Single-family Affordable Solar Homes (SASH) Program

Semi-annual
Progress Report

July 2021

GRID ALTERNATIVES

PUBLIC UTILITIES COMMISSION
STATE OF CALIFORNIA

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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.

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 provides opportunities for local volunteers to assist with installations, engage their communities, and to participate in CA energy

programs. GRID has trained over 44,642 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 consumer education program can help enhance 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 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 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 overall goal of the SASH Program established in D.07-11-045 is "to provide existing low-income single-family homes with access

[1] D.07-11-045, Appendix A, p.1.

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, split between programs, and 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 its incentive budget have been encumbered, whichever event occurs first. For ease of reading 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 Handbook[5] or at www.gridalternatives.org/sash.

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

3. Q1-Q2 2021 Update

In the first half of 2021, the SASH Program posted strong results with over 480.kW, CEC-AC of solar electric capacity interconnected for the direct benefit of 123 low-income homeowners. This is notable given the continued impacts of the COVID-19 pandemic on GRID's standard operations and modifications that GRID implemented to allow safe installations to continue. Moving forward in the latter half of 2021, GRID will work closely with its regional Outreach staff as well as affordable housing partners such as Habitat for Humanity, to qualify as many low-income homeowners for the program before a December 31, 2021 incentive reservation deadline for SASH 2.0.

Milestones and Stats: SASH 2.0 Incentives in SCE territory are predicted to be almost entirely reserved in late 2021, ahead of the program's December 31, 2021 deadline for incentive reservations. At the end of Q2 2021, 4,277 PV projects have been installed and interconnected using the SASH 2.0 incentive budget, 63 projects are reserved and awaiting installation or interconnection, and 120 applications have been submitted and are under review (per Table 4 later in this report). GRID continues implementing the SASH Program's Third-Party Ownership (TPO) model which provides additional funding for projects, thereby increasing the number of qualified families who can take advantage of the program. The SASH program's TPO model is structured to maximize homeowner benefit and champions 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

[6] Resolution E-4829, March 2, 2017.

contains a workforce development component and provides opportunities for job trainees and volunteers to get hands-on experience installing solar systems.

COVID-19 Impacts/Update: Under COVID-19, GRID continues to adjust its marketing and outreach processes, on-site installation practices, and hosting volunteers and trainees on-site. Group job training has begun to take shape again, as GRID offices around the state find safe, outdoor, online or socially-distanced training spaces that allow GRID to restart job training cohorts safely and as more of California's population is fully vaccinated.

To address limits to in-person group training due to COVID-19, GRID submitted Advice Letter (AL) 15, *Proposed Modifications related to the Program's Job Training Requirements in Response to the COVID*-19 Pandemic on June 26, 2020 to request a waiver of job training requirements in up to 10% of SASH projects. The AL was approved and became effective on July 10, 2020 and was in effect until July 10, 2021. Through Q2, GRID used this COVID waiver option a total of 11 times.

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 is 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[7]

	Budget, %	SASH 1.0 Budget, $ D.07-11-045	SASH 2.0 Budget, $ D.15-01-027	Expensed thru Q2 2021
Incentives	85%	$92,089,000	$45,900,000	$92,049,369 (SASH 1.0)[8] $41,910,025, (SASH 2.0)
Admin	10%	$10,834,000	$5,400,000	$15,992,868
ME&O	4%	$4,333,600	$2,160,000	$6,324,727
Evaluation	1%	$1,083,400	$540,000	Budget resides w/ CPUC
Total	**100%**	**$108,340,000**	**$54,000,000**	**$ 156,276,989**

[7] In its 2020 semi-annual reports, GRID double counted the Q2 2020 Admin and ME&O expenses, which inflated the final column total amounts in Table 2. Therefore in this report the Admin total is lower than what was reported in January 2021 for the previous semi-annual report.

[8] Decision 07-11-045 states that "...the program [SASH 1.0] should operate through December 31, 2015, and any unspent money on January 1, 2016, shall be used for cost-effective energy efficiency measures in low-income residential housing, as set forth in Section 2852" Conclusion of Law #4, p.44.

