

Designing a Customer-Focused DR Program

Jason Jones
Kansas City Power & Light

Overview

- ❑ Evolution of commercial and industrial demand response programs at KCP&L
- ❑ The redesign process
- ❑ Results of the redesign
- ❑ The future of DR at KCP&L

Evolution of DR at KCP&L

- ❑ 1993: Peak Load Curtailment Credit (PLCC)
 - \$10/kW-month fixed payment
 - No variable payment
 - Benefits lowered over time, to point they were less than customer's cost to curtail
- ❑ 1999: Voluntary Load Reduction (VLR) program
 - No fixed payment
 - Market-based variable payment
 - Not valued by KCP&L planners and dispatchers
- ❑ 2006: MPower (Version 1)
 - Fixed Payment -- \$16/kW-season to \$34/kW-season, depending on contract term
 - “Variable” payment of \$.36/kW of **curtailable** load
 - Low participation due to low incentives and restrictive operational parameters

Customer-Focused Redesign

- ❑ Conducted Market Research in Preparation for Customer Meeting
 - NYISO
 - ISO NE
 - Aggregators
 - KEMA and Utilipoint
- ❑ Customer Meeting
 - Held January 24, 2007
 - 40 customers representing 20 companies
 - Wide range of DR experience/inexperience

Customer Focused Redesign

□ Focus group structure

- Customers were taken through pricing and operational scenarios as discussion starters.
- Open dialogue was encouraged and achieved.
- Customers left behind written free-form notes and completed workbooks.

□ Several key themes emerged about existing MPower program

- Financial benefits too small.
- Financial benefits need to be received more in “real time”.
- Penalties too high.
- Risk too great (potential for 30 curtailments per season.)
- Baseline measurement unfair.
- Minimum curtailable load too high (200 kW).
- Too much exposure to commit to multi-year contract.

Focus Group Leads to Potential Program Changes

Focus Group Feedback	Potential Program Enhancement
Payments too low.	<ul style="list-style-type: none"> <input type="checkbox"/> Share more of benefit with customer. <input type="checkbox"/> Shift more of benefit to event payment. <input type="checkbox"/> Base event payment on kWh rather than kW.
Penalty risk too great.	Reduced enrollment payments vs. kWh penalty.
Risk of 30 potential curtailments too great.	Let customer choose # curtailments.
Risk of multi-year contract too great.	Let customer “earn” way into multi-year contract.
EPD calculation unfair.	Drop shoulder months from calculation.
Smaller customers excluded.	Lower minimum curtailable load from 200 kW to 25 kW.

MPower: Program Summary

	2007 MPower		
Contract Term	One Year	Three Year	Five Year
Annual Participation Payment	\$2.50/kW x # Events Chosen	\$3.25/kW x # Events Chosen	\$4.50/kW x # Events Chosen
Event Payment	\$.35/kWh		
Penalty	150% of enrollment payment pro-rated for event and amount of shortfall, and forfeiture of event payment during hours of shortfall.		
Curtailement Season	Jun - Sep		
Estimated Peak Demand	Based on Jun - Sep noon - 10 p.m. peaks.		
Minimum Curtailement Load	25 kW		
Max # Curtailements per Season	10		
Max # Consecutive Curtailement Days	3		
Hours of Notice	4 (with day-ahead courtesy notice)		
Hours During Which Curtailement Can Occur	noon - 10 p.m.		
Max Length of Curtailement	8 hours		
Days Excluded from Curtailements	Weekends and holidays		
Max Number Curtailement Hours per Season	80		

