

Multifamily Affordable Solar Housing
Semiannual Progress Report
July 31, 2019



Center for
Sustainable Energy®



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Multifamily Affordable Solar Housing Semiannual Progress Report

Southern California Edison (SCE), on behalf of the California Solar Initiative (CSI) Program Administrators (PAs), submits this Semiannual Progress Report for the Multifamily Affordable Solar Housing (MASH) Program (MASH Program or Program), in compliance with California Public Utilities Commission (CPUC or Commission) Decision (D.)08-10-036, which requires the PAs to submit joint semiannual reports to the Director of the Energy Division (ED) on the progress of the MASH Program.¹

This twentieth edition of the MASH Semiannual Progress Report captures administrative expenses and program data from Program inception on October 16, 2008, through July 31, 2019, includes requirements identified in Appendix A of D.08-10-036, and requested data from the ED.

1. Executive Summary

The MASH Program is one of CSI's two low-income programs and is administered by Southern California Edison (SCE), Pacific Gas and Electric Company (PG&E), and the Center for Sustainable Energy® (CSE) in San Diego Gas & Electric Company's (SDG&E) service territory. The MASH Program provides incentives for the installation of solar photovoltaic (PV) systems on low-income multifamily housing, as defined in CPUC Code Section 2852. The MASH Program was originally directed to have two incentive tracks, both of which are paid in a one-time lump sum payment, referred to as the Expected Performance-Based Buydown (EPBB).

1. Track 1 provided fixed, capacity-based rebates at \$1.90 per watt for solar PV generating systems that offset common area electrical load (Track 1A) or at \$2.80 per watt for offsetting tenant area electrical load (Track 1B).² Track 1 applications were reviewed on a first-come, first-served basis. As of August 2015, unallocated Track 1 funds were rolled into a new incentive budget for the current Track 1C and Track 1D incentive levels, and as a result, Track 1A and Track 1B are closed and no longer offered.³
2. Track 2 was a competitive application process and provided variable rebates up to 100 percent of system costs and ongoing maintenance costs. To receive Track 2 funds, an applicant had to demonstrate direct tenant benefit. Track 2 consisted

¹ D.08-10-036, Ordering Paragraph 9 and Appendix A. In addition, the PAs will file a more detailed reporting of MASH expenses, including Virtual Net Metering (VNM) implementation, as part of the CSI semiannual administrative expense report.

² D.08-10-036 originally set the Track 1 incentives at \$3.30 per watt for Track 1A and \$4.00 per watt for Track 1B. On July 14, 2011, the incentives were reduced, per Ordering Paragraph (OP) 13 of D.11-07-031, to \$1.90 per watt for Track 1A and \$2.80 per watt for Track 1B. The new incentive levels applied to any MASH reservations placed under review on or after the date of the decision.

³ Conclusion of Law (COL) 28 of D.15-01-027 provides that incentives and administrative budget surpluses should be shifted to the new iteration of MASH.

of two application cycles per year. As of July 2011, unallocated Track 2 funds were shifted to Track 1 and, as a result, Track 2 is closed and no longer offered.⁴

The PAs began accepting applications for Track 1 in February 2009 and conducted the first round of Track 2 application evaluations between July and December 2009. In addition, PG&E, SCE, and SDG&E began to offer a virtual net metering (VNM) utility tariff option in June 2009 to help with the installation of solar PV generating systems in multifamily affordable housing complexes.

Track 2 was eliminated as a program offering in July 2011 because D.11-07-031 required unallocated Track 2 funds to be transferred to Track 1. D.11-07-031 noted that “[t]he strong demand for Track 1 incentives indicates that the higher Track 2 incentives are not necessary.”⁵ Customers and applicants were given the opportunity to revisit their applications and determine their feasibility given the reduction in the incentive rates and application fee requirements.

Assembly Bill 217 (Stats. 2013, Ch. 609) extended the MASH program with \$54 million in new funding and set several new goals for the Program. On January 29, 2015, the CPUC approved D.15-01-027 to revise MASH enrollment eligibility requirements, capacity target, job training requirements, incentive levels, and program budget.

On July 30, 2015, the CPUC approved the MASH Program Handbook, outlining information and guidelines to align with D.15-01-027. These changes included two new incentive tracks, both of which continue to be paid as EPBB:

1. Track 1C provides fixed, capacity-based rebates at \$1.10 per watt for solar PV generating systems that offset common area electrical load, Non-VNM Tenant Load, or VNM Tenant Load with <50% Tenant Benefit.⁶
2. Track 1D provides fixed, capacity-based rebates at \$1.80 per watt for solar PV generating systems that offset VNM Tenant Load with ≥ 50% Tenant Benefit.⁷

The PAs began accepting applications from the existing waitlists for Tracks 1C and 1D in August 2015. As of June 30, 2019, CSE was fully subscribed within the PA’s territories, and their waitlists are currently closed to new applications. SCE and PG&E will reopen to new applications later this year.

