



# **GRID Alternatives Colorado Solar Training Academy**

**Program Report**



*December 2019*

# GRID ALTERNATIVES COLORADO SOLAR TRAINING ACADEMY

## INTRODUCTION TO GRID ALTERNATIVES SOLAR TRAINING ACADEMY

Since 2001, GRID Alternatives, Inc., has envisioned a successful transition to clean, renewable energy that includes everyone by making renewable energy technology and job training accessible to underserved communities.<sup>i</sup> In order to achieve this vision, GRID has quickly become the largest non-profit solar installer in the United States and also works internationally in Nicaragua, Nepal, and Mexico.

GRID Alternatives Colorado (GRID CO), an affiliate of GRID Alternatives, Inc., provides a variety of solar programs that increase the amount of solar in communities; these programs include creating workforce training and development opportunities for people interested in entering the solar industry. GRID CO has installed more than seven megawatts of solar capacity throughout Colorado and continues to collaborate with utilities, state and local government agencies, and affordable housing providers to provide affordable solar options to all Coloradans (see Figure 1).<sup>ii</sup>

In 2017, GRID CO, through a partnership with the Denver Housing Authority (DHA), was awarded funding from the Denver Urban Renewal Authority to launch a new solar workforce training program called the Solar Training Academy (STA). The goal of the STA is to provide hands-on training for under- or unemployed Denver residents in order to create a pipeline to employment in the solar industry and construction field.<sup>iii</sup> The STA has grown rapidly since its first session of training future solar workforce participants in the third quarter of 2017.



Figure 1. Accomplishments of the Colorado affiliate of GRID Alternatives.

In 2019, GRID CO hired Lotus Engineering and Sustainability, LLC (Lotus) to share the story of how the STA was developed, the program's evolution over the past two years, and the impacts and effects of the program on the participants, the communities served, and the local solar industry in Colorado. The information in this report was gleaned from a review of documents related to the STA, including quarterly funding reports; a review of the solar industry in Colorado and nationally; an analysis of metrics related to the program, including employment and job retention rates of participants; and one-on-one interviews with individuals involved in the program, including GRID CO staff, past program participants, and local partners.



## The State of the Solar Industry

The clean energy job industry (which includes jobs within the energy efficiency, renewable energy, solar, wind, clean vehicles, and grid modernization sectors)<sup>iv</sup> is steadily growing, and in 2019 alone there were nearly 3.3 million jobs in the industry. While the clean energy job industry is steadily growing, the solar industry is booming. In 2018, the National Solar Jobs Census found that there were more than 242,000 solar jobs, an increase of 159% since 2010. Although solar energy comprises 2.4 percent of electricity generation in the US, the solar industry employs the third most workers of all sources of electricity, only behind petroleum and natural gas. Two-thirds of all solar industry jobs are in installation and project development, and the long-term outlook on employment in the industry is positive.<sup>v</sup>

Colorado is one of the top places in the country for jobs in the solar industry and clean energy industry overall. Job growth in the clean energy industry in Colorado is nearly three times the national rate, and there are nearly three times as many workers in the clean energy industry as the fossil fuel industry in



the state.<sup>vi</sup> In 2018, there were 7,775 jobs in the solar industry in Colorado. Since 2015, job growth in the solar industry in Colorado has increased annually and is expected to increase by 7.5% in 2019.<sup>vii</sup>

**One area where the solar industry is beginning to focus and has significant room to grow is in regard to diversity and inclusion.**

As shown in Figure 2, the national solar workforce has a majority of workers who identify as White (73 percent), followed by Asian at nine percent and Black/African American at eight percent; 17 percent of

