

Single-family Affordable Solar Homes (SASH) Program

Q1 2012 Program Status Report



April 2012



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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. 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) service territories.

The SASH Program is uniquely designed to be a comprehensive low-income solar program. In addition to providing differential 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 low-income 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 even more affordable for 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, to engage their communities, and to participate in CSI programs. Currently, GRID has thousands of volunteers statewide to help promote and install solar in low-income communities. 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 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 D.06-01-024, the California Public Utilities Commission ("the Commission") adopted the Staff proposal to set aside a minimum of 10% of CSI Program funds for projects installed for low-income residential customers and affordable housing projects. In 2006, the California Legislature codified this requirement in Senate Bill (SB) 1 and Assembly Bill (AB) 2723. Subsequently, in D.06-12-033, the Commission directed the Program Administrators (PAs) to conform the CSI Program to SB 1¹ and AB 2723² requirements and directed that 10% of the total ten-year CSI budget would be reserved for the

¹ SB 1 (Murray & Levine), *Chapter 132, Statutes of 2006*, sets forth specific CSI program requirements regarding program budget, conditions for solar incentives, and eligibility criteria

² AB 2723 (Pavley), Chapter 864, Statutes 2006, required the Commission to ensure that not less than 10% of the CSI funds are used for the installation of solar energy systems on low-income residential housing and authorized the Commission to incorporate a revolving loan or loan guarantee program for this purpose.

low-income residential solar incentive programs that are now referred to as the Single-family Affordable Solar Homes (SASH) and Multifamily Affordable Solar Housing (MASH) Programs. GRID Alternatives was selected as the statewide Program Manager for the SASH Program.

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 residential housing established in Public Utilities Code Section 2852.”³ The Commission adopted an incentive structure that provides a fully-subsidized 1kW PV-solar system to “very-low income” households, and a partial-subsidy to qualified “low-income” households.

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.”⁴

The SASH Program will operate either until December 31, 2015, or when all funds available from the program’s incentive budget have been allocated, whichever event occurs first. Public Utilities Code Section 2852(c)(3) requires that any program dollars remaining unspent or unencumbered on January 1, 2016, are to be used for Low Income Energy Efficiency programs.

Details of the SASH Program can be found in the CSI Program Handbook or at www.gridalternatives.org/sash.

3. Q1 2012 Overview

The SASH Program started 2012 by posting strong first quarter results as the volume of completed installations was higher than any previous quarter. Nearly 300 SASH projects approaching 1MW in capacity were completed statewide in Q1 2012. This is particularly remarkable when taking into account that the average individual system size for SASH is under 3kW. Close to 300 low-income California families interconnected a SASH solar electric system in Q1 2012 and are now generating electricity that can help offset their load and reduce their electric bills each month. The SASH Program not only is providing direct economic benefits to these families and environmental benefits to their communities at large, but also is creating significant auxiliary benefits in the area of green job training as each SASH project contains a workforce development component and provides opportunities for job trainees and volunteers to participate.

At the end of Q1 2012, 1448 PV-systems have been installed and interconnected, 161 projects have been reserved and are awaiting installation or interconnection, and another 461 applications statewide are under review by GRID’s construction staff and sub-contracting partners to determine if the system design meets the SASH Modified Design Factor (MDF) requirement and the site is solar suitable.



To attract new SASH clients, GRID’s seven California regional offices continued to focus on the following core endeavors: expanding marketing and outreach scope; fostering new relationships and strengthening existing partnerships with volunteers, job training programs, and municipalities; and increasing communication and media capacities. Word-of-mouth and testimonials

³ D.07-11-045, Appendix A, p.1

⁴ D.07-11-045, Appendix A, p.1

from satisfied customers continue to be the best marketing tool for acquiring new SASH clients and fortifying existing clients' relationships.

