

Single-family Affordable Solar Homes (SASH) Program

Semi-annual Progress Report



January 2022

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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 was 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 but is now closed to new applicants statewide.

The SASH Program was 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 had such a diverse range of benefits for low-income communities.

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 model that makes solar affordable for low-income homeowners while also creating valuable job training opportunities. 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 has provided opportunities for volunteers to assist with installations and engage with their communities. Over time GRID has trained over 45,100 volunteers and job trainees in California to help promote and install solar in low-income communities. GRID requires volunteers to participate in a solar orientation that educates these potential solar adopters about solar PV and energy efficiency. This consumer

education program can enhance state goals of promoting the use of solar PV technology and helping build community support for solar electric technologies and energy efficiency.

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 is a double benefit to low-income communities, since many job trainees come from the same communities that SASH serves.

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 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 from its scheduled sunset in 2016 with new funding and coupled with new program objectives. In D.15-01-027, the Commission established revised program requirements for energy efficiency, job training, and a modified incentive structure.³ Resolution E-4719, approved June 25th, 2015 by the

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.

Commission, allows for a unique third-party ownership (TPO) model in SASH under AB 217's funding. The TPO model has been 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 took on new incentive reservations until December 31, 2021, with final installations taking place in early 2022. 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." Program details can be found in the SASH Program Handbook⁵ or at www.gridalternatives.org/sash.

3. Q3-Q4 2021 Update

In the second half of 2021, the SASH Program posted strong results with over 470.kW, CEC-AC of solar electric capacity interconnected for the direct benefit of 115 low-income homeowners. In Q3 GRID worked closely with its regional Outreach staff as well as affordable housing partners such as Habitat for Humanity, to qualify as many low-income homeowners as possible and their New Construction homes for the program before the December 31, 2021 incentive reservation deadline. In 2022 GRID will finalize all SASH installations, inspections, interconnections and will keep SCE apprised of any delays in New Construction projects.

Under COVID-19, GRID has continued to adjust its marketing and outreach process and on-site installation safety practices. Group job training is taking place again statewide, as GRID offices created several new, COVID-safe training spaces that allowed the organization to restart job

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 www.gosolarcalifornia.ca.gov/documents/SASH_Handbook.pdf

training cohorts in the second half of 2021. GRID now also has a robust vaccine tracking process in place for staff and job trainees.

Milestones and Stats: SASH 2.0 Incentives in SCE territory were almost entirely reserved by the end of Q4 2021, ahead of the program's end of 2021 deadline for incentive reservations. At the end of Q4 2021, 4,574 PV projects have been installed and interconnected using the SASH 2.0 incentive budget, 153 projects are reserved and awaiting installation or interconnection, and all applications have been submitted and either approved or denied (see Table 4 later in this report). GRID continues implementing the SASH Program's Third-Party Ownership (TPO) model which provides additional funding for projects, a model that is structured to maximize homeowner benefit and champion consumer protection.⁶ Of the SASH 2.0 projects installed to date, over 75% have utilized the TPO model, as illustrated in Chart 3 and [on CalDG Stats](#). The SASH Program also provides direct economic benefits to participating families and adds value to the industry with green job training and 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.

⁶ Resolution E-4829, March 2, 2017.

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 Program budget to \$162.34 million. SASH was funded by (PG&E), (SCE), and (SDG&E) according to these %s.

Table 1: 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 (millions) in D.15-01-027 (SASH 2.0)	\$23.59	\$24.84	\$5.57	\$54.00
Total Budget (millions) (Entire SASH Program)	\$70.93	\$74.64	\$16.77	\$162.34

The SASH Program budget is allocated between program functions, as detailed in Table 2.

Table 2: Budget Allocations by Program Function

	Budget, %	SASH 1.0 Budget, \$ D.07-11-045	SASH 2.0 Budget, \$ D.15-01-027	Expensed thru Q4 2021
Incentives	85%	\$92,089,000	\$45,900,000	\$92,049,369 (SASH 1.0) ⁷ \$43,132,339, (SASH 2.0)
Admin	10%	\$10,834,000	\$5,400,000	\$16,138,759
ME&O	4%	\$4,333,600	\$2,160,000	\$6,493,585
Evaluation	1%	\$1,083,400	\$540,000	Budget resides w/ CPUC
Total	100%	\$108,340,000	\$54,000,000	\$ 157,814,052

5. Program Growth and Project Details

Tables 3 and 4 below summarize the status of all SASH applications through Q4 2021.