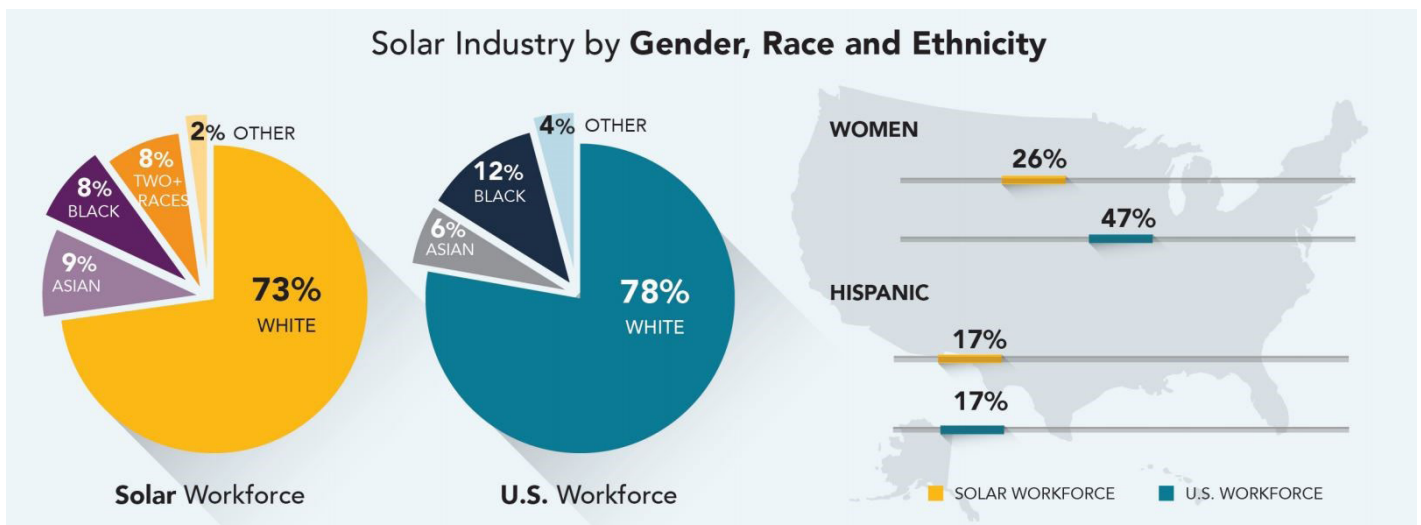


Figure 2. Solar industry and US workforce demographics.

the solar workforce nationally identify as Hispanic/Latino. The overall US workforce has more women in the workforce in comparison to the solar industry (47 percent in the overall workforce compared to 26 percent in the solar industry).<sup>viii</sup> Women in the solar workforce earn significantly less than men, with women in solar earning 74 cents to every dollar men earn. While there is a significant pay gap between men and women, there is less wage inequality between races and ethnicities. The average hourly pay rate for Black/African American employees in the solar industry is \$33.26, while White employees earn, on average, \$26.51 per hour. Nearly 40 percent of Hispanic or Latino solar industry employees report making an average of \$30 per hour.<sup>ix</sup> On average in the US, a solar installer will earn \$53,825 annually.<sup>x</sup>

Nationally, there is a distinct lack of “on-the-job” solar training programs. In a survey of solar employers conducted by the American Solar Workforce organization, only 34 percent of employers offered on-the-job workforce training programs. In the same survey, 66 percent of employers wished to see a standardized industry-wide “on-the-job” training program. Further, American Solar Workforce ranks Colorado as the state with the eighth-largest demand for solar workforce development programs.<sup>xi</sup>

**GRID’s STA is helping address this demand for workforce development in Colorado.**

## GRID’S SOLAR TRAINING ACADEMY

### Building a Diverse Solar Workforce

In 2017, GRID CO applied for funding through the Denver Urban Renewal Authority to create the STA. The program would support work already occurring at DHA, which is a natural partner to GRID CO

due to its mission of “serving the residents of Denver by developing, owning, and operating safe, decent, and affordable housing in a manner that promotes thriving communities.”<sup>xii</sup> At the time of application, DHA had a workforce training program called the Light Industrial Training Academy. The proposed STA would serve as an extension of that program, and together these two programs had a goal to provide a pipeline to employment in the construction field for under- or unemployed Denver area residents. In addition, the program aimed to help with a major barrier experienced by solar employers of finding entry-level employees who have the certifications and on-site experience necessary to fill available positions.

**82**  
Program Graduates

**55%**  
Employment Rate

**2,173**  
Kilowatts of Solar  
Installations Supported

**\$12,500,000**  
Lifetime Solar System  
Savings



GRID CO had an initial pipeline of projects ready to train STA participants in various aspects of working in the solar industry, while also supporting the successful completion of these projects. Since 2017, STA participants have worked alongside GRID staff installing rooftop systems on low-income households and affordable housing buildings, as well as on low-income community solar projects throughout the Front Range. Funding for the projects came from local and state grant dollars and philanthropic donations.



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The initial format of the STA was a two-week course that provided both classroom and in-the-field training and helped trainees gain certifications that are applicable throughout the construction industry. During the two-week training course, trainees were taught the following topics:

- Introduction to the solar industry and job opportunities
- Introduction to solar technology
- Design and project development (offered through Solar Energy International's PV 100 course)
- Basic installation skills
- Resume and cover letter writing

Additionally, trainees spent two days at an active GRID CO solar project site and received on-site solar installation training and installation crew leadership training.

