



Clean Energy Apprenticeships and People with Disabilities

Opportunities for Apprenticeship Expansion

Bhavani Arabandi, Karen Gardiner, Shruti Nayak, Jacqueline Rayfield, and Lauren Eyster

December 2023

The workforce needs of the clean energy sector in the United States are growing. To meet labor force demands, workforce development professionals and employers are seeking new approaches to train workers more quickly and effectively in this sector. The U.S. Department of Labor's (DOL) Partnership on Inclusive Apprenticeship (PIA) project seeks to expand access to registered apprenticeship in high growth sectors, such as clean energy, for people with disabilities. This brief discusses the need and opportunities for building inclusive apprenticeship within the clean energy sector (box 1).

BOX 1

Research to Support Partnership on Inclusive Apprenticeship Project

The U.S. Department of Labor (DOL) set a goal that at least 7 percent of apprentices in registered apprenticeship programs should be individuals with disabilities. To build evidence about inclusive apprenticeship opportunities throughout the United States, the DOL Office of Disability Employment Policy (ODEP) contracted with the Urban Institute, a nonprofit research organization, to document the different models of inclusive apprenticeship planned or implemented, describe how apprenticeship programs are designed to be inclusive of people with disabilities, and learn what advice, resources, and assistance employers need to develop and maintain inclusive apprenticeship programs. The study is from 2020-2024. This brief is one in a series of publications on inclusive apprenticeship being released during the project.

Registered Apprenticeship Programs in the U.S. for People with Disabilities

Apprenticeships provide on-the-job learning (OJL) and related technical instruction (RTI) in a specific occupation and deliver occupational skills that are recognized and transferrable across employers. Apprentices are employed during their training, contribute to production, earn progressively higher wages, and receive an industry-recognized credential upon completion.¹ Registered Apprenticeship Programs (RAPs) adhere to guidelines around the length of RTI and OJL and meet other standards for registration by either the DOL Office of Apprenticeship (OA) or a State Apprenticeship Agency (SAA) (box 2) (Gardiner et al. 2021).

BOX 2

Elements of Registered Apprenticeship Programs

- Approval by OA or an SAA, or sometimes both
- RTI of at least 144 hours in a physical or virtual classroom
- OJL of at least 2,000 hours overseen by a mentor at the employer's job site
- Wage increases over the course of the apprenticeship (wage progression), which can be tied to time in the program or to demonstration of skill competency
- Work process schedule that outlines the major job functions, competencies, and/or hours an apprentice completes in a RAP
- An industry-recognized credential upon completion of the apprenticeship
- A Standards of Apprenticeship document that describes the work process schedule and specifies the RTI, OJL, and wage progression for the RAP
- A sponsor to oversee the program and maintain fidelity to the Standards of Apprenticeship and collect basic data on apprentices; sponsors can be employers, consortia of employers, unions, community colleges, state or local workforce agencies, or nonprofits
- A written apprenticeship agreement between an apprentice and either the program sponsor or an apprenticeship committee acting as an agent for the sponsor

Source: Gardiner et al. 2021.

In the United States, Registered Apprenticeship is expanding rapidly, with the annual number of new registered apprentices almost doubling from 150,499 to 278,343 between fiscal years 2014 to 2023.² Studies show that RAPs have positive outcomes for apprentices and employers (Walton et al. 2022; Kuehn et al. 2022). Because of its promise as a workforce training model, DOL supports efforts to expand Registered Apprenticeship to new industries (beyond construction) and to populations traditionally underrepresented in apprenticeships, including people with disabilities.³

Inclusive apprenticeship programs have all elements of RAPs but are designed to support access and completion for apprentices with disabilities and other diverse, and under-represented populations. This includes using inclusive teaching practices for RTI, such as using Universal Design for Learning principles, a teaching approach that accommodates the needs and abilities of all learners and eliminates barriers in the learning process, as well as ensuring all training materials are accessible (Cornell University Center for Teaching Innovation, n.d.). Inclusive OJL design requires accessible workplace technology and accommodations (e.g., modified work schedules, buying or modifying equipment, and worksite adjustments).⁴ Box 3 summarizes one program sponsor’s recommendations for making apprenticeships inclusive.

