SMARTENERGY > INNOVATION
EFFICIENCY
CHOICE
SAVINGS
MANAGEMENT

MADRI: All About Peak-Time Rebates

BGE

February 2, 2012

Demand Response

Critical Peak Pricing (CPP) vs. Peak Time Rebates (PTR)

- **Demand Response**: Changes in electric usage by end-use customers from their normal consumption patterns in response to changes in the price of electricity over time, or to incentive payments designed to induce lower electricity use at times of high wholesale market prices or when system reliability is jeopardized. (FERC's definition)

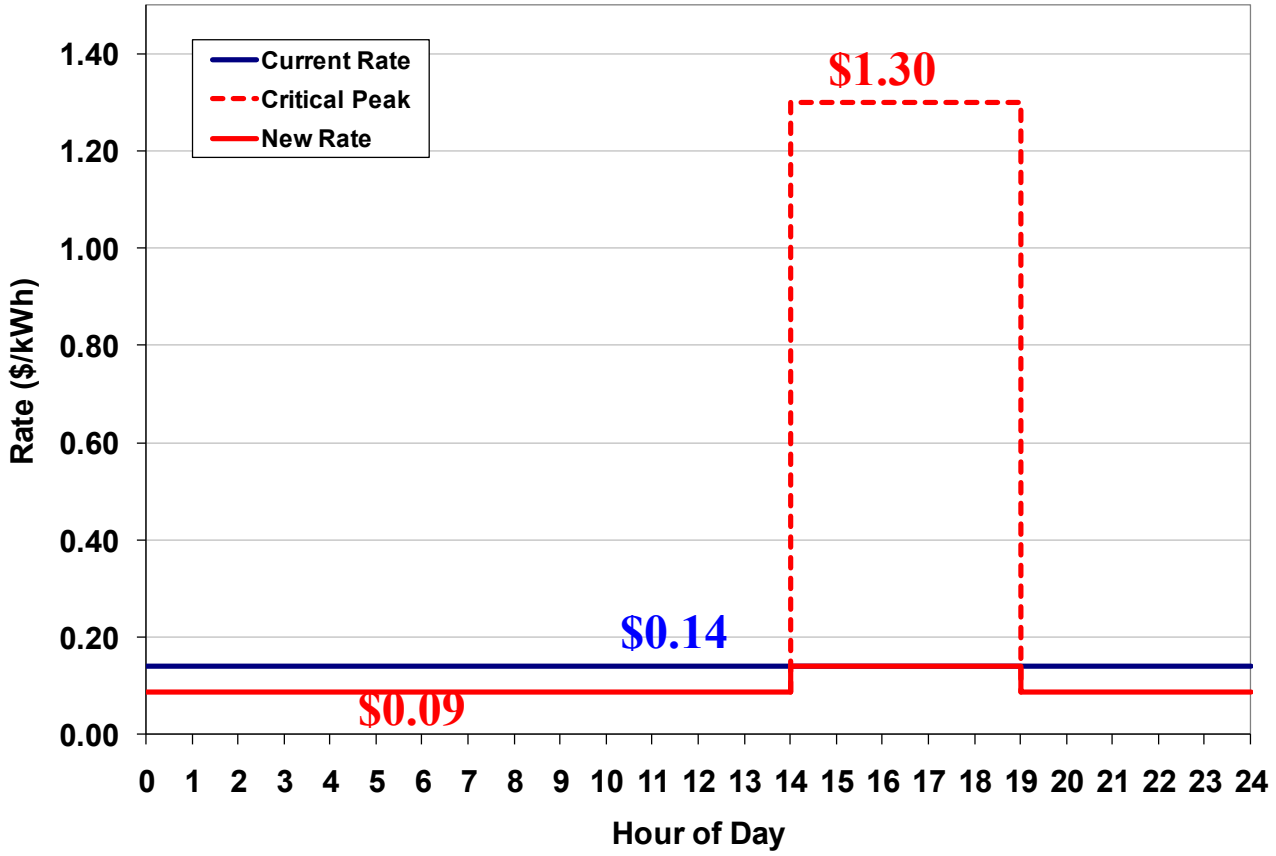
- Two prevalent forms of dynamic pricing for residential customers are Critical Peak Pricing (CPP) and Peak Time Rebates (PTR)

Roles of PTR and CPP

- **PTR and CPP**
  - Each provides incentives for customers to reduce demand during periods of high wholesale prices or system constraints
  - Each can be designed to be revenue neutral so that the average customer who makes no change in usage will see no change in the bill
- Under CPP customers typically face a significantly higher cost during for a small number of hours each summer offset by lower rates for most hours
- Under PTR customers typically face traditional rates but can earn a rebate if demand is reduced during critical periods