Based on feedback from program participants and representatives of the local solar industry, GRID CO made some modifications to the STA program starting in 2018 to enhance the experience for trainees and ensure that they are even better prepared to enter the solar and construction workforce after graduation. These changes included switching from offering the PV 100 course to offering more relevant training on construction safety. This brought significant savings to the program, as the original course came at a cost of \$7,400 per training class.

Due to the resulting savings, GRID CO was able to add additional important safety certifications that local employers indicated would ensure STA graduates were more prepared to enter the workforce after graduation, including certifications in OSHA 10 (which is required by many companies to enter a job site), CPR/First Aid, and Fall Protection Awareness. Trainees who completed the program also received trainee and recruitment support from GRID CO staff after the program ended. This support included one-on-one help from GRID CO's Workforce Team, who worked with graduates on crafting resumes and cover

*"I finished with GRID CO and went immediately to my new job. I am a residential technician with Sun Systems and am working as a crew lead, and I was Employee of the Month recently! GRID CO made me who I am today. I know so much more than I ever did before."*

*-Jude, STA Graduate*

letters and provided help with applying to jobs.

**These changes in 2018 allowed the STA to improve the rate of job placement among graduates and provide an additional level of support for STA participants after graduation.**

In addition to completing the STA, participants have the opportunity to apply to join GRID CO's Solar Construction Internship program, which is a full-time three-month paid internship that provides a living wage (\$15/hour) and gives participants construction training experience and the opportunity to put their newly-learned skills to work at an active job site. Participants can also apply for GRID CO's 13-month SolarCorps program, which is a full-time paid workforce development program that provides participants with in-depth training and experience in solar installations, creating a pipeline for highly trained solar workers.

The SolarCorps program is partially funded through the Corporation for National and Community Service (AmeriCorps), and many of GRID CO's current staff members began their tenure at the organization through this fellowship. The flow of participants from STA into the Solar Construction Internship program and the subsequent SolarCorps program has resulted in 29 STA participants working for GRID CO in some function after they graduated from the training program; this represents 30 percent of total STA participants.



**Trainees who successfully graduate from the STA in almost every case leave the program with the knowledge and experiences that will help them jump-start a career in the solar or construction industry – including within the GRID CO organization.**

## **Program Recruitment**

To attract people to the program, GRID CO uses several different recruiting channels. One successful method has been to work with DHA to identify DHA residents who would be good candidates for the program and are interested in entering a career in the clean energy or construction industries. Additionally, GRID CO works through DHA to distribute flyers and informational pamphlets to residents to spread awareness of the program. GRID CO's Workforce Assistant, April Valdez, is deeply connected to the Denver area and with various partner organizations that help spread the word and send qualified applicants to the STA. April conducts outreach at local YMCAs and schools to provide the information to interested high school students, who can participate in the program once they turn 18.

One of the most successful outreach channels has been working with the Colorado Department of Corrections Juvenile Justice probation office in Denver, which supports youth who have been involved in the justice

*Dylan Reitenbach, GRID CO's Commercial Solar Installation Supervisor, has hosted STA crews on his construction sites throughout the past four STA programs, and diligently works with the trainees to teach them the ins and outs of solar installation.*

*Dylan knows firsthand how important it is to have well-trained, hard-working employees on his team. "I rely on the interns that we hire to execute this higher-level solar work, so having someone start and finish the program with me helps ensure the systems go online," he says.*

*Employers across the country echo his thoughts, and his trainees and interns have reaped the benefits of his passion for the program. Says STA graduate Jude, "[Dylan] has been so awesome because he will always do the work with you, doing it together. He tries to see and make sure you understand, and he follows up and tries to help wherever he can." GRID CO staff's dedication to training and giving back to the program has helped make an impact on countless STA graduates.*

system by enhancing their skill sets and helping them locate employment such that they do not have to turn to illegal activity in the future to make ends meet.



**Juvenile Justice probation office staff have noted that the STA program and GRID CO's efforts to fully engage young people in the program has helped many young people develop both hard and soft skills that increase their chances at obtaining gainful employment in the future and help to boost their confidence in a way that allows them to see brighter futures for themselves.**



With every additional STA program, there are additional graduates and advocates for the program. In many cases, due to their positive experience in the program, the STA graduates help to spread awareness of the program, share their stories about how STA has positively impacted their lives, and recruit neighbors, friends, and family members to apply to upcoming STA sessions.

