ADR Solution Development and Deployment for HVAC Distributors
AGENDA

1. Project Overview
   Background, objectives, scope and schedule

2. Activity 1: Identify OpenADR Solutions
   Summary of solutions identified

3. Activity 2: Research Existing Sales Practices
   Insights and lessons learned

4. Activity 3: Provide Technical Support to Manufacturers
   Activities completed and successes

5. Activity 4: Inform and Educate Distributors
   Activities completed and successes

6. Activity 5: Communicate Findings – Program Design Recommendations
   Presentation and discussion
Project Overview
Regulatory and Business Drivers for Project

CEC and CPUC Decisions:

• 2008 Energy Action Plan, CEC – Loading Order and DR
• 2010 Automated Demand Response, CPUC
• IDSM budgets in 2018-2025 Utility Business Plans, CPUC
• 2019 Default CPP for SCE commercial customers, CPUC

From SCE’s Business Plan

...SCE will aim to reduce costs and increase EE adoption by simplifying and streamlining offerings. This will include increased use of upstream and midstream offerings and self-service delivery channels... It will also entail reducing the number of customer touchpoints in certain sectors.
Project Objectives: Build Market Capacity to Utilize (Upstream) ADR Incentives

First, we had to find a technology to work with. Then, we had to learn how to install the new technology and integrate it with our system.

Finally, we had to understand the technology well enough to be comfortable bringing it to a customer.

--HVAC Distributor, SCE Territory 2014
Project Objectives: Build Market Capacity to Utilize (Upstream) ADR Incentives

1. Address Market Feedback on Building Capacity
   Work with market to:
   - Identify OADR products and
   - Understand sales practices

2. Inform and Educate HVAC Distributors
   Direct engagement with distributors on:
   - ADR Program and technology eligibility
   - Title 24, Part 6 DR requirements

3. Provide Technical Support to Manufacturers
   Support ADR-capable solutions out-of-the-box by:
   - DRAS signal testing and connection support
   - Assess identified solutions for ADR-capability out-of-box

4. Refine Upstream ADR Design
   Update recommendations:
   - Incentive design
   - Project delivery
   - Application and enrollment

ADR Solution Development and Deployment for HVAC Distributors
Activity 1: Identify OpenADR Solutions

First, we had to **find a technology to work with.**

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## ADR-Certified Products Identified

<table>
<thead>
<tr>
<th>HVAC Distributor</th>
<th>Ferguson</th>
<th>Sigler</th>
<th>Trane</th>
<th>US Air Conditioning (US AC)</th>
<th>RSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>OpenADR Certified Thermostats</td>
<td>Zen Ecosystems Ecobee</td>
<td>Carrier Côr 5C Carrier Côr 7C</td>
<td></td>
<td>Venstar ColorTouch, Explorer, and Explorer mini</td>
<td>Pelican Wireless</td>
</tr>
<tr>
<td>OpenADR Certified EMS</td>
<td></td>
<td>Carrier Comfort iVU</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Certified, ADR-Capable Controls</td>
<td>Honeywell, Braeburn Systems, and White Rodgers (Wi-Fi) t-stats</td>
<td>Connect 33 Connectstat,</td>
<td>Concierge and Tracer SC+ EMS; Pivot Smart T-stat (Wi-Fi)</td>
<td>Honeywell (Wi-Fi) t-stats</td>
<td></td>
</tr>
</tbody>
</table>
Activity 2: Research Existing Sales Practices

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HVAC Distributor Sales Practices

Controls Sales Volumes Vary
Sold both independently and bundled with equipment. Portion of controls sold with HVAC equipment varied from 10 -20 percent to a high of 90 percent across distributors.

Promotion of ADR Contingent on Demand
Consumer awareness of ADR solutions is negligible. Distributors promote ADR when upstream incentives are available*, through internal staff education, customer events, and contractor networks.

Sales Strategies Work to Overcome Contractor Inertia
Contractors stick with familiar products with proven track record. One distributor profiles new products using social media.

Distributors with Controls Divisions Prefer EMS over Thermostat
Distributors with controls divisions prioritized energy management systems while distributors without controls teams focused on thermostats.

New Products Decisions are Made at Different Levels for Each Distributor
Some distributors make decisions for new products at the local level, others make new product decisions centrally at the national level.