Critical Peak Pricing Example

Weekday Example

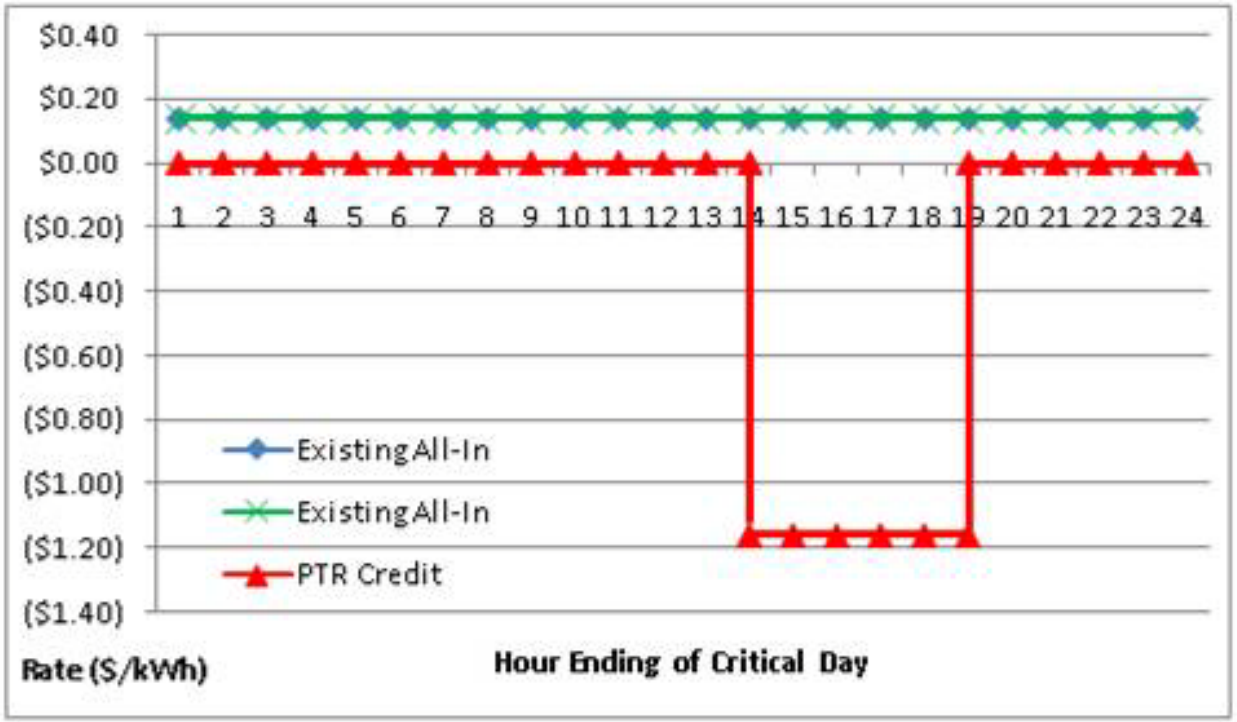


During critical events the price is raised from the normal charge of $0.14/kWh to $1.30/kWh.

Customers are typically notified the evening prior to the event.

Peak Time Rebate Example

Weekdays (excluding Holidays)



Mirror Image of CPP

The normal rate of $0.14/kWh is charged.

When critical events are called, customers are given a rebate for each kWh reduced.

In this example the rebate is $1.16/kWh

Customers' Perceptions on Dynamic Pricing

- BGE tested Critical Peak Pricing rates by holding 6 focus groups in July 2007 with 49 residential customers
  - $1.30 Critical Peak Price w/TOU peak rate $0.14, off peak $0.09
  - $0.80 Critical Peak Price w/TOU peak rate $0.18, off peak $0.10
- Customers understood Critical Peak Pricing
  - "In the summer, when the weather is very hot and people are running their air conditioners… the cost of generating electricity is higher."
- Customers liked certain features
  - Liked idea of off peak rate being lower than current rate
  - Did not see problem with $1.30 CPP given low number of hours (12 events = 2% of summer hours at $1.30, and 85% at $0.09 as compared to $0.14)
  - Preferred the savings associated with the higher price of $1.30/kWh as compared to $0.80/kWh

