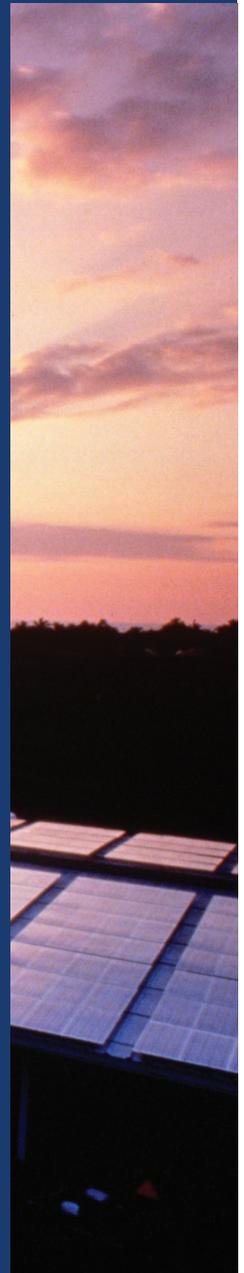




California Solar Initiative Annual Program Assessment June 2013



California Solar Initiative Annual Program Assessment

June 2013

Prepared by the
California Public Utilities Commission

Authors

Tim Drew
James Loewen
Neal Reardon
Ehren Seybert
Melicia Charles, Supervisor

Special Thanks

Table of Contents

Table of Contents	2
1. Executive Summary	5
1.1. Introduction	5
1.2. Key Report Contents	5
2. Introduction.....	8
2.1. Background on California Solar Initiative (CSI)	8
2.2. CSI Program Components.....	9
2.3. CSI Program Regulatory Process	10
3. Solar Installed Through 2012.....	13
3.1. Investor-Owned Utility Territory Solar Installations	13
3.2. Net Energy Metering Data	15
3.3. California Statewide Solar Installations	16
4. CSI Program Components	17
4.1. General Market Solar Program	17
4.2. Single-Family Affordable Solar Homes (SASH) Program	25
4.3. Multifamily Affordable Solar Housing (MASH) Program	29
4.4. Virtual Net Metering (VNM)	32
4.5. CSI-Thermal Program	32
4.6. Research, Development, Demonstration, & Deployment	40
5. Program Reporting and Evaluation.....	42
5.1. Program Reporting	42
5.2. Program Evaluation Plan.....	43
6. CSI Program Budget.....	45
7. California Solar Initiative Program Links and Contact Information	47
8. CSI and CSI-Thermal Program Administrator Contacts	47

Index of Tables

Table 1: CSI Budget by Program Component	10
Table 2: Solar Interconnections and Solar NEM Customers by Utility.....	15
Table 3: California Statewide Solar Installations	16
Table 4: CSI MW Targets by Utility and Customer Class	19
Table 5: CSI EPBB Rebate Levels per Incentive Step	19
Table 6: Current Statewide Solar Incentive Step Levels	20
Table 7: All CSI Projects Pending and Installed	22
Table 8: CSI Progress Toward Program Goal of 1,750 MW	23
Table 9: CSI Applications received by year (MW)	24
Table 10: CSI Program Activity, first quarter of 2013	24
Table 11: SASH Budget Allocations by IOU Service Territory.....	26
Table 12: SASH Budget Allocations by Functions	26
Table 13: SASH Incentive Rates in \$/Watt	27
Table 14: MASH Incentive Tracks, Revised as of D.11-07-031	30
Table 15: MASH Budget Allocations by Utility Territory	31
Table 16: MASH Budget Allocations by Function.....	31
Table 17: MASH Program Progress	31
Table 18: CSI-Thermal Gas-Displacing Budget Allocation.....	33
Table 19: CSI Thermal Gas Displacing Program Budget.....	33
Table 20: CSI-Thermal Low income Program Budget Allocation.....	34
Table 21: CSI Thermal Electric Displacing Program Budget	34
Table 22: CSI-Thermal Incentive Step Table	36
Table 23: CSI-Thermal Low Income Incentive Step Table.....	36
Table 24: Electric-Displacing Solar Thermal Incentives.....	37
Table 25: CSI-Thermal Applications by Sector and Displaced Fuel.....	37
Table 26: CSI-Thermal Program Applications by PA.....	38
Table 27: CSI RD&D Program Budget Allocations.....	40
Table 28: RD&D Grant/Incentive Allocations	41
Table 29: CSI Program Budget Allocations (millions \$).....	45

Index of Figures

Figure 1: Customer-Sited Solar Capacity Installed in CA’s IOU Territories, 1993-2012.....	14
Figure 2: Customer-Sited Solar Projects Installed in CA's IOU Territories, 1993-2012	14

1. Executive Summary

1.1. Introduction

In January 2007, California began a \$3.3 billion ratepayer-funded effort to install 3,000 megawatts (MW) of new solar over the next decade and transform the market for solar energy by reducing the cost of solar generating equipment. The California Public Utilities Commission's (CPUC) portion of the solar effort is known as the California Solar Initiative (CSI) Program. The CSI program goal is to install 1,940 MW of solar capacity by the end of 2016, and, along with other statewide solar programs, transition the solar industry to a point where it can be self-sustaining without subsidies.

This Annual Program Assessment meets statutory requirement for an annual report to the Legislature on the progress of the CSI Program.¹ Other state authorized programs, including the New Solar Homes Partnership (NSHP) and publicly-owned utilities' solar offerings, are not included in this report.²

The market for solar generating equipment in California has grown at a rapid pace since the beginning of the CSI Program. The annual rate of new solar installations and the cumulative installed capacity both provide evidence that California is well along the path of achieving the installed capacity goals set forth by Senate Bill (SB) 1 in 2006, the legislation that authorized the CSI Program.

1.2. Key Report Contents

This report contains current information on distributed solar energy systems in California, including systems installed through the CSI Program and those installed through other incentive programs. In addition, this report provides detailed information on CSI Program participation, installed capacity, equipment costs, and program impacts. The report also includes information on the progress of other CSI Program components, including the Single-Family Affordable Solar Homes Program (SASH); the Multifamily Affordable Solar Housing Program (MASH); the CSI-Thermal Program; the CSI-Thermal Low Income Program; and the Research, Development and Demonstration (RD&D) Program. This report also includes information on Net Energy Metering (NEM) and other relevant policy updates.

¹ Public Utilities (PU) Code 2851 (c)(3) states, "On or before June 30, 2009, and by June 30th of every year thereafter, the commission shall submit to the Legislature an assessment of the success of the California Solar Initiative program." The CPUC submitted the first CSI Annual Program Assessment on June 30, 2009, available at: <http://www.cpuc.ca.gov/PUC/energy/Solar/apa09.htm>.

² Information on non-CPUC jurisdictional solar programs is available at www.gosolarcalifornia.ca.gov.

1.2.1 Statewide Installed Solar Highlights

- Through the end of the first quarter of 2013, California has an estimated 1,629 MW³ of installed solar capacity on the customer side of the meter at 167,878 customer sites in the investor-owned utility (IOU) territories.
- A record 391 megawatts (MW) were installed statewide in 2012, a growth of 26 percent from 2011.

1.2.2 CSI General Market Program Highlights

- The CSI Program as a whole has installed 66 percent of its total program goal, with another 19 percent of the goal reserved in pending projects.
- PG&E and SDG&E territories have reserved and installed enough MW capacity to reach their goals in the residential sector.
- PG&E has achieved the most installations in the non-residential sector, having met 70% of their non-residential installation goal.
- The lowest installation rates for the residential sector are in SCE territory, where only 62% of the sector's goals are complete.
- NEM tariffs and the Federal Income Tax Credit (ITC) are playing a larger role in the economics of individual systems as the CSI program begins to phase out.

1.2.3 Other Program Highlights

- **Single-Family Affordable Solar Homes (SASH)**
 - Since the program was launched in December of 2008, SASH has received a total of 3,386 applications which have resulted in 8.5 MW of installed capacity on eligible homes, with another 1.8 MW currently in progress.
 - SASH applicants have received a total of \$64 million in support for their residential solar systems.

³ The installed capacity data cited in this report does not include solar capacity installed on the system side of the meter through the Renewables Portfolio Standard (RPS). The most recent RPS quarterly report can be found at <http://www.cpuc.ca.gov/PUC/energy/Renewables/>.

- **Multifamily Affordable Solar Housing (MASH)**
 - As of March 31, 2013, MASH had 287 completed projects representing a total capacity of 18.4 MW. There are an additional 83 MASH projects in process, for a total capacity of 11.3 MW.
 - Virtual Net Metering⁴ has allowed thousands of tenants to receive the direct benefits of solar as reductions in their monthly electric bills.

- **CSI-Thermal Program**
 - In just over three years of operation, the program has received 1,215 applications for \$56.3 million in incentives.

- **Research, Development, Demonstration and Deployment (RD&D) Program**
 - The CSI RD&D Program has conducted three project solicitations since its inception, resulting in grant funding for 23 projects totaling \$28 million. The funded projects focused on the following areas:
 - Integration of solar PV into the electricity grid.
 - Energy generation technologies and business development.
 - Grid integration and production technologies.
 - A fourth solicitation of \$7 million is currently anticipated for the second quarter of 2013. The focus of the fourth solicitation will be cost-effective, safe, and reliable strategies for integrating PV into distribution systems.

1.2.4 Net Energy Metering

- All but 92 MW, or 6 percent, of solar capacity in the state is signed up for Net Energy Metering (NEM) tariffs.
- Pursuant to Assembly Bill (AB) 2514 (Bradford, 2012) and Decision (D.) 12-05-036, the Commission has initiated a study on the costs and benefits of NEM to ratepayers. The study will be released later this year.

⁴ Virtual Net Metering was first approved by the Commission when the MASH Program was adopted in D.08-10-036. VNM is a tariff which allows the bill credits from a single solar system to be shared among multiple customer accounts.

2. Introduction

2.1. Background on California Solar Initiative (CSI)

The California Solar Initiative (CSI or CSI Program) is the solar rebate program for California investor-owned utilities: Pacific Gas and Electric (PG&E), Southern California Edison (SCE), San Diego Gas & Electric (SDG&E).

The goals of the CSI Program are to:

- Install 1,940 MW of distributed solar energy system generation capacity or the equivalent in the large electric IOU service territories and displace 585 million therms of natural gas usage, or the equivalent output of 200,000 solar thermal systems;
- Transform the market for solar energy systems so that it is price competitive and self-sustaining.

