

# Alternative Energy at PG&E

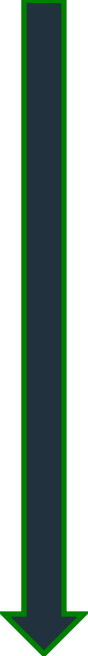
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**Director, Service Analysis**  
**Customer Energy Solutions**





# California's "Loading Order"

Energy Action Plan: "Loading Order" of preferred resources

- 
- A large, thick, black arrow pointing downwards, positioned to the left of the list items.
1. Energy efficiency
  2. Demand response
  3. Renewables and clean distributed generation
  4. Cleanest available fossil-fired generation

First adopted in 2003 (updated in subsequent years) by the California Energy Commission and the California Public Utilities Commission, as part of the state's Energy Action Plan.



# Programs and Incentives

## 2012-2014 DR Programs

	Description	Enrolled Accounts	Currently Enrolled MW
SmartAC	<ul style="list-style-type: none"> <li>Reliability program to preserve grid stability</li> <li>Immediate, direct load control of AC units</li> <li>One-time enrollment incentive for sign-up</li> <li>For residential and SMB customers</li> </ul>	~160,000	~100
Base Interruptible Program (BIP)	<ul style="list-style-type: none"> <li>Reliability program to preserve grid stability</li> <li>30-minute minimum notification of events</li> <li>Large C&amp;I customers; annual capacity payment w/ high penalties for non-performance</li> </ul>	~280	~225
Aggregator Programs (CBP & AMP)	<ul style="list-style-type: none"> <li>Peak shaving or reliability dispatch</li> <li>30-minute or day-ahead notification of events</li> <li>Monthly capacity payments based on nominated / committed load reduction</li> <li>Capacity and energy payments for actual energy conserved with penalties for non-performance</li> </ul>	~3,500	~240
Demand Bidding Program (DBP)	<ul style="list-style-type: none"> <li>Economic / peak shaving dispatch, "best efforts"</li> <li>Day-ahead notification of events</li> <li>Payment for actual energy reduction at \$500/MWH during DR events</li> </ul>	~1,000	~40
Peak Day Pricing (PDP) and SmartRate	<ul style="list-style-type: none"> <li>Peak shaving dispatch - "critical peak pricing"</li> <li>Day-ahead notification of events</li> <li>Elevated pricing during events but discounted rate all other hours</li> </ul>	~120,000	~50

Portfolio-Adjusted\* Total: ~630 MW

## Energy Efficiency Portfolio

<b>Multiple Customers</b> <ul style="list-style-type: none"> <li>Agriculture <ul style="list-style-type: none"> <li>Agriculture</li> <li>Food Processing</li> </ul> </li> <li>Commercial <ul style="list-style-type: none"> <li>Healthcare</li> <li>High Tech / Biotech</li> <li>Hospitality</li> <li>Offices</li> <li>Retail</li> <li>Schools</li> </ul> </li> <li>Industrial <ul style="list-style-type: none"> <li>Chemicals &amp; Minerals</li> <li>Petroleum</li> <li>Wastewater &amp; Water Treatment</li> </ul> </li> <li>Public <ul style="list-style-type: none"> <li>Federal Government</li> <li>State Government</li> <li>Local Government</li> </ul> </li> <li>Residential <ul style="list-style-type: none"> <li>Residential</li> <li>Low Income</li> </ul> </li> </ul>	<b>Multiple Delivery Channels</b> <ul style="list-style-type: none"> <li>In-store promotions</li> <li>Manufacturer incentives</li> <li>Distributor incentives</li> <li>On-bill financing</li> <li>Third-party programs</li> <li>Government partnership programs</li> <li>Direct utility rebates</li> <li>Point of sale rebates</li> </ul>	<b>Multiple Technologies</b> <ul style="list-style-type: none"> <li>Appliances</li> <li>Lighting</li> <li>Electronics</li> <li>Buildings</li> <li>New construction</li> <li>Retrofits</li> <li>Home / facility audits</li> <li>HVAC systems</li> <li>Food services</li> <li>Refrigeration</li> <li>Boilers / steam systems</li> <li>Industrial systems / processes</li> <li>Motors</li> <li>Pumps and fans</li> <li>Energy Management Systems</li> </ul>
<b>Multiple Market Development Mechanisms</b>		
<ul style="list-style-type: none"> <li>Codes &amp; Standards advocacy / compliance training</li> <li>Emerging Technology assessments / demos / incubation</li> <li>Workforce education</li> </ul>		