Since the inception of the Program, the PAs have paid out more than \$108,568,132 in incentives on 513 Track 1 and Track 2 completed solar projects statewide. For the

⁴ COL 26 of D.11-07-031 provides that all funds remaining in MASH Track 2 should be shifted to MASH Track 1.

⁵ D.11-07-031, pp. 52 and 53.

⁶ D.15-01-027, p. 71.

⁷ D.15-01-027, p. 72.

latest information on funding availability, check the [MASH budget report](#),⁸ contact the respective PA, or visit their program website.

2. Background

In D.06-01-024, the Commission adopted the ED Staff proposal to set aside a minimum of 10 percent of CSI Program funds for projects installed by low-income residential customers and affordable housing projects.⁹ In 2006, the California Legislature codified this requirement in Senate Bill (SB) 1 and Assembly Bill (AB) 2723.^{10,11} Subsequently, in D.06-12-033, the Commission directed the PAs to conform the CSI Program to SB 1 and AB 2723 requirements and directed 10 percent of the total ten-year CSI budget to be reserved for the low-income residential solar incentive programs that are now referred to as the MASH and the Single-Family Affordable Solar Homes (SASH) Programs.

On October 16, 2008, in D.08-10-036, the Commission established the \$108.34 million MASH Program as a component of the CSI Program. The MASH Program provides incentives “for solar installations on existing multifamily affordable housing that meet[s] the definition of low-income residential housing established in Pub. Util. Code § 2852.”¹²

The Commission adopted a two-track incentive structure “with Track 1 providing up-front incentives to systems that offset either common area or tenant load, and Track 2 providing an opportunity to compete for higher incentives through a grant program.”¹³

PG&E, SCE and CSE administer incentives under the MASH Program. The Commission selected the general market CSI PAs because the target customers of the MASH Program, who are affordable housing building owners, are similar to the commercial and nonprofit customers of the general market CSI Program. The resulting synergy allowed the PAs to incorporate MASH into their existing CSI administrative structures and to implement MASH in a quick and cost-effective manner.¹⁴

The overall goals for the MASH Program are to:

1. Stimulate adoption of solar power in the affordable housing sector;

⁸ The California Solar Statistics website provides a MASH budget report that is updated weekly: http://www.californiasolarstatistics.ca.gov/reports/mash_budget/

⁹ D.06-01-024, *mimeo.*, pp. 5 and 27, COL 9 at p. 43 (see also Appendix A, pp. 2-3).

¹⁰ SB 1 (Stats. 2006, Ch. 132) sets forth specific CSI program requirements regarding program budget, conditions for solar incentives and eligibility criteria.

¹¹ AB 2723 (Stats. 2006, Ch. 864) required the Commission to ensure that not less than 10 percent of the CSI funds are used for the installation of solar energy systems on low-income residential housing and authorized the Commission to incorporate a revolving loan or loan guarantee program for this purpose.

¹² D.08-10-036, Appendix A, *mimeo.*, p. 1.

¹³ D.08-10-036, *mimeo.*, p. 9.

¹⁴ D.08-10-036, pp. 24-25.

2. Improve energy utilization and overall quality of affordable housing through application of solar and energy efficiency technologies;
3. Decrease electricity use and costs without increasing monthly household expenses for affordable housing building occupants; and
4. Increase awareness and appreciation of the benefits of solar among affordable housing occupants and developers.

Under the initial funding, the MASH Program would operate either until December 31, 2015, or until all funds available from the Program's incentive budget had been allocated, whichever event occurred first.

On October 7, 2013, Governor Brown signed Assembly Bill (AB) 217 into law, providing renewed funding for the MASH and SASH programs at an additional \$108 million for both programs and extending both programs through 2021.

AB 217 also set the following new policy goals for the MASH program:

1. Maximize the overall benefit to ratepayers;
2. Require participants who receive monetary incentives to enroll in the Energy Savings Assistance (ESA) Program, if eligible; and
3. Provide job training and employment opportunities in the solar energy and energy efficiency sectors of the economy.

In accordance with AB 217, the MASH program will operate either until December 31, 2021, or until all funds available from the Program's incentive budget have been allocated, whichever event occurs first.

2.1. Incentive Types: Track 1C and Track 1D

The MASH Program is designed to subsidize solar PV generating systems in low-income multifamily housing. Incentivizing the installation of solar PV generating systems in the MASH Program is not as straightforward as in the general market CSI Program. Although affordable housing building owners are the target market, two different categories of customers may receive the benefits from an installed system: building owners and tenants. The incentive structure and rebate levels of the MASH Program were designed to allow benefits of the solar systems to accrue for both categories of customers.