Key Program Enhancements – *Customer Picks Max # Curtailments*

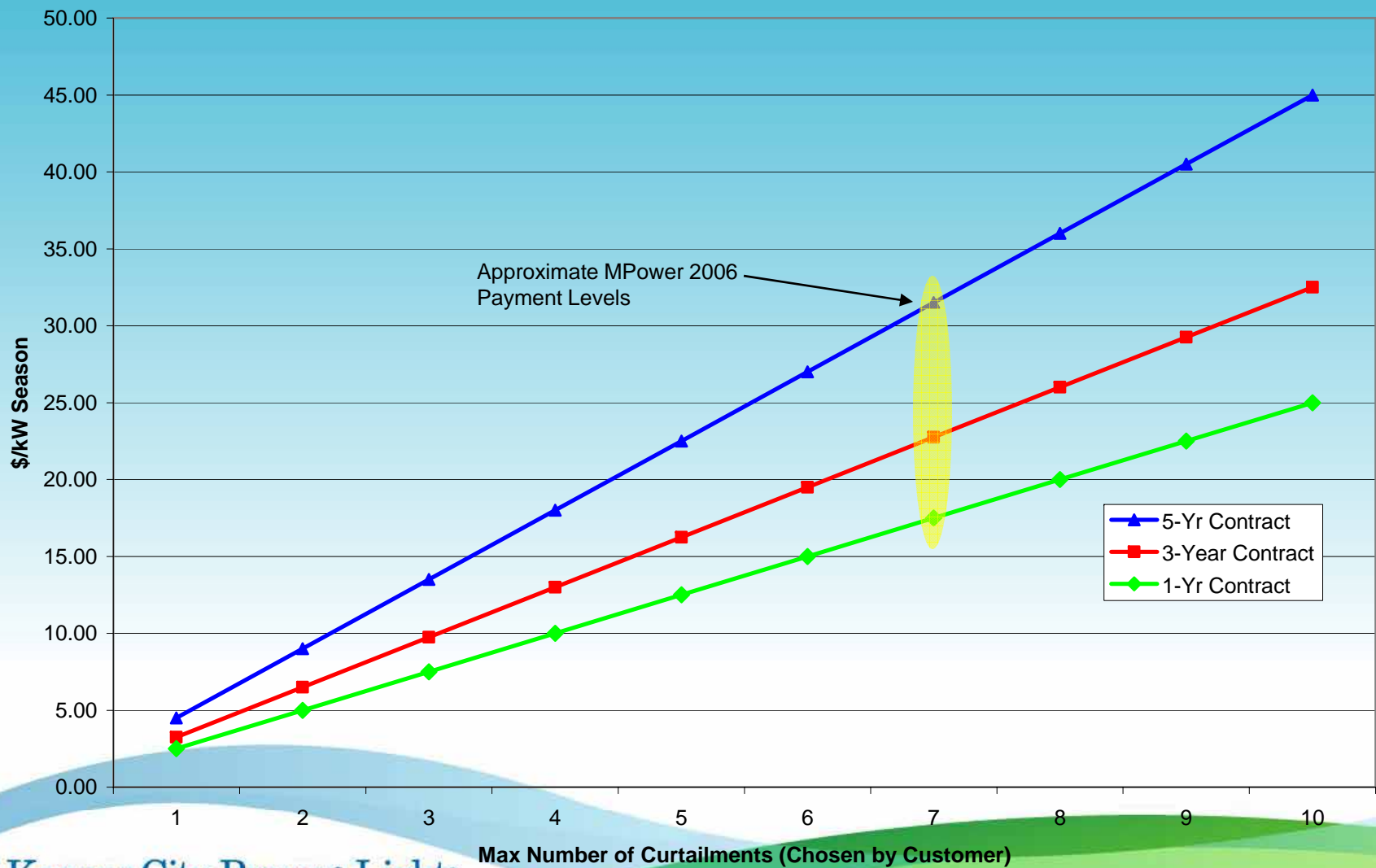
- ❑ Customer decides, up-front, max number of times they will curtail, from 1 to 10.
- ❑ The greater the commitment, the greater their participation payment.
- ❑ When called to curtail, customer must perform or be penalized.
- ❑ Provides low risk way for customers to enter program.

Key Program Enhancements – *Fixed Payment*

- ❑ Varies based on contract term, curtailable load and max number of events chosen by customer.
- ❑ 1-Yr Contract = (\$2.50/kW season) x (max # events)
- ❑ 3-Yr Contract = (\$3.25/kW season) x (max # events)
- ❑ 5-Yr Contract = (\$4.50/kW season) x (max # events)

Key Program Enhancements – *Fixed Payment*

MPower 2007 Fixed Payments



Key Program Enhancements – *Variable Payment*

- ❑ \$.35/kW of curtailable load for each hour successfully curtailed
- ❑ No additional payment for over delivery
- ❑ No partial payment for partial delivery
- ❑ 2006 vs. 2007 – Assume 6-hour curtailment, 1000 kW CL
 - 2006: Variable Payment = $\$.36 \times 1000 \text{ kW} = \360
 - 2007: Variable Payment = $\$.35 \times 1000 \text{ kW} \times 6 \text{ hrs} = \$2,100$