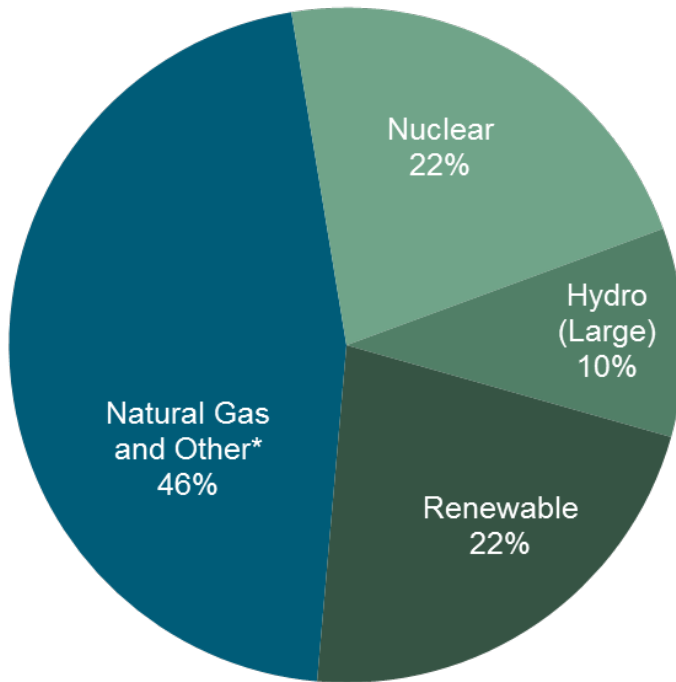
## Distributed Generation Technologies Incentivized