Incentives under the CSI Program are available to solar PV systems as well as solar thermal technologies. Existing residential homes, as well as all commercial, industrial, government, non-profit, and agricultural properties within the service territories of the large electric and gas IOUs are eligible for CSI Program participation.⁵

The CSI Program focuses exclusively on solar energy systems used by IOU customers who want to offset some or all of their own energy consumption. In the case of the solar PV program, the solar energy systems funded under the program reduce the customer's electricity consumption from the grid. In the case of the solar thermal program, the solar energy systems reduce the customer's gas or electricity consumption, depending on the customer's energy source for their existing hot water system. The CSI Program does not fund wholesale solar power plants, which are designed to serve the electric grid; nor does it contribute toward the utilities' Renewable Portfolio Standard (RPS) obligations.⁶

⁵ The electric-displacing portion of CSI Program, which covers solar PV and some solar thermal systems, was authorized by the California Public Utilities Commission (CPUC) in a series of regulatory decisions between 2006 and 2011. In addition, the Legislature expressly authorized the CPUC to create the CSI Program in 2006 in Senate Bill (SB) 1 (Murray, 2006). The gas-displacing solar thermal portion of the CSI was authorized by the Legislature in Assembly Bill (AB) 1470 (Huffman, 2007) and implemented by the CPUC in early 2010 after the required evaluation of a pilot program in the San Diego area.

⁶ The California utilities contract for a variety of renewable resources, including large and small solar power plants as part of the RPS Program. Updates on the progress of the RPS program can be found at <http://www.cpuc.ca.gov/PUC/energy/Renewables/>.

2.2. CSI Program Components

The overall CSI Program has two funding streams, depending on whether the rebated technology displaces natural gas or electricity. The electric portion of the CSI Program has a 10-year budget of \$2.2 billion collected from electric ratepayers as authorized by SB 1 (Murray, 2006). AB 1470 (Huffman, 2007) authorized \$250 million in additional spending on thermal technologies through 2017 to be collected from gas ratepayers, which will be used to fund gas-displacing technologies, such as solar water heaters, in the CSI-Thermal program.

The CSI Program has several program components, as shown in Table 1, each with its own Program Administrator and budgets overseen by the California Public Utilities Commission (CPUC or Commission):

- **The CSI General Market Solar Program** provides incentives for residential and non-residential systems between one-kilowatt to one-megawatt. The general market Program Administrators (PAs) are PG&E, SCE, and the California Center for Sustainable Energy (CCSE) in SDG&E territory. The goal of the general market rebate program is to incentivize 1,750 MW of demand-side solar capacity using a ten-year budget of \$1.9 billion for both incentives and program administration. The general market solar program funds solar PV and solar thermal technologies.
- **The CSI Single-Family Affordable Solar Homes (SASH) Program** provides solar incentives to qualifying single-family, low income housing owners. The SASH Program is administered through a statewide Program Manager, GRID Alternatives, with a budget of \$108 million. The SASH program offers job training to hundreds of volunteers and workforce development participants, and offers competitive opportunities for solar installers through a subcontractor program.
- **The CSI Multifamily Affordable Solar Housing (MASH) Program** provides solar incentives to multifamily low income housing facilities. The MASH Program also has a \$108 million budget and is administered through the same Program Administrators as the general market solar program: PG&E, SCE, and CCSE. The popularity of this fully subscribed program has resulted in the recent expansion of the Virtual Net Metering (VNM) tariffs, which allow a system owner to share bill credits for solar production with the building's tenants.
- **The CSI Research, Development, Demonstration and Deployment (RD&D) Program** provides grants to develop and deploy solar technologies that can advance the overall goals of the CSI Program, including achieving targets for capacity, cost, and a self-sustaining solar industry in California. The RD&D Program is administered through the RD&D Program Manager, Itron, Inc., and has a budget of \$50 million.

- The CSI-Thermal Program** provides solar thermal incentives to eligible systems such as gas or electric displacing solar water heaters. The CSI-Thermal program is funded separately depending on whether the project is electric-displacing or gas-displacing. There are five Program Administrators for the CSI Thermal Program. PG&E, SCE and CCSE administer the electric-displacing portion of the Program in their respective territories, and PG&E, Southern California Gas Company (SCG) and SDG&E administer the Program for the gas-displacing portion. In mid-April 2012, the CSI-Thermal program launched a \$5 million, 2-year public relations contract to spotlight the benefits of solar thermal technologies to targeted end users. The CSI-Program now consists of two subcomponents: residential program, low income program and commercial/multifamily program.

Table 1: CSI Budget by Program Component

Program Component	Budget (\$ Millions)	Goal
General Market Solar Program (includes PV and electric displacing solar thermal technologies)	\$1,897	1,750 MW
Single-family Affordable Solar Homes (SASH)	\$108	95 MW (see note)
Multifamily Affordable Solar Housing (MASH)	\$108	95 MW (see note)
Research, Development, Demonstration, and Deployment (RD&D)	\$50	N/A
Solar Water Heating Pilot Program (SWHPP)	\$2.6	750 SWH systems
Sub-Total: CSI Electric Budget (Electric Displacing)	\$2,167	1,940 MW
CSI Thermal Program (Gas-Displacing)	\$250	585 million therms ⁷
Total CSI Budget	\$2,417	

Source: CPUC D.06-12-033, p. 28 established goal of the general market program as 1,750 MW. In addition, D.10-01-022 established the CSI Thermal Program pursuant to AB 1470 (Huffman, 2008) and SB 1 (Murray, 2006).

Note: The CPUC decisions on MASH and SASH did not explicitly adopt a 95 MW per program goal; however, the CPUC did adopt a total CSI program goal of 1,940 MW in D.06-12-033. The Legislature, via AB 217, is currently considering revising the MW goals for the MASH and SASH Programs.

2.3. CSI Program Regulatory Process

Between 2006 and 2013, the Commission adopted a number of regulatory decisions establishing the CSI Program, as well as various CSI Program components.⁸ Rules and

⁷ The CSI-Thermal goal of 585 million therms is the equivalent of 200,000 SWH residential systems.

procedures pertaining to Distributed Generation, including the CSI Program, are currently developed within Rulemaking (R.)12-11-005.

In addition to formal regulatory decisions, the CPUC and CSI Program Administrators have made numerous CSI Program changes based on regular informal feedback from program stakeholders and in response to issues that arise during program implementation. To gather feedback on the program, the CSI Program Administrators host quarterly public CSI program forums to discuss potential program changes with stakeholders.⁹

The Program Administrators periodically file program rule changes via advice letters, consistent with the CPUC-established CSI Program Handbook process. These are processed by Energy Division staff in accordance with General Order (G.O.) 96-B.¹⁰ As a result, the CPUC has revised and reissued the CSI Program Handbook numerous times per year since the program first began.

2.3.1 CSI Program Decisions--General Market

Key decisions related to the CSI Program include (but are not limited to):

- D. 06-01-024 adopted the CSI Program.
- D. 06-08-028 adopted Performance Based Incentives, an administrative structure, and other program start-up elements.
- D. 06-12-033 modified earlier decisions to conform to SB 1.
- D. 07-05-007 modified the incentive adjustment mechanism to account for program dropouts.
- D. 07-05-047 established interim marketing and outreach objectives for the program.
- D. 07-07-028 and D.08-01-030 modified metering and performance monitoring requirements for the program.
- On July 29, 2008, the Assigned Commissioner issued a Ruling establishing a Program Evaluation Plan for the California Solar Initiative.
- D. 10-09-046 modifies the CSI general market budget, shifts \$40 million from the program administration budget into the incentive budget as partial mitigation for higher than anticipated performance payments under the “PBI” mechanism.

⁸ The Commission has developed the CSI program in a series of Rulemakings (R) since 2006, including R.08-03-008 and R.06-03-004, with precedents from even earlier proceedings like R.04-03-017. Each of the decisions noted herein occurs in one of those dockets, unless otherwise noted.

⁹ Information on the CSI Program Forums can be found at

<http://www.cpuc.ca.gov/PUC/energy/solar/forum.htm>

¹⁰ [G.O. 96-B](#)

- D.11-07-031 modifies prior CSI decisions, including D. 06-08-033 and 08-10-036, based on a comprehensive staff proposal.
- D.11-12-019 modifies the CSI budget requirement, as adopted in D. 06-08-028, D. 10-09-046 and D.11-07-031, in response to SB 585 (Kehoe, 2011).

2.3.2 Other CSI Program Component Decisions

- D. 06-08-028 established the Solar Water Heating Pilot Program in SDG&E territory.
- D. 07-09-042 established the CSI RD&D program.
- D. 07-11-045 established the CSI SASH program.
- D. 08-10-036 established the CSI MASH program.
- D. 10-01-022 established the CSI-Thermal Program to provide solar water heating incentives statewide.
- D. 11-10-015 establishes the Low Income Solar Water Heating Component of the CSI-Thermal program.
- D. 11-11-005 establishes the eligibility of propane-displacing technologies for the CSI-Thermal Program.
- D.13-02-018 establishes a performance-based incentive structure for the CSI-Thermal Program and expands program eligibility to process heat, solar cooling and combination systems.

3. Solar Installed Through 2012

This section of the report summarizes data on the cumulative installed capacity¹¹ and number of solar projects installed in California investor-owned utility territories and provides a table showing all distributed solar installed statewide.

3.1. Investor-Owned Utility Territory Solar Installations

Through the end of 2012, the state installed 1,427 MW of solar capacity at 142,211 sites in the investor-owned utility (IOU) territories. This data includes solar projects interconnected under any of the IOU solar programs, including CSI, NSHP, Emerging Renewables Program (ERP), and the Self-Generation Incentive Program (SGIP). IOU data does not include solar projects installed in Publicly-Owned Utility (POU) areas, such as Los Angeles Department of Water and Power or Sacramento Municipal Utility District, nor data from multi-jurisdictional utilities, such as the Pacific Power California Solar incentive Program.¹² CSI Program-only data is featured in Section 4.