The SASH Program continues to provide green job training opportunities at every installation. As GRID expands the scope of its regional offices, new partnerships are developing at a local level between GRID staff and the leaders of job training organizations and community college programs that would like to have their graduates obtain on-the-job training at a SASH installation. Every GRID installation is staffed by 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 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 the increasing solar job sector in California.

4. Budget

The SASH Program budget is \$108.34 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%
Total Budget (\$ in millions)	\$47.34	\$49.8	\$11.2	\$108.34

The Program Manager shall ensure that the \$108.34 million is allocated as follows across program functions:

Table 2: SASH Budget Allocations by Program Functions

	Budget, %	Budget, \$	Expensed / Encumbered thru Q1 2012
Incentives	85%	\$92,089,000	\$42,720,000
Administration	10%	\$10,830,000	\$3,698,207
Marketing and Outreach	4%	\$4,330,000	\$1,591,755
Evaluation	1%	\$1,091,000	Budget resides w/ CPUC
Total	100%	\$108,340,000	\$48,009,962

5. Program Growth and Project Costs

The SASH Implementation Plan delineates cumulative targets for installations and incentives for each year of the SASH Program, thereby allowing GRID to benchmark the Program's progress and ensure that the IOU's allotted incentive dollars are being applied appropriately. In the SASH Implementation Plan, the 2012 cumulative targets for completed and reserved projects are \$40M in incentives and ~6MW (CEC-AC) by the end of the year. **At the end of the first quarter of 2012, SASH has already completed and reserved projects totaling \$34.7 million in incentives and 5.5MW (kW, CEC-AC) in capacity which exceeds 85% of the entire year's goal.**

Table 3 summarizes the status of all SASH applications through Q1 2012.

Table 3: SASH Applications by Status and Service Territory

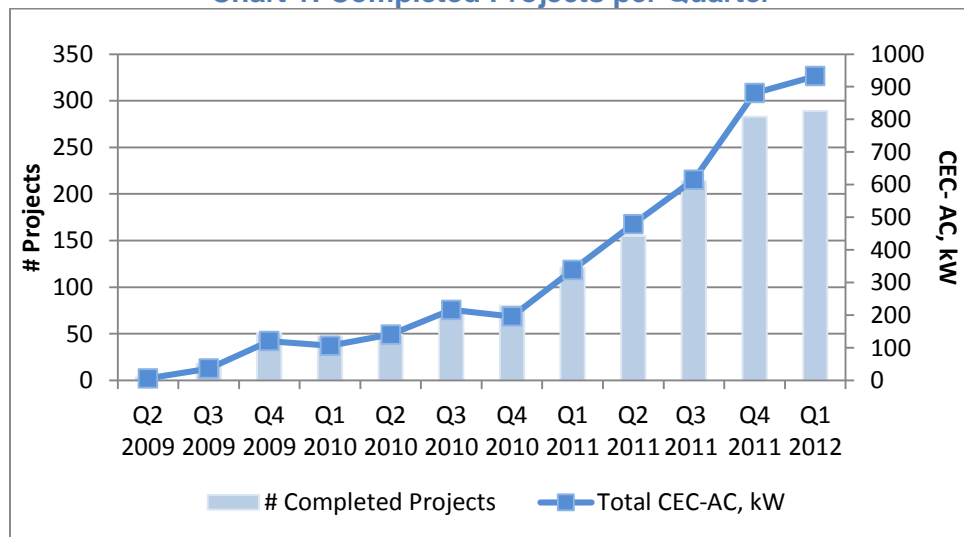
Application Status	Number of Applications				Total kW, (CEC-AC)	Total Incentives, \$ millions
	PG&E	SCE	SDG&E	Totals		
STEP 1: Applications under review	238	177	46	461	1,336.9*	\$8.02*
STEP 2: Confirmed Applications/Reservations	200	130	17	347	1,201.2	\$7.51
STEP 3: Completed/Installed	733	525	190	1448	4,332.2	\$27.19
TOTALS	1171	832	253	2256	6,870.3	\$42.72

Data collected 4/4/2012

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

Since the beginning of the SASH Program, there has been steady and incremental growth in the number of interconnected projects each quarter (Chart 1). The SASH Program continued this solid growth trajectory in 2012 as nearly 300 projects approaching 1MW in capacity were interconnected in Q1 2012. These strong first quarter results indicate that SASH interconnections have more than doubled from the same time last year.