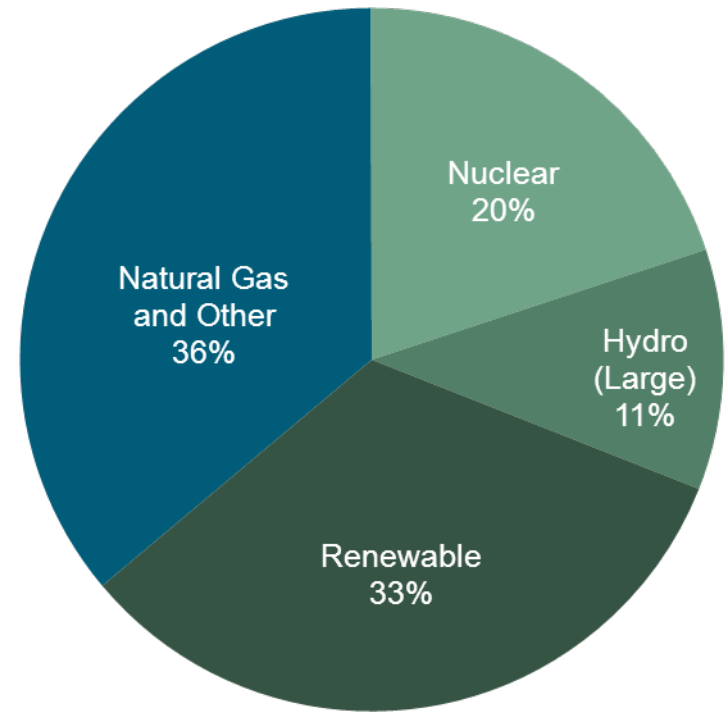
# PG&E's Electric Generation Portfolio

## 2013 Preliminary Data



**Total GWh: 76,000**

## 2020 Projected Portfolio



**Total GWh: 81,000**

**Note:** Other includes market purchases, other fossil resources

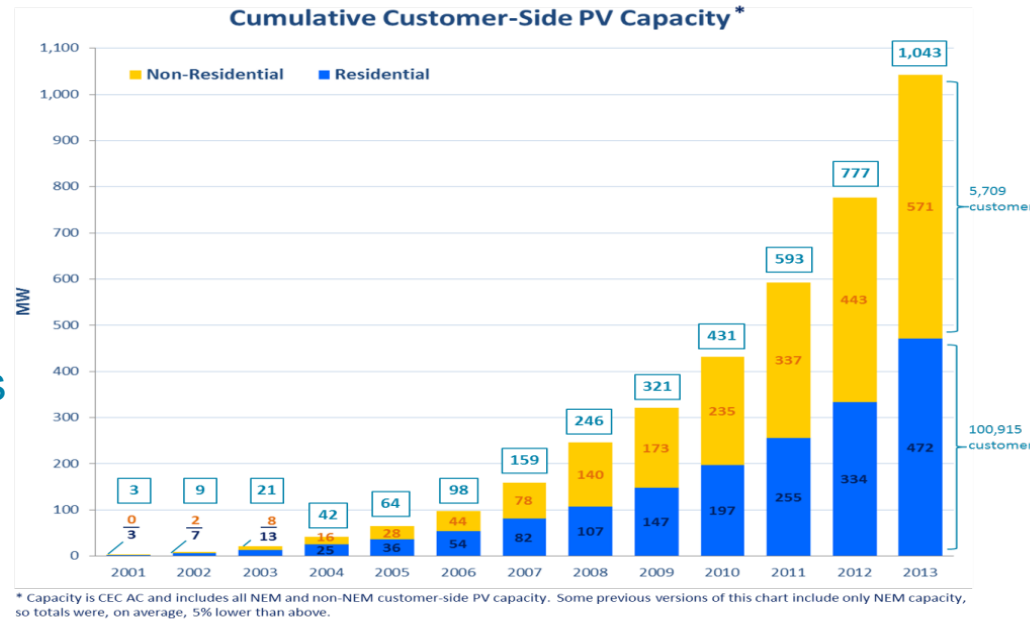
**Data Sources:** 2013 delivery statistics are preliminary and subject to an independent audit and verification that will not be completed until October 1, 2014. 2020 data from PG&E's 2013 IEPR Forecast.



# PG&E Solar Overview

PG&E has a strong track record on solar and we will continue supporting our customers who choose to “go solar”

- 25% of all U.S. rooftop installations
- Year-over-year growth of 34% since 2009
- 120,000+ solar customers
- 7 of 10 world’s largest solar projects
- Industry leading interconnection times
- Rooftop solar represents 5% of coincident peak; 2.4% of customer sales