## Supporting Local Communities

One of the most impressive successes of the STA is the impact it has on participants' abilities to find good-paying and long-term jobs around the Denver metro area. Over the first two years, GRID CO has had a total of 96 participants. Of those 96 enrolled trainees, 82 completed the program and graduated (representing an 85 percent graduation rate). The majority of participants are male (79 percent), but more women have reported employment after completing the program (65 percent for women compared to 53 percent for men).

GRID CO program participants have come from a diverse ethnic background; 25 percent of participants identify as Latino/Hispanic, 25 percent identify as White/Non-Hispanic, 28 percent identify as Black/African American, 10 percent identify as American Indian/Alaskan Native, and three percent identify as Asian/Pacific Islander (nine percent identified as 'other' or did not provide a response) (see Figure 4). The vast majority of participants (78 percent) have been younger than 55 years old.

**Fifty-five percent of graduates report being fully employed after graduation, with 35 percent of STA graduates having been hired by GRID CO.<sup>xiii</sup>**

Ultimately, the goal of the GRID CO STA is to "increase the employability of participants by both general and solar specific construction companies."<sup>xiv</sup> GRID CO staff follows up with STA participants at three-, six-, and twelve-month intervals to determine whether graduates are employed, to determine if the program is

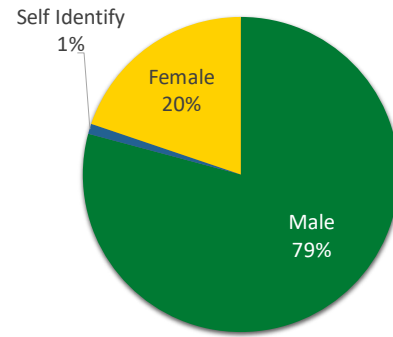


Figure 3. Gender Diversity in the STA.

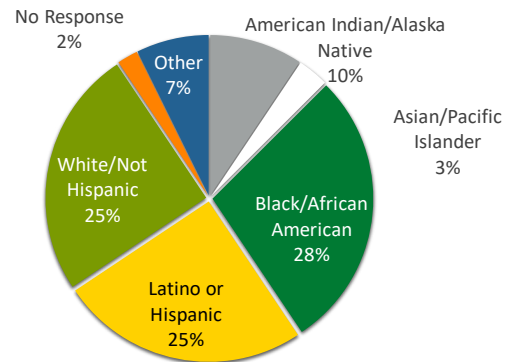


Figure 4. Racial and Ethnic Diversity in the STA.

accomplishing its goals, and to better understand the impact that the program has had on these individuals.

Beyond the direct impact that the STA has on the individuals that participate in the program, this program provides benefits across the Denver-area communities that are served. STA participants completed over 15 days of on-site installation work, much of which occurs in the predominantly low-income communities where many of the participants live.

**Since 2017, STA participants have worked on solar installations across the Denver metro area totaling 2,173 kilowatts of installed capacity; the total lifetime savings of these systems is estimated to be nearly \$12.5 million.**







**The program received overwhelmingly positive reviews from graduates.**

Some of the most common words and phrases used to describe the STA include: passion, friendly people and environment, positive atmosphere, community, support, confidence-builder, and invaluable experience. Through these conversations, it is evident that the impact on the Denver community has been positive.

The first two STA cohorts worked primarily on community solar and multifamily housing installation projects, while later cohorts have primarily worked on single-family installs and some projects that support the Colorado Energy Office's Weatherization program. These installations not only help to reduce energy costs in low-income communities and provide clean, green power for households, but also help to educate and empower community members to engage in the transition to clean energy and related work to address climate change.

STA participants and community members report feeling empowered and excited to be a part of the transition to a clean energy economy, and STA participants' ability to directly bring solar power to their neighbors, friends, and families is a significant source of pride for the participants.

### April's Story

One success story from the STA is April Valdez, who came to the program as a mother of four who was ready to get back into the workforce. While April was not interested in becoming an installer, she loved the program and its positive impact on the community so much that she wanted to be a part of its continued success. April's passion and dedication to her community, as well as to the mission of GRID CO, were clear and profound, and after graduating from the STA she put her passion to work by becoming GRID CO's Workforce and Volunteer Program Assistant.

The STA program ignited in April a newfound passion for bringing solar, jobs, and workforce training to her community; immediately after graduating April got to work in the community spreading the word about the

### In Their Own Words: STA Success Stories

At the core of the STA program is its impact on the trainees and the local communities it serves. Lotus spoke with STA program graduates and program staff to gain a better understanding of the impact of the STA on the people and communities that are most directly affected by the program.