BOX 3

Examples of Inclusive Apprenticeship Practices

Down Syndrome Innovations (DSI) sponsors an Industrial Manufacturing Technician registered apprenticeship program. The DSI Employment Coordinator suggests the following:

- Start with **inclusive hiring practices**. An example is having sponsors or employers conduct “working interviews” instead of formal interviews, where an applicant can tour the company, shadow someone in the role, and even try the job or a few tasks, when possible, before getting hired. This helps everyone know if it’s the right fit for the individual concerned.
- Once the apprentice is hired, make **onboarding practices** more hands-on. Instead of treating onboarding as a one-time event, divide it into shorter segments spread over time to give apprentices time to absorb the material. DSI also recommends allowing parents or employment professionals to be involved and support during the onboarding process.
- In terms of **accommodations for people with disabilities**, DSI recommends employers provide job coaches who can provide additional support, including visuals and prompts when needed. It is also important to train other employees on how to work with individuals with diverse abilities and give them a practical toolkit, so they become comfortable and confident. When the role of the job coach is no longer needed, employee peers become the natural supports. This builds sustainability and helps the individual maintain their employment over time, even if things in the company change.

Source: Communication with DSI Employment Coordinator, June 6, 2023.

Employment in the Clean Energy Sector

Concurrent with its focus on inclusivity and accessibility, the Biden Administration is prioritizing the clean energy industry and jobs. For example, the December 2021 Executive Order on Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability specifies the role of workforce development as: “Meeting the challenges of climate change and achieving the goals of this order requires an investment in the Federal Government’s employees and a workforce with

the knowledge and skills to effectively apply sustainability, climate adaptation, and environmental stewardship across disciplines and functions.”⁵

Additionally, the 2022 Infrastructure Investment and Jobs Act and Inflation Reduction Act (IRA) prioritizes investments and good paying jobs in clean energy (U.S. Department of Energy 2022). The IRA specifically emphasizes RAPs by requiring a certain percentage of labor hours be allocated to apprentices, increasing from 10 percent in 2022 to 15 percent by 2024. Moreover, some projects using IRA funds may receive tax benefits up to five times larger than projects that do not hire apprentices (Diaz and Chidlaw 2022).⁶

Clean energy sources, for purposes of this brief, are those that may be substituted for fossil fuels and subsequently reduce the dependence on fossil fuel. Primary among them are wind and solar power, which together accounted for about 14 percent of utility-scale electricity generated in 2022.⁷ Both industries added jobs between 2020 and 2021, with solar jobs increasing 5.4 percent and wind jobs increasing 2.9 percent.⁸ The growth of clean energy is more apparent when looking solely at the installation of new energy capacity, where wind and solar combined account for 87 percent of capacity (in megawatts).⁹ PIA describes clean energy as “a powerhouse of accessible employment opportunities” because it focuses on developing apprenticeships in high-growth, high-demand fields, such as clean energy, by working with employers and apprenticeship intermediaries to design programs and recruit apprentices.¹⁰

Exhibit 1 highlights clean energy sector employment and the percentage of employers reporting hiring difficulties. The first two columns show the size of the solar and wind power workforces by industry. For both solar and wind power, the construction industry accounted for the largest number of jobs. Every industry in the solar and wind sectors has reported hiring is very or somewhat difficult. The percentage of solar industry employers reporting hiring difficulties ranged from a low of 75 percent to a high of 93 percent. For wind, the corresponding ranges were 77 percent to 98 percent.

This demand for workers makes the sector attractive for RAPs in construction occupations (e.g., electricians, roofers, plumbers and pipefitters, carpenters); professional/business occupations (e.g., sales, accounting); and manufacturing occupations (solar equipment, wind turbines), to name a few. Clean energy jobs also have higher-than-average hourly wages. A Brookings Institution report that used a more expansive definition of clean energy found that average hourly wages for clean energy production (\$28.41), energy efficiency (\$25.90), and environmental management (\$27.41) occupations exceeded the national average (\$23.86) (Muro et al. 2019).¹¹ Other aspects of clean energy jobs make them attractive for RAPs. For example, many jobs do not require a bachelor’s degree. And, about 15 percent of clean energy production and energy efficiency jobs involve either one or more years of on-the-job training or an apprenticeship or internship, compared to about 5 percent of jobs nationally.

