Solar Energy Technologies Office (SETO)

Final Technical Report (FTR)

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Signature of Certifying Official *Date*

By signing this report, I certify to the best of my knowledge and belief that the report is true, complete, and accurate. I am aware that any false, fictitious, or fraudulent information, misrepresentations, half-truths, or the omission of any material fact, may subject me to criminal, civil or administrative penalties for fraud, false statements, false claims or otherwise. (U.S. Code Title 18, Section 1001, Section 287 and Title 31, Sections 3729-3730). I further understand and agree that the information contained in this report are material to Federal agency's funding decisions and I have any ongoing responsibility to promptly update the report within the time frames stated in the terms and conditions of the above referenced Award, to ensure that my responses remain accurate and complete.

Acknowledgement

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Disclaimer

Executive Summary

How the project adds to understanding in the field.

The “Multi-Sector Solar Career Training for Native Americans and Veterans” program (DE-EE0008575; Blue Lake Rancheria Tribe, with GRID Alternatives), was a job-training and capacity-building project for Native American people and tribal communities. The project adds to understanding by identifying potential solutions to barriers that individuals and tribes may face as they seek to build 1) individual skillsets as solar technicians, and 2) staff capacity to develop solar energy projects.

The economic feasibility of the methods demonstrated.

In the simplest terms, the cost-effectiveness of a workforce development program (e.g., program expenditures per jobs created) is improved when trainees stay in the program and when jobs are available for them when training is done. This project has highlighted some key issues regarding the attainment of industry-demanded skillsets (both technical and “soft” skills) and job placement, and the need to deliver programming that is attentive to trainees with a diversity of strengths, needs, and life situations.

DOE has a mission to support a skilled and productive workforce in the energy sector. To this end, the project team identified wraparound services and trauma-informed strategies as proactive investments in human capital that could help DOE achieve this mission; such approaches can lead to greater trainee retention, job preparedness, and ultimately to better program ROI.

Deployment of wraparound services and trauma-informed strategies may carry more initial costs, but they also lead to reduced turnover, lower recruitment costs, and improved worker satisfaction and productivity. Project results suggest that higher investments in these approaches may be warranted given the potential costs of decreased trainee and employee performance, absenteeism, and turnover resulting from unaddressed participation barriers. Such approaches also presumably align well with diversity, equity, and inclusion, and employee health and safety initiatives.

How the project is beneficial to the public.

Many tribes and rural communities face the Catch-22 where poor economic conditions lead to poor health outcomes (including unaddressed trauma), and where the economic development needed to improve community health indicators is stunted because of the potential workforce’s poor health. Deploying wraparound supports and trauma-informed methods in workforce development programming holds great promise for solutions that benefit the public by addressing these persistent problems.

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1. Background

The following document is a Final Report for the three-year "Multi-Sector Solar Career Training for Native Americans and Veterans" program (DE-EE0008575) funded by DOE-SETO and conducted by the Blue Lake Rancheria (BLR) and GRID Alternatives from June 2019 through March 2023. The report reviews the objectives, results, accomplishments, and path forward for the program, which was primarily focused on using solar PV project development and installation as a vehicle for workforce development and capacity-building for Native American communities.

Figure 1. GRID trainees on-site at the Budget Period 1 project site in Boulder, Colorado.

References to publications and proceedings on tribal solar technology workforce development and tribal energy development capacity-building are provided throughout this report and are presented in support of the report's main recommendations. Per the final report guidelines, the aim of the report is to "place the project in living context alongside the current state of the art in the literature and ongoing R&D." This report is not about technology R&D but rather technology *deployment*. Below, we provide context for the report by briefly discussing 1) a broader perspective on technology deployment, and 2) the relevance of a historical trauma lens for tribal solar workforce development initiatives.

A Broader Perspective on Technology Deployment

The purpose of this report is to "provide DOE with a concise technical review of the award's final outcomes including technical impact, scholarship, and intellectual property." While we strive to include sufficient detail to assess the project's technical merit relative to the SOPO decision points, in asking how the project's "technical" outcomes can inform the solar industry it might also be informative to think about technology more broadly. To do this we revisit some technology theorists from the past.

Ian Barbour (2007) defines technology as "the application of organized knowledge to practical tasks by ordered systems of people and machines." For Barbour, context is critical, and forces us to ask: 1) what exactly is the knowledge that needs to be organized? 2) what are the practical tasks in question? and 3) how can we order the

systems of people and "machines" in *particular places* and *ever-varying contexts* to successfully deploy technology? Everett Rogers' (1962) "diffusion of innovations" theory, now over 60 years old, notes that adoption and diffusion of innovations begins with innovators, then moves to early adopters, then to early and late majorities, and finally to the laggards, with market share of an innovation represented by an S-shaped curve (see Figure 2).

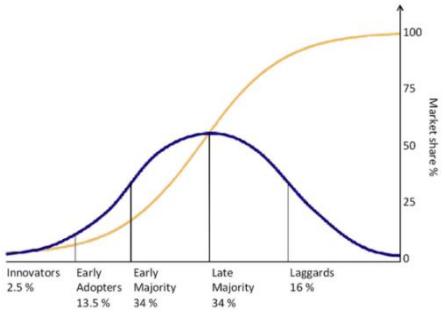

Figure 2. Everett Rogers' Diffusion of Innovation Curve

Both Barbour's and Rogers' thinking can help frame discussions about solar industry technology diffusion and market transformation in tribal (and other) settings. Following Barbour, we see that the solar industry represents an organized system of people and machines that harnesses organized knowledge to implement solar technologies for practical tasks (e.g., generating electricity, powering work). Following Rogers, we see that the adoption and diffusion of solar technology in tribal settings involves 1) innovators (e.g., SETO-funded labs and industry) who develop and promote solar solutions, 2) early adopters who embrace the technologies, and 3) subsequent groups who gradually adopt technologies over time.

As the solar industry advances, organized knowledge about solar technologies, installation methods, financing models, and maintenance practices is continuously developed and disseminated. This organized knowledge is crucial for the successful application of solar technology in widely varying tribal settings ("ordered systems of people and machines"). In short, sensitivity to context is critical for Barbour and cannot be emphasized enough.

Following Rogers framing, early adopters, such as BLR, may possess unique resources and capabilities that help reduce the uncertainty and risk of solar technology adoption. Early adopters like BLR often become opinion leaders and play important roles in creating awareness of and demand for new technologies among later technology adopters. The "ordered systems" in place in different tribal settings are widely variable, and thus the development paths will almost always be unique. Further, depending on the time elapsed between innovators and laggards, one can expect that the technologies, policies, and economics guiding technology development have changed considerably (e.g., the relative cost per installed kW trends downward).

Technology development is embedded in social and economic systems. While replicability of project pathways is an admirable goal, it is important to distinguish the factors that are replicable from those that must be worked through on a case-by-case basis. We can't claim to have achieved this in our recommendations, but pointing out the need to do so is at least a start.

Considering Historical Trauma

A review of DOE's strategic planning on solar workforce development[1] finds few references to a particularly salient issue in Indian Country: historical trauma.[2] This is not surprising, as at the federal level discussions and research about this topic are typically found at such places as the NIH, CDC, or BIA. But historical trauma is a particularly important concept to consider in government-to-government activity, including federally supported workforce development in tribal nations. A better understanding of the dynamics of historical trauma can help ensure that workforce development and other economic and community development programs are appropriately introduced to tribal nations and supported in ways that 1) acknowledge tribal sovereignty and self-determination, 2) are respectful of the perspective of tribal nations, and 3) are more effective at gaining the trust and cooperation of tribal members vis-à-vis federal government programming.

Historical trauma is the "cumulative, multigenerational, collective experience of emotional and psychological injury in communities and in descendants."[3] Traumatic events such as forced relocation, genocide, and the abduction of youth have caused lasting impacts on Native American communities. Historical trauma often presents as poor physical and emotional health, including low self-esteem, depression, substance misuse, and high rates of suicide. The reality of historical trauma cannot be discounted in considering the deployment of workforce development programs in tribal nations (and elsewhere), as it impacts how programs are perceived and how their relationship to tribal culture and existing economic and social conditions unfolds. As discussed later in this report, the reality of historical trauma is an important consideration for workforce development programming, with a strong recommendation that training entities have

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[1] For example: 1) *Summary: Solar Energy Technologies Office Workforce Request for Information and Convenings* (July 2021), 2) *DOE Solar Futures Study*, and 3) *National Solar Job Census 2021* (July 2022). The National Solar Jobs Census notes only that: "Most solar companies find it at least somewhat difficult to fill workforce vacancies. The most common reasons cited for hiring difficulties are lack of experience, training, or technical knowledge in the application pool." The *Solar Futures Study* notes only that: "The most common reasons cited for hiring difficulties are lack of experience, training, or technical knowledge in the application pool." The *National Solar Job Census 2021* has no reference to soft skills, essential skills, or factors like historical trauma. The SETO RFI and Convenings report does refer to wrap-around and similar services (p. 13).

[2] See Evans-Campbell, T. (2008). *Historical trauma in American Indian/Native Alaska communities: A multilevel framework for exploring impacts on individuals, families, and communities*. Journal of Interpersonal Violence, 23(3), 316–338. https:// doi.org/10.1177/0886260507312290.

[3] 1) Brave Heart, M. Y. H., Elkins, J., Tafoya, G., Bird, D., & Salvador, M. (2012). Wicasa Was'aka: *Restoring the traditional strength of American Indian boys and men*. American Journal of Public Health, 102(Supplement 2), S177–S183. https://doi.org/10.2105/AJPH.2011.300511. 2) Brave Heart, M. Y. H. (2003). *The historical trauma response among Natives and its relationship with substance abuse: A Lakota illustration*. Journal of Psychoactive Drugs, 35(1), 7–13. https://doi.org/10.108 0/02791072.2003.10399988

trauma-informed practices in their toolkit (noting that many of these same practices could also be applied in non-tribal settings).

Historical trauma leads to an increased fear and mistrust of people outside of the tribal community, including the federal government and the DOE, but also organizations such as GRID, and even other tribes, such as BLR. As noted, as a first step, earning trust from a tribe is critical. As BLR and GRID's tribal program are keenly aware, one is always a guest when working with and in a sovereign nation. Each tribal nation has its own unique form of government and governmental leadership and staffing structure. It is critical to work through designated tribal liaisons (whether a tribal chair or administrator or tribal government staffer) as one works to build trust.

As all tribes are unique, with individual cultures and belief systems and individual workforce and energy development needs, it is rare that a "one size fits all" model for curriculum and related programming[4] will work. To this end, SETO could explore a "customized standardization" where clear differentiation is made between training program elements that must be standardized (e.g., based on NABCEP standards), and less technical factors that call for a more customized approach. This issue is discussed further in later sections of this report.

[4] In the SETO RFI and Convenings report there is a good discussion of curriculum development approaches on pages 10-11.

2. Project Objectives

The objectives of the "Multi-Sector Solar Career Training Initiative for Native Americans and Veterans Project" were to:

1. Facilitate the transition of Native Americans into the solar industry job market.
2. Address high unemployment and the need for a skilled workforce with job training and placement assistance.
3. Increase capacity for tribes to develop solar projects on their lands and increase workforce opportunities.

"Empowering Tribal Workforce Development: Indian Country's Policy Recommendations for the Federal Government."

--National Congress of American Indians (2016)

A considerable body of research built over the past three decades concludes definitively that tribal self-determination/self-governance is the only policy that has ever succeeded in improving the lives of Native people and the quality of life in tribal communities. Nowhere does this finding ring more true than with tribal workforce development. [Tribes across the country] are creating innovative, customized solutions to their particular workforce development challenges, solutions that

- make real differences in the lives of Native people in search of employment and the education, skills, and experience necessary to build successful careers, and
- strengthen tribal sovereignty in the process.

Along the way, they are discarding or modifying one-size-fits-all programs and approaches that may work for governments elsewhere and that offer the bureaucratic path of least resistance for the federal government.

Job training and placement was primarily the responsibility of GRID Alternatives. The Blue Lake Rancheria (BLR) was primarily responsible for project management, research development and coordination, and networking and information-sharing among tribes, organizations, and government and industry partners. This networking by BLR was achieved through assistance to GRID with trainee recruitment and job placement activities, and through capacity-building workshops for tribes and other stakeholders.

In support of GRID's efforts, BLR's workshops were designed to help tribes develop the capacity to: 1) begin solar project development on their lands, 2) identify financing, regulatory, and policy issues they and their partners need to address to initiate such development, 3) increase workforce opportunities and, 4) where the tribe is engaging in solar development on its lands, to integrate workforce development activities with solar energy development. As will be noted below, not every tribe that is interested in workforce development is interested in developing solar energy, and, conversely, not every tribe interested in solar energy has the means to develop their workforce in parallel. Every tribe's situation is unique.

In fact, a key recommendation for DOE-SETO of this effort—a recommendation supported by other research by Native American workforce experts (notably, research by the National Congress of American Indians)—is that it is difficult for one-size-fits-all workforce models to succeed given the widely varying contexts in which such efforts are deployed.[5] Given that solar installation basics do not vary greatly and that a basic solar installation curriculum can support generic trainings across settings, for training to be most effective it should be cognizant of the dynamics of place, and integrated with a broader curricular and programmatic content that addresses both non-technical skills and wraparound support services customized and responsive to specific tribal and individual needs. So too, the preparation and skillsets of trainers need to adequately prepare them to be flexible and agile in the classroom and in the field as they work within a variety of settings and with a range of personalities.

As noted above, a long-standing issue between tribes and the federal government (and lower levels of government) is that of trust. The Native American population has legitimate historical grievances that have not eroded with time, and any effective outreach to and program collaboration with tribes must acknowledge this dynamic. Recognizing the sovereignty and nationhood of tribes, taking a government-to-government mindset and respect for tribal autonomy and self-determination is critical for this work to succeed. In short, judicious use of federal dollars for workforce development on tribal lands requires a context-specific approach that includes respect and patience and gives tribes the space they need to develop their communities on their own terms.

Objectives and Observations

A key objective of this project was recruiting, training, and placing Native Americans into jobs, with a primary emphasis on solar careers and a secondary emphasis on increasing employment in general; a secondary objective was building the capacity of tribal governments to develop solar energy projects on their lands. While the solar installation training helped prepare trainees for solar and other forms of employment, BLR workshops sought to provide effective platforms for tribal networking, collaboration, and information sharing around building the capacity to develop solar projects.

The work completed and the lessons learned from the project led to two very specific

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[5] As Citizen Potawatomi Nation (CPN) explains, moving its people towards self-sufficiency starts with "understanding your own tribe's distinct needs, the needs of your people, which is something that a federal, uniform approach to workforce development can't possibly account for." http://www.ncai.org/ptg/workforce-development-cpn. Margaret Zientek, Assistant Director, CPN Workforce & Social Services, mzientek@potawatomi.org.

and implementable recommendations: 1) providing stipends (like paid internships) for trainees was a significant factor in enhancing recruitment and retention and is an approach worth continuing, and 2) context-attentive wrap-around services and trauma-informed practices can greatly facilitate trainee participation and retention rates.

While the objectives and milestones established in the SOPO at project outset did provide for quantitative measurement (trainees recruited and retained, workshop attendees, job placements made, etc.), these turned out to be more descriptive than prescriptive in the end; that is, while it helps to have measures like participation-rate targets in place to drive performance, achieving these milestones alone may be less informative for policy and/or program guidance going forward.

To this end, we recommend some potential ways to structure project milestones that include both quantitative assessments and more qualitative, research-oriented outcomes that might help better address barriers to increasing solar workforce development and technology deployment in Indian Country.

Perspective:

"Targeted Solutions Matter"

--National Congress of American Indians (NCAI)

If the federal government's design of workforce development programs has taught us anything, it's that one-size-fits-all approaches don't work well for tribal nations given their distinct challenges and objectives. Tribal nations are finding success when they take the reins and develop targeted solutions customized to their needs and their people, from youth to mid-career professionals to aspiring citizen entrepreneurs.

These solutions take many forms and serve many purposes, but NCAI's research illuminates three trends – targeted solutions that: 1) serve particular groups (youth, single mothers, former felons, etc.) by neutralizing the specific workforce challenges that impact them in certain ways, 2) build particular skills and expertise among the nation's citizenry that address its critical needs and advance its long-range priorities, and 3) identify the structural trouble spots that inhibit workforce development/growth and design structural interventions to tackle them.

NCAI's research also reveals that a [tribal] nation's ability to forge such solutions hinges on its creation of a comprehensive workforce development approach that flows from its assessment-informed understanding of its people, their needs and aspirations, the nation's needs and priorities, and how its approach will deliberately target and address those things.

Impact of the Project on National Goals

National Goals: Workforce Development, Economic and Environmental Benefits, and Energy Access and Equity

SETO has identified several national goals aimed at advancing solar energy technology and accelerating its deployment that reflect a commitment to innovation, cost reduction, and expanding access to solar energy. These goals guide SETO's efforts to create innovations in solar technology, to foster solar industry growth, and to create a more sustainable and equitable energy future. Below we illustrate ways in which the BLR-GRID program impacted three of these national goals.

Workforce Development: The BLR-GRID project supported the growth of a skilled and more diverse solar workforce by providing training, education, and workforce development opportunities for Native Americans. As part of this SETO-funded effort, GRID's solar workforce training program—Installation Basics Training (IBT)—was adapted for on-line use and field-tested in unusual and challenging conditions. This national goal also includes job creation and increased diversity and inclusion within the solar workforce. As indicated below, the project did increase employment for Native Americans in both solar and non-solar occupations.

Environmental and Economic Benefits: both the building of the capacity for solar development on tribal lands and installing solar panels will help secure greater environmental and economic benefits: greenhouse gas emissions are lowered, air quality is improved, jobs are created, and local economic development is stimulated. The economic benefits are in developing capacity at the *individual* level to create a livelihood in solar energy, and at the *community/tribal* level to secure a greater capacity to develop community solar projects (either with internal resources or with the assistance of strategic partners). GRID's trainings and BLR's workshops sought to achieve both forms of capacity-building.

Energy Access and Equity: The BLR-GRID SETO project is designed to foster more equitable access to solar energy careers and to ensure that low-income and disadvantaged communities benefit from solar technologies and their deployment. For Native Americans and tribes, reducing barriers to solar adoption through capacity-building helps address energy poverty and promote access to clean, affordable energy.

Project-Specific Goals, Outcomes, and Advances

Summary of Project Tasks and Milestones

Below is a summary of the main project tasks.

Budget Period One, Main Tasks:

1. Conduct needs assessment to identify barriers to participation in solar industry.
2. Outreach to tribes and tribal groups about the program.
3. Develop job training curriculum.
4. Hold solar installation trainings.
5. Assist trainees with job placement.

Budget Period Two, Main Tasks:

1. Outreach to tribes and tribal groups about the program.
2. Conduct hands-on solar installation trainings on tribal lands.
3. Assist trainees with job placement.
4. Conduct two virtual solar development workshops (BP1 moved to BP2).

Budget Period Three, Main Tasks:

1. Outreach to tribes and tribal groups about the program.
2. Conduct hands-on solar installation trainings on tribal lands.
3. Assist trainees with job placement.
4. Conduct an in-person solar development workshop.
5. Develop Final Report.

Table 1 below provides a more detailed list of tasks and milestones by budget period. Job placements (in all budget periods) were the only project milestones not achieved; reasons for this lack of milestone achievement will be discussed later in the report.

Table 1. Project Tasks and Milestone Metrics

Budget Period	Task	Milestone Metrics	Achieved (Y/N)
1	Needs Assessment	10 key lessons.	Y
1	Curriculum Development	Curriculum with appropriate content.	Y
1	Registrants for Training	Minimum of 10 trainees registered for first training.	Y
1	Registrants/presenters for Solar Workshop (held in BP2)	Minimum of 5 presenters and 30 registrants.	Y
1	Updates and improvements to program identified.	Minimum of four.	Y
1	Completed Training	Minimum of 10 trainees completing training.	Y
1	Completed Solar Development Workshop	Minimum of 30 participants.	Y
2	Registrants/presenters for Solar Workshop	Minimum of 5 presenters and 30 registrants.	Y
2	Registrants for Training	Minimum of 10 trainees attend each of 2 job trainings.	Y
2	Job Placements	Minimum of 10.	N
2	Continuation/funding and job training strategies.	Minimum of 4.	Y
2	Updates and improvement for third budget period.	Minimum of 4.	Y
2	Trainees completing hands-on training.	Minimum of 20.	Y
2	Solar Development Workshop	Minimum of 30 participants.	Y
2	Evaluation/Assessment Report/Draft Sustainability Plan	Completed	Y
3	Registrants/presenters for Solar Workshop	Minimum of 5 presenters and 30 registrants.	Y
3	Job Placements	20 cumulative.	Y
3	Discern successes and challenges.	Minimum of 4 successes and 2 challenges.	Y
3	Presentations	Conduct 2.	Y
3	Trainees completing hands-on training.	Minimum of 40 trainees.	Y
3	Final Report and Sustainability Plan	Completed.	Y
3	Trainees placed in solar jobs.	20 trainees successfully placed in job in solar industry.	N

Significance, Innovation, and Fundamental Advances of Project

The significance, innovation, and advances of the project are related to technology deployment, and include: 1) curriculum design and delivery, 2) administrative streamlining, and 3) performance metrics. As can be expected, the pandemic impacted BP1 and BP2 (more so than BP3), with GRID pivoting to on-line training and BLR conducting virtual workshops as primary adaptations.