Chart 1: Completed Projects per Quarter



System size: Chart 2 below shows that nearly 70% of installed SASH PV-systems are less than 3kW, and the average SASH installed project is around 2.9kW. 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 7kW (kW,CEC-AC).

Chart 2: Completed SASH Installations by System Size

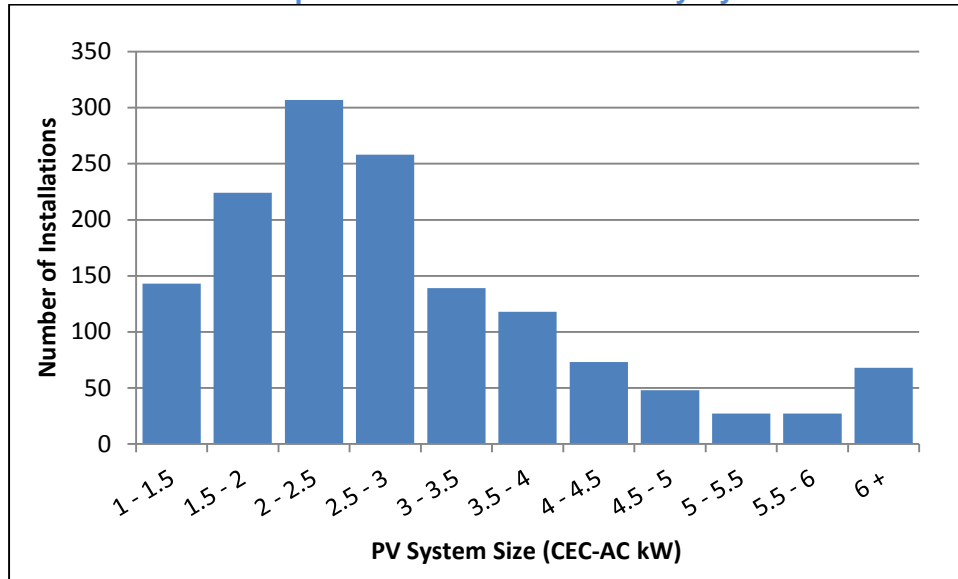


Chart 3 below compares SASH’s installed cost per Watt for similarly sized systems in the general market program. On the smallest sized systems (1-1.5kW) SASH systems cost 25% less than general market systems. In addition, SASH’s average installed costs remain substantially lower than installation costs for similarly sized projects in the general market CSI Program. **SASH systems’ installed-cost is \$1.00/W-\$2.75/W less than general market systems of the same size.**