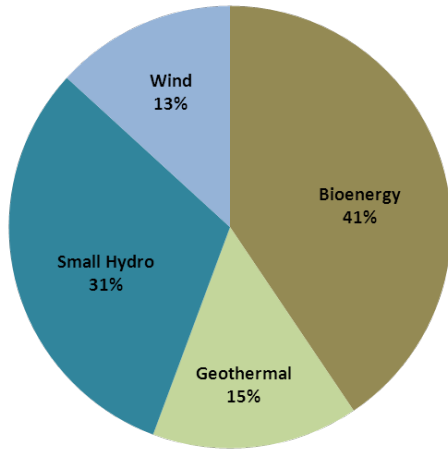




# Renewable Portfolio: Past, Present and Future

## 2002 Actual

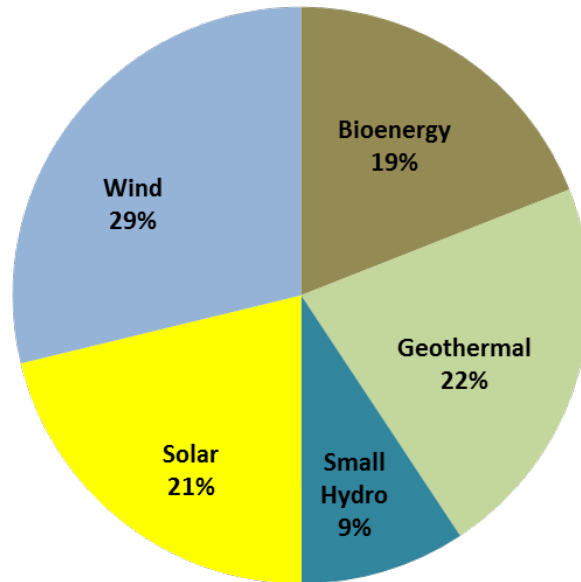
11% of total bundled retail sales



Total RPS-Eligible Procurement  
7,504 GWh

## 2013 Preliminary

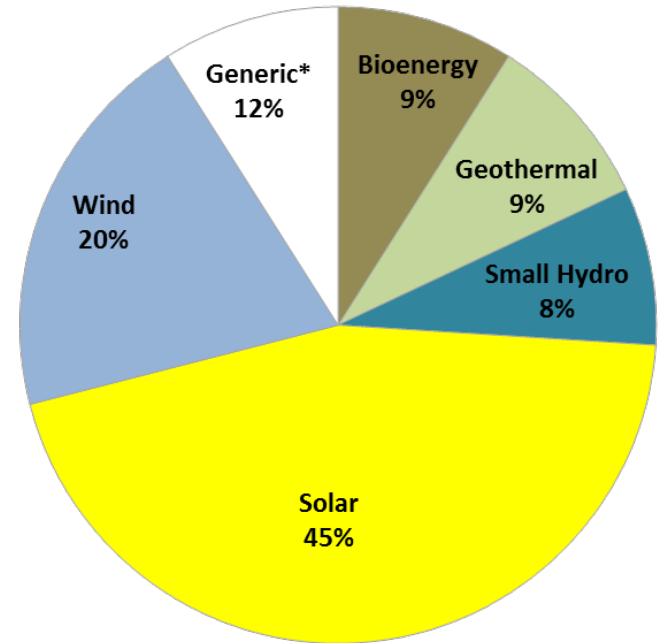
23% of total bundled retail sales



Total RPS-Eligible Procurement  
17,056 GWh

## 2020 Projected

33% of total bundled retail sales



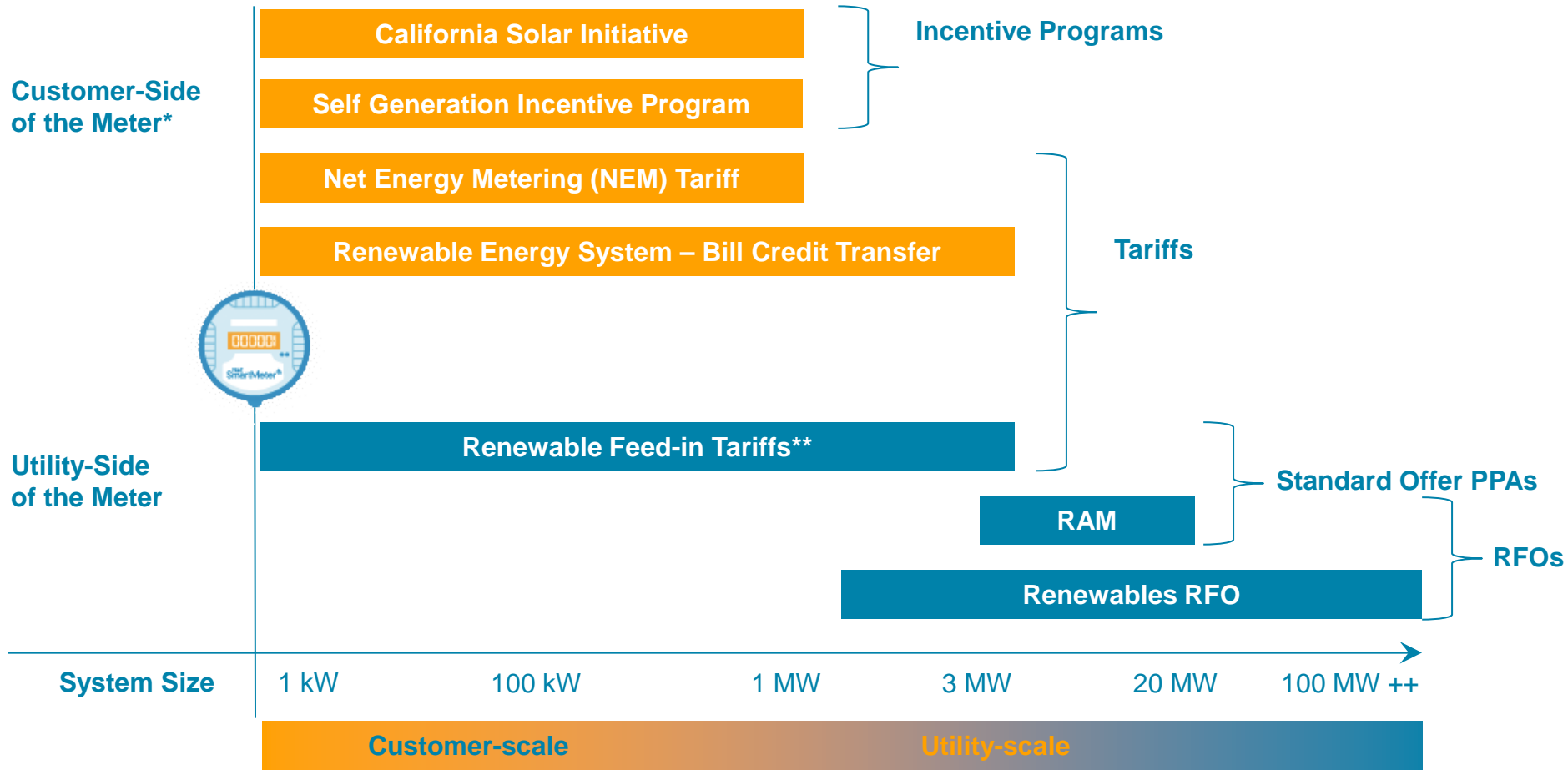
Projected RPS-Eligible Procurement  
~26,500 GWh

**Note:** Generic means PG&E will procure from to be determined resources. Some of these resources will be procured through mandated programs such as: RAM, ReMAT and upcoming SB 1122 bioenergy feed-in tariff.

