DESIGNING A PROVEN WORKFORCE DEVELOPMENT MODEL THAT IMPACTS EVERYONE

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ABSTRACT

In the face of global climate challenges and a rapidly evolving energy sector, the United States stands at a pivotal moment. The energy efficiency (EE) industry is approximately 85% understaffed, presenting both challenges and opportunities for innovation and transformation.

This paper proposes a comprehensive overhaul of traditional workforce development (WFD) approaches to address inadequacies and seize transformative opportunities within the energy sector. With trillions invested and more anticipated, the U.S. is positioned to lead efforts toward a sustainable future. Significant enhancements in WFD are imperative to fully capitalize on this investment.

Through exploratory analysis, historical insights, current challenges, and forward-looking strategies, this paper delves into the core issues. It highlights successful practices within the EE sector and identifies pivotal areas for development. The proposed WFD model aims to fill jobs and achieve broader goals of economic mobility, poverty alleviation, and climate resilience.

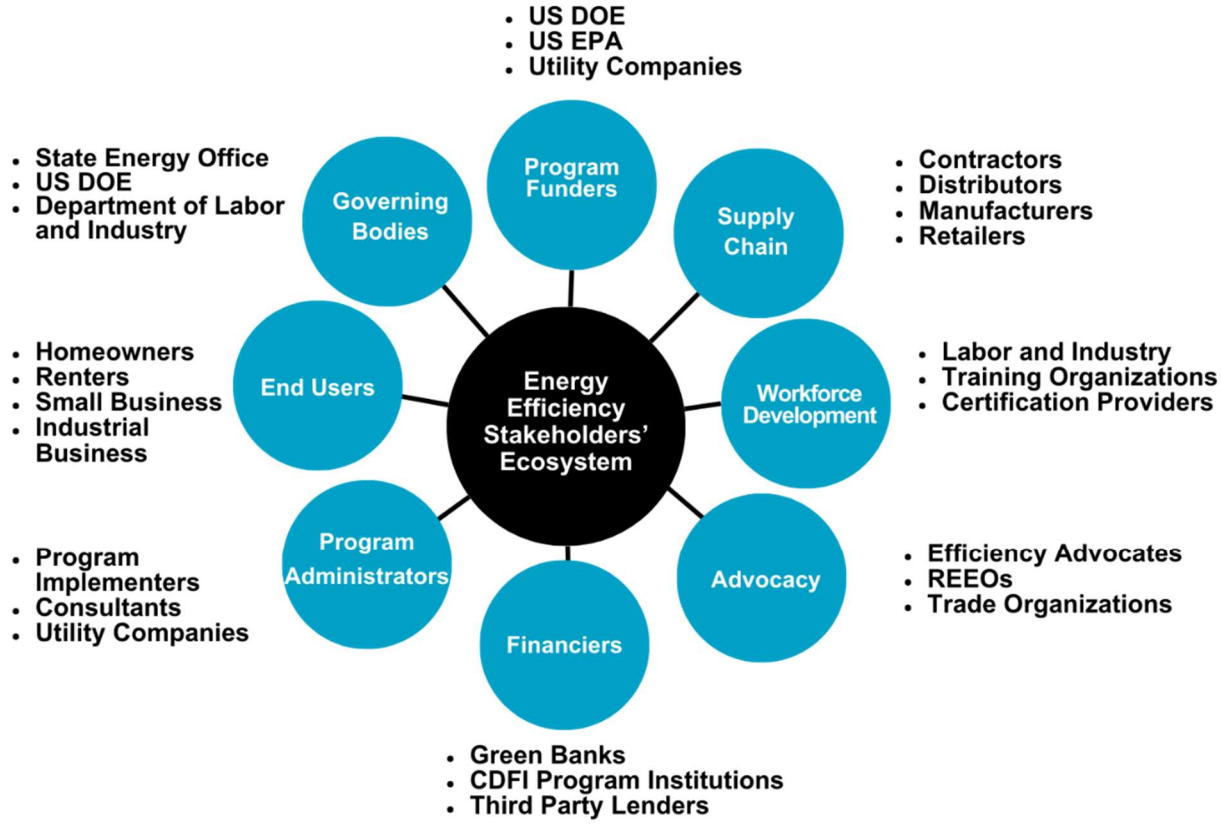
A reimagined approach to WFD unlocks the potential for employment in high-quality, clean energy jobs. This initiative supports clean energy economy growth and positions the U.S. as a global leader in the renewable energy transition. The paper outlines a pathway to a resilient, efficient, and equitable workforce, ensuring we meet our environmental objectives while enhancing economic prosperity for all.

