Building a Smarter Grid Smarter Customers

Mid-Atlantic Distributed Resource Initiative
Dynamic Pricing Workshop
May 12, 2011

Roger Levy
Smart Grid Technical Assistance Project
Lawrence Berkeley National Laboratory
Can you spot the problem in this picture?
Smart Grid from a customer perspective.

What is the objective?

- Whole House (what’s left)
- Tiered Inclining Block Rate
- Storage Water Heater
  - Discount Flat Interruptible Rate
- Solar PV System
  - Net Metering
- Electric Vehicle
  - Off-Peak Interruptible Rate
- Ice Storage
  - Time-of-Use Rate
Rates and Incentives

Current Grid
Separate Programs / Incentives

- Rates and Incentives
- Efficiency
- Demand Response
- Rates and Incentives
- Carbon
- Renewables
- Rates and Incentives

Smart Grid
Integrated Incentives

- Efficiency
- Rates and Incentives
- Demand Response
- Carbon

Program #1
Program #2
Program #3
Program #4

1. Create a long-term perspective
2. Integrate rates and incentives
3. Common, technology platform standard to link initiatives
4. Customer focused
Rates to support Smart Grid

### Smart Grid Critical Rate Features

#### Rate Components

<table>
<thead>
<tr>
<th>1. Rate Design</th>
<th>2. Prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Is there a clear relationship between usage and customer cost ?</td>
<td>Can “Price” be used to provide incentives that integrate efficiency, demand response, generation alternatives, and renewable objectives ?</td>
</tr>
<tr>
<td>□ Can the rate be translated into digital price signals ?</td>
<td></td>
</tr>
<tr>
<td>□ Is it possible to integrate retail and wholesale prices ?</td>
<td></td>
</tr>
</tbody>
</table>
Plan for a Transition: What are the issues?

1. How do we transition customers from existing flat and tiered rates to a dynamic rate?
2. How do we educate customers regarding both the opportunities and risks?
3. Will technologies be available so customers can automate their response?
4. What can we do to identify and mitigate potential adverse bill impacts before they create problems?
Plan for a Transition: What are the issues?

1. How do we transition customers from existing flat and tiered rates to a dynamic rate?

2. How do we educate customers regarding both the opportunities and risks?

3. Will technologies be available so customers can automate their response?

4. What can we do to identify and mitigate potential adverse bill impacts before they create problems?

- Implementation Time Frame Transition, Phase in, options
- Virtual participation
- Tools, case studies, subsidies, regulations
- Utility programs / options
- Non-utility open market options
- Monitoring
- Pro-active intervention
5.34 Rate Design

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional Approach</td>
<td>Rate Transition</td>
<td>Ongoing Education</td>
<td>Rate Phase-in</td>
</tr>
<tr>
<td>Basic Education 3-6 months</td>
<td>Shadow Bills 12 months</td>
<td>Bill guarantee Opt-out provisions</td>
<td>Shadow Bills 12 months</td>
</tr>
<tr>
<td>Rate Introduced</td>
<td>PTR Rate</td>
<td>CPP Rate</td>
<td>CPP Rate Step 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CPP Rate Step 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CPP Rate Step 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mitigation Opportunities 4</td>
</tr>
</tbody>
</table>

5/1/2012
Contact Information

Roger Levy  
Lead Consultant, Smart Grid Technical Advisory Project  
Lawrence Berkeley National Laboratory  
Email: RogerL47@aol.com  
Office: 916 487-0227  
Mobile: 916-708-5572