Figure 3. Trainees on-site in BP2.

Curriculum Design and Delivery

For curriculum design and delivery, the decision was made to adapt GRID's "Installation Basics Training" (the training is called "IBT 200," which stands for 200 hours of Installation Basics Training). To facilitate on-line training, GRID adapted the existing curricular format (the three-ring-bound IBT manual) to the on-line Google Classroom suite of curricular modules; additional non-technical curricular modules developed by GRID's SETO project team with input from BLR were also included (discussed below).

Two initial modifications of the IBT made by GRID staff included: 1) recording the training modules for distance learning, and 2) modifying the curriculum (which was focused on rooftop installations) for the significant number of ground-mounted arrays and off-grid solar PV the SETO projects would be focusing on (e.g., see Figure 3). GRID also added additional instructional content, for example an exercise where students learned to size a solar PV array based on their own energy bills (using tools that GRID uses for its other clients). The project team also condensed the on-line training into a one-week period; trainees had seven days to complete the IBT coursework, including quizzes for each module. Some trainees were also able to take a live, online OSHA 10 course to obtain the safety certification. Students who could not attend the two-day online OSHA 10 were given a self-guided course to complete.

The Google Classroom platform was user-friendly, and trainees were able to access it through their phones. While most trainees had positive feedback about the Google Classroom material and platform, the online platform did make it difficult to check on subject matter comprehension and some trainees struggled to attend due to internet accessibility, despite having access through mobile. GRID staff learned the importance of working with students well in advance to ensure connectivity, which led to better attendance. More on this later in the report.

Administrative and Programmatic "Advances"

Like many investigative, research-focused programs of an extended duration, this program was modified from its original structure, both administratively and programmatically. The modifications were based on lessons learned during program delivery that pointed toward more efficient pathways for funding (viz., reallocating resources from BLR to GRID) and other administrative improvements. Many administrative modifications that could be considered "advances" were the result of what was initially an unnecessarily complicated path for SETO funds to reach their destination (trainees). Figure 4 shows a simple graphic illustrating the original, current, and a proposed future model for funding:

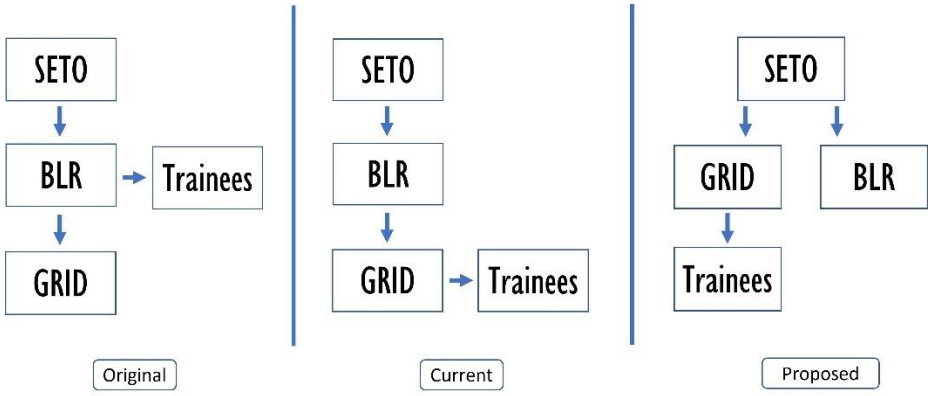

Figure 4. Original, Current, and Proposed Project Funding Flows

In effect, the switch from original model to the current model significantly reduced the coordination required between BLR and the GRID trainees, which was initially set up with the trainees operating as BLR employees; that is, *each trainee* was effectively a W-9 employee of BLR, and the coordination involved not just trainee to BLR, but trainee to BLR and trainee to GRID and then BLR to GRID. The much simpler program modification to move trainee stipends and other costs as one line item to GRID from BLR (the current model) significantly reduced administrative burden across the board.

The "proposed" future model where SETO grant funds flow to both BLR and GRID separately involves more coordination between SETO and grantees, but it would have the benefit of reducing costs, as the administration needed for GRID/BLR/trainee coordination would have been minimized. The project funds could have gone to BLR for overall project research management and workshops, and to GRID for training and job placements. (This arrangement is shown simply to illustrate potential future program payment structures.)

Throughout the project, SETO staff assisted[6] BLR's and GRID's proposed modifications to budget allocations represented in the current model, including re-allocating a portion of BLR's budget to GRID in BPs 2 and 3 for PPE and for extending the length of the training sessions. As a demonstration project, such flexibility in what grantees can do is critical to ensure that lessons learned from process evaluations (a continuous program learning and improvement model) can be implemented in the field.

This redesigned administrative arrangement may not be a particularly stunning program modification, but it does suggest that the grantor and grantee thoroughly think through the administration pathways either before or soon after the grant is awarded to get as much streamlining done as early as possible before time-consuming modifications are required.

Performance Metrics: Mid-Stream Milestones

Like other federal departments and agencies, DOE-SETO and grantees enter into grant agreements that outline terms, conditions, and expectations, including financial management guidelines, program objectives and milestones (performance metrics), compliance measures, and reporting requirements. Grantees agree to provide regular reports on program progress, program outcomes, financial statements, and other key performance metrics. Clear timelines establish timely and accurate submission of progress and financial reports. And while monitoring visits can be used to assess program implementation of and adherence to the grant agreement, the pandemic made such visits from SETO staff (and similar BLR-GRID visits to DC) more difficult; this was unfortunate, as face-to-face meetings can often be more productive ways to share project progress, to brainstorm, and to provide needed technical assistance.[7]

Project performance measurement was based largely on predefined quantitative indicators such as trainee enrollment, training completion rates, and job placements. Even so, internal program evaluation by BLR and GRID involved more of a "mixed methods" approach that measured program impact both quantitatively and qualitatively.

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[6] It should also be noted that SETO team members were patient with BLR on numerous occasions as the pandemic, staff reductions and changes, office relocation, family emergencies, and additional unanticipated administrative burdens imposed significant hardship on the BLR Finance Department, resulting in processing and reporting delays.

[7] Federal agencies often offer technical assistance and capacity-building support to grantees to enhance program effectiveness and grantee organizational capacity (e.g., through workshops, webinars, resources for best practices, access to agency subject matter experts, etc.). This formal technical assistance was not part of the agreement, but SETO staff did engage in regular check-ins and provided guidance throughout the project via virtual meeting rooms. In addition, several reviews were conducted where BLR and GRID shared challenges, lessons learned, and so on.

This is a form of “advance” in that the project team found that purely quantitative milestones did not themselves offer needed insights into program improvements.

Both BLR and GRID had some autonomy to make on-the-go program changes based on their experience with and knowledge of what works in the field—and did so often to maintain a focus on achieving quantitative performance objectives. However, the team also considered the value of performance monitoring focused on more qualitative outcomes, which, though perhaps harder to measure, may ultimately be a more fruitful avenue of inquiry. The difficulty is in creating progress milestones that ensure that target numbers are met and that also allow the project team the flexibility to adopt more “process-based” measures (e.g., to assess program delivery mechanisms) that measure program effectiveness under real operating conditions, including unique and varying project sites, the diversity of individual trainee and trainee cohort needs, the varying administrative capabilities of partnering tribes and organizations, and so on.

In most solar training-based, hands-on installations, just like in commercial (non-training) installations, things sometimes do not work as planned: investors back out, supply chains are disrupted, severe weather intervenes (see Figure 5), workers leave, and so on. All these eventualities happened on this project. Perhaps performance targets that could measure “pivoting ability” or “creative mid-stream corrections” need to be developed to support more quantitative measures.

Figure 5. Weather intervenes at the Boulder, Colorado, installation in BP1.

3. Project Results and Discussion

A high-level *quantitative* comparison of anticipated project outcomes against realized results indicated that all milestones were met except for job placement numbers. Below we discuss qualitative assessments and measures that may be helpful in shedding light on the program's achieved results (e.g., quantitative outcomes for trainees, workshops, etc.). For job placements, we also discuss potential reasons why the forecast estimates were not achieved. The methods used to obtain the results discussed below are, as noted, largely qualitative and thus interpretive.

Qualitative Results

Paying trainees. In SETO's *Summary: Solar Energy Technologies Office Workforce Request for Information and Convenings* (July 2021), the response to RFI 4 (p. 7) notes that: "One critical theme that emerged among several stakeholders was the value in providing trainees with stipends or subsidized employment or compensation, so that many different types of people, particularly those from under-resourced communities, could have the financial resources to participate in the training program. Stakeholders emphasized the need for training programs to take into consideration the educational background and learning abilities of the worker and meet participants "'where they are.'"

As Berlyn Hubler, GRID project manager noted, "It is so important to have a cohort that is getting paid. It's something we've never been able to do before—to pay people." GRID staff acknowledged that recruitment and retention was more successful with trainee stipends. The issue of compensation was brought up by trainees in their survey responses (see Appendix 2) and during conversations with GRID staff; there were no specific survey questions designed to assess the importance of stipends.

SETO Grantee Sharing. The SETO RFI and Convenings report also suggests a best practice of creating training program cohorts that shared resources and lessons learned, and leveraged successful strategies. This sharing was achieved for this program to some degree during the Fall 2022 SETO grantee presentations and sharing-out of results. It was helpful to hear from other SETO-funded workforce programs and their program lessons learned and successes/trials. These should be more regular events (noting that the pandemic interrupted planned in-person events).

Wrap-around Services. The SETO RFI and Convenings report (page 8), asks: "How could DOE funding be used to support continued education, job placement, and wrap-around needs of the clean energy workforce and ensure that workers have pathways for growth and well-paying careers within the solar and other clean energy industries?"

Responses included (report p. 13, paraphrased) among others: 1) funding for wrap-around services (basic job prep, technical literacy, and soft skills), and 2) addressing transportation needs, dependent care, psychological health, and other issues that are often especially critical for under-resourced communities.

A qualitative finding of the project was that wraparound services play a crucial role in enhancing trainee retention and job placement outcomes by helping them overcome the barriers they often face when progressing through a training program and seeking a job.[8] As reported by GRID staff, a key component of services provided by GRID (when it was able to) at several trainings, in-class and at the job-site, was *individualized support* tailored to the specific challenges and barriers to employment of each trainee (e.g., family matters like caring for an ailing grandmother or a small child). Barriers such as elder- or childcare, transportation, housing, or mental health issues are all too real in tribal lands and occurred often in GRID's installs; as makes sense, trainees are more likely to stay engaged in the program and remain motivated to pursue careers in solar (and other industries) if they have some help in addressing their unique barriers to participation.

As part of the wraparound help available, GRID staff served as points of contact and provided ongoing guidance and support for trainees during and after the program, helping them navigate, stay engaged with, and complete the program, as well as connecting them to resources to continue their post-training endeavors. In effect, the GRID trainers served as de facto case managers, working individually with trainees on development of soft skills such as communication, problem-solving, teamwork, time management, resume-writing support, interview preparation, and job-seeking. However, the resources for comprehensive and structured wraparound services and truly individualized learning did not exist in this program (nor should it be expected that GRID trainers continually go beyond their identified duties and time allowances to do so, as they repeatedly did).

Trauma-Informed Approaches. None of the trainees were assessed for their ACEs (Adverse Childhood Experiences) scores, nor are GRID staff clinical psychologists, and any observations about trainee trauma should only be taken as anecdotal. But the incidence and impacts of trauma among individuals participating in workforce development programs is important to consider. Trauma as a barrier has been compared to a lack of educational attainment and to having been previously incarcerated.[9] Researchers note, not surprisingly, that past trauma (or generational

[8] There is no shortage of research to support this. See, for example, https://leadingage.org/stabilizing-your-workforce-through-wraparound-supports.

[9] 1) National Fund for Workforce Solutions (n.d.). *A Trauma-Informed Approach to Workforce: An Introductory Guide for Employers and Workforce Development Organizations*, 2) SAMHSA (Substance Abuse and Mental Health Services Administration). *Understanding historical trauma when responding to an event in Indian Country*, 3)

trauma) has an equal if not more severe impact on trainees' performance during skill acquisition and job training than other factors—just as it would if they were in another environment that imposed continuous and challenging cognitive loads. The observed effects of trauma on skill development and learning include decreased retention and increased absenteeism, decreased ability to concentrate, and difficulty adapting to workplace environments. A comparison of outcomes between trauma-informed workforce development (TIWD) programs and conventional programs shows improvements on key performance indicators such as job retention rates, skill proficiency, and job satisfaction for the TIWD approaches (see footnote 9).

There is a Catch-22 operating in these settings: while it has been shown that employment has a protective impact on mental health, mental health (defined in context) is often needed to get employed in the first place. As one workforce development practitioner explains, ultimately it is about "*helping people get healthy to deal with opportunity*" (NCAI Workforce Development Toolkit, emphasis added). That is why workforce development approaches in tribal nations must be flexible enough to provide multiple pathways for people to reach their destinations, and to do so to the extent possible at their own pace given their unique needs. To reiterate:

> These approaches must acknowledge that for many, the challenge is not just learning how to do a specific job, but *how to work* – and *how to live*.[10]

Programming that is sensitive to these dynamics will promote 1) safe and supportive, trauma-informed learning environments, 2) culturally-responsive curricular and pedagogical choices whenever possible, and 3) empowerment through the honoring of culture alongside the development of technical knowledge, hands-on skills, and self-efficacy. Figure 6 provides an illustrative example of how wraparound services and trauma-informed content might improve program retention rates. While these numbers are illustrative, the bottom line indicates a hypothetical job placement increase of 150% over conventional approaches. This illustration also suggests a need for more research to assess the impact of wraparound and trauma-informed workforce development services on program participation, retention, and job placement outcomes—*and ultimately on program cost-effectiveness and how program funds can best be used to achieve desired outcomes.*

Hochman, A. *Business leaders in the ACEs science and resilience movement: A different kind of bottom line*, AcesTooHigh News, December 1, 2016.

[10] NCAI, "Removing Obstacles Matter." Informational Brochure.

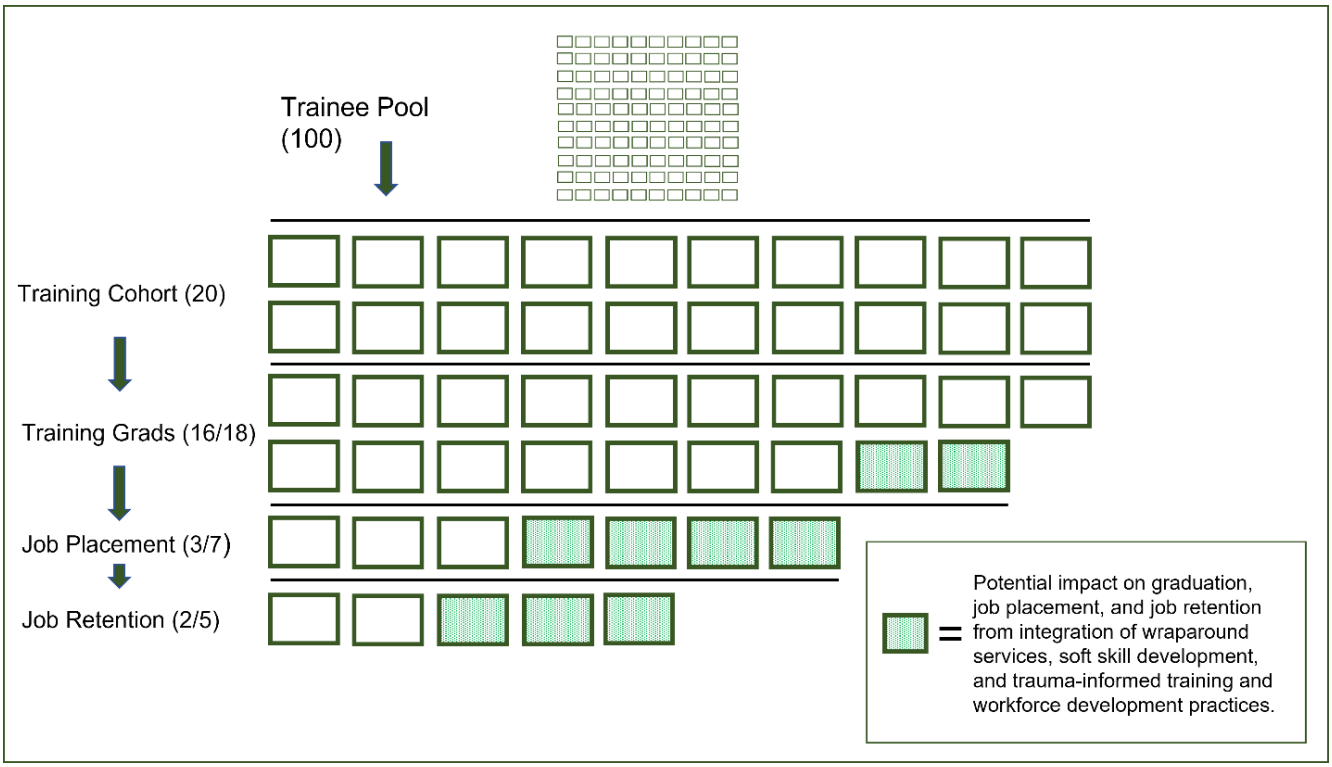


Figure 6. Illustrative Example of How Wraparound Services and Trauma-Informed Practices can Increase Program Success Rates

Results Related to Project-Team-Identified Successes

Industry Partnerships: working with solar industry employers, contractors, and other organizations (local solar companies, utility providers, renewable energy associations, etc.) at GRID jobs site was an effective method GRID used to identify job opportunities for trainees and place them in jobs. Industry representatives came and spoke at installation sites and helped trainees gain a more personal, up-close understanding of the solar workplace and solar job opportunities. During BP1 trainings, for example, GRID worked with industry partner Res Americas, who sent two staff members (an engineer and a finance manager) to the Boulder installation site to meet with trainees and talk about their business, the broader industry, and to point trainees to programs offering additional hands-on experience (that can lead to actual job placements).

The paths presented to trainees to make such transitions to work are often highly individualized and depend not just on a worker's soft and hard skillsets but also on their ability to connect to the right contact person, to live close to solar industry activity, or to relocate. Unfortunately, tribal members not able to relocate have few options if there is no solar installation activity within commuting distance. This is why it is so important to build tribal capacity building around community-scale solar project development in

conjunction with workforce development efforts: to create opportunities closer to home.

Soft Skills. To enhance trainee job prospects, the GRID team incorporated soft skill development in the IBT curriculum. During BP1, the project team conducted a needs that included research and additional outreach to an Industry Advisory Group (IAG) to assess industry job training needs; the results of this assessment were leveraged with existing research on the types of skills needed to be a successful and competent solar installer.[11] The Solar Foundation "Solar Training and Hiring Insights 2017" pointed to soft skills as the largest gaps in positions of high turnover (high turnover included sales, canvassers, and construction laborers). Soft skills cited specifically included communication (oral and written) and teamwork (53% and 42% reporting respectively). Previous PV work experience was third highest with 31% of employers surveyed reporting. The Solar Foundation report also noted that for solar PV installers, the most commonly required technical certifications include: OSHA 10/OSHA 30, NABCEP Associate/Professional, and CPR/First Aid. Soft skills were also noted as important by respondents in the SETO RFI and Convenings report.

GRID works continually to ensure that its IBT program offers and aligns as needed with these industry certifications and credentials and industry-desired soft skills. GRID also incorporates exam preparation and support into the IBT program to help trainees obtain these certifications.

[11] Research included: 1) The Solar Foundation "Solar Training and Hiring Insights 2017":"Prior-to-hire training should focus on providing a preliminary understanding of system components and electrical basics, safety techniques, softs skills, and should maximize opportunities for hands-on worksite experience. Training providers should also work with employers to develop company specific on-the job training or internship opportunities." 2) The Solar Foundation "Solar Jobs Census 2019": a key finding of this report in both 2018 and 2019 is that solar installers report it is "very difficult" to find qualified candidates, 3) the Solar Foundation Solar Job Census "State Fact Sheets 2019."