By fostering a workforce equipped to handle clean energy demands, we position the U.S. as a leader in the global energy transition. The proposed model emphasizes the strategic integration of foundational principles within EE to cultivate a workforce that is adaptable, proficient, and ready to meet future challenges.

INTRODUCTION

Given the Energy Efficiency sector and the workforce development labor shortage challenges, it is critical to ensure we understand the full ecosystem and supply chain of the broader industry. This is a major sector that is not only nationwide but also uniquely developed for each state. Figure 1 on the next page provides the framework for the Energy Efficiency Stakeholders Ecosystem.

Figure 1: Energy Efficiency Stakeholders Ecosystem



Surveyed employers identified the top reasons for their inability to discover talent: lack of industry experience, lack of industry knowledge, a small applicant pool, and competition with other growing industries.[1] In addition to these struggles, the energy efficiency industry appears to have extremely low public awareness of the impact on communities and the environmental benefits of the efforts. Furthermore, the industry is poised to see more record growth due to the specific energy efficiency funding within the Bipartisan Infrastructure Law (BIL) and the Inflation Reduction Act (IRA). Figure 2 on the next page reflects the hiring difficulties by industry sector within energy efficiency in more detail.

[1] Energy Efficiency Jobs in America, October 2023, E4TheFuture and Environmental Entrepreneurs.

Figure 2: Hiring Difficulty in Energy Efficiency by Industry Sector [2]

As shown in Figure 3, these investments estimate that over 790,000 additional jobs will be created over the current base case by 2030 in the construction and electric utilities sectors alone. An added 161,000 net new jobs over the base case by 2030 in professional services, and an additional 151,000 in manufacturing. While this referenced job creation is not only in energy efficiency, so the data has not been analyzed through that lens, 17% of the funding in the BIL and IRA is for energy efficiency and related industries. With an assumption that 17% of the jobs created will directly correlate to the funding, which would lead to an added 187,000 jobs for the energy efficiency industry by 2030. [3]

This comes at a time when over 85% of industries in energy efficiency are reporting difficulty hiring, which makes the development of a comprehensive workforce ecosystem paramount to the future success of energy efficiency. Figure 3 on the next page provides data insight into the key sectors of energy job growth from both the BIL and IRA funding.

[2] Energy Efficiency Jobs in America, October 2023, E4TheFuture and Environmental Entrepreneurs.
[3] Inflation Reduction Act Analysis: Key Findings on Workforce Demand. Foster, Maranville, Savitz, et al., January 2023

Figure 3: Key Sectors of Energy Job Growth [4]

Sector	2021 Jobs	2030 Base Case Jobs	2030 IRA Case Jobs
Construction	10,724,000	11,293,000	11,883,000
Manufacturing	13,315,000	14,326,000	14,477,000
Electric Utility	409,000	383,000	571,000
Prof. Services	25,360,000	27,942,000	28,103,000
Private Sector	196,812,000	210,144,000	211,601,000

When the energy efficiency industry is not properly staffed, the consequences affect the programs that are funded to achieve specific goals in multiple ways. First, the energy saving goals of the programs are not met, which in turn leads to unachieved climate goals. Whether the programs are run by a utility company, a state energy office, or a federal agency; these goals cannot be achieved without a proper workforce. This then leads to the slowdown of the necessary energy transition.

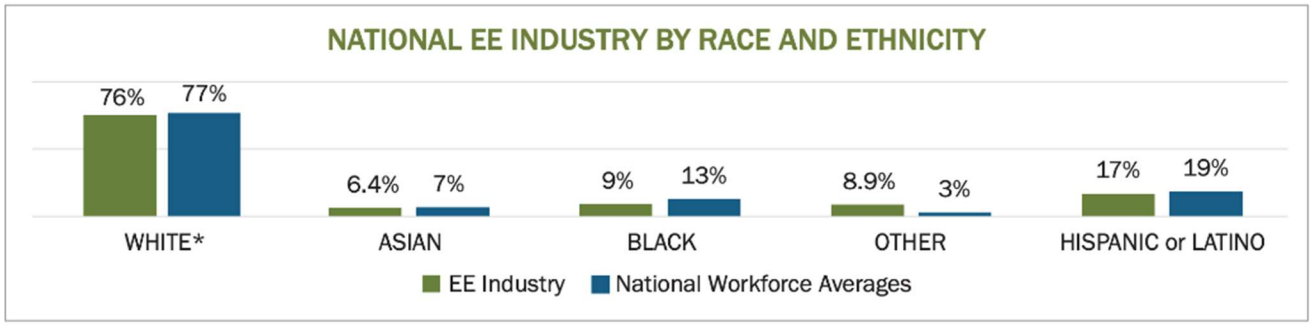
If we continue to grow our energy demand as a nation and do not enable efficiency reductions to outpace increased energy demand, we will not be able to effectively transition our energy system away from polluting fossil fuels and solely into cleaner forms of energy. Lastly, the energy burdens for limited-income households will continue to grow as the workforce will not be present to reach the quantity of these households and ensure there is less energy usage and the subsequent bills become more affordable.

