STRATEGIES FOR SOLAR WORKFORCE DEVELOPMENT
A TOOLKIT FOR THE SOLAR INDUSTRY
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For technical questions about the report, please contact: Chris Walker, The Solar Foundation, Senior Project Manager, cwalker@solarfound.org.

For press and media inquiries, please contact: Avery Palmer, The Solar Foundation, Communications Director, apalmer@solarfound.org, 202-866-0908.

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EXECUTIVE SUMMARY

Accelerated industry expansion has nearly tripled U.S. solar employment since 2010, according to The Solar Foundation’s latest National Solar Jobs Census. Today, over a quarter million Americans work in solar jobs, but recruiting and hiring qualified workers remains a priority and a challenge for the industry. The Solar Training Network strives to improve understanding of the national solar jobs landscape, and lays the groundwork for a better qualified, more diverse and better connected solar workforce.

This toolkit draws upon two years of Solar Training Network engagements with employers, trainers, industry associations and community organizations in diverse solar markets. It presents a collection of key solar workforce insights and provides actionable steps to leverage workforce challenges as opportunities to steer growth and development. Centered around themes of workforce development and work-based learning, the toolkit describes scalable and industry-driven solutions to better align training with evolving workforce needs.

Illustrated by case studies and informed by best practices, the toolkit provides the industry - particularly employers - with tools to access existing networks and resources to establish effective partnerships supporting strong and diverse regional talent pipelines. From designing robust career pathways to tapping into business support services, the first section outlines ways to integrate solar into the public workforce development system. The second section explores key considerations for employers to overcome real or perceived challenges and implement work-based learning models to invest in the skillsets of current and future workers.

This document, rather than providing an exhaustive set of solutions, is intended to start conversations among employers, with engagement from all stakeholders. The implementation guide and action plan promote collaborative, regional and adaptive strategies as markets evolve and solar continues to grow as a mainstream part of the American energy sector.
HOW TO USE THIS TOOLKIT

Throughout this toolkit, you’ll see a variety of callout boxes that provide additional information on each topic and help you incorporate these ideas into your own practices.

The question mark symbols indicate that the callout box explains key terms and ideas about workforce development, such as career pathways.

The magnifying glass symbol highlights a case study from the Solar Training Network, an employer, or another affiliate. These studies help to demonstrate how important concepts can be practically applied.

The information symbol describes a resource to make workforce development strategies easier to implement.

The quote symbol highlights a direct insight from a solar employer or affiliate.
PART 1: THE WORKFORCE DEVELOPMENT SYSTEM

LEVERAGING NETWORKS AND RESOURCES
INTRODUCTION

A decade of accelerated industry growth and rapid expansion of the solar jobs market has challenged the solar workforce to keep pace with demand. From 2010 to 2017, the number of American solar jobs grew by 168%, and despite temporary slowdowns, this growth is expected to continue over the long run. The majority of solar employers nationwide, across all industry sectors, continue to say they have difficulty finding and retaining qualified candidates.1,2

There is a clear need for solar businesses to engage with each other and other workforce development stakeholders to better align education with regional job markets, streamline training and hiring practices, and increase public awareness of diverse solar career opportunities. The workforce development system is made up of public and private partners collaborating to solve the talent shortage many businesses are facing. Through regional partnerships among education and training partners, community-based organizations and local boards, the workforce development system can support the industry in creating dedicated workforce pipelines for improved talent attraction, development and retention.

Informed by insight from diverse industry stakeholders, The Workforce Development System: Leveraging Networks and Resources provides solar businesses with resources to more effectively leverage underutilized resources including the public workforce system. From designing robust career pathways to accessing business support services, this toolkit outlines actionable steps that employers can take to better manage their current and emerging workforce needs.

THE BUSINESS CASE FOR WORKFORCE DEVELOPMENT

Solar businesses can benefit from engaging the public workforce system in their day-to-day operations in a variety of ways, as this toolkit will demonstrate. Keeping an eye on recruiting, training, and advancing the workforce even when fully staffed can help businesses bolster the bottom line.

1: THE WORKFORCE DEVELOPMENT SYSTEM // New to workforce development? This section defines key terms and provides an overview of the legislation that guides the Public Workforce System.

2: SERVICES FOR HIRING AND RECRUITMENT // The Workforce Development System can serve as an extension of businesses’ human resources staff, supporting the hiring and recruitment process. In this section, learn about the specific services that workforce agencies can provide.

3: PUBLIC RESOURCES FOR TRAINING // Learn how the Public Workforce System can support solar businesses’ workforce development needs with funds for on-the-job and customized training.

4: CAREER PATHWAYS // Solar businesses can use career pathways to improve outreach and education outcomes, and to build stronger relationships with other businesses and workforce development partners. This section explains the key elements and how to use them.

5: SECTOR PARTNERSHIPS // Collaborative partnerships with other businesses and a variety of public partners can help solar companies solve their workforce development challenges more quickly. This section will show you how.

6: WORKFORCE DEVELOPMENT ACTION PLAN // Use this section to start a conversation with local partners and identify specific next steps and resources to make meaningful change.


SECTION 1
THE WORKFORCE DEVELOPMENT SYSTEM

What is the Workforce Development System?

The Workforce Innovation and Opportunity Act

How are Public Workforce Funds Allocated?
The Workforce Development System is a broad term for the approach to developing the talent required to meet the current and emerging needs of business and industry. While it focuses on the needs of two customer bases - individual jobseekers and businesses - demand-driven workforce development systems recognize business as the primary customer. To promote economic growth and prosperity, businesses need a reliable supply of skilled talent. A demand-driven approach also ultimately benefits jobseekers by providing individuals with in-demand skills that can lead directly to employment.

Throughout the toolkit, aspects of the Workforce Development System have been highlighted to show how they can help the solar industry address its training and hiring needs. In this section, solar businesses can learn more about the public workforce development system as a whole.

What is the Workforce Development System?

The Workforce Development System is a set of partners that work together to build talent to meet the needs of business and industry. The system includes an array of agencies that offer services that contribute to talent development and retention. These partners may include:

// Workforce Development //
Organizations focused on providing services to develop a pipeline of talent that meets the needs of business and industry. Includes Local Workforce Development Boards and American Job Centers.

// Education and Training //
Institutions covering the full spectrum of education, all ages and all skill levels. Includes K-12 education, community colleges, universities, short-term training institutions, adult education, and career and technical education.

// Economic Development //
Agencies focused on business attraction, retention, and expansion. May include local economic development organizations, government agencies and chambers of commerce.

// Community-Based Organizations //
Additional non-profits and community agencies that provide services that address challenges individuals face in developing skills and obtaining employment.
These partners provide coordinated solutions to businesses. The system is designed to ensure that by contacting and working with one agency, employers can have access to the full range of services, eliminating the need to navigate the offerings of many community resources.

The role of the Workforce Development System is to be an intermediary in connecting supply (talent) with demand (business and industry), through assistance with career pathways, hiring and recruitment, sector partnerships, and training, as is described throughout this toolkit.

These resources are available to alleviate workforce challenges and ultimately benefit both businesses and jobseekers. The more the solar industry leverages the workforce system’s resources to meet its goals, the better it will be able to expand the solar workforce, increase diversity, and promote equity within the industry.

The Workforce Innovation and Opportunity Act

THE WORKFORCE INNOVATION AND OPPORTUNITY ACT (WIOA) IS THE PRIMARY FEDERAL law and funding source that governs the public workforce development system across the country, coordinating programs that serve business and job seekers to promote skill development for the 21st century economy. Under WIOA, the public workforce system provides employers with access to a large talent pool and assistance in reaching potential workers who are often difficult to reach. System partners, such as local workforce development boards, receive WIOA funds to provide services for businesses, and a variety of job seeker populations including unemployed workers, low-income adults, in-school and out-of-school youth, the unemployed, individuals with disabilities, and many underserved populations with barriers to employment.

Innovation is an overarching theme throughout WIOA, furthering the goal of being more business-driven and business-friendly. Workforce services must be more customizable to the needs of the individual or business. Under WIOA, workforce boards can tailor services to ensure the most direct path to a solution, rather than requiring customers to complete a predefined set of steps, some of which may not be needed.

While WIOA is a federal law and funding stream, funds are dispersed to states, and services are delivered locally. State and local workforce development boards provide oversight of the implementation of workforce services. State Workforce Development Boards (SWDB) act in an advisory
capacity to the Governor and provide oversight to the local boards. Local Workforce Development Boards (LWDB) convene local partners to develop a collaborative talent development system and directly oversee and provide strategic direction for implementation of workforce services in the region.

At all levels, the majority (51%) of the membership of workforce development boards (WDB) is made up of employers who represent key segments of the local economy. This makes WDBs key forums for understanding the needs of business and industry, and ensuring funds are allocated and services are delivered in alignment with those needs.

Role of a State Workforce Development Board
- Advise the state governments on workforce development issues and policy
- Promote continuous improvement of the statewide service delivery system
- Identify and disseminate best practices
- Provide technical assistance to local workforce development boards

Role of a Local Workforce Development Board
- Convene and leverage workforce development-related community partners
- Analyze and share labor market information
- Engage a diverse range of employers
- Develop career pathways with secondary and postsecondary education partners
- Coordinate with education providers

WIOA IS A FORMULA GRANT THAT IS DISTRIBUTED TO STATES BASED ON SEVERAL FACTORS, including population, economic, and labor market data. States then distribute the money to the local workforce areas based on a similar formula resulting in variations of funding levels determined by population and economic need. Funds go to support training programs, individual training accounts, and other public programs and organizations.

Outside of regular WIOA funds, state and local workforce agencies or local governments may offer additional resources to support industry-driven training needs. There are 18 states that offer either a tax credit or a grant to employers to subsidize work-based learning, eight offering a grant/reimbursement, eight offering a tax credit, and two offering both.³

Many local workforce agencies and other community partners also pursue federal, state, and foundation grant opportunities that help them support programming to business and industry. An example includes the U.S. Department of Labor’s American Apprenticeship Initiative, which will award approximately $100 million to grantees to promote and expand registered apprenticeships.

To learn more about what funding may be available, contact the local workforce development board or business services representative who can connect you to the resources offered in the community.

SECTION 2
SERVICES FOR HIRING AND RECRUITMENT

Local Workforce Development Boards
American Job Centers
Engaging Workforce Service Providers
Solar businesses have access to a range of resources through local workforce development boards (LWDB) and American Job Centers (AJC), usually at no cost. These services can be especially helpful for small businesses and businesses with limited human resource management capacity.

Local Workforce Development Boards

**THE LOCAL WORKFORCE DEVELOPMENT BOARD (LWDB)** brings together community representatives and partners to identify and address local workforce development concerns and align the workforce system with the needs of local businesses. Comprised of business, government, and non-profit leadership, LWDBs establish and carry out policies, strategies, and funding priorities for an area’s federally funded workforce development system. Among the duties of an LWDB is oversight of the American Job Centers (AJC) that provide services for job seekers and businesses. Participation on the board is a very good way for solar businesses to stay abreast of programs and policies while making sure that the industry is represented in local policy and program decisions.

Because LWDBs focus their efforts on community-based needs, they are a great partner for employers who are looking to grow or strengthen their business locally. Businesses that need help in hiring more workers, want training for employees, or have an interest in utilizing other services that WIOA has to offer (one-stop centers, hiring assistance, job postings, etc.) can engage the local board for more information.

**FIND YOUR LOCAL WORKFORCE DEVELOPMENT BOARD**
ENGAGING THE LOCAL BOARD // As described in section two, companies will often engage their local board to secure funds for training. While the board is designed to offer this service, the company’s experience with the board will be most beneficial and effective if it is approached as a conversation and partnership, rather than a training transaction.

Solar companies should also consider the following before engaging the local board:

1. What is your general willingness to engage the board and make yourself available? In addition to attending LWDB meetings, employers can invite board staff to visit their worksites. This is the first step in establishing a strong relationship with the local board.

2. Are you able to talk knowledgably and openly about your company and the solar industry? Employers must be able to talk about the jobs they have available, the wages attributed to those jobs, and, if possible, talk about how large their industry is within the region and average job growth.

3. Do you have a willingness to consider hiring non-traditional populations? Local workforce development boards have a strong desire to create sustainable lives for everyone. If your company is willing to hire TANF recipients, veterans, ex-offenders, or individuals with disabilities, boards will be more receptive and be able to provide more resources in helping you address your hiring needs.

4. Do you have a current workforce that needs to be upskilled? The local workforce development board can also assist with incumbent worker training, to help your current employees advance to the next level or transition from one function or another. This can be especially helpful if it is easier to find entry-level employees for your business, or if you need to transition workers to avoid a layoff.
American Job Centers

LOCAL DELIVERY OF FEDERALLY FUNDED WORKFORCE DEVELOPMENT SERVICES, INCLUDING WIOA, occurs through a network of American Job Centers (AJCs). AJCs are designed to be one-stop centers and are often referred to as such. The one-stop concept was implemented to make services easier to access and navigate. An employer or jobseeker can visit an AJC to learn about and access all services that are available through the public workforce system and its partners. Each center has a set of partners that are physically located in the same building and provides easy referral to additional partners within the community.

CASE STUDY
THE SOLAR TRAINING NETWORK TAPS INTO NATIONAL NETWORK OF WORKFORCE BOARDS

SOLAR SEPTEMBER 2017

» JOIN THE NETWORK
» CONNECT TO SOLAR JOBS
» HOST A SOLAR SUMMIT

As a Solar Training Network program partner, the National Association of Workforce Boards (NAWB) has been a champion for integrating solar into the public workforce system. Aligned with its goal to help train 75,000 people for solar careers by 2020, NAWB led a social media campaign in fall of 2017, called “Solar September” which raised awareness among their network of workforce development and community-based organizations of the growing and continued significance of the solar jobs market. Through a Twitter Chat, a webinar and podcast, The Solar Training Network and other national partners used this platform to share information about local programs and initiatives, best practices, and industry resources to encourage workforce boards and industry members to be more engaged across related efforts and initiatives, and more closely collaborate at regional scales. The campaign empowered all stakeholders with steps to coordinate regional ‘solar summits’ based on the STN model, to convene businesses, training partners and community organizations to identify opportunities and proactively address solar workforce challenges. Resources shared during this campaign are available online.

SOLAR SEPTEMBER
Services offered within American Job Centers include:

// BASIC CAREER SERVICES // Self-service and staff-assisted resources for individuals seeking employment, including access to labor exchange systems, resume development, labor market information, skills and interest assessments, etc.

// INDIVIDUAL CAREER SERVICES // One-on-one services for individuals to receive assistance from career coaches to become job-ready and obtain employment, including resume development, career counseling, and interview preparation.