Perspective: GRID Personnel Reflect on the Trainings

Tim Willink, (former) director of GRID's Tribal Program: "For a lot of folks who didn't have a lot of construction experience or experience in the solar industry, just being on-site provided a sense of accomplishing something, that this is do-able. Some of the folks were struggling—younger, maybe not college-bound, or they had other factors that made employment difficult. Half of the trainees were women, who are very underrepresented. Trainees become very safety conscious. They get an OSHA card and forklift training—these experiences look good on a resume."

"There is a lot more to these trainings than just the solar content. People are changing their careers, going from people who are not keeping regular schedules to going to work every day and being excited about a new career path. They are excited about their job prospects and new life opportunities."

Berlyn Hubler, GRID project manager: "It is so important to have a cohort that is getting paid. It's something we've never been able to do before—to pay people."

"In addition, we had to deal with snowstorms and wildfires. **I heard over and over how transformative the experience was for [the trainees]."**

Emily Struzenberg, GRID trainer: "It meant a lot to the trainees to accomplish a project with members from other tribes. They really valued their time together—from not knowing each other to leaving as friends. They were all looking out for each other. And there is a value to having women on-site, too. One of the women trainees felt so empowered, having experiences she thought she would never be able to do. **Representation matters!"**

Workshop Results

BLR conducted three workshops for tribes looking to develop their own solar projects. The goal of the workshops was to help tribes increase solar project development on their lands and increase solar job opportunities by building tribal staff capacity to build or expand solar energy development within their nations at the community, facility, and/or residential scale. As with the trainings, BLR and GRID used the information gathered in the IAG needs assessment and from communication with tribes interested in project development to frame and develop the workshop content. Workshops 1 and 2 (both held in BP2) were titled "Tribal Community-scale Solar Solutions for Climate & Community Resilience" and engaged virtually with tribal governments on ways that training and other direct assistance could further community solar project development, with a focus on capacity building in solar development planning and feasibility, system design and interconnectivity, economics/funding, and, the regulatory/jurisdictional context.[12] Attendees included tribal government leaders, tribal staff, tribal community members, strategic partners and businesses in energy, and others.

These first two workshops were live and on-line, moderated by Jana Ganion, BLR Sustainability Director. Discussion focused primarily on the regulatory, legislative, financial, and business approaches to solar energy development as it related to the experiences and expertise of panelists. Specific issues surrounding workforce training and the tribal self-determination benefits that can happen when tribes develop a workforce from within their own tribal member ranks were raised. Approximately 20 tribal nations from across the nation attended these virtual workshops. Participation varied from 30-40 people over the three-hour period for both workshops 1 and 2. Tracey LeBeau (WAPA), Sherry Stout (NREL), Pilar Thomas (Quarles and Brady), Stephanie Krantz (Nez Perce Tribe), Tuck Miller, (Solar Developer, Revolusun), Tim Willink (GRID), and Jana Ganion all provided expert guidance in Workshops 1 and 2, with moderation provided by Ganion (BLR has archived the workshop recordings).

The third workshop, (at BLR, March 2023), was attended by over 200 people from dozens of regional and national tribes, other stakeholder organizations, and the community. The event was called the "Smoke, Air, Fire, Energy (SAFE) Symposium: Rural and Tribal Community Resilience: Strategies for Action." Speakers included (among others): 1) Jason Ramos, BLR Tribal Administrator, and 2) Jana Ganion, 3)

[12] The workshop content was defined in the SOPO to potentially include such information as: project sizing, different potential configurations (grid-tied, micro-grid, stand-alone), comparison of solar projects to other methods of meeting energy needs, develop for energy off-set versus power export, owning versus leasing with a power purchase agreement, negotiating with consultants and utilities, cultural resource and social considerations, funding projects through grants, tax credits, and private investment, and planning for sustainable operations and maintenance.

Darcie Houck, Commissioner, California Public Utilities Commission, 4) David Hochschild, Chair, California Energy Commission, and 5) Wahleah Johns, Director, DOE Office of Indian Energy Policy and Programs. Table 2 below provides a complete list of the speakers and panelists for the SAFE Symposium. Figure 7 (following page) shows BLR's Jason Ramos and Jana Ganion speaking at the event. Ganion is shown providing a tour of the tribe's community-scale microgrid.

Table 2. SAFE Symposium Speakers and Panelists

OPENING REMARKS
• The Honorable Jason Ramos, Council Member, Blue Lake Rancheria Tribe • The Honorable Ted Hernandez, Chairperson, Wiyot Tribe • Julian Lang, Karuk, Wiyot, and Konomihu • Darcie Houck, Tribal member and California Public Utilities Commission • David Hochschild, Chair, California Energy Commission • Martha Guzman, EPA Region 9
PRESENTATION: Women's TREX – Vikki Preston, Karuk DNR
PANEL #1: Living with Fire and Smoke
• Margo Robbins, Cultural Fire Management Council • Olivia Rose Williamson, Karuk DNR • Kathy McCovey, Cultural Practitioner • Jeff Kane, Professor, Fire Ecology & Fuels Management. Cal Poly • Marlene' Dusek, Cal Poly Native American Studies
PANEL #2: Safe Air for Everyone
• Brian McCaughey, Hoopa Valley Tribe EPA • Andy Bessler, Northern Arizona University Tribal Air • Erin McTigue, US EPA Region 10 - Smoke Management Coordinator and Tribal Air Specialist • Angela Reed, California Department of Public Health • Shay Bourque, Karuk Tribe
Session A: Air – Martha Guzman, EPA, District 9
Session B: Energy – Karen Douglas, California Public Utilities Commission
PANEL #3: Building Community Energy Sovereignty
• Michael Gerace, Director, Department of Planning and Community Development, Yurok Tribe • Jana Ganion, BLR • Shay Borque, Karuk DNR • Linnea Jackson, Hoopa Valley Tribe
CLOSING PLENARY – Wahleah Johns, Director, Office of Indian Energy

Figure 7. Jason Ramos, BLR Tribal Administrator (left) and Jana Ganion, BLR Sustainability Director (right), speaking at the SAFE Symposium in March 2023.

Comparison of Anticipated Outcomes against Results

The results of the project were as expected: we achieved most of the milestones except for the job placement goals, and we learned a lot along the way. Because of the need to do a pandemic-pivot, GRID's Installation Basics Training (IBT) was administered as an on-line and hybrid course throughout the project period (on-line was not envisioned at project outset); the training team continued online delivery throughout BP3 because of positive feedback from trainees: participants enjoyed (successfully) completing a week of online coursework before heading to the job site, and reported that they felt prepared for the actual installation even with the virtual framework.[13] The online coursework was administered through Google Classroom, which proved to be an easily navigated learning platform. OSHA-10 courses were also administered online with live instructors. Digital divide concerns were real, so sessions were recorded to facilitate asynchronous delivery and reduce this inequitable impact as much as possible.

Issues with Measuring Qualitative Results

In considering anticipated project outcomes against actual results, training efficacy metrics should include pre- and post-training assessments, self-reported participant satisfaction surveys, and qualitative feedback from participants and trainers. While assessing these types of metrics was attempted through participant surveys, response

[13] GRID received feedback mostly through word of mouth from trainees, and always took their feedback into account to improve our training program. Some feedback was also acquired through online surveys.

rates were extremely poor. More formalized and mandatory structures for these types of information-gathering exercises are advisable going forward.

Structured program evaluation guidance and/or requirements that include how to implement and present the results of more formal mixed-methods approaches could be of great value. Although statistically significant results (e.g., t-tests) would likely not have been feasible with the small sample sizes here, descriptive statistics and estimates of effect sizes could be developed to shed light on the reasons for and magnitude of program-induced changes. Formal focus groups and more detailed (and open-ended) surveys could be used to gather feedback on participant experiences, perceived (as opposed to actual) trainee skill development and self-efficacy, and job placement outcomes. And while it is difficult to measure subjective experiences and impacts, it can be useful to hear such reports through testimonials and anecdotal accounts, which can still provide insights into program effectiveness. And as envisioned for GRID (and conducted informally at present), long-term tracking and monitoring of post-training progress, job stability, and career advancement could also be illuminating.

Unmet Milestone: Job Placements

The easy answer to why this project milestone was not met was that it was unrealistic. Unfortunately, it is never possible to determine ex ante if a goal is realistic or not, but that is likely too easy of an answer. Job placement outcomes were supported by GRID's and BLR's existing infrastructure and resources (including funding) to support graduates moving from training to: 1) internships or apprenticeships, 2) employment in the industry, or 3) further education in a trade school, community college, or college or university. From a logistical viewpoint, identifying locations for GRID trainings that are near to where solar industry activity is occurring and where jobs are available is a logical option to increasing job placements, but this was made more difficult owing to the pandemic travel restrictions in place. In addition, a sensible measure would be to accept only those trainees who are committed to finding employment in the solar field; this type of screen can be difficult to implement.

Other GRID program offerings that could be developed to increase job placements (but which need more assessment to be implemented effectively), include: 1) working more closely with job fairs and centers, 2) liaising with employment boards, 3) further developing industry relationships, and 4) establishing an alumni network. Additionally, as noted above, more structured wraparound services and integrated trauma-informed practices could also help with job placements. These are all program elements that can be incorporated relatively easily with more resources (staffing and funding).

As the number of graduated trainees from GRID's program grows, the opportunity has grown to establish and maintain communication with graduates for the purposes of: 1) collecting feedback on the effectiveness of the program, 2) identifying areas for

improvement, 3) tracking their personal progress, 4) providing them with ongoing support, and, importantly, 5) using them to support existing trainees through connections and/or referrals. After trainees complete the IBT program, GRID offers continuing career advancement advice, continuing education opportunities (or direction to where it can be found), and other job retention assistance as staff resources allow. Ultimately, GRID intends to create a formal alumni network with networking events, an online forum, and mentorship opportunities where graduates can share job openings, industry insights, career path support, and serve as guest speakers providing guidance and inspiration.

But developing tribal capacity to develop their own energy projects in concurrence with the development of their tribal workforce programming may be one of the preferred long-term solutions for creating lasting, high-road solar jobs in Indian Country. Building internal tribal capacity holds great promise for a comprehensive and truly holistic solution that begins to address the circular problem tribes face, where poor economic conditions lead to poor health outcomes and where the economic development needed to improve community health indicators is stunted *because of* the potential workforce's poor health. It is a wicked problem, and one that cannot be ignored if workforce development challenges are to be met.[14]

[14] Creating Comprehensive, Integrated Trauma-informed Initiatives in Native American Communities: the Roundtable on Native American Trauma-Informed Initiatives; April 2019: U.S. Center for Disease Control and Prevention: "among both men and women, the unemployment rate in 2009 was significantly higher among those who reported having any ACEs than among those who reported no ACEs....ACEs appear to be associated with increased risk for unemployment among men and women" (Lio, Y. et al. "Relationship between adverse childhood experiences and unemployment among adults from five U.S. states.").

3. Significant Accomplishments and Conclusions

The project's meeting most of the program milestones despite the pandemic challenges was an accomplishment. Conducting successful trainings, exposing young Native Americans to a new industry and new workforce and education opportunities—and finding employment for some—is a valuable outcome. The BLR workshops were successful in terms of the quality of the speakers, the attendance (virtual and in-person), and in the conversations held and (hopefully) future collaborations initiated. Many of the conversation held were continuations of prior collaborations, and BLR has already been engaged with attendees in multiple follow-on conversations, collaborations, networking activities, and proposed site visits. There is no way to tell what other connections have been made and are developing, but we can only hope they are happening.

These programmatic successes and lessons learned were balanced to some degree by administrative challenges and frustrations among project fiscal staff regarding the project's accounting and reporting requirements. This is an area noted by other grantees in the Fall 2022 presentations, and may be a place where SETO could explore simplification of reporting requirements, which can sometimes be burdensome for small staffs.

While all trainings represented successes in that most milestones were achieved (except for job placements)—and BP1 and BP2 of course had the pandemic challenges—it was BP3 that oddly enough may have presented the most challenges, the overcoming of which presented quite an accomplishment for the new and less experienced (but capable) GRID project team. In essence, despite significant staff turnover and loss of institutional knowledge at GRID, the new staffers were able to recruit and successfully train 20 tribal members and to meet project milestones. With strong support from and collaboration with GRID's tribal partners, additional funding support, and the commitment of the traveling installation team and office staff, they successfully completed the BP3 trainings.

One example of this grit and determination, in Towaoc, Colorado, GRID partnered with the Ute Mountain Tribe to install 160 kW of solar on 24 residential buildings and the tribe's supportive housing building. Originally, only 5 trainees had signed up, but with SETO funding and hard work and collaboration with the tribe, additional recruitment efforts created 8 more enrolled trainees (for a total of 13), and the training program period was extended over several months.

Understanding the Cost-Effectiveness of a Trauma-Informed Approach

This project is part of a much-needed effort to create sustainable workforce development solutions that strengthen the capacity of tribes to develop their energy resources and workforce development capacities simultaneously, particularly where there is no solar industry activity nearby and when worker relocation is not feasible. Effectively administering training programs to support long-term workforce development in tribal communities presents unique challenges, as tribal communities face high unemployment and have limited employment opportunities, especially for occupations that provide living wages and that are within reasonable travel distances. Short-term training and job opportunities presented by paid training programs are (by definition) short-term solutions, even as they may be preparing people for longer-term outcomes.

What this project has highlighted is a clear need to better articulate the link between historical trauma, workforce development, and industry-demanded skillsets—and to learn how to creatively deliver this palette to a range of trainees all presenting with different strengths and needs. Because unresolved trauma hinders an individuals' ability to acquire and apply specific job-related skills effectively, this is not an insignificant issue when seeking to create more effective programs from the federal level down to idiosyncratic rural and remote tribal (and non-tribal) settings. And what industry is learning about trauma-informed approaches is that they are in fact proactive investments in human capital that result in more resilient and productive trainees and employees. They pay off.

An assessment of the long-term cost savings from deploying trauma-informed strategies—assessing reduced turnover, lower recruitment costs, improved worker satisfaction and productivity, etc.—could suggest appropriate resource allocations when compared to the potential costs due to decreased employee performance, absenteeism, or turnover resulting from unaddressed trauma.

We recommend that DOE-SETO consider connecting trauma-informed strategies with the broader goals and priorities of the DOE and explore how trauma-informed approaches can contribute to the DOE's mission of supporting a skilled and productive workforce in the energy sector. These approaches presumably also align with initiatives related to diversity, equity, and inclusion, and to employee health and safety. If these programs can produce real results in terms of increased worker retention, improved job performance, reduced absenteeism, and enhanced overall workforce well-being—then they may well be a cost-effective and well-advised intervention.

4. Path Forward

The project team has worked to isolate key strategies for a path forward for the GRID solar workforce training to best leverage the lessons learned from the SETO-funded project, including:

1) Assessing resources established because of the project, including enhanced IBT training curriculum and related infrastructure (on-line offerings, new partnerships, additional staff expertise), and integrating the programming with other programs at GRID.

2) Continuing to identify a) existing training programs from other solar training entities that can be leveraged, b) innovative educational approaches that can be used (particularly in remote or web-inaccessible locations), and c) other organizations with similar goals who can contribute to the cause.

3) Continuing and creating new partnerships with tribal and municipal governments, educational institutions (tribal and otherwise), non-profit organizations, and private sector entities (e.g., investors) that can help with financial, technical, logistical and implementation support for the training program.

4) Continuing engagement with tribes and communities to understand their varying needs, interests, and aspirations regarding solar and other forms of renewable energy, and work to understand the difficulties with implementing community and economic development in widely varying contexts, unique governance structures, and differing governmental staff and workforce development capacities.

5) Involving tribal members in the training program design as it relates to each tribe's unique setting and tribal policies and decision-making processes. It is important—regarding establishing trust—to create transparent mechanisms for feedback and evaluation so that concerns are addressed, and the program is continually improved in a manner that is clearly being responsive to tribal input.

6) Continue to refine the IBT curriculum through work with educational, workforce (including trauma-informed workforce development), and industry experts to ensure that the curriculum is tailorable to varying tribal contexts. The IBT curriculum needs to be able to

    a) span technical aspects of solar energy installation, maintenance, and troubleshooting,
    b) establish a firm foundation in "soft" skills,
    c) be supported by wraparound services during delivery, as needed, and
    d) support advancement into entrepreneurship, economic development, and

business skill development where such opportunities exist.

As occurred over the program performance period, GRID will continue to strive to use technology and online learning platforms to extend the reach of the IBT and related curriculum and to achieve greater equity in program outcomes. Further development of online modules, webinars/workshops, and interactive training materials will provide flexible learning options for participants, especially those in the remote or underserved areas from which many SETO trainees hailed. As was found in this program, approaches that creatively utilize digital communication techniques can reduce training infrastructure costs (e.g., renting or providing classroom space) and thereby enhance accessibility.

7) GRID is always looking to innovate in how it funds its trainings. While SETO support is now complete, GRID staff are pursuing additional federal and state grants, private sector sponsorships, and potential partnerships with foundations. As noted above, support for the training program can also come from directly from industry interested in a source of workers, and from simultaneous engagement with tribal governments, who may be able to allocate resources from their budgets to support trainings.

8) GRID and BLR will continue advocacy and policy engagement efforts at local, state, and national levels to promote policies and programs that support workforce development that is suited to the needs of Native American communities.

Despite GRID staff turnover in BP3, the SETO program has increased GRID's organizational capacity going forward to produce solar training impacts (trainees graduated, certificates awarded, job placements made) through innovations in curriculum and delivery and adjustments to program administration policies and processes (e.g., streamlining trainee payment).

GRID staff will continue to explore options to sustain the program by identifying potential in-kind goods and volunteer service providers (the GRID training program has historically been *very* reliant on volunteers!). Staffing succession policies and continuity planning, addressing turnover proactively, may also be helpful, given the experience at GRID over the project performance period.

Figure 8. Trainees working during BP2.

Developing more strategic partnerships with solar industry companies, contractors, and employers and developing collaborative projects with well-defined outcomes (e.g., designed to gauge the value of trauma-informed workforce development practices) is a key next step. GRID is hopeful that it can establish more relationships with industry where industry sees the value in supporting the training program so it can have access a skilled workforce that better matches their needs. And lastly, closer collaboration with industry partners will be important to keep the IBT training curriculum aligned to ever-evolving technology advancements and associated workforce skillset needs.

5. Products

Networks/Collaborations Formed

Trainings

It is difficult to gauge how many new networks and collaborations were made among the trainee corps, but at least two trainees now work for GRID, and are themselves now trainers. These two individuals have expanded their personal network and are now collaborating with other GRID staff to expand the networks of new trainees.

Regarding opportunities for intertribal networking, it was the BP1 GRID training that had the most tribes represented, with 14 tribes represented among the 16 trainees (a few trainees represented more than one tribe). BP2 had three tribes represented, and BP3 had four. For BPs 2 and 3, however, this narrower representation was largely owing to installations happening on specific reservations, unlike in BP1.

While it is difficult to gauge the long-term networking impacts of the trainings beyond job placements, there are other likely positive outcomes. Berlyn Hubler, GRID project manager for the BP1 install, notes that other forms of "networking" benefits occurred during the training:

> The training teams, aside from gaining valuable construction experience, formed lasting relationships, and collaborated with other native and indigenous people. The cohorts were incredibly diverse, not only in where each trainee was from but also what motivation they brought to the training and their hopes for different careers following the training. Some participants hoped to pursue higher education, others were looking to use the experience to get involved in the solar industry in their home states. We invited several folks from the industry to speak and connect with trainees- each of these gatherings was positive.

Workshops and the SAFE Symposium

As noted above, the workshops were successful in terms of conversations held and, we hope, in terms of follow-on conversations, collaborations, networking activities, and other ventures (e.g., BLR has already fielded requests for site visits following the March 2023 workshop). There is no way to tell what other connections have been made and are developing, but we can only hope they are happening.

Speakers and attendees at all workshops were from several regional and national tribes. For the in-person SAFE Symposium, speakers represented several tribes:

- Bear River Band of Rohnerville Rancheria
- Blue Lake Rancheria
- Elk Valley Rancheria
- Hoopa Valley
- Karuk
- Kongiganak
- Konomihu
- Kootenai (Idaho)
- Kumeyaay
- Kupa
- Navajo
- Payomkawichum
- Santa Rosa Rancheria Tachi Yokut
- Wiyot

Several regional Indian Organizations also attended the symposium:

- Cal Poly Humboldt, Indian Natural Resources, Science and Engineering Program
- Colorado River Indian Tribes, Environmental Protection Office
- Cultural Fire Management Council
- Humboldt County Office of Education, Center for Tribal Innovation and Entrepreneurship
- Humboldt - Del Norte Indian Education Collaboration Workgroup
- Northern California Indian Development Council
- Northern Humboldt Union High School District Indian Education Program
- United Indian Health Services

And other organizations attending the symposium included:

- California Public Utilities Commission
- California Energy Commission
- DOE Office of Indian Energy
- EPA, District 9

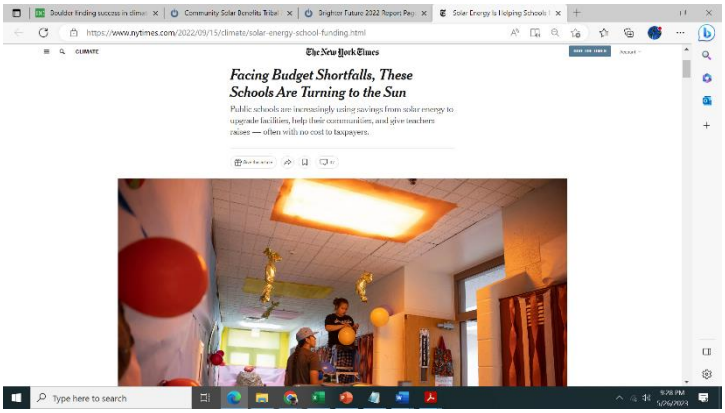
Other networks and collaborations were created, nurtured, and continued for both BLR and GRID with the multiple tribes that received outreach about the program, who provided trainees for the program, and the tribes who hosted the trainings.

