Staff Proposal for Program Modifications to the California Solar Initiative (CSI) Program

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1. Introduction to Staff Proposal

The purpose of this Staff Proposal is to recommend a number of program modifications to the California Solar Initiative (CSI) Program that would improve the ability of the program to achieve its goals. The proposed modifications are the result of observations and experiences from the first three and a half years of the CSI Program. This Staff Proposal is based on:

- Staff's review of the progress of the CSI Program against the goals of the program.
- Comments received in quarterly public CSI Program Forum where interested stakeholders gather to provide feedback on the program.[1]
- Program oversight and evaluation activities, including the reports released as part of program management as well as under the CSI Measurement and Evaluation (M&E) program[2], including:
  - Annual Program Assessments (June 2009 and June 2010)
  - Net Energy Metering Cost Effectiveness (March 2010)
  - 2007-2008 CSI Impact Evaluation (February 2010)
  - 2009 CSI Impact Evaluation (June 2010)
  - Solar Meter and Market Assessment Report (August 2009)
  - CSI Process Evaluation Early Findings (March 2010)
  - Impacts of Distributed Generation Report (January 2010)
  - Program Administrator Expense Reports (January 2010)
  - Staff Progress Reports and quarterly Data Annex reports focused on Administrative Processing times (Quarterly)[3].
- Close oversight of the CSI Program Administrators through participation in numerous standing program management committees.
- Staff hosted workshops on numerous topics, including dropouts, incentive budget, and project cost breakdown.
- Staff interaction and collaboration with program participants, including consumers and contractors.
- Staff reviews of numerous Advice Letter filings related to CSI Program Administration.
- Staff review of data requests and other information related to ongoing administration of the CSI Program.
- Review of Commission decisions and active attempts to oversee the Program Administrators' implementation of the Commission decisions.

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[1] Meeting information from each CSI Program Forum can be downloaded here: http://www.cpuc.ca.gov/PUC/energy/Solar/forum.htm.
[2] Documents related to CSI Program Evaluation can be downloaded here: http://www.cpuc.ca.gov/PUC/energy/Solar/evaluation.htm
[3] All Staff Progress Reports and quarterly Data Annexes can be found here: http://www.cpuc.ca.gov/PUC/energy/Solar/news.htm

1.1 Scope and Format of this Proposal

This Staff Proposal contains program modifications to several components of the CSI Program, including the general market program, Single-family Affordable Housing program (SASH), and the Multi-family Affordable Housing Program (MASH). The scope of this Staff Proposal addresses proposals for long-term marketing and outreach (M&O), as well as measurement and evaluation (M&E). The CSI RD&D Program is not covered by this proposal. With the exception of minor budget items related to the Solar Water Heating pilot program (SWHPP) and the CSI-Thermal program, the CSI-Thermal program is not covered by this proposal.

For each area of suggested program modification, staff provides relevant background information and makes a recommendation. A basic knowledge of the CSI Program – its regulatory authorization and implementation – is assumed of the reader. If the Staff Proposal requires a change to a prior decision, that decision is noted in the text. There are some issues which modify existing Commission guidance, and other issues that raise new issues not yet considered by the Commission.

In D. 06-08-028, the Commission indicated it would institute periodic reviews, every two years, throughout the program.[4] This Staff Proposal is intended to undertake such a periodic review.

There are a large number of recommendations in this Staff Proposal. Many of the issues may require further analysis and/or refinement of the recommendations. All issues raised in this Staff Proposal will be subject to stakeholder input, as scheduled and directed in Rulemaking (R.) 10-05-004.[5]

1.2 Background

The CSI Program is overseen by the California Public Utilities Commission (Commission) and provides incentives for photovoltaic (PV) solar system installations to customers of the state's three large regulated electric investor-owned utilities (IOUs): Pacific Gas and Electric Company (PG&E), Southern California Edison (SCE) and San Diego Gas and Electric (SDG&E). The CSI Program provides incentives for solar systems installed on existing residential homes, as well as existing and new commercial, industrial, government, non-profit, and agricultural properties within the service territories of the large IOUs. The CSI Program provides rebates to consumers for solar systems based on expected or actual system performance, and the program requires solar systems meet a variety of requirements intended to ensure high-quality and high-performing solar systems are installed in California, e.g. warranty, metering, monitoring, eligible equipment.

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[4] See D. 06-08-028, pp.106-107.

[5] For procedural information on tracking R.10-05-004, see: http://www.cpuc.ca.gov/PUC/energy/DistGen/docketinfo.htm

The CSI Program for photovoltaics (PV) focuses on onsite, grid-connected solar used by electric customers seeking to offset some portion of their own load by installing solar PV or other solar electric generating systems. The CSI Program does not fund large, free-standing solar power plants designed to serve the electric grid as wholesale power plants, such plants are used to help utilities meet Renewable Portfolio Standard (RPS) obligations. CSI installations do help achieve the RPS goals by reducing retail sales (which reduces the RPS obligations defined as the obligation to buy renewables for a percentage of retail electrical sales). CSI installations may potentially may help achieve the RPS goals if the sale of Renewable Energy Credits (RECs) from CSI facilities is allowed to count towards the RPS obligations of utilities.

The CSI Program demonstrates the State's strong support for solar technology and grew out of Governor Schwarzenegger's vision for a "Million Solar Roofs" in the state of California. The CPUC authorized the various parts of the CSI Program in a series of regulatory decisions from 2006 thru 2010[6], with several major decisions in 2006[7] to launch the general market program in early 2007. A number of later decisions continued to refine the program.[8] The Legislature provided statutory authorization to the CPUC to create the CSI Program in 2006 in Senate Bill (SB) 1 (Murray, 2006)[9] and in the CSI-Thermal Program in Assembly Bill (AB) 1470 (Huffman, 2008). In addition, the legislature authorized the California Energy Commission to have authority statewide (including over the CPUC program) for the eligibility for solar electric incentive programs. The Energy Commission has adopted "Guidelines for California's Solar Electric Incentive Programs (Senate Bill 1)".[10]

In addition to the statute, the CPUC decisions, and the California Energy Commission's Guidelines, the CSI Program is operated in accordance with the CPUC-approved CSI Program Handbook. The CSI Program Handbook is maintained by the CSI Program Administrators, who can file handbook changes via Advice Letter. There have been numerous revisions to the CSI Program Handbook since 2007. The Program Administrators take public feedback on the program and discuss proposed Program Handbook modifications at quarterly CSI Program Forums.

1.2.1 CSI Program Components, Budget and Goals

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[6] The Commission has developed the CSI program in a series of Rulemakings (R) since 2006, the current Rulemaking, R.10-05-004 and prior Rulemakings: R.08-03-008, R.06-03-004, and R.04-03-017. Each of the decisions noted herein occurs in one of those dockets, unless otherwise noted.

[7] Decision (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 Senate Bill 1 (Murray, 2006).

[8] D. 07-05-007 modified the incentive adjustment mechanism to account for program drop outs. 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.

[9] Senate Bill 1 created Public Utilities Code 2851-2 and PU Code 2860.

[10] California Energy Commission's Guidelines can be downloaded here: http://www.energy.ca.gov/2008publications/CEC-300-2008-007/CEC-300-2008-007-CMF.PDF

The CPUC's CSI Program has a 10-year budget of $2,167 million and is intended to run from 2007-2016. The funding for the CSI program comes from the distribution charge in electric tariffs. The goals of the CSI Program are to:

- Install 1,940 MW of distributed solar energy systems in the large IOU service territories; and
- Transform the market for solar energy systems so that it is self-sustaining and price competitive with conventional forms of electric generation.

The CSI Program has several program components, as shown in Table 1, each with its own Program Administrator and budgets overseen by the CPUC:

- The **CSI general market solar program** is administered through three Program Administrators: PG&E, SCE, and the California Center for Sustainable Energy (CCSE) in SDG&E territory. The goal is to install 1,750 MW with a 10-year budget of $1,897 million. The general market solar program funds solar PV and other solar technologies. The other solar technologies (including solar hot water and other solar thermal technologies) are funded from this budget only if they displace the use of electricity, and other solar technologies funded from within the general market solar budget are capped at $100.8 million.
- **The CSI Single-family Affordable Solar Homes (SASH) Program**[11] 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 through 2015.
- **The CSI Multifamily Affordable Solar Housing (MASH) Program**[12] provides solar incentives to multifamily low income housing facilities. The MASH Program also has a $108 million budget through 2015 and is administered through the same Program Administrators as the general market solar program: PG&E, SCE, and CCSE.
- **The CSI Research, Development, Demonstration and Deployment (RD&D)**[13] **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 that is granted in a series of award cycles.
- **The CSI Solar Water Heating Pilot Program (SWHPP)** provided solar hot water incentives through a pilot program for residences and businesses in the San Diego area only; the SWHPP was administered through CCSE with a budget of $2.6 million. The Solar Water Heating Pilot Program is closed to new applications as of May 1, 2010. All solar water heating incentives after that date will be through the CSI-Thermal program.

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[11] D. 07-11-045 established the CSI Single-family Affordable Solar Homes (SASH) program.

[12] D. 08-10-036 established the CSI Multifamily Affordable Solar Housing (MASH) program.

[13] D. 07-09-042 established the CSI Research, Development, Demonstration, and Deployment (RD&D) program.

ffi **The CSI-Thermal Program**[14] provides solar thermal incentives to eligible systems. The source of CSI-Thermal program funding is bifurcated, depending on whether the project is electric-displacing or gas-displacing. The gas-displacing CSI-Thermal budget is funded by gas ratepayers $250 million. The electric-displacing CSI-Thermal budget (and all other components above) is funded by electric ratepayers. The electric-displacing CSI-Thermal budget is capped at $100.8 million and is a subset of the general market program cited above.

In addition to the CSI Program, the California Energy Commission oversees the New Solar Homes Partnership (NSHP) program that offers solar rebates to new homes in IOU territories.[15] The CSI Program and the NSHP program are branded collectively as Go Solar California, sharing a statewide consumer education web site of the same name.

Table 1. CSI Electric-Displacing Budget by Program Component, 2007-2016

	Budget ($ Millions)	**Goal (MWs)**
General Market Solar Program (includes PV and other electric displacing solar thermal parts of CSI-Thermal)	$1,897	1,750 MW
Single-family Affordable Solar Homes (SASH)	$108	*
Multifamily Affordable Solar Housing (MASH)	$108	*
Research, Development, Demonstration, and Deployment (RD&D)	$50	~
Solar Hot Water Pilot Program (SWHPP)	$2.6	750 SWH systems
Total CPUC CSI Electric-Displacing Budget	**$2,167**[16]	**1,940 MW**

Notes: The funding for the electric-displacing CSI program comes from the distribution component of electric rates.
Source: Budget Goals: CPUC D. 06-12-033, p.28. MW Goals: D. 06-12-033 FOF 15 states, "The Commission's 65% of the 3,000 MW statewide goal is 1,940 MW, and 1,750 MW for the mainstream solar incentive program."

The goal of the general market program is 1,750 MW. The MW targets for the two low income programs are implied by the fact that the CSI Program overall program goal was set at 1,940 MW and the general market solar program goal was set at 1,750 MW. There is a gap of 190 MW between the overall program goals and the general market goal. In 2007 and 2008, the Commission adopted SASH and MASH, but did not adopt MW goals for either program. (See recommendation in Section 6.8).

[14] D. 10-01-022 established the CSI-Thermal Program to provide solar water heating incentives statewide.
[15] The NSHP Program is funded as part of the public goods charge, authorized for collection until January 1, 2012, pursuant to Public Resources Code 25740.5 (f) and PU Code 399.8.
[16] The budget rows do not quite add up to the total $2,167 million budget figure. See recommendation in Section 7.4.

Table 2. Administrative Budget of General Market Solar Program (Based on 10% of the General Market Program Budget of $1,897 M)

Program Component	**10-year budget allocation ($millions)**	**% of Total Administrative Budget**
Total Administrative Budget	**$189.71**	**100%**
Program Administration	$94.85	50%
Measurement & Evaluation (M&E)	$46.70	24%
Marketing and Outreach	$15.00	8%
Unallocated	$33.15	18%

Source: Budgets established in the following decisions – Total Administrative Budget: D.06-12-033 (p.28), M&O: D. 07-05-047 (Appendix A, 3a), M&E: Assigned Commissioner Ruling (ACR) July 29, 2008 (Appendix A, p.8).

All budget rows in Table 2 are split across the Program Administrators in accordance with the regular budget split across the Program Administrator territories, as per D. 06-12-033, Appendix A, p.2, with the exception of the interim marketing and outreach budget, which grants each Program Administrator a flat annual budget of $500,000, which adds up to an authorized $15 million over 10 years.

Table 3. CSI Thermal Gas-Displacing Program Budget (2010-1017)

CSI Thermal Program Elements	**CSI Thermal Program Sub-Elements**	**Budget**
Incentives (82%)	General Market Incentive Component	$180,000,000
	Low-Income Incentive Component (10% of total funds)	$25,000,000
	Subtotal	***$205,000,000***
Market Facilitation (10%)	Marketing & Outreach, including training, consumer education, and other market facilitation activities such as engaging with permitting offices or financing providers.	$25,000,000
	Subtotal	***$25,000,000***
Program Administration (8%)	Application/incentive processing, General Administration, and System Inspection	$15,000,000
	Measurement and Evaluation	$5,000,000
	Subtotal	***$20,000,000***
	Total	**$250,000,000**

Note: The funding for the gas-displacing portion of CSI-Thermal comes from the distribution component of gas rates.

2. Solar Tariff Modifications: Net Energy Metering (NEM), Virtual Net Metering (VNM), and Bill Credit Transfer (BCT) Tariffs

2.1 Background

Net Energy Metering (NEM), Virtual Net Metering (VNM), and the Renewable Energy Bill Credit Transfer (RES-BCT) tariffs all allow solar customers to interconnect to the utility and receive some compensation for solar generation. In addition to the three tariff options listed here, some customers with a solar system sized significantly below their peak load opt to remain on their regular utility tariff rate schedules rather than switch to a NEM or other solar tariff. Staff review of interconnection data demonstrates that more than 50 MW of the 541 MW of the solar MWs installed by the end of 2009 were interconnected on tariffs other than Net Energy Metering.

The Commission should undertake a comprehensive review of the various tariff options available to solar customers so that the Commission can ensure that all customer types and situations are being appropriately addressed.

Net Energy Metering (NEM)

Net energy metering (NEM) tariffs, established pursuant to Public Utilities (PU) Code 2827, are a special billing arrangement that provides credit to customers with solar PV systems for the full retail value of the electricity their system generates. Under NEM, the customer's electric meter keeps track of how much electricity is consumed by the customer and how much excess electricity is generated by the system and sent back into the electric utility grid. Over a 12-month period, the customer has to pay only for the net amount of electricity used from the utility over-and-above the amount of electricity generated by their solar system (in addition to monthly customer transmission, distribution, and meter service charges they incur).

Virtual Net Metering (VNM)

Virtual net metering (VNM) tariffs, established as a pilot program pursuant to D. 08-10-036, allow projects that participate in the CSI Multifamily Affordable Solar Housing (MASH) Program to allocate the kilowatt hour credits from a single solar system to multiple utility accounts.

VNM allows the electricity generated from a single solar energy system to be allocated as kilowatt-hour credits to common area utility accounts or individual tenant utility accounts, without requiring the system to be physically interconnected to each tenant's meter. Just like NEM allows a customer's excess kilowatt-hours to offset the customer's own load within a given time of use period, the VNM tariffs allow kilowatt-hours to

offset load at a designated account within a given time-of-use period. VNM allocates the kilowatt-hours from one account to one or more benefitting accounts. Under VNM, the kilowatt-hours are not monetized, but rather transferred as kWh credits from a generating account to a benefitting account, resulting in a lower "net" electricity consumption at the benefitting accounts. The kWh credit allocation is "virtual" under VNM, rather than 'real' under NEM where the credit allocation occurs in real time as a utility account electricity meter spins backwards and forward. Current tariff rules require that the VNM generating account, as well as any VNM benefitting accounts (either common area or tenant accounts designated to receive a VNM allocation) must be interconnected behind a single, common service delivery point at the property.

The requirements for VNM in the MASH program are as follows:

- The affordable housing building owner/manager determines the percentage of a solar system's output allocated between common and tenant areas, and the allocation remains fixed for at least five years.
- Solar energy credits are allocated as kilowatt-hours, not dollars.
- The percentage of solar energy credits allocated to tenant meters is credited across all individual meters based on the relative size of the tenant's unit.
- The annual solar energy credits allocated to common and tenant meters may not exceed the associated estimated load for the coming year.
- The building owner/manager is responsible for all costs associated with installing a generator output meter.
- Excess credits are carried forward monthly according to standard net energy metering rules.
- The VNM tariff may not apply any additional charges or fees on affordable housing tenants who benefit from the VNM tariff.

D. 08-10-036 directed the utilities, PG&E, SCE and SDG&E, to file VNM tariffs for MASH participants. Further, the decision allowed the utilities to recover their reasonable costs of VNM implementation from the administrative budget of the CSI General Market Program.

VNM is currently limited to qualifying affordable housing multitenant properties within the MASH program. However, D. 08-10-036 states the CPUC will consider expanding VNM to all multitenant properties, and directs the Administrative Law Judge to issue a ruling to take comment on the expansion of VNM within the proceeding.

The VNM tariffs were offered to MASH customers in June 2009. As shown in Table 4, completed MASH projects have designated benefits for 576 tenant subscribers. Based on MASH reserved projects, VNM tariffs will soon be available to more than 6,301 additional tenant units as projects are interconnected.

Table 4. Tenant Units Served by Virtual Net Metering (VNM) Tariffs

	CCSE	PG&E	SCE	Total
MASH VNM Tenant Units (Reserved)	197	5,134	970	**6,301**
MASH VNM Tenant Units (Interconnected)	0	490	86	**576**

Data thru: May 31, 2010.

According to the Expense Reports submitted by the Program Administrators and inquiries made to the utilities, VNM implementation costs have varied across the utilities. PG&E has spent $366,000, SDG&E has spent $47,000, and SCE anticipates unspecified expenditures in 2010 on VNM implementation, but estimated total costs of VNM implementation may be at least $1 million.

Renewable Energy Self-Generation Bill Credit Transfer (RES-BCT)
Renewable Energy Self-Generation Bill Credit Transfer (RES-BCT) tariffs, established pursuant to PU Code 2830[17], authorizes all "local governments" in California to generate energy on one account (primary account) and provide a bill credit to a "Benefiting Account" so long as both facilities are owned or operated by the same local government. The Commission approved the utility Advice Letters to implement PU Code 2830 in April 2010 in Resolution E-4283. The Commission approved the tariff name RES-BCT to apply to the tariffs pursuant to PU Code 2830.

