

Single-family Affordable Solar Homes (SASH) Program

Semi-annual Program Status Report



January 2019



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1. Program Summary

The Single-family Affordable Solar Homes (SASH) Program is one of the California Solar Initiative's (CSI) two low-income solar programs. GRID Alternatives (GRID), a non-profit solar contractor, is the statewide Program Administrator for the SASH Program. The SASH incentive is available to qualifying low-income homeowners in the Pacific Gas and Electric (PG&E), Southern California Edison (SCE), and San Diego Gas and Electric (SDG&E) Investor-Owned Utility (IOU) service territories.

The SASH Program is uniquely designed to be a comprehensive low-income solar program. In addition to providing incentives, SASH is structured to promote or provide energy efficiency, workforce development and green jobs training opportunities, and broad community engagement with low-income communities. There is no other solar program in California that has such a diverse range of benefits for low-income communities. It is truly a first-of-its-kind solar program.

The SASH incentive provides low-income families with free or low-cost solar photovoltaic (PV) systems that significantly reduce household energy expenses and allow families to direct those savings toward other basic needs. GRID Alternatives' volunteer-based installation model has proven to be a highly efficient and low-cost model that makes solar affordable for even more low-income homeowners. In addition to being the primary installer for SASH, GRID provides education on and access to energy efficiency programs that further reduce a household's energy consumption and expenses.



In implementing the SASH Program, GRID Alternatives provides opportunities for local volunteers to assist with installations, engage their communities, and to participate in CA energy programs. GRID has trained over 38,900 volunteers and job trainees in California to help promote and install solar in low-income communities since the inception of the SASH Program. GRID requires its volunteers to participate in a solar orientation program that educates these potential solar adopters about solar PV and energy efficiency. This basic consumer education program can help further state goals of promoting the use of solar PV technology and helping build broad-based community support for solar electric technologies and energy efficiency statewide.

Finally, SASH provides a foundation for promoting and building a sustainable solar industry in California by incorporating a workforce development and job training component into the program. GRID partners with local job training programs to give their trainees an opportunity to get hands-on installation experience. The SASH Program also promotes partnerships between solar contractors and local workforce development programs by including a job training requirement for all sub-contracted SASH projects. This becomes a double benefit to low-income communities since many green-collar job trainees come from the same communities that the SASH Program aims to serve.

2. Background

In 2006, the California Assembly Bill 2723 directed that no less than ten percent of the overall CSI funding be directed towards programs assisting low-income households in obtaining the benefits of solar technology. In D.07-11-045, the Commission established the \$108.34 million SASH Program as a component of the CSI Program. The SASH Program provides incentives “for homeowners who occupy

their homes and meet the definition of low-income housing established in Public Utilities Code Section 2852.”¹ The overall goal of the SASH Program established in D.07-11-045 is “to provide existing low-income single family homes with access to photovoltaic (PV) systems to decrease electricity usage and bills without increasing monthly household expenses.”²

Assembly Bill 217 (Bradford, 2013) extended the SASH Program and its sister program, the Multi-family Affordable Solar Housing (MASH) Program, from their scheduled sunsets in 2016 with \$108M in new funding coupled with new program objectives. In D.15-01-027, the Commission delineated that GRID Alternatives will continue to administer the SASH Program and established revised program requirements for energy efficiency, job training, and a modified incentive structure.³ Resolution E-4719, approved June 25th, 2015 by the Commission, allows for a unique third-party ownership (TPO) model in SASH under AB 217’s funding. The TPO model has been deliberately designed to maximize household savings and include consumer protection measures as required in D.15-01-027.⁴ The SASH Program extended under AB 217 with an additional \$54M in funding will operate either until December 31, 2021, or until all funds available from the program’s incentive budget have been encumbered, whichever event occurs first. For ease of the reader in this report, the original SASH allocation of \$108M with D.07-11-045 is referred to as “SASH 1.0” and the reauthorized SASH program with \$54M in additional funding through D.15-01-027 is referred to as “SASH 2.0.” Complete details of the SASH Program can be found in the SASH Program Handbook⁵ or at www.gridalternatives.org/sash.