Media Reports/Articles

In BP2, SETO supported a solar installation training at the Heart Butte High School with the Blackfeet Nation in Browning, Montana. A Generation 180 report and a *New York Times* article were published that highlight the project and the benefits it brought to the community and school district. Below are links to the two related pieces and screenshots (following page) of the NYT article and GRID's social media posts.

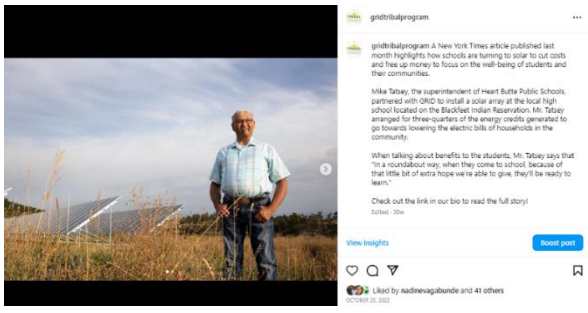
New York Times

https://www.nytimes.com/2022/09/15/climate/solar-energy-school-funding.html



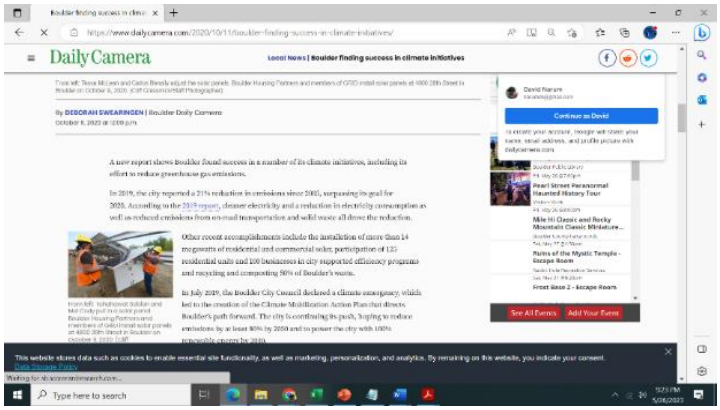
Generation 180

--https://generation180.org/brighter-future 2022/?utm_campaign=Solar%20for%20All%20Schools&utm_source=Partner&utm_medium=socialmedia
--https://generation180.org/community-solar-benefits-tribal-members/



Daily Camera

An article in the *Daily Camera, "Boulder finding success in climate initiatives"* (https://www.dailycamera.com/2020/10/11/boulder-finding-success-in-climate-initiatives/), also highlighted on the GRID installs in Boulder, Colorado.



GRID Social Media

Below are two of GRID's social media graphics used to communicate about the program. See "gridtribalprogram" on Instagram and "Grid Tribal Program" on Facebook.

6. Project Team and Roles

BLR Staff: 1) Jason Ramos, D.C., Tribal Administrator, 2) Jana Ganion, 3) Stephen Kullmann, PI #1, 4) David Narum, Ph.D., PI #2, 5) Kim Norton, and 6) Phil Aycock, CPA.

BLR Staff Roles: 1) Project Design and Delivery (Ramos, Ganion, Kullmann, Narum), 2) Project Management (Kullmann, Narum) and 3) Fiscal/Administrative Management, Reporting, and Invoicing (Norton, Aycock).

GRID Staff: 1) Tim Willink, project lead (BPs 1-2), 2) Berlyn Hubler, project manager (BPs 1-2), 3) Megan McHugh, GRID, project lead and manager (BP3), 4) Kady Titus, Program Assistant and interim Project Manager (short-term), 5) Felix Yepa, Program Assistant, 6) Michael Dela Pena, OSHA 10 Instructor, Construction Training Manager, and 7) Sean Leonard, 8) Simon Wood, 9) Kai Willink, 10) Jaiden Comes At Night, 11) Thelma Wall, 12) Julius Billie, and 13) Yulissia Raphealito

GRID Staff Roles: 1) Project Design and Delivery (Willink, Hubler, Titus, McHugh), 2) Administration and Fiscal (Leonard), and 3) Training (Yepa, Pena), 4) Support (Leonard, Wood, Willink, Comes at Night, Wall, Billie, Raphealito).

DOE-SETO Staff: 1) Andrew Graves, 2) Sarah Wilder, 3) Clay Pfrangle, and 4) Fania Barwick.

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Appendix 1: GRID Trainings

Table A-1 provides summaries of the trainings over the three budget periods. While only 14 job placements were made (goal = 20), GRID staff report that 10 trainees have gone on to continuing education opportunities. Seventeen different tribes were represented by the trainee corps over the program period.

Table A-1. Training Sites, kW Installed, Trainees, and Job Placements

Training Location	Details	Tribes Represented	Trainees/Job Placements
BP1 Fall 2020 Boulder, Colorado	In 2020, the Boulder Housing Partners (BHP) Triangle Site Project in Boulder, CO, implemented 628 kW-DC through a single community solar ground-mount system. The system serves roughly 190 families and offsets their utility bills. A total of 16 trainees worked on the project, with 14 Tribal Nations represented among them.	• Anishinaabe • Confederated Salish and Kootenai • Dakota • Dine • Leech Lake Ojibwe • Meskwaki • Navajo • Oglala Lakota Sioux • Pueblo • Quileute • Sicangu Lakota • Sisseton Dakota • Taos Pueblo • Washoe	16/2
BP2 Summer 2021 Blackfeet Reservation: Community College and Heart Butte School Rosebud Sioux Tribe	Blackfeet Community College, 29.4 kW rooftop; Muskrat Lodge, 2.8 kW rooftop; Medicine Shield Fitness, 10.5 kW rooftop; Little Star Child Care; 10.5 kW, rooftop Heart Butte School, 60 kW ground mount Rosebud: 276 total kW rooftop (126 kW) and ground mount (150 kW)	• Blackfeet • Oglala Lakota Sioux • Navajo	24/5
BP3 Ute Mountain July to October 2022	160 kW of solar on 23 residential homes and a supportive housing facility in Towaoc, Colorado. The systems are expected to produce $746K in lifetime savings on energy bills and generate a total of 5,243 MWh of clean, renewable energy.	Ute Mountain	13/2

Training Location	Details	Tribes Represented	Trainees/Job Placements
April to May 2022 Spokane Tribe Wellpinit, Washington	24 kW was installed on the Spokane Indian Housing Authority's Youth Center to complete an ongoing DOE project, totaling 650 kW on a number of essential tribal buildings to increase energy resilience and sovereignty.	Spokane	4/2
January to February 2023 The Pueblo of Santa Ana Santa Ana Pueblo, New Mexico	6kW-DC of rooftop solar PV systems installed on five residential homes. Each system is estimated to provide 10.6 MWh of clean, renewable energy a year and approximately $1,058 savings per year for 25 years.	Pueblo	3/1
November to February 2023 Ojo Encino Chapter Ojo Encino, New Mexico	15 solar systems installed for families living in the Ojo Encino Chapter of Navajo Nation. Nine of the arrays are 5-kW grid-tied systems and six are refurbishments of existing off-grid arrays that are roughly 0.9 kW in size to serve families that are not connected to electricity. The grid-tied systems will generate a total of roughly 67 MWh of clean energy in the first year.	Navajo	3/2
		TOTAL	63/14

Training Content

Training type and duration: on-line, hands-on:

- One-week hybrid (on-line) training, including OSHA 10 class.
- 3-4+ weeks hands-on installation.

Subjects taught on-line:

- Grid Orientation
- Safety Basics
- Solar and Energy Basics
- Energy Efficiency and Weatherization
- Tribal Energy and Policy
- Net Metering
- Off-Grid System Basics
- Soft Skills and Resume Building
- System Sizing
- Employment Readiness
- OSHA 10 Certification
- Commissioning and Operations and Maintenance
- 1099 Taxes
- NABCEP Solar PV Certification

Subjects taught on-site:

- Tool Safety
- PPE Use/Care
- Roof Safety
- Construction Site Safety
- Ground-Mount Installation
- Rooftop Installation

Brief Review of Trainings

The BP1 field training was at a 628-kW ground-mount installation with Boulder Housing Partners (Boulder, Colorado). From 16 who completed on-line training, 11 trainees (from Arizona, Colorado, Montana, Nevada, New Mexico, and South Dakota) came for the hands-on portion. Trainees received training stipends when they completed the

trainings, and trainees were provided travel and lodging stipends as needed. Initially, given the uncertainty surrounding how to operate with COVID-19, the first round of hands-on trainings was not to be offered until at least Spring of 2021. The project team was able to develop safety protocols and to safely deliver hands-on training (in addition to the on-line component). GRID was able to again deliver on-line training using the Google Classroom suite of curricular modules (with GRID's Installation Basics Training (IBT) manual and additional curricular modules developed by GRID's SETO project team). This effort required a significant amount of time, thought, and pivoting, all of which taught the project team a lot about how to deliver successful trainings in a variety of conditions—a practice with which they were reasonably familiar, given the variety of tribal settings and differing solar project designs.

Figure A-1. Boulder trainee learning wiring in BP1.

BP2 trainings occurred at the Blackfeet and Rosebud reservations, with trainees representing the tribes of the Blackfeet Nation, Oglala Lakota Sioux, and the Navajo Nation. As with BP1, BP2 was impacted by the ongoing pandemic. And as in BP1, BP2 hands-on trainings required a Covid protocol, including policies for PPE, social distancing, lodging, and so on. Trainees received training stipends when they completed the trainings, and trainees were provided travel and lodging stipends as needed. SETO funding was not used for the solar installations, only for the training costs. As Berlyn Hubler, GRID project manager, noted:

> Wi-Fi Adaptations. The pandemic limited many to using mobile phones and sometimes spotty Wi-Fi connections, rather than have access to public facilities like libraries or chapter houses on reservations; trainees were largely left to their own devices to access the online content.
>
> Inclusivity. Although the online training went smoothly, we could have been more inclusive had we planned for limited internet access on the part of trainees with donated hotspots.
>
> Mobile Access. Some trainees who did not have access to a personal computer

were able to access Google classroom from their mobile phones, which allowed us to reach many more candidates had we used a more restrictive platform.

Assessment. Google Classroom allowed GRID staff to easily check on trainees' understanding of subject manner through assignments and streamlined grading.

Issues with On-Line. The Google Classroom was engaging to an extent, but in offering make up quizzes and considering people's locations, it was difficult to ensure all participants were engaged with the content throughout the training and it was also a challenge to ensure long term understanding. The material remains available to trainees should anyone like to revisit it.

BP3 trainings included four different installations. One of the biggest takeaways of the BP3 GRID team (different from BPs 1 and 2) from the training program is the value of having participants complete a well-developed orientation, classroom work, and an OSHA-10 certification before stepping on site for the actual installation, as having the time to prepare for onsite installation and receiving the OSHA-10 safety certification helped participants build confidence and knowledge beforehand. GRID staff received "great feedback" from the trainees about the week-long online classroom session. Other observations on BP3 were provided by Megan McHugh, GRID project manager:

Tribal Coordination. It also was essential to coordinate with the tribe, specifically the TERO office, to provide computers and internet access to participants who needed such resources for the week-long online classroom session. Providing these resources in partnership with the tribe's TERO office allowed us to take on more participants and provide them with the resources they needed to successfully complete the online portion of the training.

Train the trainer. Another takeaway was the need to "train the trainer." Providing the tools and resources that our crew needed to successfully administer quality training to the participants was incredibly important. We hope to continue to build this capacity in projects to come, particularly with trauma-informed practices.

SETO Graduate Moves Up. Kai Willink (BP1 SETO training graduate) joined the GRID team as a Solar Installation Supervisor shortly before the project in Towaoc, Colorado, began. Kai stepped up as a leader from the very beginning and has been a huge part of the success of the project and training program.

Thanks. GRID is incredibly grateful for this opportunity to continue our work and partnership with the DOE. Providing quality training experiences to tribal members, creating local work, and opening career opportunities for participants are all integral parts of our program. This grant helped us to do exactly that.

Job Placement Assistance

GRID worked with trainees to match them with employers and access other existing avenues to secure jobs in the solar industry (e.g., resume banks, job boards, Job Fairs, etc.). During the GRID online training, staff introduced participants to GRID's online Careers page as well as other major solar installers in the US. GRID staff also showed participants how to search for solar industry jobs on websites like Indeed and LinkedIn. GRID provided trainees with career advisement, job applications, interview skills, and resume building. GRID's curriculum focuses and supports the professional development of the trainees by incorporating additional soft skills training, interview practice, and reference letters.

GRID worked with industry partners to develop and promote new internships and job opportunities. In the past, GRID has partnered with Fort Lewis College to implement a one-week long Solar Spring Break Program, where students are able to learn about the solar basics and get hands-on experience with installing a solar system on the Navajo Nation. Due to the pandemic and strict restrictions in place on Native American reservations, job placement was made more difficult. The project team (GRID and BLR) identified how to continue efforts to work with other entities (e.g., Tribal non-profits, other SETO awardees) to facilitate access to training and job opportunities. Approaches to such continued efforts for training and job placements included: 1) web portal, 2) additional training opportunities through solar installations on Tribal lands, and 3) working with partner Tribal governments to facilitate development of solar projects on their lands.

The job placement methods and efforts to pair prospective employees with employers is an area that GRID is working to improve (and they have a structure in place to support improvements). GRID is considering adding a Tribal Employment Resources page that has solar industry employment opportunities with GRID and other industry partners. GRID would be able to use the page to connect training participants with solar companies: GRID intends to research solar companies located in or around reservations or tribal communities and have the information available on its website.

Another idea was to support a tribal workforce training center. As GRID's McHugh notes:

> Workforce development programs should have an integral goal of connecting participants to long-term employment opportunities and building a community's capacity for creating and maintaining their own workforce development initiatives. Paid solar installation training programs allow participants to gain valuable knowledge and experience in the industry. But especially on reservations, there can be limited long-term employment opportunities, specifically in the renewable energy industry. DOE could focus on allocating funds not only to increase solar generation and training opportunities on tribal land, but also to increase the long-term capacity of tribes to develop their own initiatives. This could include <u>funding a project to create a training center (or centers)</u> on tribal land. Qualified tribal community members could be employed full-time to administer their own training programs to connect tribal participants to certification programs, hands-on training, and eventual employment opportunities.

Appendix 2. Grid Trainee Applicant Survey Results (n = 145)

1. Please describe why you are interested in solar job training. Your interest in our program will be a major factor in our selection process.

1. Self-sustainable living, and NABCEP training hours towards certification.
2. Because we have so many wells on our range unit that should be drilled over and reworked. We need water for our livestock and BIA will not help us. Solar power would be so helpful for a lot of ranchers.
3. I am interested in helping tribes find clean energy to provide tribal people with a more reasonable power in their homes and communities.
4. This will ensure that I can bring a sustainable form of energy and help aid in lowering tribal carbon emissions for our future generations.
5. We need to learn about alternative energy sources, our world would benefit and our climate!
6. I have a Natural Resource associate degree but would like training on alternative sustainability for reservations.
7. I want to build my own solar business.
8. I work at a coal mine and see more employment opportunities in solar systems.
9. Having the knowledge of solar panels and solar Lighting solar to better service our In lieu treaty fishing access sites provide light at the fish cleaning stations in inside of our treaty fishing access sites nobody is certified or has a knowledge to work on them and they've put on our sites 5 years ago with retrofit money but none of our crew has the knowledge to work on them would love to be that person to help our tribal community on the river.
10. We are a nonprofit indigenous led, interested in a no fossil fuel world.
11. I'm an electrician and love to help.
12. I am currently a roofer in Fargo, ND. I am interested in learning how to apply solar panels to my scope of work.. I enjoy my job very much and believe sustainability can be applied to any career. I have a BS in Environmental Science from UW-

Oshkosh and I am at the tail end of my Masters in Sustainability from UW-Green Bay.

13. I believe renewable energy is a sustainable and equitable way for receiving our power. We are very rural and sometimes we are left without power for hours or even days. I want to continue to live rural while installing solar and wind power sources to my home someday. It gives freedom from a circuit that many can benefit from with the right set up.
14. I've been to a conference about solar panels and have been interested since then.
15. Over the last five years I've been studying construction techniques and methods for the purpose of building my own home and since then it has been leading into other career opportunities. I found an interest in green building techniques for the sustainability factor which I would like to learn more about and find opportunities to gain experience.
16. I'm looking for a career. I feel solar is the way to make sure I have work in the future.
17. Learn to develop possible training and/or learning for others.
18. I have learned a lot of stuff in the construction field and always wanted to learn about solar energy and wind energy, nobody in my tribe has any experience doing this and I think it would be good to learn because it is only a matter of time before they start using that stuff around Washington state.
19. I've always been interested in solar power and think it is important for Tribes to encourage and allow as an option. Better for our environment and better for our future generations to come.
20. I am interested in helping people be self-sufficient and be kind to Mother Earth. I have been involved in remodeling and have accomplished my International Commercial. Building Inspectors certificate and I am working on Residential studies. I believe this skill can greatly help our tribal communities be off the grid and provide me with a skill to perhaps start my own business. Please give my application positive consideration and include me in your training program. Thank you for your time.
21. I am very interested in the solar job training because I believe solar is the best alternative for us out on the Hopi Reservation. It does not greatly have to impact the landscape and cultural resources and can bring power to households off the grid. I am currently working on building my house and will most definitely be installing solar as my power source, I also hope that more people in our

community will do the same so we can stop depending so much on outside fossil fuel power sources and continue to be as self-sufficient as possible.

22. I believe in solar power and would like to see our tribe move in this direction. I have always had an interest in it.

23. My family operates a farm, including raising crop, home stead, running cattle. Operating over 160 acres to solar would help with water situation, well water, fencing, possibly help our rural area where we live.

24. I love working with any native tribes. I am currently working on the Camp Fire doing TRIBAL monitoring. I am passionate about our native communities and learn fast and always move up.

25. I am interested in attending the solar job training because my family uses an off-grid solar system on the Navajo Nation that powers our home. However, the system was installed almost 15 years ago and needs maintenance. Attending this training would be an opportunity for me to build a stronger foundation of solar power advocacy and provide me with resources that can possibly help me improve my family's solar system.

26. I am very interested in learning about living off the grid and to one day help others in my Tribe become as self-sufficient as we can, and to also live in a cleaner and greener way.

27. To gain knowledge of solar energy and gain education for myself to be able to share this info with my local communities.

28. To conserve energy

29. I'm interested in solar job training because of my passion for clean energy and my passion for helping people. For the past 10 years I have been lucky enough be employed for a local non-profit, the Salish & Kootenai Housing Authority located on the Flathead Indian Reservation in Montana. During these past 10 years I have been working internally to improve energy efficiency while providing services to our low-rent, low-income tenants as well as to those who are on other programs we offer. Although the high cost of affordable solar energy and lack of qualified workforce serve as roadblocks for my tribe, my goal is to use this opportunity to further my knowledge and experience in this field to help build energy resilience within our tribal communities.

30. I believe we as tribal nation need to use alternative energy.

31. Because I've always been interested in alternative energies, especially solar. I want to install solar on my own home and live more independently.

32. Learning new skills
33. The process and experience interest me
34. I would like the education to be able to help my tribe move towards that direction.
35. Learn how works and how to apply help others and myself save.
36. With my current project almost complete, I am looking for another project to get involved with.
37. Experience and knowledge
38. Resources
39. I am saving up right now to build my own tiny house and I would love to have it solar powered.
40. I’m always interested in learning new skills Maury ham hopefully open some new job opportunities.
41. Would like to do something to protect our Mother Earth
42. Solar and being green has always been an interest to me, having a cleaner solution for our planet.
43. I work in cultural resource management and have been curious to see how the process is for setting up solar energy units. Would like to see how impactful it is compared to the other methods.
44. to make available alternative energy resources for tribal and low income homes in our area.
45. Knowledge to share
46. Because solar is awesome.
47. A good alternative to electricity
48. "I'd like to be a certified solar installer. I would like to help Indian country have solar energy at their homes.
49. Also I would like to use it for alternative class credit because I'm a senior at Forks High School."
50. energy conservation is my niche here on the Spokane Indian reservation.
51. Environmental scientist focused on regenerative agriculture and alternative lifestyles. Currently on the board for a new integrated clinic and indigenous school

we are building on our reservation. Both of which have interest in installing renewable energy options.