Under RES-BCT tariffs, bill credits are calculated by multiplying the Generating Account's time-of-use (TOU) energy component of the generation electricity rate by the amount of energy exported to the grid during the corresponding time period. These bill credits are monetized in dollars and can be applied to offset generation costs at the local government customer's other retail service accounts at different facilities. The local government customer may select one or more accounts (known as "Benefiting Accounts") to which the bill credits will be applied.

2.2 Service Delivery Point as the Boundary of Eligibility for VNM Service

In addition to requiring that each utility's VNM tariff comply with the statutory mandates of NEM, the Commission further required (in D. 08-10-036) that each utility's VNM must:

> Allow for the allocation of net energy metering benefits from a single solar energy system to all meters on an individually metered multifamily affordable housing property, without adversely impacting building tenants. (p.38)

[17] PU Code 2830 was created by AB 2466 (Laird, 2008).

The Commission did not define what "property" meant in terms of multifamily housing. Many multifamily affordable housing projects are actually comprised of multiple buildings on a single property, or on multiple parcels extending across the equivalent of several city blocks but under the same ownership. These housing complexes are often served by multiple utility service delivery points. The service delivery point is defined in utility practice as the demarcation between the customer-owned electrical system and the utility wires. Typically, each building has one service delivery point. A typical multitenant building has one service delivery point that then serves multiple tenants or utility accounts. Each tenant has their own meter installed.

The Commission's Energy Division approved the VNM tariffs that were filed in response to D. 08-10-036. As filed, the VNM tariffs limit the transfer of kWh credits among utility accounts behind a single service delivery point. This implementation of VNM has limited the viability of VNM for many potential affordable housing sites that extend beyond one service delivery point. Some parties have questioned whether "property" (the term used in the decision citation above) should be defined as "all units behind a single service delivery point" or "all units in a single affordable housing development". Several developers of MASH/VNM projects are stymied by the current implementation of the VNM tariffs and want the utility to allow all units in a development to share credits from one or more MASH solar systems.

Utilities argue that allowing transfer of kWhs across service delivery points amounts to retail wheeling and raises both policy and technical concerns. The utilities have traditionally been concerned about net energy metering customers causing cost shifting due to the transmission and distribution (T&D) credit customers receive under the NEM program. Others argue that the costs on the transmission and distribution system are very small.[18] The utilities are particularly concerned about expanding VNM beyond the service delivery point issue if virtual net metering is expanded beyond just a pilot program. At the time the CPUC approved VNM pilot tariffs via Advice Letter, it was not clear that the service delivery point issue might conflict with the Commission's intent to have all meters within the housing development receive the benefits of a single system.

Recommendation:

The Commission should determine that the "service delivery point" is not the proper boundary for VNM tariffs for affordable housing projects. The Commission should clarify that its intent was to encompass the entire affordable housing development, and not just the units behind a single service delivery point. The utilities should be ordered to modify their tariffs accordingly.

For future expansion of VNM tariffs beyond affordable housing program, the Commission should consider maintaining the boundary of VNM service as being available only to accounts behind the same service delivery point. Affordable housing should be treated as an exception to the rule. Allowing VNM to have a boundary will

[18] The CPUC's Cost-Effectiveness of Net Energy Metering report (March 2010) provides detail on the T&D costs associated with NEM.

greatly facilitate the expansion of VNM to all multitenant buildings without confounding the issue with retail wheeling or creating extremely complex billing mechanisms. (See below on the Expansion of VNM to all Customers.)

2.3 Expansion of VNM to all Customers

The VNM tariffs were established in June 2009 as a pilot program associated only with the MASH program. The utilities have gained some experience with the implementation of VNM. As directed by D. 08-10-036, the Commission should now consider whether to expand VNM to all multitenant customers.

Recommendation:

Staff recommends that VNM be expanded to all multitenant customers that are all behind the same utility service delivery point. The rules for a general VNM program might be slightly different since the occupants of multitenant buildings may be renters or owner-occupiers. So long as VNM credits are only transferred between accounts, there should be no significant cost-shifting between customer classes.

The Commission should take comment on the following questions related to VNM before issuing a final order on VNM expansion:

1. What will be the start-up costs to set up the billing systems to administer the VNM tariffs? What will be the on-going per-bill marginal costs? How do these costs compare to the costs of administering NEM and BCT?
2. Can the existing investments in MASH-VNM billing systems be used to reduce the cost of expanding the VNM tariffs to all customers? Are the costs of billing for VNM one-time start-up costs, or are they ongoing costs?
3. Should the allocation of VNM kWh credit that apply to common area and tenant utility customer accounts be determined through the square footage of the common area(s) and units, as is presently the case with VNM in the MASH program? Or should the allocation be at the sole discretion of the solar system owner?
4. Should the allocation of VNM kWh credits that apply to common and unit utility customer accounts be determined through individual energy consumption (i.e., a customer would receive a kWh credit relative to the amount of energy the customer consumed in a given month)?
5. Should the allocation of VNM kWh credits cover 100% of the common load, and then have the remainder apply equally on a per square-foot basis to unit occupants?
6. Should the building owner be responsible for all the costs associated with VNM (such as installing a generation output meter), or should those costs be shared with building occupants?
7. Should VNM be limited to multitenant properties that receive an incentive through the CSI program?

8. If VNM is limited to the CSI program, should it include all residential, non-residential and mixed-use properties within the CSI program?
9. What are the estimated costs to expand VNM? How should those costs be recovered? Through the CSI Program administrative funds? What if the tariffs serve non-CSI participants?
10. Should VNM expand beyond the CSI program to include all multitenant buildings that install a solar energy system, not just those within the CSI or MASH programs?
11. If VNM is expanded to all multitenant buildings beyond the CSI program, what are the estimated costs of expansion? How should those costs be recovered?
12. How should the kWh credits unused by occupants/tenant units be treated? Should they be reallocated to common areas and occupant/tenant units that are in use? Should the utilities or other units have the right to bank those credits until the unit is occupied?
13. Should the utilities have a single date for the annual true-up of kWh credits for all common area and occupant units within a building? Or, should each customer account have a separate true-up period?
14. Are there other more efficient ways to share the financial benefits of a single solar energy system across common area and tenant/occupant units outside of kWh transfer done through VNM?
15. Are there any other issues that should be considered with regard to the expansion of VNM?
16. Should the utilities be allowed to charge VNM customers with set up or on-going billing charges, and if so, at what level?
17. What types of multitenant customers should be eligible for VNM?

2.4 Expansion of VNM to all Affordable Housing Customers

The VNM-MASH tariffs are currently applicable to customers that receive a reservation and have an active application under either the MASH program or NSHP affordable housing program. The MASH program is currently oversubscribed in all three utility service territories with a waiting list for applicants.[19] Some multitenant affordable housing sites may not be able to participate in the MASH program, but could still install solar PV using a combination of other incentive programs and sources of funding. These buildings face the same allocation problems that VNM is supposed to address.

In D. 08-10-036, Ordering Paragraph (OP) 5 the Commission ordered the utilities to file VNM tariffs for properties that install "a solar system through the MASH program". In addition, the D. 08-10-036, OP6, states that the ALJ shall issue a ruling to explore expansion of the VNM tariff to all multitenant properties. Combined, these two ordering paragraphs imply that VNM tariffs are to remain only available only to MASH participants until the Commission acts on VNM for all customers.

[19] See MASH section in CSI Annual Program Assessment for more information on status of MASH program. http://www.cpuc.ca.gov/PUC/energy/Solar/apa10.htm

Recommendation:

The Commission should allow all qualified low-income multifamily housing customers (i.e. affordable housing customers) the opportunity to apply for the VNM tariffs regardless of participation in the MASH program or NSHP's affordable housing program. D. 08-10-036 currently limits VNM as a pilot only for participants in the MASH program (and NSHP's affordable housing program), and the decision needs to be modified to allow for this change.

This recommendation is moot if the Commission opens VNM up to all customers immediately. (See Section 2.3) However, if no Commission action is taken in the short-term on VNM applicability to all customers, then the Commission could at least open VNM up to all multitenant affordable housing customers, regardless of whether they participate in the MASH program or the NSHP affordable housing program. For example, some affordable housing solar projects may proceed under the CSI general market program and/or proceed without any CSI rebate.

2.5 Create Bill Credit Transfer (BCT) Tariff Option for All Multitenant buildings and Modify CSI Sized to Load Restrictions

Staff recommends providing multitenant buildings another tariff option, in addition to VNM tariffs, that would allow solar system owners to transfer a bill credit (in dollars) to one or more benefitting accounts. For multitenant situations where a bill credit across multiple service delivery points would be preferred, customers would be allowed to elect to take service under a BCT tariff (providing a bill credit in dollars at the generation-only rate) instead of a VNM tariff (which provides for the transfer of kilowatt-hours between accounts behind a single service delivery point). These new BCT tariffs would allow any customer to transfer bill credits to multiple accounts, so long as the account is within the same utility service area.

The new tariff recommended here would be similar to the recently approved Renewable Energy Self Generation – Bill Credit Transfer (RES-BCT) tariffs, created by PU Code 2830. The current RES-BCT tariffs are only open to local governments, but since they only offer credit at the generation-only rate, they do not pose any significant cost-shifting between customer classes.

Currently, the CSI program limits a customer to a total system size that is equal to the customer's total load at that utility account. There is no tariff that allows a customer to be paid for any excess generation (and even the implementation of AB 920 (Huffman, 2009) will be only a payment limited by the statutory guidelines), and therefore the CSI Program Handbook caps the eligible CSI system size at the customer's total load. If a new BCT tariff is available as an option for solar customers, then the sized-to-load restriction should be modified in the CSI Program. The CSI Program should only provide rebates up to the load at the host site, but the total system size should be able to exceed the rebated capacity size.

To be effective, a customer would need to be able to size a solar system up to the total load of all benefitting accounts. Staff recommends that individual customers in multitenant units only receive a CSI rebate for the portion of their solar system that serves onsite load (or perhaps the total load behind a single service delivery point).

Allowing multitenant customers to receive monetary credits rather then kilowatt-hour credits (as VNM currently allows) would allow greater flexibility to property owners to "treat all tenant or owner occupants the same" and provide monetary credits in equal amounts to all enrolled unit occupants.

The costs of administering the recently approved RES-BCT tariffs are unknown to staff; however, Resolution E-4283 did approve the utilities to charge customers for some tariff related start-up costs.

Recommendation:

The Commission should require the utilities to create a bill credit transfer tariff open to all multitenant buildings. The bill credit value should be administered similar to the existing RES-BCT tariffs for local governmental facilities.

The CSI Program should provide rebates up to the total load at the host site, but the total system size should be able to exceed the rebated capacity size for any customer eligible for the RES-BCT or otherwise similar new tariffs.

Prior to issuing an order on BCT tariffs, the Commission should take comment on the following questions:

1. What will be the start-up costs to set up the billing systems to administer the BCT tariffs? What will be the on going per-bill marginal costs? How do these costs compare to the costs of administering NEM and VNM?
2. Should the BCT tariffs be open to any customer or just multitenant customers?
3. Should the BCT tariffs have the same rates and structure as the existing RES-BCT tariffs?
4. Should the utilities be allowed to charge BCT customers with set up or on-going billing charges, and if so, at what level?

2.6 NEM: Billing Costs and Billing Simplification

The recent NEM Cost Effectiveness study[20] identified NEM billing costs as a significant portion of the costs of NEM. (See study at p.40) The monthly incremental cost of billing each NEM customer ranges from $2.34 per customer per bill to $29.34 per customer per bill, depending on the utility and customer class.

[20] Net Energy Metering Cost Effectiveness Evaluation, http://www.cpuc.ca.gov/PUC/energy/DistGen/nem_eval.htm

In addition to high costs in some instances, NEM billing is regularly criticized as being difficult to understand. The most frequent complaint of existing solar customers is lack of understanding of their NEM bills. The PG&E and SCE explanations of how to read a NEM bill are each six pages long—a simple reflection of the complications of a NEM bill.[21]

Recommendation:

Since NEM billing is both expensive and difficult to understand, the utilities should be required to take steps to improve the comprehensibility of NEM billing reports, as well as reduce the costs of NEM billing. The utilities should be required to meet a specified benchmark for NEM billing costs, such as the lowest per-bill cost found in the study. The utilities should report to the Commission on the efforts undertaken to simplify NEM bills and streamline the delivery of NEM bills.

3. General Market Program Modifications

3.1 Application Processing Timelines

The Energy Division staff has been monitoring the average application processing times for CSI applications since the program's inception. At every quarterly CSI Program Forum, and at many other opportunities, solar contractors raise issues around CSI application processing times. The CSI Program Administrators have made many laudable efforts to reduce processing times, including reducing application paperwork and making the CSI application fully online. Despite these large efforts, the CSI Program Administrators continue to have problems processing CSI reservations and incentive claim payments in a timely manner. The "Data Annex" is published quarterly[22], and it contains information about all of the phases of the CSI application review process. The next few paragraphs and tables discuss the administrative processing timeframes from the program for projects that were received or reviewed in Q1 2010.

As shown in Table 5 residential projects are more likely than non-residential projects to receive a reservation in less than 30 days, however 47% of SCE projects and 17% of CCSE's projects were unable to receive a reservation in 30 days. More than 13% of SCE residential projects did not receive a reservation within 60 days. Non-residential projects fared far worse, with less than half of these projects receiving a reservation in less than 30 days. One-third or more of non-residential projects in CCSE and SCE territory did not receive a reservation within 60 days of submittal.

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[21] See PG&E "Understanding Your NEM Bill" at http://www.pge.com/includes/docs/pdfs/b2b/newgenerator/understandingyourbill_residential.pdf and SCE's "Understandings your Domestic Energy Bill for Solar Customers" at http://www.sce.com/customergeneration/net-energy-faqs/

[22] All Data Annex reports on CSI administrative processing can be found here: http://www.cpuc.ca.gov/PUC/energy/Solar/news.htm

Table 5. Time from Application to Reservations (Q1 2010)

	30 days or less	Greater than 60 days
Residential		
CCSE	83%	4%
PG&E	95%	1%
SCE	53%	13%
Non-Residential		
CCSE	50%	33%
PG&E	45%	16%
SCE	37%	35%

Source: Data Annex Q1 2010, p.8.

The average installation time is determined by the applicant and not the Program Administrator. The installation time is the period during which the project is being installed—the time between the reservation and the submittal of the Incentive Claim Form (ICF). Residential applicants have 12 months and non-residential applicants have 18 months from the date of the confirmed reservation to submit an ICF. Installation times vary depending on whether the project is residential or non-residential. Table 6 shows the average number of calendar days between the customer's confirmed reservation date and the date that the Incentive Claim Form was received by the Program Administrator, for all applications for which the ICF was received in Q1 2010, and it compares it to Q1 2009. While the Program Administrator cannot directly reduce the average installation time, the Marketing and Outreach program could seek to reduce the average installation time indirectly by targeting activities that help to reduce the time for permitting and installation design.

Table 6. Total Installation Time

	Average Installation Time			
	Residential Q1 2010	Residential Q1 2009	Non-Residential Q1 2010	Non-Residential Q1 2009
CCSE	92.0	138.0	223.2	302.2
PG&E	134.3	129.5	210.1	240.7
SCE	76.3	111.2	138.4	241.6

Source: Data Annex Q1 2010, p. 9-10.

After CSI applicants complete their installation, they file an ICF with the Program Administrator. Table 7 shows residential ICF processing time. For both Residential and Non-Residential applicants – it often takes more than 60 days to process these ICF forms. For projects that are inspected – which is 1 in 7 projects, the wait time on processing is even longer. In SCE territory, 32% of residential projects take more than 90 days to process, if inspected, and 21% of projects take more than 90 days even when there is no inspection. Table 8 shows non-residential ICF processing time.

Table 7. Residential Incentive Claim Processing Times (Q1 2010)

	60 days or less	Greater than 90 days
Residential with inspection		
CCSE	81%	7%
PG&E	75%	11%
SCE	48%	32%
Residential without inspection		
CCSE	97%	1%
PG&E	93%	3%
SCE	73%	21%

Source: Data Annex Q1 2010, p.13.

Table 8. Non-Residential Incentive Claim Processing Time (Q1 2010)

	60 days or less	Greater than 90 days
Non-Residential with inspection		
CCSE	50%	0%
PG&E	80%	0%
SCE	70%	15%
Non-Residential without inspection		
CCSE	100%	0%
PG&E	71%	17%
SCE	77%	6%

Source: Data Annex Q1 2010, p.13.

Once an ICF is approved, additional time is needed before payment occurs. Table 9 shows the average days that elapse between ICF approved and issuance of payment. The lag between ICF approval and payment ranges from 13 to 30 days for residential EPBB projects and 16 and 26 days for non-residential EPBB projects.

Table 9. Average Days of Payment Time

	Residential	Non-Residential
CCSE EPBB	30	20
CCSE PBI	17	43
PG&E EPBB	13	16
PG&E PBI	101	111
SCE EPBB	23	26
SCE PBI	60	53

Source: Data Annex Q1 2010, p.14.

Collectively, all of the application processing times at the Program Administrators are too long. These delays cost the solar customers time and money and lead to increased system costs.

Recommendation:

The Commission should order the Program Administrators to meet minimum standards for processing CSI applications:

- 95% of all residential reservations should be issued in 30 days or less and 95% of all non-residential reservations should be issued in 60 days or less.
- 95% of all residential ICF claims should be processed in 30 days or less and 95% of all non-residential reservations should be issued in 60 days or less, unless there is an inspection.
- 95% of all residential ICF claims should be processed in 60 days or less and 95% of all non-residential ICF claims should be processed in 90 days, when there is an inspection.
- 95% of all projects should be paid within 30 calendar days after the ICF claims are approved.

The Commission should adopt consequences, such as fines or penalties, if the Program Administrators cannot meet these targets. Alternatively, the Commission should change Program Administrators if the processing times cannot improve.

3.2 Project Completion Time Requirements

The CSI Program Handbook governs the length of time consumers and contractors have to complete a solar project from the time the project receives a confirmed reservation, and it also contains exceptions and conditions for when the Program Administrators may allow for extensions. AB 2804 (Hayashi, 2008) specifically allows CSI participants that are schools to receive three 180-day extensions.

On their own accord, the Program Administrators modified the CSI Program Handbook to allow University of California and California State University (CSU) projects to receive three 180-day extensions.

There is a growing tension between customers wanting to keep their reservations even if it takes longer to complete their projects, and the CSI Program Administrators' concern that projects might remain in the queue indefinitely, essentially sitting on certain incentive levels, but preventing more viable projects from using the funds.

