ACEEE In 2040
Most Efficient Central Power Plant
Combined Cycle Gas Turbine: 50%-60%
Improving Efficiency: Solar Thermal w/ Gas Turbine
Most Efficient Distributed Generation
Cogeneration: 70%-90%
Improving Transmission Efficiency Must Become a Smart & Profitable Business...
Reduce System Losses

Reduce Line/Equipment Losses

Increase System/Resource Utilization

Source: EPRI
T&D Loss South Korea

Source: EPRI
Voltage Upgrade/EHV
AC/HVDC

Source: EPRI
Dynamic Coordinated Voltage Control - VAR

Hierarchical control structure for the coordinated regulation of the transmission network voltages

Source: EPRI
Distribution Efficiency Improving Opportunity

Reduce Distribution Line losses

Reduce Equipment Losses

Improve Utilization

Technologies to Improve Distribution Efficiency

1A. Re-Conductoring

1B. Phase Balancing

1C. Capacitor Placement, Var Control Strategy

2A. Distribution Transformers (High Efficiency and Amorphous Metal Transformers)

3A. Voltage Optimization (also known as)

3B. Smart Distribution Control

Source: EPRI
“As Found” Voltage Profiles for Small Distribution Utility
Recontrolled Voltage Profiles Using New Technology

Active Power Losses Reduced 31% / Reactive Power Requirement Reduced 30%.
Optimal Placement of DG: Increases Load Serving Capability

158 MW DG Addition Increases Load Serving Capability 240 MW (90 MW comes from Congestion Reduction)
Reactive Optimization: Increases Load Serving Capability

300 Properly Placed Transmission MVAr Increases Load Serving Capability by 250MW
OPOWER Product Suite: Web Platform
Broad Customer Engagement: Key to Success

~85%+ of Report Recipients Take Significant Action

Independent Verification by Summit Blue Demonstrates High Customer Engagement
My House
<table>
<thead>
<tr>
<th>Channel</th>
<th>Energy (kWh)</th>
<th>Watts</th>
<th>Voltage</th>
<th>Current (A)</th>
<th>Spent</th>
<th>Last Received</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mains</td>
<td>0.11</td>
<td>615</td>
<td>125.30</td>
<td>6.98</td>
<td>$0.01</td>
<td>2:51.10 PM</td>
</tr>
<tr>
<td>Refrigerator</td>
<td>0.00</td>
<td>1</td>
<td>125.30</td>
<td>0.00</td>
<td>$0.00</td>
<td>2:51.10 PM</td>
</tr>
<tr>
<td>Family room</td>
<td>0.02</td>
<td>62</td>
<td>124.40</td>
<td>0.00</td>
<td>$0.00</td>
<td>2:51.10 PM</td>
</tr>
<tr>
<td>Dishwasher</td>
<td>0.00</td>
<td>0</td>
<td>125.30</td>
<td>0.00</td>
<td>$0.00</td>
<td>2:51.10 PM</td>
</tr>
<tr>
<td>Laundry</td>
<td>0.00</td>
<td>0</td>
<td>125.30</td>
<td>0.00</td>
<td>$0.00</td>
<td>2:51.10 PM</td>
</tr>
<tr>
<td>A/C - Down</td>
<td>0.00</td>
<td>0</td>
<td>125.30</td>
<td>0.00</td>
<td>$0.00</td>
<td>2:51.10 PM</td>
</tr>
<tr>
<td>A/C - up</td>
<td>0.00</td>
<td>0</td>
<td>124.40</td>
<td>0.07</td>
<td>$0.00</td>
<td>2:51.10 PM</td>
</tr>
<tr>
<td>Air Handler - up</td>
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<td>11</td>
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<td>2:51.10 PM</td>
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<tr>
<td>Furnace - down</td>
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<td>$0.00</td>
<td>2:51.10 PM</td>
</tr>
<tr>
<td>Sump pump</td>
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<td>124.40</td>
<td>0.00</td>
<td>$0.00</td>
<td>2:51.10 PM</td>
</tr>
</tbody>
</table>

Energy Voltage / Current All
Thank You!