To accomplish this goal, MASH incentives are divided into two different tracks: Track 1C and Track 1D. Both tracks are similar to the general market CSI Program incentives in that the rebate amount is fixed and capacity-based. As shown in Table 1, the tracks offer different incentives for solar PV generating systems that offset the electric load for common areas and for tenant units while also factoring in the amount of direct benefits shared with the tenants. The rebates are based only on the EPBB method, which is a one-time lump-sum payment made after verification of system installation. In the MASH Program, the EPBB incentive rates are fixed and do not automatically decline as they do in the general market CSI Program; instead, the incentive levels can be revisited, and

the Administrative Law Judge (ALJ) assigned to the CSI proceeding has the authority to reduce MASH incentives by up to 10 percent each year.¹⁵

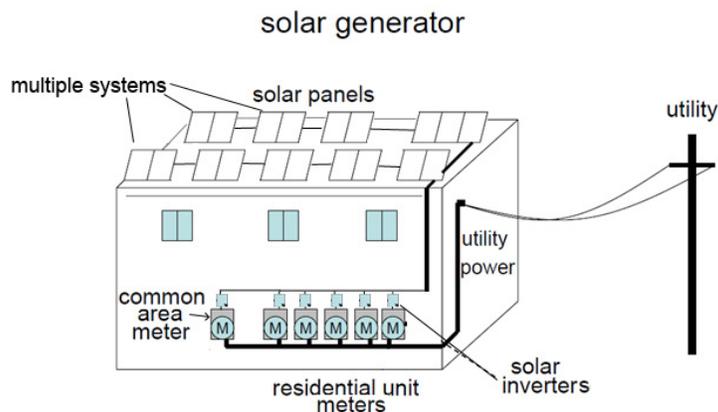
Table 1: MASH Incentive Rates in \$/Watt

Track 1C: PV System Offsetting Common Area Load, Non-VNM Tenant Load, or VNM Tenant Load with <50% Tenant Benefit	Track 1D: PV System Offsetting VNM Tenant Load with ≥50% Tenant Benefit
\$1.10/watt	\$1.80/watt

Track 1C incentives are available for solar PV system installations that offset common area load, Non-VNM Tenant Load, or VNM Tenant Load with <50% Tenant Benefit. Track 1D incentives are available for systems that offset VNM Tenant Load with ≥50% Tenant Benefit. There is no mandate requiring property owners to install systems that offset tenant unit load in order to qualify for Track 1C incentives; however, the assumption is that the higher Track 1D rate is enough to incentivize property owners to provide greater solar electric benefits to their tenants. Track 1D incentives are capped at 80 percent of the total incentive funding.

2.2.Virtual Net Metering

Following adoption of D.93586 in December 1981, most utilities closed their master meter/submeter tariffs to new installations. Pub. Util. Code § 780.5 required individual utility metering in multi-unit residential buildings that received building permits after July 1, 1982. While this setup encourages tenants to conserve energy and have more control over their usage, it presented challenges to the low-income multifamily building owners who want to install solar PV generating systems intended to serve tenants. In order to offset energy usage in tenant units, an owner would have to install a separate system with its own inverter for every meter on the property (see Figure 1).



¹⁵ See D.15-01-027, pp. 71-72.

Figure 1: Conventional Solar Systems on Individually Metered Multifamily Housing

To encourage solar installations on low-income, multi-unit, affordable housing properties through the MASH Program, D.08-10-036 directed SCE, PG&E and SDG&E to file tariffs for an arrangement called virtual net metering (VNM). These tariffs allow multifamily affordable building owners that participate in the MASH Program to install a single solar PV generating system that covers the electrical load of the owner's common areas as well as the tenants' individual meters that are located within the residential complex.¹⁶ A residential complex is defined as all of the real property and apparatus employed in a single low-income housing enterprise on contiguous parcels of land, which may be divided by a dedicated street highway or public thoroughfare or railway; so long as they are otherwise contiguous and part of the same single low-income housing enterprise, they are all under the same ownership.

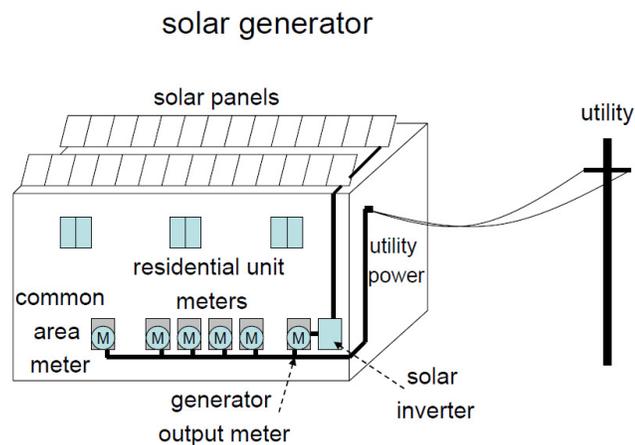
The virtual net metering process is described as a PV system installation on an individually metered building (see Figure 2) where the electricity generated by the system is fed back into the grid through a generator output meter, which measures the kilowatt-hours produced. Based on a prearranged allocation determined by the property owner, the participating utility allocates the kilowatt-hours resulting from the energy produced by the solar PV generating system to both the building owner's and tenants' individual utility accounts. The energy allocation to the tenant accounts is based on the relative size of the tenant's unit, consistent with the way affordable housing rents are established. The allocated kilowatt-hours are then netted with the customer's usage and then billed in the same manner as a regular NEM customer's account. The VNM tariffs that PG&E, SCE, and SDG&E offer are currently available to those customers that receive incentives through either the MASH Program or the California Energy Commission's New Solar Homes Partnership (NSHP) Program. Detailed VNM tariff requirements are located at each utility's website.