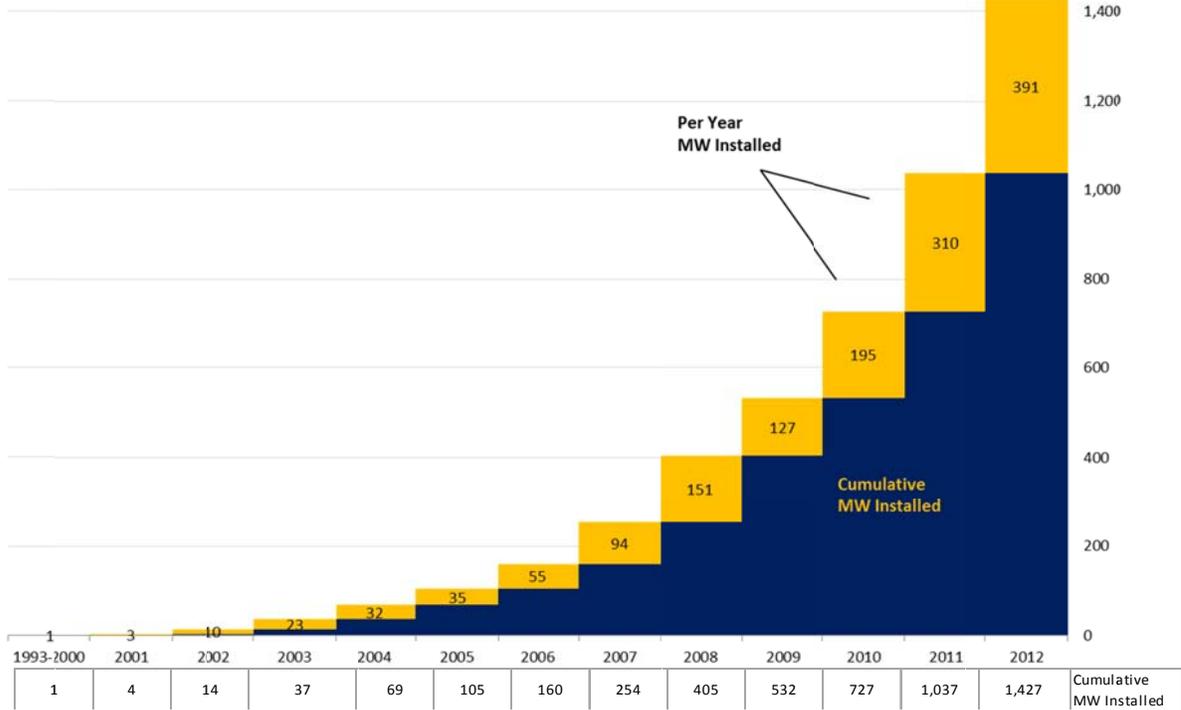
Figure 1 shows the amount of solar capacity installed by year in IOU territories, with 391 MW installed in 2012, a growth of 26 percent from 2011. This figure relies on interconnection data submitted to the CPUC by the utilities (rather than data specific to the CSI Program featured elsewhere in this report), and it does not distinguish which solar program provided funding for the solar project.

Figure 2 uses the same data as Figure 1, but shows the data as the number of installations. There were 38,436 solar projects installed in the IOU territories in 2012, a growth of 40 percent from 2011. All of the solar capacity identified in Figure 1 and Figure 2 is installed on customer sites, and does not include solar power plants installed on the wholesale side of the meter for use in compliance with the Renewables Portfolio Standard (RPS).

¹¹ All data in this assessment are for grid-tied solar PV (i.e. interconnected to the utility grid), unless otherwise noted. All solar in this report is customer-side of the meter self-generation designed to serve onsite load. All references to capacity are reported in “CEC-AC” units, which is the industry standard for net electricity output in megawatts (MW) based on the California Energy Commission’s Alternating Current rating of solar panels. The “CEC-AC” rating tends to be slightly less than the nameplate capacity.

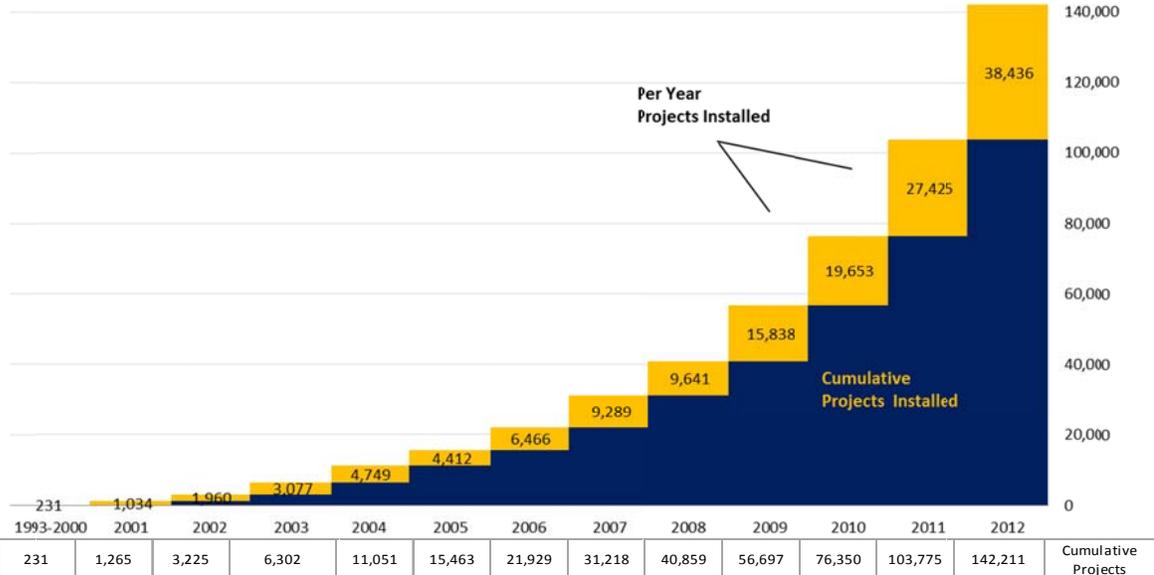
¹² In compliance with its program application, A.10-02-003, Pacific Power will submit its first annual report to the Commission by July 31, 2012. The PPCSIP program is authorized to provide incentives for 4 MW of solar energy in the next five years.

Figure 1: Customer-Sited Solar Capacity Installed in CA’s IOU Territories, 1993-2012



Data is through December 31, 2012. It Includes CSI, NSHP, ERP and SGIP data, but not POU or RPS data.

Figure 2: Customer-Sited Solar Projects Installed in CA's IOU Territories, 1993-2012



Data is through December 31, 2012. It Includes CSI, NSHP, ERP and SGIP data, but not POU or RPS data.

3.2. Net Energy Metering Data

The majority of solar customers are enrolled in NEM tariffs, pursuant to Public Utilities Code §2827. The NEM Program supports onsite solar installations up to 1MW in capacity designed to offset a portion or all of the customer’s electrical load, and does not include wholesale generation projects designed to sell electricity to the utility grid.¹³ CSI Program participants are eligible for utility interconnection and NEM tariffs that facilitate solar by allowing solar customers to feed limited amounts of excess electricity into the grid. Under NEM, customers receive a bill credit (in dollars) based on the full retail rate - including generation, transmission, and distribution rate components – for any excess generation (in kWh) that is exported back to the grid. In periods when a customer’s bill is negative (because the value of the energy produced by the DG facility exceeds the value of the energy consumed on site), the negative balance is carried forward up to one year, at which point customers may elect to receive net surplus compensation for any electricity produced in excess of on-site load, or apply the net surplus compensation credit towards future consumption.

Some solar projects, especially those with a solar system that is small relative to total load, opt to take utility service under a non-NEM tariff. Table 2 shows the total solar interconnections compared to the customers on solar NEM tariffs. Only 92 MW, or 6 percent, of solar capacity in the state is not signed up for NEM tariffs.

Table 2: Solar Interconnections and Solar NEM Customers by Utility

	MWs Interconnected	Customers Interconnected	MWs on NEM tariffs	Customers on NEM Tariffs
PG&E	780 MW	77,782	742 MW	77,508
SCE	341 MW	43,411	435 MW	43,347
SDG&E	123 MW	21,018	158 MW	20,992
Total	1,427 MW	142,211	1,335 MW	141,847

Data is from December 2012. It Includes CSI, NSHP, ERP and SGIP data, but not POU or RPS data.

¹³ The Renewable Portfolio Standard (RPS) Program supports large scale solar power plants through the procurement of such plants to serve wholesale electrical demand. Information on solar procured by large IOUs to meet RPS requirements can be found at: <http://www.cpuc.ca.gov/PUC/energy/Renewables/index.htm>.

3.3. California Statewide Solar Installations

Through the end of the first quarter of 2013, California has an estimated 1,629 MW¹⁴ of installed solar capacity at 167,878 customer sites. As detailed in Table 3, this statewide solar data combines the best available information on (1) IOU interconnections thru 2012; (2) IOU installed solar in 2013 based on CSI Program Data; and (3) POU solar data thru 2011. The CPUC tracks IOU interconnection data on a quarterly basis and CSI program data is available weekly. Data on POU solar projects is collected by the CEC, and, to date, the information is only available annually. The snapshot shown in Table 3 provides the best available estimate of California statewide solar installations.

Table 3: California Statewide Solar Installations

Data Source and Dates	Total MWs	Total Projects
Solar Installations in California IOU Territories		
All IOU Interconnections, 1993-2012	1,427	142,211
CSI Program Data Only, 1/1/2013 through 4/1/2013	92	9,260
Solar Installations in California POU Territories		
CEC through 2011	110	16,407
Total California Solar Installations	1,629	167,878

¹⁴ The installed capacity data cited in this report does not include solar capacity installed on the system side of the meter through the Renewables Portfolio Standard (RPS). The most recent RPS quarterly report can be found at <http://www.cpuc.ca.gov/PUC/energy/Renewables/>.

4. CSI Program Components

As of March 31, 2013, the CSI Program passed the notable milestone of 1,000 MW of cumulative capacity installations, for a total of 1,148 MW of installed capacity since program inception. This milestone was passed through installations in the general market, SASH and MASH programs, discussed in more detail below.

4.1. General Market Solar Program

4.1.1 Program Background

The CSI “general market” solar program is the largest CSI Program component. It offers incentives to all eligible customers in large IOU territories who install PV solar systems. These incentives are based on either the actual or calculated performance of a solar system, such that higher performing systems receive a larger incentive than lower performing systems. This heavy emphasis on performance in the CSI Program is designed to optimize California ratepayer investment in solar. In addition, the CSI Program requires program participants to complete energy efficiency audits to encourage applicants to invest in cost-effective energy efficiency measures prior to sizing their solar system, consistent with the state's Energy Action Plan and "loading order."¹⁵

4.1.1.1 Incentive Types

The CSI Program pays solar consumers an incentive based on system performance. The incentives are either an upfront lump-sum payment based on expected performance, or a monthly payment based on actual performance over five years.

