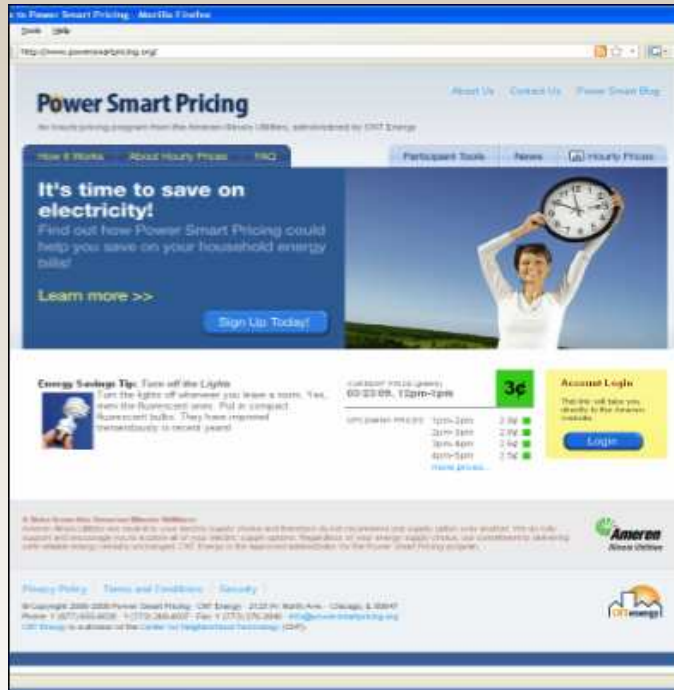
Real time pricing in Illinois

- Electricity costs unbundled from distribution and transmission
- Consumers paid hourly, market-based prices (pass through of PJM & MISO hourly prices)
- Interval meters, read by traditional meter readers
- No enabling technologies, just consumer education and high price notifications
- Customers are served by same utility

From pilot to scale

- In 2006 Illinois General Assembly unanimously passed legislation that required the two large utilities in the state to offer real-time pricing programs as an optional service for residential customers.
- Elsewhere the debate has been more contentious
 - “California should step back from the rate-base oriented mode of promoting a combination of supply side resources and advanced meters, even though those programs are most advantageous to utility shareholders, while giving short shrift to other peak-oriented programs.” (TURN, 2006)

RTP – from pilot to scale



> 9133
participants



> 9104
participants

Participant Savings

Year	Average Monthly Bill	Average Monthly kWh	Savings
Energy Smart Pricing Plan			
2003	\$51.10	630	20.10%
2004	\$56.99	648	11.30%
2005	\$77.82	758	-6.30%
2006	\$56.50	677	15.00%
ComEd RRTP			
2007	*	**	13.0%
2008	\$82.00	**	5.3%
2009	\$103.04	**	15.0%
Power Smart Pricing			
2007	*	**	16.2%
2008	\$93.00	949	7.72%
2009	\$78.67	960	24.40%