- PG&E:

¹⁶ D.11-07-031, OP 1 at p.65, states that within 30 days of the effective date of the Decision, SCE and SDG&E shall each submit an advice letter to match PG&E's NEMVNMA tariff, and PG&E shall submit an advice letter to remove the December 31, 2011, sunset date for the option to serve accounts located at multiple customer service delivery points from its NEMVNMA tariff. Via PG&E Advice Letters 3718-E and 3718-E-A, PG&E modified its Schedule NEMVNMA, VNM Service for Individually Metered Residential Units and Owners with Housing Receiving Incentives from the MASH Program and the New Solar Homes Partnership (NSHP) Program to allow customers meeting certain requirements the option to alternatively elect to serve accounts located at multiple customer service delivery points within their "Eligible Low-Income Development" so as to fully utilize their solar generator(s) of not more than 1,000 kW also sited within their "Eligible-Low Income Development." These options are available to customers who are ready to interconnect no later than December 31, 2011. Each utility submitted an advice letter as required by OP 1 of D.11-07-031, within the required timeframe. The change to PG&E's and SCE's tariff became effective September 14, 2011. PG&E's advice letter also changed the tariff name from NEMVNMA to NEMVMASH. The revision to SDG&E's tariff became effective September 13, 2011.

- [Schedule NEMVMASH](#)
- [Schedule NEM2VMSH](#)
- SCE:
 - [Schedule MASH VNM](#)
 - [Schedule MASH-VNM-ST](#)
- SDG&E:
 - [Schedule VNM-A](#)
 - [Schedule VNM-A-ST](#)
 -

Figure 2: Virtual Net Metering System on Individually Metered Multifamily Housing



As MASH VNM projects begin their initial system design, it is important for the customer and the solar contractor to understand the requirements of the VNM tariff for each utility prior to the installation. MASH PAs work with the contractors and/or the customers to ensure compliance with the tariff.

2.3. Program Eligibility

Eligibility for the MASH Program is based on the characteristics of the affordable housing development which must:

1. Meet the definition of “low-income residential housing”, as provided in Pub. Util. Code § 2852;
2. Have an occupancy permit;¹⁷ and
3. Be an electric customer of SCE, PG&E, or SDG&E.

¹⁷ COL 30 of D.11-07-031 provides that the two-year occupancy requirement for MASH applicants is no longer needed, but projects may not have received incentives from both NSHP and MASH that exceed total eligible project costs combined.

The following are *not* eligible for incentives under the MASH Program:

1. Customers who have entered into utility contracts for distributed generation (DG) services (*e.g.*, DG installed as a distribution upgrade or replacement deferral) and who are receiving payment for those services. This does not include third-party ownership arrangements, *i.e.*, power purchase agreements, which are allowed.
2. Customers who have entered into agreements that entail the export and sale of electricity from the Host Customer Site. This does not include net energy metering agreements, which are allowed.
3. Customers who have received a final interconnection authorization letter more than 12 months prior to submitting a MASH Reservation Request Package.
4. Publicly-owned or investor-owned gas, electricity distribution utilities, or any electrical corporation (ref. Pub. Util. Code § 218) that generates or purchases electricity or natural gas for wholesale or retail sales.
5. Multifamily residential new construction systems are not eligible for the MASH Program and should apply to the New Solar Homes Partnership (NSHP) Program.

2.4. Budget

In a February 5, 2007 Assigned Commissioner's Ruling (ACR), one-half of the \$216 million low-income CSI Program budget adopted by the Commission in D.06-12-033 (\$108 million) was reserved for multifamily affordable housing; the other half was allocated to single-family affordable homes.¹⁸ In 2013, the Legislature passed AB 217,¹⁹ which authorized an additional \$108 million in new funding for MASH and SASH. Further, D.15-01-027 established a \$54 million solar incentive program for MASH and a \$54 million solar incentive program for SASH. The MASH Program budget, shown in Table 2,²⁰ was adopted formally by the CPUC in D.08-10-036. Note that the existing overall budget allocation percentages by utility territory were also applied to the additional \$54 million in funding that resulted from AB 217.

The program administration budget formerly allocated 12 percent and included administration, marketing and outreach (M&O), and program evaluation. D.15-01-027 reduced the program administration budget allocation to 7 percent for administration,

¹⁸ See R. 06-03-004.

¹⁹ Stats. 2013, Ch. 609.