*"I believe in my community, whatever helps move them forward and propel them up, I am here for them."*

*-April, STA graduate and current GRID CO staff*



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program and recruiting new trainees. Having grown up in Colorado in a low-income household, April keenly understood the lived experience of many program participants and was able to connect with those in the community who simply needed to be given a chance to change their current situation. She also knows from her experience within the program how critical it is to find employment after the completion of the STA.

April works diligently to raise awareness of the STA with solar companies in Colorado and finds companies that are willing to host on-site job awareness days for the STA trainees, where trainees can learn more about the companies and have a tour of their operations. April is constantly reflecting on the program and trying to find ways to improve the program's success and impact on the community, even advocating for policy changes surrounding community solar and hiring practices in the solar industry. In the end, April believes that the GRID CO STA is critical to making positive changes to vulnerable communities in Colorado. "We want to reduce recidivism in Colorado and increase solar in Colorado," she says. "Why can't we marry the two?"

### Cory's Story

Cory came to the STA from Durango, CO, where he was struggling to make ends meet and pay for the loans on his college degree. After volunteering on a GRID CO project near Towaoc, CO, he was referred to the STA by a GRID CO employee. Cory took a bus to Denver for the next STA, and the rest is history. Whereas Cory was constantly struggling to find a job in Durango, after graduating from the STA Cory took advantage of the trainee and recruitment support and says, "It made getting a job the easiest it has ever been [for] me."

Cory now has a job as a solar installer and is making far more than he ever imagined he could, and he gives all the credit to the GRID CO STA program. He is now a vocal advocate for the STA and says he tells as many people as he can

*"I have a career thanks to GRID Alternatives now. After a month with GRID Alternatives I am a whole new person."*

*– Cory, STA graduate*

to go complete the program and change their lives for the better, just like he did. To Cory, the greatest success of the STA is its impact on the community. "An integral part of their mission is involving anyone who wants to be involved, regardless of color, gender, and background, and that is so important," he says. "It gave me more faith in humanity."

### Jude's Story

Jude came to the STA wanting a career change from the web development sector and was hoping to find a profession that was also slightly more physically active. Jude is also an altruistic person and saw the training as an opportunity to bring his skills to help communities in places like Africa and South America.

After successfully completing the STA, Jude went on to participate in GRID CO's Solar Construction Internship program. One of Jude's favorite parts of both the STA and the Internship program was the staff and the friendly environment created by staff and trainees. "With my co-interns and the staff, it was like a family," he says of the staff at GRID CO. "They always look after you and want to see you thrive." While he was an intern with GRID CO he was able to participate in the construction of the first floating solar system in the state, which was installed in Walden, Colorado.

Jude has become a strong and vocal advocate of GRID CO and the STA program. He credits GRID CO with helping him land a job with Sun Systems as a Residential Service Technician and teaching him the skills that he can eventually use to give back to communities in need across the country and around the world. He will never stop striving to give back to the program that helped turn his life in a new direction. "The thank-you I can give them is to keep climbing," he says, "because I am their product, and I want to be a good product. It's all because of GRID."

### Impacts Beyond the Individual

Beyond the job training and soft skill development support that GRID CO provides through the STA, one of the biggest impacts mentioned by multiple STA graduates who were interviewed was the program's impact on their individual self-esteem and ability to see



a bright future for themselves and their communities. Multiple STA graduates who were interviewed noted that, prior to joining the program, they did not think that they had the skills, knowledge, or support needed to change their lives for the better by learning a new skill or pursuing a new career.

GRID CO staff who were interviewed noted that a big part of what they see as their roles when working with STA participants is to help these individuals build their own self-confidence and to provide the participants with the support and encouragement necessary to empower them to take ownership over their professional paths and work towards a brighter future for themselves. Participants noted that this aspect of having someone else believe in them so fully and willingly meant the world to them and showed them that they have both the external support and the internal ability to change their lives for the better.

## The Future of the STA

GRID CO is constantly seeking feedback from trainees and program staff on ways in which the STA can be improved and better serve the participants and the communities in which GRID CO works. After running the program for a year, GRID CO made some significant program changes that would allow for trainees to be better qualified for jobs post-graduation. One of these changes is the aforementioned switch from providing the Intro to Photovoltaics course to providing more robust construction safety training; this change saves the program \$30,000 annually and the savings allowed GRID CO to offer safety certifications (OSHA 10, CPR/First Aid, and Fall Protection Awareness) that increase STA graduates' employability in both the solar and construction industries after completion of the STA. The other changes to the STA, including an additional on-site training day and providing additional support to graduates as they create resumes and cover letters and apply for jobs, will further help to improve the job placement rate of the STA's graduates.