52. I live on tribal land supporting my enrolled family waiting on the adoption list, and would love the experience this would give and the thought of helping install and help my tribe in any way would be amazing.

53. Interested in a solar training job to gain more hands on experience in the electrical side of installations.

54. I am interested in solar job training as I have focused my research for the last 3 years on energy issues within the Navajo Nation. I have focused on this issue because I have family members on the Nation who have been without electricity, and I have been able to receive an education as the tribe has helped me financially though they face widespread energy issues. I feel I have an obligation to fill for my family members, friends, and tribal members on the reservation to be the beginning of helping the reservation receive clean energy. Participating in opportunities like this allows me to learn more about energy issues, logistics, and connect with others who are passionate about the same issue.

55. I've longed to work for Tesla and this is one step closer to helping the world and working with Elon Musk himself.

56. My father always showed an interest in solar energy. I would like to better understand it in memory of him.

57. Establish a homesite program, networking.

58. I am interested in becoming a civil engineer, who is building renewable energy systems (wind & solar)

59. "Would love to learn about alternative energy."

60. This training may help my native community in the future.

61. It's the future.

62. Start a solar business!

63. I believe solar energy is important for tribes in Washington. My tribe, located in Southwest Washington, is impacted nearly every year with floods and power outages. Solar energy would provide our tribal members with power during outages. This is important for elders and the physically fragile members. I would love to be a part of an organization that not only reduces our carbon footprint, but also has no greenhouse gas emissions. I have also seen the damage to my tribe's fisheries, with electric powered dams that have killed off the fish runs. Solar

energy would be a blessing to tribes. I am physically fit and have a knack for building and installing equipment. I have taken engineering courses while in college and am able to follow design plans and install lay-out plans.

64. Gaining knowledge about the technology of solar and translating that for the youth to gain better understanding.

65. I would like to learn about and how to install solar systems, to be able to bring alternative energy and solar power to our Tribal Members and beyond.

66. To gain more knowledge and experience in the solar industry.

67. I am interested in solar job training to acquire the skills to help tribes. I enjoy helping people.

68. To further educate myself in ways to provide renewable energy to myself and the people around me.

69. because I believe green energy is essential to preserving our planet’s ecosystem! I have always been very interested in learning about solar power and how solar panels work! I also believe having tribal members trained and committed to doing this type of work is essential!

70. I am interested in the alternative energy industry, I wanted to learn a trade in construction. I want to help promote sustainable energy on the reservation.

71. While I am not enrolled in a federally recognized tribe, I am First Nations (Ojibwe) and believe in bolstering tribal energy independence, or energy self-determination. I am interested in this program because solar energy is needed in Indian Country, and I would love to be part of the team to bring solar energy in.

72. I am interested in solar job training because I believe that sustainable renewable energy is something that we should be integrating into our communities so that we are no longer reliant on the monopolizing electric companies that skirt our Reservations.

73. I'm interested in learning more about strengthening solar communities so that all areas have more consistent and natural energy resources.

74. "Very interested since I have heard of GRID Alternatives.

75. I've reached out in the past asking for assistance to my paternal grandmother’s house and receiving it.

76. I feel like it's in the best interest of myself and the community to learn about solar power as my hometown community of Cameron, Az and the surrounding areas

are in dire need of someone who can be of assistance when it comes to solar power.

77. The solar field of work always interests me, and I thought this would be a great opportunity to get into that field.
78. I prefer to partake in sustainable habits whenever possible. Learning how to install panels would give me more insight and reasoning to push the ecofriendly agenda we should all strive for.
79. To make great money and to learn new skills.
80. I am interested because I am working for an Environmental Program and Solar could potentially be important in my field of work. We have solar in our work project, and I don't know much about it.
81. I'm slowly trying to build my own solar company. Networking and learning new perspectives around solar energy is in my opinion good. I've heard a lot about Grid Alternatives and this was sent to me, so I thought I'd apply.
82. CO has ten years to become solar dependent as a goal set. Fast growing industry especially now with climate change.
83. CO has ten years to become solar dependent as a goal set. Fast growing industry especially now with climate change.
84. CO has ten years to become solar dependent as a goal set. Fast growing industry especially now with climate change.
85. I have experience in solar farms! My experience is just about everything! From the construction of frame, installation of the glass, digging the trenches and laying conduit underground, pulling wires to the glass, and hooking the wires up! As well as installing the inverters and helping with the wiring! I would like to know more than I have already learned!
86. Education is my key to true freedom.
87. Energy assistance cost savings to homeowners during economic hardship
88. I and my family live in a very remote rural area and electricity is hard to come by and very expensive. Solar is off grid living and is needed here on the Northern Cheyenne Reservation.
89. Tribal Chairwoman of my tribe would like to see solar opportunities here.

90. Personal understanding and knowledge as to what it will take to get a system up and running. Understanding the components and upkeep would be greatly beneficial as I look to adding a system to my future ranch.

91. I would like to learn about solar energy and alternative electrical powers to help others.

92. "I am interested in this solar job training program for several reasons:

a. Would enable me to learn the basics of solar jobs,

b. Would enable me to potentially start my own business on Tribal lands assisting at the local & regional level. As a current member of the Community Land Use Planning Committee the knowledge I obtain will assist 100 to 2,000 people in understanding the solar industry.

c. I am currently putting together my own residential solar panel system with just knowledge obtained from watching YouTube videos. I would really like to learn in a class & hands-on setting from knowledgeable instructors.

d. As a Navajo woman who has almost always worked in a Male dominated job sector (wildlife biologist, environment specialist/scientist and landfill inspector), I will be able to connect with women of color who may not readily want to ask questions because they are intimidated by males. I can bridge the gap.

e. I am familiar with using various types of tools and follow safety plans.

93. This training will give me opportunities and benefits to operate and manage solar logistics; equipment design, installation, operation, cost feasibility, the safety and proper guidelines and regulations for remote residential homes (specifically in native American reservation) and other infrastructures, and the potential to train people who are interested in the field.

94. There’s an opportunity for our tribal people to take advantage of. Electricity is an important necessity for our communities. Solar is a green solution that doesn’t impact our environments harshly like coal, natural gas, and oil.

95. I live in a remote area of the Navajo reservation. We have electricity, but no running water. I would rather have solar power than pay high fees to the local utility authority. I am building a new house, and I do not plan on having electricity provided by the utility authority. I want to learn as much as I can about self-sufficient electricity generation through solar power. I do not want to rely on coal powered electricity.

96. Most of the people here don’t have excess to the electric grid and this is an excellent opportunity to obtain electricity via the solar power system.

97. I would like to learn a new trade and be knowledgeable in solar energy and work on the Navajo Nation.
98. I have worked with solar panels before with Natural Resources here in Zuni, N.M. and would like to get experience with solar power.
99. I have the time and want to learn so I can be able to help bring solar to my family and community.
100. Interested in solar training to bring back to my reservation.
101. I work for a housing company on the reservation. Build and rehab homes so this is something that we would like to incorporate on the reservation.
102. I will be working in solar project development in eastern Navajo Nation-New Mexico. To learn more about the technical functions and installation procedures of panels, wiring, and output would be invaluable. It would make my work in development stronger because I would have technical hands on knowledge in the field.
103. Would like to learn more about setting up solar on the Navajo nation.
104. Renewable energy and benefits of green energy to tribes and nations
105. To help educate our youth in surviving in an economy that's turning to electronics and technology, to see natives survive.
106. I am all about sustainability and am planning to one day live exclusively off grid but also I have a job that works with the public and I know there are a lot of people out in the region who have no access, and this will give me an insight on how and where to start.
107. I am interested because it is my preferred occupation of energy systems.
108. To have a much clear understanding how solar energy works when I'm advocating to our tribal members and Utility Company
109. I have an Associate’s degree in Alternative Energy Technology from Coconino Community College and have always had an interest in its potential to reduce greenhouse gas emissions. I've worked on two solar installation jobs within that program: one with solar water heating and the other with a grid-tied system. I'm interested in potentially learning more about off-grid systems, as well as what's changed since completing my program in 2018.
110. I think this will enhance the community.
111. because it is the future, and I would like to be part of that future.

112. In the area I live in some of the areas, electricity isn't feasible.
113. I am interested in this training because I am interested in learning solar, and I feel this training will create an opportunity for me in a solar career.
114. It involves the career I want to pursue.
115. To become self-sustaining and expand my knowledge and help my community/reservation, plus ever since I was little I really liked solar panels.
116. Wanting to learn it and have another resource in my general construction career! However, to try to give back to my community make it a trade once I have my own crew up and running!!
117. I would like to expand my current HVAC business to include solar.
118. I'm interested in this program so I can give back to my community and tribe. Also to have a career in it; I think I have a passion for it.
119. Learn more.
120. It's something new for me, and I also think it's the change for our future.
121. I love renewable energy and how it's not damaging to the environment. Would be a great learning experience and possibly the doorway to a great career.
122. Give power and install water pump systems to people who need it.
123. I believe solar power is the future of the wellbeing of our planet and mankind. I want to be a part of that change we need for a sustainable future.
124. Save the planet, alternative energy.
125. continued education about solar
126. I feel it would be a great opportunity for me to learn new teachings. I would be happy about doing this kind of work because I know it will be helping fellow Natives.
127. I am currently studying Environment Resource Engineering and my goal is to live a more sustainable lifestyle while teaching others how to do the same. Native lifestyles are based upon using the resources of the land, and the Sun is a major one. I'd like to learn more about bringing solar energy to rural locations, installing systems, and bringing awareness to others.
128. It is a great alternate resource to save energy and is also a renewable source.
129. New career opportunities

130. I believe in moving towards renewable energy for alternative power source. Myself do want to have a renewable source of power and I believe it is the future for cleaner energy.
131. I am an Electrician.
132. I am interested in the solar job training because of my community, it also falls into my degree that I am studying. This impacted my community; due to the circumstances a lot of Native Americans live off grid. Most of these native families have children. These families need the resources to live off grid. This will also help me towards my degree in Mechanical Engineering. As a mechanical engineer I can redesign the solar panels, and understand the mechanics of the panels.
133. Going green energy and life
134. I am currently the Maintenance manager of a small touring business on the Navajo Reservation in Az. We are operating with no Running water and Part Generator/Solar Power. I would like to know more about Solar systems to maintain our set up and eventually be 100% Renewable.
135. I believe renewable energy is the future for us. And gaining knowledge and experience in solar would benefit myself and thus the tribal community.
136. I want to bring knowledge to my community. I completed my associates in alternative energy tech. And plan to implement changes to my family house. It is a growing field and is very important for cleaner energy.
137. "Our tribe has quite a few members that do not live on any grid.
138. Alternative energy is their only means of power for their homes."
139. Was attending school at EcoTech for electrical green energy. Interested in a career in green energy.
140. My uncle does solar and it’s a growing business and it’s an amazing new alternative way to move forward.
141. I see that solar energy is a growing industry. With growing industries comes opportunities and future employment. Now I feel like this would be great training for me because. I want to use solar energy for my home. Also, this is what's holding me back, from the lack of experience on job applications. I know this is all I need to get my foot in the door within the solar industry.

142. I want to pursue electrical engineering and the renewable resources such as Solar and wind turbines. Also because currently I am working with a nonprofit organization that is working with solar.

143. My uncle does solar and it’s a growing business and it’s an amazing new alternative way to move forward.

144. I'm a full blooded member of the Navajo Nation (NN). My elderly parents reside on the SW portion of the Navajo reservation near Leupp, Arizona. My parents had a Solar PV system installed on their home approximately 10 years ago by a California company contracted with the NN at the time via a low interest rate USDA loan. Many senior and elderly folks in this area of the NN had similar solar setups on their homes through this program. Over the last few years, I had to find a solar technician willing to travel into this remote region to troubleshoot/service my parent’s solar system each time there was an issue with it that was above my limited solar knowledge. The solar technician's repair bill was quite costly each time. I'm sure this was the case for the neighboring families having solar problems. At any rate, I realized I needed to seek a certified solar PV training program, so I could safely and properly troubleshoot and fix residential solar PV systems with the know-how and confidence. Most of this area of the NN is without electrical, gas & water utility services. In the past few years, Grid Alternatives (GA) had come out to this area on the NN for solar installation projects and I was fortunate enough to be invited each time to assist on the projects and gained some solar experience. It was a pleasure to work with all the great GA associates on the job sites and got to know Mr. Tim Willink and Ms. Berlyn Hubler over the years. I believe I possess the necessary skills, physical ability, temperament, integrity, patience, respectful demeanor, sense of humor, and team player attitude to be considered for this rare and excellent training opportunity. The NN has no trained Solar PV techs working in this area, so when most residential systems go down they stay down due to lack of Solar PV techs. With the Covid-19 pandemic, it complicates matters in these NN households relying on electrical power and running water.

145. I am interested in understanding how solar technology works as an alternative to powering our world than using oil/gas.

146. I believe it’s the way of the future in the world and right here on the Navajo Reservation. I want to work to help my people live better lives.

147. To understand the hands-on combined with book learning of solar installation. This will provide a basis for me to one day own my own solar installation company on my reservation while training others to be self-reliant and pursuing job stability.

148. Needed hands on training for future exploration.

2. Are you willing to travel outside your preferred region to attend training?

Response n = 145

No	=	5
Maybe	=	33
Yes		107

3. Are you currently employed?

Response n = 128

No	=	64
Maybe	=	
Yes		64

4. Are you interested in a career in solar?

Response n = 140

No	=	5
Maybe	=	40
Yes		95

5. Are you interested in a career in the electrical field?

Response n = 142

No	=	19
Maybe	=	58
Yes		65

6. If an online portion is offered for part or all the training, are you still able/interested in attending?

Response n = 125

No	=	0
Maybe	=	7
Yes		118

7. Are there any barriers or obstacles that could prevent you from attending an online or in-person solar training?

Note: many noted no barriers or did not respond. Forty-one responses noting barriers are listed below.

1. Work and Covid19 outbreaks between now and then, either here where I live or there where the training is at.
2. COVID19 tribal resolution for restriction of travel to hot spots and out of state.
3. My job may have some issue unless it is after fishing season or before. Unless it is cleared.
4. Online would be efficient.
5. Weather, and location at time of training.
6. I just need to hire my helper to feed and care for my goats and chickens while I am gone so advance planning is necessary.
7. The only thing that could prevent it is tree removal starting sooner than estimated.
8. Since I am a student, the only barrier would be getting permission to attend classes via Zoom or remote access while attending the in-person training.
9. distance to travel
10. None unless my kids get sick.
11. Transportation in person.
12. In person I do have a family, but I do have help also.
13. My children, but I have tons of support to help me out with them.
14. I am highly motivated.
15. I don't believe there are any barriers or obstacles that would interfere.

16. Being a full time student, and when the event will take place. I am confident in my ability to participate as my college is doing classes in the online format this fall semester which would allow me to travel.
17. Leave from work.
18. I am an international student from Germany, but I hope that would 0t be a barrier. I am also a member of the men's soccer team at Fort Lewis College, so I need to ask my coach as well.
19. I am in school and would need to k0w the dates of training so I can plan with my instructors on how 0t to fall behind. Also, the month of October will have some big events at home that I can0t miss.
20. Timing is key. I am self-employed and with a date to work around I will be able to better plan.
21. Financial reasons play a big factor but with proper planning, I'm sure it will be fine.
22. My children having issues could prevent me from training.
23. Where there is a will there is a way.
24. The length and time frame
25. In this moment I am homeless but can access the internet via my cellphone in accessible areas I drive to.
26. The only problem I see is the slow internet service here.
27. Conflict with work schedule.
28. I'm working full time right now but will do online classes and hope I can get a summer job.
29. Just CDC rules/guidelines to be followed by all.
30. Covid-19 in person and some physical limits.
31. Based on the time-frame, I may only be able to attend online training due to being in a face-to-face school. However, these circumstances may change by the time this training begins.
32. Transportation.
33. Online classes.
34. Family emergencies.

35. Just my college classes.
36. Emergency with my children.
37. Potentially travel distance and duration of training.
38. A possible upcoming job.
39. Just the Curfew hours for the Navajo Nation.
40. Other than helping my kids with virtual school, no. Looking to change my job path and try something new, this could be something new.
41. Getting approval to take 2 weeks off for training might be a challenge but not impossible. Worth the effort for career development opportunity.

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8. Do you have any questions or concerns about the training?

44 responses:

1. Just the in person training does Grid Alternative something in place for these pandemic times to insure everyone's safety staff and students. For traveling is driving an option instead of flying? I have a young family my wife, son 4 years old and daughter 1 year old. Would I be able to take my family with me if training in person? I will pay the difference for them travel and lodging they will 0t attend the training just to be my support. Please let me k0w thanks.
2. is there a certification at the end? How is this certification maintained i.e.; continuing education DOL requirements?
3. When is it scheduled for?
4. what is the cost?
5. If I were to be selected I would need a few weeks to prep and clear through work and the family. Always willing and ready to learn. Is there certified certification for this training? Thank you for taking the time out to look over my application!
6. Length of training?
7. Where & when would the training be ?
8. "Is there a proposed time frame for in-person training.
9. How much training is it.

10. When are the dates of the training?
11. When is the training planned in each of the different regions? When will I expect to hear from you as far as being selected or 0t selected for the training? When will the online portion be available to start studying? Will we have access to the products at wholesale price to start a business? Thank you very much for considering me, an Indige0us female, for this training. Best regards and I am sincerely enthused about the potential this opportunity must enrich my life!
12. Need a notice to give to job for week leave.
13. Just the time frame for when it would start? and how much does it pay?
14. How often are trainings offered?
15. Is it hard to learn?
16. Just crossing my fingers I get accepted.
17. After the training is there any help with 1 job placement
18. Can you share what a typical day is like.
19. I'm not enrolled in any federally recognized Tribe, but my kids are, and I have lived here on the Spokane reservation my entire life.
20. The timing of the event, and how long the days would be. I would just have to make sure I would have time in the evenings to work on my schoolwork.
21. How long would the training be?
22. Outsourcing of building houses, road building, to establishing go green homesites.
23. When would it be? Is it possible to do it outside of the semester?
24. When do you think this would start?
25. I would like to k0w the dates.
26. Are certificates or any accreditations being awarded upon the completion of this course?
27. What is the Schedule for the training?
28. Is this a real offer?
29. Only to gain more experience with solar power.
30. How often is this training offered? (Monthly)

31. What Tribal solar energy projects has GRID Alternatives worked with? Is GRID Alternatives the only funder of this initiative?
32. Required time commitment to allow for proper schedule adjustments.
33. Would trainings be during the day, or can we do the training online after work?
34. When are the dates?
35. Can I just do the 1 week online course if accepted?
36. When will it start and what's the pay?
37. Dates and time
38. What will the hours be?
39. Are there any other requirements that you would need from me?
40. Is it a certification?
41. What part of the installation process would this job involve?
42. How long is the training? How many people are attending?
43. What are the dates for this two week free Tribal Solar PV Training?
44. The sooner the better would be great for me as I just submitted my resignation letter today for my current job as a law enforcement officer. I need a change of pace, and this sounds like something I could get good at and do full time.

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9. What are your goals and how do you envision this training will help you achieve them?

1. Getting updated training and best practices being used in the field.
2. To get power to people and livestock who desperately need it.
3. I have heard mixed messages about solar power in my region and want to help tribes in Montana get solar energy.
4. My goal is to help lower the reliance our tribal members have on outdated predatory energy businesses. This gives an opportunity to provide choice.
5. To learn all about solar energy and how to get it into our tribe and other towns that want a change into our climate.
6. My goal is to first have solar power at my home then eventually run a small business or contract services.
7. "Help me with hands on experience to take.
8. to obtain a better self-sustaining job so I can continue to provide for my family.