EXHIBIT 1

Solar and Wind Electric Power Generation Employment by Industry, 2022

Employment by Industry	2022 Workforce (#)	% Reporting Hiring Difficulties
Solar		
Construction	175,302	97%
Professional and Business Services	54,616	84%
Manufacturing	44,875	83%
Wholesale Trade	28,150	78%
Utilities	6,132	75%
Other	33,026	99%
Total	342,092	N/A
Wind		
Construction	45,088	93%
Professional and Business Services	32,779	80%
Manufacturing	23,543	50%
Wholesale Trade	12,860	75%
Utilities	8,609	50%
Other	2,701	100%
Total	125,580	N/A

Source: United States Energy and Employment Report (2023); figures 8 and 9 (Solar); figures 12 and 13 (Wind).

Apprenticeships in the Clean Energy Sector

RAPs hold promise as a workforce training model that can help clean energy sector employers meet their workforce needs while also increasing inclusion for people with disabilities. Available data from DOL’s main apprenticeship data collection system, Registered Apprenticeship Partners Information Data System (RAPIDS) and data uploaded by SAAs indicate few clean energy-specific RAPs exist.¹² For example, the research team identified nine Hydro Operator/Hydroelectric Machinery Operator RAPs, eight Hydroelectric-Station Operator RAPs, six Wind Turbine Technician RAPs, and four Solar Mechanic (st-2) RAPs. However, many electrician programs incorporate clean energy content. For instance, the Residential Lineman Apprenticeship includes both solar project workflow process and solar sales, as well as residential and commercial project design, site inspections, and on-site installation training, general skills that a lineman would need. Similarly, various construction occupations such as electrician can support clean energy projects.

It is not clear what proportion of apprentices in these occupations report a disability. RAPIDS data indicate that the number of people with disabilities in all construction, utility, and manufacturing occupations, including clean energy-focused ones, is small but growing. The data show that:

- Of 607,509 active apprentices in FY 2023, 5,578 (1 percent) self-identified having a disability.¹³ Although a small percentage of all apprentices, it represents an increase from 186 apprentices (or 0.05 percent of 318,013 apprentices) in FY 2014. More than half of active apprentices did not self-identify as having or not having a disability, suggesting that the proportion of apprentices with a disability is higher.
- The number of construction (all occupations) apprentices that self-identified as having a disability increased from 17 (0.01 percent of construction apprentices) in FY 2014 to 2,325 (1.2 percent of construction apprentices) in FY 2023. The number of electrician apprentices (the largest construction occupation, and an important part of the clean energy workforce) that did so increased from 10 (0 percent) to 814 (1.4 percent) during the same period.

The research team reached out to various apprenticeship stakeholders, including intermediaries and clean energy employers, and did not find evidence of existing inclusive RAPs in the clean energy sector as of the writing of this brief. The team did identify an effort to connect veterans, many of whom have disabilities with clean energy RAPs (box 4). However, conversations with RAP operators and intermediaries indicate clean energy RAPs are in development.

BOX 4

Partnership on Inclusive Apprenticeship (PIA) Collaboration

PIA and an intermediary partner, the Interstate Renewable Energy Council, and The Solar Foundation work with veterans interested in solar careers, through the Solar Ready Vets Network, and connect them to employers interested in starting new or expanding existing RAPs in in-demand occupations. Current in-demand occupations include installation work in construction and electrical, manufacturing of batteries and solar panels, as well as logistics, distribution, and sales. Occupations that are adjacent to clean energy occupations but critical to the sector, such as finance, accounting, and cybersecurity to protect powerplants on the grid are examples of other high demand occupations.

Source: “Episode 8: Richard Lawrence and Megan Howes of IREC (the Interstate Renewable Energy Council),” Partnership for Inclusive Apprenticeship, <https://inclusiveapprenticeship.org/building-workforce-talent-for-the-clean-energy-sector-through-apprenticeship/>.

The Potential for Clean Energy Inclusive Apprenticeships

There are several reasons clean energy employers should consider inclusive RAPs. They include alleviating worker shortages, improving employer hiring practices, and supporting training approaches that are inclusive of people with disabilities via job accommodations and mentoring.