Chart 3: Installed Cost per Watt, SASH vs. General Market CSI

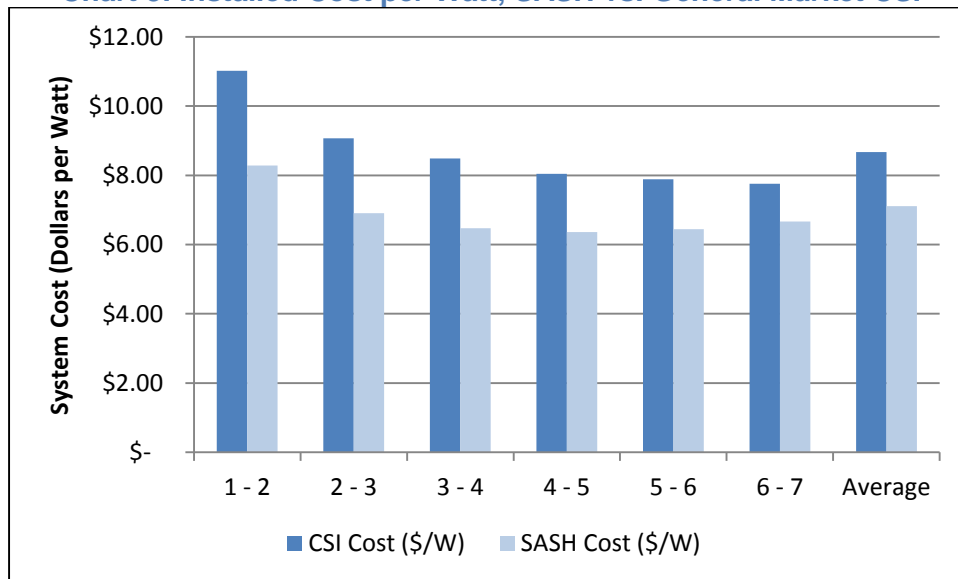
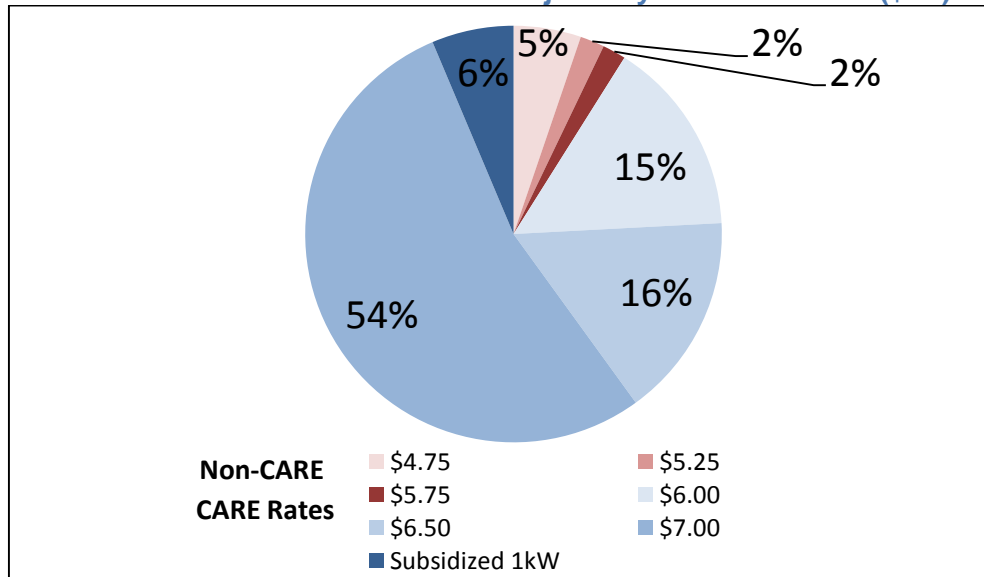


Chart 3: GRID’s data is based on the total number (1448) of installed SASH projects to date (4/9/2012). The CSI sample set is from the California Solar Statistics (updated 4/6/2012), and is filtered to include all residential projects, under 7kW, for 1/1/2009 - 4/6/2012.

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. Chart 4 below shows that over 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 CARE-eligible homeowners – homeowners at the lowest income levels who need the savings provided from solar electric systems the most. Chart 4 also illustrates that GRID has been able to qualify SASH clients and install SASH systems at every incentive level offered within the Program. At the non-CARE rate incentive levels, GRID works with the homeowner to explore avenues to cover the gap between their system costs and their available incentive.

Chart 4: SASH Installed and Reserved Projects by Incentive Level (\$/W)



GRID works with homeowners who have a financing gap to explore individual financing options, such as a client contribution or private loan, and has experienced limited success with the gap financing challenge. Some clients are able to contribute toward covering their project gap with a family contribution or small loan. In Q1 2012, several clients in San Diego opted to make monthly reimbursement payments to GRID based on their future (post-solar) electric bill savings in order to cover part of the difference between their system costs and their available incentive, and augment the fundraising contribution GRID applied toward their projects.