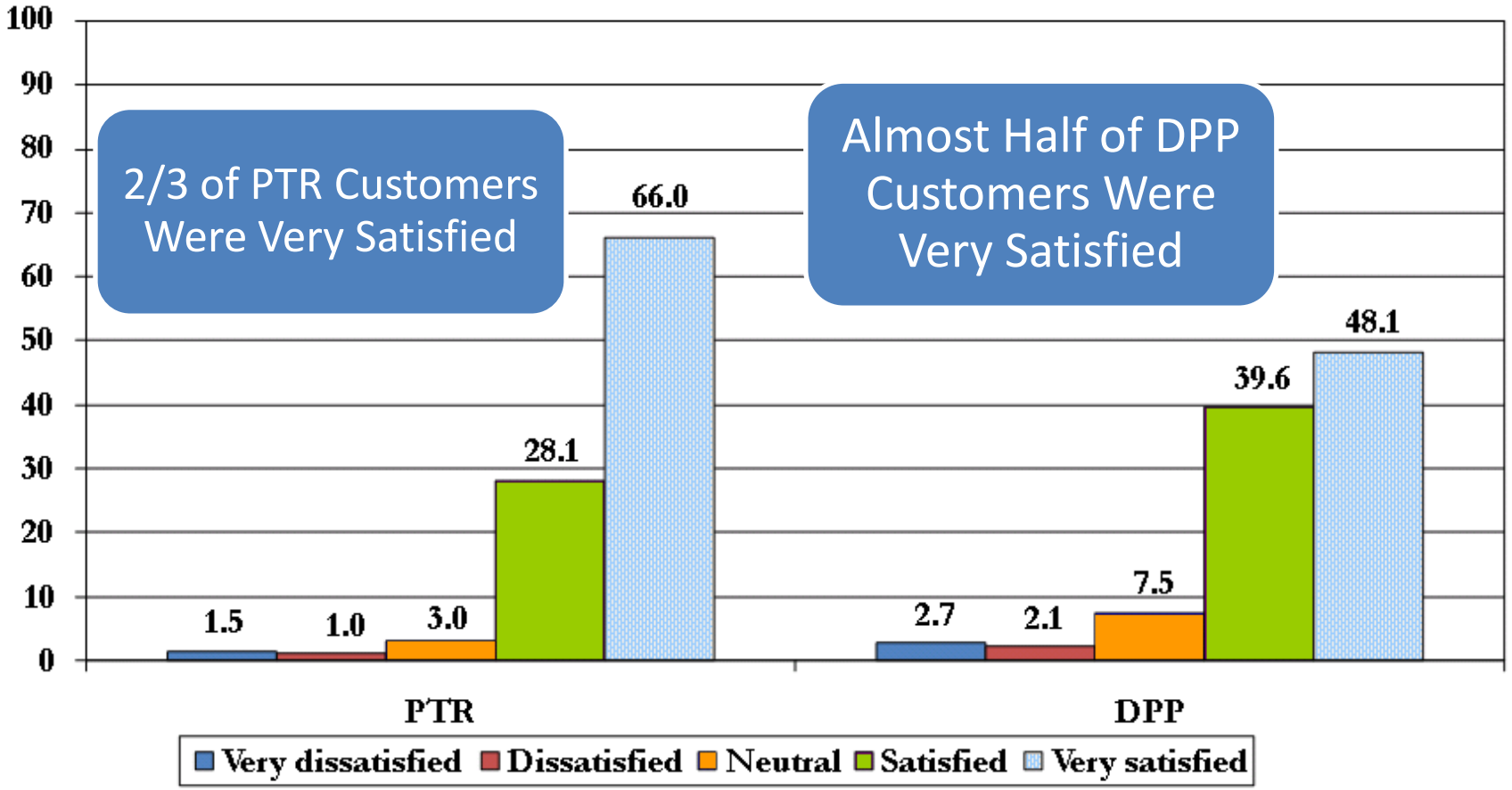
Customers' Perceptions on Dynamic Pricing

- Customers wanted to understand what they had to do to save energy and money
  - Which technologies/appliances use most energy?
  - Is it OK to adjust your thermostat?
- Customers wanted feedback on how much they were saving
- Customers expressed strong interest in finding ways to save on their bills and thought CPP would help them, but expressed concern that not everyone would understand and save

This and feedback from stakeholders led BGE to consider PTR as well as CPP

In 2008, PTR More Favorable than DPP, Overall 93% Satisfied

On a scale of 1 to 5, where 1 is "Very Dissatisfied" and 5 is "Very Satisfied", please rate your overall satisfaction with the pilot program. (77% response rate)



Customers Think Smart Energy Pricing Should be the Standard

During your pilot participation, you experienced a variable rate program where energy used during critical peak periods cost more than energy use during other times. Customers saved money by using energy during non-critical peak periods. Do you think this pricing format should be standard for all BGE customers? (Select one option)