// EMPLOYER SERVICES // Services provided to employers from dedicated Business Services Representatives to assist with various aspects of hiring, recruitment, human resources, and incumbent worker training.

// SUPPORT SERVICES // AJC staff can connect job seekers to resources or connections to community partners to address barriers to employment, including transportation, child care, housing, etc.

// COMMUNITY REFERRALS // For needs that cannot be met by AJC partners, staff maintain information about additional community partners that are available for referrals.

FIND YOUR LOCAL AJCS HERE

ONE STOP SYSTEM GLOSSARY

One Stop System // Integrated system of partners engaged in workforce development at the local and state levels

One Stop Offices // Physical locations where partners work together to provide workforce development services to businesses and job seekers (also known as American Job Centers)

One Stop Operator // Organization or consortium of organizations that directly oversee the One-Stop system and offices within a geographic service delivery area (workforce development area)

Photo courtesy of National Renewable Energy Laboratory
CASE STUDY

SOLARIZE PHILLY TACKLES ECONOMIC AND ENVIRONMENTAL CHALLENGES

Solarize Philly is expanding the Philadelphia solar market, while increasing equitable access to solar energy and creating local jobs. Solarize campaigns generate local demand by allowing homeowners to install solar together, at a below-market cost. An initiative of the Philadelphia Energy Authority (PEA), this campaign launched in summer 2017 to help all Philadelphians go solar at home, while investing in a local solar workforce. In the first phase of Solarize Philly, 186 homeowners signed contracts for solar, and the second phase is open now for enrollment. Job creation is a central feature of the program: an estimated 75 local jobs will be created within the first 18 months of the program, and localized industry training ensures that Philadelphians are prepared to join the solar workforce as 2.5 megawatts of solar are installed by the end of 2018.

In 2017, The state of Pennsylvania listed solar installation as a High Priority Occupation – a listing that informs industry-driven workforce development. The Philadelphia Energy Authority partnered with the School District of Philadelphia’s Office of Career and Technical Education to establish a 6-week “Find Your Power” training at Benjamin Franklin High School’s Renewable Energy Lab to provide job-ready skills for students interested in renewable energy careers. After a successful pilot with 18 trainees and thanks to funding from PECO and Siemens, PEA expanded the program to include energy efficiency and construction safety as an offering during the Spring 2018 semester and is now connecting students to further training and summer internship opportunities to be career-ready. Philadelphia OIC and the Energy Coordinating Agency have also recently implemented solar training for adult learners: this directly provides career education and advancement opportunities for underemployed and disadvantaged populations in the city. The Solarize Philly program is a great model where investment in solar energy and a solar workforce has compounded social, economic and environmental benefits for a community.
All LWDBs and staff have access to online and physical job boards where positions can be posted and promoted to not only job seekers but also to a wide array of community agencies that have access to a large pool of talent. Many AJCs also host or participate in job fairs which can be effective in advertising open positions in an in-person forum. Getting involved in career fairs is one way to increase visibility of the local solar industry.

Benefits:
- Objective third-party screening of candidates
- Ability to set minimum standards for applicants and filter out candidates that are not a fit
- Minimize the number of interviews needed to hire a good candidate

FINDING AND PREPARING CANDIDATES
Fielding applicants can be very time consuming. Business services staff can save companies time on the front end of the hiring process, by screening and reviewing applications for minimum qualifications, conducting background checks, or sourcing referrals from community partner agencies. Staff can also meet with selected candidates to hold an initial interview or conduct any necessary assessments before being referred to the business. AJCs can also support job seekers, coaching them on resume writing and interview skills, making it easier for businesses to accurately assess candidates’ qualifications.

Benefits:
- More compelling job postings to attract the current talent pool
- Access to a public job boards for expanded visibility

ACCESS TO INCENTIVES
Many solar business owners are not aware of the range of incentives available through state and federal agencies, but the local workforce system can provide guidance. Working with business services representatives, solar employers can access incentives such as fidelity bonds, which provide insurance for the first six months of employment for hard-to-place job seekers to diminish the risk to employers, and tax credits or grants for hiring priority populations such as ex-offenders. Most AJCs also have close relationships with economic development organizations who can work with employers to understand other opportunities that may be available locally.
Benefits:
  - Access additional resources to support business growth
  - Contribute to community development by investing in targeted populations and areas

CONNECTING WITH OTHER INDUSTRY EMPLOYERS
Local Workforce Development Boards can help facilitate connections with other solar businesses for partnerships, information sharing, and collaboration. This is discussed further in Section 5 of this toolkit.

Benefits:
  - Align public and private resources to common workforce development challenges
  - Amplify the solar industry's communications efforts about career opportunities to education institutions and other social services organizations

ACCESSING LABOR MARKET INFORMATION
The Solar Foundation provides detailed labor market information specific to the solar industry in reports such as the annual *National Solar Jobs Census* and Solar Jobs Map that help solar businesses understand the number of solar jobs within their state, metro area, or region; whether the job market is increasing or contracting; and the breakdown of jobs by sector.⁴

Solar businesses can also benefit from knowing about the broader local labor market and economy, as it may directly impact their current workforce efforts. LWDBs are charged to utilize local labor market data to make strategic decisions about the usage of funds, and often, they direct funds to industries that the data indicate are high-growth and in-demand. Because of this, it is important that solar businesses connect with LWDBs to understand how the solar industry is evaluated in labor market reports, and to provide first-hand context of solar industry opportunities to the board.

In addition, through engagement with LWDBs, solar businesses can potentially influence policy decisions related to identifying high-growth, in-demand industries. A good first step for solar companies that want to connect with their LWDB about labor market information and high-growth, in-demand industries is to reach out to LWDB staff and schedule a meeting.

Benefits:
  - Make data-informed decisions based on demographics, historical and projected future industry performance, local wage rates, and workforce analytics
  - Understand local wage rates and determine competitive compensation levels
  - Learn about the local economy, related industries, and labor force

CONNECTING TO DIVERSE TALENT POOLS AND VETERANS
One recommendation from The Solar Foundation’s 2017 *Solar Industry Diversity Study* encourages solar firms to partner with local workforce boards to reach more women and people of color when recruiting. Business services staff can help employers think about ways to access underrepresented talent, and how incorporating diverse individuals into the solar workforce can benefit the industry moving forward. Because of the variety of partner programs administered by an AJC, including staff dedicated to placing veterans, there are often many different talent pools represented. LWDBs have been mandated by the Workforce Innovation and Opportunity Act (WIOA) to serve hard-to-serve populations. While some of these populations may have

SunLink’s CEO Michael Maulick knows that having a diverse team offers vital benefits to his business, including creative problem-solving, product innovation, and improved communication and recruitment. Located in the San Francisco Bay Area, the company’s workforce reflects these corporate values: 50% of the company’s workforce is comprised of African-American, Hispanic, and Asian-American professionals, and 30% of the workforce is comprised of women. Impressively, 50% of the company’s executive team is female, and more than 70% of the company’s departments have at least one female manager.

SunLink’s commitment to diversity has become a core tenet of the company’s brand, and the company makes a point of mentioning its commitment to diversity in its job postings. SunLink employees have experienced this during the interview process, as job candidates regularly cite this value as a reason why they are interested in joining the company. After employees join the team, SunLink makes a concerted effort to promote from within, support informal mentoring, and elevate diverse voices for speaking engagements and other professional development opportunities.7

Benefits:
- Increase the size of the applicant pool (especially important where employment rates are low)
- Diversify employment base to increase inclusiveness leading to higher profits, broader market share, and better employee well-being6
- Reach more veterans, who are prepared to apply their leadership capabilities, work ethic, and relevant technical training to careers in the solar industry

6 Ibid.
7 Ibid.
SECTION 3
PUBLIC RESOURCES FOR TRAINING

WIOA Supported Training

Connect to Additional Education and Training Providers
Finding qualified candidates for job openings and honing their knowledge, skills, and abilities over time is difficult in many industries, but the solar industry faces unique challenges. These challenges include rapidly-evolving policy and market conditions playing out across 18,000 local jurisdictions, 3,000 utilities, and 50 states, as well as a bounty of changing hardware and technology requirements. The scale of these challenges underscores the critical importance of connecting employers to effective training that can apply to current employees or candidates who have no previous solar training or experience.

The Solar Training Network’s 2017 Solar Training and Hiring Insights found that incumbent worker training and advancement opportunities:

- Drive increased employee satisfaction
- Reduce turnover
- Improves productivity
- Reduces production errors
- Saves money
- Improves employee safety practices and prevents injury

Quality training can save companies money. Additional site visits to correct residential installation errors may cost solar companies up to $7,500. If improved training procedures could lead to a 1% decrease in the rate call-backs, it could save the solar industry more than $10 million per year.\(^8\)

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WIOA Supported Training

LOCAL WORKFORCE DEVELOPMENT BOARDS HAVE FUNDING AVAILABLE FOR VARIOUS kinds of training, especially for the high-demand, high-wage jobs that are prevalent in the solar industry. To qualify for funding, training must be linked to in-demand occupations, informed by the performance of relevant training providers, and coordinated with other sources of assistance.

At AJCs, career coaches may connect individuals to training when it is needed to help the individual obtain an in-demand job or take the next step in their career. Once enrolled, an individual may receive WIOA funds to complete a training program that is offered by education and training institutions that are on the Eligible Training Provider List (ETPL). Types of eligible providers include:

- Post-secondary institutions (colleges, universities, and career and technical centers);
- Registered apprenticeship programs;
- Public or private training providers (including labor unions); and
- Adult education and literacy providers.

Training funds are targeted to two different audiences: the unemployed or underemployed and existing employees, referred to as incumbent workers. In both cases, the workforce system can connect individuals with existing programs or help businesses design customized programs to address their specific skill needs.

// UNEMPLOYED OR UNDEREMPLOYED WORKER TRAINING //

WIOA training funds can be used to assist both unemployed individuals and those who are underemployed (i.e., those who are working part-time but want to be working full time, those who

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**SOLAR COMPANIES SEEK INDUSTRY STANDARD TRAINING**

Only 34% of solar employers who participated in a study completed by The Solar Foundation provided a formalized on-the-job training program. Additionally, nearly two-thirds of solar employers expressed that a standardized, industry-wide training program would be of great value. This standardized training could involve system installation and connection, system components, and electricity basics. Employers also expressed an increasing need to develop curriculum and training for new and growing technologies such as storage systems and microgrids.9

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**WHAT IS THE ELIGIBLE TRAINING PROVIDER LIST?**

The ETPL is a list that includes the educational or training programs that have been approved by a State and/or local area to receive WIOA funds for training. Programs on the list meet specific requirements such as program completion rates, employment outcomes, earning levels, and reporting. Requirements and ETPL application processes vary by state.

Solar training providers that are interested in having programs added to the ETPL should contact their LWDB to learn about the processes and requirements for application and approval. See Appendix C to find your local workforce board.

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WIOA allows up to 20% of the funding for adult and dislocated workers to be put toward incumbent workers; however, the federal law outlines funding allocation for each employer, based on firm size and other factors. Put simply, there is typically more funding available to support underemployed and unemployed trainees, so it is important for solar companies to develop relationships with their LWDBs to increase awareness of the need for up-skilling among incumbent solar employees.

// INCUMBENT WORKER TRAINING //
Designed to help current employees advance their careers, incumbent worker training builds skills needed to move up within a company or adapt to changing processes or demands.

CASE STUDY
RICHMONDBUILD PREPARES LOW-INCOME RESIDENTS FOR GREEN COLLAR JOBS

RichmondBUILD was created by the City of Richmond’s Employment and Training Department to reach underserved and unemployed residents. In 2006, the non-profit, Solar Richmond, was created to provide 4-week solar training modules for the Richmond BUILD curriculum. Solar Richmond also provides job placement and transitional employment services.

“Solar Richmond seeks to ‘move the job interview from the desktop to the rooftop,’ providing transitional work opportunities that enable program graduates to work side-by-side with professional solar installers and prove their skills on the job.” The non-profit created the Solar Staffing Agency, which allows graduates to work with solar-focused companies on a temporary basis. “Companies pay the full wages, while Solar Richmond covers workers compensation, insurance and taxes, creating an added incentive to hire its graduates.”

The Results: RichmondBUILD fields 100 applications annually for 35 openings and places 80% of its graduates into employment with an average starting wage of $18.33 an hour.

RICHMOND BUILD
**On-the-Job Training (OJT)**

On-the-Job training is a WIOA supported, employer-provided training geared toward skill development activities tailored to the specific needs of a person or group of people. OJT funds are also available for registered apprenticeship programs. When a program is approved for OJT funds, the employer can be reimbursed for up to 75 percent of the cost of training or the employee's wages. On-the-Job Training is discussed in more depth in Part Two of this Toolkit: Planning and Implementing a Successful Work-Based Learning Program.

**Uses for OJT:**

- A company needs to fill a mid-level technical position and is not finding applicants with the right skills. A high-performing entry-level employee has shown interest, but does not have the technical skillset needed, either. The company can direct OJT funds to the existing entry-level employee, upskilling this employee into the higher-level position.

- A company has entry-level positions open that require an understanding of a company-specific production process. Because of the proprietary information involved, applicants do not already possess these skills. Employers can look for candidates who are willing to learn and utilize OJT during onboarding to learn specific processes.

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**CASE STUDY**

**PUBLIC WORKFORCE SYSTEM PARTNERS TO PROVIDE TRAINING**

By aligning strategies and resources of the Energy Commission, the Employment Development Department (EDD) and the California Workforce Investment Board (CWIB), The Clean Energy Workforce Training Program (CEWTP) has become the largest state-sponsored “green” workforce development program in the nation with approximately $25.2 million in funding. By engaging in a regional industry-focused sector partnership, which provides pre-apprenticeship training for youth, unemployed, or underemployed workers, these individuals are provided opportunities to gain skills in construction, energy and water efficiency, and renewable energy. These individuals can integrate soft skills training combined with job placement services within these industries. Through the pre-apprenticeship training, participants are provided basic practices in construction (combining a solid foundation in green building), energy and water efficiency, and the installation of utility-scale renewable energy fields including generation, transmission, or distribution.

Out of all the program participants: 98 percent were enrolled in training, 89 percent have completed training, and 45 percent were placed in unsubsidized employment. More importantly, the projects have created partnerships between education and industry, where 3,552 certificates have been issued that are applicable to various green occupations.
Customized Training

Customized training is typically developed for a whole company or a cohort of employees at one or multiple companies who need to develop a specific skill set. This programming is more often a curriculum-based, classroom solution and usually has a credential or certificate attached to completion. The development of the training is based on the needs of the employer(s) or the job itself, rather than the current skills of the individual participating.