Inclusive apprenticeship can alleviate staff shortages and increase employment of people with disabilities.

Employers need workers; with low unemployment rates across the country, recruitment can be difficult. People with disabilities may be an untapped resource. In 2022, 8 percent of the working age (i.e., 16 to 64), non-institutionalized civilian population has a disability.¹⁴ Among working-age persons with disabilities, the employment-population ratio (i.e., the percent of the population employed) was 35 percent in 2022, considerably lower than the employment-population ratio among persons with no disability (74 percent) (Bureau of Labor Statistics, 2023). Among subgroups of underrepresented populations, the proportion of with disabilities is higher. For example, about 27 percent of veterans have a service-connected disability.¹⁵

There is also opportunity to increase employment among people with disabilities through inclusive apprenticeship. The data also show that the unemployment rate for people with disabilities (8 percent) is about twice that of people without a disability (Bureau of Labor Statistics, 2023). Further, nearly 8 in 10 people with disabilities were not participating in the labor force (those who are neither employed nor unemployed). Thus, making apprenticeship programs more inclusive could strengthen the match between employers and potential employees could help increase employment of people with disabilities overall.

Employers can benefit greatly from hiring people with disabilities.

There is a business case for inclusive hiring practices generally. One study found that businesses defined as “disability inclusion champions” saw higher revenue, net income, and profit margins than other companies in the sample (AAPD and Disability:IN 2018).¹⁶ Specifically, relative to other employers, champion employers have, on average:

- 28 percent higher revenue (\$50 billion versus \$39 billion).
- More than double net income (\$5.7 billion versus \$2.7 billion)
- 30 percent higher profit margins (16 percent versus 12 percent)

Champions also outperformed other companies in terms of total shareholder returns. The study notes that concern about the costs of accommodations holds employers back from establishing inclusive practices, when, in fact, a large share of accommodations cost nothing (see next section).

Business and industry are starting to make the case for hiring and retaining people with disabilities. The U.S. Chamber of Commerce notes that, “When businesses recognize and embrace different perspectives, they are better able to create value, serve customers, support employers, and solve problems.”¹⁷ In an article for Solar Power World, the author describes the rationale for designing inclusive apprenticeships in the solar industry: “Launching an inclusive apprenticeship program can offer a low-cost way to help companies of all sizes diversify their workforces, boost

productivity, reduce turnover and absenteeism, enhance their brand images and more. All of these factors can drive a company’s mission and yield key advantages for its bottom line” (Christianson 2021).

Sponsors can design RAPs with an inclusion focus.

Clean energy sector growth will likely spur development of clean energy-specific RAPs. New programs can build inclusion into every step of the process: recruitment, enrollment, OJL, RTI, and supports.

Providing apprentices with the opportunity to self-identify and request job accommodations is a central component of an inclusive RAP. Accommodations for jobs in construction-related occupations, for example, can be related to tools, vehicles, lifting aids, and protection from the elements. Box 5 describes how one employer in the clean energy sector approaches conversations about disabilities with employees and provides an example of accommodations that might be requested. The employer noted that they would use this approach with apprentice applicants as well.

Accommodations are not expensive, on average. According to the DOL Job Accommodation Network, over half of employers (56 percent) reported on a survey that accommodations costed nothing, and another 39 percent experienced a one-time cost, which averaged \$500.¹⁸

BOX 5

Wind Turbine Apprenticeship Employer Describes Their Approach to Screening Apprentices and Potential Accommodations

The discussion about potential accommodations starts during the interview stage. The interviewer asks candidates whether they can perform the job functions with or without reasonable accommodations. The interviewer then shows the candidate the list of essential functions: physical (e.g., sitting, standing, crawling, climbing, balancing, pulling, lifting); visual acuity and perceptions; and work conditions (e.g., extreme weather for long periods of time—over 100 degrees or under 32 degrees—uneven surfaces, loud noises for prolonged periods of time).

