Southern California Edison Interconnection Process Challenges

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Different Jurisdictional Tariffs

- **Three Interconnection Tariffs in CA**
  - State of California Interconnection Tariff (CA Rule 21)
  - SCE’s FERC Interconnection Tariff (WDAT)
  - TO Tariff (for transmission interconnected projects)

- **Different process requirements (WDAT and Rule -21)**
  - Project under the same tariff can be interconnected on the same system
  - Study timelines are not aligned
  - Study methodology
    - Cluster Study Process on one tariff but not the other
    - Eligibility Limits for Fast Track different
  - Study provision are different (Fast Track, Supplemental Review, etc)

- **Major Revision to SCE’s WDAT Approved First Quarter 2011**
  - Provided better alignment with interconnection procedures for large projects (>20MW)
  - Previously had a procedure for large projects (>20MW) and small projects (<20 MW)

- **Major Revision to CA Rule 21 In 2012 (approved third quarter 2012)**
  - Provided a better alignment with SCE’s WDAT procedures
Unprecedented Increase In Interconnection Requests (IR)

- Transmission IR projected have been steady
- Significant increase in IR beginning June 2009
  - First wave from WDAT Interconnection requests to the Distribution System
  - Increase in CA Rule-21 applications in 2010
  - WDAT interconnection peak March 2011 (Cluster #4)
  - Rule 21 peak in March 2012.
  - Significant withdrawal rate starting on September 2012
- Currently new IRs have stabilized (~5/week).
Location of Interconnection Requests

- Nearly 70% of our applications in the Rural area.
- No load in the rural area
  - Will result in power flow from distribution to transmission systems.
- Power flow from distribution generation project will mix with power flow from transmission projects
  - Who pays for Transmission overload?
  - Tariffs where not properly design to handle these conditions
    - Specially where interconnecting under different tariffs (CA Rule 21 or WDAT)

Urban: 8-10,000 sq. miles = 15-20%
Rural: 40-42,000 sq. miles = 80-85%
Increased Penetration Levels To The Distribution Systems

<table>
<thead>
<tr>
<th>Year</th>
<th>kW (Residential)</th>
<th>kW (commercial)</th>
<th>Total/Year</th>
<th>Running Total (MW)</th>
<th>% Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>9,519</td>
<td>31,555</td>
<td>41,074.0</td>
<td>108.4</td>
<td>61.7%</td>
</tr>
<tr>
<td>2009</td>
<td>17,358</td>
<td>19,127</td>
<td>36,485.0</td>
<td>144.9</td>
<td>57.2%</td>
</tr>
<tr>
<td>2010</td>
<td>26,929</td>
<td>29,145</td>
<td>56,074.0</td>
<td>200.9</td>
<td>58.1%</td>
</tr>
<tr>
<td>2011</td>
<td>43,521</td>
<td>57,899</td>
<td>101,420.0</td>
<td>302.4</td>
<td>60.1%</td>
</tr>
<tr>
<td>2012</td>
<td>72,268</td>
<td>73,947</td>
<td>146,215.0</td>
<td>448.6</td>
<td>59.7%</td>
</tr>
<tr>
<td>2013</td>
<td>101,310</td>
<td>62,358</td>
<td>163,668.3</td>
<td>612.2</td>
<td>57.7%</td>
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<tr>
<td>2014</td>
<td>98,000</td>
<td>74,800</td>
<td>172,800.0</td>
<td>785.0</td>
<td>56.2%</td>
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<tr>
<td>2015</td>
<td>120,000</td>
<td>89,760</td>
<td>209,760.0</td>
<td>994.8</td>
<td>55.9%</td>
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<tr>
<td>2016</td>
<td>146,880</td>
<td>107,800</td>
<td>254,680.0</td>
<td>1249.5</td>
<td>55.7%</td>
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<tr>
<td>2017</td>
<td>104,000</td>
<td>53,900</td>
<td>157,900.0</td>
<td>1407.4</td>
<td>53.0%</td>
</tr>
</tbody>
</table>

SCE Net Energy Metering Historical and Projections

- About 650 MW of DG connected to SCE’s distribution system.
- About 310 MW in process of being interconnected.
- About 560 MW in the negotiation stage.
- Significant projections of new interconnection and with different technologies (such as storage).
Remaining Activities

Generating Facilities
- Update to standards (EEE 1547a, IEEE1547.1, CA Rule 21)
- Voltage and Frequency Ride Through
- Active Voltage Regulation
- Output Intermediacy and affects to voltage control
- Communication systems and Utility Interface
- UL Certification (anti-island)

SCE planning and operational methods for high penetration areas
- Review Design standards and modify to incorporate high levels of DG
- Dependability of variable generation?
- SCE direct control of generating facilities?
- Integration of new technologies.
  - Storage
  - Advanced Inverters

Tariff Updates
- Revisions to CA Rule 21 currently in process
Thank You For The Opportunity

“QUESTIONS”