Uses for Customized Training:

- A company has adopted a new software program that will be utilized by all management and supervisors. Customized training can be developed to train this group on the program and how it will be implemented within the company.
- A company has a group of high quality employees who are at risk of lay-off due to a change in business model. The company may choose to create a customized training program that will transfer them from their current function to another area of need within the company to avoid the lay-off. For example, a solar firm that is moving from residential to commercial installation may decide to reskill their PV Installers for commercial/utility projects.
- Multiple companies have identified a common training need, but only need one or two employees each to receive the training. Together, the employers can work with AJC business services representatives to create a customized training for this combined cohort of employees.

Connect to Additional Education & Training Providers

BUSINESS SERVICES REPRESENTATIVES AND LWDBs ALSO HAVE CLOSE TIES TO AREA education and training providers, especially community colleges and career and technical education providers. They can connect employers to additional existing programs that offer or may be able to create certificate or credential programs if more formal or credit-bearing education is necessary. Solar professionals nationwide have expressed that making effective connections at local schools and community colleges is a challenge, and engaging business services staff at local AJC can help to make those connections. More information on partnering with training providers is available in Part Two of this toolkit.

Photo courtesy of National Renewable Energy Laboratory
The workforce system can connect solar businesses to training opportunities. For example, the South Bay Workforce Investment Board (SBWIB) created the Gateways to Green Building (GGB) Program to train the workforce in home energy retrofit and green building segments of the LA County construction industry. The SWIB provides oversight of the GGB program, including assessments of basic skills and career interests, occupation training, case management, and job development services.

GGB’s Home Performance Track includes four classes to prepare students for the Building Analyst certification by the Building Performance Institute (BPI). A fifth class offered in marketing and sales for students hoping to engage a career as a home performance professional. This track is important in servicing unemployed jobseekers with experience in the construction sector that are looking to increase their skills and gain credentials that would allow them to compete in green building and home performance segments of the construction industry. There is classroom training and live demonstrations in the field within this track. Participants can receive instruction on: California building codes, Title 24 measures and BPI standards, solar water heating, photovoltaic systems for grid-tied applications, green building, and sustainable development.
SECTION 4
CAREER PATHWAYS

Elements of Effective Career Pathways

Who benefits from career pathways?

Career Pathway Template
WIOA calls for more system alignment, training and education that meets the needs of in-demand industries, and collaboration among partners. Career Pathways are a tool to meet each of these requirements.

Solar businesses can use career pathways as a an education and recruitment tool, allowing students and job seekers to visualize opportunities for growth and the progression of education, training, and experience needed to advance in a career. This can be especially helpful in increasing awareness among the general public regarding the range of career opportunities available in the solar industry.

For example, a career pathway for sales and distribution occupations could help a career changer with retail experience understand that she could enter the industry as a customer service representative, pursue opportunities for work-based learning, and then move into an account executive position after gaining some solar work experience. Career pathways can also help people identify transferable skills to make solar jobs accessible to job seekers with experience in adjacent industries like electrical and construction fields.

At a systems level, career pathways can also help solar businesses and solar industry associations collaborate better with educators, training providers, and the public workforce system. Ideally, multiple solar businesses will come together to develop a common set of career pathways for the most in-demand occupations, thus creating a road map that partners can use to improve curriculum, increase enrollment, and tailor services to industry needs.

The Interstate Renewable Energy Council (IREC) has developed a career pathways map for the solar industry that does much of this work, and is a valuable resource that could be used as a jumping off point for businesses or regional partnerships that want to create a location-specific career pathway. The interactive Solar Career Map illustrates 40 jobs over four general categories, with over 60 distinct potential routes of advancement for individuals within the industry. Many solar careers start at the level of basic installation, and progress upward, where broader opportunities and higher pay come...
with experience. Each node in the web of solar career linkages displayed on the map provides information about general education requirements, applicable skill sets, and typical income for that particular position, and how a solar career can advance from that point. For example, with a high school diploma, a few years of experience and an industry credential, a solar assembler can advance within a company to become a crew chief or PV installer, and from there, chart a career path upward with pay increases at each step to become a PV technician, solar contractor, or instructor depending on their particular strengths and interests. Companies and educators can use this tool to communicate diverse opportunities to trainees and young employees looking to turn an entry level solar job into a powerful career.

INTERACTIVE SOLAR CAREER MAP

To support training and supportive services, solar businesses can collaborate at a regional scale to develop career pathways that align the needs of multiple businesses. Review Section 4 for more information on regional sector partnerships.

Elements of Effective Career Pathways

// DRIVEN AND VALIDATED BY INDUSTRY DEMAND // Business needs, including hiring requirements and qualifications, must be at the core of any career pathway. Solar businesses can partner with the public workforce system and education providers to make sure solar career pathways show a realistic and accurate vision of the solar industry.

// CUSTOMIZED BASED ON REGIONAL ASSETS AND NEEDS // While many of the skills and experiences required for typical solar occupations are the same regardless of location, there are some regional nuances—such as state licensing and certification requirements in mature markets that should be captured within a regional career pathway.

// ALIGNED ACROSS AGENCIES AND EDUCATION PROVIDERS // Career pathways emphasize the importance of a coordinated system, particularly in areas where there is not a critical mass of solar jobs but there is a need for qualified candidates; the pathway can illustrate to educators and service providers that there are ways to incorporate solar training into existing programs. For instance, construction and electrical programs are increasingly incorporating solar technology into their curriculum. Similarly, courses in business administration and operations skills, such as project management, can be infused with an awareness of solar career pathways. Greater alignment with these industries and disciplines will deepen the talent pool without having to build brand new programs.

// ACCOMMODATES DIFFERENT LEARNING STYLES AND BACKGROUNDS // Often referred to as on- and off-ramps, the best career pathways allow students and job seekers from a variety of backgrounds to see themselves entering an occupation through schooling, life experience,
and transferable skills from other industries. For instance, a veteran returning from active duty should not have to enter the career pathway at the same level as a recent high school graduate. Likewise, career pathways show people when it’s possible to exit training and education programs into full-time work. For example, one student completing an associate degree in renewable energy may decide to take an “off-ramp” from school to a full-time position as a solar site assessor, while another student in that same program may decide to continue her education to eventually become a solar system designer.

// FLEXIBLE AND MODULARIZED // Career Pathways will often highlight training and education requirements in short, stand-alone units, offering people new to the industry opportunities to start earning money and building their skills quickly. On the program side, training providers offer flexible schedules, online and hybrid learning options, and credit for prior learning to make it easy for career changers to build their qualifications while working in another industry or entry-level job.

// LINKED TO STACKABLE CREDENTIALS OR CERTIFICATIONS // Credentials such as those offered by NABCEP, the National Center for Construction Education and Research (NCCER), and OSHA are often important elements of a job candidate’s qualifications. Career pathways can and should highlight when and where individuals can gain the skills, knowledge, and experience needed to earn these credentials. The benefits of adding credentials to a career pathway—and hiring requirements—include:

**Benefits for Solar Businesses**
- Access to a skilled workforce that can further develop through on-the-job training
- Ability to focus during the hiring process on the candidate “fit” within the company
- Reduced training costs and turnover, enhanced workplace safety, and increased productivity
- Improved quality of the workforce and workforce expertise in a community or region

**Benefits for Students and Job Seekers**
- Documents knowledge and skills gained through education or life experiences
- Offers a competitive advantage when looking for work or career advancement
- Increases career opportunities and earning potential
- Enhances transferable skills across industries

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Benefits for the Workforce System

- Outlines critical foundation and workplace skills employers require
- Supports sector strategies to identify technical skills employers require, particularly in high growth occupations
- Standardizes learning outcomes and increases completion/graduation rates across similar programs

Who Benefits from Career Pathways

SOLAR BUSINESSES // Career pathways grow the pipeline of qualified candidates through improved communication and alignment with local education and training providers; improve retention and increase employees' investment and loyalty in the company and the solar industry.

STUDENTS AND JOB SEEKERS // Career pathways help individuals understand the range of skills and the qualifications required to enter and advance in the solar industry.

EDUCATORS AND SERVICE PROVIDERS // Career pathways can improve participants' job placement and advancement through improved curriculum, increased alignment with the solar industry, and more streamlined programs.
The Career Pathway Template can help solar businesses map out the job families in a company, region, or sub-sector (such as installation or sales and distribution). In addition to job titles, career pathways typically identify: required education and training, industry recognized credentials, competencies, and wages. On the opposite page, a sample PV Installer pathway demonstrates how to use the template. A blank version of the tool is available in Appendix A: Career Pathway Template.

Use this template to illustrate the work experience, training, education, and certifications an individual would have to pursue in order to climb the ranks in a company or the industry (e.g., from a sales representative to a product manager to an account executive). Once the table is filled in, use it to facilitate discussions with workforce and education partners about training needs and available programs, or share it with educators, parents, students, and job seekers to inform them about career opportunities in the solar industry. Companies can use it as a part of the new hire on-boarding process as well, helping employees envision their future with the company.

// JOB TITLE // Beginning with the most entry-level position at the bottom of the pathway, identify the logical progression of job titles for someone advancing through an occupation family. People may enter the pathway at various levels (on-ramps) based upon their individual work histories and education backgrounds. To develop a regional career pathway, spend some time exploring the duties associated with similar job title across multiple solar businesses to ensure that each business is describing the same job function.

// FORMAL EDUCATION // In the second column, list the certificate or degree that is required to hire someone at each level. Be sure to align education to specific skills and knowledge. Often businesses inflate their education requirements because they think it will bring them better candidates, but it actually shrinks an already small talent pool.

// ON-THE-JOB TRAINING OR WORK-BASED LEARNING // In this column, list any required or preferred work-based learning. This is particularly useful if a business has an internship or apprenticeship program through which many of its entry-level employees are hired. This should align to real programs that are available to students and job seekers. (If no work-based learning opportunities are available, refer to Part Two of this toolkit for information on how to launch a program.)

// INDUSTRY-RECOGNIZED CREDENTIALS // Here, list any certifications or licenses that are required or preferred in the industry, business, or this particular occupation. For instance, many solar businesses may want to include NABCEP certifications in PV Technical Sales or PV Installation.

// COMPETENCIES // In this column, list the knowledge, skills, and abilities required by the job. These should align with the standards tested by any industry credentials identified in the previous column and in the learning outcomes of the formal education and OJT/Work-based Learning columns. For more information about competencies, refer to the Work-Based Learning Toolkit.

// AVERAGE WAGES // In the final column, list the wages an employee entering each level of the pathway can expect to earn. National wage data for many solar careers is available in the IREC solar career map; however, we recommend fine-tuning these for specific businesses or regions.
<table>
<thead>
<tr>
<th>JOB TITLE</th>
<th>FORMAL EDUCATION</th>
<th>OJT OR WORK-BASED LEARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar Project Developer</td>
<td>Bachelor’s Degree / Master’s or MBA often preferred</td>
<td>Significant electrical, mechanical, and PV on-the-job training and experience</td>
</tr>
<tr>
<td></td>
<td>Solar Project Developers follow a variety of education pathways into their careers, but typically hold a bachelor’s degree in engineering, science, or finance, and often an MBA as well.</td>
<td></td>
</tr>
<tr>
<td>Solar Project Manager</td>
<td>Associate’s degree / Bachelor’s or Master’s often preferred</td>
<td>Significant electrical, mechanical, and PV on-the-job training and experience</td>
</tr>
<tr>
<td></td>
<td>Solar project management is learned in the field and enhanced in the classroom. Installation managers do not need advanced degrees but do need significant field experience. Candidates will benefit from additional training in systems design and construction management, combined with solar certification.</td>
<td></td>
</tr>
<tr>
<td>Solar Crew Chief</td>
<td>High school diploma or equivalent / Associate’s or Bachelor’s degree often preferred</td>
<td>Additional training in quality assurance and safety would be useful, particularly when pursued as part of an entry-level PV certificate.</td>
</tr>
<tr>
<td></td>
<td>Crew chiefs do not typically advance through formal education; they learn on the job and move up as experienced installers who demonstrate leadership and teamwork.</td>
<td></td>
</tr>
<tr>
<td>PV Installer (Entry-Level)</td>
<td>High-School Diploma (or equivalent) Entry-level installers typically have a high-school degree and may have some construction experience.</td>
<td>Internship Job Shadow Summer Work Experience</td>
</tr>
<tr>
<td>INDUSTRY RECOGNIZED CREDENTIAL</td>
<td>KEY COMPETENCIES</td>
<td>MEDIAN WAGES</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----------------</td>
<td>--------------</td>
</tr>
<tr>
<td><strong>Project Developer</strong></td>
<td>Leadership and management; Advanced cost-benefit analysis; Negotiation skills; Entrepreneurialism</td>
<td>$50.51/hour</td>
</tr>
<tr>
<td><strong>Solar Project Manager</strong></td>
<td>Deep understanding of PV systems; Personnel and resource management; Budgeting and planning; Complex problem solving and troubleshooting</td>
<td>$29.32/hour</td>
</tr>
<tr>
<td><strong>Solar Crew Chief</strong></td>
<td>Excellent communications; Active listening; Safety procedures; Quality assurance; Scheduling; Small-team management</td>
<td>$19.54/hour</td>
</tr>
<tr>
<td><strong>PV Installer (Entry-Level)</strong></td>
<td>Basic construction, mechanical, and electrical skills; Fundamentals of solar PV; Familiarity with basic installation practices</td>
<td>$13.77/hour</td>
</tr>
</tbody>
</table>
SECTION 5
SECTOR PARTNERSHIPS

Why Sector Partnerships Matter
Industry Leadership
Sector Partnership Checklist
Partnerships Across Industries
Why Sector Partnerships Matter

Simply listing open positions is far from being a solution to the industry’s medium- and long-term workforce needs. Solar businesses are beginning to work more closely with local and regional stakeholders, such as other solar businesses and community colleges, but most solar companies lack experience in convening full-fledged sector partnerships seen in more mature industries. Organizing and formalizing the collaborative efforts between solar companies and their relevant stakeholders (such as the LWDB, community college, solar trade associations, and economic development organizations) in a given community or market is the basis of a sector partnership—which is designed to match the industry’s workforce needs and the solutions deployed to address them. The workforce system can help solar companies establish these partnerships. Sector partnerships and cross-sector strategies (developing mutually-beneficial efforts with other relevant industries) will allow businesses to pool their resources, identify common challenges, and respond to them more efficiently and effectively.

For more information on how each state supports sector partnerships, visit the National Skills Coalition’s “Skills in the States: Sector Partnership Policy 50-State Scan.”