²⁰ COL 26 of D.11-07-031 provides that all funds remaining in MASH Track 2 will be shifted to MASH Track 1. The shift modified the MASH budget allocation amounts between Track 1 and Track 2; however, the combined incentive total for Track 1 and Track 2 remains the same. OP 13 and 14 of D.15-01-027 provided that the MASH PAs rollover their administrative and incentive budget surpluses from the earlier iteration of the program.

marketing, and evaluation, which includes one percent reserved specifically for evaluation²¹ that can only be used for program evaluation activities.

Table 2: MASH Budget Allocations by Utility Territory

	CSE	PG&E	SCE	Total
Percent of Budget	10.3%	43.7%	46%	100%
Track 1A and 1B	\$7,759,938	\$32,923,230	\$34,656,032	\$75,339,200
Track 2	\$2,060,000	\$8,740,000	\$9,200,000	\$20,000,000
Administration (12%)²²	\$1,339,082	\$5,681,350	\$5,980,368	\$13,000,800
Track 1C and 1D²³	\$5,172,660	\$21,946,140	\$23,101,200	\$50,220,000
Administration (7%)²⁴	\$389,340	\$1,651,860	\$1,738,800	\$3,780,000
Total	\$16,721,020	\$70,942,580	\$74,676,400	\$162,340,000

From October 16, 2008 through June 30, 2019, total MASH Program expenditures were \$116,219,471. Incentive payments make up a significant portion of the total expenses at 93.4 percent. Tables 3A and 3B detail expenditures by PA.

Table 3A: MASH Program Expenditures by Program Administrator (Consolidated)

MASH Program Expenditure Data October 16, 2008²⁵ to June 30 2019				
Expenditure Type	CSE	PG&E	SCE	Total
Administrative	\$1,154,869	\$3,460,283	\$1,999,519	\$6,614,671
Marketing	\$119,219	\$41,923	\$64,536	\$225,678
Measurement & Evaluation	\$89,191	\$581,878	\$139,908	\$810,977
Incentive	\$14,818,554	\$41,778,294	\$51,971,297	\$108,568,145
Total	\$16,181,833	\$45,862,378	\$54,175,260	\$116,219,471

²¹ See D.15-01-027, COL 26.

²² See D.08-10-036, COL 9.

²³ See D.15-01-027, COL 28, requires the rollover of administrative and incentive budget from the current MASH Program into the incentive budget for Track 1C and 1D. The figure in Table 2 reflected the adopted budget allocation and does not reflect the rollover amount from Track 1A and 1B.

²⁴ See D.15-01-027, p.30.

²⁵ Effective date of D.08-10-036.

Table 3B: MASH Program Expenditures by Program Administrator for Track 1C and 1D Only

MASH Program Expenditure Data January 29, 2015²⁶ to June 30, 2019				
Expenditure Type	CSE	PG&E	SCE	Total
Administrative	\$300,164	\$1,498,070	\$575,735	\$2,373,969
Marketing	\$11,678	\$237	\$5,935	\$17,850
Measurement & Evaluation	\$2,637	\$60,844	\$0	\$63,481
Incentive	\$5,072,243	\$7,951,113	\$8,720,328	\$21,743,684
Total	\$5,386,722	\$9,510,264	\$9,301,998	\$24,198,984

3. Program Progress

Since the publication of the last Semiannual Progress Report, 32 additional MASH projects have been completed program-wide for a total of 513 MASH solar projects installed with a capacity of 44.94 MW.

As shown in Table 4, the total number of completed projects by PA is comprised of 257 projects for PG&E, 194 for SCE, and 62 for CSE. At the time of this publication, \$108,568,132 in incentives have been paid to MASH projects statewide.

Table 4 also shows there are a total of 136 MASH applications in the pipeline, with incentives totaling \$25,263,863 and an estimated capacity of 18.93 MW.

Chart 1 illustrates the number of applications and their respective status as of June 30, 2019. Approximately 97 percent of CSE's active²⁷ projects are completed; approximately 78 percent of PG&E's are completed, and 75 percent of SCE's are completed.

Per the direction in D.15-01-027, MASH was authorized to use new funds to reopen the program to the waitlist. After completing the pending applications on the waitlist, the PAs opened the program to new applications if incentives were available.

To access the most current MASH Program data available to the public, go to the California Solar Statistics website at <http://www.californiasolarstatistics.ca.gov/>.

²⁶ Effective date of D.15-01-027.

²⁷ Active status is defined as applications that are either under review, reserved or completed.