The Expected Performance-Based Buydown (EPBB) is the upfront incentive available only for smaller systems. The EPBB incentive is a capacity-based incentive that is adjusted based on expected system performance calculated using an EPBB calculator¹⁶ that considers major design characteristics of the system, such as panel type, installation tilt, shading, orientation, and solar insolation available by location.

¹⁵ The “loading order” was introduced in the Energy Action Plan (EAP), which was adopted in 2003, which is a joint effort by the CPUC, the California Energy Commission and the California Power Authority. The EAP adopted a loading order of preferred energy resources - the first of which is energy efficiency.

¹⁶ The EPBB calculator is publicly available at <http://www.csi-epbb.com/>. The EPBB calculator estimates the expected performance of a solar system based various factors including the tilt, azimuth, location, PV module type and mounting type of a specific system.

The Performance Based Incentive (PBI) is paid based on actual measured performance over the course of five years. The PBI is paid on a fixed dollar per kilowatt-hour (\$/kWh) of generation basis and is the required incentive type for larger systems, although smaller systems may opt to be paid based on PBI. As of January 2010, all systems 30kW and greater are required to take the PBI incentive.

4.1.1.2 Incentive Level Design

The CSI Program offers financial incentives that decline in steps as more capacity is installed. The declining incentives, required by PU Code 2851, are intended to help the program meet the goal of creating a self-sustaining solar industry by forcing rebates down as the solar industry grows. Each step has an installed MW target that triggers the subsequent step down in incentives. The capacity targets per incentive step are further broken down into allocations across customer type and across the three IOU service territories. Table 4 presents the capacity target by utility territory and customer class, showing how all of the incentives were originally allocated over the expected 10-step life of the program. Actual allocations by step will vary due to dropouts and other factors.

Table 4: CSI MW Targets by Utility and Customer Class

Step	MW in Step	PG&E (MW)		SCE (MW)		SDG&E (MW)	
		Res	Non-Res	Res	Non-Res	Res	Non-Res
1	50	--	--	--	--	--	--
2	70	10.1	20.5	10.6	21.6	2.4	4.8
3	100	14.4	29.3	15.2	30.8	3.4	6.9
4	130	18.7	38.1	19.7	40.1	4.4	9
5	160	23.1	46.8	24.3	49.3	5.4	11
6	190	27.4	55.6	28.8	58.6	6.5	13.1
7	215	31	62.9	32.6	66.3	7.3	14.8
8	250	36.1	73.2	38	77.1	8.5	17.3
9	285	41.1	83.4	43.3	87.8	9.7	19.7
10	350	50.5	102.5	53.1	107.9	11.9	24.2
Subtotals (Res and Non-Res)		252.4	512.3	265.6	539.5	59.5	120.8
Totals		764.8		805		180.3	
Percent		43.7%		46.0%		10.3%	

Source: D.06-12-033, Appendix B, Table 11.

Notes: The MWs for Incentive Step 1 were reserved under the Self-Generation Incentive Program in 2006. Non-Residential (Non-Res) includes commercial, government, and non-profit facilities.

Table 5: CSI EPBB Rebate Levels per Incentive Step

Step	Incentive in Step (EPBB, \$/Watt)		
	Residential	Commercial	Government Nonprofit
1	n/a	n/a	n/a
2	\$2.50	\$2.50	\$3.25
3	\$2.20	\$2.20	\$2.95
4	\$1.90	\$1.90	\$2.65
5	\$1.55	\$1.55	\$2.30
6	\$1.10	\$1.10	\$1.85
7	\$0.65	\$0.65	\$1.40
8	\$0.35	\$0.35	\$1.10
9	\$0.25	\$0.25	\$0.90
10	\$0.20	\$0.20	\$0.70

Source: <http://www.csi-trigger.com/>

For comparison, the average installed cost for PV systems below 10 kW is \$6.16 per watt, as of June 25, 2013 (see <http://www.californiasolarstatistics.ca.gov/> for current average system costs).

4.1.1.3 Current Incentive Steps

Table 6 shows the current steps for each service territory for all customer classes and incentive types. Once the incentives reserved for each customer class within a utility territory reach the capacity target for a given step, the incentive level offered drops to the next lower step. These drops occur independently of one another – for example, reservations made in PG&E’s residential step do not affect the level of incentives offered to PG&E’s non-residential customers, nor do they affect other territories. This creates a demand-driven program that adjusts solar incentive levels based on local solar market conditions. It is important to note that the EPBB rebates in step 10 for residential and commercial are less than 5% of the average system installed cost.

Table 6: Current Statewide Solar Incentive Step Levels

Program Administrator	Customer Class	Current Step	EPBB Incentive Value (\$/Watt)	PBI Incentive Value (\$/kWh)	MW Remaining in Step	MW Under Review
CCSE (San Diego)	Residential	10	\$0.20	\$0.025	N/A	2.89
	Commercial	8	\$0.35	\$0.044	5.31	1.35
	Government/ Tax-exempt		\$1.10	\$0.139		
PG&E	Residential	10	\$0.20	\$0.25	N/A	2.48
	Commercial	10	\$0.20	\$0.025	47.75	15.59
	Government/ Tax-exempt		\$0.70	\$0.088		
SCE	Residential	9	\$0.25	\$0.032	4.00	2.98
	Commercial	9	\$0.25	\$0.032	86.56	3.13
	Government/ Tax-exempt		\$0.90	\$0.114		

Data as of 3/31/2013.

Note: * Per Senate Bill 585, PBI payments have been revised to reflect a 4% discount rate which creates new PBI rates for Steps 8, 9, & 10.

For comparison, the average installed cost for PV systems below 10 kW is \$6.16 per watt, as of June 25, 2013 (see <http://www.californiasolarstatistics.ca.gov/> for current average system costs).

4.1.2 Program Progress

The charts and tables in this section illustrate the CSI general market solar program progress to date, with data from the California Solar Statistics (CSS) web page.¹⁷ In addition, the CSI Program releases a Data Annex each quarter with key program application processing metrics, such as application processing times.¹⁸ The CSS website and the Data Annex are discussed further in Section 5.1.

There are many ways to measure the progress of the CSI general market program, including progress towards the two stated goals of the Program: 1) Install 1,750 MW of solar PV capacity; and 2) transform the market for solar so that it is price competitive and sustainable. This section reports on the installations, pending and complete, the solar price trends, program participation rates, and program budgets. The CSI Measurement and Evaluation (M&E) program component performs more detailed analysis, including cost benefit analyses, impact analyses, and other studies intended to help understand and improve the Program's performance.¹⁹ The progress of the M&E component is reported in Section 5.2.

4.1.2.1 General Market Program Trends

Several trends have emerged since the CSI Program's inception in 2007, suggesting that the program is approaching its goal of stimulating widespread adoption of solar and creating a self-sustaining market, free of direct cost-support in the form of program rebates.²⁰

4.1.2.1.1 Average System Costs for Program Participants

Since 2007, the average cost of residential systems has decreased 32 percent from \$8.77 per Watt to \$5.98 per Watt in the first quarter of 2013 (CEC-AC, with figures adjusted for inflation). Non-residential systems have decreased 33 percent from an average of \$8.23 per Watt in 2007 to \$5.55 in the first quarter of 2013. These significant cost declines point to the success of the CSI in contributing towards a sustainable solar industry in California. It is worth noting, however, that even great PV system cost declines have been witnessed in Germany, where the cumulative residential MW installed capacity dwarfs that of California.²¹

Since July 2010, the CSI program has imposed a “soft cap” on per watt system costs to encourage an ongoing reduction in system costs. If an application comes in above the cap,

¹⁷ California Solar Statistics can be accessed here: www.californiasolarstatistics.ca.gov.

¹⁸ The CSI Program releases a Data Annex each quarter.

¹⁹ All CSI Program Measurement and Evaluation reports are available at: <http://www.cpuc.ca.gov/PUC/energy/Solar/evaluation.htm>

²⁰ The solar industry may continue to require the support of Federal Tax Credits and Net Energy Metering for a longer term before achieving self-sustainability.

²¹ <http://emp.lbl.gov/publications/why-are-residential-pv-prices-germany-so-much-lower-united-states-scoping-analysis>

the applicant must submit an explanation for the high cost; the host customer must acknowledge that the project is higher than the cap; and the PA must find the explanation reasonable.

As directed by SB 585, the CPUC revised the methodology to calculate the system cost cap to be based on national and state installed cost data. Originally set at two standard deviations above the program’s average cost per watt, the cost cap was lowered by Resolution E-4476²² to \$1.00 per watt above the 12-month rolling average of CSI system costs. In addition, the Commission set separate cost caps for residential and nonresidential projects by calculating this average cost for systems under 10kW (largely residential projects) and for those over 10kW (largely nonresidential projects). These average cost figures are recalculated and published on www.californiasolarstatistics.ca.gov on a weekly basis. National solar installation cost data are reviewed annually by the Energy Division to keep CSI system costs in line with national trends.

4.1.2.2 General Market Program Activity

The general market CSI Program is making significant progress towards meeting the program’s goal of 1,750 MW installed by 2017. Table 7 shows the program’s current activity. In 2012, the CSI passed the thousand MW mark of total installed capacity.

Table 7: All CSI Projects Pending and Installed

Installed Projects	
Applications	102,507
Capacity (MW)	1,148
Incentive \$ million	\$1,775
Pending Projects	
Applications	18,196
Capacity (MW)	329
Incentive \$ million	\$12
Total CSI Activity	
Applications	120,703
Capacity (MW)	1,477
Incentive \$ million	\$1,617

Source: www.CaliforniaSolarStatistics.ca.gov, data through March 31, 2013

²² http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_RESOLUTION/167385.PDF

4.1.2.3 Progress Toward Goals

The CSI Program has installed 66 percent of its total program goal, with another 19 percent of the goal reserved in pending projects. The utilities are progressing towards their individual goals at varying rates, depending on the utility and customer sector. The residential sector in SDG&E territory is complete, with PG&E's not far from finishing as well. The lowest installation rates for the residential sector are in SCE territory, where only 62% of the sector's goals are complete. PG&E has the most installations in the non-residential sector, having reached 70% of their installation goal.