The Program Administrators are responsible for ensuring that projects have their reservations cancelled if they exhaust their reservation period. However, there is no easy checking mechanism to ensure that the Program Administrators are enforcing the length of time a customer can hold a reservation.

As of April 9, 2010, there were 322 MW of installed projects, and 246 MW of pending projects. Of those pending, 13 MW (or 5.3% of the MW) were more than 540 days old (greater than 18 months, or three 180-day extensions), yet PowerClerk has no easily verifiable method to determine whether a project that is greater than 18 months old has received a project extension for a legitimate reason. (Powerclerk does contain the information about deadlines and extensions, only it is not easily queried.) It is the responsibility of the Program Administrator to track extension dates and requests in Powerclerk, but this information is not easily verified by the Energy Division.

Almost 3,000 projects comprising over 178 MW of reservations have dropped out of the CSI program. It is important that nonviable projects are "encouraged" to drop out so that the incentives can be made available to other projects before the incentive levels drop to the next level.

Recommendation:

Consistent Policy on Extensions
Beyond applying the current policy more consistently, the Commission should determine whether certain types of organizations with inherently long project development lead times should be eligible for more extensions. The Program Administrators have currently extended extensions to educational institutions, but the same constraints exist for all government institutions. The Commission should consider adopting up to an 18-month extension for all public entities.

Enforcing Cancellations
The Commission should establish a process for ensuring that the Program Administrators do not allow projects to receive an incentive if they have failed to complete their project within their reservation period. The utilities appear reluctant to deny their customers incentives if they are making a good faith effort to get a solar project done. However, the Program Administrators need to enforce the program rules. The Commission should establish rules for what should be done if an audit finds that the Program Administrators have paid a project an incentive that is completed after the reservation period expired. Staff recommends that the Program Administrators should be required to pay for the rebate out of shareholder dollars instead of program funds (ratepayer dollars) if the rebate was paid to a project past its deadline. Since most CSI projects are abiding by the timeline deadline rules, the Commission needs to make sure that the CSI Program Administrators are fairly applying these rules to all projects and not making special exceptions.

3.3 Project Inspections Process

3.3.1 Background

The Commission established some parameters for the CSI inspection process (see D. 06-08-028, p. 50-52), most of which focused on inspections of EPBB systems. The Commission stated that project installers who fail three random inspections will no longer be allowed to participate in the program.

The Program Administrators have gained significant experience and incurred significant costs in implementing the inspection process for the CSI program. The Program Administrators recently revised the CSI Program Handbook's language regarding the inspection process. (See June 2010 CSI Program Handbook revision). As of June 2010, CSI Program Handbook has a "CSI Project Review" section, which details procedures to "address the severity of transgressions, correction opportunities, notification, and appeal mechanism". (D. 06-08-028, p. 51)

The inspection process has proved to be expensive for the Program Administrators. The following table outlines the costs of the inspection process. The costs identified below are the direct and indirect expenses and labor costs tracked by the Program Administrators. Some of the costs are for contractor expenses (inspections are sub-contracted) and some are for in-house labor at the Program Administrators. Although all Program Administrators are now tracking inspections as an expense report category, the three Program Administrators are not necessarily tracking exactly the same data points in this expense category, so it is difficult to draw conclusions about the data presented below. For example, CCSE clearly was not tracking expenses for inspections in 2007, and therefore their data skews low.

Table 10. CSI Program Administrator Reported Costs of Inspections

	2007	2008	2009	Total	# of Inspections through April 2010	Estimated Cost per Inspection
PG&E	$240,597	$1,042,831	$1,464,096	$2,747,524	2,637	$1,042
SCE	$34,994	$222,073	$424,974	$682,041	1,600	$426
CCSE		$18,000	$40,900	$58,900	466	$126
Total	$275,591	$1,282,904	$1,929,970	$3,488,465	4,703	$742

Sources: Cost of Inspections: CSI Program Administrator Expense Reports;
Total number of Inspections: PowerClerk, April 9, 2010.

Table 10 shows that inspection costs range from $126 to $1,042. The CCSE data appears to be low primarily because CCSE has uses "in-house" labor to conduct the inspections rather than contracting with a third party (which is how PG&E and SCE conduct inspections). The SASH Program Manager reports in their contract that contracted inspections costs $470 per inspection plus travel expenses for one contractor, and $250 per inspection for another contractor.

3.3.2 Inspection Sampling

The Program Administrators started the CSI program in early 2007 by inspecting 100% of all CSI projects; however, in September 2007, the Program Administrators moved to a sampling on a 1:7 basis, or 14.3% of all applications. The CSI Program Handbook requires that the program inspect 1:7 CSI projects.

The California Energy Commission's (CEC's) Senate Bill 1 (SB1) Guidelines require that all solar rebate programs in California inspect 1:7 systems. (This requirement is in the

CEC's "SB 1 Guidelines"[23] not the SB 1 law.) The CEC's SB 1 Guidelines adopted the 1:7 inspection sampling rate at least in part because the CSI Program had a one in seven inspection rate in the CSI Program Handbook in place at the time that the CEC was developing the SB1 Guidelines. (Fall 2007)

The SB 1 Guidelines also require certain field verification tests be conducted as part of the onsite inspections. The SB 1 Guidelines state that:

> "To be eligible for incentive payment, EPBI[24] applicants and PBI applicants whose systems are smaller than 50 kW shall be required to successfully complete third party field verification on a sampling basis. Field verification is encouraged for other PBI applicants. The field verification, at a minimum, shall include visual inspection of components, installation characteristics, and shading conditions. For EPBI systems only, performance shall be verified using the protocol described in Appendix 2 Field Verification and Diagnostic Testing of Photovoltaic Systems. The third party field verification shall be carried out on a minimum sample size of one in seven by a qualified Home Energy Rating System (HERS) rater, the program administrator, or a designated qualified contractor, as determined by the program administrator." (p. 19)

CSI Program stakeholders and the Program Administrators have expressed concern about both the 1:7 inspection requirement imposed by the CEC's SB 1 Guidelines because of the cost of inspections (see table above), as well as the stringency of the field verification and testing protocols adopted in Appendix 2 of the CEC Guidelines. The SB1 Guidelines' field verification protocol limits the inspection of systems to between 10 am and 2 pm (because it requires a solar irradiance be at a certain level, which can only be attained during four hours of the day), which significantly increases the cost of the inspection process because it limits the time that field personnel can conduct the inspections.

In D. 06-08-028, the Commission required the Program Administrators to inspect every project between 30-100 kW:

> We find it reasonable to require program administrators to verify system characteristics for all systems between 30 kW and 100 kW, as these larger systems will receive significant ratepayer investment through the EPBB incentive. (p.51)

The Program Administrators are not inspecting 100% of all EPBB system, see Table 11. The Program Administrators are sampling between 12.4% and 62.7% of applications, depending on the type of incentive and system size.

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[23] CEC's SB1 Guidelines: http://www.energy.ca.gov/sb1/meetings/index.html

[24] The California Energy Commission uses the terms EPBI for expected performance based incentive, and the CSI program typically uses the acronym EPBB for expected performance based buydown. They refer to the same thing: an upfront incentive paid based on an estimation of the performance of a system considering the design characteristics of that system.

Table 11. Number of Inspections of Completed Projects by Program Administrator, Incentive Type and Projects Size.

		Over 30 kW?	Number of Projects	Number of Inspections	Percent Inspected
CCSE	EPBB	No	3,480	431	12.4%
		Yes	26	9	34.6%
	EPBB Total		3,506	440	12.5%
	Five Year PBI	No	94	8	8.5%
		Yes	53	18	34.0%
	Five Year PBI Total		147	26	17.7%
CCSE Total			**3,653**	**466**	**12.8%**
PG&E	EPBB	No	16,515	2,376	14.4%
		Yes	164	97	59.1%
	EPBB Total		16,679	2,473	14.8%
	Five Year PBI	No	110	69	62.7%
		Yes	252	95	37.7%
	Five Year PBI Total		362	164	45.3%
PG&E Total			**17,041**	**2,637**	**15.5%**
SCE	EPBB	No	6,593	1,435	21.8%
		Yes	76	32	42.1%
	EPBB Total		6,669	1,467	22.0%
	Five Year PBI	No	170	72	42.4%
		Yes	149	61	40.9%
	Five Year PBI Total		319	133	41.7%
SCE Total			**6,988**	**1,600**	**22.9%**
Grand Total			**27,682**	**4,703**	**17.0%**

Data: PowerClerk, April 9, 2010. This table counts projects in the status "Pending Payment, PBI-In Payment, and Completed". This table counts as an "Inspected" project any project where "Last Inspection Action" data field is non-blank. This table counts "Over 30 kW" based on the "CEC-AC Rating" field.

The Program Administrators have different practices for inspecting PBI systems. SCE and PG&E have inspected over 40% of all PBI systems, but CCSE has inspected only 17% of systems. SCE inspects some PBI systems twice, once for CSI program compliance purposes and once for PBI meter accuracy.

Recommendation:

The Commission should undertake a review of the cost-effectiveness of the inspection requirement overall, including the sampling rate of the inspection rate.

The Program Administrators should file an Advice Letter with an annual Inspection Plan for the number of systems to be inspected, and the sampling method that will be used to pick the number of sites. The Program Administrators do not need to inspect one in

every seven sites randomly. They can instead choose to inspect contractors more frequently when the contractors are new to the program and less frequently when the contractors have passed all of their inspections.

In their plan, the Program Administrators should address whether the 1:7 requirement imposed by the CEC's SB1 Guidelines is too stringent from either a cost perspective or utility requirement, and the Program Administrators and Energy Division should work to provide information on the cost of inspections to the CEC and potentially request modifications to the CEC's SB 1 Guidelines.

Even though most of the EPBB projects between 30 kW and 100 kW are being phased out (because over 30 kW must now take PBI), the Commission should reiterate that all EPBB projects over 30 kW should receive an inspection.

The Commission should enforce a minimum of 1:7 sampling of all EPBB systems and create a consequence for the Program Administrators if they do not comply, assuming that 1:7 continues to be the required sampling rate.

The Program Administrators should inspect all PBI systems to ensure that the equipment is in fact present and generating electricity. Just because the PBI projects provide the CSI Program with performance data does not mean that the systems should not be inspected. The Program Administrators also should be required to annually report to the Energy Division on their inspections program, including the sampling rate for the inspections and the common issues found in inspections.

3.3.3 Inspection Cost

The Program Administrators would like to consider the inspection costs as part of the measurement and evaluation budget. As shown in Table 10, inspections are estimated to cost between $426 and $1,042 per inspection. In addition to these direct costs, the inspections have additional costs in terms of administrative scheduling and recording of inspections.

Recommendation:

The Program Administrators should not charge the inspection costs towards the evaluation budget, and the Program Administrators should continue to charge inspections to the administration budget. Allowing the Program Administrators to count inspections as part of evaluation will diminish the amount of budget that is available for evaluation studies. The inspections are part of the administration of the program. The Program Administrators should be encouraged to find efficiencies in the inspection process, including using lower cost labor for conducting the inspections.

The Commission should establish that the purpose of the inspection process is both to ensure that the program rules are being followed and to ensure that consumers are getting

systems properly installed. The Program Administrators are welcome to propose to the CPUC methods to achieve these goals in ways that reduce the total overall cost of inspections.

3.3.4 Suspension from CSI Program

The CSI Program Administrators are responsible for enforcing the Commission decision that stated that if a contractor fails three or more inspections, it will be suspended from the program (D. 06-08-028, p.51). The CSI Program Administrators later changed the Program Handbook to allow large-volume solar contractors with more than 200 installations per year to receive up to five failures per year. The CSI Program Administrators have made further modifications to the Program Handbook to allow certain inspection errors to count as failures, and other inspection errors to count as "minor infractions," with three minor infractions equal to a failure.

The CSI Program Administrators are jointly tracking failures across the three territories. The Program Administrators have put contractors on probation for receiving a number of failures, as well as suspended contractors for exceeding the allowable failures.

Recommendation:

The original Commission decision language on failures is quite narrow, and as the program has gained experience it may be valuable for the Commission to refine this area of program management.

The Commission should expressly state that the purpose of the CSI inspections (and program suspension) rules is to ensure program integrity, but not at an unreasonable level of cost. The Program Administrators incur considerable cost to conduct inspections, and the contractors incur costs to avoid failures and participate in on-site inspections.

The Commission should explicitly modify the program suspension rules to accommodate the large volume solar contractors, endorsing the current practice described in the Program Handbook. The Commission should modify D.06-08-028 to accommodate the difference between minor infractions from failures, similar to the June 2010 CSI Program Handbook revisions.

The Commission may wish to establish a dispute resolution process for contractors that are suspended from the program.

3.4 PMRS Cost Cap Exemption for EPBB Systems

The Commission has issued several decisions related to metering and performance monitoring of PV systems installed under the CSI Program. In D. 06-08-028, the Commission stated:

> While the Commission would like data for all solar systems to be accessible remotely to both support solar technology improvement and to support monitoring and evaluation data requirements, we are concerned that requiring this capability without limits could become a cost barrier. (p.76)

In light of that concern, in D. 06-08-028, the Commission established the metering cost cap:

> "…the total cost of the minimum metering, communication, and reporting system over the first five years for each solar installation size grouping shall be less than 1% of total installed solar project cost for systems up to 30 kW. For larger systems, we choose a middle ground cost cap of less than 0.5% to be somewhat conservative in the expense that owners of larger systems will have to incur. If the communications functions should cause anticipated five-year expenditures to fall outside the cost cap, we urge the metering subgroup to find some effective solution for performance feedback to solar owners while still remaining within the cost cap applicable to the different system sizes. (D. 06-08-028, p.77)

Nonetheless, the Commission decisions require all PBI and EPBB systems to be metered, but allowed EPBB systems to apply for a "cost-cap exemption" if the cost of performance monitoring and reporting services (PMRS or metering) exceeded 1% of the total system cost. The vast majority of EPBB systems under 15kW take the cost cap exemption. To qualify for the cost cap exemption, applicants need only show that they have one bid higher than the cost-cap. There were no parameters put on what the bid must include, and therefore, PMRS providers may have been asked to provide high bids for deluxe services. PMRS providers may be able to provide some services below the cost cap, but if an applicant is trying to avoid the PMRS requirement, they can simply ask for a larger bundle of PMRS services.

The PMRS providers have been inundated with requests for bids to satisfy a program requirement. The PMRS providers, who stand to benefit from a metering requirement, are doubly frustrated by the cost cap exemption because they get large volumes of requests for cost quotes "solely to demonstrate that PMRS service cost would exceed the cost cap."[25] It is easy to ask for a quote for a complicated metering system that will cost more than 1% of the cost of the system. Frequent CSI program applicants (the large solar companies) routinely file the same exact cost cap exemption paperwork over and over again to satisfy a program requirement.

In D. 08-01-030, the Commission reaffirmed the PMRS requirements and the EPBB PMRS Cost Cap. The current metering and reporting requirements are identified in the Table below:

[25] CSI Metering & Performance Monitoring Market Assessment, KEMA, Inc., Section 2.5.1.

Table 12. CSI Metering and Monitoring Rules

Incentive Type	System Size	Minimum Meter Accuracy	Performance Communication and Reporting Requirement	Cost Cap
EPBB	< 10 kW	+/- 5%	Yes	1%
EPBB	10 kW to 30 kW	+/- 5%	Yes	1%
EPBB	30 kW and greater	+/- 5%	Yes	.5%
PBI	< 10 kW	+/- 2%	Yes	No Cost Cap
PBI	10 kW to 30 kW	+/- 2%	Yes	No Cost Cap
PBI	30 kW and greater	+/- 2%	Yes	No Cost Cap

Source: D. 07-07-028, Ordering Paragraph (OP) 1.

To the extent that the Commission requires PMRS services be taken by solar customers, the Commission also intended that the stream of project performance data would be communicated to the Program Administrators for evaluation and planning purposes.

The Commission stated in 2006,

> "We will require that performance information be communicated to customers and program administrators as soon as feasible, and we direct Energy Division to ensure this issue is addressed in the initial draft CSI Program Handbook. (D. 06-08-028, p.80)"

CSI participants sign a CSI rebate program contract that allows their system information to be used for the purposes of program implementation. However, the signatory of the CSI rebate program contract is often different than the owner or operator of the PMRS service (if PMRS is taken by customers). Since PMRS providers are not directly under contract to the CSI Program, there has been a question of whether PMRS providers are required to turn over the data to the Program Administrators. The CPUC and California Energy Commission staff have made sure that only PMRS providers willing to provide the CSI program with data can be considered "Eligible PMRS providers" on the Go Solar California equipment vendors listing.[26] In light of their desire to remain listed, PMRS providers are now providing EPBB performance data on a regular basis to the program. There is a clear CSI Program Handbook requirement that states all CSI program participants must provide the program with access to performance data.

In D. 07-07-028 (OP 4), the Commission required the Program Administrators to undertake a Meter Market Assessment to identify better information about the costs of metering services. The Assessment report included a survey of 37 PMRS/PDP providers, of whom, only 13 were willing to respond about the range and cost of their services. The Assessment was conducted and paid for by the CSI general market program administrative budget.[27]

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[26] See Go Solar California list at: http://www.gosolarcalifornia.org/equipment/perf_monitor.php

[27] The meter market assessment is available for download here: http://www.cpuc.ca.gov/PUC/energy/Solar/evaluation.htm. Although the report is an evaluation report, it was

The Meter Market Assessment was completed in August 2009 by KEMA and concluded, among other things, that the Cost Cap Exemption has been a "problem" in the CSI Program. The report recommended that the CPUC either eliminate the cost-cap or eliminate the metering requirement since there is such severe "gaming" going on. If the program eliminates the cost-cap, then the Program needs to clearly define (which it has not until this point) the minimum metering and reporting requirements.

The cost ranges in service offerings for PMRS service can vary. A full system monitoring PV output, weather conditions, and building consumption can cost approximately $1,500-$3,000. A simpler system that only measures PV output can cost approximately $300-$500.

The small number of EPBB systems with metered data subject to the PMRS requirement, which includes a provision that those sites must supply the program with actual performance data, has proved particularly perplexing for the evaluation of the program.[28] Without access to large quantities of existing metered data, determining the performance of solar systems in the CSI program has proved quite costly. For example, the CSI Impact Evaluation has begun to install meters on some EPBB sites at a significant cost (originally estimate at $6,000 per EPBB site). The cost of metering post-installation is significantly higher because it involves recruiting customer participants and making completely separate installation trips to the customer site. The cost is also high because it includes hanging a meter and a meter communication device (e.g. cellular modem) at a customer location and then reading the data regularly for a number of years.