Key Program Enhancements – *Increased Total Benefit*

- ❑ Total financial benefit determined by focus group feedback.
 - One-year benefit had to increase by approximately 100%.
 - Three- and five-year benefit had to increase by approximately 60%.
- ❑ Customer-stated price points had to be checked against avoided cost of a CT.
 - This was done by looking at what would be paid in an average season and what the maximum possible payment would be if KCPL curtailed during all possible curtailment hours.
 - Average case = 42 curtailment hours (13 year historical average).
 - High case = 80 curtailment hours (based on program design; 10 curtailments x 8 hours per curtailment).
- ❑ Had to determine how to split total benefit over variable and fixed payments
 - Old MPower program, variable payment = 10% of total benefit.
 - New MPower program, variable payment = 30% of total benefit on average.
 - Decision driven by feedback received in focus groups.

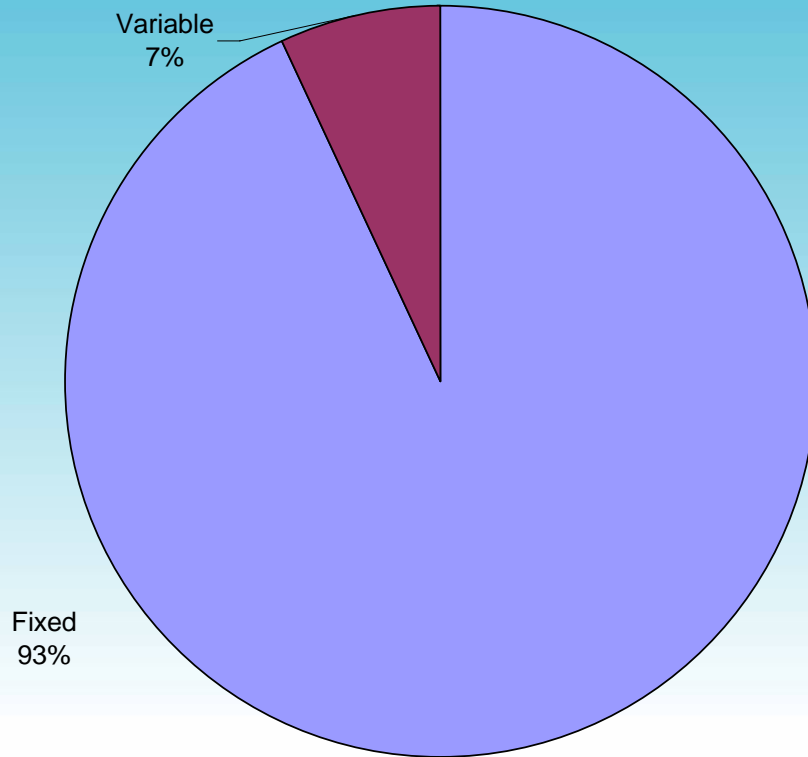
Key Program Enhancements – *Increased Total Benefit*

Average Case			New Program			Old Program		
Contract Term	# Events Signed Up For	# Event Hours	Fixed Payment	Variable Payment	Total Payment (\$/kW)	Fixed Payment	Variable Payment	Total Payment (\$/kW)
1 Year	10	42	\$ 25.00	\$ 14.70	\$ 39.70	\$ 16.00	\$ 2.52	\$ 18.52
3 Year	10	42	\$ 32.50	\$ 14.70	\$ 47.20	\$ 24.00	\$ 2.52	\$ 26.52
5 Year	10	42	\$ 45.00	\$ 14.70	\$ 59.70	\$ 34.00	\$ 2.52	\$ 36.52