Table 8: CSI Progress Toward Program Goal of 1,750 MW

Customer Class	Installed	Pending	Remaining	Goal
SCE				
Non-Residential (MW)	250	85	205	540
Non-Residential (% of Goal)	46%	16%	38%	
Residential (MW)	172	47	47	266
Residential (% of Goal)	65%	18%	48%	
PG&E				
Non-Residential (MW)	361	130	23	514
Non-Residential (% of Goal)	70%	25%	5%	
Residential (MW)	245	41	0	252
Residential (% of Goal)	97%	16%	0%	
SDG&E (CCSE)				
Non-Residential (MW)	58	20	42	120
Non-Residential (% of Goal)	48%	17%	35%	
Residential (MW)	64	6.5	8	59
Residential (% of Goal)	108%	10%	0%	
Total (MW)	1,148	329	273	1,750
Total (% of Goal)	66%	19%	16%	

Source: www.CaliforniaSolarStatistics.ca.gov, data through March 31, 2013.

4.1.2.4 CSI Program Activity

CSI Program activity continued to grow in 2013 despite the declining incentive levels per Watt of installed capacity. This suggests that the CSI program design of declining incentives levels as the market matures has been successful. In the final steps of the CSI, NEM and the Federal Income Tax Credit (ITC) provide a much greater level of financial support than the CSI incentives.

Table 9: CSI Applications received by year (MW)

Year	Residential	Non-Residential	Total
2007	30	105	134
2008	43	65	108
2009	64	89	152
2010	91	283	373
2011	109	147	256
2012	48	141	149

Source: www.CaliforniaSolarStatistics.ca.gov, data through December 31, 2012.

Table 10: CSI Program Activity, first quarter of 2013

	New Applications Received
Capacity (MW)	47
Number of Projects	4,734

Source: www.CaliforniaSolarStatistics.ca.gov, data through March 31, 2013.

4.1.2.5 Impacts of Tax Credits and Net Energy Metering

The Federal Investment Tax Credit (ITC), which was expanded in 2008 by the Energy Improvement and Extension Act and by the 2009 American Recovery and Reinvestment Act, provides a tax credit of up to 30% of the total installed cost of solar systems. Since 2008, California has received an estimated \$2.7 billion of ITC support for solar projects. At 30% of total installed cost, the ITC is now a much more significant incentive than that provided by the CSI in most program areas. Similarly, in the 2010 cost-effectiveness study of the NEM program,²³ the CPUC found that NEM represents an ongoing incentive equivalent to approximately \$0.88 per watt (on average, and on a net present value basis), in addition to any rebates received under the CSI program. The value of the ITC and NEM credits can be compared to the current CSI per watt rebates, which range from \$0.35 to \$0.20 for residential and commercial customers.

4.1.3 Marketing and Outreach Efforts

The overall budget for CSI Marketing and Outreach (M&O) was established in D.11-07-031 at \$21,625,000, and the CPUC provides guidance for statewide M&O activities. Such activities include free monthly training for professionals and consumers on a wide range of solar-related topics at various level of technical expertise. The program administrators also

²³ http://www.cpuc.ca.gov/NR/rdonlyres/0F42385A-FDBE-4B76-9AB3-E6AD522DB862/0/nem_combined.pdf

issue a monthly electronic newsletter, now distributed to more than 10,000 subscribers. Sponsorships and solar promotions provide opportunities for program representatives to interact with various solar audiences. The program features a main solar web site, www.GoSolarCalifornia.ca.gov, and each PA maintains a website with information specific to their particular territory. Program administrators actively promote integration with other demand-side programs, particularly in the development of online customer decision making tools like online energy analyzers, as well as “welcome kits” that cover the range of energy services available to new utility customers.

4.2. Single-Family Affordable Solar Homes (SASH) Program

4.2.1 Program Background

The Single-Family Affordable Solar Homes Program (SASH), one of the two low income components of the CSI Program, provides incentives for solar PV systems for eligible low income homeowners. The CPUC approved the SASH Program in November 2007 in D.07-11-047 as part of the CSI Program. GRID Alternatives (GRID) was selected as the statewide Program Manager for the SASH Program.²⁴ GRID is a non-profit providing renewable energy services, equipment, and training in low income communities throughout California since 2001. As Program Manager for the SASH Program, GRID identifies eligible low income households, markets the SASH program, and installs PV systems for eligible SASH participants.

The SASH Program is designed to be a comprehensive low income solar program. In addition to providing incentives, SASH is structured to promote or provide energy efficiency services, workforce development and green jobs training opportunities, and broad community engagement with low income communities. To achieve this, the SASH Program provides consumer education on solar and energy efficiency technologies to the diverse volunteer base that contributes to SASH installations. On average, over 200 volunteers per month participate in these solar orientation programs. This outreach helps further the broader goals of promoting the use of PV-solar technology statewide and helping build broad-based community support for solar electric technologies and energy efficiency. In some cases, GRID Alternatives sub-contracts with qualified solar contractors to install SASH projects through the SASH Sub-Contractor Partnership Program (SPP).

²⁴ D. 07-11-045 ordered the SASH Program to be administered by a single statewide program manager to “ensure consistency and equity in program delivery statewide while working with a diverse group of stakeholders and service providers.” (p. 45, Conclusion of Law 10).

4.2.1.1 SASH Program Budget

The SASH budget is \$108.3 million, allocated according to the information in Table 11 and Table 12.

Table 11: SASH Budget Allocations by IOU Service Territory

Utility	PG&E	SCE	SDG&E	Total
Percentage	43.7	46	10.3	100%
Total Budget (millions)	\$47.3	\$49.8	\$11.2	\$108.3

Source: D.07-11-045

Table 12: SASH Budget Allocations by Functions

Function	Allocation
Administration	10%
Marketing and Outreach	4%
Measurement and Evaluation	1%
Incentives	85%

Source: D.07-11-045

4.2.1.2 Program Eligibility

The SASH Program is open to customers of the large electric IOUs who qualify as single-family, low income households as defined in PU Code 2852 (described further below). PU Code 2852 allows owner-occupied residences that are part of a larger multifamily complex to qualify under certain conditions. GRID Alternatives has created a statewide database of eligible homes in collaboration with the California Housing Partnership Corporation (CHPC) which is instrumental in the effort to establish relationships and identify resources within targeted local jurisdictions.

4.2.1.3 Program Incentives

The SASH incentives are higher than the CSI general market on a \$/Watt basis, and vary depending on the household's income level and their eligibility for the California Alternate Rates for Energy (CARE)²⁵ program. The SASH incentive does not decline over time as in the general market CSI Program.

²⁵ CARE provides a minimum of a 20% discount on the energy bills of qualifying low-income customers.

Eligible participating households are provided a one-time payment under the CSI EPBB structure to help reduce the up-front cost of installation. The SASH Program has one *fully-subsidized* (i.e. covers the full installed cost of the system) and six highly-subsidized incentive payment levels based on the applicant’s income compared to the area median income (AMI), tax liability, and eligibility for the CARE program. The incentive rates shown in

Table 13 are intended to provide low income residents who have no federal tax liability with a positive cash flow in the first year of solar installation.

4.2.1.3.1 Incentive Structure

The following incentive structure is available to customers whose total household income is below 80% of the area median income. The incentive is calculated on a sliding-scale that is based on the homeowner’s tax liability and the customer’s eligibility in the CARE program. If the Applicant qualifies for the CARE program but is not currently enrolled, the Program Manager will work with the Applicant to enroll them into CARE.

Table 13 shows the sliding-scale incentive rates:

Table 13: SASH Incentive Rates in \$/Watt

Federal Income Tax Liability	Low income CARE-Eligible	Low income Residents Not Eligible for CARE
\$0	\$7.00	\$5.75
\$1 – \$1000	\$6.50	\$5.25
\$1001 +	\$6.00	\$4.75

Source: D.07-11-045.

For comparison, the average installed cost for PV systems below 10 kW is \$6.16 per watt, as of June 25, 2013 (see <http://www.californiasolarstatistics.ca.gov/> for current average system costs).

4.2.2 Program Progress

The SASH Program has experienced heavy growth in program applications and made significant progress in key areas including: expanding the Sub-Contractor Partnership Program (SPP); increasing marketing and outreach efficiency; building partnerships with volunteers and job training/workforce programs; and broadening the affordable housing client database. GRID Alternatives currently has seven offices located in Oakland (PG&E), Carson (SCE), San Diego (SDG&E), Fresno (SCE/PG&E), Atascadero (SCE/PG&E), Riverside (SCE), and Chico (PG&E).

4.2.2.1 SASH Program Data

Since the program was launched in December of 2008, SASH has received a total of 3,386 applications which have resulted in 8.5 MW of installed capacity on eligible homes, with another 1.8 MW currently in progress. These applicants have received a total of \$64 million in support for their residential solar systems.

Nearly all of the completed SASH installations were made at no cost to the homeowners. GRID Alternatives accomplished this by leveraging funding from local jurisdictions, project sponsorships, and through general non-profit fundraising. Since the SASH incentive does not cover 100 percent of installation costs, identifying gap financing from third-party sources is critical to achieving the long-term goals of SASH since individual homeowners are unable to fund the additional incremental costs.

4.2.2.2 SASH Workforce Development Efforts

Every SASH installation provides workforce development opportunities. In implementing the SASH Program, GRID Alternatives provides opportunities for job trainees and local volunteers to assist with installations, to engage their communities, and to participate in the California solar and energy efficiency programs. As a result of these training sessions, many participants have gone on to receive NABCEP (North American Board of Certified Energy Professionals) certifications, the gold standard for PV installation work.

The SASH Program, as currently structured, will provide job training and volunteering opportunities totaling over 1 million hours of hands-on solar installation experience. GRID reserves at least twenty percent (20%) of all SASH installations for solar-installer job trainees, often targeting low income communities. This becomes a double benefit to low income communities, since GRID recruits job trainees from the same communities that the SASH Program aims to serve.

4.2.3 Sub-Contractor Partnership Program

The SASH Sub-Contractor Partnership Program (SPP) provides opportunities for licensed California contractors to participate in SASH installations, not limited to GRID employees, volunteers and workforce program trainees. Qualified contracting companies agree to a reduced cost model and commit to hiring at least one eligible job trainee for each SASH installation. Though the SASH Program requires contractors to hire only one eligible job trainee per installation, some sub-contractors have exceeded this expectation by having more than one eligible trainee on their SASH installations.

For more information on the SASH program, see the SASH Q3 2012 Program Status Report on the CPUC website at <http://www.cpuc.ca.gov/PUC/energy/Solar/sash.htm>.