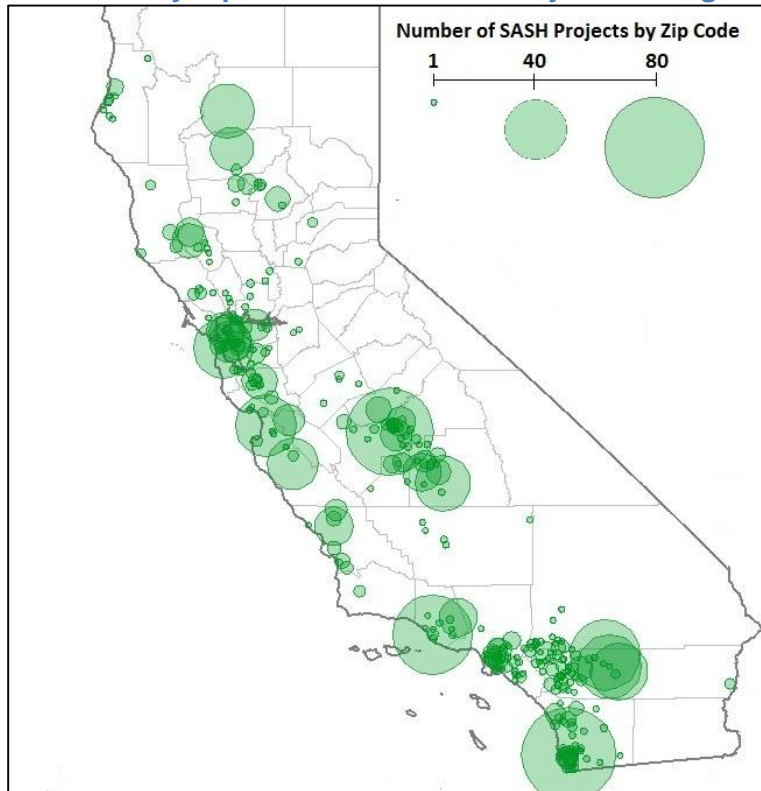
In most instances GRID has aided in overcoming the gap financing obstacle for families by contributing the organization's own fundraising dollars toward covering the gap between the available incentive and the project's costs, thereby allowing more families to go solar with the SASH Program than otherwise would have been able to do so. GRID's contributions toward covering these financing gaps include: fundraising dollars, in-kind donations, philanthropic donations, and sponsorships. GRID's partnerships with major module manufacturers Yingli Solar and Sunpower Corporation, announced in early 2012 and slated to continue for the duration of the year, will be a significant asset to help cover many SASH clients' gap funding requirements. Collectively, these two partnerships are expected to benefit as many as 600 low-income families. Given the slow economic recovery, continued tight credit markets, and the inability for most homeowners to assume more debt, gap financing remains a potential obstacle for low-income families to participate in the SASH Program.

7. Marketing and Outreach

GRID currently has seven offices located in Oakland (PG&E), Carson (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 completed and interconnected projects, reserved projects, and identified eligible clients through Q1 2012 of the SASH Program.