5. Program Growth and Project Details

Tables 3 and 4 below summarize the status of all SASH applications through Q2 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 close date of December 31, 2015. *Step 1 system sizes (kW) and incentives ($) for SASH 1.0 projects are estimates based on average system size of 2.9kW, CEC-AC and incentive level of $6.00/W

Table 4: SASH 2.0 Applications by Status and Service Territory

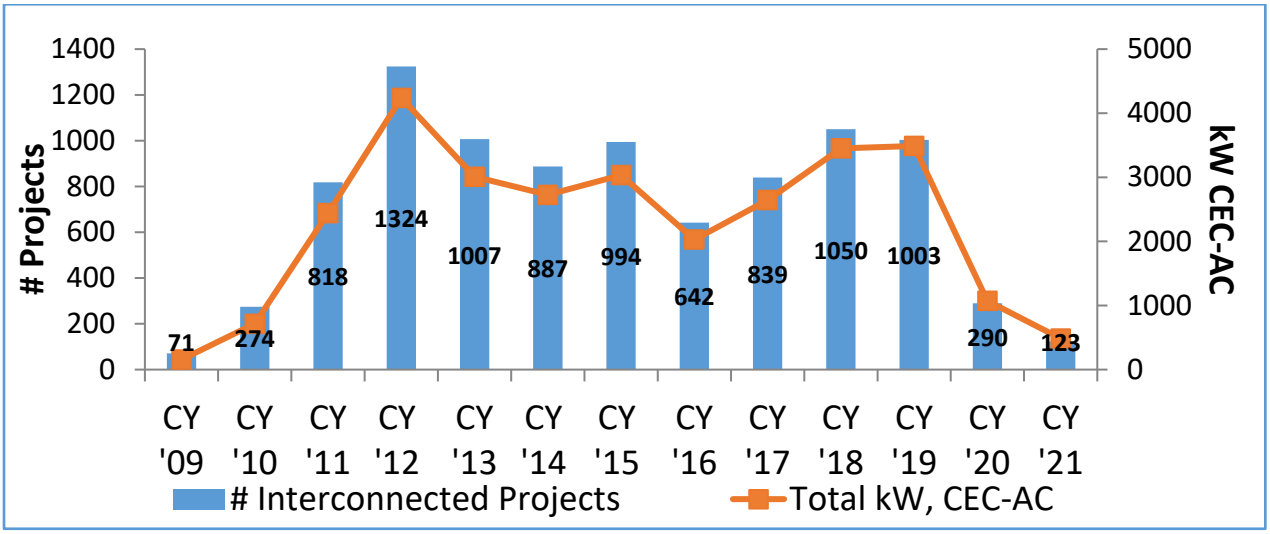
Application Status	Number of Applications				Total kW, (CEC-AC)	Total Incentives ($ millions)
	PG&E	SCE	SDG&E	Total		
STEP 1: Applications under review	1	108	0	109	381.5	$1.14
STEP 2: Confirmed Applications/Reservations	0	66	0	66	262.6	$0.79
STEP 3: Completed/Installed	2,125	1,654	504	4,283	14,141.8	$42.40
TOTAL	**2,126**	**1,828**	**504**	**4,458**	**14,785.9**	**$44.33**

Table 4: Data collected 7/22/21. *Step 1 system sizing (kW) and incentives ($) are estimates based on an average system size of 3.5kW, CEC-AC and incentive level of $3.00/W. Designs are not completed until the Applicant is confirmed to meet other program requirements. Over 90% of projects in Step 1 will receive Step 2 reservations.

Below, Chart 1 illustrates the progress of the SASH Program since 2009. Over 9,500 projects have been installed and completed (i.e., interconnected to the electric utility) through Q2 2021. In 2020 and 2021, installations have decreased as PG&E incentives became encumbered in late