The CSI program evaluators were not able to hang meters at EPBB sites prior to the completion of the 2009 Impact Evaluation. Therefore, to conduct the 2007-2008, as well as the 2009 studies, the CSI program evaluators used only that data that was available from EPBB sites.

The market for metering and monitoring services has changed in the past several years. Many solar companies now offer a wide range of PMRS services. Some basic PMRS service – if defined as being 15-minute interval kilowatt-hour production data from the solar system plus a means of communicating that information to the customer – can be provided at a quite low cost, less than $500 per site. Some PMRS service is being offered routinely by customers, but sometimes it is difficult to parse the exact cost of such service when it is bundled in with a variety of other solar system product, such as installation, warranty, labor, etc.

Recommendation:

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initiated before the authorization of the CSI Measurement and Evaluation budget; therefore, it was funded out of the CSI general market program administrative budget, not the evaluation budget.

[28] As previously mentioned, the vast majority of EPBB systems have taken the PMRS cost cap exemption. The CSI Program Evaluators are receiving some PMRS data on EPBB systems from some sites that did not take the cost cap exemption, as well as some that took the exemption but then installed metering anyway.

The Commission should eliminate the EPBB metering cost-cap exemption and require that all EPBB customers take PMRS service. The Commission should require that all CSI systems with PMRS service report 15-minute interval kWh production data to the Program Administrators on a quarterly basis for five years.

The Commission should require that the CSI Program Handbook adopt a definition of PMRS service required, initially defined as being the ability to collect and deliver to the customer 15-minute interval kilowatt-hour production data from a solar system.

The Commission should require all EPBB systems over 15 kW to report the data to the Commission on a quarterly basis for 5 years.

The Commission should offer a selected sample of EPBB customers under 15 kW a flat $100 annual incentive to install PMRS and turn over the data on a quarterly basis to the Commission for up to five years. (This recommendation is repeated in Section 4.6 on M&E Funding for Metering.) This recommendation might cost between $5-$10 million, and needs to be evaluated in light of the overall M&E budget and evaluation plan objectives.

3.5 Program Administrator Reporting Requirements

The Program Administrators are currently required to file a variety of reports related to the program with the Commission related to the progress of the CSI program. These reports include the following:

- Expense Reports, on a semi-annual basis
- Letters to the Energy Division Director whenever there is an incentive level change
- Quarterly reports on the percent of incentives committed or paid on a PBI basis
  - "We will require quarterly reporting by the program administrators to the Director of the Energy Division on the percent of incentives committed or paid on a PBI basis." (D. 06-12-033, p.14)
- The MASH program semi-annual program updates
- The SASH program quarterly program updates

The Energy Division has required that the Program Administrators develop a quarterly report, called the Data Annex, tracking some administrative processing statistics, such as length of time to review applications.

There is no Commission-imposed ongoing program reporting required of the Program Administrators for the bulk of the activity under the general market program, including marketing and outreach activities. The Program Administrators are currently required to file annual marketing and outreach plans via advice letter with the Energy Division, as well as semiannual M&O updates that offer feedback on progress achieved by certain activities.

A large amount of information about the program's progress is available through the public reporting site, California Solar Statistics, without the Program Administrators having to actively report it to the Commission. The Energy Division has compiled key program progress information in its quarterly reports using California Solar Statistics. The Program Administrators host a quarterly Program Forum that often presents a large quantity of information about the status of the program, in addition to information about potential changes. As part of the marketing of the program, the Program Administrators issue a monthly newsletter (with a circulation of over 8,000 readers) that contains information about the program.

The Commission is required to submit a report to the legislature each June on the progress of the CSI program. To the extent possible and feasible, the Program Administrators should prepare information on the program progress in advance of the Commission's legislative reporting needs.

The Commission ordered the Program Administrators to file semi-annual expense reports in D. 07-05-047. The Energy Division has worked with the Program Administrators over the past three years to come up with a format to convey information in a useful and comparable manner (across the three Program Administrators). These expense reports contain public information, but they generally are not publicly available.

Recommendation:

The general market Program Administrators should be required to submit to the Commission a consolidated report on a periodic basis about the progress achieved under the general market program. (The MASH and SASH programs are already required to submit reports.) The periodic report should summarize program progress (data), recent program changes, recent M&O activity, recent M&E activity, status of incentives reserved and paid, and should identify programmatic issues that should be brought to the attention of the Commission. For example, the report could identify required program changes, especially areas where the Program Administrators have been unable to implement a Program Handbook change.

The Commission should require that the semi-annual Expense Reports be submitted via Advice Letter so that the Energy Division has to review and approve the expense report information. The purpose of this process is mainly to ensure that the information is presented in a clear and consistent manner that can be used for later analysis.

The Commission should provide the Energy Division with parameters for approving or rejecting the expense reports. Any rejections could only be made via a Resolution in response to an Expense Report advice letter filing.

3.6 Administrative Budgets

The Commission has limited the administrative budget of the Program Administrators to 5 percent of their total budget. The Commission did not adopt annual budget targets for the Program Administrators who claim prudent spending despite the fact that the early years of the program bore the high cost of the development of systems and tools to run the program. The Program Administrators have noted that in lower incentive steps of the program, the Program Administrators are going to process a far larger volume of applications which will lead to higher (rather than lower) annual administrative costs.

Table 13. Administrative Spending per Program Administrator

PGE	2007	2008	2009	Total
Total Budget	$4,145,164	$4,889,372	$3,064,928	$12,099,464
Expenditures	$3,400,955	$5,969,607	$6,206,369	$15,576,931
Balance	$744,209	($1,080,235)	($3,141,441)	($3,477,466)
CCSE				
Total Budget	$976,955	$1,055,446	$955,115	$2,987,516
Expenditures	$898,464	$1,077,286	$1,231,317	$3,207,067
Balance	$78,491	($21,840)	($246,202)	($189,551)
SCE				
Total Budget	$4,363,330	$6,252,224	$4,637,344	$15,252,898
Expenditures	$2,474,436	$5,978,210	$7,610,255	$16,062,900
Balance	$1,888,894	$274,014	($2,972,911)	($810,002.9)

Source: Expense Report

The expense reports asked the Program Administrators to consider their total administrative budget, divide it by 10 years of the program, and compare each year's expenditure to that year's budget. As shown in Table 13, all of the Program Administrators appear to have been slow to spend money in 2007, but even considering the rollover of extra funds from 2007, the Program Administrators all appear to be close or exceeding their administrative budget allocations. However, the Commission only provided the Program Administrators with a 10-year budget, and so it is difficult to assess whether the current spending patterns will leave the Program Administrators overspent since it will be several more years before they exceed their 10-year budget caps.

Each of the parts of the CSI program (RD&D, SASH, MASH, etc.) has its own administrative budget. Occasionally, there are administrative expenses that span all of the programs and/or do not neatly fit into one of the program categories. There are also instances of minor administrative costs associated with processing contracts, incentive applications, or other paperwork for the RD&D and SASH programs. The CSI general market program administrative budget is the largest administrative budget. The Program Administrators should be allowed to charge administrative expenses related to these

miscellaneous (or cross-cutting) functions to the CSI general market program administrative budget.

Recommendation:

The Commission needs to consider whether to allow cost-overruns in the administrative budget. The Commission also needs to consider whether to include any parameters addressing the exclusion of certain costs from administration.

It also seems reasonable that the Program Administrators may need more funding for program administration. It is a fact that the Program Administrators are going to process more applications in the later half of the program (as incentive levels decline and number of projects increase).

The Commission should consider increasing the amount of monies available for the administration of the program but should put bounds around what may be acceptable spending levels. The Commission may need to consider what other budget can be cut (e.g. marketing and outreach or measurement and evaluation) to attain this objective. The Commission may also need to seek administrative streamlining to lower administrative costs of processing CSI applications.

The Program Administrators should be allowed to charge administrative expenses related to miscellaneous (or cross-cutting) functions to the CSI general market program administrative budget.

The Commission should clarify that since there may be a need for administrative costs beyond December 31, 2016[29], the Program Administrators need to reserve funds for post-2016 program administration tasks, and the Commission should indicate whether those costs need to be borne by the current administrative budget levels.

The Commission should further establish consequences if the Program Administrators exceed their allocated administrative budgets. For example, the Program Administrators could be required to pay for administrative cost overruns from shareholder dollars.

3.7 Design Factor for Calculating Payment to EPBB Projects

A major factor in the Expected Performance Based Buydown (EPBB) incentive formula is the "design factor," which is a ratio comparing a given solar facility's expected output to that of an optimal or reference system. The Commission established the parameters for calculating the design factor in D. 06-08-028, p. 44-50. The design factor is measured relative to a reference, or "optimally designed," solar system. The factor equals the ratio

[29] For example: A government project applies for the CSI program on December 31, 2016 and then takes 3 years to complete receives PBI payments for five years after project completion. Such a project will finish being paid CSI incentives in 2024.

of simulated solar output for a customer's specific system divided by the simulated output for an optimal reference system.

$$\text{Design Factor} = \frac{\text{Simulated solar output of customer's proposed system}}{\text{Simulated solar output for optimal reference system}}$$

The Commission further directed the development of the design factor calculation tool.

"We direct the program administrators to ensure a set of technical protocols and a corresponding user-friendly estimation tool (either software or a set of reference tables) are developed to calculate the design factor for each solar incentive application." (D. 06-08-028, p.48-49).

The Program Administrators have developed the "EPBB Calculator," which is available at http://www.csi-epbb.com/. It is an online tool that calculates the design factor of a given project. The design factor is multiplied by the solar system size to determine the incentives that are paid to that project. The required system inputs in the EPBB Calculator are zip code, utility, customer type, incentive type, equipment (PV module, number of modules, inverter type, number of inverters), equipment mounting method, shading, tilt, and azimuth.

In practice, the EPBB design factor is capped at 1.0.[30] In D.06-12-033 the Commission did not cap the design factor at 1.0, although a reading of Table 6 in Appendix B could suggest this. In any event, the Program Administrators capped the design factor to support budget certainty. For EPBB projects, a project with a design factor of greater than 1.0 is capped at 1.0, and thus receives an incentive equal to 1.0 times the available incentive. For PBI projects, a project with a design factor of greater than 1.0 is recorded in Trigger Tracker as the actual system size (e.g. 1.3 kW counts against the MW step table if the design factor is 1.3). EPBB projects could be treated the same way as PBI projects and not cause budgetary uncertainty.

Under current program rules, a solar system receiving an EPBB incentive can receive no more than 100% of the available incentive, but a well-designed PBI project can receive more than 100%.

The concept of the design factor is meant to provide an incentive payment based on the expected performance of a system. The implementation of design factor has led to the reality that a system designer can receive a lower payment for a system that is expected to perform worse than the reference system, but cannot be rewarded for a system that performs better than a reference system. The reference system location in the current EPBB calculator is mid-state, so the design factor cap disadvantages projects in southern California that might otherwise have design factors of greater than 1.0. Regardless of where the reference system location is in the state, projects that are designed optimally (or even greater than optimal) should be paid more than systems that are designed only to the reference standard.

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[30] The EPBB Calculator User Guide states numerous times that the design factor is capped at 1.0. http://www.csi-epbb.com/CSICalculatorV4UserGuide.pdf, see page 8 for geographic correction and installation correction.

The design factor cap was introduced, at least in part, to minimize uncertainty around the CSI budget. However, D. 07-05-007 ordered the Program Administrators to use the design factor when tracking system size against the total number of MWs available per step, so it follows that paying EPBB systems based on the actual design would not affect the budget so long as on a per system basis the Program Administrators tracked the right number of MWs in the CSI Trigger Tracker.

As shown in Table 14, the average design factor in the program is 0.94 for EPBB systems and 1.01 for PBI systems. It appears from reviewing PowerClerk data that EPBB systems cannot be recorded as having a design factor of greater than 1.0.[31] As we would expect, based on their geographic location, SCE and CCSE have higher design factors, on average, than does PG&E.

Table 14. EPBB Projects and Design Factors by Program Administrator

Incentive Type	Program Administrator	Number of Projects with Design Factor >0.90	Percentage	Number of Projects with Design Factor <0.90	Percentage	Grand Total	Average Design Factor
EPBB	**CCSE**	3,559	95.1%	183	4.9%	3,742	0.97
	PG&E	13,643	78.1%	3,827	21.9%	17,470	0.93
	SCE	6,777	94.0%	432	6.0%	7,209	0.97
EPBB Total		23,979	84.4%	4,442	15.6%	28,421	0.94
Five Year PBI	**CCSE**	153	96.8%	5	3.2%	158	1.02
	PG&E	288	76.8%	87	23.2%	375	0.96
	SCE	342	99.1%	3	0.9%	345	1.07
Five Year PBI Total		783	89.2%	95	10.8%	878	1.01
Grand Total		24,762	84.5%	4,537	15.5%	29,299	0.95

Source: CPUC, PowerClerk, April 9, 2010. Data shown includes only "installed" projects.

The EPBB Design Factor is 'capped' at 1.0 which effectively means that the program only can lower rebates to that have an expectation of poor performance, but cannot reward systems expecting superior performance.

[31] This limitation in the collection of design factor data leads to a systematic downward estimation of the range of expected EPBB performance. The CSI 2009 Impact Evaluation compared expected EPBB performance to actual EPBB performance, using some EPBB metered data. The EPBB systems outperformed expectations, but the expectations were based on design factor data that is capped at 1.0. If the program was recording actual design factor data, it would be better able to predict and assess the actual performance of EPBB systems.

The EPBB Design Factor cap may also force some projects to take the Performance Based Incentive (PBI) payment method to maximize their incentive value. While the Commission supports paying more projects on a PBI basis, the administrative costs of cutting 60 checks to small projects is significant. As shown in Table 15 and Table 16, the rate of projects "opting-in" to PBI is three times (or more) higher in southern California than PG&E's territory. There are two tables because in 2007 projects over 100 kW were required to take PBI, and there were 167 projects (out of a total of 6,655) less than 100 kW projects that opted-in to PBI as a means of payment. In 2008, projects over 50 kW were required to take PBI, and there were 154 (out of 9,994) projects under 50 kW that opted-in to PBI. As of 2010, projects over 30 kW are required to take PBI.

Table 15. 2007 CSI Projects that Opted into PBI

System Size	CCSE	PG&E	SCE	Total
<30kW	20	63	38	121
30<50kW	4	8	4	16
50<100kW	6	12	12	30
Total	30	83	54	167
# of Systems <100kW	550	4,776	1,329	6,655
% of Systems <100kW in PBI	5.50%	1.70%	4.10%	2.50%
% of Systems <100kW in EPBB	94.50%	98.30%	95.90%	97.50%

Source: PowerClerk, April 9, 2010

Table 16. 2008 CSI Projects that Opted into PBI

System Size	CCSE	PG&E	SCE	Total
<30kW	35	32	74	141
30<50kW	2	10	3	15
Total	37	42	77	156
# of Systems <50kW	1,031	6,393	2,570	9,994
% of Systems <50kW in PBI	3.60%	0.70%	3.00%	1.60%
% of Systems <50kW in EPBB	96.40%	99.30%	97.00%	98.40%

Source: PowerClerk, April 9, 2010

Recommendation:

The cap of the EPBB design factor should be reconsidered for the purposes of calculating incentives to be paid to customers on an individual project basis.

The potential budgetary impact of this recommendation is likely very small, but the system performance outcome of this recommendation could be very large. In addition, this recommendation would allow system owners to be automatically educated about the value of a high performing system. This recommendation would seek to align the EPBB portion of the program with the Commission's overall goal to pay incentives based on

performance. The cap on EPBB incentives may be deterring contractors from truly optimizing systems. The actual design factor (even if greater than 1) could be used for the purposes of calculating the progress towards the MW steps, thus addressing any concerns that this approach may have on the budget certainty. The PBI part of the program already allows for the actual design factor and tracks MWs accordingly. Any pending projects that have not filed an ICF by the date of Commission action on this recommendation should be eligible for the uncapped design factor EPBB incentive.

The Commission may wish to proceed with this Recommendation only after further examination of its potential budgetary impact. The staff notes that net energy metering serves the same general purpose of providing an ongoing encouragement for customer's to maximize the energy output of their solar systems.

3.8 EPBB Calculator Integration with PowerClerk

Energy Division staff notes that the EPBB calculator implementation has faced several complex challenges.

- The calculator is separate from the CSI program's online application processing database, PowerClerk. This limitation means that all applicants to the CSI program have to go to the online calculator and type in their system characteristics to get a design factor. The applicants then have to type the same information into their CSI application in PowerClerk, as well as attach (or upload) a PDF file of their "EPBB Print out" to document their project's design factor.
- The PowerClerk database does not capture all of the system characteristic fields that are used to generate the Design Factor in the EPBB Calculator. For example, PowerClerk is missing the shading information about projects. Solar system characteristics can be used to generate "simulated" solar system energy generation; however, without the shading information, the accuracy of the system characteristic dataset is significantly reduced. The shading information is contained on the "EPBB printout" that is attached to the CSI application, but the data is not in a format that can be easily mined by evaluation consultants.[32]
- The EPBB Calculator is not transparent to users. The user interface does not produce results that can easily be understood by a solar customer. The solar contractor community has "gotten used to" the user interface, but it has not developed as a consumer educational tool that demonstrates to customers how to optimize the performance of their solar system. Since the EPBB Calculator is expressly not intended to be used for other purposes other than calculating an incentive; the program tool misses opportunities for the rebate application process itself to be an outreach mechanism to educate customers about how to ideally design their system.[33]

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[32] The recent CPUC Net Energy Metering Cost-Effectiveness evaluation relied upon solar production simulation data to estimate the solar production of existing solar systems. PowerClerk system installation characteristics were used in the simulation, but the simulation lacked granularity because of the lack of shading data.

[33] The EPBB Calculator User Guide states: "Contractors, participating customers, and other interested parties should utilize the calculator only to determine an appropriate incentive when applying to the CSI

Recommendation:

Staff recommends that the Program Administrators be required to integrate the EPBB Calculator, or even a further simplified calculation of expected performance, into the CSI online database, PowerClerk. The Program Administrators have been considering various ways to make this change for several years.

The CSI Program online application database should capture all of the EPBB Calculator data fields (including shading) so that the calculation can occur either in PowerClerk, or in such as manner as to appear to be run in PowerClerk from a user perspective. D. 06-08-028 stated that a "single database of project information would provide a valuable tool for ongoing program assessment." (p. 63)

Staff recommendations are based on an assessment of what is necessary for ongoing program assessment. Furthermore, the EPBB Calculator, to the extent that it is a CSI program tool or resource, should be modified to ensure that it does not merely calculate the amount of money paid to a solar customer, but that it can also promote solar customer understanding of how modifications to system design characteristics can improve both the customer's rebate and the customer's solar system production over the long-term.