3. Q3-Q4 2018

In the second half of 2018, the SASH Program posted strong results, with over 1.8 MW (CEC-AC) of solar electric capacity interconnected for the direct benefit of over 500 CA low-income homeowners. GRID continued its implementation and expansion of the SASH Program’s Third-Party Ownership (TPO) model which helps provide additional funding for projects, thereby increasing the number of qualified families who are able to take advantage of the SASH Program. The SASH Program’s TPO model is uniquely structured to be a “families-first” model that maximizes homeowner benefit and champions consumer protection. In March 2017, the Commission approved a second TPO provider for the SASH program, allowing GRID to increase the volume of TPO-funded projects.⁶ To illustrate, of the SASH 2.0 projects installed, over 75% utilized the TPO model.



The SASH Program provides direct economic benefits to participating families, and also adds value to the industry in the areas of green job training and broad consumer education. Each SASH project contains a workforce development component and provides opportunities for job trainees and volunteers to get hands-on experience installing solar systems. Every

¹ D.07-11-045, Appendix A, p.1.

² D.07-11-045, Appendix A, p.1.

³ D.15-01-027, p.12-14; 44-48.

⁴ Resolution E-4719, June 15, 2015, and D.15-01-027, Minimum Consumer Protection standards for SASH TPO model, at pgs. 52-53. D.15-01-027 online at

<http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M145/K938/145938475.PDF>.

⁵ http://www.gosolarcalifornia.ca.gov/documents/SASH_Handbook.pdf

⁶ Resolution E-4829, March 2, 2017.

SASH installation includes either a team of volunteers from the local community or graduates from job training programs. In addition, each sub-contracted installation requires at least one job trainee to participate in the project, as a paid worker learning valuable skills. These green job training opportunities form the backbone of SASH and create lasting value in local communities by helping foster a new green workforce – a workforce of skilled laborers, many hailing from the same communities that SASH aims to serve – that will have high employability in California’s solar job sector.

At the end of Q4 2018, 2,962 PV-systems have been installed and interconnected using the SASH 2.0 incentive budget, 198 projects have been reserved and are awaiting installation or interconnection, and another 256 applications statewide have been submitted and are under review.

To attract new SASH clients, GRID’s Affiliate offices continue to implement strategies that have proven successful in previous quarters such as expanding marketing and outreach scope, and fostering new relationships and strengthening existing partnerships with volunteers, job training programs, local businesses, and municipalities. Word-of-mouth testimonials from past program participants continue to be the best marketing tool for acquiring new SASH clients and fortifying existing clients’ relationships.

4. Budget

The original SASH Program budget from D.07-11-045 is \$108.34 million. D.15-01-027 extended the SASH Program with an additional \$54 million, bringing the total SASH Program budget to \$162.34 million. The program will be funded by Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), and San Diego Gas & Electric Company (SDG&E) according to the following percentages:

Table 1: SASH Budget Allocations by Utility Territory

	PG&E	SCE	SDG&E	Total
Budget %	43.7%	46%	10.3%	100%
Budget (\$ in millions) in D.07-11-045 (SASH 1.0)	\$47.34	\$49.8	\$11.2	\$108.34
Extended Budget (\$ in millions) in D.15-01-027 (SASH 2.0)	\$23.59	\$24.84	\$5.57	\$54.00
Total Budget (\$ in millions) (Entire SASH Program)	\$70.93	\$74.64	\$16.77	\$162.34

The SASH Program budget is allocated between various program functions, as detailed in Table 2 below:

Table 2: SASH Budget Allocations by Program Functions

	Budget, %	Budget, \$ D.07-11-045 SASH 1.0	Budget, \$ D.15-01-027 SASH 2.0	Expensed thru Q4 2018
Incentives	85%	\$92,089,000	\$45,900,000	\$92,075,000 (SASH 1.0) \$26,839,674(SASH 2.0)
Administration	10%	\$10,834,000	\$5,400,000	\$14,296,248
Marketing & Outreach	4%	\$4,333,600	\$2,160,000	\$4,797,002
Evaluation	1%	\$1,083,400	\$540,000	Budget resides w/ CPUC
Total	100%	\$108,340,000	\$54,000,000	\$138,007,924

5. Program Growth and Project Details

Tables 3 and 4 below summarizes the status of all SASH applications through Q4 2018.