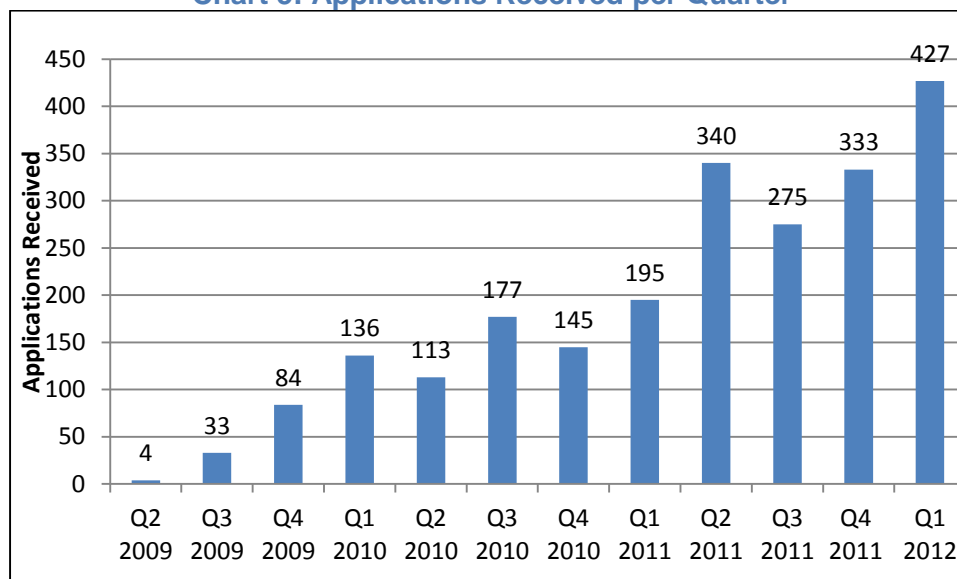
Map 1: Location by Zip Code of All SASH Projects through Q1 2012



Map 1 above illustrates that SASH projects have been completed and reserved over a wide range of geographic areas in the state.

Chart 5 below shows that GRID received 427 applications from eligible SASH clients in Q1 2012, bringing the total number of approved SASH applications to 2262 – a sufficient pool of clients to propel the SASH Program well into 2012 on-track to meet its robust installation targets for the year. GRID received 25% more applications from eligible clients in Q1 2012 than in any previous quarter of the Program – indicating both that the marketing and outreach strategies continue to be effective; and, that SASH is gaining exposure and expanding its scope throughout the state.

Chart 5: Applications Received per Quarter



GRID continued 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 the SASH program through events, media and marketing collateral.

GRID also continued to leverage its existing relationships with key community partners to spearhead outreach efforts in low-income communities. GRID also continued to garner support and participation from the first-adopters of the SASH Program to discuss it with their neighbors and acquaintances and encourage them to contact GRID. 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's unique volunteer-based installation model has made every in-house SASH project a workforce development opportunity for a broad range of professional interests. These volunteer and training opportunities can help create the solar market transformation sought through the California Solar Initiative. These opportunities create a well-informed public and proof that the technology can be adopted by everyone in every community within California. Over 11,500 workday positions on SASH installations have been filled by volunteers or job trainees, and thousands more participants will help

bring the SASH Program and solar energy to low-income families throughout the state and prove solar is a technology for all 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.

Over 8,200 individuals have completed GRID's mandatory volunteer orientation and the majority have gone on to participate in an installation. During Q1 2012, over 860 solar volunteers attended GRID's volunteer orientation sessions held regularly in each of the seven GRID regional offices, and 330 volunteers participated in a SASH installation.

Volunteers and job trainees form the backbone to GRID's installation model and will be an important part of the overall success of the SASH program. To date, the SASH Program has provided over 18,900 opportunities for volunteers to become involved and over 3,900 opportunities specifically for solar installation job trainees, further strengthening California's solar industry.

