California’s Solar Market

The policies and programs working towards the goal of a sustainable solar industry
California Solar Initiative (CSI)

California has:

- Over 600 MW+ installed PV statewide
  - 342 MW installed under CSI Program since 2007
- Over 65,000+ solar installations statewide
  - 31,000 + installed under CSI Program since 2008
- Over 2/3rds of nation’s solar market
- A rebate program that funds solar installations on the customer-side of the meter
  - Launched in 2007
  - But built upon CA solar rebate programs available since 1998
- A growing solar market
  - Over 1,000+ solar contractors
  - Installations growing every year
- A range of solar policies
  - Net Energy Metering
  - Interconnection
  - Tiered Rate Structures
  - + other policies for wholesale solar

Photo: Don Schramm, P-H-D EnterprisesStadt, 7.74kw STC, May 06, 2008, Stevenson Ranch
California Solar Initiative is Part of Statewide Solar Program Offering: Go Solar California

Goals of Go Solar California
• Electric: 3,000 MW of new customer-owned distributed solar statewide
• Gas: 585 million therms
• Self-sustaining solar industry free from ratepayer funded incentives

Budget
• Electric: $3.3 billion budget (2007-2016) split across programs throughout state
• Gas: $250 million (2010-2017)

<table>
<thead>
<tr>
<th>Program Authority</th>
<th>California Public Utilities Commission</th>
<th>California Energy Commission</th>
<th>Publicly Owned Utilities (POUs)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budget</td>
<td>$2,167 million (Electric) $250 million (Gas)</td>
<td>$400 million</td>
<td>$784 million</td>
<td>$3,351 million (Electric) $250 Million (Gas)</td>
</tr>
<tr>
<td>Solar Goals</td>
<td>1,940 MW (Electric) 585 million therms (Gas)</td>
<td>360 MW</td>
<td>700 MW</td>
<td>3,000 MW (Electric) 585 million therms (Gas)</td>
</tr>
<tr>
<td>Scope</td>
<td>All solar systems in large IOU areas except new homes</td>
<td>Solar systems on new homes in large IOU areas</td>
<td>All solar systems in POU areas</td>
<td>All of California</td>
</tr>
</tbody>
</table>
Key Aspects of CSI Program Design

- Statewide eligibility guidelines
  - Warranty Requirements
  - Eligible Equipment
- Performance-Based Rebates
  - Incentives paid based on expected or actual performance
  - Incentive payments adjusted based on the design installation characteristics
- Declining Incentives
  - Rebate levels drop based on program demand, not calendar dates or budget availability

Photo: Brian Peterson, Sierra Nevada Brewing Company, Chico, CA
California Solar Initiative Funded System, 1,258 kW, September 2007
Installer: Chico Electric
Incentives decline as demand grows:
CPUC part of program has a goal of 1,750 MW

As of June 29, 2010
PG&E: Step 7
SDG&E: Step 7
SCE: Step 4 Res
Step 6 Non-Res

PBI: Paid based on actual output over 5 years
EPBB: Paid upfront based on expected output using installation design characteristics
Other CSI Program Components

- Single-family Affordable Solar Homes (SASH) Program
  - Provides higher rebate to low income customers in deed-restricted single-family residences
  - Large workforce development component
- Multifamily Affordable Solar Housing (MASH) Program
  - Provides higher rebate to multifamily affordable housing in deed restricted multi-family residences
  - Provides access to Virtual Net Metering pilot tariff for splitting bill credit
- RD&D Program (www.CalSolarResearch.org)
  - Provides up to $50 million in a program for projects related to CSI goals
  - First round solicitation proposed award winners announced
  - Second round of funding proposals were received on 2/16/10
- CSI-Thermal Program
  - New in 2010: Provides up to $350 million for solar water heating and solar heating/cooling technologies
  - Will accept applications in May 2010, replaces a San Diego pilot
Track Our Solar Market Progress

• Annually: Reports to CA legislature
  www.cpuc.ca.gov/PUC/energy/Solar/apa09.htm

• Quarterly: Public “CSI Program Forums” – in person meetings
  www.cpuc.ca.gov/PUC/energy/Solar/forum.htm

• Monthly: Go Solar California! Newsletter
  www.gosolarcalifornia.ca.gov/news/

• Weekly: All program data available each Wednesday
Solar Interconnections and NEM Customers by Utility thru 2009

<table>
<thead>
<tr>
<th></th>
<th>MWs Interconnected</th>
<th>Customers Interconnected</th>
<th>MWs on NEM Tariffs</th>
<th>Customers on NEM Tariffs</th>
</tr>
</thead>
<tbody>
<tr>
<td>PG&amp;E</td>
<td>327.2 MW</td>
<td>36,441</td>
<td>300.6 MW</td>
<td>36,241</td>
</tr>
<tr>
<td>SCE</td>
<td>147.9 MW</td>
<td>12,649</td>
<td>147.9 MW</td>
<td>12,649</td>
</tr>
<tr>
<td>SDG&amp;E</td>
<td>66.0 MW</td>
<td>8,535</td>
<td>64.5 MW</td>
<td>8,522</td>
</tr>
<tr>
<td>Total</td>
<td>541.1 MW</td>
<td>57,625</td>
<td>512.9 MW</td>
<td>57,412</td>
</tr>
</tbody>
</table>

Data: April 2010. Includes CSI, NSHP, ERP, and SGIP. Does not include POU or RPS.
Installed Solar Projects (#) by Year thru 2009

Data: Installed Solar PV projects at Customer-Sites by year in California’s Investor-Owned Utility Territories (PG&E, SCE, SDG&E). Does not include projects in publicly owned utility territories. Does not include wholesale PV projects or any projects used to directly serve utility load, such as Renewable Portfolio Standard projects.