**Data Sources:** PG&E's 2002 Corporate Environmental Report, PG&E's 2013 Power Source Disclosure Report (The 2013 data is subject to an independent audit and verification that will not be completed until October 1, 2014.) PG&E's 2014 33% RPS Procurement Progress Report. Last updated June 2014.



# Renewable Energy Programs



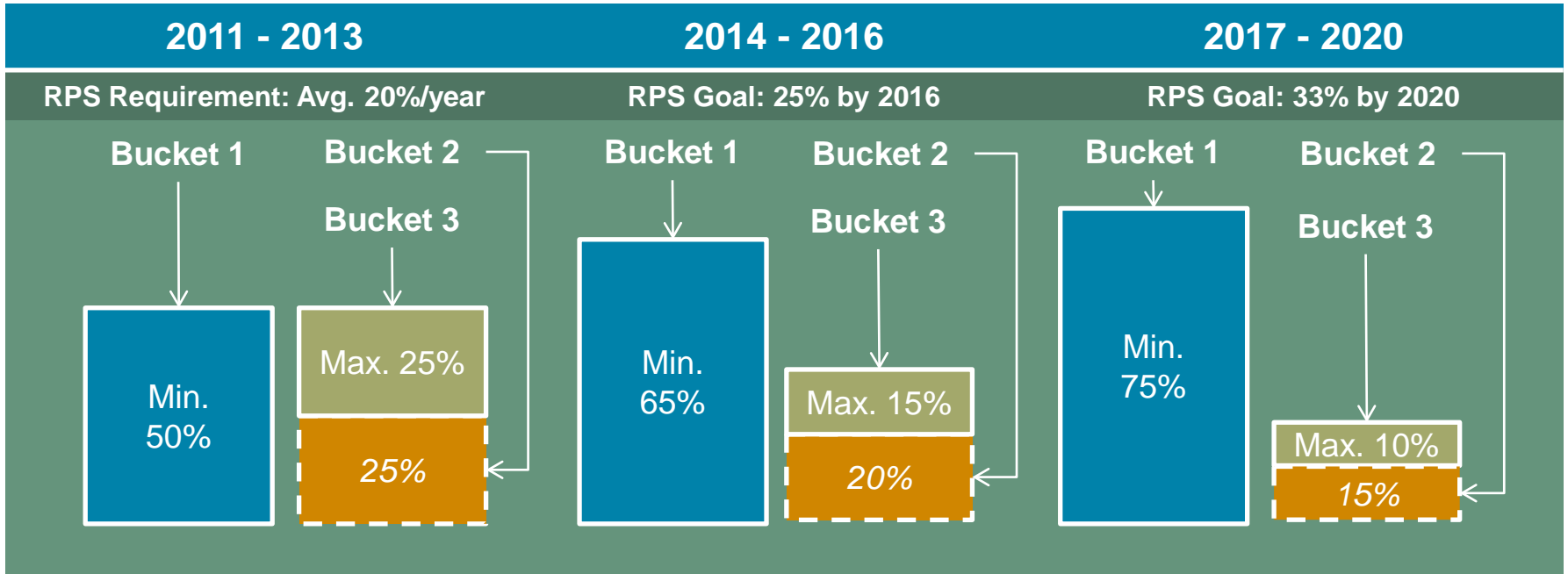
\*Programs do not count towards RPS generation

\*\* Includes existing E-SRG and E-PWF tariffs (AB 1969), E-ReMAT tariff (SB 32), and expected bioenergy FIT (SB 1122)



# Procurement – Geographic Restrictions

Restrictions on procurement by product category vary over the three compliance periods, with Bucket 3 being the most restrictive compliance category.