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 partners with existing job training organizations to incorporate GRID Alternatives' volunteer-based installation projects into their construction training curricula. GRID Alternatives dedicates 20% of its internal installations for these trainees to build hands-on experience with real-world solar PV installations that have conditions and requirements comparable to what they would encounter in private industry. Through Q1 2012, nearly 1,700 job trainees have received valuable hands-on experience in solar construction by participating in a SASH installation.
- **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. These opportunities give a job trainee more opportunities to get the critical hands-on PV-installation experience required by most PV-solar contractors. To date, GRID has qualified over 175 individuals as Certified Roof and/or Ground Team Leaders.
- **Team Leaders may apply their experience toward NABCEP certification.** The North American Board of Certified Energy Practitioners (NABCEP) is widely recognized and accepted as the definitive certification for solar energy professionals. An individual pursuing NABCEP's PV solar installer certification must meet the Board's requirement of having completed two PV solar installations as part of their application. One of the auxiliary benefits for a GRID Team Leader to become "Certified" to lead volunteer SASH installations by completing various GRID Team Leader requirements is that the experience can be applied toward meeting NABCEP's requisite installations. Several of GRID's standout "Certified" Team Leaders have applied their GRID experience toward their successful pursuit of their NABCEP certification, thereby improving their resume for prospective employers and making them more competitive in the job market.
- **Paid work and job placement opportunities for training program graduates.** Students or graduates of these 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 Subcontractor Partnership Program (SPP). These trainees will work alongside experienced installers from for-profit companies to install SASH systems, reducing total installation costs for the homeowner

while providing the job trainees and the contractors with extended, paid “field interviews” where the trainees can be evaluated for available long-term installer positions with the company. Since the inception of the SPP, over 530 paid job opportunities have come to fruition for California solar job trainees through SPP installations.

- **Innovative new partnerships between private industry and community-based job training organizations.** The Sub-Contractor Partnership Program’s job training requirement helps foster new partnerships between for-profit sub-contractors with local workforce development programs. The requirement that sub-contractors use one or more job trainees for each SASH installation often causes the for-profit company to look to community job training organizations or other local green job programs that they otherwise might not have considered when hiring new staff. Not only does this increase the breadth and impact of SASH on the solar industry’s job development, but also can prove to a for-profit contractor that solar can be a viable technology for all and that outstanding employees can come from all neighborhoods and backgrounds.



- **General volunteering opportunities.** Over 8,500 volunteers have completed GRID’s volunteer/solar orientation. Since the commencement of the SASH Program, over 6,200 volunteers participated in GRID’s educational solar orientation program and worked directly on SASH installations. 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.

Providing low-income individuals with hands-on solar installation experience and avenues to employment in the growing solar PV installation industry is an important part of GRID Alternatives’ mission to empower communities in need through renewable energy. GRID Alternatives currently partners with a growing number of low-income job training organizations interested in providing green-collar job training to their constituents. These programs need to provide real-world, hands-on experience for their trainees. GRID’s volunteer-based installation model lends itself perfectly to this need – these projects serve as a solar PV version of a teaching hospital, where trainees can “learn by doing” in the field and gain valuable exposure, experience and skills that will significantly increase their employability.



The Sub-Contractor Partnership Program requires all contractors to use one or more current or recent solar job trainee on each sub-contracted SASH installation. Through Q1 2012, over 530 paid employment opportunities for job trainees have resulted from installations orchestrated through this Program. Though there is not a requirement to hire the trainee for full-time work, several sub-contractors have promoted the job trainees they employed on SASH installs to full-time work with the company. This becomes a double benefit to the low-income community since many solar job trainees come from the same communities that the SASH Program aims to serve. GRID encourages sub-contractors to hire from the local communities whenever possible. This will continue to propel the California solar industry forward and provide long lasting benefits beyond the scope of the CSI and SASH programs’ lifecycles.

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 solar PV. To this end, GRID performs an energy efficiency audit for every SASH applicant and shares comprehensive EE report with the homeowner. The EE report is based on the Department of Energy's Home Energy Saver online tool. The audit is conducted regardless of the clients' enrollment into CARE or LIEE. GRID works with the LIEE program administrators to enroll homeowners into LIEE if they are eligible, and with the IOUs to streamline LIEE enrollment for SASH clients. The following Table 5 summarizes the number of homeowners that qualified and were enrolled into the LIEE programs.

Table 4: LIEE Enrollment

Utility	Total
PG&E	602
SCE	760
SDG&E	195
Total	1557