Table 4: Summary Data: MASH Applications by Status (Consolidated)

Summary Data				
UNDER REVIEW APPLICATIONS	CSE	PG&E	SCE	Total
Application (Number)	0	0	0	0
Capacity (MW)	0	0	0	0
Incentives	\$0	\$0	\$0	\$0
RESERVED APPLICATIONS				
Application (Number)	2	71	63	136
Capacity (MW)	.17	8.31	10.45	18.93
Incentives	\$157,474	\$9,996,620	\$15,109,769	\$25,263,863
COMPLETED APPLICATIONS				
Application (Number)	62	257	194	513
Capacity (MW)	6.09	17.99	20.86	44.94
Incentives	\$14,818,554	\$41,778,292	\$51,971,286	\$108,568,132
WAITLIST APPLICATIONS				
Application (Number)	1	0	0	1
Capacity (MW)	0.35	0	0	0.35
Incentives	\$0	\$0	\$0	\$0
OTHER DETAILS				
Average Project Costs (\$/watt) Completed, before incentive	\$6.04	\$6.17	\$6.32	\$6.18
Average Dropout Rate ²⁸	53%	56%	61%	57%

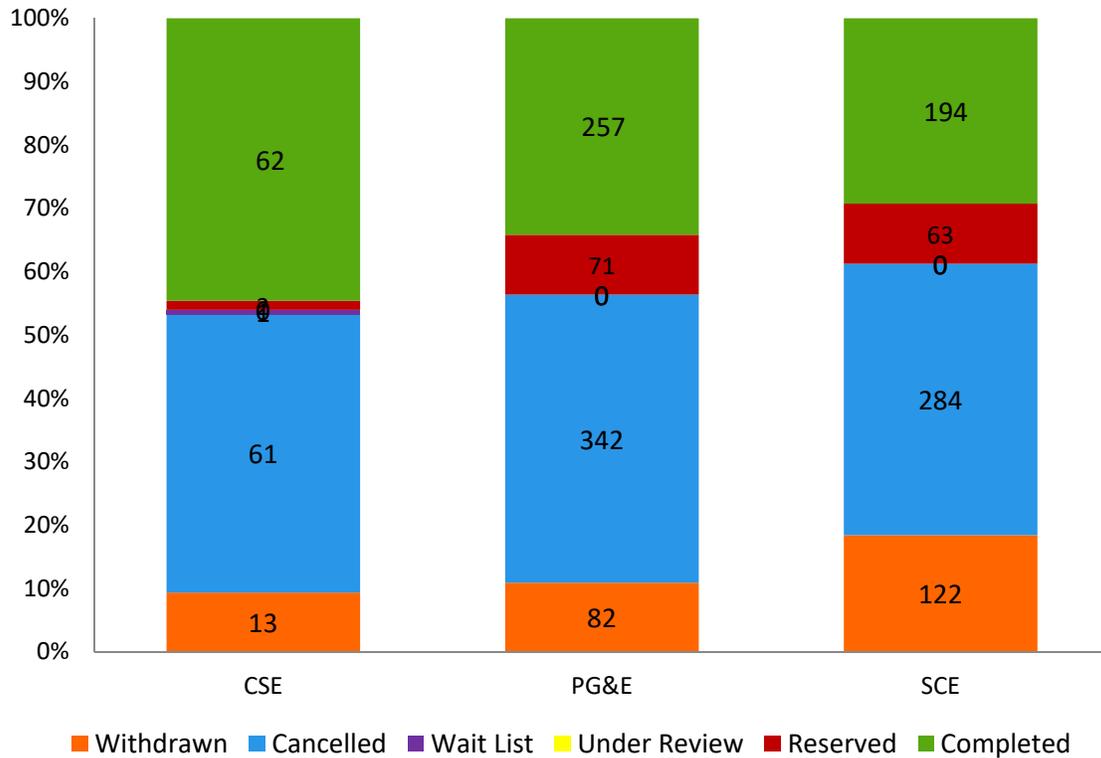
Data: October 16, 2008 – June 30, 2019

Source: PowerClerk and www.californiasolarstatics.ca.gov

Note: All system capacity measured in CEC-AC MW

²⁸ Dropout rate includes both cancelled and withdrawn applications.

Chart 1: MASH Applications by Status



Data as of June 30, 2019
 Source: www.californiasolarstatics.ca.gov and PowerClerk

3.1. MASH Track 1A and 1B Activity

The charts and tables in this section illustrate detailed MASH activity based on application status, number of active applications, system capacity, and incentive dollars.

To illustrate program subscription under Track 1A (common area) and Track 1B (tenant area) incentives, the information has been separated between the two incentive tracks. All Track 1A and 1B projects have been completed and paid out.

With a total of 36 percent of incentive dollars allocated for Track 1A and 64 percent allocated for Track 1B, PV system investments appear to lean more toward those that offset tenant electrical usage.

Table 5 below shows that 11 MW of solar projects have been completed under Track 1A.