4/5 of PTR participants

think smart energy pricing should be standard for all BGE customers

97% would like to return to the same pricing structure in 2009

Smart Energy Pricing Evolved Based on Research

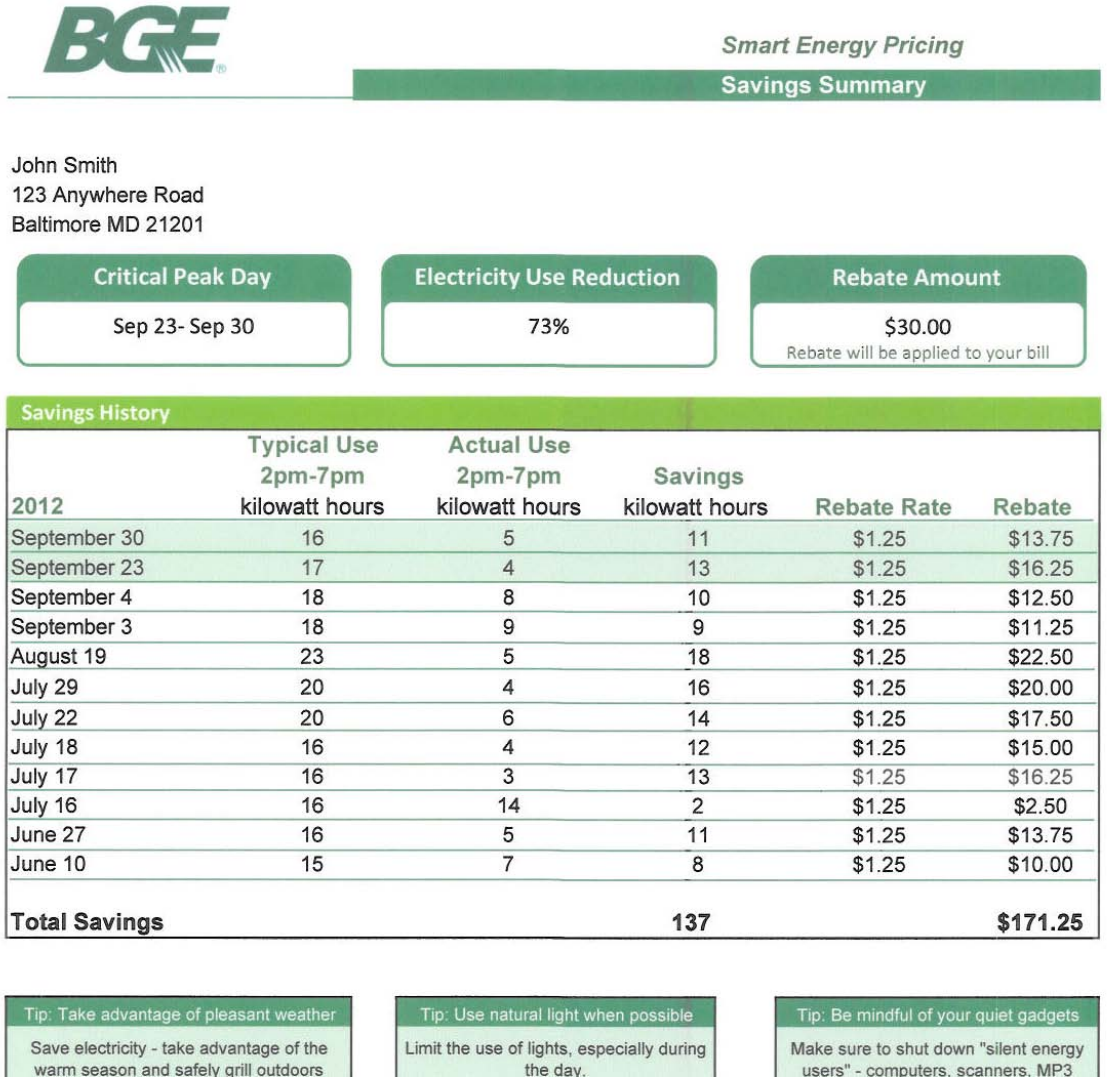
- **BGE decided to offer Peak Time Rebates only in the subsequent summers of 2009 – 2011**
  - There was no difference in demand elasticity for CPP vs. PTR
  - Stakeholders including customers, PSC Commission and Staff, Office of People's Counsel and AARP preferred PTR
  - Customers' understanding of their electricity usage varies considerably and the higher price point for CPP caused concern
  - Under PTR customers can earn a rebate, but are not exposed to higher priced periods

Peak Time Rebate Savings Reports Were Sent Soon after Each Event

Timely feedback on **meaningful savings** is essential to a successful PTR program.

Customers who save take notice, and will continue to perform on future events.

Push this report to customers at first, and let them realize the value



BGE

Smart Energy Pricing

Savings Summary

John Smith
123 Anywhere Road
Baltimore MD 21201

Critical Peak Day	Electricity Use Reduction	Rebate Amount
Sep 23- Sep 30	73%	$30.00 Rebate will be applied to your bill

Savings History

2012	Typical Use 2pm-7pm kilowatt hours	Actual Use 2pm-7pm kilowatt hours	Savings kilowatt hours	Rebate Rate	Rebate
September 30	16	5	11	$1.25	$13.75
September 23	17	4	13	$1.25	$16.25
September 4	18	8	10	$1.25	$12.50
September 3	18	9	9	$1.25	$11.25
August 19	23	5	18	$1.25	$22.50
July 29	20	4	16	$1.25	$20.00
July 22	20	6	14	$1.25	$17.50
July 18	16	4	12	$1.25	$15.00
July 17	16	3	13	$1.25	$16.25
July 16	16	14	2	$1.25	$2.50
June 27	16	5	11	$1.25	$13.75
June 10	15	7	8	$1.25	$10.00
Total Savings			**137**		**$171.25**

Tip: Take advantage of pleasant weather	Tip: Use natural light when possible	Tip: Be mindful of your quiet gadgets
Save electricity - take advantage of the warm season and safely grill outdoors	Limit the use of lights, especially during the day.	Make sure to shut down "silent energy users" - computers, scanners, MP3

Funding Peak Time Rebates

- **Utilities funding of Peak Time Rebates may vary**
  - Utilities in organized markets, such as PJM, may monetize the value of demand response to finance rebates
  - Surcharge mechanisms may also be used to fund rebates
- **Is rebate funding a form of cross-subsidization?**
  - The cost of electricity varies considerably over time and this underlying cost is not reflected in static volumetric rates
  - In BGE's zone in 2011, the maximum LMP was over $800, more than 17 times higher the mean of $49, over 20 times higher than the median $38
  - Reducing the demand for electricity during critical peak periods has the potential to increase the efficiency of electricity usage and thereby lower costs for all customers

Program Satisfaction

- Satisfaction with the SEP Pilot Program remained consistently high, with two thirds of the participants (63% in 2009 and 62% in 2008) claiming to be 'Very Satisfied' with the pilot program, and nine out of ten participants stating they are at least 'Satisfied' (92% in 2009 and 93% in 2008).
- Results for 2010 indicated 61% were very satisfied and 32% were satisfied.