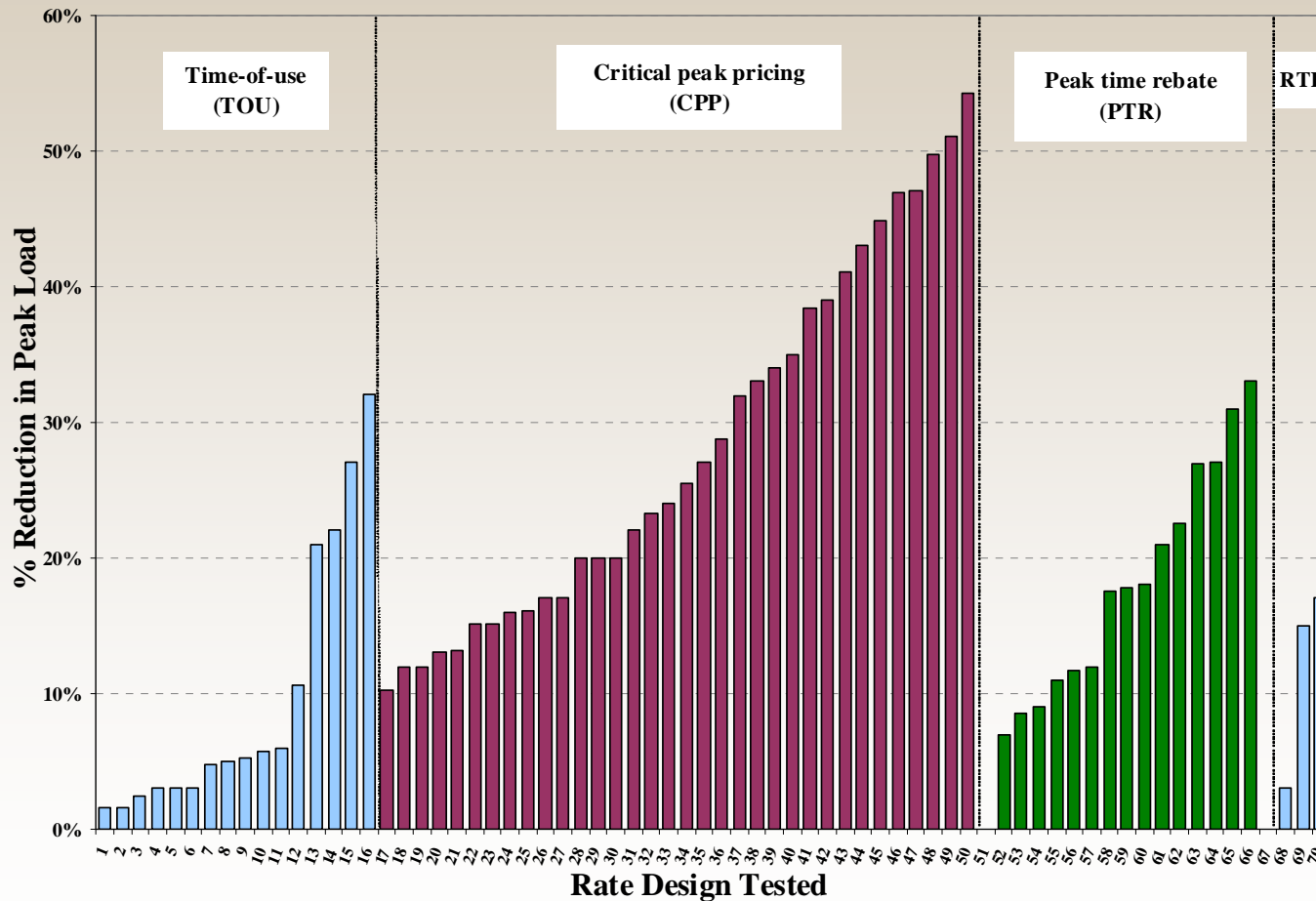
Assessing the Potential Benefits of RTP

- Illinois legislation required assessment of net benefits to consumers from program, including consideration of:
 - Improvements to system reliability and power quality
 - Reduction in wholesale market prices and price volatility
 - Electric utility cost avoidance and reductions
 - Market power mitigation, and
 - Other benefits

Long-Term Evidence of Price Response

Location	Type	Year	Own-Price Elasticity
San Diego	Mix	2000	-6.8%
CA CPP-Fixed	Residential	2003	-3.5%
CA-CPP-Fixed	Residential	2004	-5.4%
CA-CPP Variable	Res. w/technology	2003-04	-2.7% to -4.4%
Chicago ESPP	Residential	2003	-4.2%
Chicago ESPP	Residential	2004	-8%
Chicago ESPP	Residential	2005	-4.7%
Chicago ESPP	Res w/AC switch	2005	-6.9%
Ameren PSP	Residential	2008	-4.3%
Ameren PSP	Residential	2009	-2.3%