Reasonable accommodations are subjective, notes the employer. Factors include whether the disability is temporary or permanent, the severity of the disability, and the cost of the accommodation. For example, an applicant has a medical condition that would make it difficult to work in extreme weather conditions for hours at a time. A potential accommodation would be looking for a warm/cool building nearby where the apprentice could go after 30-minute spans of work. The employer noted that, thus far, they have not had apprentice applicants with disabilities.

Source: Conversation with Utility Group Human Resources Manager, June 2023.

Mentoring, a cornerstone of RAPs, may be particularly beneficial for individuals with disabilities.

In addition to OJL, mentors can provide input, support, and encouragement as apprentices process new information, manage stress, gain confidence, and persist through challenges. Mentors, with training to support apprentices with disabilities, also can help the apprentice identify strategies and accommodations to successfully complete work.¹⁹ They can then help apprentices identify any needed accommodations.

Conclusion

The clean energy sector is growing rapidly, and RAPs will likely follow in a range of occupations from construction-related to manufacturing and management. Employers in the solar and wind sectors report difficulty hiring workers for a range of industries. RAPs generally, and inclusive apprenticeships specifically, are promising strategies to train workers for in-demand jobs that pay above-average wages. The combination of industry interest and federal support for inclusive clean energy RAPs can vastly expand apprenticeship opportunities, including opportunities for people with disabilities. Employer education around the benefits of inclusive apprenticeships and the generally minimal costs of accommodations could create further opportunities.

Notes

- 1 “Discover Apprenticeship,” Apprenticeship.gov, accessed November 12, 2023, https://www.apprenticeship.gov/sites/default/files/Apprenticeship_Fact_Sheet.pdf.
- 2 All national apprenticeship data comes from: “Data and Statistics,” Apprenticeship.gov, accessed November 12, 2023, <https://www.apprenticeship.gov/data-and-statistics>., The data are frequently updated, so numbers could change over time.
- 3 For example, the American Apprenticeship Initiative, launched in 2015, provided \$175 million in five-year grants to increase apprenticeships in non-traditional industries and to underrepresented populations. “The American Apprenticeship Initiative (AAI) and AAI Evaluation: Background,” Apprenticeship.gov, accessed November 12, 2023, https://www.apprenticeship.gov/sites/default/files/aai-background-document-final_0.pdf.,
- 4 A guide on how to design inclusive apprenticeships can be found here: “Designing Inclusive Apprenticeship: A Guide for Recruiting & Training Apprentices with Disabilities,” Partnership for Inclusive Apprenticeship, accessed November 12, 2023, <https://inclusiveapprenticeship.org/guide/>.
- 5 “Executive Order on Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability,” WhiteHouse.gov, accessed November 12, 2023, <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/12/08/executive-order-on-catalyzing-clean-energy-industries-and-jobs-through-federal-sustainability/>.
- 6 This tax benefit is available for many types of energy projects, including renewable energy storage and alternative-fuel vehicles.
- 7 “Frequently Asked Questions (FAQS): What is U.S. electricity generation by energy source,” U.S. Energy Information Administration, October 20, 2023, <https://www.eia.gov/tools/faqs/faq.php?id=427&t=3>.
- 8 “2022 U.S. Energy and Employment Report Fact Sheet,” U.S. Department of Energy, accessed November 12, 2023, https://www.energy.gov/sites/default/files/2022-06/USEER%202022%20Fact%20Sheet_0.pdf.
- 9 Authors’ calculation from table called “Generation Capacity Additions and Retirements” from “Energy Infrastructure Update for September 2023,” Federal Energy Regulatory Commission, November 20, 2023, <https://cms.ferc.gov/media/energy-infrastructure-update-september-2023>.
- 10 “The Clean Energy Workforce: A Powerhouse of Accessible Employment Opportunities,” Partnership for Inclusive Apprenticeship, accessed November 12, 2023, <https://inclusiveapprenticeship.org/the-clean-energy-workforce/>.
- 11 Brookings included hydroelectric, nuclear, geothermal, biomass, and other (e.g., tidal) in addition to solar and wind. Examples of clean energy production occupations include power plant operators, wind turbine technicians; examples of energy efficiency occupations include manufacturing more energy-efficient products; examples of environmental management occupations include waste management treatment operators.
- 12 All SAAs provide data to RAPIDS except for Minnesota, Washington State, and the District of Columbia.
- 13 All Registered Apprenticeship sponsors required to develop an Affirmative Action Plan (generally, those with five or more apprentices) must begin inviting each apprentice and applicant for apprenticeship to self-identify as an individual with a disability within two years of the date of program registration (OA states) or a timeline determined by the state (SAA states). More

