Integrating Dynamic Pricing with Inclining Block Rates

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Intelligent rate design promotes more efficient electricity consumption

Dynamic pricing
- Revolutionizing today’s electricity rates
- Pricing pilots are being conducted around the country
- Costs of enabling technologies are rapidly falling
- States are adopting policies to promote the new rates

Inclining block rates
- Do not require new technology
- Focus on conservation
- Complement dynamic rates
What is dynamic pricing?

Dynamic pricing refers to the family of rates that:

- Vary by time of day
- Are “dispatchable”
- Focus on reducing peak demand
- More accurately convey the true cost of providing electricity
Several new dynamic pricing experiments have been conducted across North America since 2000.
The pilots have shown that customers do respond to dynamic pricing.

Non-Technology Enabled Impacts of Pricing Pilots

<table>
<thead>
<tr>
<th>Pricing Pilot</th>
<th>Average Reduction in Peak Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ontario-1</td>
<td>0%</td>
</tr>
<tr>
<td>Ontario-2</td>
<td>5%</td>
</tr>
<tr>
<td>SPP</td>
<td>10%</td>
</tr>
<tr>
<td>PSEG</td>
<td>15%</td>
</tr>
<tr>
<td>Anaheim</td>
<td>20%</td>
</tr>
<tr>
<td>Ontario-1</td>
<td>25%</td>
</tr>
<tr>
<td>Ontario-2</td>
<td>30%</td>
</tr>
<tr>
<td>TOU</td>
<td></td>
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<tr>
<td>PTR</td>
<td></td>
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<tr>
<td>CPP</td>
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</tbody>
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Enabling technologies facilitate even greater demand response

Role of Technology on Pilot Program Impacts

<table>
<thead>
<tr>
<th>Pilot Program</th>
<th>No Technology</th>
<th>Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSE&amp;G (TOU)</td>
<td>15%</td>
<td>25%</td>
</tr>
<tr>
<td>PSE&amp;G (CPP)</td>
<td>17%</td>
<td>30%</td>
</tr>
<tr>
<td>CA SPP (CPP)</td>
<td>12%</td>
<td>28%</td>
</tr>
<tr>
<td>AmerenUE-2004 (CPP)</td>
<td>8%</td>
<td>35%</td>
</tr>
<tr>
<td>AmerenUE-2005 (CPP)</td>
<td>10%</td>
<td>32%</td>
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</table>
The potential benefits of dynamic pricing and demand response are significant.

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These benefits are driven primarily by avoided investment in new generating capacity through peak demand reductions.
The conservation impacts of dynamic pricing are unclear

- Some pricing pilots have suggested moderate conservation impacts
- The California Statewide Pricing Pilot did not find a significant conservation effect
- Long-run conservation effects have not yet been tested

If conservation is the dominant policy objective, inclining block rates are an attractive complementary option...
Dynamic pricing could be complemented by inclining block rates

Illustration of Inclining Block Rate

- **Size of Average Customer**
- **Inclining Block Rate**
- **Existing Flat Rate**

Monthly Consumption (kWh/Month)

Cents/kWh

- 25
- 20
- 15
- 10
- 5
- 0

0 500 1,000 1,500 2,000

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Energy use and customer bills could decrease significantly in response to inclining block rates.

Average short run impacts suggested by our simulations:
- Consumption reduction ranges from 1% to 6%
- Bill savings range from 1% to 9%

Simulated Distribution of Bill Impacts

- Change in Monthly Bill
- Customer Size (kWh/month)

Break-even Point

Tier 1 Cutoff
The way forward is to offer customers a menu of rate options.

- **Flat Rate**
- **TOU**
- **Seasonal Rate**
- **Inverted Tier Rate**
- **CPP**
- **VPP**
- **RTP**

These options cater to different risk preferences, where:

- **More Risk Averse Customers** are rewarded with larger discounts (up to 10%) for taking on higher risk.
- **Less Risk Averse Customers** have smaller rewards (up to 5%) for lower risk.

Risk is measured by Variance in Price.