The Program Administrators are currently working on integrating the EPBB Calculator into PowerClerk even in the absence of a Commission order; however, the Staff includes this recommendation in this proposal to reiterate the importance of doing so. Further, if the Program Administrators have not acted by the time the Commission acts on the Staff Proposal, the Commission can provide guidance to the Program Administrators on the importance of this issue.

3.9 Payment Intervals for Performance Based Incentive Payments

In D. 06-08-028, the Commission established that systems above certain size limits were required to be paid on a PBI basis. The Commission also allowed that any solar system, even those of a smaller size, can "opt-in" to PBI (p. 27). As shown in Table 15 and Table 16, there are a number of smaller systems that have opted into the PBI incentive structure.

However, small systems with little generation present a large payment processing burden to the Program Administrators. In D. 06-08-028, p.36-37, the Commission required the payments to be made monthly. However, the original staff proposal had recommended "monthly payments, on utility bills, if possible, with quarterly payments if monthly payments prove too administratively costly or burdensome" (p.36). The quarterly payments concept was not adopted in the final decision. Staff has attempted to investigate the administrative cost of issuing monthly vs. quarterly PBI payments. Thus

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program. Additional uses for the calculator other than its intended purpose as stated above are not endorsed or encouraged."

far, the Program Administrators have been unable to identify the exact cost of making PBI payments on a monthly basis.

In D. 06-08-028, the Commission expressly stated it would "consider the impact of applying a PBI mechanism to all systems over 30 kW" (p.106). It is difficult to assess the impact of applying the PBI mechanism to all systems without an accurate assessment of the cost of issuing 60 checks to PBI participants.

The "on bill" PBI payment concept was not adopted in the final decision, and there is no utility making PBI payments "on bill". It is unlikely that PBI "on bill" payments would be worthwhile since many PBI projects have third party ownership[34], wherein the PBI payment is designated to go to an entity other than the host customer.

Recommendation:

In order to minimize the administration costs of the PBI payment issuance portion of the CSI program, the Commission should allow Program Administrators to have the discretion to pay solar projects earning incentive payments of less than a certain amount per month (e.g. $50 or $300 a month) on a quarterly or semi-annual basis instead of monthly.

3.10 Eligibility of Multiple EPBB Projects

One issue that has come up is whether a site can receive multiple EPBB systems that are smaller than 30 kW, and what to do if a site with an existing system funded under CSI wants to add to capacity to the system such that the total system (including the addition or additions) would exceed the 30 kW limit on EPBB.

Thus far, the Program Administrators are allowing multiple EPBB systems that result in systems larger than 30 kW so long as the second system is installed after completion of the first system. The Program Administrators have also tried to avoid a situation where one customer site has two solar systems, one paid for by EPBB and one paid for under PBI because under this complicated scenario, tracking performance for the PBI portion of the system would need to be metered separately.

The Program Administrators are currently allowing multiple EPBB systems, so long as they are each filed as a separate project application (and the first one must be complete before the second one starts). This program rule could lead to some gaming, whereby some customers install multiple EPBB systems – each under 30 kW – instead of filing them as one large system under a PBI.

[34] For a breakdown of third party-ownership rates by incentive type, see the CSI 2009 Impact Evaluation, June 2010, Section 2. From 2007 to 2009, 12% of projects are third-party owned (with that percentage increasing each year), and 40% of the program MWs are third-party owned.

Recommendation:

The Commission should affirm that it is acceptable to allow multiple EPBB projects all at the same site, so long as each project is less than 30 kW, and each project is finished before a new reservation is issued for the next project. The Commission should consider whether any other modifications to this rule area are required.

3.11 Revising the Application Processing Program Application Database and Confidentiality

In D. 06-08-028, the Commission ordered the Program Administrators to develop a single statewide program administration database "to streamline the CSI application process as well as administration and data collection activities". (p. 63). The CSI Program Administrators achieved part of this milestone in late 2007 when they all started using an online database called PowerClerk. In the past several years, the Program Administrators have invested significantly in the technical capabilities of PowerClerk[35] and in January 2010, the program achieved the goal of allowing applications to be submitted fully online, with the addition of a document upload feature in PowerClerk.

PowerClerk Functionality

Energy Division staff has actively participated in the discussions around the development of PowerClerk on a weekly basis for the past several years. Energy Division has participated in the discussion on a collaborative basis, but Energy Division is not under direct Commission order to ensure that the Program Administrators make changes to PowerClerk that might facilitate program evaluation. The Program Administrators manage the technical services contract for PowerClerk, which is charged to their administrative budgets, and are generally (and appropriately) cautious about modifying the program database due to the expense incurred to do so.

The Commission decision that ordered the Program Administrators to establish a statewide online application database did so with the intention that the database would be useful for evaluation purposes. In D. 06-08-028, the Commission stated:

> "We remain convinced that a statewide online application system will enhance the ability of customers to take advantage of our solar programs. In addition, a single database of project information would provide a valuable tool for ongoing program assessment." (p.56)

Although the purpose of the online application database was program assessment, which can be interpreted to mean both near term program monitoring as well as longer term

[35] Recent expense reports demonstrate that the Program Administrators have spent over $3.7 million in database development over the first three years of the CSI Program.

program evaluation, some aspects of the database continue to prove frustrating in terms of functionality. Powerclerk faces challenges typical of any large database, including data integrity and missing data when new fields are added.[36] PowerClerk does not contain the information from Trigger Tracker, which the Program Administrators maintain separately to track the availability of MWs in each incentive step level. Powerclerk does not contain the EPBB Calculator. The issues with PowerClerk have made evaluation more cumbersome, and the differences between PowerClerk and Trigger Tracker are nearly impossible for the Energy Division to audit or compare.

Confidentiality and PowerClerk Data

The Program Administrators have decided to make certain PowerClerk fields public and retain other fields as confidential. The Commission addressed confidentiality in a limited basis in 2006:

> "Once the program database is established as described above, the data it contains should initially be accessible only to the program administrators and CEC and Commission staff. We will direct the CSI Program Forum, which we discuss below, to address broad access to non-confidential information in the database and consumer-oriented summary statistics, so the general public can monitor program details.[37]" (D. 06-08-028, p.64)

The footnote refers parties to R.05-06-040 (and D. 06-06-066) related to confidentiality; however that rulemaking did not handle confidentiality of program information for customer-funded incentive programs, and it focuses almost exclusively on utility electricity supply procurement related data, or data related to projects that are on the utility-side of the meter.

The public data set from PowerClerk currently deletes some information from public viewing, including the Host Customer name and Host Customer address. The program Administrators collect and store solar project performance data on PBI projects separately from the PowerClerk database (that hosts the system design characteristics).

The CPUC staff is regularly contacted by researchers interested in access to the full data set of PowerClerk. Researchers are interested in being able to map all the solar systems in California, but they would need access to address information to do so, or they request access to the solar system performance data. The Commission staff is directing some research under the evaluation program that makes use of some of this data, but it is unclear whether the Commission intends to allow greater access to solar program data or not.

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[36] Stakeholders have routinely criticized Powerclerk data integrity and uses public export data has been occasionally stymied by dramatic data entry errors. These challenges are unfortunate since overall the database contains a large volume of very useful data.

[37] Rulemaking 05-06-040 is examining confidentiality generally. Parties may wish to refer to the first decision in that proceeding, D. 06-06-066, for guidance on how to treat information relevant to CSI.

Recommendation:

PowerClerk Functionality

Although the current mode of collaborative consultation on Powerclerk development is generally satisfactory, Energy Division should be authorized, when it considers it necessary, to order Program Administrators to make modifications on the CSI Program database, i.e. spend money on the database changes if the Energy Division thinks the changes will improve the outcome of the program, enhance oversight, and/or help with evaluation of the program.

Data Confidentiality

The Program Administrators should be expressly allowed to maintain customer confidentiality and not release all data fields related to each CSI project, i.e. the status quo of Powerclerk public data export should be maintained.

However, there should be some access to confidential program data for research purposes. The Program Administrators should be ordered to evaluate targeted opportunities for solar research and collaboration with third parties – one of the benefits of the program is the data that it provides researchers. The Program Administrators should be asked to spend some of their administrative resources collaborating with solar research organizations as part of their duties as administrators.

3.12 Coordination of CSI Program Application Process with Utility Interconnection Application

Currently CSI program applicants make two separate applications – one for the CSI program rebate and one for the utility interconnection. This duplicative step increases "end-to-end cycle time" of solar projects (See also Section 3.1), increasing ratepayer, solar industry, and solar customer costs unnecessarily.

Recommendation:

To increase overall efficiency of both the utilities and the contractors processing CSI and interconnection paperwork, the utilities should move expeditiously to extend their CSI processing systems to incorporate interconnection and vice versa. The cost of interconnection processing should not generally be charged to the CSI program, but the CSI program's administrative budget could bear some of the costs of technology system upgrades to allow the two departments – the CSI Program and the utilities' interconnection departmentsffto more efficiently share information and reduce application processing time for applicants. To the extent that these expenses have already occurred, they can be paid for by the CSI program. The Program Administrators should be required to track any expenses incurred towards the goal of interconnection-program streamlining.

3.13 Public Reporting via California Solar Statistics

Since the onset of the program, the Energy Division has worked extensively with the Program Administrators to ensure that the program is providing adequate public data about the program. Initially, the Program Administrators complied with this effort by making a "PowerClerk export" publicly available on a weekly basis. The Program Administrators provide a worksheet with a subset of database fields on every CSI project (called the "Working Data Set" and referred to as the public export).

The PowerClerk public export is useful to researchers or analysts that want to dig deep into the CSI data, but it requires a significant amount of program knowledge in order to understand and interpret the data.

The Energy Division has issued two Annual Program Assessments and a number of Quarterly Staff Progress Reports to provide the public with an easy look at some key program data. The Energy Division has also worked with the Program Administrators to create California Solar Statistics: a dynamic website (updated weekly) that takes publicly available PowerClerk data and translates it into charts and tables. The California Solar Statistics website has become popular with press, industry analysts, stakeholders, contractors, and increasingly with consumers.

The Program Administrators are continuing to develop and expand the California Solar Statistics website in response to stakeholder interest in program information. The California Solar Statistics site does not currently target consumers specifically, but Program Administrators are working on modifying the user interface and site content to enhance the user experience and make the site more understandable to solar consumers. The Program Administrators are also working on incorporating some non-CSI data on solar in California, so that the site can be a one-stop shop for all solar data in California (or at least all solar data that is available on a statewide basis such as the number of MWs installed and the number of sites).

Recommendation:

While the approximate cost of developing the website has been approximately $200,000 to date, the Program Administrators have concerns about paying for the development of the California Solar Statistics website out of their administrative budget. However, the project is highly valuable as a real-time means of monitoring the program. It furthermore helps policy makers monitor the program, solar contractors monitor the market, and it helps consumers by providing real-time pricing information based on actual program data. Funding the California Solar Statistics website could conceivably be justified out of the administrative budget, marketing and outreach budget, or evaluation budget.

The Program Administrators should continue to develop and refine public reporting using the California Solar Statistics website. The Program Administrators should fund the

development of public reporting out of the marketing and outreach budget. The Program Administrators should strive to make the public reporting website as user-friendly as possible—useful to both solar researchers as well as consumers.

As part of public reporting, the Energy Division should work with the Program Administrators to ensure that the site presents consumer friendly information about solar project costs, as part of the program's efforts to help put downward pressure on price through the exposure of pricing data. Public reporting should also include data broader than CSI, to the extent that data is easily available to be integrated to the site.

3.14 Tax Exempt Documentation for Non-Profit Agencies

The CSI Program Handbook requires tax exempt entities to provide certain documentation. In D. 06-08-028, the Commission required that the CSI Program Administrators collect information from CSI participants that take the non-profit incentive rate to demonstrate that they are tax exempt. The CSI non-profit participants that are PBI projects must provide that documentation annually. The Commission stated:

> "The program administrators should ensure marketing and outreach to applicants from the government and non-profit sector makes them aware that third-party financing arrangements are available and may be more beneficial in the long-run than the higher incentive rate. Tax-exempt entities who apply for the higher incentive level must include with their incentive application a certification under penalty of perjury from their Chief Financial Officer or equivalent that they are a government or non-profit entity and they are not receiving, and will not in the future receive, federal tax benefits through financing arrangements. Non-profit entities must renew this certification annually if they receive PBI payments." (D. 06-08-028, p. 21-22)

The requirement for non-profit entities to submit tax exempt certification on a yearly basis for PBI customers is unwarranted because non-profit entities rarely, if ever, lose their tax exempt status. This Program Handbook provision cannot change unless modified by Commission decision.

Recommendation:

The Commission should remove the requirement that tax-exempt entities must provide a certification annually that demonstrates their tax exempt status. The Commission should maintain a requirement that non-profit system owners notify the Program Administrators if tax-exempt status is forfeited (e.g. if a system owner changes to a commercial entity), and that if this occurs, the Program Administrator could change their payment to the commercial PBI payment levels if the project was suddenly eligible for the federal investment tax credit. Program Administrators would review non-profit eligibility if a PBI non-tax project seeks to change the PBI incentive recipient.

3.15 Warranty Requirements

The CSI Program Handbook requires that all solar systems that receive an incentive have a 10-year warranty. The Public Resources Code requires solar energy systems receiving an incentive to have a 10-year warranty:

> Public Resources Code 25782 (a)(4): "The solar energy system has a warranty of not less than 10 years to protect against defects and undue degradation of electrical generation output."

The CSI Program Handbook warranty language was modified to include additional information about system warranties with the intent of further elaborating on the language in the Resources Code cited above.

The point of requiring warranties is to offer customers some assurance that their solar investment will be reliable and long lasting, thus allowing a customer to realize long term financial benefits. However, although the state has established a warranty standard for solar installations, the state has not yet taken an active role in ensuring that the warranties provided are enforceable.

The warranty language in the Program Handbook implies, but yet does not explicitly state, that the warranty must include both solar system parts and labor. The Public Resources Code language is brief and general, and it does not include any language regarding the labor; however some have argued that it is implied that labor would be included. The Commission would need to mandate that labor and parts are required to be included in the ten-year warranty. The CEC's SB1 Guidelines do not provide additional specifics on the warranty issue.

Recommendation:

The Commission should clarify that the warranty must include parts and labor. The Commission should determine whether it wants to investigate whether the warranty requirement is meeting its intended purpose, and whether warranties offered are being honored.

3.16 Five Percent Metering Accuracy Standards for EPBB PMRS meters

The EPBB participants are required to take PMRS service unless they apply for a cost cap exemption. The EPBB project "meters" are used for recording the performance of solar systems, but they are not used to bill customers for electricity or pay projects a solar rebate. The meters are for data gathering to assist participants understand their solar system performance and CSI program evaluation.

In light of the uses of EPBB metered data, in D. 07-07-028, the Commission established a requirement that the Program Administrators begin to plan for a new standard for meters

at the 5 percent accuracy level, which means that any given reading by the meter will be within 5 percent of the actual power flow. The 5 percent standard was intended to be easier (and cheaper) to meet than more accurate 'revenue-grade' meters. The Commission stated:

> Within six months of the date of this decision, the metering subcommittee reporting to the program administrators shall investigate and develop a plan to ensure the accuracy level of +/- 5% meters used to report output from systems receiving CSI incentives under the EPBB program. (In D. 07-07-028, OP 3)

The Program Administrators have taken numerous steps towards this goal, including the creation of a 5 percent metering accuracy testing protocol. This interim protocol would need to be followed until a nationally recognized testing lab (NRTL) could certify testing standards for these meters. One challenge in implementing this new standard is that this range of accuracy is not the industry norm[38], and currently no meters are designed to fit this category. Furthermore, this meter accuracy does not conform to the requirements of the Western Renewable Energy Generation Information System (WREGIS), the system used to track renewable energy certificates for California and the rest of the West. In March, 2009, WREGIS approved rules for small generator meter accuracy to vary by State, but that does not make the 5 percent standard any more practical.

The original plan was to have all EPBB meters meet the 5 percent standard by January 2010. The California Energy Commission included a requirement in the SB1 Guidelines related to metering that allows that EPBB solar systems (that have metering) to have meters that have 5 percent accuracy, as opposed to PBI meters at +/-2 percent accuracy. All inverter-integrated meters shall be tested to ± 5 percent accuracy by a Nationally Recognized Testing Laboratory (NRTL,) in accordance with "Inverter Integral 5% Meter Performance Specification and Test Requirements" adopted by the California Public Utilities Commission in the CSI Program Handbook. However, in light of the fact that few if any meters could qualify, the California Energy Commission has delayed the implementation of the requirement that all meters be certified to the proposed protocol until July 2011. Although the Commission adopted the 5 percent standard in response to industry comments, it is possible that the imposition of a new 5 percent standard for meters is possibly impractical for the industry to sustain.

Recommendation:

Staff recommends considering eliminating the 5 percent metering accuracy standard, instead requiring meters for both EPBB and PBI projects to be certified as +/- 2 percent accurate; in addition, meter installation must at a minimum meet the applicable ANSI C-12 standard or its equivalent.

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[38] The most common meters are revenue-grade utility meters that have an accuracy of +/- 0.2 percent. The PBI metering requirement is +/- 2 percent.

4. Measurement and Evaluation (M&E) Program Modifications

4.1 Background

D. 06-01-024 set aside 10 percent of the CSI general market program funds for Program Administration, Measurement and Evaluation (M&E), and Marketing and Outreach (M&O). There are three types of administrative related costs: Program Administration (application processing, etc.), marketing and outreach (M&O) and measurement and evaluation (M&E). In D. 06-08-028 (p. 99) and repeated in D. 07-05-047 (p. 8), CSI Program Administration costs can not exceed 50% of the total CSI budget allocated towards administrative-related costs. There was no fixed budget established via decision for M&E.

The decision stated "that program administrators are not appropriate candidates for program evaluation because of the inherent conflict of interest that occurs with self-assessments." (D. 06-01-024, page 33) Therefore, the decision calls for Energy Division staff to oversee program evaluation. The decision states that the Program Administrators should issue requests for proposals (RFPs) for program evaluation and "contractors would be selected and managed by Commission staff" (Ibid.). The Commission further indicated how these reports would be used:

> "On the basis of these reports, we will solicit the proposals of staff and the parties for recommendations on program changes that would promote cost-effectiveness, a robust market, innovation and reduced program risk to ratepayers."

The decision also directed the Program Administrators to file a motion by March 31, 2006 seeking approval of a proposed outline for evaluation schedules. In response to D. 06-01-024 (page 34), the CSI Program Administrators filed a motion in R.06-03-004 on March 31, 2006 with a proposed outline and schedule for the CSI Evaluation Plan.