This challenge is not unique to energy efficiency. Employers across various industries throughout the country are experiencing similar workforce deficits that they too are trying to overcome. This can lead to competition between all job sectors for a small and potentially underqualified workforce. But unlike other industries, energy efficiency has positive advantages. As a mission-driven industry that not only helps people but helps create a cleaner environment, the industry creates and provides good paying jobs with direct career paths. [5] This positive mission can also show benefit to other efficiency-adjacent industries such as renewable energy jobs. The competition for a quality workforce will require a multi-faceted approach. The most critical approach we will examine is addressing the inefficiency in workforce development programs to address future energy efficiency workforce needs. Figure 4 on the next page provides labor insight regarding the national energy efficiency industry by race and ethnicity.

[4] Inflation Reduction Act Analysis: Key Findings on Workforce Demand. Foster, Maranville, Savitz, et al., January 2023

[5] Good Clean Energy Jobs Powered by the Inflation Reduction Act. https://www.dol.gov/general/good-jobs/cleanenergyprojects

Figure 4: National EE Industry by Race and Ethnicity [6]



*Includes non-Hispanic and Hispanic whites.

What is Workforce Development

It is important to define this term and provide a brief history of WFD. WFD has played a crucial role in shaping economic strategies across the globe, particularly in responding to evolving labor market demands and technological shifts. The origins of modern WFD programs in the United States can be traced back to the -World War II era when the need to reintegrate returning soldiers into the civilian workforce was paramount. This period saw the inception of formalized training programs, often supported by government initiatives aimed at preventing unemployment spikes and revitalizing the economy.

Significant Milestones in Workforce Development

The strategic integration of WFD with national policies, especially in response to demographic shifts and labor force composition changes, highlights its pivotal role in supporting sustainable economic growth and development. WFD has continually adapted to meet changing economic, technological, and environmental challenges. Over the past century, key events have triggered significant changes in WFD strategies:

- Establishment of the Department of Labor. The Department was created in 1913 to "foster, promote, and develop the welfare of wage earners," setting foundational policies for labor rights and workers' welfare. It played a crucial role in mediating labor disputes and improving working conditions. [7]
- New Deal Era. Under President Franklin D. Roosevelt, the government significantly expanded its role in WFD in the 1930s. Initiatives like the Civilian Conservation Corps (CCC) were introduced, reducing unemployment through public works and tying WFD to environmental conservation. [8]

[6] Energy Efficiency Jobs in America, October 2023, E4TheFuture and Environmental Entrepreneurs.
[7] A Brief History: The U.S. Department of Labor. MacLaury, Justin. https://www.dol.gov/general/aboutdol/history/dolhistoxford.
[8] A Brief History: The U.S. Department of Labor. MacLaury, Justin. https://www.dol.gov/general/aboutdol/history/dolhistoxford.

- Post-World War II Reintegration. As mentioned, the initial focus was on assisting veterans to transition back into civilian roles, which set the precedent for government-funded workforce training programs. [9]
- Technological Revolutions. With each wave of technological innovation, from manufacturing automation to information technology, updates in workforce skills have been needed. For example, the rise of computers in the 1980s and 1990s spurred a massive push for IT and computer-related training programs. [10]
- Globalization in the 1990s and 2000s. As companies expanded operations globally, there was a significant shift in job demands, with a greater focus on managerial and technical skills that could support international commerce and communication. [11]
- The Great Recession (2007-2009). This period underscored the need for WFD programs to be more agile and responsive to rapid changes in the job market, leading to an emphasis on retraining displaced workers in emerging sectors like renewable energy and digital technologies. [12]
- COVID-19 Pandemic. The recent pandemic has accelerated remote working capabilities and further highlighted the importance of digital skills across all job sectors. This has led to a renewed focus on digital literacy and remote working capabilities within WFD programs. [13]

WFD Aligns Support for Key Populations

Most WFD programs have a broad yet diverse target audience, with each aligned around specific societal, economic, or educational needs. These programs aim to address various gaps and demands in the labor market by providing targeted training and development opportunities. Here is a detailed look at the primary populations WFD programs serve and the impacts they have on these specific groups.