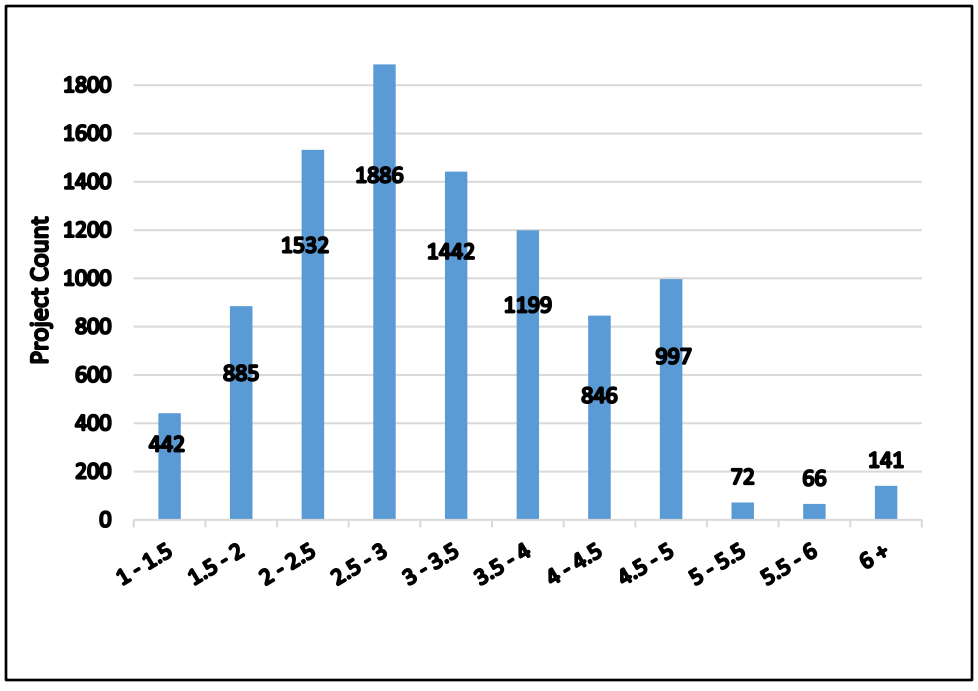
2019 and SDG&E's incentives became encumbered in mid-2020.

Chart 1: Completed Projects by Year



Below, Chart 2 indicates that over half of installed SASH solar PV systems are 3kW CEC-AC or smaller, and the average installed project is 3.5kW 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. This demonstrates that the SASH Program is primarily serving homeowners at the lowest income levels who most need the savings provided from solar electric systems. 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 the project costs .

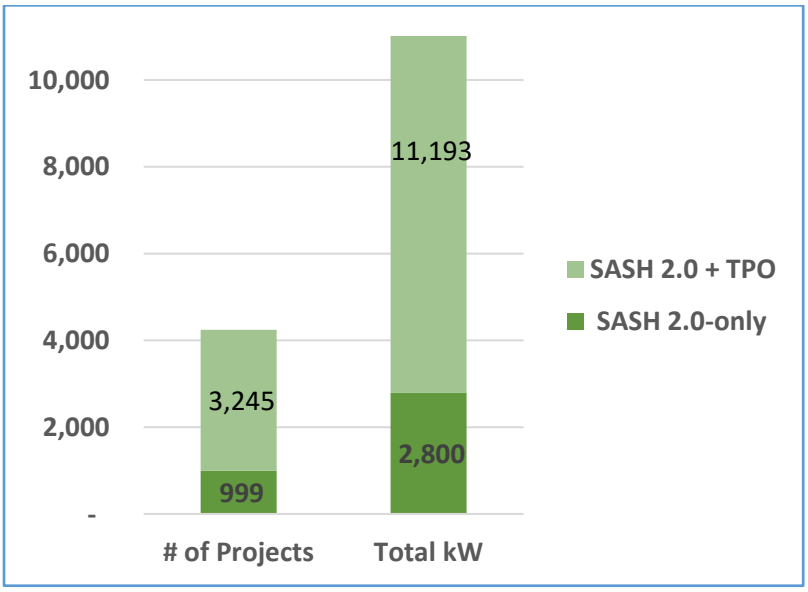
GRID's contributions toward covering these financing gaps include general philanthropy, in-kind equipment donations, proceeds from a third-party ownership model, and corporate sponsorships. GRID's long-standing partnerships with major equipment manufacturers including Enphase Energy, and SMA Solar – renewed for 2021 – continue to help cover many SASH clients' gap funding requirements. GRID expects to utilize philanthropic and in-kind contributions from donors and sponsorships to augment gap financing efforts for the duration of the SASH Program. Given tight economic conditions 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 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 4,244 total SASH 2.0 projects completed, 3,245 are third-party owned or roughly 80% of the total kW (CEC-AC) capacity installed.[9] It is expected that the TPO model will be a significant contributor to financing SASH 2.0 projects through the program's end.