Table 3: SASH 1.0 Applications by Status and Service Territory

Application Status	Number of Applications				Total kW, (CEC-AC)	Total Incentives, \$ millions
	PG&E	SCE	SDG&E	Totals		
STEP 1: Applications under review	0	0	0	0	0.0*	\$0.0*
STEP 2: Confirmed Applications/Reservations	0	0	0	0	0.0	\$0.0
STEP 3: Completed/Installed	2,292	2,415	559	5,266	16,048.8	\$92.08
TOTALS	2,292	2,415	559	5,266	16,048.8	\$92.08

Table 3: Data collected 01/16/19.

* Step 1 system sizing (kW) and incentives (\$) for SASH 1.0 projects are estimates based on an average system size of 2.9kW, CEC-AC and incentive level of \$6.00/W. System designs are not completed until the Applicant is confirmed to meet all other program requirements. The majority (>90%) of projects in Step 1 will receive Step 2 reservations.

Table 4: SASH 2.0 Applications by Status and Service Territory

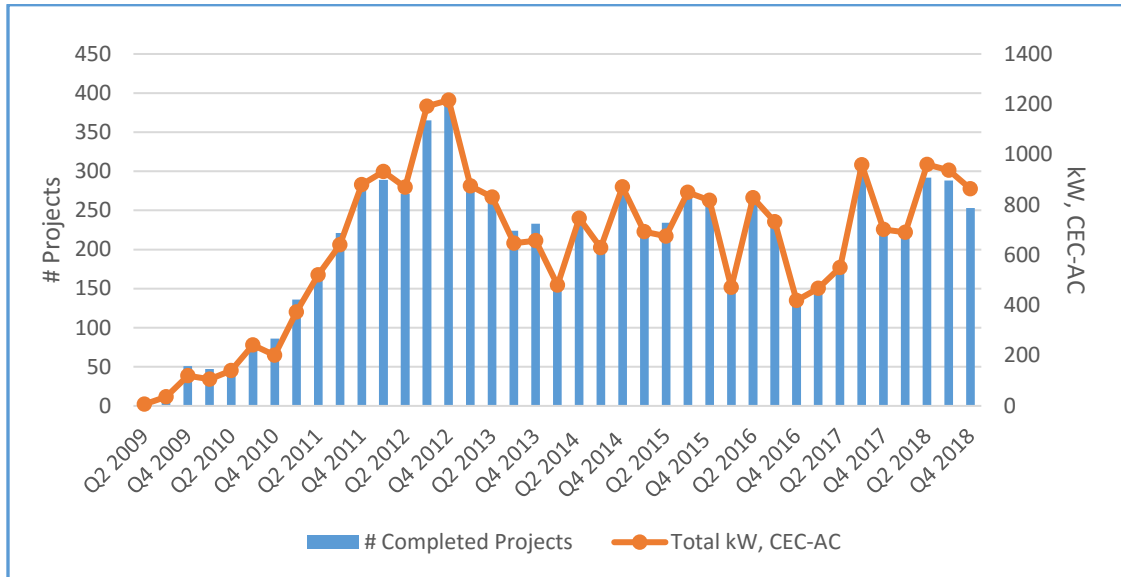
Application Status	Number of Applications				Total kW, (CEC-AC)	Total Incentives, \$ millions
	PG&E	SCE	SDG&E	Totals		
STEP 1: Applications under review	82	150	24	256	793.6*	\$2.38*
STEP 2: Confirmed Applications/Reservations	116	75	7	198	613.8	\$1.84
STEP 3: Completed/Installed	1,746	819	397	2,962	9,182.2	\$27.55
TOTALS	1,944	1,044	428	3,416	10,589.6	\$31.77

Table 4: Data collected 01/16/19.

* Step 1 system sizing (kW) and incentives (\$) for SASH 2.0 projects are estimates based on an average system size of 3.1kW, CEC-AC and incentive level of \$3.00/W. System designs are not completed until the Applicant is confirmed to meet all other program requirements. The majority (>90%) of projects in Step 1 will receive Step 2 reservations.