Key Components of a Sector Partnership

- **Employer Led** // to ensure the system is truly demand-driven and will lead to better outcomes for individuals
- **Single Industry Focus** // to allow employers to connect with peers from their own industry, identify needs beyond basic workplace skills, and dive deeply into the technical needs of the industry
- **Regional** // to address unique needs of subsectors while reflecting the true dynamics within a regional economy
- **Convened by a Neutral Intermediary** // to align all relevant partner programs and resources as solutions to identified industry needs
Industry Leadership

THE MOST IMPORTANT ELEMENT OF ANY SECTOR PARTNERSHIP, BUT ESPECIALLY FOR SOLAR sector partnerships, is industry leadership. Without solar businesses recommending priorities and influencing decisions, the public workforce system will continue to prioritize other industries or provide solutions misaligned with solar workforce needs. By taking a more proactive role in addressing the solar industry’s workforce challenges, businesses can contribute to effective and lasting change.

Solar industry executives or business owners may consider becoming an industry champion and perhaps a founder of a local solar sector partnership.

An industry champion takes a personal interest in and responsibility for the success of a sector partnership, organizing and encouraging other stakeholders to make substantive contributions to workforce development initiatives and programs. Industry champions should be the kind of leaders who not only have decision-making authority at their businesses but also understand that the long-term success of their companies is linked to the broader prosperity of the community and the solar industry.

Effective Sector Partnerships

When solar businesses and their workforce partners come together to form sector partnerships, they:

- Identify common issues, challenges, and opportunities across companies;
- Coordinates previously disconnected stakeholders to address the priority needs of the solar industry, reducing duplication and leveraging each stakeholder’s impact;
- Communicate industry priorities to policy makers and workforce development partners, enabling them to design responsive solutions;
- Address current and emerging skill gaps, both short- and long-term;
- Provide a means to engage directly with industry across traditional boundaries; and,
- Better align programs, education/training curriculum, and other resources serving employers and workers.

Benefits of sector partnership participation include:

- System adapts to regional business needs, including reduced duplication and system inefficiencies;
- Streamlined and maximized resources and services;
- Capacity to build a stronger pipeline of future workers and shortens the time to hire;
- Builds career pathways with seamless transitions between educational stepping stones;
- A cohesive voice for the industry to influence training programs, impact policy, and attract funding;
- Mechanism for ongoing feedback with education, training, and workforce programs.

Photo courtesy of National Renewable Energy Laboratory
1 // ASSESS YOUR MARKET AND DECIDE IF IT IS MORE APPROPRIATE TO CONVENE A SECTOR PARTNERSHIP OR A CROSS-SECTOR PARTNERSHIP.

- Do you have a high concentration of solar businesses in your region? Are the solar businesses in your area expecting significant growth in the coming months? If yes to either of these questions, a sector partnership may be right for you.
- Do you have a small number of solar businesses in your region, but a thriving manufacturing, construction, or renewable energy economy in your area? If yes, a cross-sector partnership may be right for you.

Your local workforce development board or solar trade association can help you answer these questions. Boards often sponsor State of the Workforce studies, keep track of in-demand jobs data, and, in general, have a good understanding of the economic and industry factors that will determine which route you should take. Regional economic development organizations sometimes take on similar roles.

2 // IDENTIFY INDUSTRY CHAMPIONS AND BEGIN TO ORGANIZE YOUR PARTNERSHIP.

- Are other business owners in your area having similar recruitment and hiring challenges as your business? Do you see neighboring businesses as competition for qualified candidates? If yes, contact the business owners or executives and invite them to help solve the problem.

Industry Champions are the driving force behind sector and cross-sector partnerships, and peer-to-peer outreach is key. If you need help making connections with other potential champions, contact your local workforce development board.

3 // DEFINE YOUR PARTNERSHIP’S MISSION AND VALUE PROPOSITION.

You can use any number of strategic planning or visioning processes to accomplish this step. Or, start by answering the following questions:

- How will your partnership benefit businesses?
- How will your partnership change and improve the solar workforce? (i.e., what are your goals?)
- How will your partnership collaborate with the public workforce system? (Workforce Development Board, Economic Development Organizations, Local Governments, Community Based Organizations, and Education Providers)
- How will you know when your partnership has been successful? (i.e., how will you measure outcomes?)

4 // ENGAGE POTENTIAL MEMBERS, STAKEHOLDERS, AND PARTNERS.

Begin with your professional network and others who have similar goals (such as the workforce system partners described in Section 5 of this toolkit), local governments, and utility companies. Schedule an information and planning session with these potential members. Be sure there’s a clear purpose and a detailed agenda. Topics should include the following.
IDENTIFY LOCAL RESOURCES

Identify local resources, including policies and incentives to support the solar industry and/or sector partnerships; grant funding; education and training providers; potential third-party conveners.

SECTOR PARTNERSHIP CHECKLIST

- Value Proposition - why are we here?
- Partnership Scope: industry/sector, region, etc.
- Workforce Challenges and Potential Solutions (be sure this isn’t just a chance for attendees to vent—it’s important that people see the partnership as a place to solve problems)
- Next Steps and Responsible Parties

WISCONSIN REGIONAL TRAINING PARTNERSHIP (WRTP)/BIG STEP ALIGN PROGRAMS WITH BUSINESS NEEDS

The solar industry is just getting started down the path to sector partnerships; however, many complimentary industries have mature sector partnerships that solar businesses can learn from. The Wisconsin Regional Training Partnership (WRTP) is one example.

WRTP/Big Step is an industry-led, worker-centered and community-focused sector partnership with the mission to enhance the ability of private sector organizations to recruit and develop a more diverse, qualified workforce in construction, manufacturing, and emerging sectors of the regional economy. WRTP/Big Step’s success relies on industry champions to help drive the partnership. Serving as a workforce intermediary, WRTP:

- Recruits and assesses job-ready candidates from community-based referral programs;
- Prepares qualified candidates for recruitment and advancement opportunities;
- Offers employment readiness training designed by industry; and
- Provides placement and retention services that link career and apprenticeship-ready candidates to the trades.

WRTP/Big Step has served 3,302 individuals, connected 850 to employment, and trained more than 2000 people, preparing them for apprenticeships and assisting in career exploration in construction and other skilled trades.
SOLAR COMPANIES ARE FOUND ACROSS the United States but concentrated in some regions more than others. For emerging markets where there are a small number of solar employers, there may not be enough critical mass to develop a solar-specific sector partnership. If this is the case, a cross-sector partnership can provide support and create a pipeline of workers that possess competencies and qualities that are transferable to fill workforce needs in the solar industry. Cross-sector partnerships bring government, education, training, economic development, labor, and community organizations together to focus on the workforce needs of businesses within a regional labor market.

Typically, effective cross-sector partnerships include representation from various sectors or industries with similar training and education requirements and competencies. According to The Solar Training Network’s 2017 Solar Training and Hiring Insights, solar employers look less to job-specific training among applicants and place more value on those experiences that develop technical abilities, safety techniques, and soft skills that are common to all companies. Many of these competencies are prevalent within other industries like manufacturing, construction, and energy/utilities and would make for effective cross-sector partnerships.

When thinking of industries to engage for a cross-sector partnership, consider the following:

<table>
<thead>
<tr>
<th>SOLAR-FOCUSED COMPANY</th>
<th>POSSIBLE SECTORS TO ENGAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Installation</td>
<td>Roofing, Home Energy Efficiency</td>
</tr>
<tr>
<td>Home Energy Installation</td>
<td>Heavy Construction</td>
</tr>
<tr>
<td>Electricians</td>
<td>Solar Storage</td>
</tr>
<tr>
<td>PV Design</td>
<td>Architecture</td>
</tr>
<tr>
<td>Solar Sales</td>
<td>Real Estate</td>
</tr>
</tbody>
</table>

The image on the right illustrates solar employers across the United States to show where clusters are located that would be better suited for a sector partnership. The colored dots indicate the location of a solar company. Those areas without colored dots may be better suited for a cross-sector partnership.
Since passage of the Future Energy Jobs Act (FEJA) in 2016, Illinois is expanding its renewable energy economy and striving to become a solar jobs powerhouse. As a part of FEJA’s $750 million commitment to help low-income communities benefit from clean energy, ComEd, the state’s largest investor-owned utility, has committed $30 million in funding to three workforce training programs: a solar training pipeline, a craft apprenticeship program, and a multicultural jobs program.

ComEd’s first cohort of grantees for the multicultural jobs program included the Chicago Urban League, the National Latino Education Institute, ASPIRA, the Hispanic American Construction Industry Association (HACIA), Chatham Business Association, and the Austin People’s Action Center. Grantees are working with diverse and underserved communities in Illinois, including people of color, low income communities, individuals reintegrating from the criminal justice system, and foster care alumni. In addition to providing job training to community members, the funding will also reach some existing minority contractors, who will grow their business in the state’s expanding clean energy marketplace.

ComEd’s solar training efforts complement the CONSTRUCT program, a 9-week construction sector training in partnership with several of the same community organizations. Since its inception in 2013, CONSTRUCT has worked with over 400 trainees, about 70% of whom have received job offers through partnering companies.
Strategies for Solar Workforce Development // 40
SECTION 6
WORKFORCE DEVELOPMENT ACTION PLAN
Below is an industry-driven action plan that outlines specific high-level actions business owners and hiring managers can take to address their hiring and training needs. Each action is a jumping off point that will require additional planning with local partners to identify resources, timelines, and the level of priority. Each action can take place in any sequence or concurrently, depending on the resources and time available. Use this tool to start a discussion with other businesses or workforce development partners in the region. By increasing collaboration among workforce development stakeholders on multiple fronts, solar businesses and the workforce system can find innovative solutions to complex staffing challenges.

The action plan also includes a few specific actions for workforce development partners and education providers to support industry-driven solutions. Business-driven solutions can and should be supported by public resources, and it’s important to engage these partners in the solar workforce development strategy. Take this action plan to the local workforce development board or community college and invite them to join the solar industry in addressing its workforce development needs.
<table>
<thead>
<tr>
<th>Action</th>
<th>Responsible Party</th>
<th>Other Partners &amp; Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>THE WORKFORCE DEVELOPMENT SYSTEM</strong> // Using the guidelines in Section 1, contact your local workforce development board and American Job Center to set up a meeting. Talk with the staff about your training and hiring needs, and identify ways that you can get involved.</td>
<td>Solar Businesses</td>
<td>Local Workforce Development Board (LWDB), American Job Center (AJC) Business Services Staff, Career One Stop Business Center, Solar Businesses Solar Foundation’s Research</td>
</tr>
<tr>
<td><strong>Partner Action</strong> // Learn about solar industry needs and how they are reflected by your area’s in-demand jobs data</td>
<td>Workforce Development Board Staff</td>
<td></td>
</tr>
<tr>
<td><strong>HUMAN RESOURCES, HIRING, AND RECRUITING</strong> // Share your job postings and hiring projections with your local partners, including the American Job Center, K-12 education system, and colleges and universities. Use the talking points in Section 2 to create meaningful collaborations.</td>
<td>Solar Businesses</td>
<td>AJC</td>
</tr>
<tr>
<td><strong>RESOURCES FOR TRAINING</strong> // Identify your business’s most pressing training needs Be sure to project how many people you need to train (current employees and potential new hires). Then, armed with those numbers, contact your local American Job Center to find out what resources are available. Ask about support for Incumbent Worker and Customized Job Training.</td>
<td>Solar Businesses</td>
<td>Education and Training Partners, Local Workforce Development Boards, American Job Centers</td>
</tr>
<tr>
<td><strong>CAREER PATHWAYS</strong> // Using the blank Career Pathway Template in the Appendix, map out the logical career progression for people in your company, occupation, or industry. Share the results with local educators and teach students and job seekers about opportunities in the solar industry.</td>
<td>Solar Businesses</td>
<td>Education Providers To find community colleges in your region visit Community College Finder, Solar Businesses Solar Foundation’s Research Also see the Work-Based Learning Toolkit for links to sample curricula.</td>
</tr>
<tr>
<td><strong>Partner Action</strong> // Work with solar businesses to incorporate solar industry information into curriculum and career exploration activities.</td>
<td>Education Providers</td>
<td></td>
</tr>
<tr>
<td><strong>SECTOR PARTNERSHIPS</strong> // With the help of the Solar Training Network and/or your local workforce development system partners, identify nearby solar (or solar-adjacent) businesses. Reach out to those businesses to start a conversation about your common workforce challenges. How can you work together?</td>
<td>Solar Businesses</td>
<td>Businesses from adjacent industries (e.g., construction, other renewable energy providers, manufacturing, etc.)</td>
</tr>
<tr>
<td><strong>SOLAR TRAINING NETWORK DIRECTORY</strong> // List your business or organization in the Solar Training Network Directory.</td>
<td>All Solar Industry Stakeholders</td>
<td></td>
</tr>
<tr>
<td>Measure of Success</td>
<td>Timeline</td>
<td>Status</td>
</tr>
<tr>
<td>--------------------</td>
<td>----------</td>
<td>--------</td>
</tr>
<tr>
<td>Solar businesses represented on LWDB. AJC staff understand solar industry hiring needs.</td>
<td><img src="https://via.placeholder.com/15" alt="Timeline" /></td>
<td><img src="https://via.placeholder.com/15" alt="Status" /></td>
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<tr>
<td>Increased training funds directed to solar industry.</td>
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<tr>
<td>Increased number of solar industry workshops offered 2018 to 2019. Increased number of applicants referred to solar industry jobs and training programs.</td>
<td><img src="https://via.placeholder.com/15" alt="Timeline" /></td>
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<tr>
<td>Increased WIOA-funded training for solar industry employees. Incumbent workers and job seekers trained for relevant skills.</td>
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<tr>
<td>Increased awareness among teachers, parents, and students.</td>
<td><img src="https://via.placeholder.com/15" alt="Timeline" /></td>
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<tr>
<td>Solar curriculum tailored to local solar market. Number of trainees/graduates aligned with needs of local or regional solar market.</td>
<td><img src="https://via.placeholder.com/15" alt="Timeline" /></td>
<td><img src="https://via.placeholder.com/15" alt="Status" /></td>
</tr>
<tr>
<td>Regional hiring insights developed. Decreased “poaching” of skilled workers. Increased communication with stakeholders about common hiring and training needs.</td>
<td><img src="https://via.placeholder.com/15" alt="Timeline" /></td>
<td><img src="https://via.placeholder.com/15" alt="Status" /></td>
</tr>
<tr>
<td>Solar Training Network map accurately reflects your region’s industry.</td>
<td><img src="https://via.placeholder.com/15" alt="Timeline" /></td>
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Together with your local partners, determine a timeline and track progress in these columns.
PART 2: PLANNING AND IMPLEMENTING A SUCCESSFUL WORK-BASED LEARNING PROGRAM

RESOURCES AND TOOLS
INTRODUCTION

AS THE SOLAR INDUSTRY CONTINUES TO EXPAND, COMPANIES OF ALL SIZES ARE struggling to hire candidates with requisite skills and experience for positions from entry-level installation jobs to more advanced technical roles. By better aligning training with workforce needs through industry-education partnerships and broader experiential learning, solar employers have an opportunity to make an investment in a stronger talent pipeline to support continued industry growth. In this relatively young industry, work-based learning is not yet a widespread approach to solar workforce development. In other industries, a range of work-based learning models such as internships and apprenticeships provide opportunities for students or incumbent workers to hone technical and professional skills through hands-on training. Such programs offer employers the opportunity to instruct trainees on the exact skills needed to succeed and advance within their companies and careers. Types of work-based learning range from informal short-term engagements to more structured education programs, and each is designed to meet a particular set of objectives within a given time frame.