Comparison of Peak Load Reductions Across Dynamic Pricing Programs



Defining the Framework for Evaluating Net Benefits



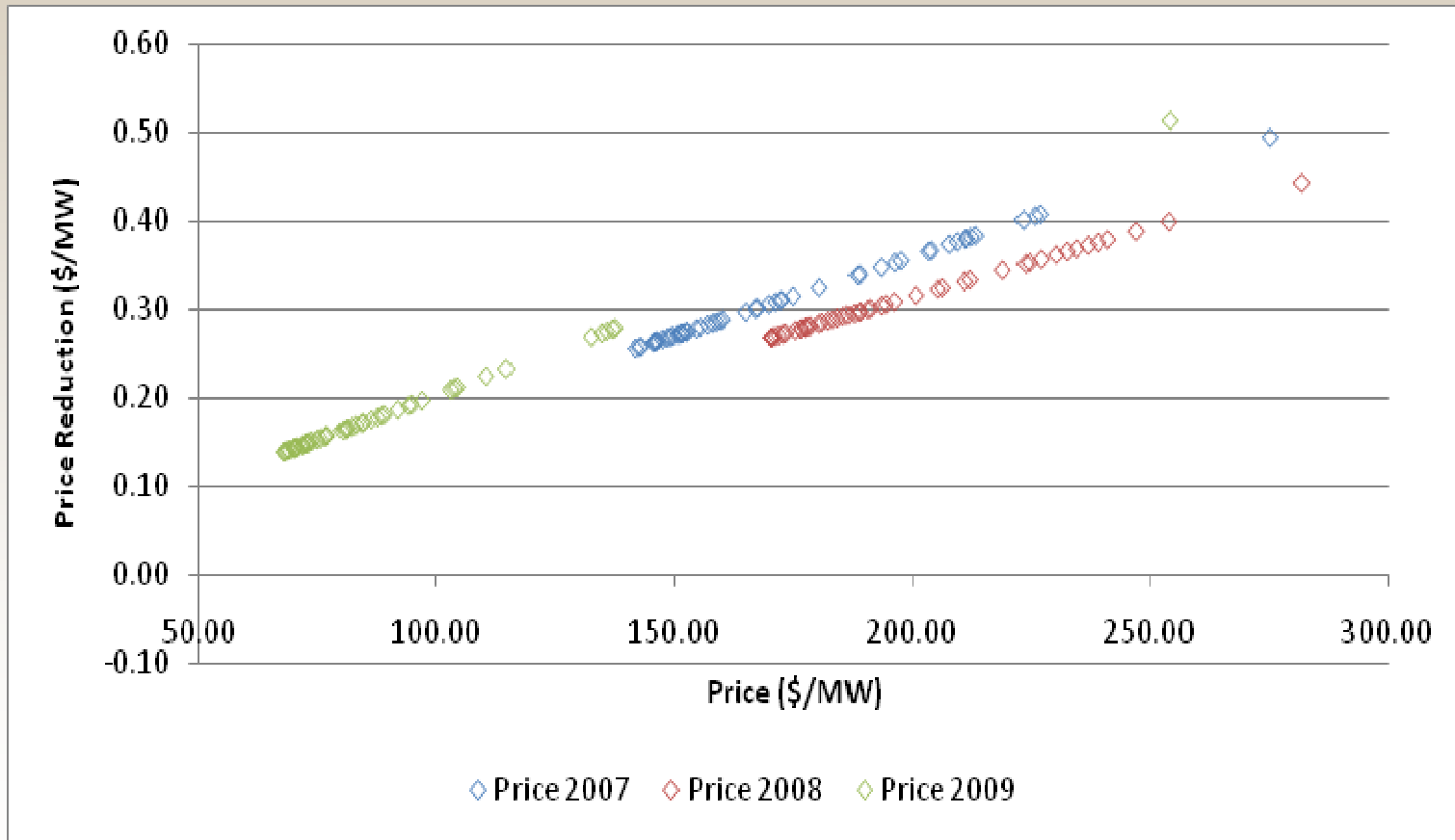
Use four models:

1. SBC 2005 report for the IEA
2. Brattle report for MADRI
3. 2006 testimony to ICC Docket 06-0691
4. PSERC open source simulation models

Preview of One-Year Net Benefit Assessments

	2008	2009
Non-Participant Benefits: Reduction in MISO Price	\$978,664	\$758,700
Participant Benefits: Avoided Capacity Costs	\$10,928	\$8,915
Participant Benefits: Avoided Energy Costs	\$207,375	\$1,735,400
TOTAL BENEFITS	\$1,196,967	\$2,503,015
Program Implementation Costs – CNT	\$420,458	\$420,458
Program Implementation Costs – AIU	\$211,418	\$351,689
Evaluation Costs	\$64,000	\$82,000
TOTAL COSTS	\$695,876	\$925,308
NET BENEFITS	\$501,091	\$1,577,707

The Real-time (Hourly) Energy Price Reduction from a One MW Reduction in Demand



The challenges ahead

- What is the size of the potential market?
- Will regulatory climates tolerate exposing some customers to more risk in exchange for more potential rewards?
- How will smart rates such as real-time pricing inform the debates on smart metering?

Merci beaucoup
(Thank you)



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