D. 06-01-024, Finding of Fact 20. "Program evaluation and monitoring for the CSI program, including the pilot solar water heating program, should be overseen by the Commission staff and/or CEC staff. The utilities shall issue an RFP for program evaluation consulting and should contract with consultants selected by the CEC and/or Commission staff, who will be responsible for all other contract decision-making and management." (D. 06-01-024, Finding of Fact 20).

On July 29, 2008, an Assigned Commissioner's Ruling (ACR) responded to the March 2006 motion from the Program Administrators on program evaluation. The Ruling established the Program Evaluation Plan for the CSI program, with a budget of $46.7 million over the lifetime of the program. The Evaluation Plan included the Program Administrator's suggestions from March 2006, but modified them to incorporate the events and decisions that occurred in the intervening time. One important modification was that some of the studies would be contracted for directly by the Energy Division, and some of the evaluation studies would be contracted for by the Program Administrators,

but under the direction of the Energy Division. The July 2008 Ruling only addressed evaluation studies to review the general market portion of the CSI program. Additional program elements of the CSI have been implemented since that time, each with their own M&E component and M&E budget.

4.2 Total M&E Budget

The Commission needs to affirm the total M&E budget for the general market program via a decision, as well as the M&E budget for each of the other CSI program components. The Commission should affirm that the M&E program is to be jointly managed as one CSI M&E program budget, even though certain studies only pertain to one program component.

Both Commission staff and Program Administrators have expressed confusion over whether market research should be funded out of the M&O budget or the M&E budget. The CSI program currently allocates funds in the M&E program for market characterization studies, but these could equally be carried out through the M&O budget. It is appropriate to use these studies to establish baseline market research, including size, segmentation, distribution and other characteristics, against which the program can make M&O plans, as well as chart program progress and market transformation.

The SASH and MASH Decisions (D. 07-11-047 and D. 08-10-036 respectively) authorized spending for those programs, including $2.167 million on M&E. The RD&D M&E budget is limited to 3% of the total sub-Program budget, or approximately $1.5 million. The CSI-Thermal Program has an M&E budget of $10 million.

Given the complexity of the various M&E efforts, the Commission staff has in practice attempted to jointly coordinate all of the M&E efforts. Currently, the general market program evaluation funds an M&E Project Coordinator. The contractor's funds currently only come from the General Market budget, although staff would ideally have them coordinate M&E across all program components. In addition, there are occasionally other program evaluation expenses that cross multiple program components and staff would like those expenses to be covered by the general market program.

Recommendation:

The Commission should affirm that the M&E program will be jointly managed across the CSI program areas, even though certain studies only pertain to one program component. If there is an M&E study that crosses over multiple program components, it can be charged in whole or part to the general market program.

The Commission should adopt the following authorized M&E Budget, which is subject to further modification as the program progresses:

Table 17. Authorized M&E Budgets for CSI Program Components

Program	Authorized M&E Budget (millions)	Decisions/ Rulings	Spent M&E Budget (millions)	Notes
CSI General Market	$46.7	7-29-08 ACR	$5.47	Certain Market Studies should be contracted from M&O budget
SASH	$1.08	D. 07-11-045	$0325	No change; M&E budget is combined with MASH M&E
MASH	$1.08	D. 08-10-036	$0.325	No change; M&E budget is combined with SASH M&E
CSI RD&D	$1.5	D. 07-09-042	$0	No change, no funding spent
CSI Thermal	$10	D.01-01-022	$0	No change, no funding spent
Total	**$60.36**			

4.3 M&E Plan Annual Review

The July 2008 ACR establishing the CSI Program Evaluation Plan requires that an annual Advice Letter process be used to coordinate the implementation and budgeting of CSI program evaluation tasks. The Advice Letter is intended to be filed in August of each year, containing details about the following year, and the process allows for stakeholder input and examination of budgeting details. The Advice Letter process is a bit awkward, however, since the Energy Division is expected to provide direction and oversight to the Program Evaluation program to avoid the inherent conflict of interest noted in D. 06-01-024.

Recommendation:

The Commission should not require the Program Administrators to file an Advice Letter on M&E. Instead, the Energy Division should provide the public with a plan every two years about the status of the M&E efforts. The collaborative plan between the Energy Division and Program Administrators will contain the status of the M&E budget, the status of any pending M&E studies, and the general plan for future studies, including which entity will contract for the M&E studies (if known). The plan should be made available for informal public comment, and for the sake of efficiency should cover the plans for all of the CSI program components (including SASH, MASH, RD&D, and CSI-Thermal) and not just the general market program.

4.4 M&E Expenditures and Reimbursement Requirement

In January 2006, the Commission did not have budgetary authority to spend money on CSI program evaluation contracting. Therefore, the January 2006 Commission Decision (D. 06-01-024) did not order the Energy Division to enter into contracts for the CSI program evaluation studies. The Commission subsequently established $2.167 million in reimbursable budget authority[39] to cover annual CSI-related M&E expenses (see Item 8660-001-0462, Chapter 171, 2007 Budget Act) with the expectation that evaluation expenditures (and related contracting) would be conducted, at least in part, directly by Commission staff. The CPUC received authority from the same Budget Act to be reimbursed for three full-time Public Utility Regulatory Analyst (PURA) staff for CSI related activities.

The July 2008 ACR on program evaluation established a budget that included contracting both through the Program Administrators, as well as through the Commission, using the Commission's reimbursable authority. In July 2008, Commission staff expected that most of the direct M&E contracting would go through the Program Administrators with only a limited amount of reimbursable authority for the Commission. The July 2008 ACR demonstrated that the initially authorized amount for the Commission's reimbursable authority ($2.167 million per year) was insufficient to support the entire M&E plan. As a result, the Commission received additional reimbursable contracting authority (see Item 8660-001-0995, Chapter 268, 2008 Budget Act) of up to $5.575 million with the expectation that the Commission would have more ability to do direct contracting for CSI program evaluation expenses.

The Commission has not ordered (via a decision) that the Program Administrators are responsible for reimbursing the Commission for any expenses incurred on behalf of evaluation related activities, including staffing and contracting costs.

The July 2008 Ruling did not expressly budget for Program Administrator staff time or CPUC staff time related to the evaluation of the CSI program. Both the CPUC and the Program Administrators have spent significant staff time and expenses related to M&E. Staff time has included developing and managing evaluation RFPs, developing and responding to data requests, and drafting, issuing and conducting public reports and meetings. These efforts are separate and distinct from normal CSI Program Administration functions such as application processing, incentive disbursement, and general program management.

Recommendation:

The Commission needs to establish that staff time at the CPUC and the Program Administrators designated for M&E is a legitimate expense to be charged to the CSI evaluation budget. The Commission should confirm through a decision that the overall CSI M&E budget is authorized to cover CPUC and Program Administrator contracted evaluations, CPUC staff time (currently 3 PURA positions), Program Administrator staff

[39] Reimbursable budget authority refers to the Commission's ability to order reimbursement from regulated utilities for certain expenses. Reimbursable authority funds numerous Commission activities, including some activities related to energy efficiency, low income programs, and California Environmental Quality Act (CEQA) programs.

time (up to 2 FTE's per Administrator), and other direct and indirect expenses associated with CSI M&E activities.

The Commission must establish that the Energy Division and Program Administrators are jointly responsible for executing the CSI program evaluation plan. The Program Administrators must reimburse the Commission promptly for any staff (labor and direct expenses) or contracting expenses incurred by the Commission in order to carry out CSI Program Evaluation. The Program Administrators must track M&E related expenses per program component and report on their expenses in their semi-annual expense reports. The Program Administrators may charge M&E costs, including staff (labor and direct expenses) and contracting expenses, as well as CPUC reimbursements, to the CSI Balancing Accounts.

4.5 Scope of CSI M&E Studies

Since 2007, the CSI Program's M&E efforts have largely focused on the CSI installations, yet the Commission is very interested in tracking the overall impact of distributed solar. Other programs — including older solar programs that pre-date CSI (e.g. Self Generation Incentive Program, SGIP, and Emerging Renewables Program, ERP), the NSHP program, and publicly owned utility programs — also affect the long-term health of the solar industry. The SGIP program has its own M&E program that has studied solar projects in various ways over the years. Referring researchers to two different sets of evaluation studies has proved cumbersome and inefficient: a full understanding of the solar market in California entails first looking at SGIP studies for SGIP solar project information and then looking at CSI studies for CSI solar project information before finally comparing the two programs

Recommendation:

In order to provide sound policy guidance, all future M&E efforts should look at solar through the most comprehensive lens possible while coordinating as necessary with the California Energy Commission. The CSI Program's evaluation studies should, whenever possible and appropriate, look at the cumulative effects of all solar installed in the investor-owned utility territories. As possible and as appropriate, the CSI Program should clearly indicate the originating program. For example, it would not be appropriate to ask an SGIP solar installation customer about their experience with CSI Program rules. The Commission should affirm that M&E efforts legitimately focus on all solar installations in the investor-owned utility areas, if appropriate, and not just CSI program solar installations.

The CSI M&E program should be the primary vehicle for evaluation studies related to solar performance and impact, even if the solar system was originally installed under the SGIP program. The SGIP program should no longer fund studies related to solar.

4.6 M&E Related Metering Expenses

Currently, the CSI program requires all participating systems to provide some performance monitoring and reporting services (PMRS), but some cost-cap exemptions are allowed for systems receiving the upfront EPBB incentive. (See Section 3.4) The initial requirement had two purposes: 1) Provide the CSI M&E team with data to evaluate the electrical impacts of the program; 2) Provide participants with valuable information about the performance and operation of their systems. The PMRS cost-cap exemption, set at 1% of the total system cost, was intended to relieve very small systems from installing expensive monitoring equipment that might undermine the economics of the solar PV system. The CSI team anticipated that this would still result in robust reporting of performance data which would in turn lead to robust evaluations of the program impacts. In practice, however, the majority of EPBB participants exercised the cost-cap exemption and the program continues to face difficulties collecting large samples of performance data. The problem is not even entirely alleviated for PBI systems because 15-minute interval data reporting is not required in all cases. This has constrained the ability of the Commission staff and evaluation contractors to report metered data for the impact of the CSI on the electrical grid, as well as to estimate costs and benefits to participants and ratepayers.

At the same time, residential systems in particular clearly benefit from enhanced metering and monitoring, if only because participants will have timely indications of any system failures or degradation due to soiling, shading, or other factors. Enhanced metering and monitoring probably has significant economic value to all participants, but uptake seems to be limited due to transaction costs, lack of information, and confusion about reporting authority or requirements.

In order to ensure a proper sample of system performance from the early years of the CSI program (2007-2010), the Commission staff in collaboration with the Program Administrators and Impact Evaluation contractor, has approved nearly $3.5 million in expenses to install performance meters on individual systems across all three IOU service territories. These are high-end metering systems, capable of secure communication, interval data recovery on multiple channels and installed with a minimum of disruption to the customer or their premises. Slightly less robust systems could provide adequate data, but the total costs for this set of installations would not go down much as a result.

Data collection and processing are already large portions of the effort and expense for impact and cost benefit evaluation. Add to that the direct costs for installing adequate metering on a representative sample of customers, and simply subsidizing the installation of metering systems, or at least making the metering requirement more stringent, appears to be more cost-effective. Installing more metering and reporting equipment would serve both the CSI M&E efforts and improve customers' management of their systems. See also the discussion of metering in the Metering, Performance Monitoring and Reporting Section.

Recommendation:

The Program Administrators can spend program funds from the M&E budget to directly subsidize the installation of PMRS equipment on a sample of systems below 15 kW. The cost of administering the subsidy would be born by the program administration budget, but the direct cost of the meter subsidy, as well as the related costs of data processing, can be born by the M&E budget. The details of meter subsidy program would need to include a requirement that participants provide the data to the CSI program for a period of time, e.g. five years. The details of the program will be included in the Annual Advice letter on M&E, as well as an Advice Letter to modify the CSI Program Handbook. Currently, more than 30,000 solar systems have been installed through the CSI, but fully metered data exists for only about 13% of those systems. Average system size for residential and small commercial is about 4.7 kW, while average size for non-residential is about 122 kW. Assuming the larger systems will be metered under PBI rules, the issue is the smaller systems.

Assuming some changes in average system size as the market grows, the CSI program expects to install between 95,000 and 140,000 residential and small commercial systems, most under 15 kW, over the life of the program. In order to have an adequate sample of metered systems, including stratification by class, climate zone, utility and other characteristics, the Commission staff estimates that at least 15 percent of the sites should be metered and monitored. That suggests that a reasonable estimate for the number of systems that need metering is in the range of 14,000 to 21,000. At approximately $500 per system (a subsidy of $100/year for five years), a $5 million budget would help subsidize metering on at least 10,000 systems, going a long way towards ensuring an adequate sample of metered systems. A $10 million budget would help subsidize metering on at least 20,000 systems. Getting more systems metered (and providing the program data) helps with program evaluation, but also helps with the overall program goal of improving the solar industry since metering and monitoring of systems is so closely correlated with increased system performance and customer satisfaction. In addition, a requirement that all systems over 15 kW should be required to take PMRS service will help meet the target number of metered sites.

5. Marketing and Outreach (M&O) Program Modifications

5.1 Background

In D. 07-05-047, the Commission established a process for approval of "Interim Marketing Plans" for the CSI Program. In accordance with the details in Appendix A of the decision, the CSI Program Administrators have filed annual plans (with a mid-year update) with the Energy Division via a business letter to the Director of the Energy Division.[40] The Energy Division has issued approvals, sometimes with modifications, to

[40] D. 07-05-047, Appendix A, p. 5 requires the mid-year update.

each of the M&O plans. The CSI Interim M&O plans and approval letters are available on the CPUC CSI Web site.[41]

The Interim M&O plans were intended to cover the development and delivery of a limited scope of M&O activities specified in the order. D. 07-05-047, Appendix A (p.1-3) required that the Program Administrators develop plans that included:

a. A budget of no more than $500,000 annually for each program administrator.
b. A description of planned interim marketing and outreach activities and types of materials.
c. Plans for each program administrator to conduct at least one training session per month directed at solar installers. Invitations should be distributed to at least all those persons or organizations on the CSI, Self Generation Incentive Program (SGIP), and the California Energy Commission's Emerging Renewables Program (ERP) databases, eligible installer lists, and the service list of this proceeding.
d. Plans for PG&E and SCE to distribute at least two bill inserts either in 2007 or no later than the end of the first quarter of 2008 to promote CSI. At least one of these bill inserts should target the residential and small commercial market. The proposed inserts should be submitted to the Energy Division for review and approval prior to release. CCSE should propose other independent mailings or target marketing activities in lieu of a bill insert.
e. Plans for program administrators to coordinate on one monthly electronic newsletter that they would issue jointly to update readers on new program tools and information, the current focus of CSI implementation discussions, and methods for the public to submit suggested solutions on implementation concerns. The newsletters must be sent to all applicants in the SGIP, CSI, and ERP databases, to lists of registered sellers and installers, posted to the Go Solar California and program administrators' websites, and sent to the service list of this proceeding. Energy Division staff may recommend particular topics to be addressed.
f. A method for tracking and allocating marketing costs between energy efficiency and CSI programs if CSI is jointly marketed with energy efficiency.
g. The interim plans may include, but are not limited to, plans to develop the following outreach materials, as long as program administrators stay within the $500,000 annual budget limit:
   - ffi Brochures
   - ffi Fact sheets
   - ffi Bill inserts or other direct mailings
   - ffi A short video for the Go Solar California website (jointly funded by all program administrators) to walk interested applicants through the application process.
   - ffi Web-based applicant training seminars.

[41] Marketing and Outreach plans for each Program Administrator are available here: http://www.cpuc.ca.gov/PUC/energy/Solar/outreach.htm

Per D. 07-05-047, Appendix A (Item #6 on p.4), the Program Administrators submit CSI marketing pieces to the Energy Division directly for approval. This oversight has ensured that promotional materials maintain a consistent message and quality across the three service territories.

The decision in May 2007 was intended to be "interim" because there was an immediate need for basic marketing and outreach by Program Administrators. In May 2007, the Commission indicated that it would give further consideration to CSI marketing and outreach activities in a later portion of this proceeding. (D. 07-05-047, Finding of Fact 1).

Commission Decision (D.) 06-01-024 directed 10 percent of the general market CSI Program budget be reserved for administrative costs, including M&O and M&E. D. 06-12-033 specified in Appendix A that $189.7 million over 10 years be set aside for Program administration, marketing and outreach, and Program evaluation. This total budget covers all these costs for the 10-year life of the CSI Program. D. 07-05-047 allowed the CSI Program M&O budgets for the general market program to be $500,000 per year per Program Administrator. Program Administrators are allowed to request a 20% budget increase, or an additional $100,000, providing detailed justification to Energy Division why additional marketing expenses are required.[42] Program Administrators are not allowed express authority to rollover unspent budget. In some cases, Program Administrators have requested the 20% budget increase authorized by the Decision to expand on training programs and specialized promotion of the CSI program in their territory.

The M&O total expenditures for 2007 through 2009 statewide were $3.8 M, as shown in Table 18. The M&O materials developed under the Interim M&O Plans have included:

- Monthly electronic newsletter
- Three CSI Program Fact sheets
- Bill inserts (PG&E and SCE only)
- Other direct mailings
- Videos
- Trainings, Webinars
- Website development at the Program Administrator's website
- Attendance at trade shows and other events

[42] D. 07-05-047, Appendix A, Item #5 on p.4.

Table 18. CSI General Market M&O Expenditures 2007-2009

	PG&E	CCSE	SCE	Total
2007	$257,389	$485,248	$239,056	**$981,693**
2008	$761,802	$531,044	$183,476	**$1,476,323**
2009	$309,651	$487,311	$517,899	**$1,314,861**
Total	**$1,328,842**	**$1,503,604**	**$940,431**	**$3,772,877**

Source: Expense Reports

The Interim M&O plan focuses exclusively on the general market portion of the CSI program. Each of the other program components – SASH, MASH, and RD&D – have their own marketing efforts. The MASH Program Administrators have filed their M&O plans concurrently with the general market program M&O plans. The CSI-Thermal program has a significant Market Facilitation budget ($31.25 Million between 2010-2017).[43] The CSI-Thermal Program Administrators are required to file an Annual Advice Letter with the market facilitation plans.

The California Energy Commission's NSHP program spent approximately $4 million on a significant M&O campaign that ran between 2007 and 2009. The M&O campaign was outsourced to a consulting company, Edelman and Associates. Edelman delivered project management services, performed market research, delivered campaign materials, advised on the strategic direction of the M&O program, and conducted outreach to specific audiences. The CSI M&O program has attempted to coordinate with the CEC's NSHP M&O efforts, primarily on the re-design of the Go Solar California Web site and shared booth space at trade shows, and, to a lesser degree, on messaging, branding, and press issues.