Work-based learning programs are promising tools both for talent recruitment and skill development within the local solar workforce. For those unfamiliar with the solar industry, these programs can provide career exploration and awareness to students and allow job seekers to explore industry career pathways. For new or experienced incumbent workers, work-based learning programs help to fill knowledge gaps where additional job-specific skills are needed either during onboarding or for advancement within a company.

The solar industry encompasses many different job types: a solar job can be focused on installation, manufacturing, project development, or sales and distribution, and solar careers can also include finance, advocacy, research and development. While the talent needs and career pathways in each of these sectors vary widely, employers consistently report that hiring remains a challenge. According to The Solar Foundation’s National Solar Jobs Census 2017, “the three primary reasons reported for hiring difficulty are lack of relevant experience or technical knowledge among the candidate pool, insufficient qualified applicants (certifications or education), and the high volume of workers needed.” A coordinated approach to work-based learning across the solar industry can help to address each of these challenges. This toolkit is designed to help solar businesses identify the right training and workforce development partners and coordinate resources to find small and scalable solutions to address training needs.

Part Two: Planning and Implementing a Successful Work-Based Learning Program provides solar employers with comprehensive resources and best practices for designing and implementing work-based learning solutions to build a strong solar workforce. Part Two contains the following sections:

1: WORK-BASED LEARNING BASICS // This section describes the various types of work-based learning and when to use them.

2: OUTREACH AND RECRUITMENT // Many businesses struggle to reach enough potential students and job seekers to fill the jobs or programs available, even at the entry level. This section provides specific strategies for engaging key populations.

3: PROGRAM PLANNING RESOURCES // Concerned about the rules and regulations around work-based learning? This section provides some important resources and things to consider.

4: IMPLEMENTATION GUIDE // This step-by-step manual is perfect for businesses ready to build a work-based learning program from the ground up.

SECTION 1
WORK-BASED LEARNING BASICS

Types of Work-Based Learning
WORK-BASED LEARNING BASICS

Whether through formal internships and apprenticeships, short term project-based experience, or on-the-job training, work-based learning (WBL) is a key element of workforce development. The ability to apply practical skills on the job is a key part of career readiness, and work-based learning ensures that solar graduates and trainees are ready to immediately meet workforce needs.

Robust WBL systems can create a stronger talent pipeline for businesses, reduce the cost of hiring and on-boarding employees, and streamline the training process for new hires. WBL can also:

- Increase awareness of the industry, relevant career pathways, and companies that are hiring;
- Ensure individuals are equipped with the latest industry-specific skills and competencies;
- Offer businesses a low-risk opportunity to vet new hires before making a long-term investment;
- Reduce installation errors and expensive, time consuming call-backs.

Types of Work-Based Learning

- **JOB SHADOWING** // Short-term experience aimed at career exploration.
- **INTERNSHIPS** // Designed to give students/trainees a structured opportunity for career exploration, skill development, and networking.
- **COOPERATIVE EDUCATION (CO-OP)** // Combines classroom training with work experience; usually tied to a post-secondary degree program.
- **APPRENTICESHIPS** // A combination of structured on-the-job and classroom training resulting in periodic wage increases and certifications.
- **ON-THE-JOB TRAINING** // Practical post-hire training located on the job site, usually consisting of an experienced worker conferring skills to a new employee or upskilling an incumbent employee to perform tasks of higher complexity.
SECTION 2
OUTREACH AND RECRUITMENT

Making Connections
Recruiting Strategies
Prioritizing Diversity in Work-Based Learning
OUTREACH AND RECRUITMENT

The solar industry and its sub-sectors often report the talent pool is too small, and it’s a costly problem. Nearly 40 percent of employers surveyed for the Solar Training Network’s 2017 Solar Training and Hiring Insights report agreed that the costs of recruitment and missed opportunities are substantial, often exceeding $10,000.00 per unfilled position annually, and restricting their business’ ability to grow.12

Building general awareness of solar career and training opportunities is key to supporting enrollment and maintaining sustainable talent pools. When career and technical centers and community colleges struggle to fill their classrooms, they may lose the funding needed to maintain equipment and hire qualified faculty, further limiting a region’s solar workforce and the market’s capacity to grow.

In addition to strengthening partnerships with educational institutions, the solar industry should bolster links to community-based organizations, the public workforce system, and veterans’ career development programs. These kinds of partnerships are key to creating and raising awareness of opportunities to support a steady and sustainable talent pipeline.

BUILDING A PIPELINE

Students and job seekers may not identify solar as an interest or have the right technical skills, but they do have interests and skills from adjacent disciplines. For example:

Installation
In addition to construction, you may also want to recruit from agriculture programs, where graduates have good mechanical aptitude and enjoy being outside. Mechanical engineering and engineering technology also attract people who like to work with their hands.

Manufacturing
Many community colleges have recently invested in robotics and automation labs, where students learn the basics of electricity and ladder logic, skills that would prepare them for solar panel manufacturing.

Sales and Distribution/Other
Humanities and liberal arts students often struggle to connect their interests to in-demand jobs. However, these students typically have excellent written and verbal communication skills and the ability to synthesize new information. With short-term, on-the-job training, they can quickly become sales representatives, customer service providers, or part of the business operations team.

Making Connections...

...With K-12 Education

Establishing relationships with K-12 schools is an effective avenue to build interest in solar as a career path for young people. Work-based learning at the K-12 level includes field trips, classroom visits, and other low-cost, low-commitment activities to plant seeds of industry awareness. It also includes job shadowing and internships for high school students to engage near-future job seekers in relevant skill development.

SCHOOL COUNSELORS, ADMINISTRATORS, AND TEACHERS
When developing solar work-and-learn models, counselors, school administrators, and teachers can provide information about existing programs and support solar businesses in creating outlines and materials. In some cases, partnerships between solar businesses and K-12 systems leads to “solar schools,” in which solar systems are installed on or near the school, saving the school money on utilities while boosting the local solar economy, enhancing the visibility of solar in the community, and supporting solar curriculum in the classroom. K-12 staff and faculty are also key to meeting students who may be interested in participating in work-and-learn opportunities. Most local school districts have an online staff directory with contact information for administrators, counselors, and teachers.

What to Ask: “How can we work together to help your students learn about jobs available in the solar industry?”

What to Offer in Return: Company tours, demonstrations, classroom visits, technical assistance for integrating solar content into science curriculum, donations of solar tools and materials for use in classroom activities.

“Nearly 5,500 schools nationwide have made the switch to solar energy, a 46% increase [from 2014 to 2017]. This provides a unique opportunity for teachers and students to learn more about the mechanics of solar energy and apply it to their science, technology, engineering, and math (STEM) curriculum and it’s happening in classrooms across the country from Antelope Valley Union School District in California to Discovery Elementary in Arlington, Virginia. In some cases, solar energy educational programs have been woven into the curriculum. In Philadelphia, for example, two companies, Solar States and Clean Currents, started the Philadelphia Solar Schools Initiative which provides daily solar energy classes at Youthbuild Charter School. By partnering with the K-12 system, your organization can directly prepare and influence the knowledge of solar energy and build a foundational relationship with administrators and teachers.”


CAREER AND TECHNICAL EDUCATION (CTE)
CTEs provide high-quality technical and career-oriented education to both high school students and young adults, focused on the latest occupational standards and industry-recognized credentials, such as the North American Board of Certified Energy Practitioners (NABCEP) and the National Center for Construction Education and Research (NCCER). Reach out to the local CTE’s industrial program coordinator, principal, or adult learning coordinator to find out about opportunities to partner. These institutions are often looking for businesses to validate curriculum, hire interns, visit students in the classroom or lab, host company tours, participate
in career fairs, and conduct mock interviews. In turn, they can help solar businesses develop customized WBL programs and provide insights about their current students who are looking for internships or full-time jobs. Even if the local CTE doesn't have a solar program, there are opportunities to increase students' awareness of the industry and job opportunities they may not have thought of when they chose their program. For instance, sharing information about the solar industry with manufacturing, information technology, and building trades students may encourage some to explore solar businesses when they are looking for internships and full-time jobs.

**What to Ask:** “How can we work together to make sure students who are interested in the solar industry get exposure to the skills and knowledge they need to jump start their career?”

**What to Offer in Return:** Internship opportunities, curriculum review, classroom visits, company tours, donations of tools and materials for student practice.

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### EDUCATIONAL SOLAR PROGRAMS AND CURRICULA

If your local schools don’t already have solar industry programming or curriculum, you can save them some time and resources by pointing them to the following curricula and lesson plans. Click on the links to learn more.

- **NATIONAL RENEWABLE ENERGY LABORATORY EDUCATIONAL RESOURCES**
- **BORREGO SOLAR: SOLAR ENERGY LESSON PLANS**
- **SOLAR READY VETS CURRICULUM**
- **NATIONAL ENERGY EDUCATION DEVELOPMENT (NEED) PROJECT: CURRICULUM**
- **FLORIDA SOLAR ENERGY CENTER: CURRICULA**
- **CENTER FOR ENERGY WORKFORCE DEVELOPMENT**
- **BONNEVILLE ENVIRONMENTAL FOUNDATION CURRICULUM**

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### ...With Higher Education

Many community college and university students are eager to find summer work experience and internships before they graduate. Whether they are studying the solar industry or a completely unrelated field, these students are often open to a variety of learning experiences and can provide a much-needed help during a business’s busiest season. While posting a job description is a first step, employers can take proactive measures to engage the best candidates by contacting college career centers.
CAREER NAVIGATORS, ADVISORS, AND SUCCESS COACHES
Many post-secondary institutions are committed to providing direct and proactive support services for students, such as job-readiness coaching, job and internship placement, and wrap-around services that continue even after a student starts working. This kind of coaching lessens the business’s commitment to mentoring during work hours. To find staff in these roles, look for “Student Success” on the college or university’s website.

What to Ask: “I’m looking to hire some interns this summer. Can you connect me with students who are well-prepared for a work-based learning opportunity?”

What to Offer in Return: Written or verbal feedback on interns, participation in career fairs.

CAREER CENTERS
College students can visit their campus career center to explore job postings and request additional assistance. The staff at these centers can provide interview coaching, resume assistance, and networking support. Unlike the navigators and coaches described above, career center staff typically only work with students during the job search phase. In some cases, these career centers have established models for cooperative education or internships that your organization may be able to tap into easily. Search “Career Services” on the college or university’s website to find the career center.

What to Ask: “What’s the best way to share information about solar industry jobs and internships with students who visit the career center?”

What to Offer in Return: Host workshops about the solar industry, meet with students, share job postings to make sure the career center knows your business needs.

FACULTY
At community colleges and universities, instructors are often looking for opportunities to bring in guest speakers and/or offer their students field experience. If the local college or university offers solar or programming in fields with transferable skills to solar occupations, consider contacting the faculty to arrange a visit. If it doesn’t, getting in front of students is a great way to raise awareness about solar career pathways in emerging markets. Building these relationships may also give you more influence over curriculum and program design if the department sees your business as a partner in their students’ success. Find faculty in solar-related disciplines by browsing the “Academics” section of the college or university’s website.
What to Ask: “How can I help you expose students to today’s solar industry?” or “I’d like to help your department update its solar-related curriculum—how can I get involved?”

What to Offer in Return: Curriculum review, cooperative education positions, on-the-job training/work experience, real-world examples/case studies for classroom use.

...With Community-Based Organizations

Many community-based organizations (nonprofit and non-government agencies, membership organizations, trade associations, etc.) are committed to connecting employers with students and job seekers. While the resources and partners will be different in every community, the following organizations are an excellent “first stop” for information.

CHAMBERS OF COMMERCE
The local chamber exists to help businesses make connections with resources, partners, and customers. Often, they have workforce staff who can help with work-based learning programs or resources.

What to Ask: “Are there any incentives available for on-the-job training?” or “Are any of your members/partners addressing the workforce shortage in our region? How can I get involved?”

What to Offer in Return: Your membership and/or involvement in the organization’s activities or a willingness to provide data and feedback on programs and services.

PHILANTHROPIC ORGANIZATIONS
Every region has a number of nonprofit, community-focused organizations that can assist businesses with recruiting and supporting job seekers and students. For example, United Way is a front door to other nonprofit organizations and can help you find partners who are providing case management and job coaching or placement services to potential interns and apprentices.

What to Ask: “Which of your partners are providing wrap-around services to training program participants?”

What to Offer in Return: A willingness to provide data and feedback on the programs and services your business participates in.
With the Public Workforce System

The local workforce board has a federally mandated relationship with education, business, and government that can provide organizations with the connections to programs and services to promote the solar industry and in-demand jobs.

American Job Centers (AJC)

There is an AJC in every community, each with trained staff who can help recruit talent and align workers with the necessary training. Job seekers come to the AJC for placement assistance, including training and reskilling as required by unemployment insurance.

Case Study

At-Risk Individuals Trained for Solar Industry Jobs

Homeboy Industries serves high-risk, formerly gang-involved men and women, and has played a vital role for employers, community clients, and trainees. Homeboy Industries offers a series of weekly workshops to help clients break down employment barriers and enter into the job market.

Annually, Homeboy Industries trains 80 participants in solar panel installation through their Los Angeles Unified School District’s Adult and Career Education Division. Trainees can enroll in a free pre-exam tutoring program, job-seeker workshops, job placement services, and industrial safety training.

Job-seeker workshops help trainees build their resumes, practice interviews, improve computer skills, and study business communication. During safety training, participants complete DOT, Confined Space Training, OSHA, and HAZWOPER. Homeboy Industries pays all the trainees’ educational expenses.

The staff at Homeboy Industries works with employers and businesses to help identify jobs and place trainees into them after training. Trainees are highly sought after in the solar panel marketplace. In 2017, 27 participants were able to take the advanced energy certification test, which had a 100% pass rate. Since the program started six years ago, they have graduated 92% of candidates with a 70% placement rate within 90 days of graduation. Follow the link below to learn more.

Homeboy Industries Solar Panel Installation and Certification Program

...With the Public Workforce System

When Should I Connect with Education Providers?