9. To better serve our Tribal communities and have the knowledge to put more solar panel and keep what we have running in way it benefits our community.
10. Bringing visibility and amplification to our indigenous people.
11. Build sustainable communities. I can offer sustainable alternative to customers.
12. It helps me better understand the process of installation and the cost of it all. I'd like to get all tribal housing on solar or at least give the option if they choose. While also providing to those with private property the benefits of it as well. Those that live out on tribe land or what to get home sites can use this as an easy option for setting up if they need be and this training could help with just that.
13. I want to be able to help my community and my tribe in any way possible.
14. I believe this training will help me in the future in building a sustainable home for myself as well as showing others in my community that going solar could be one of many solutions for the challenges that we face here on the reservation.
15. I'd be interested in the training. Preferably online but if needed I would be interested in Washington. My goal is to be able to have at least part time work full time would be great.
16. My goal is to take learned training and develop project options.
17. My goal is to have our tribe run off of completely green energy and to be self-sufficient and not have to spend money on energy that we could be making for free , then take that money and invest it into the our nation's infrastructure, we are relocating our village out of the tsunami danger zone and building an entire new village up on the hill where we live , new houses for all of the people that are in the tsunami danger zone and a new k-12 school and I think that it would help in making our coming village to be totally self-sufficient on green energy. It would be quite the accomplishment to be the guy who spearheaded something like that.
18. I would love for this to be a career path for me, and this will open the doors to finally be able to get the chance to learn.
19. Self-employment as an end goal and a very huge advantage to Native communities for off grid power. I envision a growing company that can put tribal members to work and provide great opportunities for employment as well as a great product.
20. "My goals are to finish building my house with repurposed and recycled materials and make it as self-sufficient as possible; while continuing to build up Recycling (recycling start up my brother and I have been working on getting off the ground) on Hopi and my work at the Hopi Cultural Preservation Office to continue to educate on what stewardship means today using our traditional worldview and way of life.
21. This training will give me the skills to be more knowledgeable about solar power and solar installment so that I can bring that back to my community to teach others and help out when needed."
22. Creating opportunities to make change in the world of energy.

23. Help our rural areas, elderly to balance the cost of electricity. Other farmers to get on board. To be self-sufficient.
24. My goals are to work within any TRIBAL community and help. I have gone to college for several years and want to continue my education and feel like this would be an amazing opportunity to learn more and strive with our native and cultural people.
25. Although my family uses solar power, I feel like I still have so much to learn about solar power and solar system maintenance. This training can provide me with those skills and provide me with resources that I need to not only expand my own knowledge but also raise solar energy awareness.
26. To establish my own business to employ Tribal members in living better for our grandchildren's future. To do this I would gain more education, find resources, and have a plan.
27. Gaining education about solar energy and help promote greener energy sources.
28. To better our reservation on saving money and energy.
29. "My goals for this training are to learn the fundamentals of PV solar energy. Fundamentals such as the theory behind photovoltaics and the understanding of what components make a PV system. PV solar safety practices and the tools and techniques needed for the installation, operations, and maintenance of PV systems. Learn how to conduct site analysis, PV solar design, from the array configuration to proper mounting methods as well as becoming familiar with the needed electrical connections to complete a grid tied installation.
30. I see these goals being achieved through the guidance and instruction provided by GRID's highly experienced qualified trainers who create a learning environment that is both challenging and informative, structured around the success of the student.
31. Self-sustainability and the ability to promote the lifestyle in a working way.
32. I want to start my own alternative energy business. Gaining knowledge through this program will help me do that.
33. To learn and be connected to a good job.
34. To get any and as much experience with all the opportunities I can take advantage of
35. Helping my people learn new ways to live off the land and not be so dependent on the rest of the world.
36. help save money and use nature supply energy.
37. I am almost done with the casino/hotel project on my reservation. Sounds interesting.
38. I want to major in political science.
39. My goals are to have my tiny house solar powered. My original plan was to just watch YouTube videos, but I don't understand one thing they are saying. I am so glad I ran into this training. I am hoping to be able to take this training to get a better understanding that way I can get electricity to my tiny house while being off the grid.

40. My goal is to obtain as many skills as possible and knowledge I can In hopes to open more job opportunities.
41. To transition to solar power individually but also to possibly find work in the field.
42. I'm pursuing a construction company building custom homes and solar training would help educate my goals of advancement in adding another service on top of my construction building and adding solar panels as well.
43. To learn the process of installing a unit and what landscape features you look for prior to installation. Attending would provide me with the opportunity, or hopefully at the very least, to see the installation process. The other would come from asking someone attending.
44. to learn as much as I can before the tribe begins the move to solar energy.
45. Helping my tribe be self sufficient
46. To bring awareness to people
47. Learn about solar product, and installation.
48. being able to help install solar for my community .This training would help me to obtain this by giving me more experience in the field.
49. Micro grids and decentralized power are important to me. This training will give me more practical tools to accomplish this.
50. to be a journey man and any experience towards installation and working with my hands would benefit me.
51. My goals are to become a better electrical worker and I envision this training will help me to gain my electrician license.
52. "My career/education goals are centered around helping the planet become more environmentally friendly, and harmonious among all species. To achieve this, I believe focusing on the base of what powers our system, electricity, will aid in it as transitioning to clean energy will delay or eliminate many issues. I also believe that banning redlining would be beneficial as it fuels issues like poverty, poor education, crime rates, etc. I believe that an education in law would help me get into the office to achieve these goals.
53. In conclusion, my main career/education goals are centered around helping the globe attain clean energy, while also banning one of the main mechanisms that fuels many other social issues."
54. This training will teach me to work with solar panels as a way of harnessing the power of solar energy. The training will also help me work with equipment that Elon Musk is utilizing for a better world. To eventually add solar power to my land and offer solar energy to my neighbors.
55. Previously, attended a training session, would like continue & networking.
56. This training would definitely help to specialize myself for the direction I want to work in my life. It is a great opportunity to work for a construction company in the US, since I am an international student from Germany.
57. Advancing in the science field.
58. I have many goals. The most important goal for me is to make sure my family is taken care of. As long as I stay focused, I'm sure I will accomplish that goal.

59. Learn more about solar energy, and work towards creating environmental solutions against global warming.
60. Help community members and youth find a better way to power up. Provide information and help involve them.
61. My short-term goal is to obtain my BA online by 2021. With the flexibility of online courses, I can devote time and energy to this opportunity. This training will assist me in not only supporting myself, but hopefully in assisting tribes in their knowledge and buy-in of continual renewable energy. My long-term goal is to work in a field that aligns with my personal beliefs. This field is one that I fully support and would love to share knowledge with other tribes. I believe this opportunity will assist generations of tribal people. I would very much like to be part of a generation that reduces their carbon footprint.
62. Being a strong team member and eventually team leader to help with as many installations as possible.
63. I would like to either join a solar company or potentially form my own business.
64. To gain more knowledge and training in the solar industry. To get better work opportunities.
65. My goal is to provide electricity to every home in the Chinle Agency of the Navajo Nation. This training will help me understand the installation portion of the process. I need to know this and much more to be successful. This will be the second of many installations I plan on joining. This hands on experience, alongside my Electrical Engineering degree I am currently pursuing, will help shape me into a more than capable energy warrior.
66. It will allow me to bring knowledge and a sustainable way of energy consumption back to my people.
67. My goals are to gain knowledge and understanding of these systems and possibly build a career in this field of work...not only here on the reservation but anywhere!
68. I can use the skills learned to work for an alternative energy company. I would like to help install solar on homes on the reservation.
69. My long-term goals have always been to increase self-determination for indigenous peoples/tribal nations/first nations. I believe removing reliance on outside energy companies and developing our own energy systems is an important component of achieving self-determination. Learning solar training would help me be a better asset for Indian Country; thus, moving closer to my personal goals.
70. My goal is to contribute to helping those in need of energy assistance. This training will provide the knowledge needed to do so and can be further used to bring sustainable housing to the communities.
71. My goal is to develop a solar program that sustains energy infrastructure for small and rural communities. This training will assist me in not only understanding solar systems but also the proper framework for creating a supported infrastructure for installation, maintenance, and sustainable energy resource through solar.

72. I think this specific training will help steer me in the direction of my capabilities and my career. I am a Sustainable Business major @ ASU and this program will boost my interest even more as I've always wanted to learn more about solar power-systems and to help boost power shortages in remote areas of the Indigenous Reservations.
73. My goals are to learn. I've done many trades and see this as an opportunity to expand my knowledge. I also understand there is a project in planning on our reservation and this training could teach me skills I can use to help do the job.
74. One of my bigger goals is self-sustainability. This training would support that goal by providing me with the knowledge and skill to improve not only my own life, but also the lives around me. I've come to a point in my life where I feel learning and passing on knowledge is the most rewarding thing I could do.
75. To learn the trade
76. I believe knowing more about solar can help me bring solar to my community.
77. To continue to work in the solar industry and help others get into it as well. More importantly, helping other natives get interested in renewable energy careers.
78. As stated above the Solar Energy industry is fast growing. With any big boom comes opportunities.
79. As stated above the Solar Energy industry is fast growing. With any big boom comes opportunities.
80. As stated above the Solar Energy industry is fast growing. With any big boom comes opportunities.
81. I would like to see our tribal properties use this and slowly integrate this into our housing units! It's a very good idea, and it will help with costs and help with the environment!
82. To live self-sufficient. Any knowledge or training of passive living will help me.
83. Help my tribal community to be more energy efficient on our tribal trust lands.
84. I envision a solar powered farm lifestyle is the future and am very interested in applying training for the benefit of the people.
85. training, seminars, training.
86. "Find ways to implement solar use. Be the catalyst to help start it.
87. If not me then one assigned to attend training for me"
88. I would like to understand how to set up and maintain a solar system.
89. I will use my newfound knowledge for the greater good of others. I volunteer many hours in my community & am familiar with the needs of my follow community members who lack basic utility services.
90. My goal is to learn and apply the proper methods and practices of cost benefits, design, installation, operation, maintenance, and safety principles. I would like to increase my skills and knowledge of solar nomenclature; equipment, tools, parts, etc. I will be confident to successfully apply my training to work in this field for years. The benefits are that I will be an asset to my community and self.

91. My goals are to help others to use green energy solutions. I hope to run my home someday on green energy and homestead. This training should help me understand how to set up the solar panels we have already for our travels. I want to provide access to solar energy to others.
92. My goal is to not rely on coal generated electricity to provide electricity for the home I am building and to become more self-sufficient in how I live. I believe this training will help me learn more about harnessing solar energy to become self-sufficient.
93. My line of work was power production (generation of electricity) 37 years of working in this field both in the private and government sectors Therefore I'm familiar with this line of work. With the training I envision empowering myself to install solar panels for the people that have limited resources to the power grid.
94. Providing financial stability for my family and learning a new trade.
95. To get more experience on how far we can get in using solar power and much we can gain in using solar power.
96. Learn as much as I can about solar training.
97. My goal is to see the benefits of solar energy and provide jobs on my reservation.
98. To be able to install solar panels on our units so we can be more energy efficient.
99. My goals are to advance Solar energy education, support, and development in my immediate community that has been traditionally reliant on the extraction industry for decades. The training will also help me to gauge realistic smaller scale projects that could use solar energy to power water delivery for agriculture.
100. to live a sustainable, off-grid, on the Navajo reservation and direct/teach others to do the same.
101. Gain a greater insight on solar and other green energy sources to ensure environmental sustainability and support Tribes and Nations in our ongoing goal of safeguarding our lands for future generations.
102. Being taught on installing solar panels with help any native train to serve their communities and become efficient.
103. It will give me some needed info that I need to know before committing to a solar lifestyle and I am willing to learn more about alternative green energy resources. My goal is to get my own family off grid to save up on financial needs to be used elsewhere instead of worrying about how much that energy bill will be next month. This training will help by getting clarification on what's needed to know on how to operate and how to maintain and fix when something goes wrong.
104. I wish to finish both Associates of Science and Applied Science degrees. The AS degree is transferable to the University of Arizona where I wish to obtain a bachelor's degree in electrical engineering. The AAS is a two year program called the Energy and Industrial Technician (EIT) through Northland Pioneer College (NPC) and the Northern Arizona Vocational Institute of Technology

(NAVIT). I believe this training will further enhance my knowledge of renewable energy systems and more opportunities of getting hired.

105. To achieve more solar acceptance and usage on our Tribal land through education.
106. "I'm currently a Senior in the Engineering program at Fort Lewis College and will be actively applying to Graduate programs for Electrical Engineering. I strongly believe this added experience will further my career ambitions.
107. Beyond this, I have loftier goals in mind such as creating a machine learning-based solar panel company. Some sort of solar panel that not only tracks the sun based on irradiance, but also temperature and power used to move the solar panel itself. Being more familiar with the mechanical aspects of solar panel installation will give me a better idea of potentially designing these components in the future."
108. More solar homes on the pueblo.
109. Want to be in the management on train others so they can share in the future.
110. My goal is to help family that are in need.
111. My goals are to take care of my family one day and solar is a very good job pay wise. Solar also seems very interesting to me, and I have been wanting to learn about this kind of stuff.
112. To help provide the Navajo nation with solar power.
113. to have my own solar panels and learn how to operate them.
114. Just having the knowledge of solar will help me in the long run of my career!!
115. I currently don't have electricity at my home and have explored with solar at a minimal scale, but it has helped my homestead tremendously and I would like to help my community and my people to enjoy the power of solar as well.
116. There is a Lakota youth development program that would benefit from my training. I also seek to have a career in Solar, and I envision that this training will help me give back to my community.
117. Learn more about solar installation.
118. My goal is to gain all the knowledge in this training so maybe I can come back to my homelands to make a change.
119. I love learning about anything and everything and learning about solar would be big because it can help impact the world in a good way.
120. Let people know it's a clean energy system and there is a way to get power.
121. My goals are to learn and be Proficient in my knowledge of solar systems and instillation on residential and commercial buildings as well as to develop good sales skills.
122. Support energy resources on federal reservations
123. expand solar knowledge to share with others.
124. This training will help me understand what help we can give to our fellow Natives. I want to learn how to do hard work installing solar panels.
125. My goal is to live a sustainable lifestyle that does not depend on fossil fuel production. This training would broaden my knowledge in the energy sector,

invite innovative ideas into my lifestyle and work, and help me be a better advocate for sustainable practices.

126. My goal is to have this experience so if an opportunity presents itself then I will have good experience in this particular field.
127. To build all learning experiences into a possible future career in a new professional environment. Training will not only build respectful work ethic but also steer me onto a path of financial stability and success.
128. My goal is to have my own solar energy and in hopes to encourage others to do so. I envision this training will help me have a better idea of solar education/installation and knowledge. This training will help me to move forward and fulfill my goals.
129. Help teach others.
130. My goals for this job training are to gather more knowledge about building and being able to understand how panels work.
131. Help the community become empowered.
132. My goal is to further the knowledge of the community of solar energy and encourage the establishment of our own solar entity to provide solar energy to all the tribes in the surrounding area.
133. My goal is to help change my family home from being on the grid to being off the grid. Besides getting it installed and that being it, I want to know how to maintain and repair. I also want to have a career in renewable energy.
134. Our goal is to provide those members with renewable energy. This is another step towards that goal.
135. To find a career in the electrical part of the green energy field. Enjoy learning and hands on in this field and looking for a good fit to contribute to the industry.
136. Wanting to just learn new things and new skills. Especially if it involves the betterment of my future and the future of the planet.
137. My goal is to understand the fundamentals and learn the terminology of the solar industry. I have plenty of experience in construction. So maybe the building and installing will be easy for me. What I really want to know is how much Amps/Watts a certain solar panel can produce. Something like how many panels does it take to run a refrigerator or electric water heater.
138. I want to expand my knowledge about solar and use it to help my tribe, also so it can’t be a major steppingstone in my current job and possible future jobs.
139. Wanting to just learn new things and new skills. Especially if it involves the betterment of my future and the future of the planet.
140. My primary goal is to become proficient in understanding the techniques & science involved in solar photovoltaic (PV) systems and attain a working knowledge of the proper installation techniques to provide safe solar electrical energy to a structure.
141. Some of the goals I wish to achieve are having a greater understanding of how the sun powers the grids and learning methods to teach others why solar is environmentally friendly.

142. I would personally like to put solar panels around my future home, so this would be beneficial as well. Of course, it would be nice to make a living installing solar panels for the Navajo People.
143. My goal is to own my own solar installation company and being a resource for my tribe and community. This training will be the foundation of pursuing that goal and helping other tribal members achieve their goal in this field of developing their craft and possibly their own company too. This training would help me stay on the reservation by working with tribal government and others to be resource for solar applications and development on the reservation.
144. Needed hands on training for future exploration.

Appendix 3. GRID Programs Leveraged

GRID utilized significant internal resources in developing the IBT curriculum and adapting it to the exigencies of the unusual pandemic-impacted performance period. As noted in the report body, the unique health-related issues of the pandemic combined with the context-specificity of the trainees and training sites demanded a flexible and adaptive response by GRID's training staff. It was fortunate that GRID staff with several years of experience in the field. Below some of the programs pre-existing at GRID are described; GRID staff drew from these and others in developing the SETO program. The box below highlights GRID's focus on safety as it delivers its trainings.

GRID Tribal Program and the Tribal Solar Accelerator Fund: Growth into the Future

GRID Alternatives' National Tribal Program has worked since 2010 to help tribal communities across the United States achieve their renewable energy goals. Using a community-centric approach, the Tribal Program partners with Tribes to identify, develop, finance, and implement solar power projects that meet community needs. The Tribal Program provides project development and installation services, including design and engineering, procurement, construction of solar systems, and operation and maintenance support. Each project implements GRID's Installation Basics Training (IBT) to facilitate workforce development opportunities for local tribal members. The goal of these solar projects is to build capacity within tribal communities to transition to clean energy, create local job opportunities and solar knowledge, and generate significant cost savings for the community.

In 2018, GRID developed the Tribal Solar Accelerator Fund (TSAF) to provide tribes with access to philanthropic capital through competitive grantmaking and leadership development programs. At its core, TSAF is about more than just regranting; it's about mobilizing and developing tribal solar projects and integrating workforce development and training, nation-building, and strengthening the energy resilience of tribal communities with visions for a clean energy outlook for generations to come. The upfront expenses to install and maintain solar systems are out of reach for many tribal communities, which is why TSAF funding has been critical to each grantee we have supported.

Both tribal-focused and tribal-led programs (National Tribal Program and TSAF) are mission and values aligned, dedicated to building tribal renewable energy capacity, and working to strengthen energy resilience and energy sovereignty. In 2023, the National Tribal Program and the TSAF will be "unifying" to provide a full implementation of programming ranging from fundraising, tribal relationship building, grantmaking, planning, design, workforce development, and installation for federally recognized

tribes.

GRID Tribal Workforce Development:

Tribal focused workforce development (WFD) programs utilize pragmatic and culturally engaging strategies to create and implement sustainable WFD programming for tribal members. Two key areas of tribal WFD are the focus on technical training and tribal energy project management. Our WFD models support tribes in building their own capacity to implement WFD programs and break away from the reliance on outside contractors for installation, training, etc. GRID's key training program; Installation Basics Training (IBT) is designed to develop the skills most relevant to entry-level solar installation jobs and related construction employment fields. IBT focuses on industry-recognized skills, providing trainees with valuable hands-on experience and access to potential employment opportunities. GRID's tribal focused programs facilitate IBT alongside its installations to provide training opportunities to tribal members, increase local solar knowledge, connect participants to potential job opportunities, and expand local capacity for tribally owned/developed renewable energy projects. Our tribal focused programming is working to enhance these offerings and strengthen our IBT curriculum and implementation across the board to increase the impact our WFD is having in tribal communities. To do this, we must continue to grow internal capacity through funding, resourcing, staff training, etc.

The tribal focused leadership programs address the need for renewable energy capacity in tribal communities by providing access to project funding, industry related curriculum, project management training and culturally centered professional development. Our leadership and WFD strategies also include stipend based opportunities through scholarships, experiential learning, and fellowships. The expansion of tribal focused WFD initiatives will include creating funding opportunities for tribal led energy positions, project based research, technical assistance training, and an adaptable tribal renewable energy curriculum toolkit. In doing so we will also need to increase our own internal capacity to oversee quality programming.

CASE STUDY

PRIORITIZING SAFETY FOR TRAINEES AND VOLUNTEERS

GRID Alternatives provides no- to very-low-cost solar power for low-income families while providing hands-on installation experience for job seekers and community volunteers. GRID's installation teams include short-term volunteers as well as interns and full-time staff, and every team member gets thorough safety training before setting foot on a job site. Some of GRID's best practices include:

- ***Safety Orientation*** – Prior to their first day, volunteers participate in a classroom-based safety orientation, which covers topics such as: fall protection, ladder safety, power tool safety, and who to go to at the job site if there is a safety concern.
- ***Morning and Afternoon Safety Talks*** – On the job site, each day begins with a safety talk that goes over what they will be working on that day and any safety concerns they need to be aware of. Both volunteers and staff participate in this talk. A second safety talk occurs after lunch to make sure everyone stays focused. Repetition is important to keep safety at the front of everyone's mind throughout the day.
- ***OSHA and CPR Training*** – Interns and paid staff complete OSHA 10 and CPR certification shortly after beginning their training.
- ***Safety Officer*** – Every job site has a designated safety officer, and volunteers and staff know that they can turn to this person with questions or concerns.
- ***Setting Expectations*** – The safety officers and trainers also help volunteers and new trainees to understand what to expect on the job site. This includes coaching on what to wear, what equipment they should bring vs. what will be provided by GRID, how climate/weather affects the job site, and how to safely interact with others (including an awareness of sexual harassment and how to report it).
- ***Ground Activity for Volunteers Under 18*** – GRID doesn't allow anyone under the age of 18 to work at height (i.e. roof installation), but there are a number of tasks that younger volunteers can learn, including: movement and passing of equipment, conduit bending, system installation, and testing panels.
- ***Liability*** – Every volunteer (or their parent if under 18) signs a liability waiver before starting training. GRID provides volunteer insurance, which is a secondary measure to cover any costs that are not covered by the volunteer's personal medical insurance.