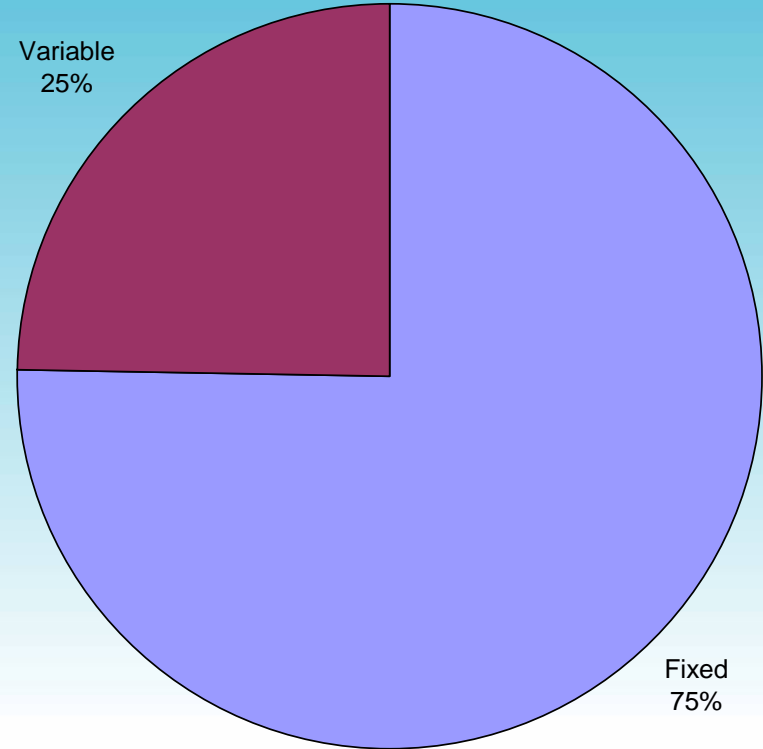
High Case			New Program			Old Program		
Contract Term	# Events Signed Up For	# Event Hours	Fixed Payment	Variable Payment	Total Payment (\$/kW)	Fixed Payment	Variable Payment	Total Payment (\$/kW)
1 Year	10	80	\$ 25.00	\$ 28.00	\$ 53.00	\$ 16.00	\$ 3.60	\$ 19.60
3 Year	10	80	\$ 32.50	\$ 28.00	\$ 60.50	\$ 24.00	\$ 3.60	\$ 27.60
5 Year	10	80	\$ 45.00	\$ 28.00	\$ 73.00	\$ 34.00	\$ 3.60	\$ 37.60

Key Program Enhancements – *Increased Emphasis on Variable Payment*

Old MPower Fixed vs. Variable Benefit



New MPower Fixed vs. Variable Benefit



Key Program Enhancements – *Reduced Penalty*

Example

- ❑ 5-year contract
- ❑ One six-hour event
- ❑ 1,000 kW curtailable load
- ❑ Customer delivers 0 kW during first two hours of event & 1,000 kW during each of last four hours

Penalty Comparison

	MPower 2007	MPower 2006	% Diff
Penalty	(\$2,250)	(\$2,500)	-10%
Event Payment	\$1,400	\$360	289%
Net Event Payment	(\$850)	(\$2,140)	-60%