## BUCKET 1

Majority of deliveries from incremental (post June 2010) contracts must be sourced from resources located in California or directly connected to the State through a California Balancing Authority

## BUCKET 2

Remaining incremental deliveries may come entirely from firming & shaping (F/S) contracts, or

## BUCKET 3

A mixture of F/S and other resources ineligible for Bucket 1 or Bucket 2





# Executed RPS Contracts

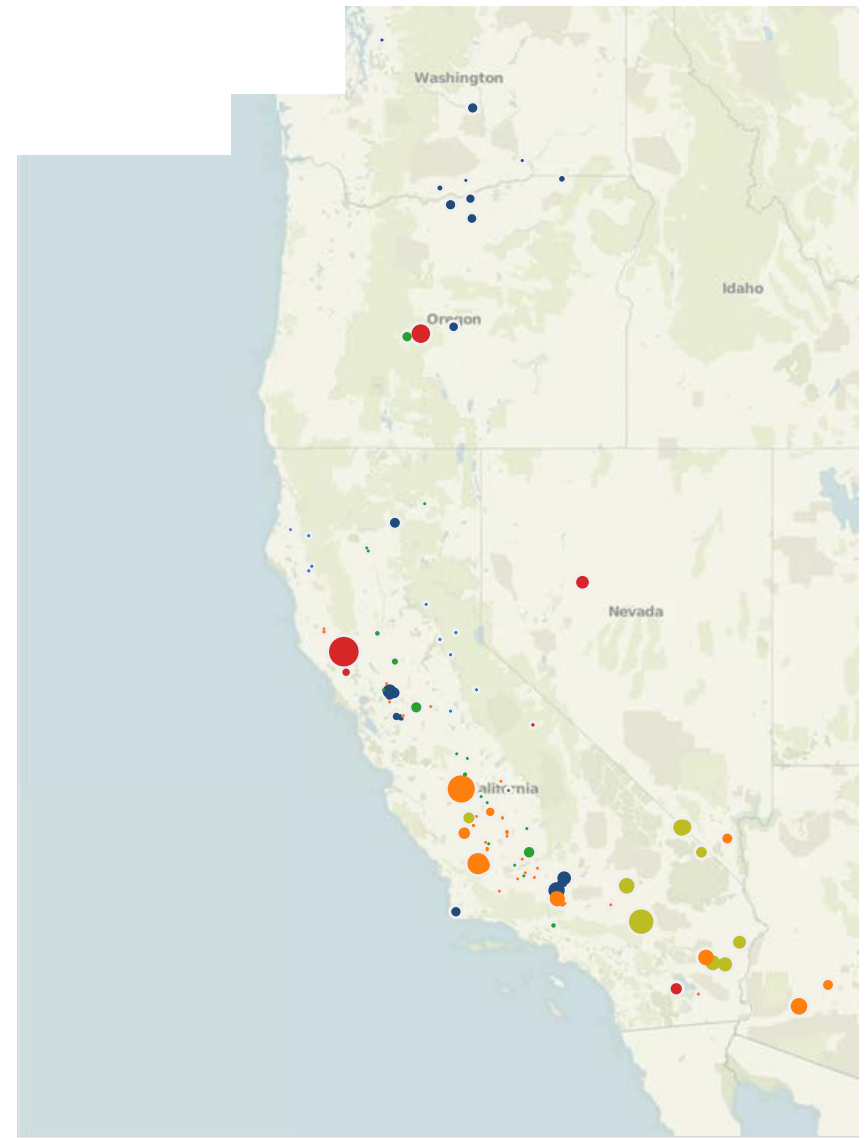
156 RPS contracts totaling over 10,900 MWs, since the program began in 2002<sup>(1,2)</sup>

Technology	#	MW
Bioenergy <sup>3</sup>	22	352
Geothermal	10	769
Small Hydro	9	153
Solar PV	56	3,371
Solar Thermal	14	2,755
Wind	44	3,545
Wave	1	2
<b>Total</b>	<b>156</b>	<b>10,947</b>

<sup>1</sup>Table does not include renewable Feed-in Tariff AB1969, ReMAT and SB 1122 PPAs, amended post-2002 Qualifying Facility and REC-only contracts.

<sup>2</sup>Table includes terminated/expired/rejected contracts, which are excluded in the map