ADR Solution Development and Deployment for HVAC Distributors

*Upstream incentives include 2013 pilot, 2019 Manage Your Power pilot at SCE.
Activity 3: Provide Technical Support to Manufacturers

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## ADR-Capable Out-of-the-Box Product Assessment

<table>
<thead>
<tr>
<th>Certified Solution</th>
<th>DR-Mode Display*</th>
<th>DR-Mode Display Access**</th>
<th>Installation &amp; Configuration***</th>
<th>On Site VEN or Gateway*</th>
<th>Overall ADR Readiness/Friendliness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zen Ecosystems thermostats</td>
<td>1</td>
<td>2</td>
<td>2.5</td>
<td>1</td>
<td>6.5</td>
</tr>
<tr>
<td>Pelican Wireless thermostats</td>
<td>1</td>
<td>3</td>
<td>2.5</td>
<td>1</td>
<td>7.5</td>
</tr>
<tr>
<td>Carrier I-Vu EMS software add-on VEN</td>
<td>0.5</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3.5, more information needed</td>
</tr>
<tr>
<td>Venstar thermostats</td>
<td>1</td>
<td>2</td>
<td>2.5</td>
<td>0</td>
<td>5.5</td>
</tr>
</tbody>
</table>

*0 = “no”; 1 = “yes”,
**1 = >2 clicks from homepage, 2 = 1 to 2 clicks from homepage, 3 = on homepage
***1 = need controls engineer support; 2 = need contractor support; 3 = self-install
OpenADR Signal Testing Support for Venstar

Goal: Confirm Venstar's VEN could successfully connect to and respond to a signal from SCE and PG&E's Demand Response Automation Servers (DRAS)

- **SCE DRAS Testing**
  - Connect VEN to DRAS: Successful
  - Signal all resources under VEN: Successful
  - Signal subset of resources under VEN: N/A

- **PG&E DRAS Testing**
  - Successful
  - Successful
  - In Progress
Activity 4: Inform and Educate Distributors

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<table>
<thead>
<tr>
<th></th>
<th>Distributor</th>
<th>In-Person Meeting Dates</th>
<th>Calls and Emails</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ferguson</td>
<td>4/29, 10/1</td>
<td>3/28, 4/2, 5/24, 6/25, 7/30</td>
</tr>
<tr>
<td>2</td>
<td>Lennox</td>
<td></td>
<td>5/20, 5/21, 6/12, 7/22, 8/7</td>
</tr>
<tr>
<td>3</td>
<td>RSD</td>
<td></td>
<td>5/1, 5/9, 5/15, 5/28, 6/7</td>
</tr>
<tr>
<td>4</td>
<td>Sigler</td>
<td>5/30, 8/13</td>
<td>4/23, 7/30, 8/29, 10/3, 10/23</td>
</tr>
<tr>
<td>6</td>
<td>US Air Conditioning, Venstar</td>
<td>5/22, 8/2, (2020): 3/11</td>
<td>6/5, 6/24, 7/12, 8/1</td>
</tr>
<tr>
<td>7</td>
<td>DMG, NSW*, Air Treatment</td>
<td></td>
<td>8/15, 8/16</td>
</tr>
<tr>
<td>8</td>
<td>GridLink, UDI*</td>
<td>9/16</td>
<td>8/6, 8/8</td>
</tr>
</tbody>
</table>

*Norman S. Wrightm Universal Devices Inc.
Activity 5: Communicate Findings – Program Design Recommendations
Distributor Feedback on Design

**Upstream Incentive would spur ADR controls sales**
- An upstream incentive is the difference between distributor making customer aware of available incentives, and selling controls whenever possible, creatively
- Upstream incentive would enhance margins for controls sales and motivate sales engineers and account managers via commissions

**Need to simplify program design**
- Limit to two application fields for contractors – zip code and SAID
- Getting install address can be challenging for distributors, just like with other upstream EE programs
- Distributors need to be able to easily estimate incentives for any particular project
- Remove stranded asset testing for SMB

**Project incentives should be based on number of thermostats or (for EMS controls) number of HVAC units**
- Number of thermostats or HVAC units determine project costs
- Contractors are unlikely to know the total site tonnage for a retrofit project
- Sites with higher load shed potential can realize higher compensation via ongoing DR participation payments
Project Delivery Recommendations

Easy installation & setup for contractors
pre-configure controls from factory (manufacturers), leverage cloud-based controls & VENs

Limit DR strategies
2-3 strategies e.g. temperature reset “basic”, “light”, and “green/eco”

Streamline post-inspection & verification
Leverage trade allies & remote verification.
Pathways to Implementation of Design Recommendations

1. Layer with Existing Programs
   Add to upstream efficiency, low income, electrification, schools

2. Upstream Incentive Option to Existing ADR Program
   Payment to HVAC distributors following eligible sales

3. Standalone Upstream ADR Program
   Allow to-code equipment to maximize eligible market