Demand Response National Trends: Implications for the West?

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San Francisco, CA
March 25, 2004
Overview of Presentation

- National Trends in Demand Response
- Integrating Demand Response into IRP Plans – Some Technical issues
- Incorporating DR as part of Utility Resource Portfolio: Policy Issues
Declining Load Mgmt Resources in most U.S. regions

- Uncertainties surrounding electricity restructuring
- Changing load resource balance

Energy Analysis Department
Increasing Policy Support from FERC and DOE

- National Transmission Grid Study Recommendations
- At a December 16, 2003, meeting of the PJM Demand Side Response Working Group, Alison Silverstein, Advisor to FERC Chairman Pat Wood, advised:
  - FERC wants demand response, “no matter what”
  - FERC is not kidding: prefer that we design and send up good programs and strong filings, instead of making them do it
  - FERC expects credible, quality programs that yield “big time” results
- DOE designated as lead for IEA study on Demand Response Resources
Energy Analysis Department

ISO “Emergency” DR Programs: Enrollment is increasing

- Steady growth in subscribed load, except for Active Load Mgmt in PJM.

MW Enrolled: Emergency and ICAP Programs

Source: Neenan Assoc.

Energy Analysis Department
DR Resource Targets: How much is enough??

- ISOs don’t have explicit targets
- NYISO DR program exemplifies “best practice”
- ISO-NE needs more DR, particularly in congested areas (SW CT)

Source: Neenan Assoc.
ISO “Economic” DR Programs: Enrollment is increasing, but performance lags

<table>
<thead>
<tr>
<th>Year</th>
<th>MW Enrolled (ISO-NE)</th>
<th>MW Enrolled (NYISO)</th>
<th>MW Enrolled (PJM)</th>
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<tbody>
<tr>
<td>2001</td>
<td>0</td>
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<td>2009</td>
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<td>0</td>
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</tbody>
</table>

Source: Neenan Assoc.

- Subscribed load increasing, particularly in PJM
- However, scheduled load curtailments are ~10-15 MW in NYISO day-ahead market
NYISO EDRP Program: Customer curtailments had significant impact on system reliability

- 1,711 enrolled participants in 2002 (1,481 MW)
- ~75% load curtailment: Onsite generation ~20%
## ISO Payments for DR Programs

<table>
<thead>
<tr>
<th>Year</th>
<th>Emergency Payments</th>
<th>Economic Payments</th>
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<tbody>
<tr>
<td>2001</td>
<td>ISO-NE $380</td>
<td>$226,100</td>
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<td></td>
<td>NYISO $4,200,000</td>
<td>$200,000</td>
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<tr>
<td></td>
<td>PJM $287,500</td>
<td>$14,000</td>
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<td>2002</td>
<td>ISO-NE $1,800,900</td>
<td>$172,000</td>
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<tr>
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<td>NYISO $3,300,000</td>
<td>$100,000</td>
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<tr>
<td></td>
<td>PJM $282,800</td>
<td>$762,000</td>
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<tr>
<td>2003</td>
<td>ISO-NE $497,100</td>
<td>$212,000</td>
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<tr>
<td></td>
<td>NYISO $3,900,000</td>
<td>$121,300</td>
</tr>
<tr>
<td></td>
<td>PJM $26,600</td>
<td>$678,200</td>
</tr>
</tbody>
</table>

*Source: Neenan Assoc.*
DR programs used during August 2003
Blackout Recovery Process

- NYISO called emergency DR programs on Aug. 15 and 16
  - Every MW of load taken off system allowed another MW to come up faster during rebuilding

<table>
<thead>
<tr>
<th>Date</th>
<th>System State</th>
<th>Benefit</th>
<th>Cost</th>
<th>B/C ratio</th>
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<tr>
<td>August 15</td>
<td>Recovering</td>
<td>$50.8 million</td>
<td>$5.9 million</td>
<td>8.6</td>
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<tr>
<td>August 16</td>
<td>Fully recovered</td>
<td>$3.5 million</td>
<td>$1.7 million</td>
<td>2.1</td>
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</table>

Outage cost = $5,000/MW

Source: NYISO 2003 PRL Program Evaluation Summary
Understanding Customer Response: Performance Metrics

- **Subscribed Performance Index (SPI):** ratio of customer’s *actual* average hourly load reduction to their *subscribed* load reduction
  - Indicates customer’s actual performance relative to their commitment

- **Peak Performance Index (PPI):** ratio of customer’s *actual* average hourly load reduction to their non-coincident peak demand
  - Characterizes customer’s relative technical potential when compared to similar facilities

- **Implications for system operators** – how reliable a resource?
NYISO: Customer Curtailment Potential is significant

- Mfg & Govt. Customers can curtail 30-40% of peak demand during emergencies
RTP as Default Service in States with Retail Competition

• Growing interest in RTP for large customers as default service tariff option in some states with retail competition:
  - NJ, MD, NY (Niagara Mohawk), OH, OR
• Migration to competitive suppliers with flat rate options
• Purchase of risk management products
Integrating DR into IRP plans: Some issues

- Defining resource potential: applicability of concepts and tools from EE technical and market potential studies?
- Typology of DR resources
- Scarcity of load data on which to estimate DR potential
- Limited experience on which to predict price response and customer risk preferences
- Lead times for new DR resources
- Model capabilities for integrating price response into resource portfolio evaluation?
Incorporating DR as part of Utility Resource Portfolio: Policy & Program Issues

- Role and responsibility of utility in current market setting vs. RTO environment
- Establishing incentive payment levels without a transparent wholesale market
  - ICAP markets (NY) vs. interruptible rate
- Capturing locational value of DR
- Coordinating delivery & implementation of DR and EE programs
  - EIS systems offer common platform for DR and EE
  - Portion of DR “savings” are operational & controls improvements
Incorporating DR as part of Utility Resource Portfolio: Policy & Program Issues (cont.)

- Environmental impacts of onsite generators
  - Coordination with local air quality regulators
  - Limits on use of emergency generators in DR programs (“emergency” vs. economic pgms)

- Recovery of program costs
  - Are incentive payments coming from retail or wholesale market customers?
  - Treatment of utility & non-utility entities