Demand Side Management in a New Era Of Utility (Re)regulation

September 22, 2008
What is Demand Side Management

Includes both:

Energy conservation measures

• Actions that conserve energy over a broad range of conditions

• Long-term measures such as lighting retrofits, appliance and equipment upgrades and building insulation

Demand response measures

• Actions that reduce peak demand on the electrical grid system

• Short-term measures such as thermostat changes, HVAC cycling, lighting reductions, industrial process reductions and on-site generation
Conservation vs. Demand Response

Residential Load Shape – Peak Use Day

- **Demand Response**
- **Conservation**

Hour

0 0.5 1 1.5 2 2.5

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

Dominion®
Increasing Energy Use


Energy Use
Renewed Interest in DSM

- Rising energy costs
- Concern over climate change
- Interest in all things green
- Regional demand growth
- Challenges to new infrastructure

Petroleum & Inflation

Electric Industry Deregulation

Customer / Regulator / Legislator Interest in DSM
Demand Growth

Addressable by Demand Response

Demand Growth

Peak Demand


Dominion®
Two-Prong Approach To Increase Efficiencies

**CHALLENGE:** Reduce Consumption

**STRATEGY:** Conservation & Efficiency

**TACTICS:**
- Education
- Incentives
- Monitoring Tools

**BENEFITS:**
- Reduce Cost
- Reduce Emissions
- Defer Capacity

**Reduce Peak Demand**

**Load Control & Load Curtailment**

**Curtailment Incentives**
- Automated Controls
- Peak Rates

**Reduce Average Cost**
- Lower Peak Demand
- Delay Capacity
- Reduce Emissions
Dominion’s Approach

- Roll out pilot energy conservation / demand response programs in 2007
- Apply for expanded programs in 2009
- Expand renewable generation portfolio
- Offer customers renewable energy options
## Pilot Implementation Schedule

<table>
<thead>
<tr>
<th>Pilot</th>
<th>Percent Enrolled</th>
<th>Percent Installed</th>
<th>Completed Installations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Load Cycling – Programmable Thermostats</td>
<td>100%</td>
<td>100%</td>
<td>✓</td>
</tr>
<tr>
<td>Home Energy Audits</td>
<td>100%</td>
<td>100%</td>
<td>✓</td>
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<tr>
<td>Energy Efficiency Welcome Kits</td>
<td>100%</td>
<td>100%</td>
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<tr>
<td>PowerCost Monitor</td>
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<td>Small Commercial Energy Audits</td>
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<tr>
<td>Direct Load Cycling – Switches</td>
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<td>99%</td>
<td></td>
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<tr>
<td>Advanced Metering Infrastructure &amp; Critical Peak Pricing</td>
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<td>18%</td>
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<tr>
<td>ENERGY STAR® Homes</td>
<td>43%</td>
<td>42%</td>
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<tr>
<td>Distributed Generation</td>
<td>27%</td>
<td>9%</td>
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</tbody>
</table>
How does this affect air quality planning?

- Regional net emission reductions over time

1,000,000!

1,566,673 CFLs Sold*
Equates to:
94,348 cars off the road for one year
541,090 tons of CO2 not emitted
$104,820,088 saved (over life of CFLs)
*through the program as of 07/03/08
Regulatory Questions

- How to quantify the emission reductions? MWh to emissions

- How credible are the emission reductions? Integrated Resource Plans / PUC filings

- How to model the emissions change? Deferred plants or adjustments in growth projections
Utility DSM in the SIP?

- Not a revolutionary idea – applied in other contexts, but not universally applied
- EPA guidance available
- Very much worth exploring / should not be overlooked
- Detailed analyses of DSM potential used to support PUC / SCC filings support credibility of projections
- Extensive measurement & verification required by PUC / SCC after the fact
- Caveat: DSM success depends upon customer participation