5.2 Goal of long-term Marketing & Outreach Plan

The Interim M&O decision was intended to address basic program materials and outreach necessary to launch the program successfully, but did not establish an overall goal for the M&O strategy. It is difficult for Energy Division to assess the implementation or overall effectiveness of the M&O Plans in the absence of Commission-adopted M&O goals. However, the Program Administrators distribute a monthly electronic newsletter to nearly 9,000 subscribers and have trained 7,000 solar installers and consumers: numbers that indicate some degree of messaging penetration.

The goals of the CSI program are to install 1,940 MW (current goal of the general market program is 1,750 MW) and help achieve a sustainable solar marketplace.

[43] D. 10-01-022, Appendix A, p.17-19 includes a list of potential market facilitation activities.

In order to meet the goals of CSI, the Commission should establish an M&O Program that allows some of the CSI program general market program funds to be spent on M&O activities that are designed to (1) market the solar program and solar technology to consumers and end-users and (2) to facilitate the development of a sustainable solar industry through the creation of tools, information, trainings, events that expand or support the solar industry, and (3) facilitate efforts to reduce installed cost of systems (e.g. reducing permitting fees, promoting group discounts, facilitating price competition, streamlining administrative costs, reducing administrative costs to contractors).

The goals of the CSI Program M&O Program are to:

- ffi Support the State reaching the program goals of 1,750 MW installed
- ffi Facilitate the creation of a self-sustaining solar industry
- ffi Conduct a coordinated statewide M&O campaign that merges the resources of all Program Administrators to inform ratepayers about the CSI program
- ffi Increase the efficiency of CSI Program Administrators through communicating the most efficient ways to interact with the Program
- ffi Provide solar consumers with tools and resources that assist them with the decision to buy solar systems; provide solar contractors with the tools and resources that support their ability to sell solar in the California marketplace.
- ffi Serve as a source of solar-related information to consumers that is considered trusted and reliable
- ffi Coordinate M&O activities across the entire CSI Program (including all sub-components, especially CSI-Thermal program) as well as coordinate with other state agencies on the implementation of the CSI M&O efforts.
- ffi Coordinate outreach efforts with demand response and energy efficiency programs to encourage statewide adoption of integrated demand-side management solutions.
- ffi Push for a downward trend in solar pricing by providing accurate and timely solar market information to consumers, including information about pricing using information available from the program
- ffi Distribute consumer protection information to solar consumers, such as advice on warranties, receiving multiple bids from licensed solar contractors, price shopping, information about how to compare prices among Power Purchase Agreements, solar leases and other financing options, as well as information about insurance, security systems, performance monitoring, maintenance, warranty, and fire safety issues.
- ffi Maintain a statewide consumer outreach website, Go Solar California, for consistent statewide messaging about the state's various solar offerings.

Recommendation:

The Commission should direct the Program Administrators to conduct M&O activities that meet the above-listed goals. The Commission should order the review of annual M&O (according to a process described below) plans to be measured against the plans' ability to accomplish the above objectives.

5.3 Annual M&O Plans

The CSI Program's Interim M&O Plans are filed via a business letter to the director of the Energy Division, per D. 07-05-047, Appendix A, p.1. The Energy Division has ensured that the business letters are always made available to the service list and that parties have an opportunity to comment on them. The Interim M&O Plans are intended to be filed in December of each year; however, the actual filing dates have fluctuated due to issues with the timing of expense information being available.

Recommendation:

This recommendation seeks to modify both the means (currently the plans are filed via a business letter), the dates of filing, as well as the scope (should include all sub-components or be filed concurrently).

The CSI Program Administrators for the general market program should file M&O plans via Advice Letter by September 30th of each year.[44] (Every 2 years could also be considered as an appropriate filing interval.) The filing should be in late September (instead of December) in order to give time to review and approve the plans before the year begins.

The M&O plans should be filed concurrently with any MASH-related M&O activities, as authorized by D. 08-10-036, which requires MASH M&O plans. The M&O plans should ideally be filed concurrently with the CSI-Thermal M&O plans.

The M&O Plan filings should be presented for discussion at the Quarterly CSI Program Forum and/or at a separate Commission workshop.

The M&O Plans should include details on the actual activities that will be conducted by each Program Administrator to achieve the Commission's CSI M&O goals, as well as the budget for each activity. The Advice Letters should include a summary of the status of the M&O budget to date as well as a review of the M&O activities underway or completed. The Advice Letters should include details of the strategy to conduct statewide coordinated marketing and outreach activities. The Advice Letters should include information about how the CSI M&O Program will integrate with M&O efforts for SASH, MASH, CSI-Thermal, RD&D, and NSHP program. The Advice Letters should also include details of how the M&O-related market research (either from past M&O efforts or any to be conducted as M&E studies) will be applied to refine the M&O strategy, and they should be filed as Tier 1 Advice Letters. Energy Division should be required to approve, amend, or reject the Advice Letters after reviewing whether they conform to the direction provided by the Commission, especially the approved M&O activities discussed herein.

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[44] The California Center for Sustainable Energy (CCSE) is a non-utility program administrator, but nonetheless, CCSE has been using the "Advice Letter" process to file required reports with the Energy Division for some time. This process has been working fine and provides a fair opportunity for public comment on any CCSE filed information.

5.4 Marketing and Outreach Budgeting

As noted in Table 2, D. 06-01-024 directed 10 percent of the General Market CSI Program budget to be reserved for administrative costs, including Marketing & Outreach. D. 06-12-033 specified in Appendix A that $189.7 million be set aside for Program administration, marketing and outreach, and Program evaluation.

- There is a pending Ruling (July 9, 2010) seeking comments on reducing the administration portion of the budget from $189.7 million to $169.7 million.
- The Program Administration budget is capped at $94.85 million.
- The Measurement and Evaluation budget is currently capped at $46.7 million.
- The Interim M&O decision provided CSI Program Administrators authorization to spend at least $500,000 per year per Program Administrator, for a total of $15.0 million. However, the Commission did not authorize the Program Administrators to carry over unspent M&O funds from year to year, so the Energy Division has advised Program Administrators to stay within the annual budget.
- There is an unallocated administration budget of $33.15 million.

Recommendation:

Staff recommends the Commission adopt a 10-year Marketing & Outreach budget of at least $30 million. (This figure may need to be refined to reflect if the 10-year CSI administration budget is modified per the Assigned Commissioner Ruling of July 9, 2010 which proposed reducing the administrative budget.)

The total amount of funds budgeted for Marketing & Outreach recommended would be inclusive of the Program Administrators' interim M&O expenditures to date, which totaled approximately $3.8 million at the end of 2009. In addition, D. 10-01-022 authorized up to $12.5 million in marketing and outreach for the CSI-Thermal program to be paid for by the electric displacing program budget. Therefore, the *remaining* Marketing & Outreach budget available to the General Market portion of CSI from the date of this decision forward is estimated at $13.7 million for 2010-2016, some of which is already being spent in 2010.

Staff notes that one unintended consequence of this budget calculation is that the long term M&O budget for CCSE (which is only 10.7% of the budget) is considerably smaller than prior years under the interim $500,000 budget, while the budgets for PG&E and SCE are significantly greater. CCSE's region still requires the same level of M&O—or more—than it has in the past, so decreasing the budget for CCSE could be challenging. Furthermore, if the Commission adopts an expectation for statewide coordinated marketing campaign – that will require CCSE to contribute to statewide efforts which might disproportionately affect their ability to conduct local campaigns.

To even-out the M&O budgets to reflect actual marketing needs per territory, the Commission should consider using alternative allocation percentages for the Program Administrators when developing the CSI M&O budget. For example, maybe CCSE would contribute less to a statewide campaign.

The CSI M&O Program needs to spend some M&O dollars from the general market program to ensure consistency and coordination across M&O for all related programs, including SASH, MASH, RD&D, CSI-Thermal, and NSHP. For example, the general market program should take the lead on Web site issues, including Go Solar California web site and Program Administrators' websites, and coordinate with the subprograms as necessary.

5.5 Authorized M&O Activities

The Interim M&O Activities are currently limited to a small number of authorized activities, primarily focused on facilitating customer participation in the CSI Program.

The CSI Program has not developed an effective statewide consumer marketing campaign, and this represents a significant missed opportunity for the program.

Recommendation:

The CSI Program should issue a competitive request for proposals (RFP) to conduct a statewide consumer education campaign and activities, jointly funded by the Program Administrators. Up to 50 percent of the budget each year can be allocated to the development and execution of statewide marketing efforts. The Program Administrators should target spending at least 25 percent of the budget on statewide efforts.

The CSI Program M&O budget should be expanded to cover a wider variety of activities than the Interim M&O plans. Activity areas for consideration are any activities that can be shown to accomplish the adopted CSI M&O goals.

The M&O plans shall draw from this list of suggested Activities:

- Ongoing development of *Go Solar California* website that includes a suite of consumer tools and resources available through the web site such as:
  - Solar Savings Calculators
  - Product buying comparison shopping tools
  - Photo gallery
  - Solar success stories (case studies)
  - Interactive social media features
- Execute a statewide strategic marketing campaign that is integrated across the state. The marketing campaign may integrate a number of activities listed herein and reduce overall costs by having the marketing efforts not be duplicated across the Program Administrators.

- Participation in development and dissemination of industry best practice guides. For example: solar permitting, fire safety education, building permit official education.
- Development of specialized training courses, such as a course on financing models for the commercial sector, a course on financing models for the governmental sector (use of Clean Renewable Energy Bonds, etc.)
- Development of tools or activities that support streamlining and expediting local jurisdiction solar permitting, including building and code inspection and the issuance of building permits.
- Work with consultants to publish a consumer guide to financing to help consumers understand the differences among financing options, including purchasing aggregation, power purchase agreements (PPAs), leases, Property Assessed Clean Energy (PACE), and municipal bond financing (e.g. Clean Renewable Energy Bonds, CREBs).
- Develop of a statewide effort to educate consumers about enforcement of warranty issues.
- Develop a consumer-friendly solar estimate comparison form so that prospective solar customers can compare the estimates of multiple solar contractors; develop tools to help consumers understand solar bids.
- Develop and regularly update interconnection informational links page on the Go Solar California website and announce relevant interconnection news; additional activities such as workshops or interconnection issues surveys on an as-needed basis.
- Participate in solar workforce development programs by facilitating partnerships between job training organizations and the solar industry. Coordinate potential activities with the recommendations from the Green Jobs Needs Assessment underway under the auspices of the energy efficiency programs.
- Coordinate with other programs, including the New Solar Homes Partnership (NSHP).
- Coordinate and sponsor integrated activities with the energy efficiency programs and demand response programs by participating in the Integrated Demand Side Management Task Force. Develop marketing and outreach programs that target the participation of solar customers in an integrated demand side management program offerings. The energy efficiency programs are leading the effort to develop some integrated Demand Side Management pilot programs that will need matching CSI Program M&O support.
- Leverage, promote and coordinate with U.S. Department of Energy (DOE) solar market transformation programs, including Solar America Initiative and dozens of other DOE sponsored market facilitation activities.
- Develop activities specifically directed at consumer protection, such as solar contractor ethics training, information for consumers on selecting a solar contractor or making a solar financing decision.
- Coordinate M&O strategy based on market research studies of up to $10 million, as detailed in the CSI general market Program Evaluation Plan. The CSI Program Administrator staff should collaborate on the implementation and contracting for

M&E studies to ensure proper coordination between M&E study outcomes and M&O efforts for both the market research as well as the other M&E studies.

- ffi Promote the *Go Solar California* brand and web site on Program Administrator websites (via banners, links, etc.), as well as other solar related sites taking care to maintain brand and message integrity.
- ffi Sponsor targeted events and or third-party organizations that specifically target specific goals and objectives of the M&O goals. Funding or sponsorship opportunities to outside organizations should be made available in a transparent manner and detailed in the Annual plan.

5.6 CSI Required Messaging and Branding

The Go Solar California website, logo, and brand have been developed as a single statewide consumer education site for all things related to solar PV and solar thermal.

The CSI M&O program has been requiring that the solar program materials developed through the M&O program include the Go Solar California logo, as well as maintain a consistent look and feel of the Go Solar California website. In 2010, the Go Solar California website is undergoing a site rebranding that may lead to changes to the standard motif used in other materials, but the logo is still the same and shall continue to be a required element in any CSI product. .

The CSI program seeks opportunities to integrate M&O information with other customer programs such as energy efficiency and demand response. The energy efficiency proceeding has been planning the launch of a new statewide energy efficiency brand and web portal that will communicate energy information to consumers. The Go Solar California program will need to coordinate with that statewide consumer brand.

Recommendation:

The Commission should require that the Program Administrators maintain the Go Solar California brand as the statewide brand for solar M&O. The M&O materials should focus on "calls to action" that include pushing the resources that should be developed for the statewide M&O site.

The Program Administrators are responsible for ensuring that all consumer materials (tools, resources, marketing materials, videos, calculators, webinars, trainings, etc.) paid for by the CSI Program will be made available through an appropriate part of the statewide website Go Solar California. No CSI M&O materials should reside exclusively on the Program Administrators own solar web sites.

The Program Administrators should be required to coordinate the Go Solar California brand with the new statewide energy efficiency brand and consumer education portal.

6. Low Income Program Modifications: MASH and SASH

6.1 Background

The following table represents the number of applications received on a statewide basis by the SASH Program through March 31, 2010.

Table 19. SASH Program Applications

Application Status	Number of Applications				Total kW, (CEC-AC)	Total Incentive
	PG&E	SCE	SDG&E	Totals		
STEP 1: Applications under review	101	56	9	166	n/a*	n/a*
STEP 2: Confirmed Applications/Reservations	30	7	3	40	126.25	$813,857
STEP 3: Completed/Installed	62	27	28	117	265.05	$1,745,400

Source: SASH Quarterly Report, April 2010. Each row is mutually exclusive.
* System designs are not completed until the Applicant is confirmed to have met all eligibility requirements.

6.2 SASH Workforce Development Benefit

One of the benefits of the SASH program is that GRID Alternatives, as part of their program implementation plan, is using workforce development labor on almost every installation. This provides students enrolled in solar job training programs with on-the-job experience in solar installations. The workforce development benefit of the program is significant.

Recommendation:

The Commission should adopt workforce development as an explicit goal of the SASH program, thereby paving the way for that aspect of program implementation to continue and be monitored over the course of the program, and potentially to allocate more funds into the projects that have a workforce development component.

6.3 SASH Design Factor Requirement

The SASH program reports that there are many eligible projects that cannot move forward because D. 07-11-045 requires that the SASH program only pay incentives to projects that have a design factor of 0.95 or better. The primary objective of this requirement is to ensure that low-income homes have an optimally designed system that decreases electricity usage from the grid and reduces monthly billing costs for affordable housing occupants.

In D. 07-11-045 (p.21), the Commission adopted the SASH design factor requirement and said:

> We will adopt the Staff Proposal to require a minimum performance requirement equal to .95 of the EPBB Design Factor. The overall CSI Program intent is to reward high-performing systems and avoid poor installations that would disadvantage the consumer. If we require that systems meet a Design Factor of .95, this provides better assurance of high performing installations for low-income homeowners. In addition, we will remove the geographic correction from the EPBB calculation for low-income applicants, as suggested by Grid Alternatives. We will allow a well-designed system anywhere in the state that meets a Design Factor of .95 to qualify for low-income incentives without the geographic correction required for mainstream CSI applicants. In our view, if an applicant meets the eligibility criteria in Section 2852 and the other Design Factor criteria, we do not want to prevent them from receiving incentives solely based on their geographic location in the state.

The SASH Program Administrator, GRID Alternatives, has reported to Energy Division that many eligible customers have been unable to receive SASH-funded systems because of the design factor requirement.

- 18% of the applications reviewed by SASH (April 2009 to January 2010) failed to meet the 95% design factor;
- If 20% - 40% of potential SASH projects fail to meet the 95% DF, the program would recruit and reject potentially 1,600 to 3,200 projects over the life of the program; and
- Significant resources are used to review applications and verify program eligibility for projects rejected due to the design factor requirement.

Looking at data in Table 20 from the general market program, only 56 percent of projects in the CSI general market program would meet the requirement that is a prerequisite for all SASH projects. The CSI general market program data includes the application of a geographic correction that is intended to be excluded from the calculation of the design factor for SASH projects. Nonetheless, the data gives a strong indication that the SASH requirement may be too stringent. If the design factor minimum was 0.85 or 0.90, there would be a significantly larger number of projects that could pass the SASH eligibility test. In addition, GRID Alternatives would re-qualify all previous projects that failed to

meet the 95% design factor if the Commission approved this recommendation. The SASH requirement was put in place to make sure that SASH incentives are only used to fund high quality systems. However, many factors that feed into the design factor, including tilt and angle of a roof, are not factors that a homeowner can control.

Some SASH projects that are marginally eliminated by the existing design factor could receive a better design factor if the project installed racking to tilt the solar panels, but this type of racking can inflate project costs and is not aesthetically pleasing or architecturally appropriate. The SASH program should not be artificially required to impose expensive racking that may not actually be cost-effective.

Table 20. Percentage of General Market Program EPBB Projects with Various Design Factors

	Number of EPBB Projects with Design Factor Above 0.85	Percentage of EPBB Projects with Design Factor Above 0.85	Number of EPBB Projects with Design Factor Above 0.90	Percentage of EPBB Projects with Design Factor Above 0.90	Number of EPBB Projects with Design Factor Above 0.95	Percentage of EPBB Projects with Design Factor Above 0.95	Total Number of EPBB Projects
CCSE	3,693	99%	3,559	95%	3,022	**81%**	3,742
PG&E	16,018	92%	13,643	78%	7,374	42%	17,470
SCE	7,087	98%	6,777	94%	5,573	77%	7,087
Total	**28,421**	**94%**	**28,421**	**84%**	**28,421**	**56%**	**28,421**

Source: PowerClerk, April 9, 2010. Data includes only completed projects with application status "Complete" or "Pending Payment".

Recommendation:

The Commission should change the minimum design factor requirement for SASH systems from 0.95 to 0.85.

6.4 SASH Inspections

In terms of inspections, the SASH Program Administrator, GRID Alternatives, is held to a higher standard than the Program Administrators in the general market program. This affects the administrative cost of inspections. In D. 08-11-005, the Commission required that 100% of the systems installed under the SASH Program be inspected by a third-party inspector. The Commission adopted this proposal out of concern for a "conflict of interest" that may occur if the incentives are assigned to the Program Administrator (who also serves as the contractor for the projects). The SASH program, however, has financial safeguards through program reporting and auditing to ensure the integrity of the program is maintained. While there is certainly room for conflict of interest, we think that the

conflict of interest can be successfully addressed if a random sample of projects (not be chosen by the Program Administrator) receives an inspection.