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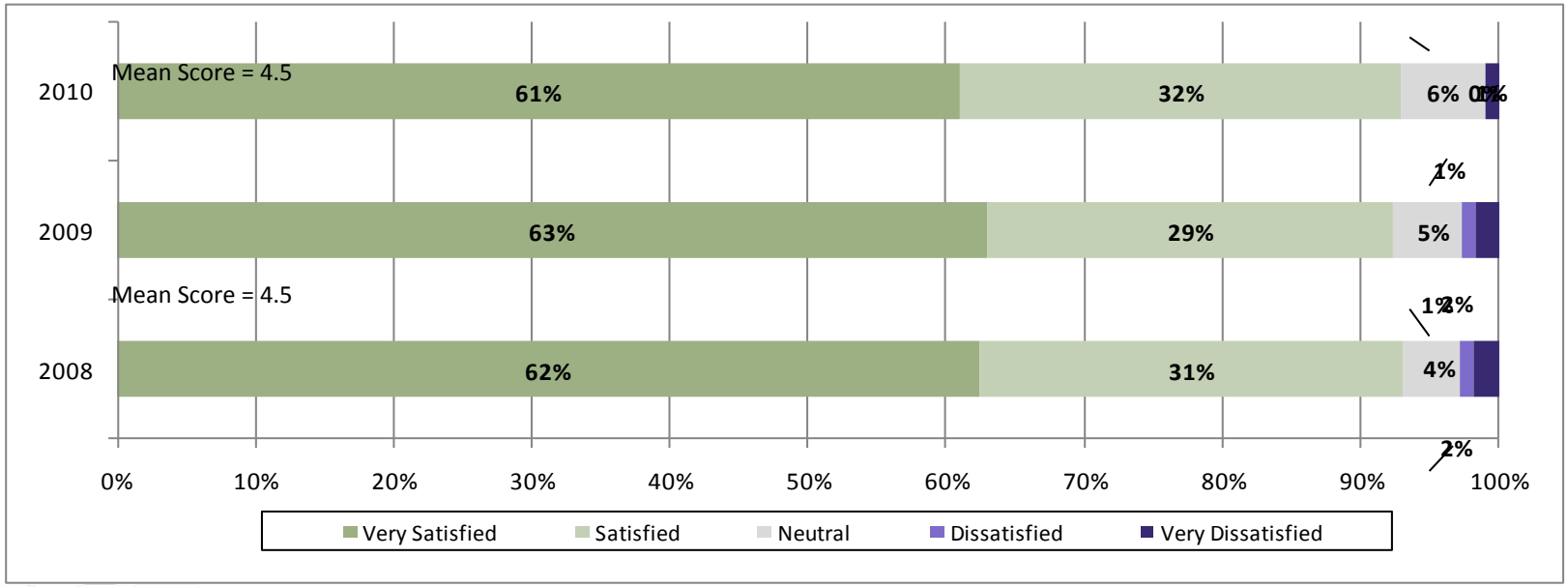
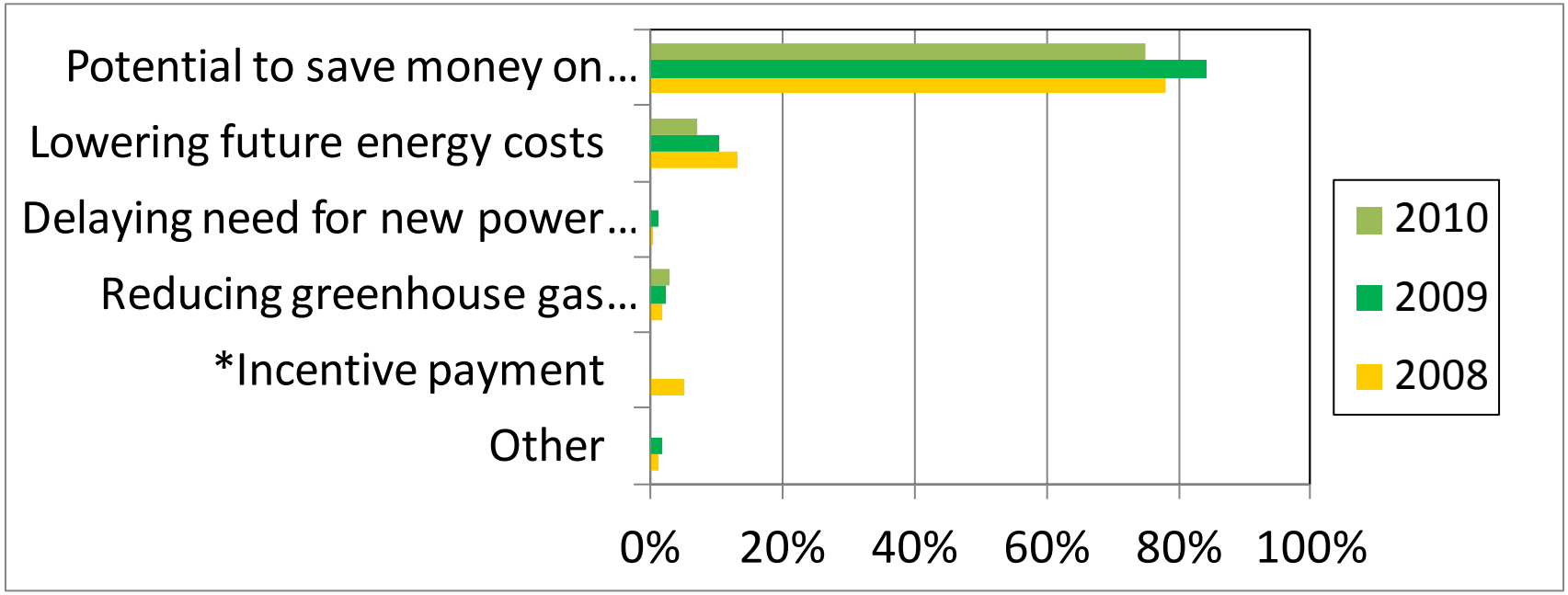
Q 2a). On a scale of 1 to 5, where 1 is "Very Dissatisfied" and 5 is "Very Satisfied", please rate your overall experience with the Smart Energy Pricing pilot program.