Key Populations for WFD programs.

- **Unemployed and Underemployed Individuals.** Provides skills training to reduce unemployment, boosting the economy by increasing consumer spending and reducing reliance on social welfare.
- **Youth (Including At-Risk Youth).** Early skill acquisition prevents long-term unemployment. This builds a skilled workforce, reduces delinquency, and ensures smoother workforce transitions.

[9] A Brief History: The U.S. Department of Labor. MacLaury, Justin. https://www.dol.gov/general/aboutdol/history/dolhistoxford.
[10] A Brief History: The U.S. Department of Labor. MacLaury, Justin. https://www.dol.gov/general/aboutdol/history/dolhistoxford.
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[13] Monthly Labor Review. Telework during the Covid-19 pandemic: estimates using the 2021 Business Survey Response Survey. https://www.bls.gov/opub/mlr/2022/article/telework-during-the-covid-19-pandemic.htm. March 2022.

- **Veterans.** Helps veterans transition to civilian jobs by transferring military skills and providing new career training, boosting societal integration and utilizing their skills effectively.
- **Displaced Workers.** Retrains workers displaced by economic shifts or technological changes, preventing long-term unemployment and maintaining economic stability in affected communities.
- **Immigrants.** Adapts immigrant skills to local standards, maximizing their economic contributions and promoting diversity.
- **Individuals with Disabilities.** Ensures inclusivity and equal opportunities, fulfilling societal equity obligations and fostering diverse workplaces.
- **Minorities and Other Underrepresented Groups.** Corrects systemic imbalances, promoting social justice, reducing income disparities, and fostering a diverse, innovative workforce.

Types of WFD Programs

There are different types of WFD programs to address the diverse needs and challenges of various industries, particularly in the EE sector. Each program is designed to target specific skills, career stages, and educational backgrounds, ensuring a comprehensive approach to workforce training and development. The complexity and rapid evolution of the EE sector demands a flexible and multifaceted workforce capable of adapting to new technologies, regulatory changes, and market needs.

By offering a range of WFD programs, programs can accommodate different learning styles and cater to various preferences, whether hands-on, classroom-based, or online. These programs address specific skills gaps critical to the Energy Efficiency (EE) industry, ensuring that individuals have the specialized knowledge required.

To support career transitions, these programs assist individuals in moving from other industries into EE roles, making the shift smoother and more accessible. They also promote lifelong learning by providing continuing education and professional development opportunities, helping workers stay current with industry advancements.

Additionally, they enhance diversity and inclusion by implementing community-based initiatives and targeted outreach efforts to diversify the workforce. They facilitate regional development by partnering with community colleges and technical schools to develop local talent, meeting the specific needs of regional industries.

WFD programs come in multiple variations, including the ones below:

- Apprenticeships
- Certificate programs
- Associate and bachelor's degrees
- Continuing education and professional development
- Community-based training programs
- Internship programs
- Pre-Apprenticeship programs
- Bootcamps
- Co-Op programs
- Sector partnership programs
- Workforce investment programs
- Online training and E-learning
- Industry certifications
- Community College and Technical College programs

The U.S. already allocates significant recurring funds to WFD programs and recent legislation has increased the national WFD budget significantly. This does not include philanthropy or employer-funded programs.

The Infrastructure Investment and Jobs Act (IIJA) focuses funding on infrastructure projects across various sectors, with estimated funding at $490 billion for programs allowing WFD activities. The Inflation Reduction Act (IRA) focuses on clean energy and carbon emission reduction with estimated WFD funding at nearly $400 billion. The CHIPS and Science Act focuses on semiconductor manufacturing and research with estimated WFD funding at $52 billion. Figure 5 below provides insights with details included for direct funding and initiatives. However, it is important to note that the funding outlined in the table does not include allocations from more recent legislative acts such as the IIJA, CHIPS Act, and IRA, which were passed after May 2021. These newer acts are expected to significantly impact workforce development funding, particularly in the clean energy sector, addressing many of the previously cited inefficiencies and enhancing the overall effectiveness of WFD programs.