Installed Solar Capacity (MW) by Year thru 2009

**Data:** Installed Solar PV megawatts (MW) at Customer-Sites by year in California’s Investor-Owned Utility Territories (PG&E, SCE, SDG&E). Does not include projects in publicly owned utility territories. Does not include wholesale PV projects or any projects used to directly serve utility load, such as Renewable Portfolio Standard projects.

**Source:** California Public Utilities Commission, April 2010.
# Statewide Solar Installations

<table>
<thead>
<tr>
<th>Area</th>
<th>Data Source &amp; Dates</th>
<th>MWs</th>
<th>Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IOU area Solar Installations in California</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All IOU Interconnections 1993-2009</td>
<td></td>
<td>541.1 MW</td>
<td>57,625</td>
</tr>
<tr>
<td><strong>POU area Solar Installations in California</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CEC</td>
<td></td>
<td>11.3 MW</td>
<td>~</td>
</tr>
<tr>
<td><strong>Total California Solar Installations</strong></td>
<td></td>
<td>609.6 MW</td>
<td>64,627</td>
</tr>
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</table>
## CSI Program Data

### All CSI Projects

<p>| | |</p>
<table>
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<tr>
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</thead>
<tbody>
<tr>
<td><strong>Installed Projects</strong></td>
<td></td>
</tr>
<tr>
<td>Applications</td>
<td>31,799</td>
</tr>
<tr>
<td>Capacity (MW)</td>
<td>342 MW</td>
</tr>
<tr>
<td>Incentive $ million</td>
<td>$738 M</td>
</tr>
<tr>
<td><strong>Pending Projects</strong></td>
<td></td>
</tr>
<tr>
<td>Applications</td>
<td>10,065</td>
</tr>
<tr>
<td>Capacity (MW)</td>
<td>387 MW</td>
</tr>
<tr>
<td>Incentive $ million</td>
<td>$661 M</td>
</tr>
<tr>
<td><strong>Total CSI Activity</strong></td>
<td></td>
</tr>
<tr>
<td>Applications</td>
<td>41,864</td>
</tr>
<tr>
<td>Capacity (MW)</td>
<td>729 MW</td>
</tr>
<tr>
<td>Incentive $ million</td>
<td>$1,400 M</td>
</tr>
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</table>

CSI Progress Towards 1,750 MW Goal

• Program has Installed 20% of MW Goal,
• Program has 22% of MW Goal Pending

California has policies to promote solar as both Customer-Side DG and Wholesale Generation

<table>
<thead>
<tr>
<th>Policies</th>
<th>Customer Generation or Self-Generation Offset Customer’s Load</th>
<th>Wholesale Generation Procurement (Sell to Utility or Other)</th>
</tr>
</thead>
</table>
| Programs and Project Size | Supports Generation up to 5 MW in project size with Incentives. Incentives based on program:  
  - Solar = Incentives for up to 1 MW eligible for incentives through California Solar Initiative (CSI)  
  - Wind and Fuel Cells = Up to 3 MW eligible for incentives through Self-Generation incentive Program  
  - Advanced Energy Storage = Up to 3 MW if installed with wind or fuel cells (looking to expand in 2010) | Projects of any size eligible for contract, but not for incentives, rebates or subsidies. Price based on contract path:  
  - Renewable Portfolio Standard (RPS) annual Competitive Solicitations  
  - Feed-in Tariff  
  - Qualifying Facility program  
  - Utility solar programs |
| RPS? | Does not qualify for RPS  
  - Customer Retains Renewable Energy Credits (RECs) | Does qualify for RPS  
  - RECs transfer to buyer as per contract |
| NEM? | Does qualify for Net Energy Metering (NEM) and Net Surplus Compensation (not yet implemented) | Does not qualify for Net Energy Metering (NEM) |
| Export? | Projects sized to customer load. Projects allowed to export but not designed primarily for export. | Projects sized for export of generation, size larger than customer onsite load if located at a customer |
| Demand vs. Supply? | Reduce Electricity Demand: Projects Count Towards Reduced Demand Forecast (like Energy Efficiency) | Provide Electricity Supply: Projects Count Towards Procurement and Capacity (Resource Adequacy) Obligations |
| Interconnection? | Most exempt from interconnection charges: Rule 21 allows for “Simplified Interconnection” for most clean DG | Generation pays interconnection charges: May interconnect under CPUC’s Rule 21 or FERC’s Self Generation Interconnection Protocol (SGIP) |
Solar Tariff Options

- **Net Energy Metering (NEM) per PU Code 2827**
  - Provides a bill credit in $ for any excess kilowatt hours in a given time of use period
  - Modified by AB 920 (2009) to add “Net Surplus Compensation” which will provide for utilities to pay out for excess kilowatt hours at the end of 12 months. May be different than monthly bill credit calculation. CPUC considering in A-10-03-001.
  - CPUC issued a comprehensive NEM Cost Benefit study in March 2010, per statute.
  - Limited to 1 MW of NEM

- **Virtual Net Metering (VNM) Pilot**
  - Provides a kilowatt hour credit based on the energy produced by a solar PV generating system to both the building owner’s and tenants’ individual utility accounts, based on a pre-arranged allocation agreement.
  - Pilot program limited to MASH projects only.
  - CPUC planning on reviewing VNM in R.10-05-004 this year

- **Local Government Bill Credit Transfer (BCT) per PU Code 2830**
  - Provides a bill credit transfer in dollars between a generating account and a benefitting account, so long as both utility accounts belong to the same local government.
  - Final tariffs approved by CPUC in March 2010, available as of June 2010.
  - Projects limited to 1 MW per “arrangement”, but a local government can have multiple arrangements.
Thank You

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