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	2,293	2,412	559	5,264	16,044	\$92.05
TOTAL	2,293	2,412	559	5,264	16,044	\$92.05

Table 3: Last updated in early 2016, due to the program’s end date of December 31, 2015.

Table 4: SASH 2.0 Applications by Status and Service Territory

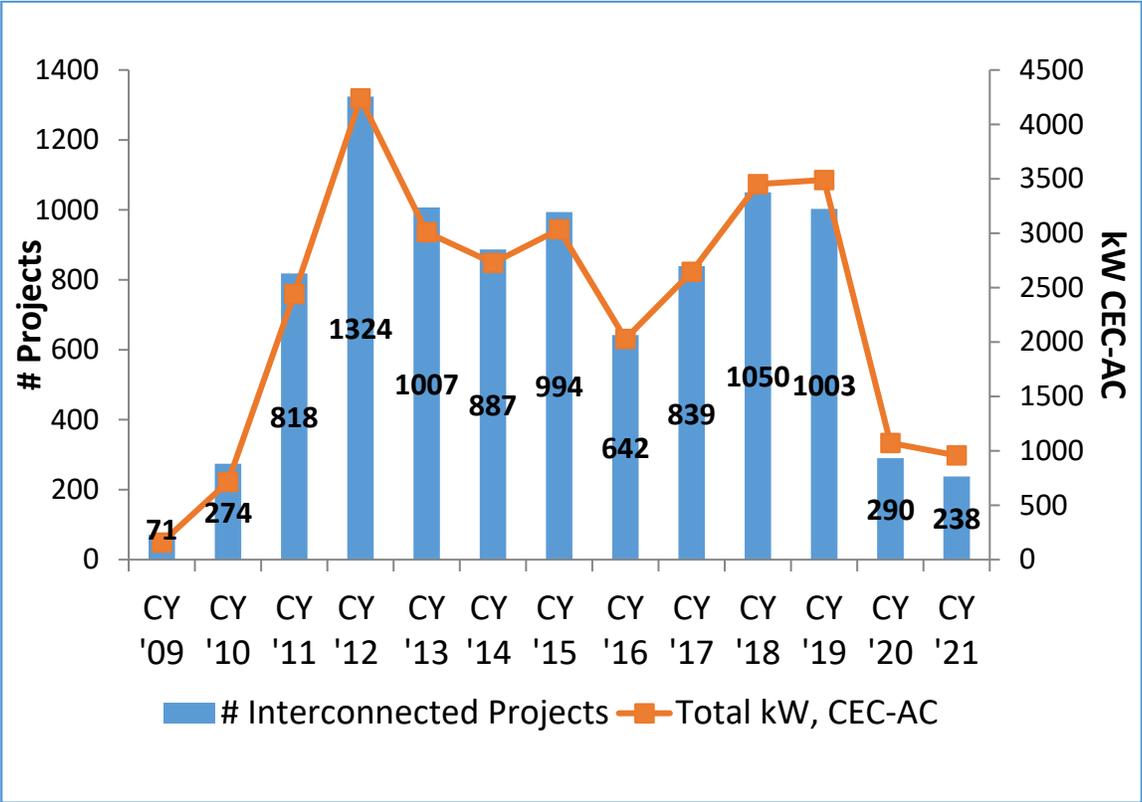
Application Status	Number of Applications				Total kW, (CEC-AC)	Total Incentives (\$ millions)
	PG&E	SCE ⁸	SDG&E	Total		
STEP 1: Applications under review	0	0	0	0	0	\$0.00
STEP 2: Confirmed Applications/Reservations	0	153	0	153	607.5	\$1.78
STEP 3: Completed/Installed	2,126	1,791	504	4,421	14,702.8	\$44.08
TOTAL	2,126	1,944	504	4,574	15,310.3	\$45.87

Table 4: Data collected January 22, 2022. *Step 1 system sizing (kW) and incentives (\$) were estimates based on an average system size of 3.5kW, CEC-AC and incentive level of \$3.00/W.

⁸ SCE projects with an “Application under review” are “New Construction” projects where a homeowner has not yet been identified, but where the affordable housing developer signed a contract with GRID Alternatives in 2021.