Figure 5: Funding Details Included for Each Category [14]

Category	Funding (USD)	Details and Included Categories
Federal and State Direct Funding	$19.149B	DOL, WIOA, AEFLA, Carl D. Perkins Act, State Funding
Local and Community Initiatives	$6.5B	Local Government, Community-Based, Philanthropy Funding
Employment Specific Programs	$5.5B	Apprenticeship Grants, H-1B Skills Training, Trade Adjustment Assistance, Reentry Opportunities
Targeted Workforce Initiatives	$2.72B	Veterans, Disability, Migrant Workers, Justice and Rehabilitation Programs
Educational and Training Programs	$5.975B	Senior Employment, Career Pathways, Innovative Workforce Solutions, Workforce Data Initiative
Industry-Specific Development	$6.075B	Utility Commission, Industry-Specific Funds, Public-Private Partnerships
Sector and Skill Development	$4.181B	Digital Literacy, Entrepreneurial Training, Immigrant Programs, Green Jobs, Emergency Training, Healthcare, Transportation, Arts, Construction, Hospitality
Total Funding	**$50.19B**	Sum of all categories

Opportunities for Improvement in Workforce Development

There has been criticism from various stakeholders regarding the inefficiency of WFD programs over the years. The complexity of these programs has led to dissatisfaction among employers, job seekers, training partners, funding organizations, and even government agencies.[15] The American Recovery and Reinvestment Act (ARRA) of 2009 provides insights and examples of these inefficiencies. ARRA allocated over $60 billion towards clean energy investments, including approximately $27.2 billion for energy efficiency and renewable energy projects, aiming to develop advanced energy technologies and improve workforce readiness in the clean energy sector. The use of this funding presented potential challenges:

[14] GAO 2021 Annual Report: Additional Opportunities to Reduce Fragmentation, Overlap, and Duplication and Achieve Billions in Financial Benefits. GAO-21-455SP, May 12, 2021.

[15] GAO 2021 Annual Report: Government Efficiency and Effectiveness: Opportunities to Reduce Fragmentation, Overlap, and Duplication and Achieve Billions in Financial Benefits. GAO-21-544T, May 12, 2021.

- **Unmet Oversight and Accountability**: One primary concern included management of monitoring funds. Inadequate oversight led to challenges in ensuring money was spent as intended and that it reached the programs and populations most in need.
- **Misallocation of Resources**: Funds were sometimes not allocated to the sectors or regions where they were most needed, which resulted in inefficiencies and fostered a continuation of unmet and urgent workforce development needs.
- **Inadequate Impact Measurement**: Without rigorous methods to measure the impact of funded programs, it became problematic to determine the effectiveness in improving employment outcomes or enhancing skill levels.
  Rapid Deployment Challenges: The urgency to distribute funds has sometimes led to less thorough planning and execution, causing wasteful spending on projects that did not fully meet intended goals and outcomes.

We recognize these issues are not unique to ARRA; and that, if not addressed, similar concerns may arise within recent initiatives like the Inflation Reduction Act (IRA) and the Bipartisan Infrastructure Law (BIL). The U.S. Government Accountability Office (GAO) has conducted studies highlighting past inefficiencies, many of which continue to remain unaddressed, and may continue to hamper the effectiveness of WFD programs. The GAO has made several recommendations to improve WFD programs as listed below.

- **Improve Data Collection and Sharing**. Enhance the ability of workforce agencies to collect and share accurate data among different programs for effective monitoring and management.
- **Strengthen Performance Accountability**. Implement rigorous performance measures to ensure workforce programs meet their objectives efficiently.
- **Enhance Interagency Collaboration**. Foster greater collaboration among federal agencies to minimize duplication and streamline services.
- **Regular Program Evaluations.** Conduct thorough evaluations of workforce programs to identify inefficiencies and reallocate resources to more effective initiatives.
- **Co-Enrollment Strategies**. Develop strategies to improve co-enrollment in multiple WFD programs to maximize resource utilization and participant benefits.
- **Audit and Oversight Enhancements**. Increase the frequency and depth of audits to detect and prevent fraud and mismanagement.
- **Technical Assistance for Local Agencies.** Provide comprehensive technical assistance to state and local workforce agencies to better manage programs and reduce administrative costs.
- **Legislative Reforms**. Recommend legislative changes to improve the effectiveness and efficiency of workforce programs, such as restructuring funding mechanisms and modifying program objectives.