<sup>3</sup>Bioenergy includes biomass, biogas and landfill gas



**Note:** Data tables and map current as of June 10, 2014. Includes terminated & expired contracts.

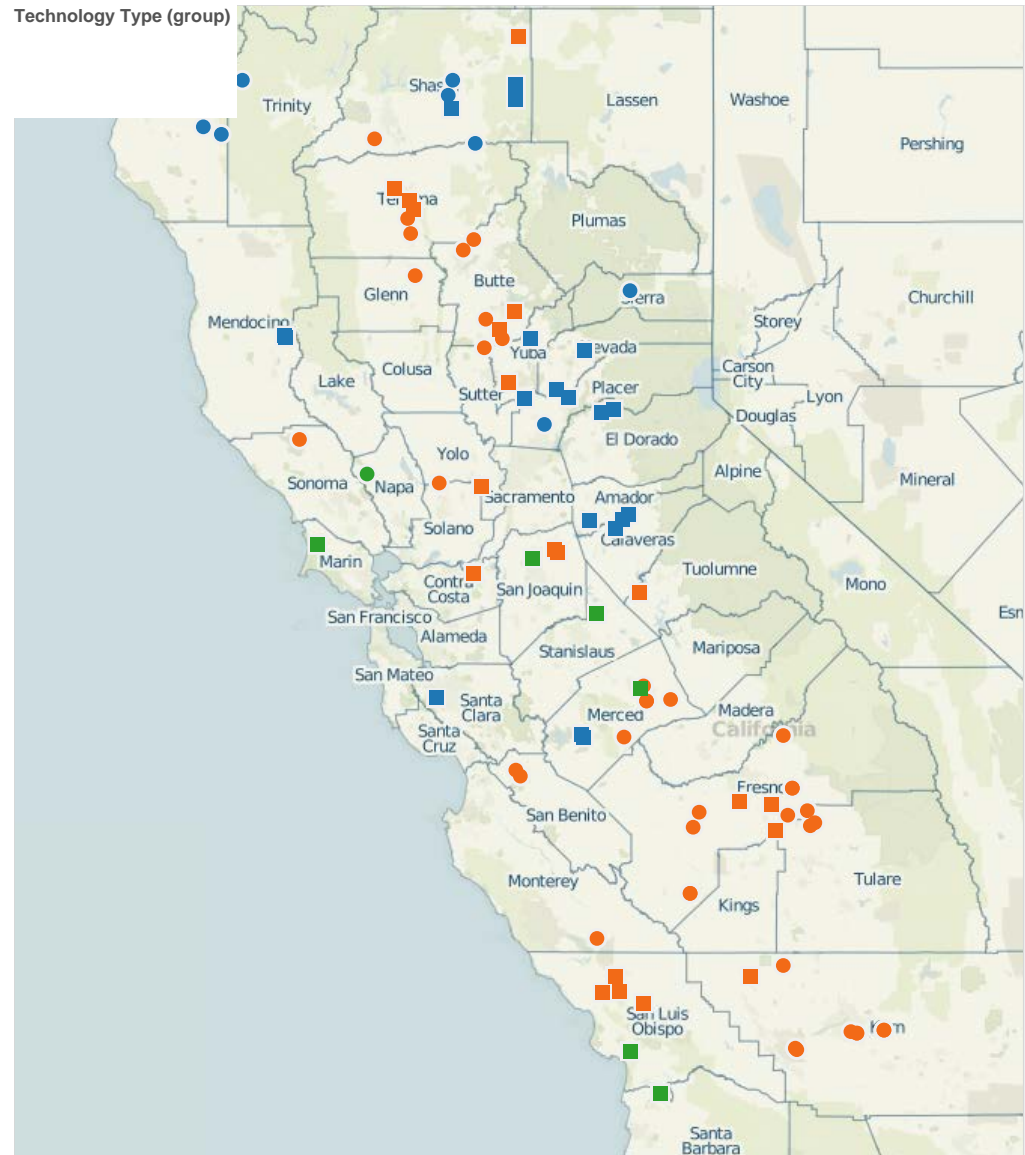


# Active Feed-In Tariff Contracts

Contracted portfolio under the AB 1969/ReMAT FIT program is mostly solar PV

Technology	#	MW
Bioenergy <sup>1</sup>	7	6
Geothermal	0	0
Small Hydro	28	16
Solar PV	67	86
Wind	0	0
<b>Total</b>	<b>102</b>	<b>108</b>