Table 5: Detailed Data: MASH Track 1A (Common Area) Applications by Status

UNDER REVIEW	CSE	PG&E	SCE	Total
Capacity (MW)	0	0	0	0
Incentives	\$0	\$0	\$0	\$0
RESERVED				
Capacity (MW)	0	0	0	0
Incentives	\$0	\$0	\$0	\$0
COMPLETED				
Capacity (MW)	0.437	5.548	5.047	11.032
Incentives	\$1,273,846	\$14,248,500	\$15,436,617	\$30,958,963
WAITLISTED				
Capacity (MW)	0	0	0	0
Incentives	\$0	\$0	\$0	\$0

Data: October 16, 2008 – June 30, 2019

Source: PowerClerk and www.californiasolarstatics.ca.gov

All system capacity measured in CEC-AC MW

All Waitlisted Track 1A/1B projects were transferred to the 1C/1D waitlist on August 3, 2015

Table 6 below shows that 16.3 MW of solar projects have been completed under Track 1B.

Table 6: Detailed Data: MASH Track 1B (Tenant) Applications by Status

UNDER REVIEW	CSE	PG&E	SCE	Total
Capacity (MW)	0	0	0	0
Incentives	\$0	\$0	\$0	\$0
RESERVED				
Capacity (MW)	0	0	0	0
Incentives	\$0	\$0	\$0	\$0
COMPLETED				
Capacity (MW)	2.13	5.73	8.46	16.32
Total Incentives	\$8,472,463	\$19,578,682	\$27,814,341	\$55,865,486
WAITLISTED				
Capacity (MW)	0	0	0	0
Incentives	\$0	\$0	\$0	\$0

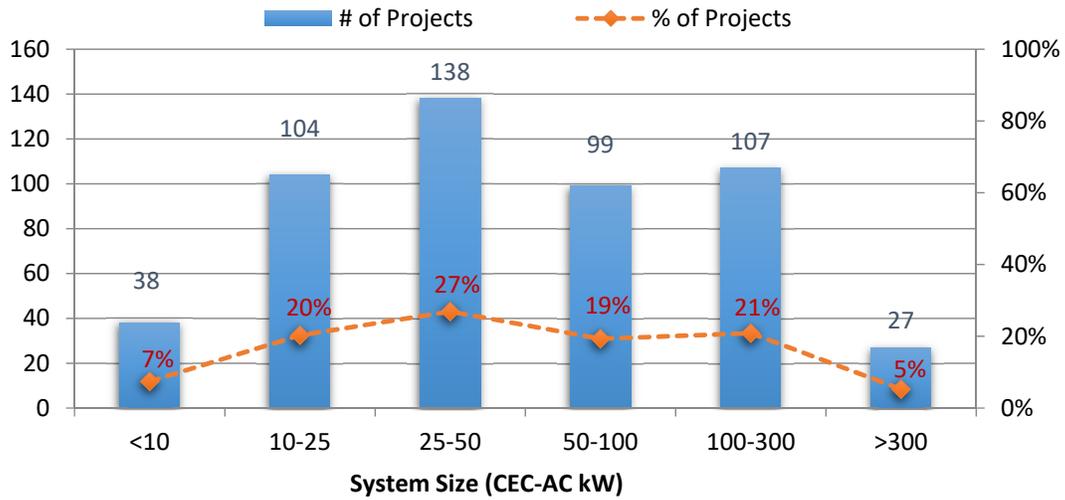
Data: October 16, 2008 – June 30, 2019

Source: PowerClerk and www.californiasolarstatics.ca.gov

All system capacity measured in CEC-AC MW

All Waitlisted Track 1A/1B projects were transferred to the 1C/1D waitlist on August 3, 2015

**Chart 2: Projects by System Size
(in CEC-AC kW)**



Data as of June 30, 2019
 Source: www.californiasolarstatics.ca.gov
 Only includes projects from MASH Track 1 (A/B/C/D).

Chart 2 above indicates that most active projects across all PA territories are in the range of 10 to 100 kW CEC-AC.

Chart 3: Average Cost per Watt by Project Size



Data as of June 30, 2019
 Source: www.californiasolarstatics.ca.gov
 This table is a random sample of all projects in the filtered data set.

When looking at the MASH Program for indications of economies of scale and localized installed cost variances for multifamily systems, it is important to review the average cost per watt. To provide representative cost information for this analysis, the data set used for Chart 3 above is limited to projects that have been completed. As shown in Chart 3, there is some cost variability between the PA territories. Overall, the average cost per watt for systems that are less than 100 kW CEC-AC are higher than those for systems 100 kW and greater. This is consistent with the general market CSI Program, where economies of scale lead to cost efficiencies in larger systems.

3.2. MASH Track 2 Incentives

Prior to the closure of Track 2, 13 distinct Track 2 projects were awarded across all PA territories. PA-specific Track 2 program information is shown in Table 7. As reported in the previous Semiannual Progress Report, all MASH Track 2 projects have been completed across all service territories. In summary, a total of 1.162 MW of capacity was installed, and \$7,977,314 of MASH Track 2 incentives were paid across all PA territories.