In addition to these recommendations, we have experienced additional challenges with the current state of WFD programs that need to be addressed. Those are listed below:

- **Lack of Awareness**. Many job seekers and employers are unaware of these programs or find the processes too complicated.
- **Alignment with Small, Minority, and Women-Owned Businesses**. Many such businesses are unaware of the programs and lack the resources to leverage them effectively.
- **Funding for Barriers**. Insufficient funding to address major barriers like daycare and transportation.
- **High Cost Per Trainee and High Administrative program cost**. Inefficient tracking of funds allocated per hire, with significant administrative costs reducing overall efficacy.

By addressing these issues and implementing GAO's recommendations, the WFD ecosystem can be significantly improved to better meet the current and future demands of the energy efficiency and renewable energy sectors.

Developing an Agile Program Approach to Workforce

To address workforce challenges and ensure the success of current and future programs like IRA, and BIL, we propose an agile project structure that mitigates identified issues and ensures key performance indicators (KPIs) are met. This plan emphasizes rigorous data collection, performance accountability, interagency collaboration, and support for Small, Minority, and Women-Owned Business Enterprises (MWBEs), while minimizing administrative burdens.

Initiation

To effectively manage the hiring process, define clear goals specifying the number of hires, timeline, and required qualifications, ensuring alignment with DEI compliance and community support. Engage key stakeholders, including utility representatives, training institutions, MWBEs, and potential candidates, through a thorough stakeholder analysis. Additionally, conduct a labor market analysis to assess the availability of qualified candidates and adjust hiring strategies accordingly.

Best Practices:

- Data Collection and Sharing: Utilize integrated data management systems for accurate data collection and sharing among stakeholders, ensuring transparency and effective monitoring.
- Performance Accountability: Set clear KPIs and establish regular reporting mechanisms to track progress and hold parties accountable.

Planning

Develop a recruitment strategy by creating detailed plans for attracting candidates through partnerships with educational institutions, job fairs, and digital campaigns. Plan training programs to bridge skill gaps, leveraging existing resources and industry needs. Allocate necessary resources, including recruitment tools, HR personnel, and training facilities. Identify potential risks, such as candidate shortages or certification delays, and develop mitigation strategies.

Best Practices:

- Interagency Collaboration: Foster collaboration among federal, state, and local agencies to minimize duplication and streamline services.
- Regular Program Evaluations: Conduct regular evaluations to identify inefficiencies and reallocate resources effectively.

Execution

Execute recruitment campaigns through selected channels, adjusting based on feedback and response rates. Deliver training sessions for candidates needing additional qualifications, ensuring accessibility for MWBEs. Establish a continuous feedback loop to gather and act on feedback from candidates and stakeholders, improving the process in real-time.

Best Practices:

- Co-Enrollment Strategies: Develop strategies to improve co-enrollment in multiple WFD programs, maximizing resource utilization and participant benefits.
- Technical Assistance: Provide comprehensive technical assistance to state and local workforce agencies to reduce administrative costs.

Control

Monitor candidate progress through the recruitment pipeline, from initial contact to hiring. Regularly assess the hiring process and candidate fit against job requirements. Use agile methodologies to make necessary adjustments based on performance data. Track the budget rigorously to ensure resource efficiency.

Best Practices:

- Audit and Oversight Enhancements: Increase the frequency and depth of audits to detect and prevent fraud and mismanagement.
- Efficiency Tracking: Implement robust tracking of funds allocated per hire to minimize administrative costs.

Closure

Analyze recruitment and training outcomes against initial goals. Document insights and provide recommendations for future projects. Review outcomes with stakeholders, sharing successes and identifying areas for improvement. Recognize contributions and celebrate successful integrations.

Best Practices:

- Legislative Reforms: Recommend changes to improve workforce program effectiveness, such as restructuring funding mechanisms and modifying program objectives.
- Awareness and Accessibility: Enhance awareness of WFD programs among job seekers and employers, simplifying processes to improve participation.

By incorporating these strategies and ensuring agile, responsive processes, we can effectively address the inefficiencies highlighted in previous programs and build a more robust, inclusive, and efficient workforce development system.

