

Single-Family Affordable Solar Homes (SASH) Program

Semi-Annual Program Status Report



January 2017



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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 programs, the second is the Multi-family Affordable Solar Housing (MASH) Program. GRID Alternatives, a non-profit solar contractor, is the statewide Program Manager 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 and provide energy efficiency, workforce development and green jobs training opportunities, and broad community engagement with solar in low-income communities. The SASH Program is a first-of-its-kind solar program, and offers a diverse range of benefits for low-income communities throughout the IOU service territories.

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 energy efficiency education and access to energy efficiency programs that can 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 participate in CSI programs. To date, GRID has trained over 31,850 volunteers and job trainees to help promote and install solar in low-income communities, with over 28,300 in CA alone 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 will help further the broader CSI goals of promoting the use of solar PV technology statewide and helping build broad-based community support for solar electric technologies and energy efficiency.

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 every installation. 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 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 has an additional \$54M in funding and will operate either until December 31, 2021, or when 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 CSI Program Handbook or at www.gridalternatives.org/sash.

3. Q3-Q4 2016 Overview

2016 brought on a host of new opportunities and exciting changes for GRID Alternatives and the SASH Program. 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. To illustrate, of the SASH 2.0 projects installed in 2016, nearly 75% utilized the TPO model. Throughout 2016, the SASH Program furthered its workforce development impact in low-income communities by launching new initiatives and expanding existing programs aimed at bringing in more veterans, high schoolers, tribal members and women to participate on SASH installations. Over 6,800 individuals specifically interested in obtaining employment in the solar industry have received training on a SASH project through 2016, totaling close to 250,000 hours of hands-on experience.



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 SASH installation includes either a team of volunteers from the local community or graduates from job training programs. In addition,

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>.

each sub-contracted installation requires at least one job trainee to be on site, 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 expanding solar job sector.

At the end of Q4 2016, 5,262 PV-systems have been completed utilizing the SASH 1.0 incentive budget. For SASH 2.0 incentive funding, 1,140 PV-systems have been installed and interconnected, 70 projects have been reserved and are awaiting installation or interconnection, and another 143 applications statewide have been submitted and are under review.

To attract new SASH clients, GRID’s seven California regional 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 / Encumbered thru Q4 2016
Incentives	85%	\$92,089,000	\$45,900,000	\$92,022,849 (SASH 1.0) \$8,609,671 (SASH 2.0)
Administration	10%	\$10,834,000	\$5,400,000	\$11,688,151
Marketing & Outreach	4%	\$4,333,600	\$2,160,000	\$4,716,166
Evaluation	1%	\$1,083,400	\$540,000	Budget resides w/ CPUC
Total	100%	\$ 108,340,000	\$54,000,000	\$117,036,837

5. Program Growth and Project Details

Tables 3 and 4 below summarizes the status of all SASH applications through Q4 2016.

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	1	0	1	2.3	\$0.01
STEP 3: Completed/Installed	2,292	2,411	559	5,262	16,038.4	\$92.03
TOTALS	2,292	2,412	559	5,263	16,040.7	\$92.03