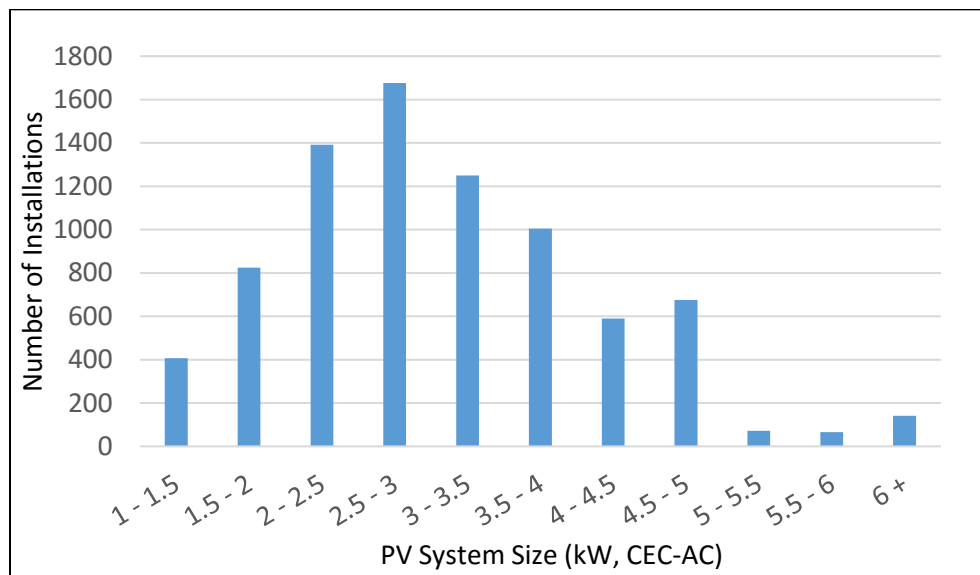
Chart 1 below illustrates the progress of the SASH Program since 2009 and the nearly 8,100 projects installed and interconnected through Q4 2018.

Chart 1: Completed SASH Projects per Quarter



System size: Chart 2 below indicates that about 53% of installed SASH PV-systems are 3kW (CEC-AC) or less, and the average SASH installed project is around 3.1kW (CEC-AC). Where the system size is not constrained by roof space, SASH system sizing is based upon the client’s annual usage (kWh) minus the energy efficiency savings the client may realize by adopting basic energy efficiency measures, and is capped at 5kW (CEC-AC).

Chart 2: Completed SASH Installations by System Size



6. Incentives and Project Financing

The SASH Program is designed to be a comprehensive low-income program, and serve homeowners in the most distressed and impoverished areas of California. Nearly 90% of SASH clients qualify for the California Alternate Rates for Energy (CARE) Program that offers reduced electric rates to income-qualified households. This demonstrates that the SASH Program is primarily serving homeowners at the lowest income levels who need the savings provided from solar electric systems the most. GRID consults with homeowners who have a financing gap between their system costs and available incentive to explore individual financing options, such as a client contribution or private loan, and has experienced limited success with this challenge. In most instances GRID has aided in overcoming the gap financing obstacle for families by contributing the organization's own non-profit fundraising dollars and additional resources toward covering the gap between the available incentive and the project costs, thereby allowing more families to go solar with the SASH Program than otherwise would have been able to do so.

GRID's contributions toward covering these financing gaps include: general philanthropy, in-kind equipment donations, proceeds from a third-party ownership model, and corporate sponsorships. GRID's 2018 partnerships with major equipment manufacturers including SunPower, Enphase Energy, IronRidge, Jinko Solar, and Schneider Electric continue to help cover many SASH clients' gap funding requirements, and GRID expects to utilize philanthropic and in-kind contributions from donors and sponsorships to augment gap financing efforts in future years. Given the slow economic recovery in many low-income communities, and the inability for most households to assume more debt, gap financing remains a potential obstacle for low-income families to participate in the SASH Program.

Through its unique "families-first" TPO model, GRID is able to leverage the Federal Investment Tax Credit (ITC) to help finance SASH 2.0 projects, while providing additional benefits to participating families, including a performance guarantee, system monitoring, and 20-year warranty coverage. In 2017 GRID began partnering with Sunrun to further expand its third-party ownership (TPO) model for SASH 2.0 as approved by the Commission in Resolution E-4829. GRID's TPO partnership with Spruce Finance is ongoing though all Q3-Q4 installations were with Sunrun. As seen in Chart 3 below, of the 2,832 total SASH 2.0 projects completed, 2,199 are third-party owned and total over 80% of the total SASH 2.0 kW (CEC-AC) capacity installed.