Aligning Workforce Strategy with Diversity, Equity and Inclusion, Supplier Diversity, Justice40, and Community Engagement

The intersection of Justice40, Diversity, Equity, and Inclusion (DEI), supplier diversity, community engagement, and community benefit plans provide the backbone of a successful workforce development strategy, particularly in addressing the workforce shortage in the energy efficiency sector. The Justice40 Initiative ensures that 40% of the benefits from federal investments reach disadvantaged communities, highlighting the importance of equitable access to opportunities in the clean energy transition. This alignment not only prioritizes historically marginalized groups but also fosters economic growth and social equity. Similarly, DEI's emphasis on fair treatment and full participation enriches workforce strategy by incorporating diverse perspectives, which are crucial for innovation, productivity, and employee satisfaction. This holistic approach ensures that workforce development efforts are not just about filling positions but about creating meaningful, sustainable employment opportunities that contribute to a more equitable society.

Incorporating supplier diversity and community engagement into workforce strategies enhances these efforts by fostering economic opportunities at the local level and ensuring that programs are responsive to community needs. Diverse suppliers often hire within their communities, thereby directly contributing to local job creation and economic vitality. Community engagement, on the other hand, builds trust and partnerships, ensuring that workforce initiatives are tailored to the specific needs and goals of the communities they aim to serve. Through alignment and integration with community benefit plans, which outline collaborative efforts between developers and communities, workforce development strategies ensure connectivity with local employment, training, and well-being goals. Together, these elements create a comprehensive, aligned approach to workforce development that not only addresses the current workforce shortage in the energy efficiency sector but also lays the foundation for a resilient, equitable, and sustainable future. The impact model from The JPI Group in Figure 6 reflects the strength of creating this ecosystem.

Figure 6: Impact Model [16]

[16] Source: The JPI Group LLC

Workforce Development (WFD) programs have profound impacts across communities, countries, and industries, facilitating sustainable growth and cohesion. They significantly reduce unemployment, improve income levels, and enhance the overall quality of life, promoting social cohesion within communities. Nationally, WFD programs drive economic growth by enhancing workforce adaptability to cope with technological changes and globalization while reducing unemployment rates and dependency on social welfare systems. [17] Industries, particularly in the energy sector, benefit from a constant supply of skilled workers trained to manage the latest technologies. This capacity helps industries stay competitive, drives innovation, and supports sustainability goals. In the energy efficiency sector, WFD programs meet the increasing demand for green jobs, preparing the workforce to support initiatives that reduce environmental impact and achieve sustainability objectives. [18]

To effectively address the inefficiencies identified in WFD programs, below are examples of organizations that have successfully executed various parts of a WFD project plan. Each of these examples demonstrate a portion of a targeted strategy to lead to successful outcomes and scalability. These individual portions need to be combined for a completely successful program as outlined in a future program approach.

- NYSERDA (New York State Energy Research and Development Authority) [19]
  Success Example: NYSERDA's Clean Energy Internship Program addresses labor market needs by funding internships for students and recent graduates, creating a pipeline of skilled workers for clean energy businesses. By collaborating with companies to ensure relevant skills are taught, NYSERDA aligns training with industry needs and scales the program as demand grows. This approach improves data collection and sharing, aligning with GAO recommendations for performance accountability and regular program evaluations.
- CEJA (Clean Energy Jobs Act) – Illinois [20]
  Success Example: CEJA creates Workforce Hubs providing comprehensive training and job placement services, particularly targeting underserved communities. This centralized model allows efficient resource allocation and scaling, addressing misallocation of resources and promoting diversity and inclusion.
- Exelon – Workforce Development [21]
  Success Example: Exelon's internship programs offer direct experience in energy efficiency projects, ensuring practical skill acquisition. Partnerships with community colleges tailor programs to meet industry needs, resulting in high job retention rates and

[17] The Three Spheres of Equity in Workforce Development Programs. Crane, Sarah and Fenstermaker, Emma. January 2024.
[18] New Report Details States' Workforce Needs for Deploying Clean Energy Technologies. Office of State and Community Energy Programs. https://www.energy.gov/scep/articles/new-report-details-states-workforce-needs-deploying-clean-energy-technologies. May 11, 2022.
[19] "Clean Energy Internship Program." New York State Energy Research and Development Authority, Clean Energy Internship Program, n.d., https://www.nyserda.ny.gov/All-Programs/Clean-Energy-Internship-Program.
[20] "The Clean Energy Jobs Act" CEJA - Clean Energy Jobs Act, Illinois Environmental Protection Agency, September 15, 2021, n.d., https://ilcleanjobs.org/wp-content/uploads/2021/03/CEJA-Overview.pdf.
[21] "Powering Opportunity." Exelon – Workforce Development, Transforming Communities Through Workforce Development, n.d., https://www.exeloncorp.com/community/powering-opportunity.

scalable models. This approach supports interagency collaboration and technical assistance for local agencies.