The CSI general market program currently inspects 1 in 7 applications, or 14% of projects. SASH's administrative costs would be reduced if the Commission reduced the SASH program requirements to a similar level.

While it was prudent to include require 100 percent inspections during the first year of the program, the experience has shown that SASH projects routinely pass inspection.

If the inspection requirement were reduced, the reduction in administrative costs could be applied to other areas and would be significant savings if applied for the remainder of the program. This savings will allow more SASH projects to be installed.

Recommendation:

The SASH Program should require that only 14% of projects receive onsite inspections. On a random basis, the inspector (not the SASH Program Manager) should determine which projects will be inspected.

6.5 SASH Program Manager Contract Administration

In accordance with D. 07-11-045, the Energy Division appointed SCE to administer the SASH program contract, of which it has raised the following concerns:

- SCE is concerned that it is unable to charge SCE staff time to the SASH program for the administration of the SASH contract.
- SCE is concerned because the SASH program manager contract requires up front payment of expenses, with a true-up to actual expenses, for the management of the contract. This situation was established due to the nature of the SASH Program Administrator being a small nonprofit. If the program was not paid using a quarterly estimated payment, then GRID Alternatives would be required to use a line of credit to pay their expenses and raise their billing rates to cover the cost of borrowing money. Paying GRID Alternatives on an up-front basis and then true-up the invoices with actual expenses seemed justifiable.

Recommendation:

The Commission should allow SCE to recover administrative costs of administering the SASH program from its administrative budget for the general market program.

The Commission should endorse the quarterly pre-payment of SASH program expenses out of the SASH balancing account.

The Commission should request semi-annual reports from SCE on the progress of SASH to avoid future concerns about the administration of the program or contract.

6.6 Increasing Incentives Available for Sold Out MASH Track 1

The MASH program provides two types of incentives - Track 1 incentives and Track 2 incentives. Track 1 incentives provide fixed, upfront capacity-based incentives for solar PV systems that offset common area and tenant loads. Unlike the general market program, the MASH incentives did not decline in steps over time. The MASH Track 1 incentive rate structure is as follows:

Table 21. MASH Track 1 Incentive Rates (shown in $ per watt)

Track 1A: PV System Offsetting Common Area Load	Track 1B: PV System Offsetting Tenant Load
$3.30/watt	$4.00/watt

Track 2 offers higher incentives to applicants who provide quantifiable "direct tenant benefits" (i.e. any operating costs savings from solar that are shared with their tenants). Track 2 incentives will be accepted every six months through a competitive process.

The MASH program for "Track 1" is "sold out" in all three utility territories.[45] Each of the Program Administrators has established a waiting list. The Program Administrators received many applications for "Track 2" incentives in their first solicitation, but they did not find any of the projects sufficiently compelling in terms of benefits to provide incentives.

Eliminating the Track 2 incentives and reallocating the money to Track 1 could allow the MASH program to install more megawatts of solar PV, since Track 1 incentives buy more MW per dollar. This change should not affect program demand, since the demand for the Track 1 incentives demonstrates that the program does not need to offer higher payment to incent specialized projects.

Additionally, MASH could install more MWs if the program lowered the per-Watt incentive level for Track 1A and Track 1B systems. The MASH program will experience some amount of dropouts, and the dropouts should only be offered the new lower incentive levels.

[45] See MASH data in Annual Program Assessment, June 2010. http://www.cpuc.ca.gov/PUC/energy/Solar/apa10.htm

Finally, the MASH program can achieve more MWs of installation than the SASH program because the MASH program pays a lower incentive on a dollar/Watt basis. This fact could support shifting funds from the SASH program to the MASH program.

The Commission could also authorize the CSI general market program to offer higher incentives to otherwise "MASH eligible" facilities. Even if the MASH program budget is modified in accordance with the options listed above, the CSI MASH program may still experience higher demand than available incentives can fund. After the MASH program exhausts available incentives for eligible MASH projects, projects that would otherwise meet MASH criteria could be allowed to take the currently applicable "government/non-profit" incentive level rate in the general market program. This program change would essentially eliminate a CSI MASH program cap.

Recommendation:

The Commission should eliminate all future MASH Track 2 incentives and allocate all of the funding towards Track 1.

The Commission could consider reallocation of some SASH program funding to fund incentives for the MASH program.

The Commission should lower the MASH Track 1 incentives by $1/watt and $1.20/watt respectively, for Track 1 A and Track 1 B. The new lower incentive levels should apply to any reservations confirmed after the date the Commission adopts this decision. The new lower incentive levels will apply to any projects reserved as a result of additional funds available from dropouts of existing MASH Track 1 reservations, reallocation of SASH funds, and/or elimination of MASH Track 2.

Table 22. Proposed Revised MASH Track 1 Incentive Rates (shown in $ per watt)

Track 1A: PV System Offsetting Common Area Load	Track 1B: PV System Offsetting Tenant Load
$2.30/watt	$2.80/watt

The Commission should revise the general market program incentive eligibility to allow projects that would otherwise be eligible for MASH program to receive incentives under the general market program, at the "government/non-profit" incentive level. The projects will use general market program incentives but operate under the rules of the MASH CSI Program Handbook.

6.7 Two year Occupancy Requirement for Eligibility for MASH

The CSI MASH program requires that projects be occupied for two years prior to applying for the MASH program. The Commission adopted this requirement in D. 08-

10-036 to avoid a situation where projects purposefully avoided the CEC's NSHP program during their construction just so that they could participate in the CPUC's CSI program.

Since the launch of the MASH program, the two-year occupancy requirement has caused needless anxiety and confusion. The CEC's NSHP Guidebook was modified recently to allow projects that have been occupied for less than two years to qualify for the NSHP program to "close the gap" between the NSHP affordable housing program and the CSI MASH program. The Commission could eliminate the two-year occupancy requirement so that recently constructed affordable housing buildings are not forced to go to the NSHP program.

Recommendation:

The Commission should eliminate the two-year occupancy requirement. In implementing this program modification, the Commission will maintain the otherwise applicable rule that a project cannot receive both NSHP and CSI incentives.

6.8 MW Goals of MASH and SASH Solar Programs

The Commission established the overall CSI Program budget and goals in D. 06-12-033. The overall budget for the program is $2.167 billion, and the total goal is 1,940 MW. In that decision, the Commission allocated 10 percent of the program budget ($216.7 million) to the low-income programs and 90 percent ($1,897 million) to the general market program. The Commission adopted a capacity of 90 percent for the general market program (1,750 MW). In later decisions, the Commission adopted incentive levels for the SASH and MASH programs that preclude the low-income programs from achieving 190 MW from within their budgets.

As currently authorized, the SASH program could reasonably be expected to achieve between 12 and 15 MWs. As currently authorized, the MASH program could reasonably be expected to achieve between 20 and 35 MWs.

Recommendation:

The Commission should adjust the SASH and MASH program MW target goals within the overall CSI program goals to correspond to the achievable MWs as authorized in those program decisions. The Commission should acknowledge that the low-income programs are not going to provide 190 MW towards the overall CSI goal.

Rather than adjust the general market program goals, budget and incentive step table to make up for the MWs not achievable by the low-income programs, the Commission should decrease the total MWs expected to be attained by the overall CSI program. The new goals should be 1,750 MW from the general market program and 50 MWs from the two low-income programs. Alternatively, the Commission might want to adjust the

1,750 MW goal for the general market program to capture the higher effect that high performing systems are having on the grid. The Commission could do this by evaluating the overall program goal as a MWh goal and a peak-hour capacity factor goal, not just a MW goal.

7. Program Budgets and Rate Collection Modifications

7.1 Electric Program Rate Collections

The Commission established a rate collection schedule for the CSI Program in D. 06-12-033, and later modified it in D. 08-12-004 and D. 10-04-017. This rate collection schedule applies only to electric ratepayers and the electric-displacing portions of the CSI Program. D. 10-01-022 established a rate collection schedule for the gas portion of the CSI program. PG&E filed a Petition for Modification to the electric component rate collection schedule on February 10, 2010, which was resolved in April 2010. The current rate collection schedule, as adopted in D. 10-04-017, is as shown in Table 23.

Table 23. Annual CSI Revenue Requirements (In Millions of Dollars)

Year	PG&E	SCE	SDG&E	Total
Transfer from SGIP on 12/31/2006	$0	$104.6	$37.2	$141.8
2007	$140	$147	$33	$320
2008	$140	$147	$33	$320
2009	$140	$0	$0	$140
2010	$43.75	$110	$25	$240
2011	$105	$110	$25	$240
2012	$120	$110	$25	$240
2013	$85	$74	$16	$160
2014	$85	$74	$16	$160
2015	$85	$74	$12.8	$156.8
2016	$3.25	$45.4	$0	$47.4
Total	**$947**	**$996**	**$223**	**$2,166**

Source: D. 10-04-017.

Information on the rate collections to date is included in the CSI Program Administrator expense reports. The table below is a summary of the balancing accounts is compared to the outstanding payments expected to completed projects and pending reservations in April 2010

Table 24. Status of CSI Balancing Account if Pending and Completed projects are considered

	Balance at the end of 2009	Completed Projects, Pending Incentives	Pending Reservations[46]	Potential Over/(Under) collection
SDG&E	$67,840,288	($27,602,191)	($65,000,000)	($24,761,903)
SCE	$284,656,179	($110,385,969)	($246.400,000)	($72,129,790)
PG&E	$208,624,630	($33,497,339)	($218,900,000)	($43,772,708)

Data: Expense Reports, March 2010. Completed Projects includes any project in the Status "PBI In Payment", "Complete" or "Pending Payment". Most of this category is the pending payments for PBI projects. The number listed is just the estimated remaining amount to be paid. The Pending Reservations category includes any other project with a Confirmed Reservation that is not in one of the Completed categories listed above.

Table 24 shows that although all three utilities had significant positive balances in their CSI accounts compared to complete and pending incentives; if pending reservations are considered, the balancing accounts actually show a net under collection of between $24M and $72 M. This potential under collection is unlikely to represent a problem because many "Reserved" applications will never move to "Complete" or "In Payment" status, and there are ongoing collections in 2010, as shown in Table 25 below. Furthermore, "PBI in Payment" status represents incentives spread out over five years. Nonetheless, the Commission intentionally chose to front load collections to cover those estimated payments in order to provide the investor certainty that the funds for PBI payments would be available regardless of any other policy development. In addition, the expected PBI payments are deposited into a PBI subaccount of the CSI Balancing Account. This ensures that the funds payments are available and that those not-yet-paid PBI payments for finished projects will be available.[47]

Table 25. 2010 Rate Collections

	Rate Collections Authorized in 2010
SDG&E	$25,000,000
SCE	$110,000,000
PG&E	$43,750,000

In the 2006 CSI decisions, the Commission preferred to have the funds collected early and held until spent later. The Commission required the utilities to establish PBI

[46]Pending Reservations for May 5, 2010 can be found here: http://www.californiasolarstatistics.ca.gov/reports/5-05-2010/AdminStats.html (Click on Table view and Incentive amount).

[47] There is uncertainty associated with PBI projects that over perform relative to performance expectations because the PBI subaccount receives a deposit for the expected performance of the project. If the expected performance exceeds the estimated performance, the account could be short. This particular aspect of CSI budget is particularly difficult to manage given the long time frames involved in paying the PBI projects, and Program Administrators cannot know for certain that a project has over performed until the end of the 5 years.

subaccounts within their CSI Balancing Account to account for the PBI expected payments. All CSI funds are held in accounts that earn interest; all the utilities use the Federal Reserve Commercial Paper Nonfinancial three-month rate for interest in balancing accounts.[48] The next three tables summarize the forfeited application fees and interest collected in balancing accounts across the three utilities.

Table 26. PG&E Forfeited Application Fees and Interest Collected in Balancing Accounts

	Interest	Forfeited Fees
2007	$(4,190,374.00)	$ (78,390.00)
2008	$(2,644,624)	$ (278,779.35)
2009	$(624,510)	$ (278,779.35)

Source: Expense Reports

Table 27. SDG&E Forfeited Application Fees and Interested Collected in Balancing Accounts

	Interest	Forfeited Fees
2007-2009	Not reported	$ (151,490)

Source: Expense Reports

Table 28. SCE Forfeited Application Fees and Interest Collected in Balancing Accounts

	Interest	Forfeited Fees
2007	($9,060,494)	$0
2008	($5,914,921)	$0
2009	Not reported	($698,856)

Source: Expense Reports

The program will be closed to new applications after December 31, 2016, but there may need to be payments for many more years after 2016. The Commission could choose to reduce collections now since the payments will not be made until after 2016. The Commission might also need to accelerate the pace of collections to keep up with program payouts if the program sees large increases in installation rates.

Public Utilities Code 2851 (e)(1) states that the total cost over the duration of the CSI program under the supervision of the Commission funded by charges collected from customers of SDG&E, SCE, and PG&E shall not exceed $2,166,800.

The Program Administrators have asked for clarification as to whether interest and forfeited application fees (which both are credits to the balancing accounts) both reduce the amount of ratepayer collections that need to be collected to meet the needs of the

[48] The Federal Reserve Commercial Paper Non-Financial 3 month rate has varied on a monthly basis, from a high of 5.24% in January 2007 to a low of 0.19% in November 2009. The rate in May 2010 is 0.44%. The rate can be found here: http://www.federalreserve.gov/releases/h15/data.htm.

balancing accounts. Since the statute states that there is a limit on the total cost of the program, any forfeited fees and interest reduce the collections for the program but cannot be used to increase the expenditures of the program.

Recommendation:

The Commission should clarify that the utilities should have a goal of making sure they have enough funds to cover all future payments to PBI projects, even though those projects will not be paid for several years. In other words, the Commission will not consider a utility "over-collected" if there are pending PBI payments to completed projects that will draw down the existing balance in future years.

The Commission should affirm that all rate collections for CSI must occur prior to December 31, 2016, even if program expenditures occur after that date.

The Commission may wish to trigger a modification to the collections if the current rate collection schedule leaves the utility over-collected even after PBI and pending projects are accounted for. If so, the Commission should apply that logic to reduce the collections of SCE in 2011 and 2012 in light of the fact that the collection and expenditure schedule appears to leave SCE over-collected. SCE has had lower demand than the other utility territories.

The Commission could clarify that interest and/or forfeited application fees that accrue as credits in the balancing accounts reduce the amount of ratepayer collections that are needed to fully fund the CSI program. This practice is the norm across balancing accounts held by the utilities. Alternatively, the Commission could seek legislative action to modify PU Code 2851 (e) to allow the interest or feeds to be applied to higher than forecast PBI system performance.

7.2 Gas Program Rate Collections

The Commission approved D. 10-01-022 which directed the utilities to each file an advice letter to amend their preliminary statements and establish a memorandum account to record actual annual expenditures for the gas-displacing CSI-Thermal Program, beginning on the effective date of the decision through December 31, 2017. (D. 10-01-022, OP 16.)

Additionally, this decision authorized that on an annual basis each utility may, in its appropriate ratemaking proceeding, recover the prior year's memorandum account balance from its gas customers. Total expenditures by each utility over the duration of the CSI-Thermal Program may not exceed the total CSI-Thermal Program budget.

The Commission should clarify that a balancing account, rather than a memorandum

account, is more appropriate for this situation. In D. 02-08-054 (p.3)[49], the Commission states that memorandum accounts are appropriate when the following conditions exist:

a. The expense is caused by an event of an exceptional nature that is not under the utility's control;
b. The expense cannot have been reasonably foreseen in the utility's last General Rate Case (GRC) and will occur before the utility's next scheduled rate case;
c. The expense is of a substantial nature in the amount of money involved; and
d. The ratepayers will benefit by the memorandum account treatment.

The CSI-Thermal Program memorandum account does not meet the definition detailed by the Commission stated above. The CSI-Thermal expenses that will be incurred by the utilities are already authorized, and not exceptional in nature. These are expenses ordered by the Commission, authorized completely in advance of spending, up to the budgeted amount.

Recommendation:

The Commission should amend D. 10-01-022 OP 16 to state that the utilities should each establish a balancing account to record actual annual expenditures for the gas-displacing CSI-Thermal Program.

7.3 Allocation of Solar Hot Water Pilot Program Budget

As shown in Table 1, the total 10-year budget for the CSI program is $2,166.8 M. From within that budget, the Commission authorized $3 M to be spent on a solar hot water pilot program.

In the February 15, 2007, *Assigned Commissioner's and Administrative Law Judge's Ruling Approving Solar Water Heating Pilot Program*, the Pilot Program Budget was reduced to $2,590,730 and was identified as being funded solely from "CSI funds collected by SDG&E." (Ruling, page 12)

In reviewing the CSI expense reports submitted in May 2010, Commission staff noticed there was some confusion around the SWHPP budget and whether SDG&E customers alone were paying for the program because SDG&E is the only utility that has incurred expenses for the program to date. SCE and PG&E have not been billed for the program.

Recommendation:

The Commission should clarify that the SWHPP costs should only be paid for by SDG&E ratepayers. The Commission should modify D. 06-12-033 to indicate that SDG&E ratepayers need to pay for both $223 million to cover the CSI program (general market, SASH, MASH, and RD&D) plus an additional $2.5 million to pay for the

[49] http://docs.cpuc.ca.gov/WORD_PDF/FINAL_DECISION/18513.PDF

SWHPP program. The actual pilot program expenditures should be deducted from two accounts: the incentives should count against the available incentives in the general market program, and the administrative costs should count against the administrative cap in the general market program.

7.4 Rounding Error in IOU Share of CSI Costs Table

Decision 06-12-033 (Appendix A, Table 2) shows the IOU Share of CSI Costs, as shown in Table 29 below. Unfortunately, this budget appears to a rounding error in this Table that leads the total collections to add up to $2,165 million instead of $2,167 million.

Table 29. IOU Share of CSI Costs

	% of Total Budget	Budget (in Millions)
PG&E	43.7%	$946
SCE	46.0%	$996
SDG&E	10.3%	$223
	100%	$2,165

The corrected version of the table appears below in Table 30.

Table 30. Corrected Version of IOU Share of CSI Costs

	% of Total Budget	Budget (in Millions)
PG&E	43.7%	$946.9
SCE	46.0%	$996.7
SDG&E	10.3%	$223.2
	100%	$2166.8

Recommendation:

The Commission should adopt the corrected version of the IOU Share of CSI Costs as shown in Table 30.

(END OF ATTACHMENT A)