BRINGING DYNAMIC PRICING TO THE MASS MARKET

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The demand response imperative

- NERC projects that capacity margins will fall below minimum levels in several areas in the next 2-3 years
- Electricity rates are likely to go up
  - Rising capacity costs
  - Rising fossil fuel prices
  - Climate Change
- We don’t have time to build our way out of this problem
- Customers should be given the ability to control their usage, ensuring that the lights stay on and their bills come down
- AMI and dynamic pricing can help
However, not every customer is on AMI, nor is every AMI customer on dynamic pricing

- Regulators and utilities are concerned about AMI costs, the perceived “rate volatility” associated with dynamic pricing, and the threat of a backlash
- In attempts to ensure rate stability, regulators and utilities forgo the benefits that dynamic pricing can bring in the form of reducing customers’ energy bills
- In the eastern PJM region, a load drop of 3% in the top 100 hours of only 5 utilities is estimated to yield customer benefits of $275 million per year
- But will customers respond?
Several pilots have addressed this burning question

1. PSE&G Pilot Program
2. GPU Pilot Program
3. Ontario Energy Board Smart Price Pilot
4. Anaheim Critical Peak Pricing Experiment
5. Idaho Residential Pilot Program
6. Energy-Smart Pricing Plan
7. AmerenUE Residential TOU Pilot
8. ADRS Pilot
9. Statewide Pricing Pilot
10. The Gulf Power Select Program
11. Olympic Peninsula Project
12. PSE TOU Program
Across these pilots, there is compelling evidence of demand response.
Higher impacts are observed for dynamic pricing rates than for TOU rates

Percentage Reduction Estimates from Reviewed CPP/PTR Pilot Programs

% Reduction in Load

CPP

PTR

CPP w/ Tech

Pilot Program
Time-of-use (TOU) pricing programs provide a modest amount of demand response.
The PTR rate has achieved demand response but the evidence is limited to two pilots.

Comparison of Peak Time Rebate (PTR) Program Tariffs and Resulting Impacts

<table>
<thead>
<tr>
<th>Pilot Program</th>
<th>Existing</th>
<th>Off-Peak</th>
<th>Mid-Peak</th>
<th>PTR</th>
<th>Load Impact</th>
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Different CPP tariffs induce different load impacts during the peak hours of critical event days.

Comparison of Critical Peak Pricing (CPP) Program Tariffs and Resulting Impacts

Note: PSE&G load impact on CPP days is not provided in the reviewed study. The load impact is calculated using the reported kWh reductions and an estimate of consumption during peak on CPP days.
Enabling technologies magnify demand response

Role of Technology on Pilot Program Impacts

Note: PSE&G load impacts on CPP days are not provided in the reviewed study. The load impacts are calculated using the reported kWh reductions and an estimate of consumption during peak on CPP days.
But there is another problem: Bills will rise for 50% of the customers who choose dynamic pricing.

Distribution of Bill Impacts

- Electricity Bill Increase (Decrease)
- Percentile of Customer Base
- Customers with Flatter Consumption
- Customers with Peakier Consumption
That fear may keep customers from even trying out the new rates

• And *fear of that fear* may keep us from even offering dynamic pricing to customers, since we are anxious to “protect the customers from themselves”
• How do we break out of this bubble?
Flat rates embody an *implicit* but very real risk premium that insures customers against price volatility.
By crediting customers for the risk premium, dynamic pricing rates become attractive for 70% of customers.

**Distribution of Bill Impacts**

- **Electricity Bill Increase (Decrease)**
  - Revenue Neutral
  - Risk Adjusted

**Percentile of Customer Base**

- Customers with Flatter Consumption
- Customers with Peakier Consumption

The Brattle Group
With demand response, dynamic pricing becomes attractive to over 95% of customers.