- Mass Save (Massachusetts) [22]
  Success Example: Mass Save collaborates with utility companies, government agencies, and educational institutions to deliver comprehensive training programs. This ensures market relevance and resource pooling, facilitating streamlined operations and state-wide expansion, which addresses issues of interagency collaboration and resource efficiency.
- PSEG (Public Service Enterprise Group) [23]
  Success Example: PSEG's specialized training centers offer courses in energy efficiency technologies. Investments in state-of-the-art facilities and strategic industry partnerships ensure the relevance and scalability of training programs. This model effectively uses resource allocation and continuous feedback loops.

These examples demonstrate how organizations can successfully execute distinct parts of a WFD project plan, addressing common inefficiencies such as lack of oversight, misallocation of resources, insufficient impact measurement, and high administrative burdens. By leveraging strategic partnerships, adaptive strategies, and data-driven approaches, these programs have achieved scalability and improved their effectiveness.

The imperative to revamp the WFD system is more pressing than ever. As our analysis and numerous case studies have shown, very few programs have implemented a comprehensive turnkey model that fully addresses the myriad challenges in aligning workforce training with industry needs. The shortcomings of ARRA provide a stark warning: without significant changes, we risk repeating the same inefficiencies and missing an historic opportunity.

The current inflection point represents a once-in-a-lifetime chance to effect generational change. If we seize this moment to restructure WFD programs into performance-based models, we can ensure lasting economic and social impact. The alternative—continuing to distribute funds without rigorous tracking of key performance indicators such as placement rates, career trajectories, economic impact, and cost per trainee—will likely result in wasted millions and a failure to support the energy transformation critical to our future. To avoid these pitfalls, we have found within our work experiences in multiple projects and programs that the adoption of key approaches is crucial:

- **Performance-Based Models.** Shift from funding grants without accountability to models that emphasize measurable outcomes. By tracking placements, career growth, and economic impacts, we ensure that resources are used efficiently and effectively.
- **Comprehensive Data Collection and Sharing**. Implement integrated data management systems to enhance transparency and facilitate better decision-making. This allows for real-time adjustments and continuous improvement based on empirical evidence.
- **Enhanced Interagency Collaboration**. Foster greater collaboration among federal, state, and local agencies to minimize duplication, streamline services, and leverage shared

[22] "Home Energy Assessments." Mass Savings, n.d., https://www.masssave.com/residential/programs-and-services/home-energy-assessments/home-energy-assessments

[23] "NJADAPT Workshop Training." PSEG (Public Service Enterprise Group), n.d., https://nj.pseg.com/saveenergyandmoney/energysavingpage/cleanenergyjobsprogram.

resources. This holistic approach ensures that all stakeholders are working towards common goals with clear, coordinated efforts.

- **Regular Program Evaluations**. Conduct thorough and ongoing evaluations to identify inefficiencies, reallocate resources to more effective programs, and scale successful initiatives. This proactive approach helps in continually refining WFD strategies to meet evolving market demands.
- **Technical Assistance and Support for Local Agencies**. Provide robust technical assistance to state and local workforce agencies to manage programs more effectively and reduce administrative burdens. Ensuring that local agencies have the tools and knowledge they need is critical for program success.
- **Targeted Support for MWBEs.** Ensure that small, minority, and women-owned businesses have access to WFD programs and the necessary support to leverage these opportunities. This includes addressing barriers such as daycare and transportation, which are significant hurdles for many job seekers.
- **Legislative Reforms.** Advocate for legislative changes to improve the effectiveness and efficiency of WFD programs. This could involve restructuring funding mechanisms, modifying eligibility criteria, and aligning program objectives with current labor market needs.

The EE industry's potential to influence positive environmental and community impacts is immense. By reimagining WFD, we unlock the capability to not only meet labor demands but also drive significant economic and societal benefits. This approach ensures a resilient, sustainable future, empowering the U.S. to lead by example in the global pursuit of renewable energy solutions.

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