The Rocky Road to Shifting Load

Challenges of Installing Advanced Energy Storage and EV Chargers

Sean Maher, Itron

August 21, 2019
Overview

Why does it matter?
Smart Home Study
Equipment
Customer selection and preliminary sites
Reasons for installation failure
INCREASE IN EV AND AES ADOPTION

Project % of global vehicle shares attributed to EV's

US annual expected energy deployment
SMART HOME STUDY
SMART HOME STUDY

100 houses in San Diego

Smart Thermostats  Level 2 EV chargers  AES
## SMART HOME STUDY

<table>
<thead>
<tr>
<th>Tier</th>
<th>#Participants</th>
<th>Equipment Received</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tier 1</td>
<td>50</td>
<td>Smart Thermostat</td>
</tr>
<tr>
<td>Tier 2</td>
<td>20</td>
<td>Smart Thermostat + EV Charger</td>
</tr>
<tr>
<td>Tier 3</td>
<td>20</td>
<td>Smart Thermostat + AES system</td>
</tr>
<tr>
<td>Tier 4</td>
<td>10</td>
<td>Smart Thermostat, EV Charger and AES system</td>
</tr>
</tbody>
</table>
## PATH TO INSTALLATIONS

<table>
<thead>
<tr>
<th>AC</th>
<th>PV</th>
<th>EV</th>
<th>Storage</th>
<th>Target Number</th>
<th>Applicants</th>
<th>Preliminary Sites</th>
<th>Installed Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Maybe</td>
<td>6</td>
<td>19</td>
<td>18</td>
<td>11</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>14</td>
<td>114</td>
<td>50</td>
<td>34</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Maybe</td>
<td>20</td>
<td>19</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>48</td>
<td>157</td>
<td>60</td>
<td>28</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Maybe</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>8</td>
<td>43</td>
<td>18</td>
<td>8</td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td></td>
<td></td>
<td>100</td>
<td>353</td>
<td>165</td>
<td>100</td>
</tr>
</tbody>
</table>
Challenges to Installing AES and EV chargers

1. Main electrical panel capacity
2. Physical space in panel and garage
3. Incompatible system
MAIN PANEL AMPERAGE

% of Preliminary Sites Main Panel Amperage

Main Panel Amperage

©2019 ITRON CONFIDENTIAL PROPRIETARY
PHYSICAL SPACE IN PANEL
INSTALLED EQUIPMENT
EV CHARGER ISSUES

- Distance from panel: 37%
- Room for charger: 22%
- Existing breaker adjustment needed: 22%
- Service upgrade needed: 11%
- Insufficient space in panel: 8%
BATTERY ISSUES

- Insufficient space in panel, 30%
- Distance from panel, 23%
- Service upgrade needed, 22%
- Physical Area Adjustment, 21%
- No garage, 5%
Conclusion

Limiting Factors include
- Residence type
- Building age
- Breaker panel
- Physical space
Recommendations

Prepare any programs with these thoughts in mind
Provide some incentivizes toward upgrade costs
Questions?
THANK YOU