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



[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.

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 pending or completed SASH applications through Q2 2021. It illustrates that GRID has qualified SASH applicants over a wide range of geographic areas throughout the utility territories.

Map 1: All SASH projects by California county through Q2 2021

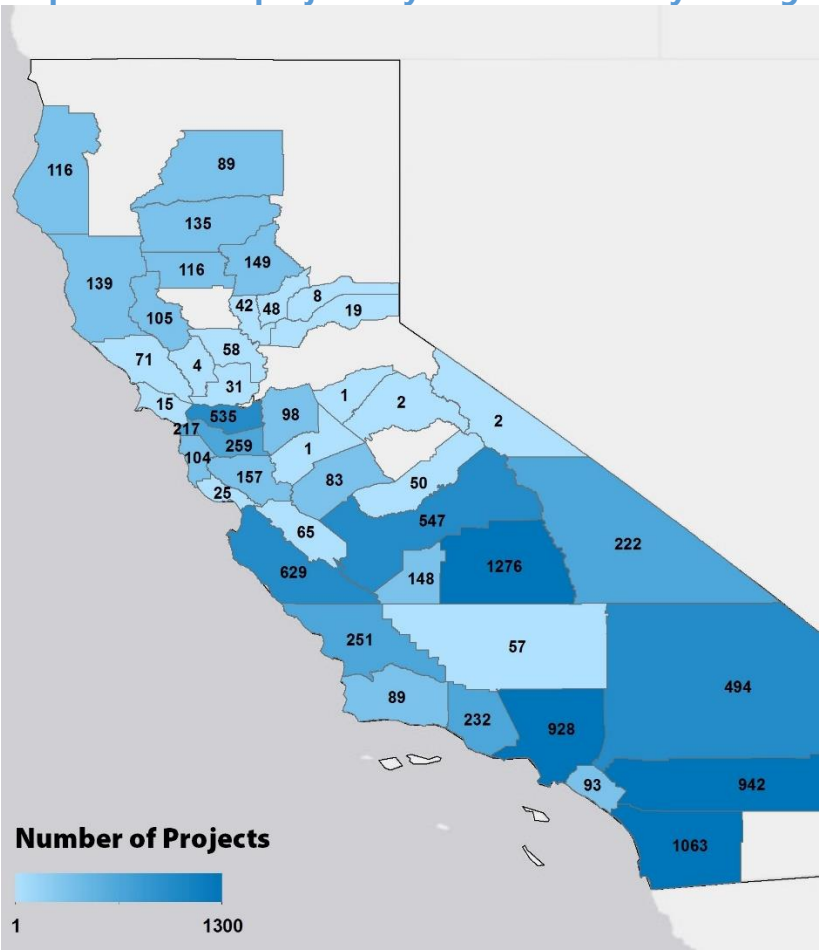
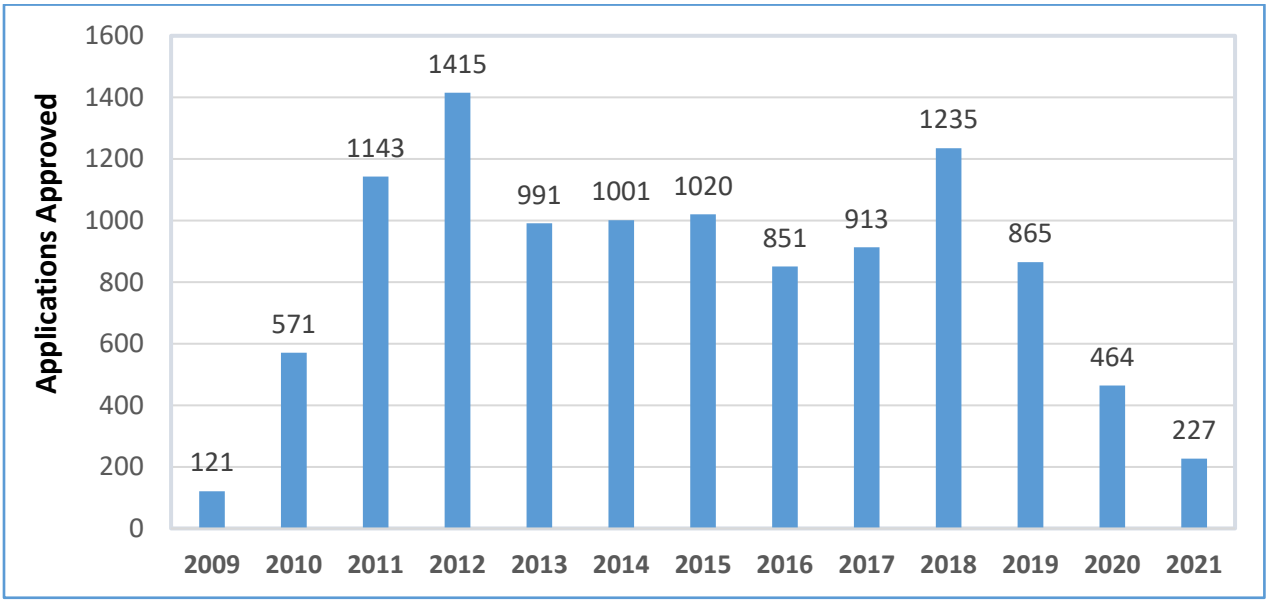