Table 3: Data collected 1/29/2017

* 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

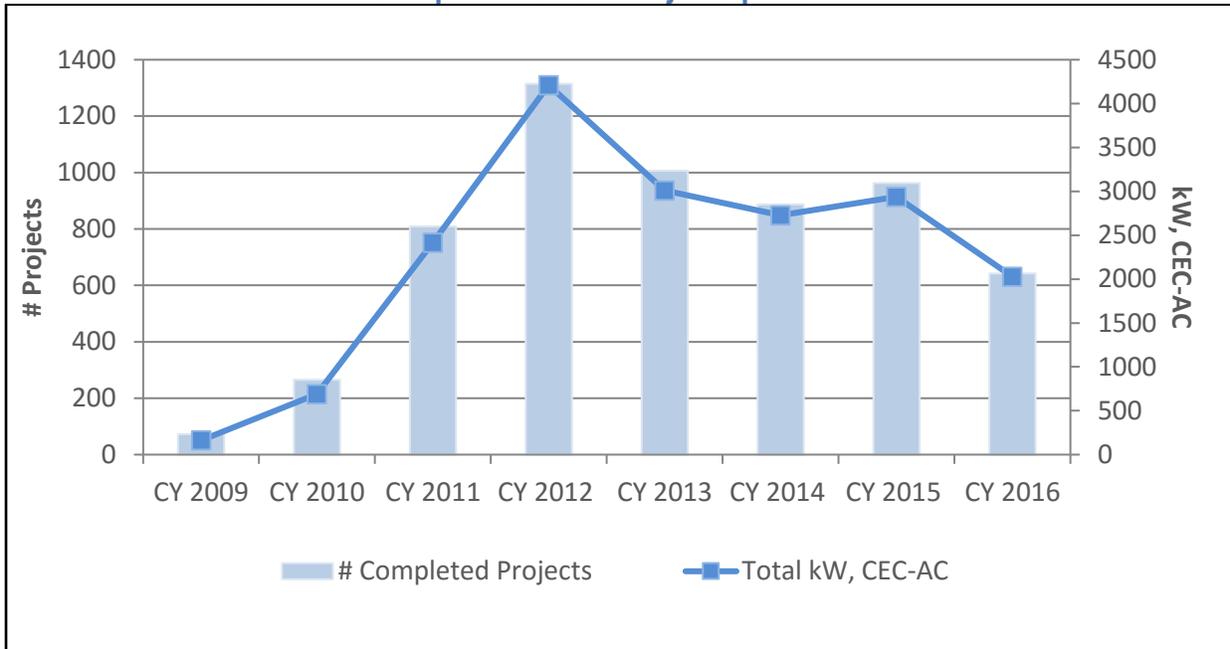
Application Status	Number of Applications				Total kW, (CEC-AC)	Total Incentives, \$ millions
	PG&E	SCE	SDG&E	Totals		
STEP 1: Applications under review	88	54	1	143	163.1	\$0.49*
STEP 2: Confirmed Applications/Reservations	47	20	3	70	210.2	\$0.63
STEP 3: Completed/Installed	628	308	204	1,140	3,520	\$10.55
TOTALS	763	382	208	1,353	3,893.3	\$11.67

Table 4: Data collected 1/29/2017

* Step 1 system sizing (kW) and incentives (\$) for SASH 2.0 projects are estimates based on an average system size of 2.9kW, 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.

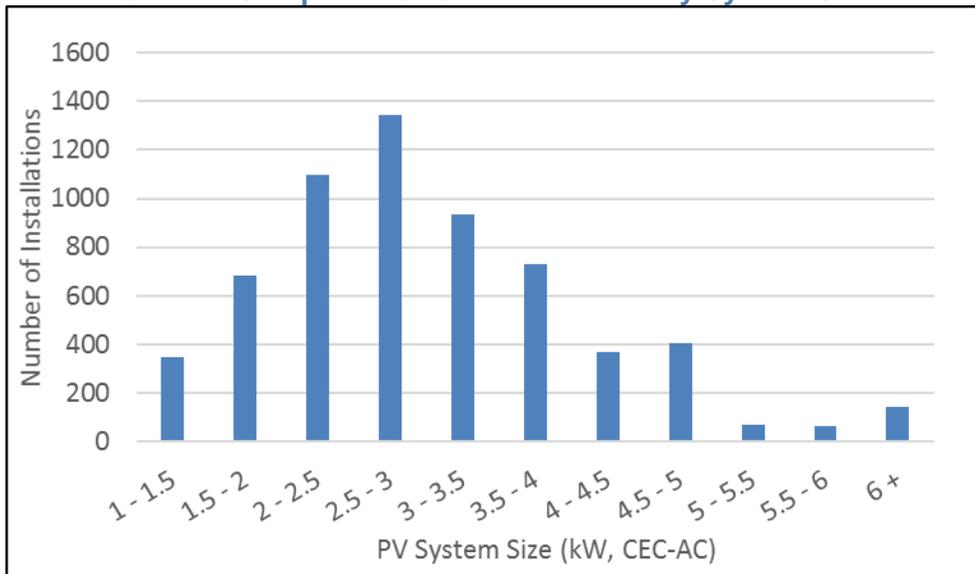
Chart 1 below illustrates the progress of the Program since 2009 and the 642 projects that were completed in 2016.

Chart 1: Completed SASH Projects per Calendar Year



System size: Chart 2 below indicates that nearly 60% of installed SASH PV-systems are 3kW or less, and the average SASH installed project is around 2.9kW (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 now capped at 5kW (CEC-AC).