4.3. Multifamily Affordable Solar Housing (MASH) Program

4.3.1 Program Background

The second low income solar program in the California Solar Initiative targets affordable multi-tenant housing. In October 2008, Commission D.08-10-036 established the \$108.3 million Multifamily Affordable Solar Housing (MASH) Program for solar installations on existing multifamily affordable housing that meet the definition of low income residential housing established in PU Code 2852.²⁶

The goals of the MASH program are to: (a) Stimulate adoption of solar power in the affordable housing sector; (b) Improve energy utilization and overall quality of affordable housing through application of solar and energy efficiency technologies; (c) Decrease electricity use and costs without increasing monthly household expenses for affordable housing building occupants; and (d) Increase awareness and appreciation of the benefits of solar among affordable housing occupants and developers.

Like the SASH Program, MASH incentives do not decline over time as they do in the general market CSI Program. The MASH Program was intended to operate until January 1, 2016, or until all funds available from the program's incentive budget have been allocated, whichever event occurs first.

4.3.1.1 MASH Incentive Types

As shown in Table 14 the Commission originally adopted a two-track incentive structure: Track 1, which provides up front incentives to systems that offset either common area (Track 1A) or tenant load (Track 1B), and Track 2, which provides an opportunity every six months to compete for higher incentives through a grant program. As mentioned above, D.11-07-031 eliminated Track 2 in favor of a more robust Track 1 incentive budget.

²⁶ D.08-10-036, Appendix A, *mimeo.*, p. 1

Table 14: MASH Incentive Tracks, Revised as of D.11-07-031

Track 1A PV System Offsetting Common Area Load	Track 1B PV System Offsetting Tenant Area Load	Track 2 (Grant) PV System Providing Enhanced Tenant Benefits NOW CLOSED
\$1.90/Watt	\$2.80/Watt	\$/Watt not specified; determined by proposal

Source: D.11-07-031.

For comparison, the average installed cost for PV systems below 10 kW is \$6.16 per watt, as of June 25, 2013 (see <http://www.californiasolarstatistics.ca.gov/> for current average system costs).

Track 1 incentive funding in all three service territories was quickly absorbed and new applications were placed on waitlists. To augment this popular incentive track, the Commission eliminated the Track 2 grants, which were proving less effective and more difficult to manage than expected, and moved the remaining \$11 million in Track 2 incentives to Track 1. Another step to reinforce Track 1 involved the reduction of the incentive levels (\$/Watt) from \$3.30 to \$1.90 for Track 1A (serving common area load) and from \$4.00 to \$2.80 for Track 1B (serving tenant load.)

4.3.1.2 Program Eligibility

The MASH Program is open to multifamily affordable housing properties that meet the definition of “low income residential housing” per PU Code 2852 and have an occupancy permit of at least two years, and deed restrictions on file with the County Assessor verifying that at least 20 percent of the tenants are low income.

The MASH Program also provides eligibility for certain pre-identified tenant units to enroll with their utility’s VNM tariffs. In PG&E territory, any tenant in a qualifying affordable housing property listed by the applicant may enroll in VNM; in SCE and SDG&E territories, tenants eligible for enrollment in VNM tariffs must take service at the same single service delivery point that serves the solar system generation meter.

4.3.1.3 Program Budget

The budget and allocations for MASH, shown in Table 15 and Table 16 were adopted by the CPUC in D.08-10-036.

Table 15: MASH Budget Allocations by Utility Territory

Utility	PG&E	SCE	SDG&E	Total
Percentage	44%	46%	10%	100%
Total Budget (millions)	\$47.3	\$49.8	\$11.2	\$108.3

Source: D.08-10-036.

Table 16: MASH Budget Allocations by Function

Function	Allocation
Administration and Marketing and Outreach	10%
Measurement and Evaluation	2%
Incentives	88%

Source: D.08-10-036.

4.3.2 Program Progress and Project Attributes

Since the MASH Track 1 incentives are fully subscribed, the progress of the program has been measured in terms of reserved projects reaching completion and waitlisted projects being brought into the incentive reservation queue when additional funds are made available via system resizing and project dropouts.

As of March 31, 2013, MASH had 287 completed projects representing a total capacity of 18.4 MW. There are an additional 83 MASH projects in process, for a total capacity of 11.3 MW.

Table 17: MASH Program Progress

Status of Application		Total	CCSE	PG&E	SCE
Completed	Number	287	38	135	114
	Capacity (MW)	18.4	2.4	7.8	8.2
Pending	Number	83	3	51	29
	Capacity (MW)	11.3	0.3	5.6	5.4
Average Project costs (\$/W)		\$ 6.41	\$6.13	\$6.29	\$6.58

Source: MASH Program Administrators, Data as of March 31, 2013.

4.4. Virtual Net Metering (VNM)

Multitenant buildings are a challenging segment for solar PV because of the problem of distributing system output among individually metered occupants. PV systems could be connected to a common area meter, or to individual tenant meters, but distribution of energy from a single system among multiple meters was not allowed under previous tariff structures. To solve this issue, the Commission directed the IOUs to file tariffs for VNM.²⁷

The MASH program piloted the VNM tariffs, which allow individually metered tenants to receive credits on their electric bills for the energy production of a solar system installed on buildings or multifamily housing complex. Based on the merits of these tariffs, the Commission expanded VNM to the general market in 2011 and included all NEM-eligible technologies for eligibility. As of March 2013, PG&E and SDG&E have 24 projects with a combined 916 kW capacity on the VNM tariff who are not participants in the MASH program.

Under VNM, the utility meters the PV system's output, then allocates energy credits for the energy produced by the PV system to the building owners' and/or tenants' individual utility accounts, based on a pre-arranged allocation agreement. The intent of VNM is to help low income multifamily residents receive direct benefits of the building's solar system, and is available to all tenants and meters in a defined affordable housing property.

4.5. CSI-Thermal Program

4.5.1 Program Background

The CSI-Thermal Program was established by legislative language in SB 1, which contains a provision which allows for up to \$100.8 million of CSI funds to be used for incentives for solar thermal technologies that displace electricity. SB 1 also directed the CPUC to implement a Solar Water Heating Pilot Program (SWHPP). AB 1470 (Huffman, 2007) authorized the creation of a \$250 million incentive program to promote the installation of 200,000 SWH systems in homes and businesses that displace the use of natural gas by the end of 2017.

Following the successful implementation of the SWHPP, the Commission established the CSI-Thermal Program in January 2010 in D. 10-01-022. The CSI-Thermal Program aims to promote the market for SWH and other solar thermal technologies through up-front incentives, technical training, marketing and outreach. The Program began accepting

²⁷ D. 08-10-036

applications from single-family residential customers that install SWH on May 1, 2010 and from multifamily and commercial customers on October 8, 2010. In March 2012, the CSI-Thermal Low Income Program, which provides higher incentives for low income single and multifamily residences, began accepting applications.

4.5.2 CSI-Thermal Budget

For the natural gas displacing portion of the program, the \$250 million program budget will be collected during the duration of the Program by the three gas utilities based on the percentages in Table 18.

Table 18: CSI-Thermal Gas-Displacing Budget Allocation

Utility	Budget Allocation	Total Program Collections (in millions)
PG&E	39%	\$97.5
SDG&E	10%	\$25.0
SoCalGas	51%	\$127.5
Total	100%	\$250 million

Source: D.08-12-044.

The gas-displacing program budget is divided as shown in Table 19.

Table 19: CSI Thermal Gas Displacing Program Budget

CSI Thermal Program Elements	CSI Thermal Program Sub-Elements	Budget (\$ Millions)
Incentives	General Market Incentive	\$180
	Low income Incentive (10% of total funds)	\$25
	Subtotal	\$205
Market Facilitation	Marketing & Outreach	\$25
	Subtotal	\$25
Program Administration	General Administration	\$15
	Measurement and Evaluation	\$5
	Subtotal	\$20
Total		\$250

Source: D.08-12-044.

For the low income program, \$25 million in incentives are intended to promote the installation of gas-displacing SWH systems. The program budget will be collected by the three gas utilities based on the percentages in Table 20.

Table 20: CSI-Thermal Low income Program Budget Allocation

Utility	Budget Allocation	Total Program Collections (in millions)
PG&E	39%	\$9.75
SDG&E	10%	\$2.50
SoCalGas	51%	\$12.75
Total	100%	\$25 million

Source: D.08-12-044.

The electric-displacing program budget of \$100.8 million, if utilized, reduces the amount of incentives available for PV, and shall be allocated as shown in Table 21.

Table 21: CSI Thermal Electric Displacing Program Budget

CSI Thermal Program Elements	CSI Thermal Program Sub-Elements	Budget (\$M)
Incentives	General Market Incentive	No more than \$100.8
	Low income Incentive ²⁸	\$0
	Subtotal	\$100.8
Market Facilitation	Marketing & Outreach	\$6.25
	Subtotal	\$6.25
Program Administration	General Administration	Subject to the overall CSI budget, but tracked separately
	Measurement and Evaluation	\$1.25
	Subtotal	\$1.25
Total		\$108.3 + CSI Admin Budget Costs

Source: D.08-12-044.

The Program Administrators perform marketing and measurement and evaluation activities for all SWH systems, whether they displace gas or electricity. The Program Administrators

²⁸ Because AB 1470 established the low income program, the CSI-Thermal Program only provides incentives for natural gas displacing SWH systems.

fund these activities on a 4:1 ratio, so that for every \$4 spent from the gas-displacing budget, \$1 is spent from the electric-displacing budget.

4.5.3 Program Eligibility

The CSI-Thermal Program provides incentives to customers who install solar hot water heating systems that have received a certification from the Solar Rating and Certification Corporation (SRCC) or from the International Association of Plumbing and Mechanical Officials (IAPMO). Single-family residential, multifamily and commercial customers may apply for incentives. Contractors are required to be certified by the Contractor State Licensing Board, and all installers (self-installers and contractors) must complete a one-day training course provided by the utilities. Contractors must also submit to random inspections of projects by Program Administrators and ensure that those systems are properly installed to remain in good standing.

Eligibility for the low income program requires all of the above mentioned requirements however, in addition the low income program requires that applicants meet the low income residential housing definition CPUC code Section 2861 (e). Section 2861 (e) includes multifamily housing units and individual residences that are subject to resale restriction or an equity sharing agreement.

The program also extends eligibility to participants in the Energy Savings Assistance Program (formerly known as the Low Income Energy Efficiency program) on the condition that the participants either occupy a single-family home or at least 50 percent of all units in a multifamily unit.

Incentives are paid based on expected first-year energy displacement of the SWH system. Incentives are divided between the single-family and commercial/multifamily sectors, with 40 percent of incentives on the natural gas side reserved for single-family customers.