It’s a good idea to start forming relationships with the local education providers even when the business isn’t actively recruiting. This creates a mutually beneficial partnership that can be tapped into when the need arises.
and other federal programs. Some AJCs also provide soft skills training to ensure the workforce is well-rounded and prepared to enter employment within the solar industry. Many AJCs also offer specialized placement services for interns.

**What to Ask:** “I’m looking to hire # interns in the next three months. Can you help me get the word out and pre-screen candidates?”

**What to Offer in Return:** A willingness to share data and results about job seekers the AJC places with your business, continued information sharing about your skill and hiring needs.

**OFFICE OF APPRENTICESHIP**

Solar businesses interested in offering structured work-based learning that takes place over several months or years should work with the local office of apprenticeship. The staff can help businesses develop and register an apprenticeship and guide businesses through the process of selecting an education partner, developing an application and recruitment process, and implementing a new program. They can also help connect businesses with existing programs.

**What to Ask:** “How can I start an apprenticeship program for my business?”

**What to Offer in Return:** Share best practices and lessons learned, encourage other businesses to use apprenticeship as a WBL solution.
Recruiting Strategies

There are several avenues to finding candidates for work-based learning opportunities, including the following:

// Career Fairs //
High schools, technical centers, colleges, and universities often host career fairs for their students. With a small investment of time and resources, businesses can meet dozens of potential candidates in just a few hours. The Solar Training Network and GRID Alternatives host solar-focused career fairs around the country, but there are many other opportunities for engaging broader groups of job seekers to get the word out about the solar industry and diverse solar careers.

// Internal Recruitment Practices //
Word of mouth continues to be one of the primary ways people learn about job opportunities and
the solar industry. Engage current employees in the recruiting process by offering employee referral bonuses, engaging in alumni networks, and sharing job postings with their families and friends.

// SOCIAL MEDIA & PAID ADVERTISEMENTS //

Social media is becoming a prominent recruitment tool. By posting, sharing, and promoting WBL programs on social media, businesses can reach a wide array of people who may be interested in the solar industry. Paid advertisements in newspapers, television, and radio can drive the message to an even more concentrated audience and should be considered accordingly.

59% of candidates use social media to research companies they are interested in.\(^\text{13}\)

83% of candidates are active on Facebook, 40% are active on Twitter, and 36% are active on LinkedIn.\(^\text{14}\)

The Chicago Urban League has taken proactive measures to attract job seekers to the solar industry by advertising on popular radio stations including iHeartRadio and WVON 1690 AM – The Talk of Chicago. Andrew Wells, Director of Workforce Development at the Chicago Urban League, said the first step in developing a solar talent pipeline is making people aware of the need for a solar workforce. Broadcast advertisements are supplemented with Facebook posts, including one about the new Solar Energy Jobs Training Program. Ads target program applicants and invite them to apply for solar installation training offered as a result of the Future Energy Jobs Act.

Prioritizing Diversity in Work-Based Learning

AS DOCUMENTED IN THE SOLAR FOUNDATION’S SOLAR INDUSTRY DIVERSITY STUDY, THE correlation between diverse workforce and financial performance is clear. Companies with diverse staff, and particularly diverse representation in leadership, perform better than their less diversified counterparts.\(^\text{15}\) These improvements may be attributed to varying skill sets that make for better decision-making, particularly in hiring, recruiting, and retaining talent, resulting in a positive bottom line.

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overall diversity in the solar industry is slowly increasing, but the industry still needs to be far more inclusive in order to reflect the overall population. Between 2015 and 2017, the number of Black or African American individuals in the solar workforce grew to over 18,500, but this still only represents 7% of the solar workforce. Women and people of color are under-represented in the solar workforce; as a result, the workforce is still overwhelmingly white (73.7%) and male (73.1%). The solar industry is predominantly made up of small-to medium-sized companies, which generally have fewer resources to allocate processes related to diversity. However, the solar industry remains more diverse than similar industries like construction, oil and gas extraction, and utilities industry.

Several Solar Training Network partners, such as GRID Alternatives, are making a concerted effort to support workforce diversity and equitable access to solar careers. You can join them by taking some of the following actions:

- Look at demographics within your own company to understand where you’re starting from and empower your staff to engage others from their communities and meet diverse communities where they are. Make outreach, recruitment, and retention of diverse populations deliberate and intentional.
- Contact your local YMCA/YWCA to schedule an information session or, better yet, a recruitment fair for internships, pre-apprenticeships, or apprenticeships.
- Work with your local SNAP Employment and Training office to develop training for women receiving public assistance.
- Contact Historically Black Colleges and Universities (HBCUs), predominantly Latino colleges and universities, and colleges and universities with large Native American populations. Develop relationships with their career services staff, attend career fairs, and recruit their graduates.
- Work with Goodwill Industries and similar service providers to develop training programs and support systems for differently-abled job seekers.
- Work with children’s services to provide summer work opportunity for older youth (16-17-year-olds) in the foster care system.

For more information, see the Solar Energy Industries Association’s diversity best practices guide.

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**SOLAR INDUSTRY DIVERSITY BEST PRACTICES**

17 QWI Explorer, U.S. Census Bureau Center for Economic Studies, https://qwiexplorer.ces.census.gov/static/explore.html#x=0&g=0.
SolarWorks DC is a six-week training program designed to serve low-income DC residents aged 18 to 24. During the program, participants receive on-the-job training through GRID Alternatives Mid-Atlantic on solar installation, OSHA 10 safety instruction, and customer service. A 12-week program is also available for individuals 18 and over.

Funded by the District of Columbia Department of Energy and Environment and the Department of Employment Services, SolarWorks DC is implemented by GRID Alternatives, a nonprofit organization committed to providing solar energy solutions to low- and fixed-income residents of the cities it serves. Through this partnership, 60-100 DC residents are receiving free solar panel installation in their homes. These residents can expect to see their electric bills drop 50%, saving them approximately $600 per year.
SECTION 3
PROGRAM PLANNING
RESOURCES

Labor, Insurance, and Legal Considerations

Safety Training and Onboarding
MANY EMPLOYERS RECOGNIZE THE BENEFITS OF A WORK-BASED LEARNING PROGRAM, such as encouraging company loyalty among future workers as well as increased industry and brand exposure for students. However, some employers remain hesitant to participate, often citing perceived insurance restrictions or undefined legal concerns.

The following overview provides general guidance for employers and references to the applicable federal laws and regulations. The overview does not cover workplace and safety laws, rules, and regulations that govern all employers, including occupational safety and health, equal employment/non-discrimination, and disability protections/access, but focuses specifically on laws and regulations that hosts of work-based learning participants should understand. Although federal laws are referenced, it is important to also check with each state’s labor website for state laws, regulations, or policy that may also apply.

*This information has not been reviewed by licensed attorneys, and merely seeks to provide an overview of the applicable themes. This information should not replace or be considered legal counsel.

**Fair Labor Standards Act (FLSA)**

The Fair Labor Standards Act (FLSA) was enacted in 1938, establishing minimum wage, overtime pay, recordkeeping requirements, and child labor standards affecting full-time and part-time workers in the private sector and in federal, state, and local governments. Some work-based learning opportunities are subject to the FLSA and some are not. The FLSA specifies certain limits on the employment of minors under the age of 18, along with child labor laws and the minimum wage.

Workplace or work-based learning is a learning experience for students at an employer’s work site. Workplace activities that do not involve the performance of work are not considered employment subject to the FLSA. Examples are career awareness and exploration, field trips to work sites, and job shadowing where students follow and observe employees in daily duties but perform no work.

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Family Educational Rights and Privacy Act (FERPA)

The federal Family Educational Rights and Privacy Act (FERPA) protects students’ records from public disclosure. While employers must receive information on students participating in a work-based program (like a social security number, school grades, or courses taken), this information cannot be released without a signed release-of-information form. When the student is under 18 years old, his/her legal guardian must sign the form. Students 18 or over may sign their own form.

Child Labor Laws

One of the biggest deterrents to employers engaging in a work-based learning opportunity is the myth that child labor laws complicate hosting minors at job sites, or liability issues are prohibitive. It is important to adhere to all federal law, but this should not deter employers as it is much simpler to comply than they may realize.
Liability, Insurance, and Workers’ Compensation

It is essential that educators, employers, and students understand potential risks associated with WBL placements and the laws governing students in the workplace. Educators who place students in a work site need to confirm the existence of sufficient insurance coverage and provide comprehensive information concerning potential risks associated with work-based learning to students, employers, parents, and guardians. Students and their parents or guardians must review information provided to them, so they can make an informed decision about student participation in a WBL placement.

The school should first determine if their coverage extends to any and all work-based learning activities, including those that occur outside of school hours, off school grounds, or are not directly supervised by a school employee, and also find out if the school’s liability policy has any exclusions, such as malpractice (health services) or a garage exclusion. The employer should also inquire with their existing insurance, as many students are hired as employees of the company and compensated for their time. In these cases, most are likely to be covered under the company’s current insurance policy in the same manner as any regular employee in the same class code and wage group.

Workers’ Compensation

Per federal law, students who are involved in a paid WBL position must be covered by workers’ compensation. Workers’ compensation is insurance that compensates an individual’s lost wages (a percentage) due to injury suffered while on the job, and covers medical costs, disability rehabilitation, the loss of functional capacity, and survivor benefits, as well as providing liability protection for the employer. Workers’ compensation insurance should pay for all reasonable and necessary medical services and supplies related to an on-the-job injury. In some cases, this may include not only coverage for doctor visits and hospital treatment, but also coverage for physical therapy, medication, chiropractic treatment, and psychological counseling. States vary as to who is responsible for covering a student’s paid WBL and may have state-specific policy, so be sure to consult the appropriate state website for details.

Employers many times provide workers’ compensation coverage for the student. Sometimes this coverage is part of their regular workers’ compensation policy, and sometimes employers may host a WBL student through a temporary agency in which the temp agency provides coverage.
For more information on work-based learning in your state, click on the link below to find your local contact.

DIRECTORY OF STATE APPRENTICESHIP CONTRACTS

Safety Training and On-Boarding

MANY SOLAR TRAINING NETWORK PARTNERS – BUSINESSES AND EDUCATORS ALIKE – HAVE agreed that one of the challenges to implementing work-based learning is the safety of employees and students. This is a particular challenge for installation firms that have lofty insurance costs for each employee who gets on a roof, but personal safety is a concern across industries and occupations.

Similarly, every company that brings on interns or apprentices has to quickly acclimate trainees to the workplace culture, policies, and practices. For many small businesses the capacity to develop effective on-boarding is not readily available. In the Implementation Guide that follows in the next section, you’ll find some guidelines for developing an orientation that will quickly get interns up-to-speed.
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.
SECTION 4
WORK-BASED LEARNING IMPLEMENTATION GUIDE

Step 1: Choose the Right Fit
Step 2: Outline Skills Needs
Step 3: Define a Training Plan and Select the Right Partner
Step 4: Put the Plan into Action
Step 5: Monitor Progress
What follows is a step-by-step manual to developing a customized solar work-based learning program. This guide is organized into five steps:

1. **Step 1: Choose the Right Fit**
2. **Step 2: Outline Skills Needs**
3. **Step 3: Define a Training Plan and Select the Right Partner**
4. **Step 4: Put the Plan into Action**
5. **Step 5: Monitor Progress**

**CONSIDERATIONS FOR CUSTOMIZATION**

There is no “cookie-cutter” or “one size fits all” training model that encompasses the complexity of the solar industry—particularly as it crosses installation, project development, manufacturing, sales and distribution, and other sectors. Whenever it’s relevant, this implementation guide will highlight specific considerations for these five sub-sectors. However, the biggest difference across programs will be in the technical skills and competencies included in the learning objectives and curriculum. Many of the logistical and curricular concerns will be similar, regardless of the job title or technical focus of the program. Employability skills, communication, and safety are common themes across the industry.

**Step 1: Choose the Right Fit**

**The Best Work-Based Learning Programs Are Employer-Driven and Designed to**
address specific skill gaps and long-term talent needs. The first step in planning a work-based learning program is to identify a goal for the business and for potential trainees. For example, possible goals might include establishing a program that:

1. Supports participants as they explore solar career pathways. For this goal, good options include job shadows, short-term projects, or competitions;
2. Provides participants with the skills and credentials they need for entry-level employment within the solar industry. Appropriate options to meet this goal include internships and co-ops; or

3. Incorporates ongoing education and training to assist with career growth while contributing to the business’s bottom line with increasing efficiency and productivity. An apprenticeship would be an effective way to meet this goal.

Be sure to set realistic expectations for the work-based learning program. This isn’t a short-term solution that will fill the skills gap on day one. Trainees will need some time to get up to speed and may not be able to work full-time hours right away. Making a proactive investment in training will help businesses build a pipeline of talented and skilled workers in the solar industry. This is a sustainable, scalable solution, not an overnight fix.

Other factors to consider early on:

- How many trainees are needed, considering overall demand for labor and likelihood of turnover?
- What skills need to be developed (this should include not only skills needed at the entry level, but also mid- to high-level skills that will be needed to address growth and turnover in the next 3-5 years)?
  - Consider not only technical skills, but also soft skills (professionalism, communication, integrity, initiative, etc.). The local American Job Center may offer workshops that cover some of these skills. There are also adult basic education and literacy programs that you can refer underprepared candidates to.
- Will trainees be paid or unpaid? If unpaid, are there other benefits that can be offered (e.g., transportation assistance, tools or uniforms, small stipend, etc.)?
- What other costs and resource needs should you consider? For instance, some formal apprenticeship programs include classroom instruction at an off-site training facility, and in some cases, employers cover the cost of tuition.

The flow chart on the following page will help guide you toward the best type of work-based learning for your organization or company.
WHICH TYPE OF TRAINING SHOULD YOU CHOOSE?
Using the flow chart below, answer a couple of questions to find the right fit for you.