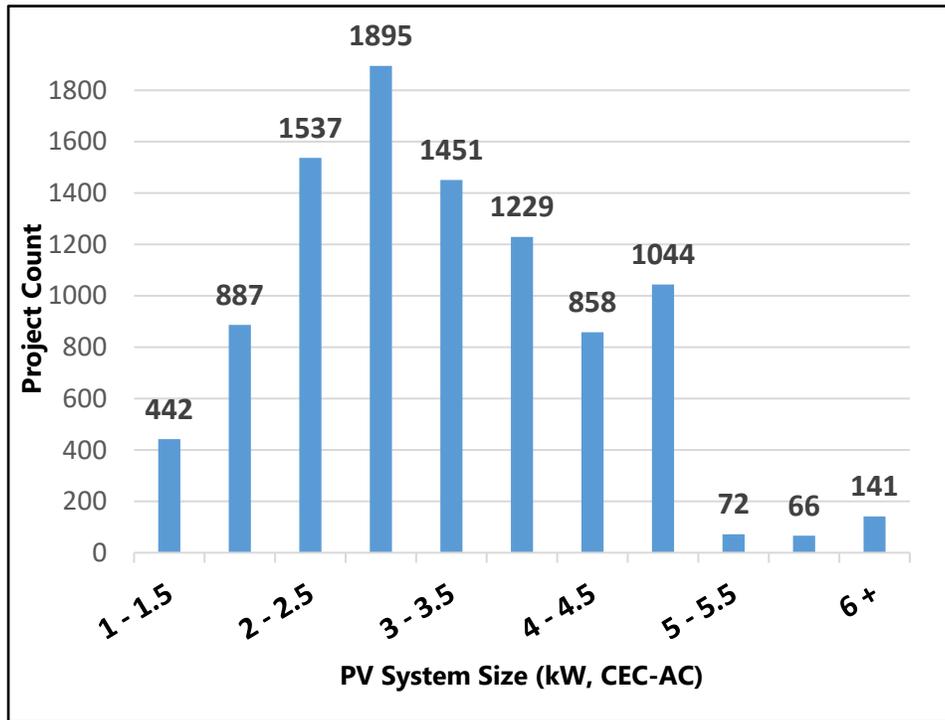
Below, Chart 1 illustrates the progress of the SASH Program over the past decade. Over 9,600 projects have been installed and completed (i.e., interconnected to the electric utility) through Q4 2021. In 2020 and 2021, installations decreased as PG&E and SDG&E incentives became encumbered and as focus shifted to the DAC-SASH program.

Chart 1: Completed Projects by Year



Below, Chart 2 indicates that roughly half of installed SASH solar PV systems are 3kW CEC-AC or smaller, and the average installed project is 3.2kW CEC-AC.

Chart 2: Installations by System Size through 2021



Where the system size is not constrained by roof space, system sizing is based on the client's annual usage (kWh) minus energy efficiency savings the client may realize by adopting basic energy efficiency measures. SASH systems are capped at 5kW.

6. Incentives and Project Financing

The SASH Program was designed to be a comprehensive low-income program and serve homeowners in the most distressed and impoverished areas of California. Roughly 80% of SASH clients qualify for the California Alternate Rates for Energy (CARE) Program that offers reduced electric rates to income-qualified households. Because CARE uses 200% of the Federal Poverty Level as its income limit (whereas SASH uses 80% of Area Median Income or AMI), more SASH clients from lower cost-of-living counties qualify for CARE than those in higher cost-of-living counties. In all instances in recent years, GRID has aided in overcoming the gap financing obstacle for families by contributing the organization's own non-profit fundraising dollars and