- information is available at: “Disability Self-Identification: A Guide for Apprenticeship Sponsors,” Apprenticeship.gov, accessed November 12, 2023, <https://www.apprenticeship.gov/sites/default/files/eo-disability-self-id-sponsor-guide.pdf>.
- 14 Authors’ calculation from Table A of “Persons with A Disability: Labor Force Characteristics—2022,” Bureau of Labor Statistics, February 23, 2023, <https://www.bls.gov/news.release/pdf/disabl.pdf>.
- 15 “Economic News Release: Employment Situation of Veterans,” Bureau of Labor Statistics, March 21, 2023, https://www.bls.gov/news.release/archives/vet_03182021.htm.
- 16 Champions are companies assessed as providing leading-edge disability programs and initiatives that can potentially be implemented by others (AAPD and Disability:IN 2018).
- 17 “Diversity, Equity, and Inclusion,” U.S. Chamber of Commerce, accessed November 12, 2023, <https://www.uschamber.com/diversity>.
- 18 “Costs and Benefits of Accommodation: Accommodation and Compliance: Low Cost, High Impact,” Job Accommodation Network, accessed November 12, 2023, https://askjan.org/topics/costs.cfm?csSearch=4389867_1.
- 19 “On-Site Mentoring,” Job Accommodation Network, accessed November 12, 2023, <https://askjan.org/solutions/On-site-Mentoring.cfm>.

References

- The American Association of People with Disabilities (AAPD) and Disability:IN. 2018. *Getting to Equal: The Disability Inclusion Advantage*. Dublin, Ireland: Accenture. <https://www.accenture.com/content/dam/accenture/final/a-com-migration/pdf/pdf-89/accenture-disability-inclusion-research-report.pdf>.
- Bureau of Labor Statistics. 2023. “Persons with A Disability: Labor Force Characteristics—2022.” February 23, 2023. <https://www.bls.gov/news.release/pdf/disabl.pdf>.
- Christianson, Josh. 2021. “Diversifying the solar workforce through inclusive apprenticeships,” *Solar Power World*, December 21. <https://www.solarpowerworldonline.com/2021/12/diversifying-the-solar-workforce-through-inclusive-apprenticeships/>.
- Cornell University Center for Teaching Innovation. n.d. “Universal Design for Learning,” <https://teaching.cornell.edu/teaching-resources/designing-your-course/universal-design-learning>, accessed November 12, 2023.
- Diaz, Bernice, and David B. Chidlaw. 2022. “Inflation Reduction Act: Wage and Apprenticeship Requirements,” Energy Law Blog, *The National Law Review*. <https://www.energylawinfo.com/2022/11/inflation-reduction-act-wage-and-apprenticeship-requirements/>.
- Gardiner, Karen, Daniel Kuehn, Elizabeth Copson, and Andrew Clarkwest. 2021. *Expanding Registered Apprenticeship in the United States: Description of American Apprenticeship Initiative Grantees and Their Programs*. Report prepared for the U.S. Department of Labor, Employment and Training Administration. Abt Associates, Rockville, MD; and Urban Institute, Washington, DC, September. https://www.dol.gov/sites/dolgov/files/OASP/evaluation/pdf/AAI%20Grant%20Program%20Description_Final.pdf.
- Kuehn, Daniel, Siobhan Mills De La Rosa, Robert Lerman, and Kevin Hollenbeck. 2022. *Do Employers Earn Positive Returns to Investments in Apprenticeship? Evidence from Registered Programs under the American Apprenticeship Initiative*. Report prepared for U.S. Department of Labor, Employment and

Training Administration. Rockville, MD: Abt Associates; and Washington, DC: Urban Institute, August.
https://www.dol.gov/sites/dolgov/files/OASP/evaluation/pdf/AAI/AAI_ROI_Final_Report_508_9-2022.pdf.