Chart 3: Comparison of Completed SASH 2.0 Projects with and without Third-Party Ownership

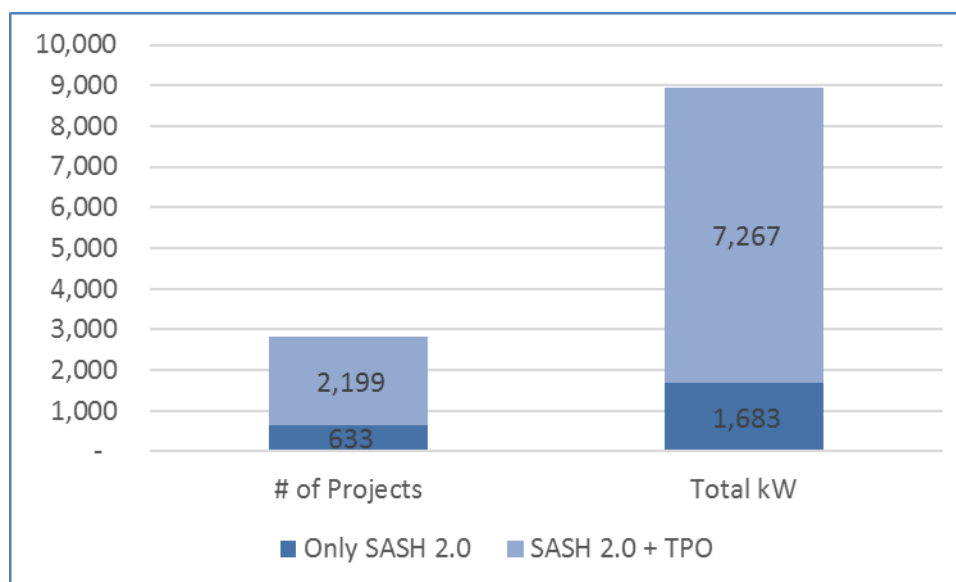
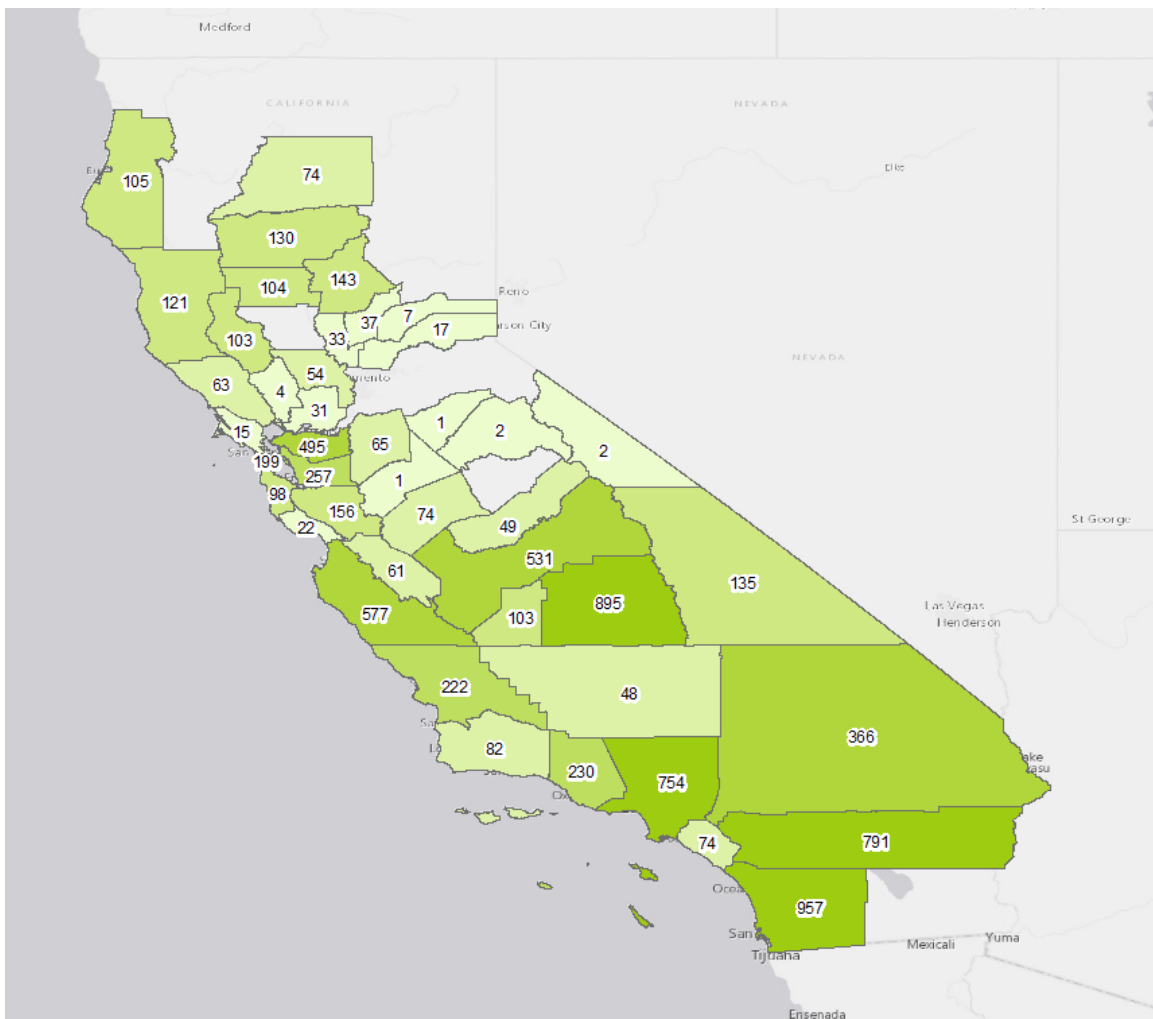