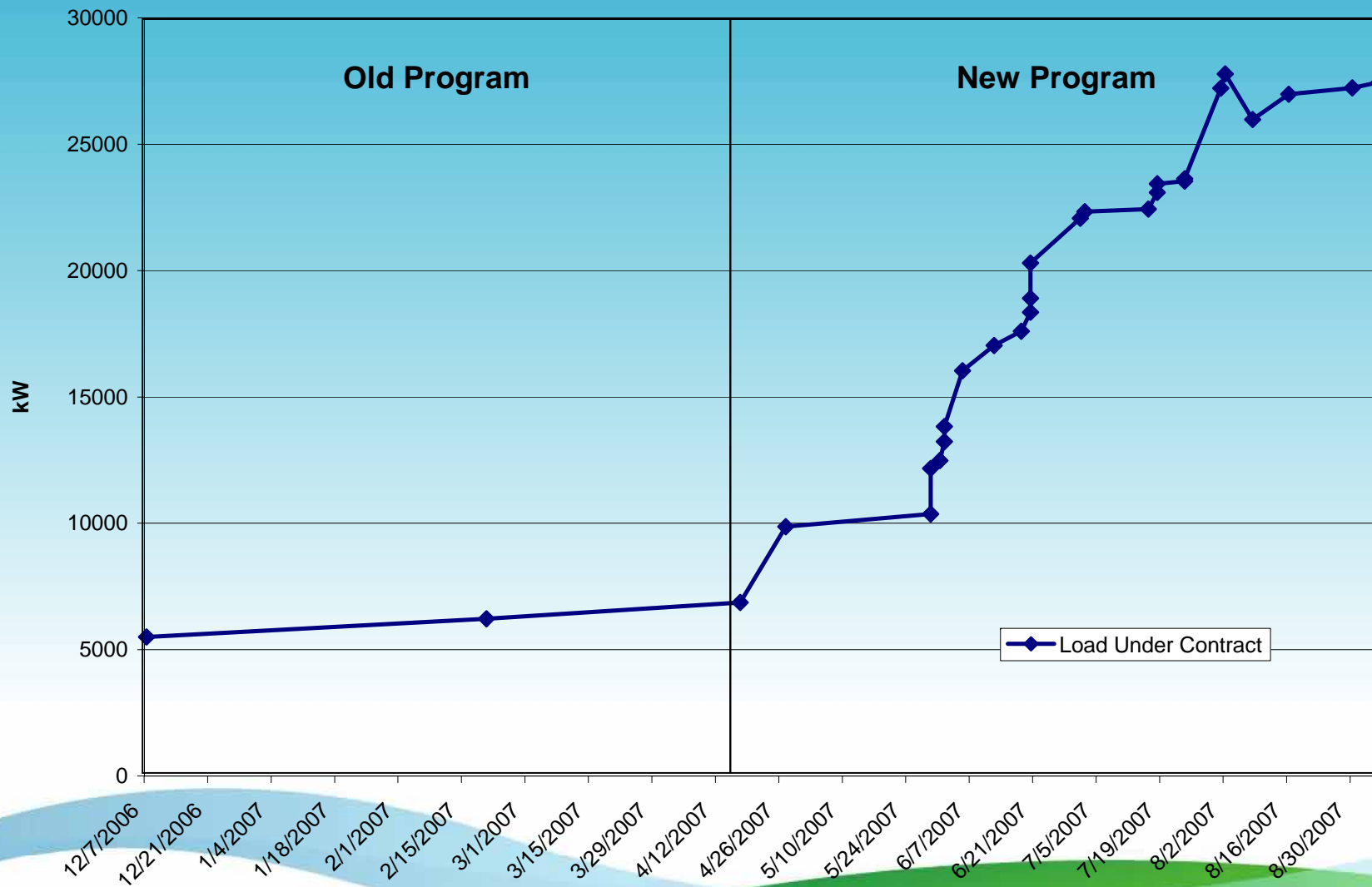
Key Program Enhancements – Other

- ❑ Revised EPD calculation method
 - Dropped shoulder month of May
 - Season now matches purchased power contracts: Jun – Sep
- ❑ Customers can earn their way into the benefits of a multi-year contract
 - Rewards consecutive years of participation
 - Customer still receives greater return by making multi-year commitment up front

Fixed Payment Scenarios: 5-Yr Contract vs. Consecutive 1-Yr Contracts

	5-Yr Contract	1-Yr Contract
Yr 1	\$4.50	\$2.50
Yr 2	\$4.50	\$2.50
Yr 3	\$4.50	\$3.25
Yr 4	\$4.50	\$3.25
Yr 5	\$4.50	\$4.50