**While the program has seen great success to date, there is always room for improvement.**

When asked how the program might be improved or changed, a common response among those that were interviewed was that adding additional services to accommodate lower-income individuals who may face hardship by missing work for the two-week program would support increased participation and graduation; this could include providing a small stipend for participants for their time over the two-week program.

GRID CO staff try to provide wrap-around support from the time a trainee is applying for the STA through the completion of the STA and even after the program has ended by providing resources and support especially in the job search process. This includes providing a childcare stipend to participants and bus passes to get to the GRID CO training site. However, developing a more structured approach to this by partnering with additional service providers in the communities served (such as other employment and job-training organizations and organizations that could provide transportation and other services) was suggested as something that might be helpful. Others see the need for a longer, more in-depth program that would offer additional certifications and educational opportunities to further prepare graduates to get jobs after wrapping up their short time in the STA.

Those managing the program see a need to collaborate with additional partner organizations, specifically juvenile detention centers and community organizations, so the program can reach out to more at-risk populations throughout the Denver metro area and continue to expand its positive impact on the community. Providing additional support for participants in the forms of helping them reach job sites through transportation support and including more hands-on training days for participants was also referenced as an opportunity to enhance the program's impacts and successes. Lastly, multiple participants noted that they believe that the STA could have a very positive impact on many communities outside of just the Denver metro area and the Front Range, and hope that in the future GRID CO can expand its reach with the program and bring it to more communities across Colorado.







One area where there is room for growth is in attracting more women to participate in the STA. The gender disparity that GRID CO sees in this program is common across the solar industry and creating some intentional messaging to recruit women into the program may be beneficial.

**GRID CO is always attempting to refine the STA to better support the communities and individuals that the organization serves.**

Aside from these opportunities for improvement, in the coming year GRID Alternatives nationally is shifting to a five-week Installation Basics Training program that will focus largely on residential installations and GRID CO is looking into hiring a Field Trainer to help provide

more focused, one-on-one training for STA program participants and other volunteers and trainees when they are doing on-site trainings. Finally, GRID CO is looking at extending the length of the available training programs to provide more on-site and soft skill training for the participants. Ever-evolving, GRID CO is constantly searching for ways to expand the STA program's impact while simultaneously making a positive impact on the environment.

As the program continues to evolve, the positive benefits accrued to both individuals and the communities that are served through the STA will also grow through the development of a skilled, knowledgeable, and empowered workforce that can lead Colorado's transition to a clean energy economy.



## ENDNOTES

<sup>i</sup>For more information see <https://gridalternatives.org/who-we-are/mission-history>.

<sup>ii</sup>For more information see <https://gridalternatives.org/regions/colorado/about>.

<sup>iii</sup>For more information see GRID's original Denver Urban Renewal Authority application for STA funding.

<sup>iv</sup>For more information see <https://www.e2.org/reports/clean-jobs-america-2019/>.

<sup>v</sup>For more information see <https://www.thesolarfoundation.org/national/>.

<sup>vi</sup>For more information see <https://www.thesolarfoundation.org/national/>.

<sup>vii</sup>For more information see <https://www.thesolarfoundation.org/solar-jobs-census/factsheet-2018-co/>.

<sup>viii</sup>For more information see <https://www.thesolarfoundation.org/wp-content/uploads/2019/05/Solar-Diversity-Infographic.pdf>.

<sup>ix</sup>For more information see <https://www.thesolarfoundation.org/wp-content/uploads/2019/05/Solar-Industry-Diversity-Study-2019-2.pdf>.

<sup>x</sup>For more information see [https://www.glassdoor.com/Salaries/solar-installer-salary-SRCH\\_KO0,15.htm](https://www.glassdoor.com/Salaries/solar-installer-salary-SRCH_KO0,15.htm).

<sup>xi</sup>For more information see <https://www.americansolarworkforce.org/wp-content/uploads/2018/09/sthr.pdf>.

<sup>xii</sup>For more information see <http://www.denverhousing.org/aboutus/Pages/default.aspx>.

<sup>xiii</sup>For more information see GRID Quarterly Report June 2019.

<sup>xiv</sup>For more information see GRID's Denver Urban Renewal Authority application for initial STA funding.

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