Chart 2: Completed SASH Installations by System Size



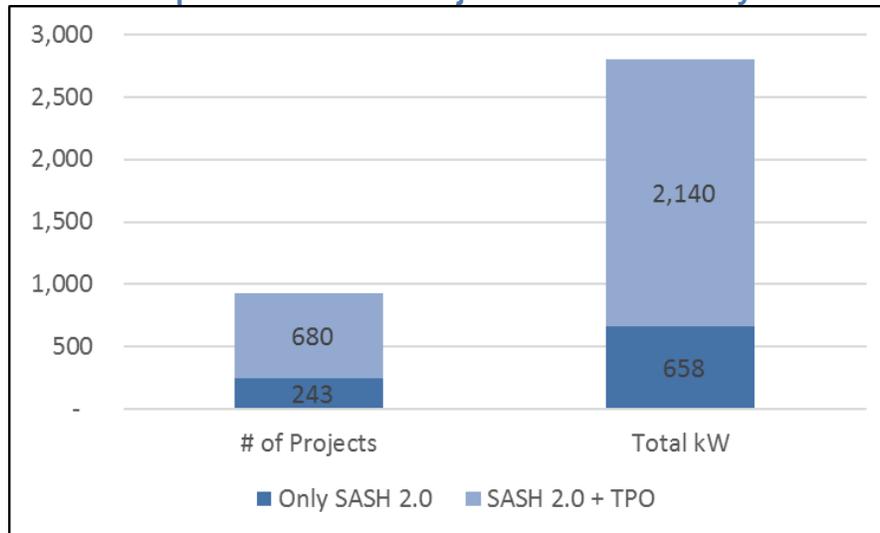
6. Incentives and Project Financing

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 mainly 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’s costs, thereby allowing more families to go solar with the SASH Program than otherwise would have been able to do so.



In 2015 GRID began partnering with Spruce⁵ to implement a third-party ownership (TPO) model for SASH 2.0 as approved by the Commission in Resolution E-4719.⁶ In 2016, the SASH TPO model continues to play a crucial role in filling in funding gaps for installations across California. By using a TPO model, GRID is able to apply Federal Investment Tax Credit (ITC) financing to SASH 2.0 projects, and participating families receive the benefits of a performance guarantee, system monitoring, and a 20-year warranty coverage. Participating families have the opportunity to contribute philanthropically to GRID with a non-binding, nominal “pay-it-forward” client contribution as part of the TPO model. As seen in Chart 3 below, of the 923 total SASH 2.0 projects completed through Q4 2016, 680 of them are third-party owned and total over 70% of the total SASH 2.0 kW (CEC-AC) capacity installed.

Chart 3: Completed SASH 2.0 Projects with Third-Party Ownership



⁵ Clean Power Finance merged with Kilowatt Financial LLC in early 2015 and is now consolidated under one company, Spruce.

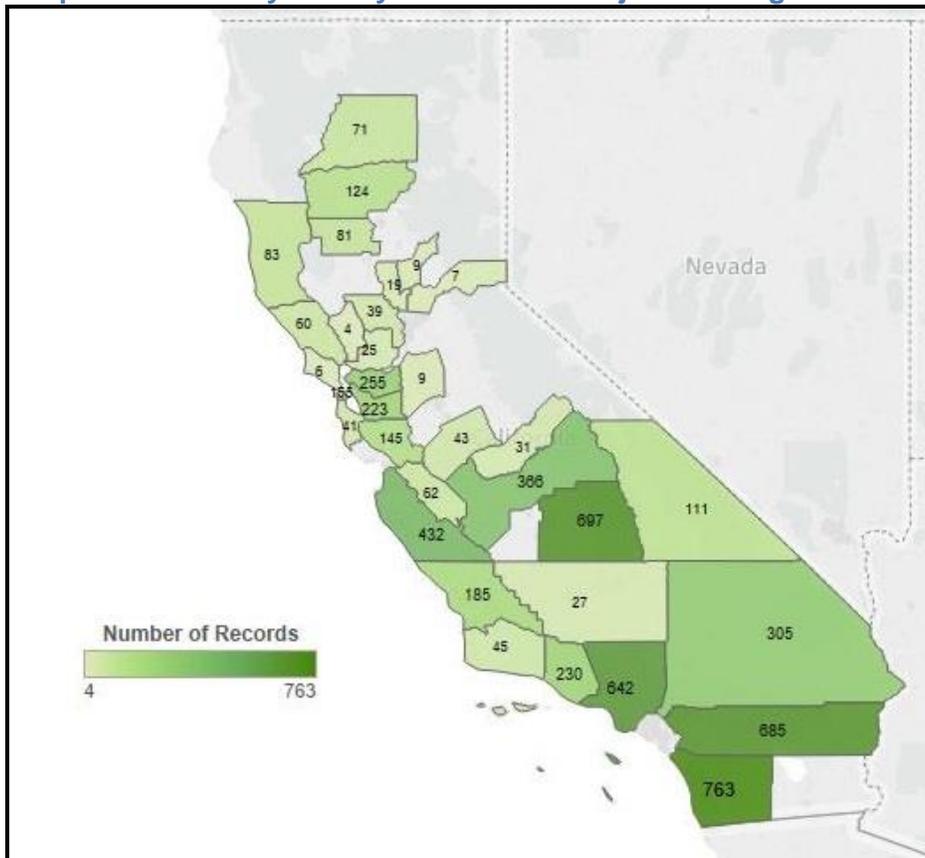
⁶ Resolution E-4719, June 25th 2015.