Chart 3 illustrates that the majority of SASH 2.0 projects to date are third-party owned and it is expected that the TPO model will continue to be a significant contributor to financing SASH 2.0 projects.

7. Marketing and Outreach

GRID Alternatives currently has 10 California Affiliate offices, located in Oakland (PG&E), Ukiah (PG&E), Los Angeles (SCE), San Diego (SDG&E), Fresno (SCE/PG&E), Atascadero (SCE/PG&E), Riverside (SCE), Chico (PG&E), Sacramento (PG&E), and Salinas (PG&E). Map 1 below shows the location of all pending or completed SASH applications through Q4 2018.

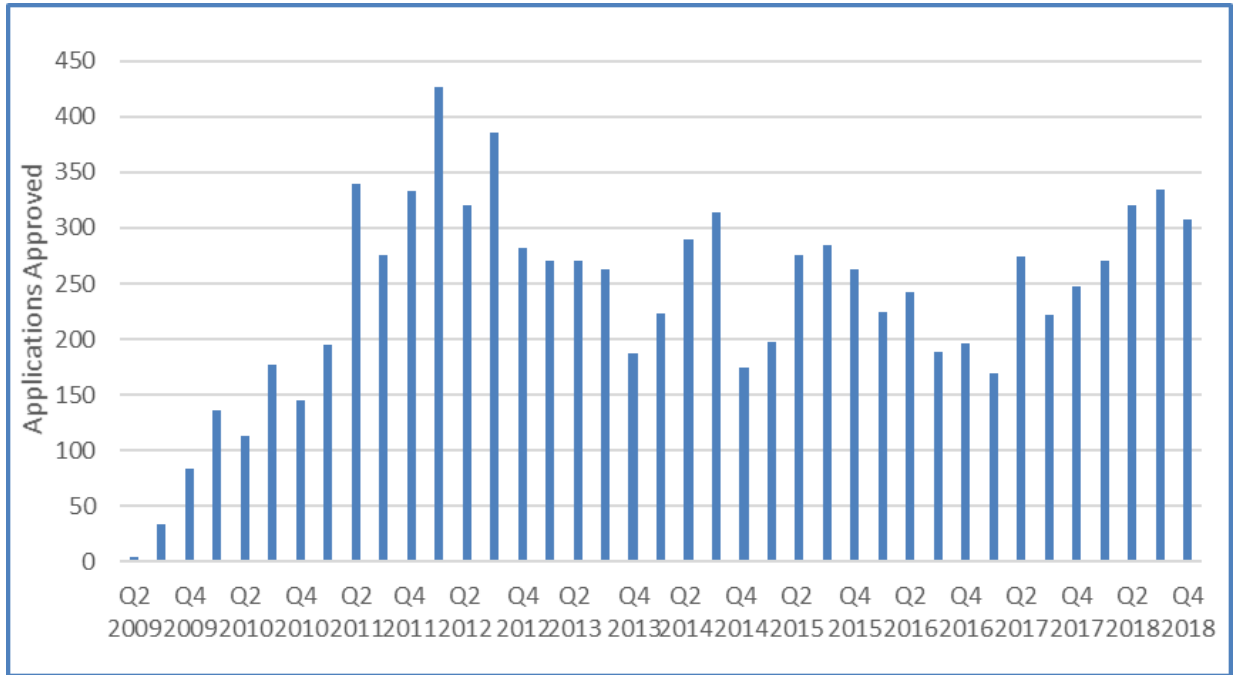
Map 1: Location by County of All SASH Projects through Q4 2018