Reasons to Participate in Smart Energy Pricing

- The *potential to save money on monthly utility bills* continues to be the primary motivation behind customers' participation in the Smart Energy Pricing Pilot, with selection of this response at 78% in 2008, 84% in 2009 and 75% in 2010.

Q 1. What was the most important reason for your participation in the 2009 Smart Energy Pricing Pilot? (Select one option)

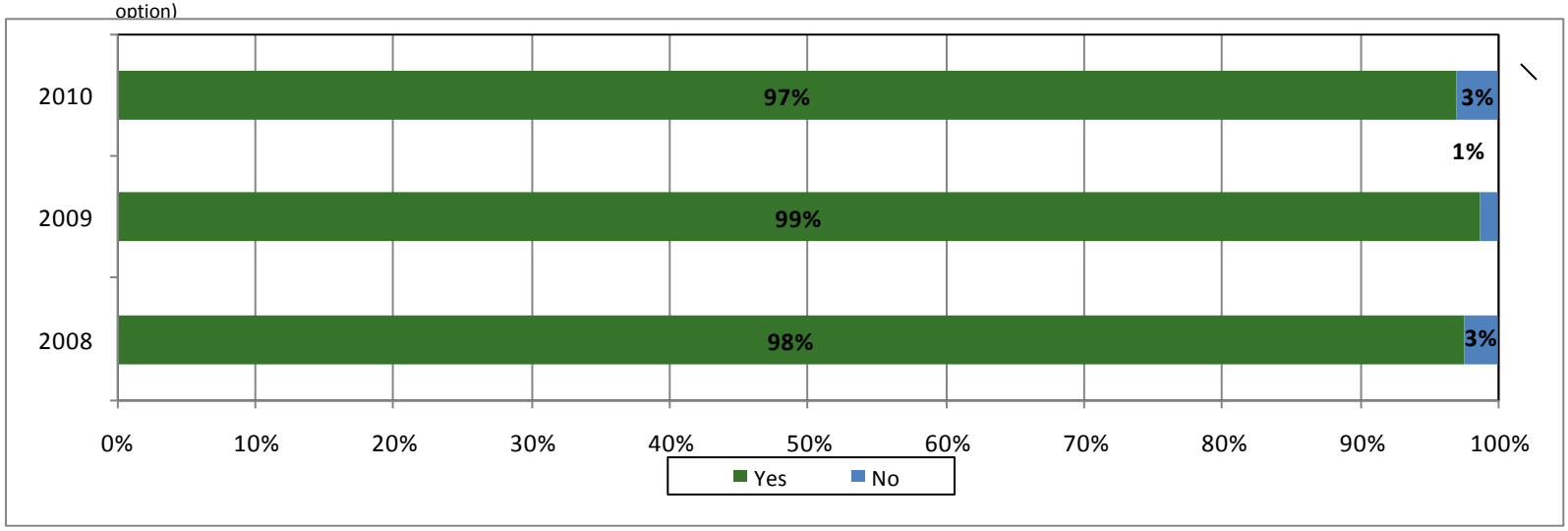


Interest in Future Participation

- Participants in each year's SEP Pilot Program: 97% in 2010, 99% in 2009, and 98% in 2008 – were overwhelmingly interested in returning to a similar pricing structure the following summer.

- Further, 93% of 2009 study participants believe the opportunity to earn rebates for reducing energy usage during Critical Peak periods should be standard for all BGE customers.

Q.4. The Smart Energy Pricing Pilot program has ended and all participants who received special rebate credit opportunities have returned to the normal billing structure. Would you be interested in returning to similar billing program structure as you experienced during the 2009 summer pilot program for the summer of 2010? (Select one option)



Did Customers Save?

- Results of The Brattle Group Evaluations found statistically significant, persistent savings over the 3 summer periods

Savings	2008	2009	2010
Peak Conditions	22 - 37%	28 - 38%	26 - 36%
Average Savings	18 - 33%	23 - 31%	24 - 35%
Rebates	$1.16 or $1.75	$1.50	$1.25

" We realized significant savings. I absolutely want to do it again next year."

"I liked the savings, and it is something we can fit into our lifestyle to save on energy costs."