What type of training will you provide?
- **ON-THE-JOB ONLY**
- **ON-THE-JOB & CLASSROOM**
- **CLASSROOM ONLY**

Do you want to compensate your trainees?
- **YES**
  - **ON-THE-JOB ONLY**
  - **ON-THE-JOB & CLASSROOM**
  - **CLASSROOM ONLY**
- **NO**

**INTERNERSHIP**
- **Type:** On-the-Job
- **Duration:** <1 Year
- **Age:** ≥16 Years
- **Compensation:** Maybe

**JOB TRAINING PROGRAM**
- **Type:** Combination
- **Duration:** 3-4 Months
- **Age:** ≥18 Years
- **Compensation:** None

**CO-OP**
- **Type:** On-the-Job
- **Duration:** 6 Months - 1 Year
- **Age:** College Students
- **Compensation:** Yes

**APPRENTICESHIP**
- **Type:** Combination
- **Duration:** ≥12 Months
- **Age:** ≥16 Years
- **Compensation:** Yes

**JOB SHADOW OR CAREER CAMP**
- **Type:** Classroom or Controlled Environment
- **Duration:** ≤2 Weeks
- **Age:** ≤18 Years
- **Compensation:** None
Step 2: Outline Skills Needs

// STEP 2.1: DEVELOP A JOB DESCRIPTION //
Once you have identified which work-based learning model is the best fit for the organization, the next step is to develop a job description for the trainees. A well-crafted job description will attract the right candidates to the program and communicate the business’s needs to potential partners. For apprenticeship programs, it will lay the groundwork for your standards of apprenticeship if you decide to register your program with the Department of Labor:\textsuperscript{20}

<table>
<thead>
<tr>
<th><strong>Photovoltaic (PV) Installer</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Our organization is seeking a full-time photovoltaic (PV) system installation intern. This is a 3-month internship that will support all aspects of residential solar design, installation and maintenance under supervision of senior team members. The intern will receive training in best installation and safety practices and will gain valuable hands-on installation experience. Upon successful completion, the intern will be well-positioned to transition to an entry-level solar job.</td>
</tr>
</tbody>
</table>

**Key responsibilities include, but are not limited to:**
- Assist staff with site visits for system design and layout planning
- Stage, load/ unload, take regular inventory of equipment, and maintain clean work-site
- Assist installation team with array layout, racking installation and module placement – including measuring, cutting, assembling and bolting structural framing and panels
- Assess operating conditions of systems or equipment, trouble-shooting when necessary
- May perform minor electrical work such as current checks
- Attend mandatory training sessions on new products, methodology and safety
- Participate in regular check-ins / updates with intern supervisor.
- Other relevant tasks as assigned

**Qualifications**
A successful candidate will be a self-directed, motivated team player with a strong work ethic and desire to master all aspects of PV system installation.
- Must have excellent active listening and strong verbal, written communication skills
- Demonstrated ability to complete tasks safely and effectively in a timely manner
- Demonstrated strong organizational, critical thinking, problem-solving, decision-making skills
- Ability to work effectively as part of a team, or independently with limited supervision
- Must be able to lift and carry at least 50 lbs, and be comfortable working at heights and outdoors
- Attention to detail, ability to take and apply precise measurements.
- Professional demeanor when interacting with team members and customers

An ideal candidate will have a strong mechanical aptitude, and prior work experience in general construction, roofing or ladder work. Basic understanding of electrical wiring and conduit bending is also preferred. Experience using all types of handheld and power tools is a plus.

**Requirements**
This position requires a high school diploma or equivalent as well as OSHA - 10 certification. Applicants must be at least 18 years of age, possess a valid driver’s license and reliable transportation. The successful candidate must pass a comprehensive background check and drug screening.

Women, the formerly incarcerated, and people of color are encouraged to apply.

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Strategies for Solar Workforce Development

STEP 2.2: IDENTIFY COMPETENCIES

Once you have identified in general terms the skills to cover in the program, explore the competencies (knowledge, skills, and abilities) that trainees will be exposed to. The U.S. Department of Labor has developed several industry competency models that highlight the workplace, academic, personal effectiveness, and occupation-specific competencies needed in a sector. Below are the competencies recommended for the renewable energy sector:

**Workplace Competencies**
- Business Fundamentals
- Teamwork
- Adaptability and Flexibility
- Marketing and Customer Focus
- Planning, Organizing, and Scheduling
- Problem Solving and Decision-Making
- Working with Tools and Technology
- Checking, Examining, and Recording
- Sustainable Practices

**Personal Effectiveness Competencies**
- Interpersonal Skills
- Integrity
- Professionalism
- Initiative
- Dependability and Reliability
- Lifelong Learning

**Registered Apprenticeships** are recognized and monitored by the United States Department of Labor and, in some states, by a State Apprenticeship Agency. Registering an apprenticeship brings a level of quality assurance and technical assistance from the Office of Apprenticeship staff. It also offers apprentices a nationally recognized credential when they complete the program. Specific requirements (such as the minimum length of the program) vary by state and by occupation. Click on the link to learn more.

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Beyond the competencies that apply across occupations, identify the specific technical competencies that trainees will develop. In many cases, the business may already have a great deal of information built into job profiles or job descriptions, especially if it already offers internal or on-the-job training. If not, you may need to complete a job task analysis or work with a local educator or instructional designer to do so.

Essentially, a job task analysis breaks down responsibilities and tasks into practicable skills, so that trainees learn each step in a process—choosing and using appropriate tools, understanding when and why to complete a task, and being able to evaluate the accuracy or completeness of a task. This kind of thorough and intentional planning is recommended, because experts have often internalized so much of what they do that they may overlook key steps or rationale when explaining or demonstrating a skill.

If the program will include both on-the-job and classroom training, determine which skills will be taught through hands-on practice during the work day and which skills will be taught in the classroom. Typically, classroom training will cover the theoretical underpinnings that contextualize technical skills. For instance, a technical sales trainee may need to learn about shade analysis—what it is and why it’s important to the solar industry—before going with a mentor to a job site to observe how a shade analysis is conducted.

To see how others have defined the key competencies in various occupations, visit the links below.

**Step 3: Define a Training Plan and Select the Right Training Provider**

**STEP 3.1: DETERMINE RESOURCES NEEDED**

Running a work-based learning program requires financial, human, and physical resources. A few key considerations are outlined below.

**Staff Capacity**
A good work-based learning program will require the time and energy of several key staff members, including:

- **HR or Training Manager** // Someone to design, develop, and oversee the program and ensure that trainees are screened, hired, and on-boarded properly and according to all company, state, and federal regulations. This person also offers trainees an opportunity to provide feedback and raise concerns in a safe environment.

- **Operations or Production Manager** // This person will ensure that the trainee is learning appropriate technical skills and that the trainee is contributing to the business’s bottom line at an appropriate level. This person will also work with HR to determine the appropriate wages (if applicable) at each stage of the training. For example, registered apprenticeships are required to schedule wage increases along with skill increases. Even if it is not a registered apprenticeship, this is a best practice that should be considered in any training program.
Mentor or Supervisor
High-performing employees can be assigned to coach trainees. Carefully consider how much time these employees will have to devote to training, and how many trainees they can safely and effectively mentor at once. In registered apprenticeships, the Department of Labor determines the mentor-to-apprentice ratio.

Physical Resources
What space, supplies, and equipment will the business need to take on trainees? Is there enough room at the work site or in the office to add additional people? In an office, make sure there’s a desk and a computer for the apprentices to use. If the trainees will travel to different job sites, make sure that they understand the expectations around transportation. It might seem obvious, but make sure trainees understand if they need to bring a lunch, coffee or water to the job site. What will trainees need to provide for themselves? Keep in mind that student workers and trainees may not have the same resources that typical job seekers do. If the business typically requires employees to supply their own uniforms, steel-toed shoes, Personal Protective Equipment (PPE), and tools, make sure that expectation is clear. If it’s possible to offer scholarships or stipends to trainees, do so.

Financial Resources
Determine any insurance responsibilities for bringing on trainees, and account for the possibility of initial production slow-downs, mistakes, or breakages. Be sure to build this into the budget as you prepare for the program.

// STEP 3.2: SELECTING A TRAINING PROVIDER //
In many cases, WBL programs require the participation of both an employer and a training provider. This is most obvious in apprenticeships, in which there’s a clear distinction between classroom and on-the-job training. Even in shorter and/or less formal programs, the involvement of an educator or trainer can be extremely helpful in mapping the learning outcomes or goals of the program, developing assessments and evaluations, and designing learning experiences. In some cases, such as for-credit internships required by a school, the training provider will already be provided. In others, the business will have to select a partner.

If the company has an in-house training department (or a dedicated staff member to develop and deliver the curriculum), then selecting a training provider won’t be necessary. Otherwise, the company should partner with a local career and technical center, community college, or private trainer/instructional designer. There are different benefits to each, as outlined in the chart on the following page.

In many cases, particularly for apprenticeship programs, WBL will involve classroom or lab time for participants, so the location of the training provider will make a big difference. Keep in mind that trainees will have to travel between work and school, so make sure they have ample time between the end of the shift and beginning of class (or vice versa). Students will also need access to public transportation or affordable parking.
### Type of Provider

<table>
<thead>
<tr>
<th>Type of Provider</th>
<th>Direct Link to K-12 System</th>
<th>Flexible Schedule</th>
<th>Budget-Friendly</th>
<th>Offers College Credit</th>
<th>Fully Tailored Solutions</th>
<th>E-Learning Option</th>
<th>Lab and Classroom Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career and Technical Center</td>
<td>Y</td>
<td>Usually limited by full-time course schedule and space available</td>
<td>Y</td>
<td>Sometimes</td>
<td>May provide customized job training (CJT)</td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>Community College</td>
<td></td>
<td>Usually limited by full-time course schedule and space available</td>
<td>Y</td>
<td>Y</td>
<td>May provide customized job training (CJT)</td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>Private Teacher or Instructional Designer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sometimes</td>
</tr>
</tbody>
</table>

### STEP 3.3: DEFINE SUPERVISION, TRAINING, AND PERFORMANCE PLAN

Once partners have been identified, they will work together to determine the training plan for all apprentices (this is called a Work Process Schedule in registered apprenticeship). The competency list should be the foundation for the training plan, with time allotted throughout the program to instruct trainees on new concepts and give them time to practice and apply new skills. Mentors and Supervisors must also be prepared to review trainees’ work, provide feedback, and help trainees improve.

For shorter-term training programs, include both daily schedules and a weekly overview so that trainees can see the program at-a-glance. For example, GRID Alternatives uses the following simple model for an 8-week program with three installations and 60 hours of classroom training.

<table>
<thead>
<tr>
<th>Week</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real-World Lab</td>
<td>Orientation to hands-on training opportunity, safety, and expectations</td>
<td>1st Install</td>
<td>2nd Install</td>
<td>Final Install</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classroom Hours</td>
<td>7.5</td>
<td>7.5</td>
<td>7.5</td>
<td>7.5</td>
<td>7.5</td>
<td>7.5</td>
<td>7.5</td>
<td>7.5</td>
</tr>
</tbody>
</table>
STEP 3.3: VALIDATING CURRICULUM

When the training plan is complete, the next step is to develop and/or validate the program curriculum based on the organization's needs. As the employer, you have a vested interest in making sure that the lessons being taught are aligned with business needs so that you have a skilled and trained talent pipeline prepared to fill in-demand jobs. While it is outside of the scope of this toolkit to explain the curriculum development process, validation is something businesses can and should do in-house. This is a simple four step process:

1. **Identify your in-house subject matter experts.**
   Look to your highest performers, shift leaders, and production managers. Experts should know the ins and outs of the daily tasks trainees will perform, so you should go to those who are most skilled in performing the company's day-to-day tasks.

2. **Present the curriculum to the experts.**
   This curriculum review will ensure the content is complete and relevant. This process can either be a facilitated roundtable discussion with SMEs or a simple email to experts asking for their review of attached training outlines or facilitator's guide. If you've used an outside curriculum developer, you may want them to facilitate this discussion.

3. **Collect feedback from experts.**
   Note first the importance and relevance of each lesson or task, and then highlight any gaps in content that would be necessary for trainees to learn.

4. **Update curriculum.**
   Update the curriculum to include expert feedback and finalize the program.

Step 4: Put the Plan into Action

STEP 4.1: RECRUIT PARTICIPANTS

When launching an effective recruiting campaign, you will need to develop the following:

- Messaging that highlights the career opportunities in the solar industry as well as the skills and experience trainees will gain in your program;
- A clear understanding of the candidate profile and the program's target population (refer to the job description, particularly the qualifications section); and
- Strategies for recruitment and who is responsible for implementing them. Recommended strategies include:
  - General outreach (flyers) shared with community-based organizations, libraries, adult education programs, community action agencies, churches;
  - Engage low-wage working applicants targeted through the public workforce system or similar services;
  - Build the recruitment network by asking community-based organizations to share the materials with their grantees and business organizations to share with their contacts;
  - Consider a referral bonus for prior participants or graduates of similar programs to spread
the word. Bonus is paid if applicant is eligible, accepted, and starts the program:

- Social media; and
- Paid advertising.

If you are launching a large program and need to attract many candidates at once, consider offering information sessions for candidates. At these sessions, provide an overview of the opportunity and the company, set expectations for the program, and begin pre-screening candidates. You may want to work with your American Job Center or a community-based organization to assist in conducting the information sessions and pre-screening. Community colleges, career and technical centers, and veterans’ services can also help recruit participants.

Refer to Part 2, Section 2: Outreach and Recruitment of this toolkit for suggestions on engaging the public workforce system in your recruiting process. These partners can help you reach a wider, more diverse candidate pool.

// STEP 4.2: SELECT PARTICIPANTS //
Businesses may choose to use their typical interview and hiring process for WBL participants, or they may decide to work with a staffing agency to assist with hiring. If you are launching a registered apprenticeship program, you will create a detailed selection process to include in the apprenticeship paperwork. In other cases—particularly for unpaid interns—a formal hiring process may not be required.

When considering candidates, keep in mind that you may be working with individuals who do not have much experience in the workforce and/or have barriers to employment that you do not encounter in a typical search. A few tips for interviewing these candidates:

- Approach the interview and hiring process as an opportunity to strengthen the solar industry’s workforce overall. This means treating each interview like a coaching opportunity, so that even if you don’t hire a candidate, you’re still helping them to have a positive impression of the industry and giving them an advantage in their next interview.
- These candidates may be nervous and unfamiliar with interview conventions. Try to put them at ease, and explain the conventions (e.g., that they should be asking questions about the job, too).
- Be prepared to troubleshoot transportation and scheduling challenges. Have contact information handy if you need to refer candidates to supportive services.

// STEP 4.3: ON-BOARD PARTICIPANTS //
As with the interviewing process, on-boarding work-based learning participants can be more complex than on-boarding full-time staff. A thorough introduction and on-boarding process can go a long way toward making trainees effective and productive team members.
In general, during on-boarding or orientation:

- Make sure trainees have all the information they need to be effective on the job, including:
  
  - Understanding of company culture and workplace expectations
  - Safety awareness
  - Responsibilities
  - Who to go to with questions

- Complete or review paperwork such as I-9s, liability waivers, emergency contact forms, etc. (If trainees can complete forms prior to coming to orientation, encourage them to do so.)
  
  - Be careful to avoid making orientation all about the paperwork. Even while walking through the forms, use this time to explain your work environment, why certain forms are required, etc., or use time to get to know the apprentices better.