Map 1 illustrates that SASH projects have been completed and reserved over a wide range of geographic areas throughout the IOU territories.

Chart 4 below shows that GRID processed and approved nearly 650 applications from eligible SASH clients in the second half of 2018, bringing the total number of approved SASH applications to over 9,300.

Chart 4: SASH Applications Received per Quarter



GRID Alternatives' statewide staff continue to utilize many of the marketing and outreach methods proven to be effective for recruiting SASH clients and building SASH brand recognition since the inception of the SASH Program. These activities include: leveraging partnerships with organizations trusted by low-income homeowners, offering consumer education sessions, and increasing community exposure to SASH through events, media and marketing collateral.

GRID also leverages its existing relationships with key community partners to spearhead outreach efforts in low-income communities. GRID garners support and participation from the first-adopters of the SASH Program to discuss their experiences with their neighbors and acquaintances and encourage them to contact GRID. Oftentimes, a former SASH client will invite their neighbors, and GRID's outreach staff, to a meeting at their own home to help promote the Program in their neighborhood. Involving neighbors, volunteers, and civic supporters at SASH installations helps build the SASH brand recognition on-the-ground in low-income communities, and for a wide audience of stakeholders.

8. Volunteer and Workforce Development



GRID Alternatives' unique volunteer-based installation model and organization-wide focus on green jobs training has made every SASH project a workforce development opportunity for a broad range of professional interests. GRID Alternatives has created over 74,500 installation workday positions for volunteers in CA since the inception of the SASH program. Over 16,500 of these positions have been filled by groups of students from CA job training programs. These volunteer and job training opportunities help strengthen California's solar industry by imparting broad consumer education and providing a means for individuals from diverse backgrounds to learn

about PV-solar design and installation through hands-on experience. Volunteer and training opportunities can help create the solar market transformation sought through the California Solar Initiative. These opportunities also create a well-informed public, and proof that the technology can be adopted by everyone in every community within California.

GRID ensures that the volunteers on SASH projects are adequately trained in safety and installation techniques and understand the basic fundamentals of the SASH Program, the California Solar Initiative, and the benefits of PV-solar by requiring all volunteers to attend a mandatory volunteer/solar orientation. GRID Alternatives has trained over 38,900 community volunteers in these pre-installation orientations and the majority have gone on to participate in a SASH installation. Volunteers and job trainees form the backbone to GRID's installation model and are an important part of the overall success of the SASH Program.

GRID Alternatives has incorporated "green job" training and workforce development initiatives into the SASH Program with the following initiatives:

- **Integration of hands-on solar installation experience into low-income job training programs.**

GRID Alternatives presently partners with 86 California job training organizations to incorporate GRID's volunteer-based installation projects into their construction training curricula. GRID dedicates approximately 20% of its internal installations for these trainees to gain hands-on experience with real-world solar installations that have conditions and requirements comparable to what they would encounter in private industry. This becomes a double benefit to the low-income community since many solar job trainees come from the same neighborhoods that the SASH Program aims to serve.