MPower 2007 Results

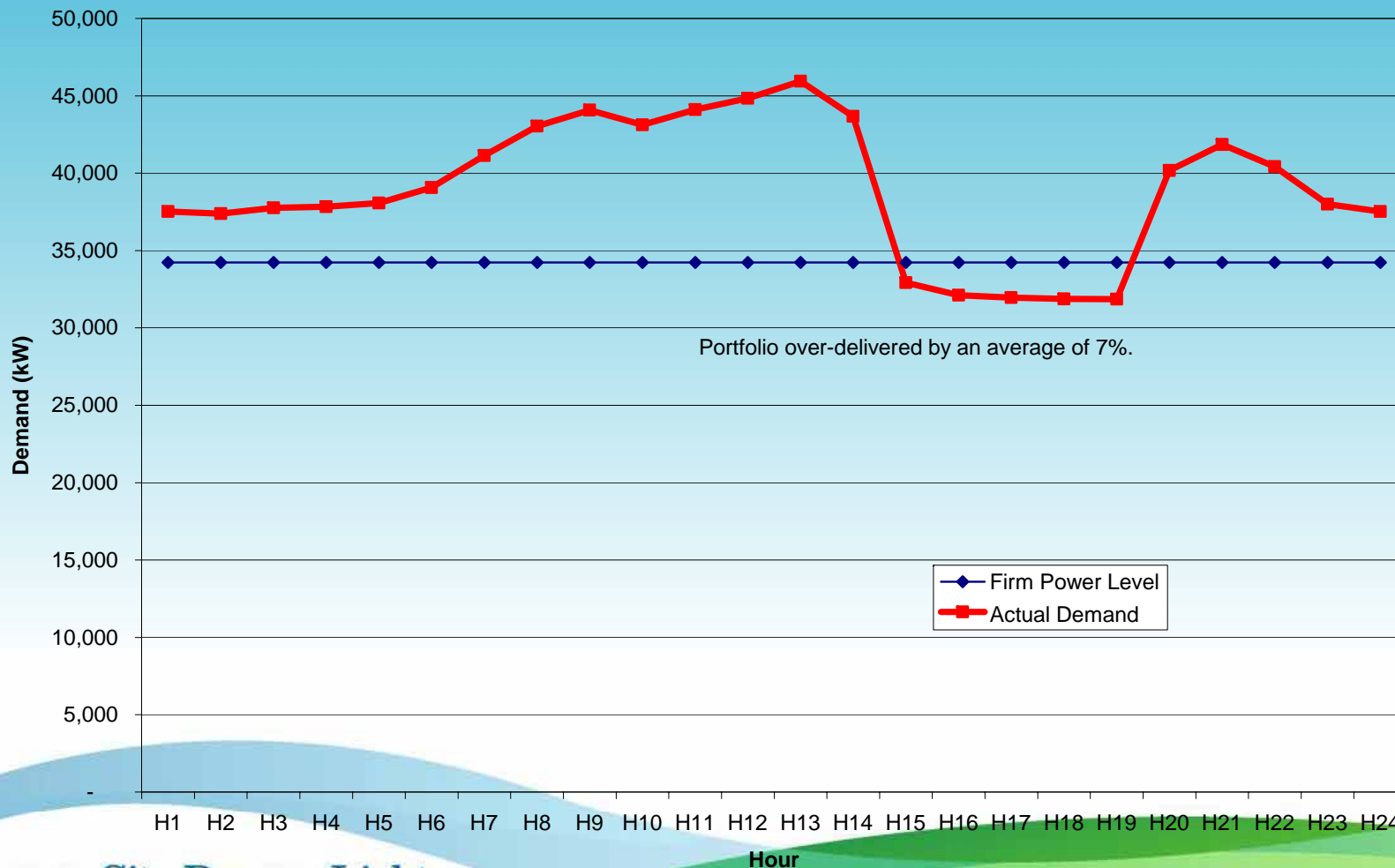


MPower 2007 Results

- ❑ KCP&L called four curtailments in 2007, lasting an average of 5.25 hours each.
- ❑ Were reduced penalties, increased payouts and greater customer choice detrimental to performance?
- ❑ No, customers still over-delivered by an average of 7% during curtailments.

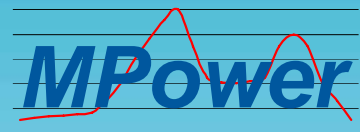
MPower 2007 Results

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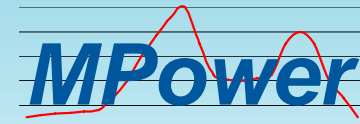
MPower 2008 – What's Next?

Industrial



Large Commercial

Mid-Size Commercial

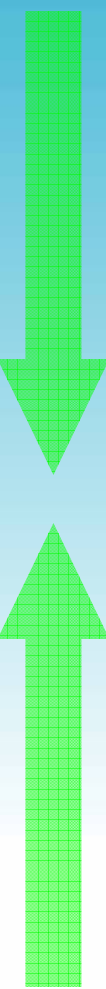


Small Commercial

Energy Optimizer



Residential



MPower 2008 – What’s next?

- ❑ Aggregation
- ❑ Revise EPD calculation method
- ❑ Allow for “blackout” dates
- ❑ MPower “Light”
 - Narrower intra-day curtailment window
 - Later-in-the-day curtailment window
 - 4 consecutive day availability

MPower 2008 – What's next?

And most importantly...

Customer needs will continue to drive the evolution of the program.