Muro, Mark, Adie Tomer, Ranjitha Shivaram, Joseph Kane. 2019. *Advancing Inclusion Through Clean Energy Jobs*. Washington, DC: Metropolitan Policy Program, Brookings Institution, April.
https://www.brookings.edu/wp-content/uploads/2019/04/2019.04_metro_Clean-Energy-Jobs_Report_Muro-Tomer-Shivaram-Kane_updated.pdf.

U.S. Department of Energy. 2023. *U.S. Energy and Employment Report 2023*. Report No. DOE/OP-0020. Washington, DC: U.S. Department of Energy, June. <https://www.energy.gov/sites/default/files/2023-06/2023%20USEER%20REPORT-v2.pdf>.

U.S. Department of Energy. 2022. "Apprentices 'Earn While they Learn' to Build a Clean Energy Future," November 15. <https://www.energy.gov/articles/apprentices-earn-while-they-learn-build-clean-energy-future>.

Walton, Douglas, Karen N. Gardiner, and Burt Barnow. 2022. *Expanding Apprenticeship to New Sectors and Populations: The Experiences and Outcomes of Apprentices in the American Apprenticeship Initiative*. Prepared for the U.S. Department of Labor, Employment and Training Administration. Rockville, MD: Abt Associates. https://www.dol.gov/sites/dolgov/files/ETA/publications/ETAOP2022-35_AAI_Outcomes_Final_Report_508_9-2022.pdf.

About the Authors

Bhavani Arabandi is a principal research associate in the Center on Labor, Human Services, and Population. She is a labor sociologist whose work focuses on enduring inequities in the labor market, gender, apprenticeship, and international development. Her expertise is in program design and implementation, qualitative research, policy analysis, and technical assistance. Arabandi has an MSW from the Tata Institute of Social Work, Mumbai, and grassroots experience working with women's groups in rural India. She also has an MA in sociology from George Mason University and a PhD in sociology from the University of Virginia.

Karen Gardiner is a senior fellow in the Income and Benefits Policy Center. She directs evaluations of workforce training programs, including their implementation and effects on participants. Most recently, Gardiner directed the evaluation of the US Department of Labor's American Apprenticeship Initiative. Previously, Gardiner was a principal associate at Abt Associates. She holds an MPP from the University of Chicago.

Shruti Nayak is a policy assistant in the Center on Labor, Human Services, and Population, where she researches workforce development and apprenticeship. She graduated with honors from The Ohio State University, earning a BA in political science and public policy analysis. Prior to joining Urban, Nayak's research focused on congressional processes, and she completed a senior thesis and internship with the Brookings Institution.

Jacqueline Rayfield is a former policy associate in the Center on Labor, Human Services, and Population. She is now a law student at Harvard University.

Lauren Eyster is a senior fellow in the Income and Benefits Policy Center, where her research focuses on innovative workforce development programs and how to best evaluate and learn from them. She has examined industry-focused job training and career pathway initiatives implemented through the workforce investment system and at community colleges. She studies how these programs can best provide education and training to different groups such as laid-off workers, youths, low-income people, and older workers. Eyster holds a PhD in public policy and administration from the George Washington University.

Acknowledgments

This report was prepared for the U.S. Department of Labor (DOL), Office of Disability Employment Policy, by the Urban Institute, under contract number 1605DC18A0032-1605C520F00042.

The views expressed are those of the authors and should not be attributed to DOL, nor does mention of trade names, commercial products, or organizations imply endorsement of same by the U.S. Government. The views expressed should not be attributed to the Urban Institute, its trustees, or funders. Funders do not determine research findings or the insights and recommendations of Urban experts. Further information on the Urban Institute's funding principles is available at urban.org/fundingprinciples.



ABOUT THE URBAN INSTITUTE

The Urban Institute is a nonprofit research organization that provides data and evidence to help advance upward mobility and equity. We are a trusted source for changemakers who seek to strengthen decisionmaking, create inclusive economic growth, and improve the well-being of families and communities. For more than 50 years, Urban has delivered facts that inspire solutions—and this remains our charge today.

Copyright © December 2023. Urban Institute. Permission is granted for reproduction of this file, with attribution to the Urban Institute.