Adding even more value for interns and volunteers, GRID's trainers help work-based learning participants understand how to effectively report their solar experience on their resumes and in job interviews. For example, volunteers learn how to talk about how participating in safety orientation taught them how to adhere to safety standards and policy, to be aware of safety concerns, and how to report accidents, hazards, or risks when they recognize them.

GRID ALTERNATIVES

Appendix 4: Program Design Considerations

"Non-Technical" Training Considerations

The originally-defined goal of the BLR-GRID SETO project was to facilitate the transition of Native Americans and Native American Veterans into the solar industry job market, helping address both the high unemployment within these targeted communities and the need for a skilled workforce in the solar industry through training and job placement assistance.

As the project evolved through the pandemic, the project team began to ask: what are the broader economic development needs in tribal communities and how have they changed with the pandemic? A goal of GRID, BLR, and DOE with the SETO initiative was to create a program with quality, quantity, and access, a program that leads to solar (and related energy) jobs that: 1) pay good wages, provide benefits, and provide well-articulated career ladders and lattices (quality), 2) provide opportunities to replicate and scale (quantity), and 3) ensure that jobs are attainable for people with barriers to employment (access).

As noted in the body of the report, the interviews developed by GRID for the Industry Advisory Group (IAG) highlighted soft skills as the largest gaps in positions of high turnover (includes sales, canvassers, and construction laborers), specifically work readiness, communication (oral and written), and teamwork. This survey also noted that for solar PV installers, the most commonly required/preferred certifications include: OSHA 10/30, NABCEP Associate/Professional, CPR/First Aid. These surveys and additional research assessing solar industry and workforce development needs helped the project team better understand the skills pathways for SETO trainees.

The project team tailored training offerings to offer both hard and soft skills. As a goal of the program is to enhance tribal capacity to develop energy programs, and as soft skills are a clearly defined need for workers (not just at tribes), a focus on soft skill development was seen as critical to address barriers and, in fact, to achieve success with hard skills. Table 1 shows a list of soft skills included alongside the hard skills in SETO:

Table A4-1. Soft and Hard Skills SETO Trainings

Soft/life skills: prepare for work and life. • basic literacy skills (math, English, writing, computer, oral presentation, basic communication skills), • life skills, social and emotional needs, stress/anxiety management, anger management, conflict resolution, etc. • work skills, interviews, work ethic, time management, hygiene, • creativity, problem framing/solving, critical thinking, entrepreneurial thinking, pivoting/flexibility, • leadership, communication, • diversity and sexual harassment training, • money, credit—prioritizing and managing expenses (linking participants to banks that do not charge for checking and savings accounts, access to debt counselors, etc.)
Hard skills: preparing participants for solar and energy jobs. • basic construction trades/manual labor skills training, OSHA safety training certification (harness, safe equipment, basic tools, power tools, forklift certificate, CPR, etc.), • specialized solar job training skills following GRID's established curricula (basic knowledge of electricity basics (electrical principles and common electrical system components), the solar installation process and system components, and • additional energy management skills, including energy auditing (energy efficiency/conservation assessment), energy accounting basics, etc.

Developing Soft Skills

A clear value for tribal members and their tribes of enhancing the hard skills with soft skills is that trainees are better prepared both for solar jobs (and potential solar careers) and for jobs in other sectors as well. Other program components could enhance soft skill development such as internships and on-the-job training opportunities. As an example, a program called "Roots of Success" (rootsofsuccess.org) teaches environmental literacy alongside of soft skills, giving trainees tools to solve environmental problems from the perspective of environmental science, land use planning, public health, and social justice, among other areas.

BLR has experience with career-tech education and culturally responsive workforce

development. We use research to better understand how students and workers lacking in soft skills and presenting with ACEs (adverse childhood experiences and trauma) can develop the needed social and emotional skills through mentoring, culturally responsive trainings, and entrepreneurial skill development that is integrated into workforce training programs. With these types of supports, trainees can gain confidence in navigating the job market.

Mentors. Developing soft skills in SETO trainees requires the intentional use of experienced trainers and mentors. BLR has experience with mentor programs, having developed one of only two mentor-based, culturally-responsive STEM education programs in the United States focused on makerspaces and STEM education (the other is at the Navajo tribe). BLR's K-12 program, called *Pathmakers* (creating pathways to career and college for native youth), relies on mentoring as a key pedagogical tool. Mentors provide models for learner/worker expectations and behaviors; they can be teachers/trainers, tribal members/elders, parents, solar employers, or people in other roles designed to serve SETO trainees. They might be people providing apprenticeships, internships, and job-shadowing opportunities. Regardless, structuring any tribal workforce program should take seriously the opportunity to create a mentor program as part of the offering. Importantly, a mentoring model reflects more traditional educational practices where something to be learned is first modeled and demonstrated, and the learner then practices that activity and reflects on their experience.

As always, context is critical. Situated learning such as that offered by GRID in this program is a well-known educational theory that involves a learner's "peripheral participation" in a community of practice, where new entrants are coached/taught/mentored by experienced practitioners. This approach, in fact, mimics the way indigenous people have tended to teach and learn throughout history, by demonstration, observation, practice, and trial and error. The "situated" aspect is somewhat more challenging in that the situations tend to differ widely. (Thus, the importance of skilled trainers/practitioners who can be attentive to context and who are cultural sensitivity.)

By demonstrating through their own actions the skills necessary to enter and succeed in the workforce, mentors allow trainees to see themselves in those roles and to see the value of the soft skills first-hand. Mentors can be especially crucial for first-generation and marginalized worker populations by providing "empowerment training" that helps build self-worth and confidence. As the National Institutes of Health notes, "At its essence, mentoring is about providing a model for students so they can imagine what

their own life might be like after graduation"[15]

Leveraging Research and Partnerships

The enhanced SETO training components emphasizing soft skills were developed with resources from workforce and economic development partners, including:

1. Tribal and community colleges: curriculum development.
2. Tribal governments: networking and/or job opportunities.
3. Tribal and non-Tribal non-profit organizations: address barriers to employment and help with outreach, recruitment, and curriculum development.
4. Solar and green businesses and industry representatives: help evaluate the market for solar jobs and offer placements for trainees.

Other job training programs, educational institutions, and government agencies (e.g., NREL) can support solar curriculum development. The project team did have conversations with NREL about ways to enhance the capacity of tribes for community solar development (among other things).

Trauma Informed Workforce Development (TIWD). Trauma-informed workforce training programs can play a crucial role in recruiting and retaining Native American trainees by emphasizing:

- Cultural sensitivity: understanding and respect for culture, traditions, and values, including acknowledging historical trauma and the impact it has on individuals and communities.
- A safe and supportive environment with clear boundaries, open communication, and a sense of community. Safe spaces for trainees foster greater participation and reduce potential triggers or retraumatization. A holistic TIWD considers technical skills and trainees' mental, emotional, and physical well-being. As noted in the report body, wrap-around services, wellness activities, mental health resources, and other supportive services can be essential to ensure program success.
- TIWD programs can give trainees a sense of self-efficacy control over their life (both learning and career paths). Providing a range of training options, individualized education plans (IEPs), and opportunities for trainees to contribute their own ideas and partake in the decision-making processes helps them feel

[15]National Institutes of Health, The Science of Mentoring, https://www.ncbi.nlm.nih.gov/books/NBK552775/).

valued. The result is they are more likely to stay engaged with and committed to the program.

- Project staff should be TIWD trained so they have the knowledge and skills to recognize signs of trauma, and to respond appropriately and provide support when needed. With this support system in place, trainees are more likely to feel understood, validated, and connected to their training journey.
- Mentors with similar cultural backgrounds who have navigated similar challenges can provide valuable guidance, support, and encouragement.
- Peer support networks provide a sense of belonging and offer an additional support system where trainees can share experiences, learn from one another, and build camaraderie.
- As noted in the report, follow-up and continuing support in the form of job placement assistance, trainee alumni networks, and access to further education and career development opportunities enhances long-term career growth and smooths the transition into the workforce.

Program Re-Design

The confusion and uncertainty of the early pandemic resulted in considerable research and reflection on project design and whether it worked in the new reality. Workshop structure was considered in this re-design, and considerable team resources were expended as part of this process. As part of this effort, interviews were conducted with a working group consisting of:

- BLR staff: Jason Ramos, Jana Ganion, Alison Robbins, Marlee Mansfield, focusing on BLR solar and solar workforce development strategies.
- GRID personnel: Tim Willink, Berlyn Hubler, Emily Struzenberg, Cora Saxton, Alisha Pegan, Lisa Castilones, Cindy Corrales. The focus of these conversations was related to training on tribal lands, and the factors most important to consider (these are addressed in the main report).
- Karin Wadsack and Sherry Stout, NREL. Our conversations with these federal energy professionals with tribal experience helped inform both GRID training and BLR workshop content.
- Piper Wilder, 60 Hertz Energy (private business). Informed trauma-informed practices for workforce development. 60 Hertz works in energy installation and O&M in largely off-grid, distributed, rural and remote Alaskan tribal settlements.
- Xubi Wilson, Sante Fe Community College. Discussed workforce needs and skills.
- Stephen Tsoodle, Spokane Indian Housing Authority: Discussed workforce needs and skills.

Based on these interviews we clarified the importance of identifying *trackable* factors that lead to progress in individual and tribal workforce development (with a particular

focus on solar workforce development). Identifying these factors would help customize training to better meet individual, training cohort, and tribal needs. Additionally, these interviews sought to identify: 1) other research on individual development factors to inform curriculum content, trainee screening and tracking, and related program evaluation factors, and 2) path-forward indicators (PFI) and individual path (IP) tracking.

We also leveraged the results of the GRID trainee survey (Appendix 2 above) as we developed mid-course changes to the program outreach and delivery efforts.

One of our expert interviews was with Lisa Castilones (December 2020) from GRID's Inland Empire office provided insightful information. Castilones notes that in a survey of solar employers they conducted in 2018, 60% identified not being able to access a sufficient pool of qualified candidates as a challenge, and nearly 40% said that employees who do not have the required work experience is a challenge. Castilone's office serves seven tribes, and she had several reflections about solar install programs (including the SETO project) on tribal lands:

- these installations are often the first renewable energy tribes have seen
- for their office, the subcontractor partnership program (SPP) has been key to completing projects:
    - find local licensed contractors and sub-out jobs,
    - subs have to hire trainees from the pool that GRID trains (roof team, ground team, etc.),
    - everybody gets paid, and can maybe work their way on to a crew
- barriers to success:
    - systemic problems with drugs and alcohol,
    - the workforce model was thought of as a pathway out, but transportation (getting to a job site) and the short time-span of work make it more difficult to create lasting changes,
        - basically, just hard to get people to come out and train even with dangling the carrot of pay and/or a guaranteed job,
    - getting people to get up on time→apathy.
        - "this has always been a problem finding people but women have traditionally stepped up,"
    - Trust issue is there in the beginning, but it can be developed for the program-level.

Because solar can be a new concept for many people old enough to enter the workforce, many workforce development programs are creating pipelines that reach back to children at a very early stage in their education. These much longer-term programs help plant the seed. Tribal (and non-tribal) youth are familiar with what they are regularly exposed to on or off the reservation. As solar power and careers in solar may be something completely new to them, it might be helpful to provide examples

(during trainings) of other tribes and communities doing this work, of the people doing this work (if local, even better), and to discuss the practical outcomes (wages, careers, etc.) that can come with creating a future in solar energy.

Nativization

Research on workforce "Nativization"[16] hiring, developing, and retaining Native Americans to replace nontribal workers, and creating jobs on or near reservations, to improve tribal welfare. To do this it is important to identify tribal members' educational and workforce needs and work to meet them with career training programs tailored to each tribal community's needs. Education/training is often needed to find jobs or to be promoted. As Ahmed Al-Asfour, chair of the Business Department at Oglala Lakota College, notes:

> The aim of many Native nations in the United States is to secure their status as sovereign entities. In addition, tribes want to make sure that their community needs are met, educationally, culturally, traditionally, financially, and so forth. Educating tribal members is the cornerstone in achieving these goals. Nativization means that tribal members would have the skills needed to occupy almost all the employment opportunities within their community. This cannot be accomplished without setting goals, finding the skills and training needed, and providing those skills and training to local community members.
>
> Unemployment is a challenge for many Native nations. We need to move ahead and see this challenge as an opportunity to rebuild tribal communities educationally by providing formal and informal training, and by meeting the developmental needs of tribal members. This starts with leadership from educational institutions such as TCUs. For this challenge to become something of the past, TCUs, tribal members, and all stakeholders need to work in tandem to achieve the Nativization of the workforce.

Wrap-Around Services

Wraparound support services are comprehensive case management services provided by trained counselors or social workers. These services are critical for supporting people who face barriers to employment. Counselors develop individualized plans

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[16] The Nativization of the Tribal Workforce: A Vision for the Future, Volume 29, No. 3 - Spring 2018 Ahmed Al-Asfour. . https://tribalcollegejournal.org/nativization-tribal-workforce-vision-future/).

based on an assessment of a full range of needs, such as childcare, transportation, housing, mental health, physical health, financial stability, and educational achievement. Counselors will often work with an individual's family members to involve them as part of the wraparound plan. And counselors will meet regularly and frequently with individuals to ensure progress and follow-through.

Wraparound services can be instrumental for success as students go through a training program.[17] And they are equally important for graduates as they find jobs and adjust to the realities and challenges of employment. As graduates begin working, the job-training program should continue to provide case management and retention support to keep track of graduates' status. Maintaining relationships with graduates enables the program to refer graduates to community service providers as needed. Data tracking makes it possible to evaluate a program's long-term effectiveness. In addition, strong case management increases the chances of an employer's willingness to hire a graduate. Having a liaison from the job-training program (in most cases, a job developer or trainer) who builds relationships with the employers is a strong practice to consider.

The Role of the Federal Government in Tribal Workforce Development

Placing tribal self-determination at the heart of tribal workforce development was codified when Congress passed the Workforce Innovation and Opportunity Act (WIOA) in 2014.[18] In the Act, Congress asserted (as it has repeatedly in legislation dating to 1973) that among the purposes of the Section 166 programs "is to support employment and training activities for Indian, Alaska Native, and Native Hawaiian individuals in order to…promote the economic and social development of Indian, Alaska Native, and Native Hawaiian communities in accordance with the goals and values of such communities."

The Citizen Potawatomi Nation (CPN)[19] took full ownership of the workforce development programs serving its citizens and other local Native people in 1996. As

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[17] 1) https://www.ellabakercenter.org/sites/default/files/downloads/making-green-work.pdf, 2) https://www.americansolarworkforce.org/wp-content/uploads/2018/09/FINAL_Strategies-for-Solar-Workforce-Development-TOOLKIT.pdf, 3) https://www.cde.ca.gov/ci/ct/gi/guidingpps.asp

[18] National Congress of American Indians. Empowering Tribal Workforce Development: Indian Country's Policy Recommendations for the Federal Government (Version 2.0). Washington, DC: National Congress of American Indians. February 2020.

[19] https://www.ncai.org/ptg/workforce-development-cpn; https://www.youtube.com/watch?v=EUc1Bz-dbo8

CPN explains, moving its people towards self-sufficiency starts with "understanding your own tribe's distinct needs, the needs of your people, which is something that a federal, uniform approach to workforce development can't possibly account for."

Margaret Zientek, CPN's Workforce and Social Services Director, notes that the key is to design what works for the tribe:

> "If that kid is in grade school you start teaching them about soft skills. You're working with them to get their GED, to become future leaders. Our tribe did the Potawatomie Leadership Program (PLP). PLP is a work experience program. Education in a work specific area. Live in a house for several weeks over the summer. The newest innovation is an internship program. Training position partnered with 477. Get a job, get an education in a specific program area—get in that area (roads, engineering, health, etc.) and learn it. House them, pay them, get money to use toward college. Then they go off and come back and work for the tribe."[20]

Zientek was asked: What is the appropriate role of the federal government?

> "Let us have funds and let us do what's appropriate. Don't micromanage. "The way it's done" is not always right. Get on the same page and recognize you're working with a sovereign government—Government to Government."

Self-Determination and the Federal Government's Role

Tribal self-determination/self-governance through workforce development. Modifying one-size-fits-all programs. As one TCU President noted: "Flexibility works – enabling tribes to do what we're good at doing. We know our problems intimately. We also know the solutions."[21] The appropriate role of the federal government in tribal workforce development, according to the NCAI, is to provide tribal nations, Native organizations, and TCUs with the governance freedom, programmatic flexibility, training and technical assistance, and resources needed to design and implement strategies capable of advancing the distinct workforce development priorities of the specific tribal communities that they serve. The Federal government can enhance and support of tribal workforce development needs of smaller, remote, and resource-strapped tribal communities and Native people living outside of reservations:

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[20]http://www.ncai.org/ptg/workforce-development-cpn.

[21]"Empowering Tribal Workforce Development: Indian Country's Policy Recommendations for the Federal Government." https://www.ncai.org/NCAI_PTG_Empowering_Tribal_Workforce_Development_Brief_10-3-16.pdf

- Establish regional workforce training centers for tribal nations and communities.
- Support the creation of regional institutes serving multiple tribal nations that would teach tribal leaders and workforce development practitioners about innovative tribal approaches to the provision of workforce development and related services. TCUs would be appropriate hosts for such regional institutes.
- Explore developing a partnership between DOL and HUD to provide temporary housing to Native people who must travel great distances from home to participate in workforce training programs, or who are participating in training programs where housing is very limited.

According to *Empowering Tribal Workforce Development Indian Country's Policy Recommendations for the Federal Government* (October 2016; National Congress of American Indians), the role of federal government is to:

> identify and remove the obstacles that currently obstruct tribal innovation and create new opportunities for tribal ingenuity to take root and flourish. . . . to endow its systems, processes, programs, and funding protocols with the ease and adaptability that tribal nations and communities have shown that they need to effectively build their human capacity in accordance with their cultural values and in furtherance of their community and economic development goals. "It's about letting tribes be tribes and doing things in a tribal way."

According to Norm DeWeaver, "Every reservation is different. Even the most common problems may be present in different ways or may be completely absent in many reservation communities"[22] As DeWeaver explains, "With jobs scarce and many too discouraged to look for work or facing barriers that keep them out of the workforce, a significant portion of Native people are not counted in the official unemployment rate at all. They become invisible in the unemployment numbers, showing up in the data as simply 'not in the labor force.' The idea of 'actively seeking work' has been an essential element in the definition of unemployment in the federal statistical system for the past 75 years. However, it is rather nonsensical from a reservation perspective."[23]

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[22] DeWeaver, Norm. "Indian Workers and the Reservation Labor Market: Reality, Research, and a Way Forward." Wyoming Labor Market Information, Wyoming Department of Workforce Services, August 2014, p. 3; https://doe.state.wy.us/lmi/LAUS/LM-dynamics-inreservation-areas-9-1-14.pdf, accessed February 3, 2017).

[23] DeWeaver, Norm. "Tribes and the Census: Severe Disadvantage Persists Among the Native Population." December 13, 2007, p. 3)

National Congress of American Indians (NCAI)

The workgroup research identified a significant body of underutilized workforce development research that has been conducted by the National Congress for American Indians. NCAI research steadfastly rejects one-size-fits-all training approaches, instead urging targeted programs customized to the needs of specific tribes and tribal members.

NCAI's research illuminates three targeted solutions that: 1) serve groups (youth, single mothers, former felons, etc.) by "neutralizing" specific workforce challenges, 2) build skills and expertise that address critical needs and advance long-range priorities, and 3) 3) identify the structural trouble spots that inhibit workforce development/growth and design structural interventions to tackle them. NCAI's workforce development research seeks to develop comprehensive workforce development strategies that flow from assessment-informed understanding of people, their needs and aspirations, and their nation's needs and priorities.