Goals
1. LCM: CvK leadership; RZ PJM and regulatory; EzB org savvy; self ask WH 2. EE n DR: SEP; support for BP bid and RO accounting;
4. Load research aeic production PDF smart grid support lrc Recruits
5. Exelon transition support

In Conclusion

DYNAMIC PRICING WORKS

IF IT IS IMPLEMENTED THOUGHTFULLY BY

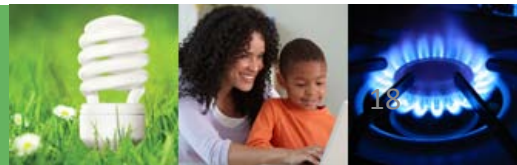
- Understanding participants' understanding of energy
- Developing simple program design
- Engaging and educating participants
- Providing robust pricing signals

THEN

- Providing timely feedback, showing value to participants
- Obtaining feedback from participants

Appendix

Additional Slides
Smart Energy Pricing



BGE Planned Smart Energy Pricing Based on Feedback

- BGE decided to offer Peak Time Rebates as well as Dynamic Peak Pricing (DPP a.k.a. CPP) beginning in June 2008
  - 1,021 randomly selected customers from the
    - entire BGE service territory
  - Day ahead notification of a peak event
  - Test groups included
    - Price incentive only
    - Price incentive with in-home display (Orb)
    - Price incentive with direct load control and Orb
  - Advanced meters were provided to collect 15-minute interval data
- Due to stakeholder input BGE decided to move forward with PTR only for 3 additional summer pilots and is now in its first winter pilot

Summer 2008 Pilot
Summary of *The Brattle Group* Analysis

Program	Number of Customers	Peak Demand Savings***			Energy Savings for SEP Critical Events**		
		Control Group	Participant Peak Reduction		Control Group Average Usage	Average Participant Reduction	
		kW	%	kW	kWh/hour	%	kWh/hour
PTR Low - $1.16 / kWh							
No Technology	126	3.19	22.3%	0.71	2.70	17.8%	0.48
Orb Technology	141	3.19	26.9%	0.86	2.70	23.0%	0.62
Orb and Switch Technologies	113	3.19	31.9%	1.02	2.70	28.5%	0.77
PTR - $1.75 / kWh							
No Technology	127	3.19	26.0%	0.83	2.70	20.9%	0.56
Orb Technology	137	3.19	31.2%	1.00	2.70	26.8%	0.72
Orb and Switch Technologies	118	3.19	36.8%	1.17	2.70	32.9%	0.89
Dynamic Peak Pricing							
No Technology	148	3.19	25.4%	0.81	2.70	20.1%	0.54
Orb and Switch Technologies	111	3.19	36.5%	1.16	2.70	32.5%	0.88

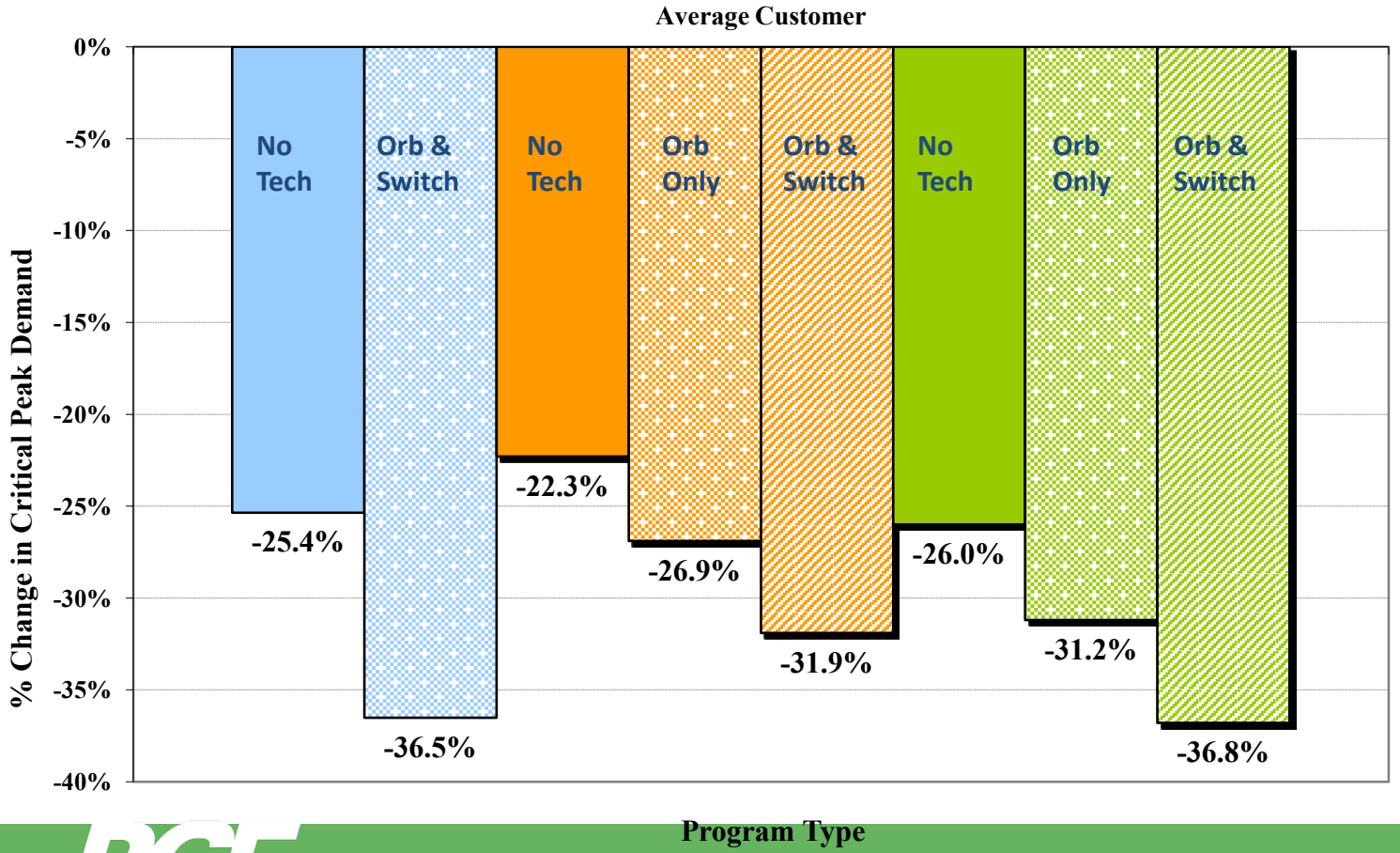
***** 'SEP Critical Events' are defined as the 10 hottest critical events during the 2008 summer from HE 15:00 to HE 19:00***