- Share information about the solar industry and company

- Set goals for the learning experience and/or share learning outcomes

- Establish workplace norms and address some common assumptions, such as:
  
  - Start and End Times // A trainee might arrive at 8:00 while the supervisor was expecting them to have arrived at 7:45 in order to be clocked in and ready to work at 8:00.
  
  - Breaks // Does the trainee need to check in before leaving their desk or work station to use the restroom (i.e., for coverage of a reception area or for safety reasons)? Can trainees leave the premises for lunch, or do they need to pack a lunch and eat on site?
  
  - Attendance // Describe the call off procedure and explain that this should be saved for emergencies. Talk about scheduling appointments outside of work hours and emphasize that every team member is an important part of a productive work day.
  
  - Communication // In which situations should trainees use phone calls, text messages, or email? What is the supervisor’s preferred method of communication?

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**Step 5: Monitor Progress**

**// STEP 5.1: EVALUATE TRAINEES //**

Trainees and their mentors will need to keep track of daily activities, progress and proficiency in competency areas, and mastery of learning outcomes. This is especially important for internships connected to for-credit academic programs and registered apprenticeships, but monitoring trainees’ progress will be valuable for any program.

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Strategies for Solar Workforce Development // 78
On the following page is a simple activity log that includes space for a mentor to evaluate the trainee’s progress. This example includes the workplace competencies in Step 2.2, but could be expanded or adjusted to include any relevant competencies.

Depending on the content of the program, you may want to incorporate formal assessments. This will be particularly useful if apprentices are being prepared for NABCEP certifications or similar industry recognized credentials. This is also a requirement in some registered apprenticeships.

// STEP 5.2: CONTINUOUS IMPROVEMENT //
Implementing a WBL program is likely to be a learning process for the company as well as the trainees. Flexibility and the capacity to recognize and adapt to lessons learned are key to long-term success. Some recommendations:

- Schedule frequent check-ins between supervisors and trainees. Make sure that trainees are getting regular feedback on progress and performance, and have a chance to ask questions or provide feedback of their own.
- Schedule weekly check-ins among supervisors and program administrators. Use this time to troubleshoot any issues and to review the plan for the coming week.
- If your program is concurrent with a classroom component, schedule regular check-ins with the instructors or advisors at the school. Use this time to provide feedback on the trainees and to find out how the classroom instruction is going.

Be sure to apply lessons learned to the next round of training, and encourage your trainees to stay in touch even after they’ve completed the program. Hopefully, many trainees will stay with the business and pursue long-term career opportunities in the solar industry. Developing strong relationships with these individuals, even if they don’t stay with the company, will help increase awareness and positive perceptions of the solar industry long after the training is complete.
### Activity Log:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Date</th>
<th>Start Time</th>
<th>End Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

### Evaluation:

<table>
<thead>
<tr>
<th>Competency</th>
<th>Excellent</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Fundamentals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teamwork</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adaptability and Flexibility</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marketing and Customer Focus</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planning, Organizing, and Scheduling</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problem Solving and Decision-Making</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working with Tools and Technology</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Checking, Examining, and Recording</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sustainability in Practices</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
On Blattner Energy’s solar and wind job sites, you’ll find workers sporting color-coded helmets, which are almost a visual guide to a potential career pathway: orange and yellow hardhats are for craft employees, green hardhats are for foremen, and white ones are for superintendents and field engineers. “Some folks come with skills and licenses already, but most new hires are going from being a general laborer to being a skilled labor,” Jerry Carrow, general superintendent explains. Getting enough workers onto the job site is a job in itself. “Our biggest challenge is to get enough people who want to be trained and want to go out and work 8 to 12 hours a day and follow the industry as it moves.”

Jerry has been with Blattner Energy since 2005 and helped to design and lead a training effort to upskill solar and wind installers to become foremen, a position in high demand. A new hire’s path to becoming a foreman depends on the market as well as their trade skills, work ethic, and attitude. Training modules are delivered through a combination of classroom and hands-on training, and equally emphasize trade skills and soft skills.

Jerry is a former Marine and noted that large solar and wind construction teams aren’t unlike platoons, squads, and teams in the military. “We truly as a company and as an industry look forward to being able to pick up a veteran. Whether they’re a veteran from 10 years ago or 10 months ago, veterans had to get up every day and perform at a set level - whether they were a cook or infantry - and they depended on their team to follow guidelines, meet their objectives, and in some cases survive.” Companies like Blattner Energy are making concerted efforts to provide jobs and opportunities for career advancement to this talent pool, but less than 12 percent of America’s solar companies have strategies to recruit veterans.

“When I came to Blattner, right off the bat, it was a culture of prioritizing people. How we treat people matters. How we train people matters. It’s a culture of developing people who then produce for us rather than seeing what we can take from them.” Asked to describe the most exciting part of his work, Jerry replied, “It’s the day that I hire somebody and the day I get to promote them to be more than what they were when they came to work for us - and knowing that themselves and their families are benefitting. Their smile, their handshake, and thankfulness - we’re all better off for having met each other.”
APPENDICES: RESOURCES, SUPPORT, AND REFERENCES

Appendix A: Career Pathway Template

Appendix B: Other Workforce Development Topics of Interest

Appendix C: Other Work-Based Learning Topics of Interest

Appendix D: How to Find and Contact Your Local Workforce Representatives

Appendix E: Full Text of URLs and Referenced Links
## APPENDIX A
### CAREER PATHWAY TEMPLATE

<table>
<thead>
<tr>
<th>Job Title</th>
<th>Formal Education</th>
<th>OJT or Work-Based Learning</th>
<th>Industry-Recognized Credential</th>
<th>Competencies</th>
<th>Average Wages or Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bachelor’s Degree &amp; Above</td>
<td>Internship</td>
<td>Co-Op</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Associate’s Degree</td>
<td>Internship</td>
<td>Apprenticeship</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adult Certificate Program*</td>
<td>Internship</td>
<td>Apprenticeship</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High School Career &amp; Technical Program or GED plus industry-specific work readiness course</td>
<td>Job Shadow</td>
<td>Summer Work Experience</td>
<td>OSHA 10</td>
<td></td>
</tr>
</tbody>
</table>

*Examples of Adult Certificate Programs include non-credit workforce programs at a community college, adult career and technical education, or a technical certificate from a community college.*
To explore other topics of workforce development online, prior to contacting the representative, these are other areas that have reliable information:

- The Solar Training Network's National Directory is a great resource for identifying the solar training provider nearest to you and your solar business, as well as WFBs which are already in-the-know about solar workforce development opportunities. // https://www.solartrainingusa.org/registration-employer/

- The Energy and Utilities Competency Model is a resource for employers in developing supporting workforce preparation for energy-related jobs. The model evolves in conjunction with changing skills requirements. // https://www.careeronestop.org/CompetencyModel/competency-models/renewable-energy.aspx


- The National Skills Coalition conducted a fifty-state scan of state's policies regarding sector partnerships. This tool identifies if states have policies or allocated funding streams in place that support local sector partnerships. // https://m.nationalskillscorperation.org/resources/publications/file/Sector-Partnership-Scan.pdf

- National Governor's Association (NGA) is a national resource where governors can share best practices, speak on national policy, and develop innovative solutions to pressing challenges in their area. // https://www.nga.org/cms/home

- The National Association of Workforce Boards (NAWB) advocates for workforce development boards by working with policymakers in Washington, DC. NAWB represents over 500 Workforce Development Boards, consisting of over 12,000 business members, to leverage workforce-related strategies to meet the needs of employers. // http://nawb.org/

- Career One Stop provides customized solutions that address recruiting, hiring, and training needs of the employer. // https://www.careeronestop.org/BusinessCenter/Toolkit/toolkit.aspx

Best Practices:

- Corporate Diversity Benefitting Hiring and Retention // https://www.thesolarfoundation.org/new-research-study-provides-baseline-insights-solar-industry-workforce-多样性/)
- Training to Address the Need of Workers // https://civicworks.com/bmores-first-ever-solar-training-program-shines-bright/
- Pairing up with the Workforce System // http://www.californiagreensolutions.com/cgi-bin/gt/tpl_h_content=3555
To explore other topics of work-based learning online, check out the links below.

➤ The National Skills Coalition conducted a fifty-state scan of state’s policies regarding work-based learning. This tool identifies if states have policies or allocated funding streams in place that support local work-based learning opportunities. // https://m.nationalskillscoalition.org/resources/publications/file/WBL-Learning-Policy-50-State-Scan.pdf

➤ While implementing work-based learning experiences it is important to remember that the safety and health of the student is of the utmost importance. The Occupational Safety and Health Administration offers guidance on safety practices in the workplace. // https://www.osha.gov

➤ Employers with 15 or more employees must comply with the Americans with Disabilities Act (ADA). Title I, Employment covers all aspects of employment, including the application process and hiring, on-the-job training, advancement, wages, benefits, and employer-sponsored social activities. // https://www.ada.gov

➤ Federal Equal Opportunity in Employment Laws prohibit educational institutions and employers from discriminating on the basis of race, religion, ethnicity, national origin, age, disability, sex, marital, or veteran status. // https://www.eeoc.gov/employers/index.cfm

➤ The U.S. Department of Labor offers fidelity bonds which provide insurance for the first six months of employment for hard-to-place job seekers to diminish the risk employers take on. // http://bonds4jobs.com/

➤ Registered Apprenticeships are recognized and monitored by the United States Department of Labor and, in some states, by a State Apprenticeship Agency. To learn more about Registered Apprenticeship, check out the DOL’s Quick Start Toolkit. // https://www.doleta.gov/oa/employers/apprenticeship_toolkit.pdf

➤ The North American Board of Certified Energy Practitioners (NABCEP) has completed thorough job task analyses (JTAs) for several key solar occupations. // http://www.nabcep.org/certification

Best Practices:


➤ Community-Based Organizations Partner with Baltimore’s Workforce System to Offer Solar Training // http://baltimoregreencareers.civicworks.com/solar/

➤ Diversity & Inclusion Team // https://www.sunrun.com/

➤ SolarWorks DC Trains Youth and Reduces Energy Costs at the Same Time // https://gridalternatives.org/regions/midatlantic/solar-works-dc

➤ Prioritizing Safety for Trainees and Volunteers // https://gridalternatives.org/
APPENDIX D

HOW TO FIND AND CONTACT YOUR LOCAL WORKFORCE DEVELOPMENT REPRESENTATIVE

For assistance with workforce development, contact the business services representative at the local American Job Center (AJC). There are more than 2,500 AJC’s located across the United States. Visit this website for more information:

- Local AJCs are located at https://www.careeronestop.org/LocalHelp/AmericanJobCenters/find-american-job-centers.aspx?newsearch=true.
- Search by city, state, or ZIP code
- Chose the local AJC
- At this website, the physical address and general phone number of the AJC are provided. If there is a business representative listed, it is best to contact this individual.

To become more involved with workforce development at the community level, contact the Board Director:

- Search by city, state, or ZIP code
- Chose the Local Workforce Board
- At this website, the physical address and general phone number for the Board are provided. If a CEO or Executive Director is listed, it is best to contact this individual.

Include the following in an email body to the Business Representative at the AJC or the Board Director:

- Company name, current position, and company’s size
- Workforce concerns of the business/industry
- The goals of reaching out to the AJC/Board Director
- Multiple modes of contact information
APPENDIX E
FULL TEXT URLs AND REFERENCED LINKS

PART 1 // THE WORKFORCE DEVELOPMENT SYSTEM: LEVERAGING NETWORKS AND RESOURCES

SECTION 1: THE WORKFORCE DEVELOPMENT SYSTEM

SECTION 2: HUMAN RESOURCES, HIRING, AND RECRUITMENT
- Solar September // http://nawb.org/SolarSeptember/
- Find Your Local AJCs Here // https://www.careeronestop.org/LocalHelp/AmericanJobCenters/find-american-job-centers.aspx?newsearch=true
- Local AJCs // https://www.careeronestop.org/LocalHelp/AmericanJobCenters/find-american-job-centers.aspx?newsearch=true
- Corporate Diversity // https://www.thesolarfoundation.org/new-research-study-provides-baseline-insights-solar-industry-workforce-diversity/

SECTION 3: PUBLIC RESOURCES FOR TRAINING
- RichmondBUILD // https://www.ci.richmond.ca.us/1243/RichmondBUILD
- Gateways to Green Building // http://www.californiagreensolutions.com/cgi-bin/gt.tpl.h.content=3555

SECTION 4: CAREER PATHWAYS
- Interactive Solar Career Map // http://irecsolarcareermap.org/

SECTION 5: SECTOR PARTNERSHIPS
- National Skills Coalition // https://m.nationalskillscollection.org/resources/publications/file/Sector-Partnership-Scan.pdf
- Wisconsin Regional Training Partnership // http://www.wrtp.org/
- Jobs for the Future // https://www.jff.org/

SECTION 6: WORKFORCE DEVELOPMENT ACTION PLAN

87 // Strategies for Solar Workforce Development
PART 2 // PLANNING AND IMPLEMENTING A SUCCESSFUL WORK-BASED LEARNING PROGRAM: RESOURCES AND TOOLS

SECTION 1: WORK-BASED LEARNING BASICS

SECTION 2: OUTREACH AND RECRUITMENT

- Bonneville Environmental Foundation Curriculum // http://www.solar4rschools.org/resources-teachers
- Regional Community Colleges // https://www.aacc.nche.edu/college-finder/
- Local Universities // https://collegestats.org/colleges/all/
- Sunrun Diversity and Inclusion Team // https://www.sunrun.com/about/solar-careers/diversity
- Solar Works DC // https://gridalternatives.org/regions/midatlantic/solar-works-dc

SECTION 3: PROGRAM PLANNING RESOURCES

- USDOL Fact Sheet #71 // https://www.dol.gov/whd/regs/compliance/whdfs71.pdf
GRID Alternatives // https://gridalternatives.org/

SECTION 4: WORK-BASED LEARNING IMPLEMENTATION GUIDE
Solar Job Task Analyses // http://www.nabcep.org/certification
Competency Model Clearinghouse // https://www.careeronestop.org/CompetencyModel/
O*NET Online // https://www.onetonline.org/
Effective Interview Questions // https://www.careeronestop.org/BusinessCenter/RecruitAndHire/InterviewAndHire/effective-interview-questions.aspx
Illegal Interview Questions // https://www.careeronestop.org/BusinessCenter/RecruitAndHire/InterviewAndHire-illegal-interview-questions.aspx

Photo courtesy of National Renewable Energy Laboratory
If you have any questions or ideas about what we can do next, we’d love to hear from you.

THE SOLAR TRAINING NETWORK
1717 Pennsylvania Avenue Northwest | Suite 750
Washington, DC | 20006
+1.202.866.0914
www.SolarTrainingUSA.org