Beating the Peak

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Jordan, MN
• MVEC overview
• Peak types and their importance to DR program value
• Programs – Tools in the toolbox
  • Capabilities
  • Constraints
• Managing load
• Summary of concepts and value drivers
MVEC Overview

- Distribution Cooperative
- Based in Jordan, Minnesota
- 90 employees
- 42,000 member-owners
- ACSI score of 89
- 900 sq mile service territory
- 10 consumers per mile
- 3 wholesale power suppliers
- $6M in DR savings annually
Wholesale Power agreements:

- Great River Energy
- Basin Electric
- Alliant Energy

- Billed for demand and transmission based upon monthly system peaks
- All MISO market participants
- Each G&T has a different peak
Two Peak Types

Basin peak – Non-COIN

GRE Transmission Peak - COIN
Demand Response Programs

Commercial and Industrial Interruptible loads
- With generator
- Without generator

Air conditioning
- Cycled
- Wi-Fi thermostats

Water heaters
- Peak shave
- Storage

Interruptible heating
- Peak shave
- Storage

Electric vehicles
- Peak shave
- Storage
- Time-of-use

Beat the peak energy challenge
## Program Participation and Shed

<table>
<thead>
<tr>
<th>Program</th>
<th>Participants</th>
<th>Technology used</th>
<th>Groups</th>
<th>MW of controllable load</th>
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<tbody>
<tr>
<td>Commercial and Industrial Interruptible Loads</td>
<td>130</td>
<td>Direct load control (DLC)</td>
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<td>Nest and Honeywell thermostats</td>
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<td>DLC</td>
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<td>6 MW</td>
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<tr>
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<td>DLC</td>
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<td>1 MW</td>
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<td>Interruptible Dual Heat</td>
<td>7,500</td>
<td>DLC</td>
<td>4</td>
<td>10 MW</td>
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<td>DLC</td>
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<td>150 kW</td>
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<td>Electric Vehicles - TOU</td>
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<td>30 kW</td>
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<tr>
<td>Beat the Peak Energy Challenge</td>
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<td>Notifications – Email, Phone</td>
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<td>1.2 MW</td>
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<td>Season</td>
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<td>Spring</td>
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<td>Beat The Peak Competition</td>
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</table>
What is control for?
Normal distribution of 10 years of July High temperatures

- Median: 83°
- 20% at 78°
- 20% at 89°
Eliminating Extremes

July High Temperatures
Load vs Temperature Relationship

MVEC System Daily Peak Relationship to Temperature - Estimated No LM
When to Control?
Non-COIN Control – Done Well
Non-COIN Control – Done Poorly

Gen 5
Gen 6
Gen 7
Gen 8
AC 1,2,3,4
WH 1,2,3,4
31 Days of Weather to Manage!
Think about...

- Managing the resources and technologies
  - Dispatch – How many systems?
  - Notification – How many groups?
  - Analysis
    - Baselines – How many MW
    - ROI – Red or black?
    - Failure identification – Am I getting what I pay for?

- The business case for load control, under changing circumstances
  - RTO rules, G&T rates/incentives, coincident vs non-coincident peaks
Discussion?