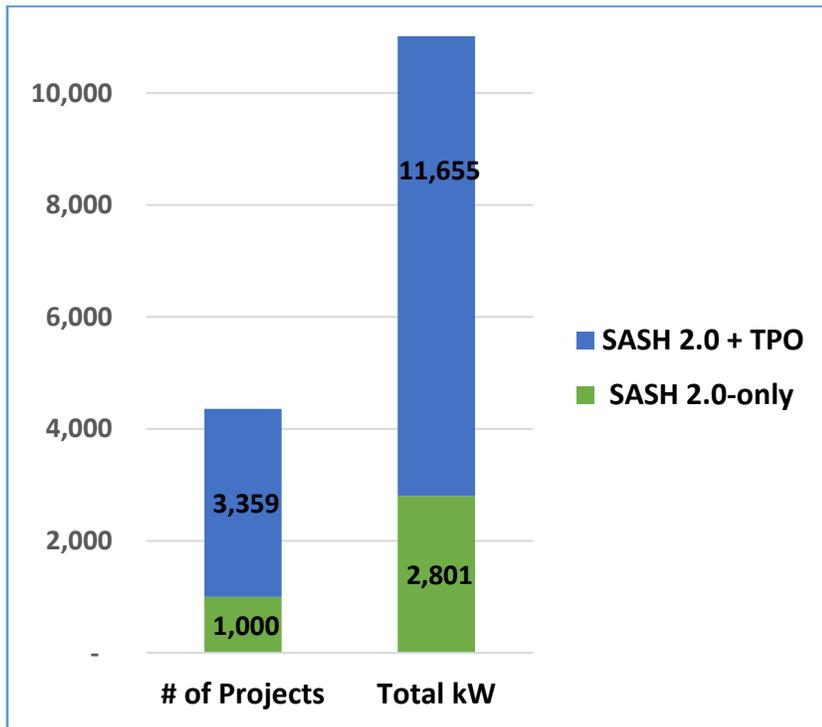
additional resources toward covering the gap between the available incentive and true project costs .

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 long-standing partnerships with major equipment manufacturers including Enphase Energy, and SMA Solar – renewed for 2021 – continued to help cover many SASH clients' gap funding requirements. GRID will utilize philanthropic and in-kind contributions to augment gap financing efforts for the remainder of the SASH Program. Given tight economic conditions in many low-income communities, gap financing remains an obstacle for low-income families to participate in the SASH Program.

Through its 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 25-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 2020 TPO installations and future systems are planned to be financed with partner company Sunrun. As demonstrated in Chart 3, of the 4,360 SASH 2.0 projects completed, over 80% of the kW (CEC-AC) capacity installed utilized the TPO funding model as well.⁹

⁹ SASH 2.0 projects that do not utilize the TPO model are typically those located on tribal lands, or that are less than 2kW and thus do not qualify.

Chart 3: SASH 2.0 Projects with Third-Party Ownership (TPO)



7. Marketing and Outreach

GRID Alternatives currently has eight California regional offices, located in Oakland (PG&E), Willits (PG&E), Los Angeles (SCE), San Diego (SDG&E), Fresno (SCE/PG&E), Riverside (SCE), Chico (PG&E), and Sacramento (PG&E). The map below shows the location of all completed SASH applications through Q4 2021, illustrating that GRID has qualified SASH applicants over a wide geographic area throughout the utility territories.

