The Need for Market Innovations to Promote Policy Innovations

Edward Randolph
Director, Energy Division

California Public Utilities Commission

May 2, 2013
# RPS Programs

<table>
<thead>
<tr>
<th>Program Type</th>
<th>Program Size (MW)</th>
<th>Participating Buyers and Sellers</th>
<th>Eligible RPS Technologies and Project Size</th>
<th>CPUC Status</th>
<th>Market Opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual RPS RFO</td>
<td>Defined in annual procurement plan</td>
<td>3 large IOUs</td>
<td>All technologies, all sizes</td>
<td>Authorized by CPUC approval of annual RPS procurement plan</td>
<td>Annual RFO</td>
</tr>
<tr>
<td>Bilateral Contracts</td>
<td>As negotiated</td>
<td>3 large IOUs</td>
<td>All technologies, all sizes</td>
<td>Authorized by CPUC approval of annual RPS procurement plan</td>
<td>As negotiated</td>
</tr>
<tr>
<td>Feed-In Tariff (AB 1969)</td>
<td>500</td>
<td>3 large IOUs</td>
<td>All technologies Up to 1.5 MW</td>
<td>Fully Implemented (D.07-07-027)</td>
<td>Contracts accepted until cap reached</td>
</tr>
<tr>
<td>Revised FIT / ReMAT (SB 32)</td>
<td>Expands AB1969 FIT to 750 MW</td>
<td>IOUs and municipal utilities</td>
<td>All technologies Up to 3 MW</td>
<td>Rules adopted last year (D.12-05-035), Full Implementation pending</td>
<td>Contracts accepted until cap reached</td>
</tr>
<tr>
<td>RAM</td>
<td>1,299</td>
<td>3 large IOUs</td>
<td>All technologies 3 MW to 20 MW</td>
<td>Fully Implemented (D.10-12-048)</td>
<td>RAM4: June 2013</td>
</tr>
<tr>
<td>SCE Solar PV Program (SPVP)</td>
<td>250</td>
<td>125 MW UOG</td>
<td>Solar PV (Primarily rooftop 1-2 MW)</td>
<td>Fully Implemented (D.09-06-049, Resolution E-4299)</td>
<td>1 auction per year</td>
</tr>
<tr>
<td>PG&amp;E Solar PV Program</td>
<td>500</td>
<td>250 MW UOG</td>
<td>Solar (Primarily ground-mount 1-20 MW)</td>
<td>Fully Implemented (D.10-04-052, Resolution E-4368)</td>
<td>1 auction per year</td>
</tr>
<tr>
<td>SDG&amp;E Solar PV Program</td>
<td>26 MW</td>
<td>26 MW UOG</td>
<td>Solar PV Primarily ground-mount 1-5 MW</td>
<td>Fully implemented (D.10-09-016, Approved AL 2210-E)</td>
<td>n/a</td>
</tr>
</tbody>
</table>
Overview of Customer-Side Solar

- Solar in California: 1,500+ MW installed PV at 130,000+ locations
- Nearly 1,200 MW installed in CSI Program
- California is over 2/3rds of nation’s solar market and nation’s largest rebate program
- California supports solar self-generation with four interrelated state policies: Rebates, net energy metering (NEM), interconnection policies, and rate structures (e.g. tiered rates, time of use rates)

Stone Brewing Co., North County
San Diego
Courtesy: Stone Brewing Co.

San Diego County Water Authority
San Diego
Courtesy: Borrego Solar
California’s Residential PV Market

CSI Residential Projects by Year

*2013 data is through April.
Source: www.californiasolarstatistics.ca.gov, Data through April 24, 2013
The Rise of Residential Leases and PPAs

*2013 data is through April.

Source: www.californiasolarstatistics.ca.gov. Data through April 24, 2013
US PV costs vs Germany PV costs

- The installed cost of residential solar in Germany is significantly lower.
  - Germany was $3.54/watt AC in 2011 ($14,160 for a 4 kW system)
  - US was $6.78/watt AC in 2011 ($27,120 for a 4 kW system)

- A recent LBNL study* cited various reasons, including the regular reductions to the residential German feed-in-tariff (FiT), more efficiently encourage German installers, and lower prices to attract customers.

*Source: “Why Are Residential PV Prices in Germany So Much Lower Than in the United States? A Scoping Analysis”. Joachim Seel, Galen Barbose, and Ryan Wiser, Lawrence Berkeley National Laboratory
Thank you!