NCAI: Important to Start Young

One tribal nation created a summer "pre-employment" training program for tribal youth ages 13-15 that promotes the development of personal accountability, work ethic, and "pride in community." The program was a "hands-on" initiative encourages participants to stay in school by teaching them a "multitude of transferable skills they can apply to later employment" for the nation or elsewhere. This nation is among many who are realizing that if they are to develop their human capacity to create brighter futures of their own design, then they need to start young. Taking action, they are developing "first-chance" academic and workforce preparedness programs that target youth at an early age, providing them chances to: explore different careers (and the hard work involved with building them); cultivate their desire, confidence, and ability to pursue them; and deepen their appreciation of their role as citizens of their nations – and contributors to their nations' futures. These initiatives (internships, fellowships, summer camps, job shadowing, etc.) help to raise tribal nations' expectations of their young people, heighten young people's expectations of themselves, and support young people as they strive to meet those expectations.

> NCAI: One-size-fits-all approaches don't work well for tribal nations given their distinct challenges and objectives. Tribal nations are finding success when they take the reins and develop targeted solutions customized to their needs and their people, from youth to mid-career professionals to aspiring citizen entrepreneurs.

Overarching goal: build tribal sovereignty with strengthened workforces and renewable energy.

Specific goal: develop solar workforce capacity of tribes by training tribal members (with

a focus on veterans) in solar installation skills and additional work-related competencies.

Program design: recruit trainees from a diversity of tribes and provide both n-class and hands-on training that addresses gaps in solar installation knowledge, and that addresses identified gaps in work-related competencies.

Issues:

- Working with a diverse collection of tribal members who each bring unique strengths and needs to the training.
- Understanding the training as existing as an intermediate tick mark on a pipeline from pre-training to post-training. This suggests the need to assess trainee age, education level, work experience, individual and social factors (e.g., trauma-related), and to follow-up post-training with job placement assistance or through other means.

NCAI: Coeur d'Alene Tribe (CDA) In the mid 2000s, many CDA members faced an "educational achievement gap" that inhibited their ability to enter and advance in the workforce. In response, CDA decision makers created the Tribe's "Education Pipeline," a holistic approach fusing education with workforce development. Key to the Pipeline's success – which has proven effective in closing CDA's educational gap – is its commitment to own its own data. Whereas before much of the data CDA collected was based on someone else's criteria and for someone else's benefit (i.e., the federal government), today CDA's Department of Education (DOE) occupies the driver's seat, ensuring that it's learning what it needs to develop solutions customized to tribal members' particular needs and the Tribe's priorities.

The CDA-DOE tracks the status and progress of all members from pre-school through Ph.D., from where they are being schooled to the specific support programs they rely on, and it now asks new and different questions through its data collection processes. Recognizing the data needs strengthening the Pipeline will entail, CDA-DOE is partnering with area universities to cultivate degree-bearing "research cohorts" of CDA members who can build its research capacity over time.

NCAI: What data should we be tracking/monitoring?

NCAI: "For tribal nations to develop effective local workforce development approaches, they need to drive the data that informs them. Since they know their own communities and conditions best, they are best positioned to collect the data and assess what it means for them. Because it's their people and futures at stake, they know the right questions to ask – questions that outsiders wouldn't think to pose. Leading in this way

also enables them “to incorporate cultural, contextual, and political concerns in program evaluation,” and it enhances “self-determination over program activities” (https://www.ncai.org/ptg/WDEV_TOOLKIT.pdf).

For example, tribal nations can create a strong system of incentives (financial support for education, hiring preference, competitive wages, housing, etc.) aimed at keeping tribal citizens at home or attracting them back home. They can take it one targeted step further by supporting tribal citizens in obtaining degrees, certifications, and skills in critical fields and then directly channeling those individuals into specific positions working in tribal government or businesses where they apply what they’ve learned on their nations’ behalf. Doing so not only strengthens tribal nations’ ability to leverage their human capacity in targeted ways that address community needs and advance their nation-building priorities, but it also enables more tribal citizens to participate in culture and community, enriching and strengthening them over time (NCAI).

Integrating the training program with a variety of tribal-level program goals—in other words, how can the efforts of the SETO training be leveraged into either existing or proposed programming at the tribal level (e.g., trainees working within the tribe as “solar ambassadors,” teaching tribal members about solar power). As NCAI notes:

> It also demands that tribal nations not get distracted by the symptoms these obstacles produce, but instead target their root causes. For example, if a program client is routinely late for training or work, it may not be the result of poor work ethic. It may instead be due to a lack of reliable transportation, childcare, or any number of other factors. Each person’s story and set of challenges is different, requiring a customized solution that empowers that person to overcome them.

Consequently, tribal nations must develop flexible workforce development approaches that provide their people multiple pathways to reach their chosen career destinations at a pace they can handle. These approaches must acknowledge that for many, the challenge is not just learning how to do a specific job, but how to work – and how to live. As one workforce development practitioner explains, ultimately it’s “helping people get healthy to deal with opportunity.”

Appendix 5. Web Resources Compiled on Tribal Energy Development

Below is a collection of web-sites accessed during the project period, organized into three areas: 1) Social and Cultural Factors, 2) System Basics, and 3) System Planning and Management.

Social and Cultural Factors

1. A Trauma-Informed Approach for Youth and the Workforce System, https://www.workforcegps.org/events/2018/02/22/18/28/Our-Journey-Together-A-Trauma-Informed-Approach-for-Youth-and-the-Workforce-System
2. Adoption of Trauma Informed Practices Learning Community, https://www.thenationalcouncil.org/webinars/adoption-of-trauma-informed-practices-learning-community-webinar-1-workforce-development/
3. Advancing Future Leaders Through STEM, https://www.energy.gov/indianenergy/downloads/2018-tribal-energy-january-webinar-office-indian-energy-advancing-future
4. Are we in control of our decision? https://www.youtube.com/watch?v=9X68dm92HVI
5. Bringing energy independence to Indian Country, https://www.indianz.com/News/2019/05/02/native-renewables-powering-up-tribal.asp#:~:text=An%20organization%20focused%20on%20increasing,new%20opportunities%20to%20tribal%20communities.&text=There's%20something%20amiss%20in%20the,live%20in%20homes%20without%20electricity
6. Building a Trauma Informed Workforce, https://www.seaetc.com/wp-content/uploads/2020/06/20200617-There-Is-No-Time-Like-Now-To-Build-a-Trauma-Informed-Workforce.pdf
7. Building the Human Capacity to Rebuild Tribal Nations, https://www.ncai.org/ptg/workforce-development
8. Building Tribal Youth Resiliency, https://www.youtube.com/watch?v=FQ616X5gS5A&feature=youtu.be
9. Career Pathways Planner, https://lincs.ed.gov/publications/topic/mpf/TACP_Planner_for_OCTAE_ADA.PDF
10. Career Pathways Toolkit, https://www.spra.com/wordpress2/wp-content/uploads/2017/11/CareerPathwaysToolkit2011.pdf
11. Coeur d'Alene Workforce Development, https://www.ncai.org/ptg/workforce-development-coeur-dalene
12. Confederated Salish and Kootenai Tribes, https://www.ncai.org/ptg/workforce-development-cskt
13. Decolonization Not Inclusion, https://journals.sagepub.com/doi/10.1177/2332649215615889

14. Digital Storytelling 101, https://www.youtube.com/watch?v=Tslr91gurY8&feature=youtu.be
15. Empowering Tribal Workforce Development, https://www.ncai.org/NCAI_PTG_Empowering_Tribal_Workforce_Development_Brief_10-3-16.pdf
16. Energy and Economic Success Studies, https://www.energy.gov/indianenergy/downloads/2016-tribal-energy-and-economic-development-november-webinar-energy-and
17. Forest County Potawatomi Community Energy Program, https://www.energy.gov/sites/prod/files/2016/06/f33/FCPC-Drescher_0629.pdf
18. Gila River Indian Community Workforce Development, https://www.ncai.org/ptg/workforce-development-gila-river
19. GRID Alternatives Tribal Program, https://gridalternatives.org/what-we-do/tribal-program
20. GRID Alternatives, https://www.energy.gov/sites/prod/files/2016/08/f33/grid-alternatives.pdf
21. Helping Native Americans achieve energy independence, https://phys.org/news/2014-06-native-americans-energy-independence.html
22. How Personalized Learning Unlocks Student Success, https://er.educause.edu/articles/2016/3/how-personalized-learning-unlocks-student-success
23. Identifying Barriers and Pathways for Energy Development, https://www.energy.gov/sites/prod/files/2017/05/f34/Sandia_Report_2016-311J.pdf
24. Jobs and Economic Development from Tribal Energy Projects, https://www.energy.gov/indianenergy/downloads/june-2019-tribal-energy-webinar-jobs-and-economic-development-tribal-energy
25. Looking Back and Moving Forward, https://www.energy.gov/indianenergy/downloads/2017-expanding-tribal-energy-development-february-webinar-indian-energy
26. Low-Income Solar Policy Guide, https://www.lowincomesolar.org/best-practices/workforce-development-district-of-columbia/
27. Making Green Work, https://www.ellabakercenter.org/sites/default/files/downloads/making-green-work.pdf
28. Myths and Realities of Tribal Sovereignty, https://scholar.harvard.edu/files/jsinger/files/myths_realities.pdf
29. Occupational Dissimilarity between Native and White Workforce, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6424522/
30. Philadelphia Workforce Strategy, https://www.phila.gov/media/20180205133517/FUELINGPHILADELPHIASTALENTENGINGE_FULLSTRATEGY.pdf
31. Settler Colonial Power and the American Indian Sovereignty Movement, https://www.jstor.org/stable/10.1086/662708?seq=1

32. Settler colonialism and the elimination of the native, https://www.tandfonline.com/doi/pdf/10.1080/14623520601056240
33. Settler Colonialism as Structure, https://www.asanet.org/sites/default/files/savvy/journals/SRE/Jan15SREFeature.pdf
34. Solar Futures Program, https://gridalternatives.org/what-we-do/workforce-development/solar-futures
35. Solar Workforce Development, https://americansolarworkforce.org/solar-workforce-development/
36. Strategies for Solar Workforce Development Toolkit, https://www.americansolarworkforce.org/wp-content/uploads/2018/09/FINAL_Strategies-for-Solar-Workforce-Development-TOOLKIT.pdf
37. Strengthening Tribal Communities, Sustaining Future Generations, https://www.energy.gov/sites/prod/files/2017/09/f36/DOE-IE-brochure_0917.pdf
38. Student Career Pathway Handbook, http://www.nemcc.edu/wp-content/uploads/2015/08/Student-Handbook-1.pdf
39. Targeted programs and career pathways, https://files.eric.ed.gov/fulltext/ED556036.pdf
40. The Key to Workforce Development Success, https://www.youtube.com/watch?app=desktop&v=RY4xbH3cH9U
41. There is No Time Like Now to Build a Trauma Informed Workforce, https://www.seaetc.com/webinar-there-is-no-time-like-now-to-build-a-trauma-informed-workforce/
42. There is No Time Like Now to Build a Trauma Informed Workforce, https://www.seaetc.com/wp-content/uploads/2020/06/20200617-There-Is-No-Time-Like-Now-To-Build-a-Trauma-Informed-Workforce.pdf
43. Tribal Clean Energy for Sovereignty and Economic Development, https://www.energy.gov/sites/prod/files/2016/06/f33/Lowder-Tribal-Clean_0629.pdf
44. Tribal Energy Success Stories, https://www.energy.gov/indianenergy/downloads/2020-tribal-energy-webinar-series-tribal-energy-success-stories
45. Tribal Workforce Development Decision-Framing Toolkit, https://www.ncai.org/ptg/WDEV_TOOLKIT.pdf
46. Tribal Workforce Development Decision-Framing Toolkit, https://www.youtube.com/watch?app=desktop&v=YvcKKgapLTg
47. Tribal Workforce Development Toolkit, https://www.youtube.com/watch?app=desktop&v=IUXMeASk68c
48. Tribes Working Together, https://www.energy.gov/indianenergy/downloads/2017-expanding-tribal-energy-development-october-webinar-tribes-working
49. UNDP Jobs, https://jobs.undp.org/cj_view_jobs.cfm?is_consult=1
50. Workforce Development Innovation: Success Stories, https://www.youtube.com/watch?v=yjoEBvNyKOU&feature=youtu.be

51. Workforce Development Webinar and Video Series, https://www.youtube.com/watch?v=v55qf2SMPUM&list=PLBjQrzrj0IyshzCqxlBiNXY4L2PgtKZlY&index=12
52. Workforce Pathways Guiding Policy Principles, https://www.cde.ca.gov/ci/ct/gi/guidingpps.asp
53. Ysleta del Sur Pueblo Workforce Development, https://www.ncai.org/ptg/workforce-development/ydsp

System Basics

1. Behind-the-Meter Projects, https://www.energy.gov/indianenergy/downloads/2020-tribal-energy-webinar-series-behind-meter-projects
2. Building Blocks for Distributed PV Deployment, https://cleanenergysolutions.org/sites/default/files/documents/2018-05-23-transcript.pdf
3. Building Blocks for Distributed PV Deployment, https://cleanenergysolutions.org/sites/default/files/documents/cesc_building-blocks-for-distributed-pv-deployment-part-2-interconnection-and-public-policy_05.23.2018.pdf
4. DC Coupled Solar Plus Storage, https://microgridknowledge.com/white-paper/solar-plus-storage/
5. Distributed Energy Tech Trends and Costs, https://www.energy.gov/indianenergy/downloads/2018-tribal-energy-october-webinar-distributed-energy-technology-trends-and
6. Energy Consideration of New Tribal Buildings, https://www.energy.gov/indianenergy/downloads/july-2019-tribal-energy-webinar-energy-considerations-when-designing-and
7. Energy Efficiency Basics, https://www.energy.gov/indianenergy/downloads/february-2020-tribal-energy-webinar-series-energy-efficiency-basics
8. Energy Modernization Through Microgrids, https://microgridknowledge.com/white-paper/energy-modernization-through-microgrids/
9. Fundamentals of the Tribal Energy Industry , https://www.energy.gov/indianenergy/downloads/april-2019-tribal-energy-webinar-fundamentals-tribal-energy-industry
10. Geospatial Analysis of Renewable Energy Technical Potential on Tribal Lands, https://www.nrel.gov/docs/fy13osti/56641.pdf
11. NABCEP, https://coursecatalog.nabcep.org/
12. NABCEP, https://coursecatalog.nabcep.org/
13. NREL Support for State, Local, and Tribal Governments, including the data tool, https://www.nrel.gov/state-local-tribal/decision-support-tribes.html; www.nrel.gov/state-local-tribal/data-tools.html
14. NREL Support for State, Local, and Tribal Governments, including the data tool,

https://www.nrel.gov/state-local-tribal/decision-support-tribes.html; www.nrel.gov/state-local-tribal/data-tools.html
15. Powering Your Community with Tribal Energy, https://www.energy.gov/indianenergy/downloads/2017-expanding-tribal-energy-development-august-webinar-powering-your
16. SEI online courses and workshops, some free some not, as well as more in depth certification programs, www.solarenergy.org
17. SEI online courses and workshops, some free some not, as well as more in depth certification programs, www.solarenergy.org
18. Solairgen online classes that can lead to certification; offer an online design and installation course that leads to an installer certification test, www.solairgen.com/california/
19. Solairgen online classes that can lead to certification; offer an online design and installation course that leads to an installer certification test, www.solairgen.com/california/
20. Spending Energy Dollars Wisely, https://www.energy.gov/indianenergy/downloads/2017-expanding-tribal-energy-development-may-webinar-spending-energy-dollars
21. Techno-Economic Renewable Energy Potential on Tribal Lands, https://www.nrel.gov/docs/fy18osti/70807.pdf
22. Transmission and Grid Basics for Tribal Economic and Energy Development, https://www.energy.gov/sites/prod/files/2016/04/f30/IntroMarchwebinar.pdf
23. Tribal Energy Technology Options, https://www.energy.gov/indianenergy/downloads/may-tribal-energy-webinar-series-tribal-energy-project-technology-options
24. Tribal Microgrid Case Studies, https://www.energy.gov/indianenergy/downloads/2018-tribal-energy-november-webinar-tribal-microgrid-case-studies
25. Tribal Microgrids, Energy Storage, and Resilience, https://www.energy.gov/indianenergy/downloads/2019-tribal-energy-webinar-series-tribal-microgrids-energy-storage-and
26. Tribal Microgrids: Why and How, https://www.energy.gov/indianenergy/downloads/2020-tribal-energy-webinar-series-tribal-microgrids-exploring-why-and-how
27. Understanding the Power Grid and Organized Markets, https://www.energy.gov/indianenergy/downloads/2018-tribal-energy-may-webinar-understanding-power-grid-and-organized-markets

System Planning and Management

1. Advancing Strategic Energy Partnerships, https://www.energy.gov/indianenergy/downloads/2017-expanding-tribal-energy-development-march-webinar-federal-and-state
2. Assessing Capital for Tribal Energy and Economic Development,

https://www.energy.gov/sites/prod/files/2016/12/f34/Octoberintroslides.pdf
3. Best Practices in Tribal Energy Business Models, https://www.energy.gov/indianenergy/downloads/2018-tribal-energy-april-webinar-best-practices-tribal-energy-business-models
4. Building Capacity and Collaboration for Energy Resilience, https://www.nrel.gov/news/program/2019/qa-sherry-stout-building-capacity-for-energy-resilience.html
5. Current Funding Opportunities, https://www.energy.gov/indianenergy/funding/current-funding-opportunities
6. Developing Clean Energy Projects on Tribal Lands, https://www.nrel.gov/docs/fy13osti/57748.pdf
7. Developing Your Energy Vision, https://www.energy.gov/indianenergy/downloads/april-tribal-energy-webinar-series-developing-your-energy-vision
8. DOE Office of Indican Energy, https://www.energy.gov/indianenergy/funding; https://www.energy.gov/indianenergy/energy-development-assistance-tool; https://www.energy.gov/indianenergy/technical-assistance
9. Economic Market Potential on Tribal Lands, https://www.energy.gov/indianenergy/downloads/2017-expanding-tribal-energy-development-december-webinar-economic-market
10. EDA grant funding, https://www.grants.gov/web/grants/view-opportunity.html?oppId=290874
11. Effective Tribal Project Partnerships, https://www.energy.gov/indianenergy/downloads/2017-expanding-tribal-energy-development-july-webinar-effective-tribal
12. Energy Decision Support, https://www.nrel.gov/state-local-tribal/decision-support-tribes.html
13. Energy Efficiency Projects, https://www.energy.gov/indianenergy/downloads/march-tribal-energy-webinar-series-energy-efficiency-projects-concept
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15. Energy Planning, www.energy.gov/sites/prod/files/2016/03/f30/leslie_01_Energy%20Planning.pdf
16. Engineer Helps Tribes, Alaskan Villages Find Energy Solutions, https://www.nrel.gov/news/features/2019/call-sherry-engineer-helps-tribes-alaskan-villages-find-energy-solutions.html
17. Essential Tribal and Utility Relationships, https://www.energy.gov/indianenergy/downloads/2017-expanding-tribal-energy-development-november-webinar-essential-tribal
18. Facility and Community Scale Project Development, https://www.energy.gov/indianenergy/downloads/2018-tribal-energy-september-webinar-facility-and-community-scale-project
19. Federal Resources and Collaboration Supporting Indian Energy Development, https://www.energy.gov/indianenergy/downloads/2019-tribal-energy-webinar-series-federal-resources-and-collaboration
20. Five-Step Process for Tribal Energy Project Development, https://www.energy.gov/sites/prod/files/2016/08/f33/Doris-five-step-overview.pdf
21. Fundamentals of Organized Energy Markets for Tribes, https://www.energy.gov/indianenergy/downloads/2017-expanding-tribal-energy-development-september-webinar-fundamentals
22. How to Create Partnerships to Advance Tribal Energy Projects,

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36. Steps Toward Tribal Community Energy Future, https://www.energy.gov/indianenergy/downloads/2018-tribal-energy-february-webinar-steps-toward-your-tribal-community-energy
37. Strategic Energy Planning for Tribal Governments, https://www.energy.gov/sites/prod/files/2016/08/f33/Haukaas-Rosebud.pdf
38. Strategic Partnerships for Clean Energy and Economic Development , https://www.energy.gov/sites/prod/files/2016/10/f33/strategic-partnerships.pdf
39. Strategic Partnerships for Clean Energy and Economic Development, https://www.energy.gov/sites/prod/files/2016/10/f33/blue-lake-hsu.pdf
40. Strategic Partnerships for Clean Energy and Economic Development, https://www.energy.gov/sites/prod/files/2016/10/f33/front-back-slides.pdf
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https://www.energy.gov/sites/prod/files/2016/05/f31/maccourt-understanding-energy-policy.pdf
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47. USDA Rural Development, https://www.rd.usda.gov/programs-services/community-facilities-direct-loan-grant-program; https://www.rd.usda.gov/programs-services/rural-energy-america-program-energy-audit-renewable-energy-development-assistance; https://www.rd.usda.gov/programs-services/rural-business-development-grants; https://www.rd.usda.gov/programs-services/rural-community-development-initiative-grants
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