Map 1: SASH projects by California county¹⁰

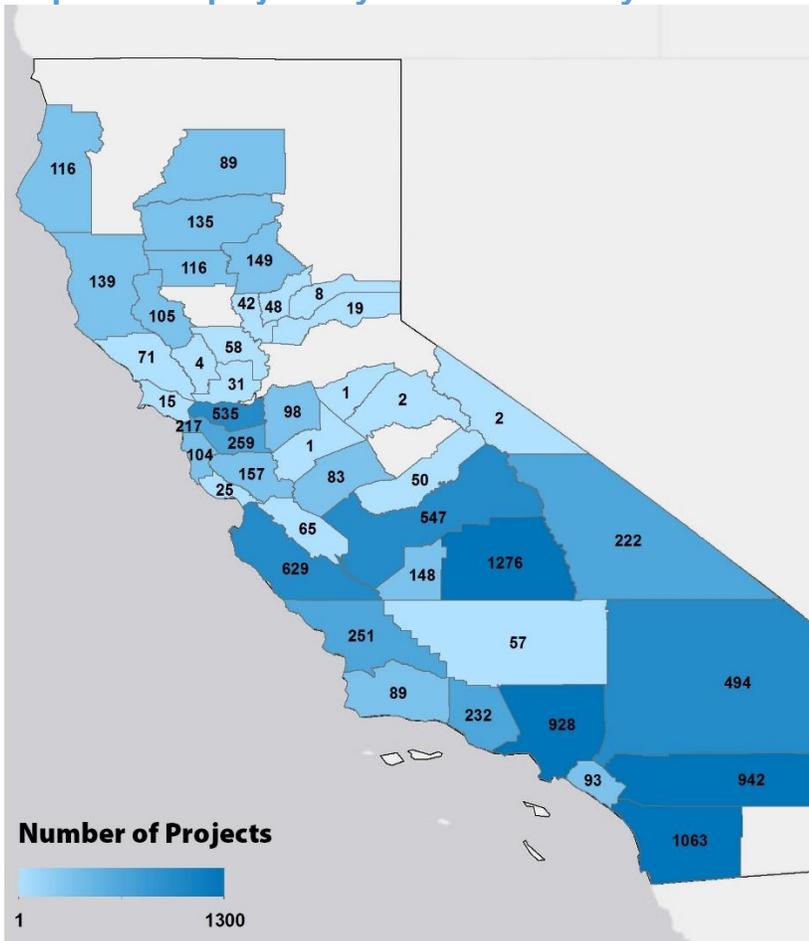
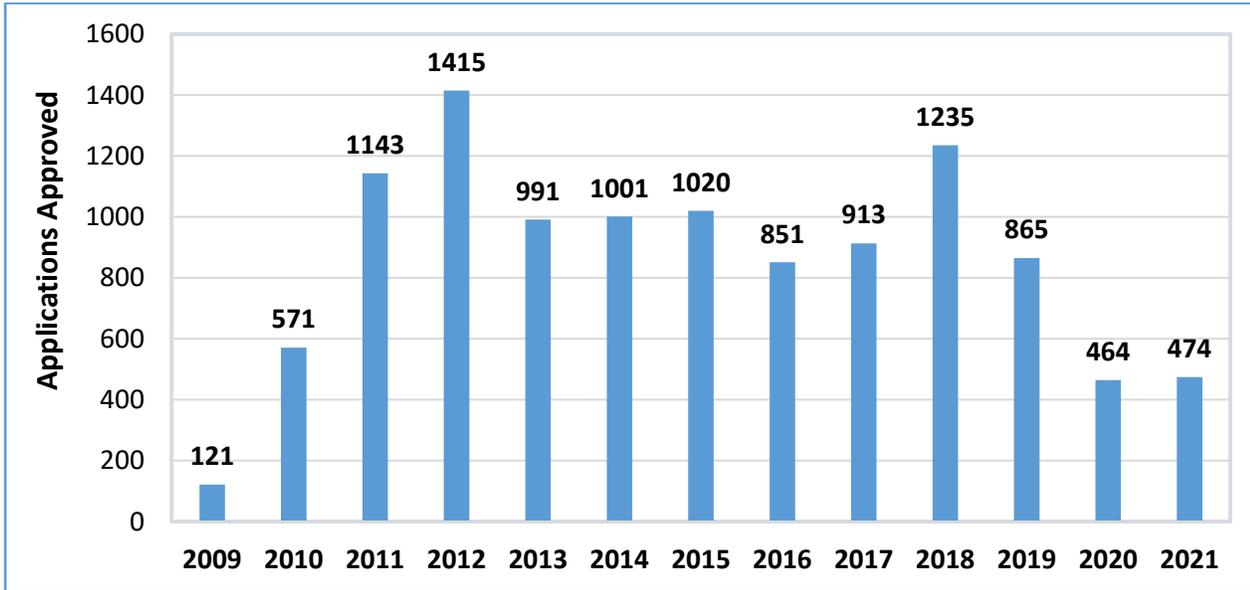


Chart 4 below shows that GRID processed and approved almost 250 applications from eligible SASH clients in the second half of 2021, bringing the total number of approved SASH applications to over 11,000.

¹⁰ Could not be updated for the January 2022 version of this report, thus it captures projects through Q2 2021

Chart 4: Applications Approved by Year



GRID Alternatives' staff continued to utilize many of the marketing and outreach methods proven to be effective for recruiting SASH clients and building 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 media, marketing collateral and some events. Over time GRID found that co-marketing with a city, county, or utility to compile a co-branded mailer sent directly to target populations was an effective method to create interest.

GRID also leveraged its existing relationships with key community partners to spearhead outreach efforts in low-income communities. GRID encouraged adopters of the SASH Program to discuss their experiences with neighbors and acquaintances and encourage them to contact GRID. Often a former SASH client would invite neighbors to their own home to help promote the SASH Program in their neighborhood. Involving neighbors, volunteers, and civic supporters at installations also helps to build the SASH brand recognition on-the-ground 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 86,278 installation workday positions for volunteers in California since the inception of the program. Over 19,700 of these positions have been filled by groups of students from California job training programs, with 225 in the past year (fewer than is typical due to the ongoing impacts of COVID-19). These volunteer and job training opportunities help strengthen California's solar industry by providing consumer education and a means for individuals from diverse backgrounds to learn about PV-solar design and installation through hands-on experience.