<sup>1</sup>Bioenergy includes biomass and biogas

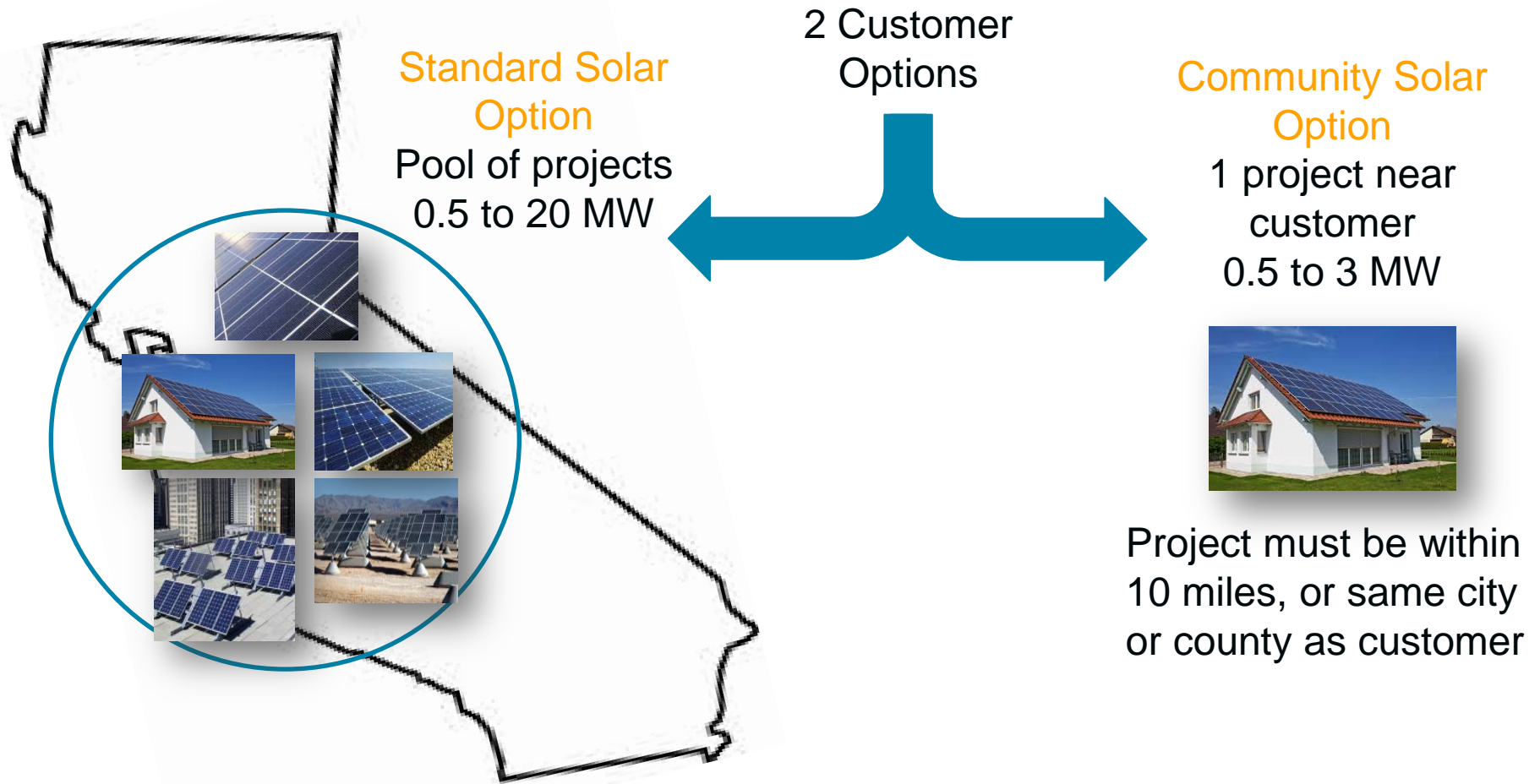


**Note:** Data tables and map current as of June 10, 2014. Excludes terminated contracts.



# PG&E's Proposed Green Option

PG&E's Green Option is a voluntary program that, once approved, will enable all PG&E bundled electric customers to purchase up to 100% of their electricity from PG&E-procured solar projects within PG&E's service territory. Customers can choose between 2 ways to participate (subject to CPUC approval).

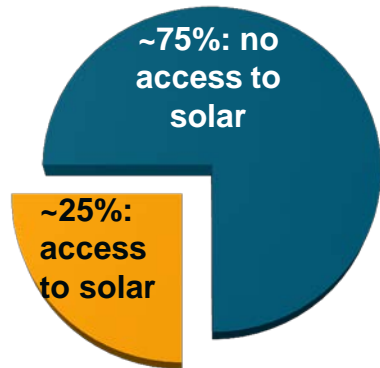




# Benefits of a Voluntary Green Power Program

## Responds to Customer Interest

- PG&E studies have consistently shown that customers want more renewable energy options. In addition, civic and environmental leaders have asked PG&E to offer such an option.



## Provides Solar Access For All

- ~ 75% of residential customers, including renters and those with unsuitable roof space, lack access to solar today.

## Doesn't Shift Costs to Non-Participants

- The program does not shift costs to non-participants, unlike the current situation under Net Energy Metering.

## Creates More Renewable Energy

- PG&E's program would create up to 272 MW of new solar resources within our service territory