For systems that displace natural gas, incentives initially start at \$2,175 for the typical single-family system and decline in four steps to \$380 for the typical systems. Incentives are capped and cannot be more than 25% higher than the incentive for an average system. Multifamily commercial projects are incentivized at the same rate per therm displaced, with a maximum incentive of \$500,000 per project. Incentive levels decline when the total incentive budget for a particular step has been exhausted.

Step incentive levels for natural-gas displacing systems are as follows in Table 22.

Table 22: CSI-Thermal Incentive Step Table

Step	Incentive for Average Residential SWH System	Funding Amount	Incentive per Therm Displaced	Therms Displaced Over System Life
1	\$2,175	\$50,000,000	\$18.59	97,500,000
2	\$1,535	\$45,000,000	\$13.11	109,687,500
3	\$900	\$45,000,000	\$7.69	146,250,000
4	\$380	\$40,000,000	\$3.23	212,727,275
Total		\$180,000,000		566,164,775

Source: D.08-12-044.

Incentives for qualifying single-family low income customers are 200% of the applicable CSI-Thermal SWH incentive level. Incentives for qualifying SWH installations on multi-family housing are 150% of the applicable CSI-Thermal SWH incentive level. Incentives will decline as incentives in the larger CSI-Thermal Program decline.

Table 23: CSI-Thermal Low Income Incentive Step Table

Step	Single-Family Low income Incentive per therm displaced	Incentive Cap for Single-Family Low Income Projects	Multifamily Low Income Incentive per therm displaced	Incentive Cap for Multifamily Low Income Projects
1	\$25.64	\$3,750	\$19.23	\$500,000
2	\$20.52	\$3,000	\$15.39	\$500,000
3	\$15.38	\$2,250	\$11.53	\$500,000
4	\$9.40	\$1,376	\$7.05	\$500,000

Source: D.08-12-044.

Electric-displacing systems are incentivized at a lower level than natural gas displacing systems to account for the fact that electric displacing systems are more cost-effective. Incentives for electricity displacing systems also decline in four steps, but those incentive declines are triggered by step changes on the natural gas side, since the much larger natural gas market is likely to drive the industry. Incentives for electric-displacing systems are as shown in Table 24.

Table 24: Electric-Displacing Solar Thermal Incentives

Step Level	Single-Family Incentive (\$/kWh)	Incentive for Average Residential System	kWh Savings
1	\$0.54	\$1,467	2,730
2	\$0.38	\$1,048	2,733
3	\$0.22	\$602	2,727
4	\$0.10	\$263	2,714

Source: D.08-12-044.

4.5.4 Program Participation

The CSI-Thermal Program began taking applications from single-family customers on May 1, 2010 and from multifamily and commercial customers on October 8, 2010. In just over three years of operation, the program has received 1,215 applications for \$56.3 million in incentives (See Table 25). As seen below, the residential sector dominates in terms of number of applications, while commercial/non-profit shows the majority of incentive amounts, project costs, and energy savings. This is to be expected from the larger projects installed by commercial customers.

Table 25: CSI-Thermal Applications by Sector and Displaced Fuel

Sector	Number of Applications	Incentive (\$ thousands)	Project Cost (\$ thousands)	Annual energy savings
Commercial/Nonprofit	391	\$11,507	\$33,410	
Gas	385	\$11,462	\$33,070	877,917 therms
Electric	6	\$44	\$340	110,472 kWh
Single Family	640	\$874	\$5,552	
Gas	361	\$550	\$3,334	43,466 therms
Electric	237	\$259	\$1,832	655,159 kWh
Propane	42	\$65	\$387	160,844 kWh
Multi Family	184	\$5,262	\$17,372	
Gas	184	\$5,262	\$17,372	278,042 therms
Subtotal Gas	930	\$17,643	\$53,776	1,199,425
Subtotal Electric	243	\$303	\$2,172	765,631
Subtotal Propane	42	\$65	\$387	160,844
Total	1,215	\$17,642	\$56,334	

Source: www.csithermal.com/public_export; data through March 31, 2013

Nevertheless, participation in the overall program has been slow. Declining natural gas prices in recent years make the economics of SWH projects that displace natural gas less attractive, especially in the residential market. Electric-displacing SWH systems, though, have seen a much higher level of demand as they are not influenced by natural gas prices. Additionally, the CSI-Thermal Low Income Program began taking applications on March 29, 2012 and has experienced high demand in the last year.

4.5.4.1 Program Administration

4.5.4.1.1 Incentives Received

The CSI-Thermal Program is jointly administered by PG&E, SoCalGas, SCE and CCSE. While PG&E and CCSE administer incentives for both natural gas and electric-displacing systems, SCE only administers incentives for electric-displacing systems, and SoCalGas only administers incentives for natural gas displacing systems. As shown in Table 26, PG&E has received the most applications by far followed by SoCalGas, CCSE, and SCE.

Table 26: CSI-Thermal Program Applications by PA

Program Administrator	Pending and complete applications	Total Incentive (\$ thousand)
PG&E	626	9,113
CCSE	224	3,696
SCE	36	63
SoCalGas	329	4,771
Total	1,215	\$17,642

Source: www.csithermal.com/public_export; data through March 31, 2013.

Although most water in California is heated with natural gas, the economics are much more favorable for electric-displacing SWH, and indeed, one quarter of the applications received so far have been for electric-displacing SWH (see Table 25).

4.5.4.1.2 Market Facilitation

D. 10-01-022 sets aside \$25 million from the \$250 million natural gas budget and \$6.25 million from the electric budget for market facilitation activities, particularly marketing and outreach, consumer education, workforce training, and reaching out to permitting officials to raise awareness. On April 1, 2010, each of the four Program Administrators filed a market facilitation plan with Energy Division. On April 28, 2010, the Division of Ratepayer

Advocates protested the plans, stating that “Since the plans lack both a unified vision on one hand, and detailed activities on the other, the Commission should require that the plans be improved before the Commission will adopt them.”²⁹

Upon reviewing the plans and based on stakeholder feedback, Energy Division determined that long-term plans for CSI-Thermal Marketing would not be successful without some level of coordination and collaboration among the Program Administrators. Thus, on November 4, 2010, Energy Division issued a guidance memo directing the PAs to re-file their market facilitation plans. The guidance memo contained specific direction for the PAs to collaborate on hiring a professional marketing firm to run a statewide coordinated marketing campaign aimed at increasing consumer awareness of solar thermal.

The PAs hired a marketing firm in June 2011 to develop a state-wide advertising campaign. In April 2012, the PAs have launched a multimedia statewide advertising campaign. This marketing effort has successfully encouraged higher participation levels.

4.5.4.1.3 Measurement and Evaluation

Unlike the CSI PV Program, where generation performance can be evaluated at the meter, CSI-Thermal technologies offset electric and gas consumption. This requires evaluation of kWh and therm savings to assess whether the program is meeting its goals.

D.10-01-022 adopted a \$6.3 million total budget for measurement and evaluation of the CSI-Thermal Program. The decision directs Energy Division to “work in consultation with the assigned Commissioner to establish the CSI Thermal M&E budget and scoping plan through an assigned Commissioner’s Ruling, which will serve as the basis for conducting M&E Studies.”³⁰ The decision also directs Energy Division to oversee the evaluation efforts of the CSI Thermal Program.

²⁹ DRA Protest of Advice Letters PG&E 3108-G/3645-E; SCE AL 2460-E; SOCALGAS AL 4098; AND CCSE ADVICE 11 Seeking Approval of Market Facilitation Plans and Budgets for the California Solar Initiative Thermal Program Pursuant to Decision 10-01-022, April 28, 2010

³⁰ DRA Protest of Advice Letters PG&E 3108-G/3645-E; SCE AL 2460-E; SOCALGAS AL 4098; AND CCSE ADVICE 11 Seeking Approval of Market Facilitation Plans and Budgets for the California Solar Initiative Thermal Program Pursuant to Decision 10-01-022, April 28, 2010

4.6. Research, Development, Demonstration, & Deployment

4.6.1 Program Background

The purpose of the CSI Research, Development, Demonstration and Deployment (RD&D) Program is to identify and support projects that will help reach the CSI Program’s goal of 1,940 MW of installed distributed solar by 2016, and to create a self-sustaining, subsidy-free solar market in the years beyond.

Table 27 details the total CSI RD&D budget by funding area. The Program is administered by Itron, on behalf of the CPUC, who is responsible for developing requests for proposals (RFPs), evaluating grant requests, entering into grant agreements, and monitoring progress on all approved projects. The CSI RD&D Plan, established in September 2007 by D.07-09-042, identifies criteria for the selection and funding of RD&D projects, and sets allocation guidelines for using incentive funds along three targeted areas, including: 1.) Grid integration, storage, and metering, 2.) energy generation technologies, and 3.) Business development and deployment. The RD&D portfolio allocation percentages are guidelines meant to help steer funds across a range of diverse projects, and should not be interpreted as firm limits. As required in D.07-09-042, \$10 million of the CSI RD&D grant funding was allocated to support construction of the Helios Solar Energy Research Center at U.C. Berkeley, which will focus on developing low cost solar energy conversion technologies.

Table 27: CSI RD&D Program Budget Allocations

CSI RD&D Program Funding Areas	Estimated Budget (millions)
Administration	\$5.98
Triennial Evaluations	\$1.50
Grants/Incentives	\$42.52
Total	\$50.00

Source: D.07-09-042.

Notes: The estimated budgets for administration and evaluation activities represent maximum amounts, and any unused funds may be reallocated to the grants/incentives budget.

4.6.2 Program Progress

The CSI RD&D Program has conducted three solicitations for projects since it began: The first program solicitation focused on integrating solar PV into the electricity grid; the second program solicitation had two focus areas, energy generation technologies and business development and deployment; and, the third program solicitation had a primary focus of grid

integration with a secondary focus of production technologies and business development and deployment. These three solicitations resulted in grant funding for 23 projects totaling \$28 million. With the additional award of \$10 million to the Helios Solar Energy Center at U.C. Berkeley, the total allocation of CSI RD&D funds to date is approximately \$38 million. Table 28 provides the suggested allocation and maximum budget amounts pursuant to the CSI RD&D Adopted Plan, along with the total project funding to-date for each of these target areas. As the table illustrates, the total funded to-date for both Energy Generation Technologies and Business Development falls within the budget range outlines in the CSI RD&D Plan, while projects funded in the area of grid integration, storage and metering total nearly \$15 million - well below the budgeted allocation.