- **The Installation Basics Training (IBT) program awards trainees with certificates for industry-relevant skills learned under the supervision of GRID's professional solar**

installation staff. GRID's Installation Basics Training (IBT) program provides job trainees' valuable hands-on training, support for development of a specific skillset solicited by employers, and access to potential employment opportunities. IBT trainees earn certificates by demonstrating their competency on specific skills while working on installations. GRID currently offers 11 Skills Certificates that cover a variety of array and electrical skills. To earn all 11 Skills Certificates, IBTs typically need to dedicate 130-300 hours in the field (8-20 complete installations). Employment opportunities for IBT trainees include on-site networking opportunities with corporate sponsors, referrals to companies hiring for installation positions in the solar industry, and access to GRID's Resume Bank, which connects job seekers and employers. Graduates of the IBT program may advance to Team Leader status to further their technical skills and gain leadership experience.

- **GRID Team Leader and ongoing hands-on opportunities of job trainees.** In addition to reserving entire installations for job training partnerships, GRID gives individual job trainees priority to participate on volunteer installations. Additionally, job trainees can participate in GRID's "Team Leader Program" that provides leadership roles on GRID's volunteer installations. To date GRID has 433 volunteers who have been trained as Team Leaders and are available to improve their skills and gain valuable leadership experience on installations in California. These Team Leader initiatives give job trainees the opportunity to get critical hands-on PV-installation experience required by most PV-solar contractors.
- **GRID Team Leaders may apply their experience toward NABCEP certification.** The North American Board of Certified Energy Practitioners (NABCEP) is widely recognized as the leading certification for solar energy professionals. An individual pursuing NABCEP's PV solar installer certification must meet the Board's minimum requirement of having led 5 PV solar installations in order to sit for the certifying exam. One of the auxiliary benefits for GRID Team Leaders is that their experience working directly under professional installers while leading other volunteers can be applied toward meeting this NABCEP requirement for certification.
- **Paid work and job placement opportunities for training program graduates.** Students or graduates of job training organizations may be provided with short-term paid work and opportunities for long-term job placement in the solar PV industry through the SASH Sub-Contractor Partnership Program (SPP). Trainees from over 50 different CA job training programs have worked alongside experienced installers from 52 for-profit companies to install SASH systems. These opportunities provide the job trainees and the contractors with extended, paid "field interviews" where the trainees can be evaluated for available long-term installer positions within the company. Since the inception of the SPP, 2,255 job opportunities have come to fruition for 247 unique California trainees through SPP installations. Although the minimum requirement is to hire one job trainee per SPP installation, over 17% of SPP installations have had two or even three job trainees on site.
- **General volunteering opportunities.** Over 38,900 individual volunteers have completed GRID's



volunteer/solar orientation in California since the commencement of the SASH Program. The orientation program allows GRID to promote solar energy and educates volunteers on solar technologies, the importance of energy efficiency, and the CSI incentive programs. Individuals who complete the volunteer/solar orientation leave not only with eligibility to work on SASH installations, but also with heightened knowledge about the solar industry and the SASH Program that can motivate them to be solar advocates in their own communities.

Though GRID has incorporated job training into every SASH project since the program inception in 2009, GRID is now meeting additional requirements related to D. 15-01-027 including having each volunteer-based installation include either one Solar Corp, one Team Leader, or three students from a job training organization,⁷ further enhancing the job training opportunities created by the SASH program.

9. Energy Efficiency

Energy efficiency (EE) remains an important part of the SASH program and the overall mission of GRID Alternatives. GRID believes that energy efficiency is the essential first step to implement in clients' homes before installing PV-solar. To this end, GRID conducts an energy efficiency education and training session for every SASH applicant. GRID works with the Energy Savings Assistance Program (ESAP) administrators to enroll eligible homeowners, and with the IOUs to streamline ESAP enrollment for SASH clients. Per D. 15-01-027, GRID includes in Appendix A the required data for ESAP enrollment for SASH participants in SASH under AB 217 funding. Table 4 below summarizes the number of SASH applicants that have been referred to the IOUs for enrollment into the ESAP programs through Q4 2018.

Table 5: SASH ESAP Referral

Utility	Total
PG&E	3,974
SCE	3,740
SDG&E	745
Total	8,459

⁷ D.15-01-027, requirements for volunteer-based installations, at pg. 21. Requirements for SPP installations include an affidavit signed by subcontractor and job trainee, and specific reporting requirements, at pg. 23.

**APPENDIX A
Data Annex**

Confidential to CPUC per D. 15-01-027