GRID ensures that the volunteers on SASH projects are trained in safety and installation techniques and understand the basic fundamentals of the SASH Program and the benefits of PV-solar by requiring all volunteers to attend a volunteer orientation. GRID Alternatives has trained over 45,100 community volunteers in these pre-installation orientations and the majority have gone on to participate in a SASH installation; Over 880 were trained in 2021. Volunteers and job trainees formed the backbone of GRID's installation model before the pandemic began. Finally, GRID has incorporated "green job" training and workforce development initiatives into the SASH Program. This includes the following initiatives:

- **Hands-on solar installation experience for low-income job training programs.** GRID Alternatives presently partners with over 20¹¹ active job training organizations (JTOs) and has worked with roughly 80 California job JTOs all-time to incorporate its volunteer-based installation projects into their construction training curricula. GRID has dedicated approximately 20% of its in-house installations to these trainees to gain hands-on

¹¹ Job Training Organizations (JTOs) included are those that are considered active JTO partners that GRID has worked directly on SASH installations in the past 2 years.

experience with solar installations. This is a double benefit to the low-income community, since many job trainees come from the same neighborhoods that the 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 offers 10 Skills Certificates that cover a variety of array and electrical skills. To earn all 10 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.
- **Team Leader and hands-on opportunities for job trainees.** In addition to reserving installations for job training partnerships, GRID gives individual job trainees priority to participate on other installations. Job trainees can also participate in GRID’s “Team Leader Program” that provides leadership roles on its volunteer installations. Almost 800 volunteers have been trained as Team Leaders, giving job trainees the opportunity to get more critical, hands-on PV-installation experience.

- **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 leading 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 for training graduates.** Students or graduates of JTOs may receive short-term paid work and/or 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 54 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 long-term installer positions within the company. Since the inception of the SPP, over 2,400 paid job opportunities have come to fruition for 269 unique California trainees through SPP installations. Although the minimum requirement is to hire one job trainee per SPP installation, over 15% of SPP installations have employed two or three job trainees on SASH projects.
- **General volunteer opportunities.** Over 45,100 individual volunteers have completed GRID's volunteer/solar orientation 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. 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.

Though GRID has incorporated job training into every SASH project since the program's inception. With the addition of SASH 2.0 requirements under D. 15-01-027, GRID is reporting on specific types of attendees, ensuring that each volunteer-based installation includes either one Solar Corp, one Team Leader, or three students from a job training organization.¹² This enhanced the job training opportunities created by the SASH program.

In June 2020, GRID submitted Advice Letter 15 to propose two modifications to the program's job training requirements. The AL was approved on July 10, 2020 and created a waiver process for SASH job training requirements, to be used on a limited basis for up to 10% of projects for 12 months due to COVID-19 social distancing requirements. Just eleven SASH waivers were needed total.

The above Advice Letter also permanently aligned job training requirements between the SASH and DAC-SASH programs, with two new types of job training categories that are now allowed for SASH as well, listed below:

- Three (3) or more participants in Installation Basics Training (IBT); or
- One (1) Design and Construction Intern

¹² D.15-01-027, requirements for volunteer-based installations on pg. 21. Requirements for SPP installations include an affidavit signed by subcontractor and job trainee, and specific reporting requirements, on pg. 23.

9. Energy Efficiency

Energy efficiency is the essential first step to implement in clients' homes before installing PV solar. To this end, GRID works with the Energy Savings Assistance Program (ESAP) administrators to refer and enroll eligible homeowners, and with the IOUs to streamline ESAP enrollment for SASH clients. Table 5 below summarizes all SASH applicants who were referred to the IOUs for enrollment into ESAP through Q4 2021.

Table 5: ESAP Referrals, by Utility

Utility	Enrolled	Total Referred	% Enrolled in ESAP
PG&E	1,907	4,835	39%
SCE	2,378	5,252	45%
SDG&E	576	835	69%
Total	4,861	10,922	44%

APPENDIX A Data Annex

Confidential to CPUC per D. 15-01-027