Table 28: RD&D Grant/Incentive Allocations

Target Areas	Budget Range (percent)	Funded To-date
Solar Energy Research Center		\$ 10,000,000
Grid Integration, Storage and Metering	50-65%	\$ 14,495,013
Energy Generation Technologies	10-25%	\$ 6,561,345
Business Development	10-20%	\$ 7,118,071
Total	100%	\$ 38,174,429

Source: <http://www.calsolarresearch.ca.gov/Funded-Projects/>, data through April 19, 2013.

4.6.3 Fourth Solicitation

The CSI RD&D Program will be releasing a fourth solicitation for proposals with total funding not to exceed \$7 million, currently anticipated for the second quarter of 2013. The focus of the fourth solicitation will be to address cost-effective strategies and solutions for integrating large amounts of PV into distribution systems, with specific emphasis on issues related to maintaining the safety and reliability of the grid, as well as follow-on research to past or current RD&D projects. Demonstration projects that provide solutions to integrate PV into the electricity grid will be preferred. Further information on the process for submitting proposals to CSI RD&D Program Grant Solicitation #4 will be made publically available on the program website, here: <http://www.calsolarresearch.ca.gov/Current-Solicitations/>

5. Program Reporting and Evaluation

5.1. Program Reporting

5.1.1 Online Reporting

The CSI program data is provided online at the “Trigger Tracker” (www.csi-trigger.com) and at the California Solar Statistics (CSS) web site (www.californiasolarstatistics.com). The Trigger Tracker tells the public which incentive step is in effect for a given sub-program, and how many MWs are left in that step.

The CSS site, which launched in 2010, is a collaborative effort between the CSI PAs and the CPUC’s Energy Division and contains a wealth of program data. The website has historically focused on the CSI General Market Program, but recently added data on the MASH and SASH programs. CSS data is populated entirely from PowerClerk, the CSI program’s online database and application interface. The CSS data is updated weekly and includes the following features:

- Data on individual installations (while maintaining customer confidentiality).
 - System costs.
 - Manufacturer, model, capacity, and other technical information.
 - Geographic location.
- A “Find an Active Solar Contractor” feature which helps prospective solar buyers do just that, as well as a search page that facilitates data queries.
- Weekly (and daily, for the General Market) updates to the budget status of the General Market and the MASH programs.
- Data annex, containing information about the efficiency of the program’s administrative processing.
- Relies primarily on data from the CSI online database, PowerClerk, which was inaugurated in 2007 and is used to assist in evaluation efforts.

Market participants (installers, third party owners, manufacturers, etc.) have repeatedly told the CPUC how much they value this online data. They find it valuable because it is current (updated weekly), comprehensive (covering the vast majority of California’s PV DG installations), and in-depth (including many data fields).

Because the CSI program is nearing completion in the CCSE (SDG&E) and the PG&E territories, there is a natural concern that this source of insight into the PV DG market will be lost. For this reason, Energy Division is working, together with the CSI PAs and the utilities' interconnection departments, to add non-CSI installations to the DG database. We hope to have this in place in 2013. This represents a potentially significant bonus, as the CSS would then extend beyond CSI to cover all PV DG in the IOU territories and will track PV DG even after the CSI program ends.

5.1.2 Online CSI-Thermal Reporting

Similar to the Trigger Tracker, the CSI-Thermal “Incentive Step Tracker” (<https://www.csithermal.com/tracker/>) tells the public which incentive steps are currently in effect for the various CSI-Thermal sub-programs, including low income sub-programs. And using the CSS as a model, ED and the PAs are now in the process of developing a similar site, which will post easily accessible data about program installations.

5.1.3 Periodic CSI and CSI-Thermal Reports

A number of periodic reports are filed publicly and are posted here (www.cpuc.ca.gov/PUC/energy/Solar/legreports.htm)

- The Annual Program Assessment (APA) to the Legislature (this document), required by statute every year no later than June 30.
- The Annual Data Annex report. This elaborates on the data annex (e.g. administrative efficiency) information available online, showing trends over time in graphs, including trends in NEM participation.
- MASH and SASH semi-annual reports.
- CSI-Thermal Program quarterly reports tell the story of therms and kWh avoided by program participants as well as incentives disbursed.

5.2. Program Evaluation Plan

The CSI Program General Market goals are to deploy 1,940 megawatts (MW) of new solar capacity by 2016, and to help create a self-sufficient solar industry in which solar energy systems are a viable mainstream option for both homes and businesses within 10 years, without ratepayer support. The CSI Evaluation Plan measures the program's progress towards those goals.

The CSI Evaluation Plan and the final reports of completed studies can be found here (<http://www.cpuc.ca.gov/PUC/energy/Solar/evaluation.htm>). The current status of CSI M&E is as follows:

- **Net Energy Metering Cost/Benefit Study:** Pursuant to SB 1, a study was published in January 2010. Pursuant to Assembly Bill (AB) 2514 (Bradford, 2012) and Decision (D.) 12-05-036, the Commission has initiated a second study on the costs and benefits of NEM to ratepayers. The study will be released later this year.
- **Impact Evaluations:** three studies covering 2007-2010 have been published, and a 2011-2012 Impact Evaluation is now underway, with the final report expected in Q3 2013. This study will provide up to date information on the CSI program accomplishments; including energy, capacity, and environmental impacts and PV system performance degradation.
- **PV Market Transformation Studies:** these studies addresses the core question of how much the PV DG market has been transformed, how much we expect it will be transformed after the CSI Program’s market interventions are ended, and how we will know. In addition, it looks specifically into the impact of third party ownership on the PV DG market, and at the relationship between roofing (e.g. structural aspects, periodic replacements) and the (rooftop) PV DG market. This set of studies is underway, with final reports expected in Q4 2013 and Q1 2014.
- **CSI Cost Effectiveness Study:** completed April 2011. This study looked at cost effectiveness from several perspectives – program administrators, ratepayers, and especially program participants and society as a whole. Based on participant economics, the study suggested that the residential solar PV market will be self-sustaining by 2017, with a mixed outlook for non-residential customers.
- **Impact of Distributed Generation (DG) reports:** these reports, as mandated in AB 578, are due every two years. The first report, delivered in 2010, showed that, while California’s solar DG is large compared to other states, there was no noticeable impact on the distribution and transmission infrastructures.
- **External Financial Audit Report:** CPUC audit staff completed the 2007-2008 audit in 2010. The 2010-2011 audit, being conducted by an outside firm, is underway, with a final report expected Q3 2013.

6. CSI Program Budget

With the inclusion of the additional \$200 million in incentives authorized by SB 585 (Kehoe 2011) the CSI Program has a total budget of \$2,367 million to be spent between 2007 and 2016.

Table 29: CSI Program Budget Allocations (millions \$)

CSI Program Components	Budget
General Market Total	\$2,098
<i>Incentives</i>	<i>\$1,948</i>
<i>Administration</i>	<i>\$95</i>
<i>Measurement and Evaluation</i>	<i>\$27</i>
<i>Marketing and Outreach</i>	<i>\$21</i>
<i>Unallocated</i>	<i>\$7</i>
SASH	\$108
MASH	\$108
RD&D	\$50
SWH Pilot	\$3
Total	\$2,367

In most cases these project costs are allocated across the PAs in proportion with their annual electric sales: PG&E at 43.7%, SCE at 46.0%, and SDG&E at 10.3%.

Weekly and daily budget updates for the General Market incentive buckets are available online (http://www.californiasolarstatistics.ca.gov/reports/budget_forecast/). The online reports display the program capacity goals, original dollar allocations, and capacity and dollars confirmed, under review, and still available. They also break down the dollars confirmed, in payment, and paid, according to the type of project: EPBB, PBI, or thermal electric (electric-displacing CSI-Thermal program dollars come out of the General Market budget).

The CSI Program will accept applications for rebates while there is money still available in those incentives buckets, but not later than December 31, 2016. The PAs are responsible for ensuring that the program's rebate commitments do not exceed the budget allocations. As the program winds down it is important to increase the precision of the estimates of the PBI payments, whose ultimate sum is dependent on the amount of electricity actually generated over the first five years of operation.

Two of six sub-programs' incentives buckets (PG&E and CCSE Residential) are now have now reserved enough MW to fulfill their CSI goals. Both PG&E and CCSE have issued Petitions to Modify (PTMs) earlier CSI Decisions, which request the Commission address budget issues related to the closing the CSI Programs.³¹ The Commission – including ED – and the PAs are looking at a variety of ways to bring those sub-programs with depleting budgets smoothly to a close, whether it means allowing programs to shut down when their remaining budgets reach a certain percentage of original allocation, or when they reach their capacity targets, or another guideline.

³¹ The CCSE PTM is available here: <http://docs.cpuc.ca.gov/PublishedDocs/EFILE/PM/172338.PDF>. The PG&E PTMs are available here: <http://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=64128110>, <http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M063/K547/63547038.PDF>.

7. California Solar Initiative Program Links and Contact Information

The main web portal for the *Go Solar, California!* campaign provides comprehensive solar e-resources for consumers and professionals:

www.GoSolarCalifornia.org

The California Public Utilities Commission Energy Division web site provides information related to the CSI program, including regulatory updates and documents for the Distributed Generation Docket (R.)10-05-007:

www.cpuc.ca.gov/PUC/Energy/Solar

E-mail for CSI inquiries: energy@cpuc.ca.gov

Telephone for CSI inquiries: 415-355-5586

The CSI-Thermal Program provides program information at www.CSIThermal.com

8. CSI and CSI-Thermal Program Administrator Contacts

PG&E

CSI Program: www.pge.com/csi

E-mail: solar@pge.com

877-743-4112

CSI-Thermal Program:

www.pge.com/csithermal

Email: solar@pge.com

877-743-4112

California Center for Sustainable Energy (San Diego territory)

CSI Program:

www.energycenter.org

E-mail: csi@energycenter.org

858-244-1177

CSI-Thermal Program:

www.energycenter.org/swh

Email: swh@energycenter.org

877-333-SWHP

Southern California Edison

CSI Program:

www.sce.com/csi/

E-mail Address: CSIGroup@sce.com

866-584-7436

CSI-Thermal Program:

www.sce.com/solarleadership/gosolar/solar-thermal/

Email: CSIGroup@sce.com

800-799-4177

So Cal Gas (CSI-Thermal only)

www.socalgas.com/rebates/solar/

Email: swh@SoCalGas.com

1-800-Gas-2000