****** 'Peak Demand Savings' are defined as hour ending 17:00, for WTHI of 83.1 degrees***

WTHI = [current day's THI](10/14)+ [previous day's THI] * (3/14)+ [two day's ago THI] * (1/14)*

$THI_t = 17.5 + .55*DryBulb_t + .2*WetBulb_t$

Summer 2008 Pilot
Smart Energy Pricing - Peak Demand Reductions *



DPP Tariff

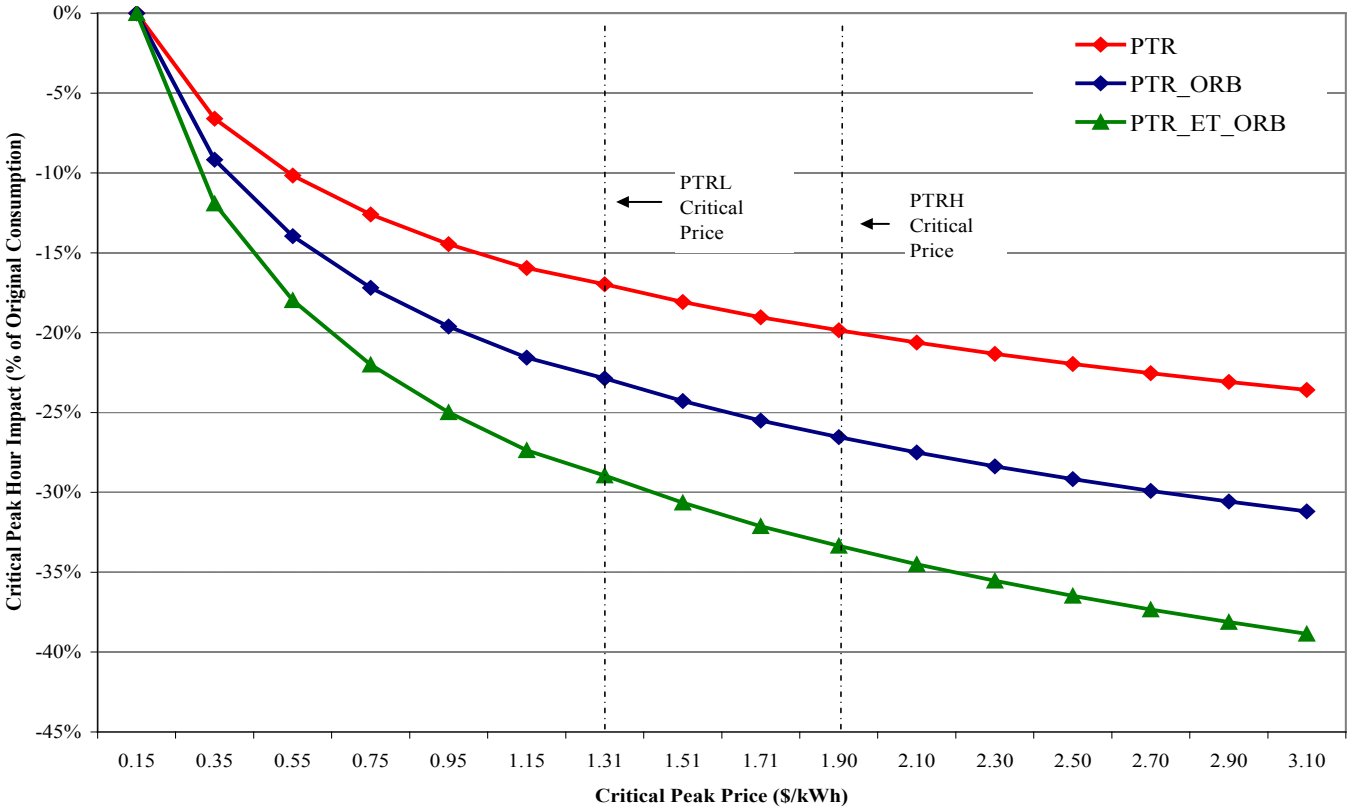
Low Rebate $1.16 / kWh

High Rebate $1.75 / kWh

*Peak demand reductions are defined for HE 17:00 for THI of 83.1 degrees

Price Response Curves- PTRL and PTRH

As critical peak price goes up, peak load impact increases.



Original Price= 0.146 $/kWh	Peak Price= 0.146 $/kWh	Off-peak Price= 0.146 $/kWh

Peak load impact increases when enabling technology is activated