Chart 4 below shows that GRID processed and approved over 220 applications from eligible SASH clients in the first half of 2021, bringing the total number of approved SASH applications to over 10,800.

Chart 4: Applications Approved by Year



GRID Alternatives' staff continue 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. GRID has found co-marketing with a city, county, or utility to compile a co-branded mailer sent directly to target populations to be a very effective method to create interest.

GRID also leverages its existing relationships with key community partners to spearhead outreach efforts in low-income communities. GRID encourages adopters of the SASH Program to discuss their experiences with neighbors and acquaintances and encourage them to contact GRID. Often a former SASH client will invite neighbors to a meeting at 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 85,417 installation workday positions for volunteers in California since the inception of the SASH program. Over 19,498 of these positions have been filled by groups of students from California job training programs, with just 40 in the past two quarters (far 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. Volunteer and training opportunities help create the solar market transformation sought through the California Solar Initiative. These opportunities also create a well-informed public and proof that PV solar can be adopted by different types of communities.

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 orientation. GRID Alternatives has trained over 44,642 community volunteers in these pre-installation orientations and the majority have gone on to participate in a SASH installation; roughly 330 were trained in 2021 so far compared to over 700 in first half of 2020 and over 2,400 in first half of 2019. Volunteers and job trainees form the backbone of GRID's installation model. Finally, GRID has incorporated "green job" training and workforce development initiatives into the SASH Program. These include the following initiatives:

- **Hands-on solar installation experience for low-income job training programs.** GRID Alternatives presently partners with over 20[10] 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 dedicates approximately 20% of its in-house installations to these trainees to gain hands-on experience with solar installations that have conditions and requirements comparable to what they would encounter in private industry. 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 ceritificates by demonstrating their competency on specific skills while working on installations. GRID offers 10 Skills Cerfiticates 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

[10] 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.

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 improve their technical skills and gain leadership experience.

- **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. GRID has over 790 volunteers who have been trained as Team Leaders. The Team Leader initiative gives job trainees the opportunity to get 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 available long-term installer positions within the company. Since the inception of the SPP, over 2,353 paid job opportunities have come to fruition for 267 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 44,642 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, 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 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's inception in 2009, with the addition of SASH 2.0 requirements under to 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.[11] This enhances the job training opportunities created by the SASH program.

In June 2020, GRID submitted Advice Letter (AL) 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%

[11] 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.

of projects for 12 months due to COVID-19 social distancing requirements. To date, eleven SASH waivers have been needed.

The above AL 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

9. Energy Efficiency

Energy efficiency (EE) remains an important part of the SASH program. GRID believes that 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. Per D. 15-01-027, GRID includes in Appendix A the required data for ESAP enrollment for SASH 2.0 participants under AB 217 funding.

Table 5 below summarizes SASH applicants who were referred to the IOUs for enrollment into ESAP through Q2 2021.

Table 5: ESAP Referrals, by Utility

Utility	Enrolled	Total Referred	% Enrolled in ESAP
PG&E	1,907	4,835	39%
SCE	2,378	5,119	46%
SDG&E	576	835	69%
Total	**4,861**	**10,789**	**45%**

APPENDIX A
Data Annex

Confidential to CPUC per D. 15-01-027