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 seven offices located in Oakland (PG&E), Los Angeles (SCE), San Diego (SDG&E), Fresno (SCE/PG&E), Atascadero (SCE/PG&E), Riverside (SCE), and Chico (PG&E). Map 1 below shows the location of all pending or completed applications through Q4 2016.

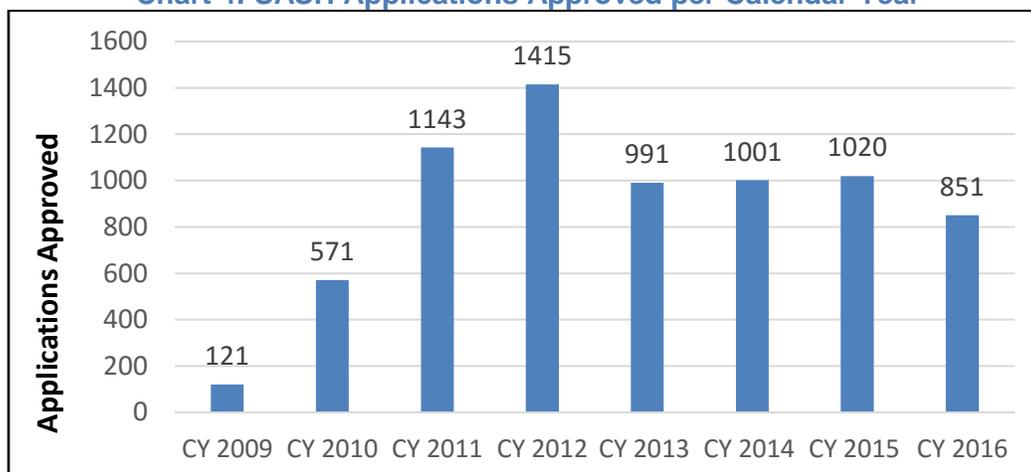
Map 1: Location by County of All SASH Projects through Q4 2016



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 over 850 applications from eligible SASH clients in 2016, bringing the total number of approved SASH applications to over 7,100.

Chart 4: SASH Applications Approved per Calendar Year



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 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 56,660 installation workday positions for volunteers in CA since the inception of the SASH program. Over 12,510 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 31,850 community volunteers in these pre-installation orientations. Since the inception of the SASH Program, over 28,300 prospective volunteers have completed GRID's mandatory orientation in California 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 over 70 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.
- **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 over 550⁷ 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 the NABCEP Installation Professional certification's field experience pre-requisite.** 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 Installation Professional certification must meet the Board's minimum requirement of having led five 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 70 different CA job training programs have worked alongside experienced installers from 46 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



⁷ In September of 2016, GRID launched a new Installation Basics Training (IBT) Program which expanded and increased the qualifications of a Team Leader to better represent the distinction. The more rigorous requirements likely contribute to the lack of new Team Leaders in Q3-Q4.

positions within the company. Since the inception of the SPP program, over 2,100 job opportunities have come to fruition for over 210 unique California trainees through SPP installations. Although the minimum requirement is to hire one job trainee per SPP installation, nearly 20% of SPP installations have had two or even three job trainees on site.

- **General volunteering opportunities.** Over 28,300 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 educate volunteers on solar technologies, the importance of energy efficiency, and the CSI 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 organization⁸, 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 2016.

Table 5: SASH ESAP Referral⁹

Utility	Total
PG&E	2,332
SCE	2,671
SDG&E	525
Total	5,528

⁸ 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.

⁹ Previously reported numbers published in the July 2016 SASH Progress report were inadvertently inflated due to the inclusion of GRID projects in CA that were not SASH-funded.

**APPENDIX A
Data Annex**

Confidential to CPUC per D. 15-01-027