Table 7: Summary Data: Total MASH Track 2 Applications by Status

Summary Data (Track 2)				
RESERVED APPLICATIONS	CSE	PG&E	SCE	Total
Application (Number)	0	0	0	0
Capacity (MW)	0	0	0	0
Incentives	\$0	\$0	\$0	\$0
COMPLETED APPLICATIONS				
Application (Number)	2	7	4	13
Capacity (MW)	0.104	0.482	0.576	1.162
Incentives	\$818,964	\$2,540,968	\$4,617,382	\$7,977,314

Data: October 16, 2008 – June 30, 2019

Source: www.californiasolarstatics.ca.gov

Note: All system capacity measured in CEC-AC MW

3.3. MASH Track 1C and 1D Activity

The charts and tables in this section illustrate detailed MASH Track 1C and 1D activity based on application status, number of active applications, system capacity, and incentive dollars.

To illustrate program subscription under Track 1C and Track 1D incentives, the information has been separated between the two incentive tracks.

With a total of 46 percent of incentive dollars allocated for Track 1C and 54 percent allocated for Track 1D, PV system investments will be incentivized toward those that offset tenant area electrical usage.

Table 8 shows that there are currently 8.04 MW reserved and 0 MW of capacity under review for Track 1C incentives. Across all PA territories, there is a total of 0 MW on the waitlist for Track 1C incentives.

Table 8: Detailed Data: MASH Track 1C Applications by Status

UNDER REVIEW	CSE	PG&E	SCE	Total
Capacity (MW)	0	0	0	0
Incentives	\$0	\$0	\$0	\$0
RESERVED				
Capacity (MW)	0.17	4.73	3.14	8.04
Incentives	\$157,474	\$4,995,940	\$3,834,515	\$8,987,929
COMPLETED				
Capacity (MW)	1.36	4.79	4.99	11.14
Incentives	\$1,595,515	\$4,979,531	\$5,356,111	\$11,935,156
WAITLISTED				
Capacity (MW)	0	0	0	0
Incentives	\$0	\$0	\$0	\$0

Data: August 3, 2015 – June 30, 2019

Source: PowerClerk and www.californiasolarstatics.ca.gov

All system capacity measured in CEC-AC MW

In comparison, Table 9 below shows that there are 10.14 MW reserved and 0 MW of capacity under review for Track 1D incentives. Across all PA territories, there is a total of 0 MW on the waitlist for Track 1D incentives.

Table 9: Detailed Data: MASH Track 1D Applications by Status

UNDER REVIEW	CSE	PG&E	SCE	Total
Capacity (MW)	0	0	0	0
Incentives	\$0	\$0	\$0	\$0
RESERVED				
Capacity (MW)	0	3.58	6.56	10.14
Incentives	\$0	\$5,000,679	\$10,448,926	\$15,449,605
COMPLETED				
Capacity (MW)	2.12	1.92	2.06	6.10
Total Incentives	\$3,455,165	\$2,971,582	\$3,085,172	\$9,511,919
WAITLISTED				
Capacity (MW)	0	0	0	0
Incentives	\$0	\$0	\$0	\$0

Data: August 3, 2015 – June 30, 2019

Source: PowerClerk and www.californiasolarstatics.ca.gov

All system capacity measured in CEC-AC MW

3.4. Virtual Net Metering Activity

As discussed in Section 2.2, VNM is offered to MASH participants as an option for the installation of solar systems on multi-unit affordable housing properties. Since the VNM tariffs became available to SCE, PG&E and SDG&E customers, property owners have used VNM to pass on the benefits of the solar system installation to their tenants.

Participating tenants receive monthly allocation of the energy produced by the solar PV system, resulting in a reduction of their electric bill. As of June 30, 2019, a total of 16,301 tenant units are being served by MASH VNM tariffs offered by the utilities. The number of participating tenants by PA territory is in Table 10.

Table 10: Tenant Units and Projects Served by MASH Virtual Net Metering (VNM) Tariffs

	CSE	PG&E	SCE	Total
MASH VNM Tenant Units	2,869	4,552	8,880	16,301
MASH VNM Projects	62	96	95	253

Data through June 30, 2019

4. Regulatory Update

The standalone MASH Handbook filed on March 30, 2015, was approved on July 30, 2015. D.15-01-027 required the MASH Program Administrators to roll over remaining administrative funding from the existing program into the MASH Track 1C and 1D incentive budgets. The rollover of funding occurred in August 2015.

In accordance with Ordering Paragraphs (OP) 5 and 9 of D.15-01-027, a confidential data annex containing job training information and ESA Program enrollment has been sent separately from this report as an addendum.

5. Conclusion

In conclusion, a total of \$108,568,132 in incentives have been paid, and 44.94 MW of capacity have been installed for Track 1 and Track 2 projects through June 30, 2019, with an additional 18.93 MW of capacity expected from active reservations. Additionally, the MASH PAs reopened the program to the waitlist on August 3, 2015 after confirming that incentive funds were still available.

As of June 30, 2019, CSE is fully subscribed within the program territory and the waitlist is currently closed to new applications. SCE and PG&E will reopen to new applications later this year.