

NYSERDA Workforce Development Program Evaluation Case Study

Final

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Key Results

NYSERDA's Workforce Development (WFD) Program provided over \$118 million in funding to the Industry Partnerships Building O&M Program (\$33.3 million) and the Talent Pipeline Program (\$85 million).

- Through March 31, 2024, **Partnerships projects have trained 5,703 workers** and impacted **3,012 buildings with 585 million square feet**.¹ 42% of Partnerships expenditures to date and 38% of committed funds have gone to disadvantaged communities (DACs).²
- The **Talent Pipeline Program has trained 23,943 new and existing workers** through March 31, 2024. About 12% of Talent Pipeline trainees were from priority populations³ (which include, but are not limited to, low-income individuals) or were involved in a project focusing on disadvantaged communities.

Interviews with organizations that have received WFD funding highlighted several benefits:

- **Economic benefits for trainees** include decreased financial burden; skills development and certification; and career advancement.
- **Economic benefits for the NYS clean energy industry** include an increase in qualified clean energy workers and a stronger clean energy industry.
- **Economic benefits for building managers** include generally improved building operations and maintenance and operating cost savings.
- **Equity benefits** include skills development for disadvantaged workers, and improvements of buildings located in DACs and/or improvements of multifamily housing.
- **Environmental benefits** include increased awareness of environmental issues; anticipated energy efficiency benefits; and indirect environmental benefits from introducing workers to energy efficiency.

1 Introduction

NYSERDA's Workforce Development ("WFD") program facilitates the entry of new workers into the clean energy industry and provides the existing clean energy workforce with relevant training and continuing education opportunities. With eight funding opportunities (Program Opportunity Notices, or PONs), WFD supports a variety of workforce training and development projects within the clean energy industry. These PONs fall within two areas:

- **Buildings Operations and Maintenance Partnerships ("Partnerships"), which uses an "industry partnership" approach to promote skill and career development of maintenance and operation workers.** Partnerships projects leverage existing training infrastructure to develop on-the-job training for building operation and maintenance workers that align with clean energy

¹ The numbers of buildings and square footage include where operators have been trained and where they will be trained through the program based on contracted projects.

² Disadvantaged communities meet criteria established by the Climate Justice Working Group under the Climate Leadership and Community Protection Act. An explanation of the criteria is available at <https://climate.ny.gov/Resources/Disadvantaged-Communities-Criteria>.

³ NYSERDA defines priority populations as veterans, individuals with disabilities, low-income individuals, incumbent or unemployed fossil fuel workers, previously incarcerated individuals, 16- to 24-year-olds who are enrolled in or have completed a comprehensive work preparedness training program, homeless individuals, and single parents. [Definitions for Clean Energy Workforce Development and Training Terminology - NYSERDA](#)

needs. For example, WFD provided a three-day training for building operators at Prestige Management, Inc., a multi-family housing management company in New York City, in partnership with the Association for Energy Affordability. The training covered best practices for building management, the heating systems used in Prestige Management buildings, and the creation of an energy master plan to increase the energy efficiency of buildings.

- **The Talent Pipeline Program (“Talent Pipeline”), which uses a variety of mechanisms to attract and develop workers to meet New York State’s clean energy needs.** Projects funded under Talent Pipeline focus on developing the emerging clean energy workforce through internships and subsidized employment, while also improving the existing workforce through various training opportunities. For example, Blocpower, a climate technology startup in Brooklyn, used NYSERDA WFD funding to train existing employees and hire interns to support their work. The firm hires unemployed workers from priority populations.⁴

NYSERDA WFD has provided longstanding support, with over \$118 million in funding provided over the period 2018-2025 with substantial investments occurring in the years prior as well. A detailed breakdown of this WFD funding is displayed in the **Appendix**, Table 1. The **Appendix**, Figure 1 shows the timeline of NYSERDA WFD PONs associated with the 2018–2025 funding.

2 Barriers to Clean Energy Workforce Development

Several barriers exist to developing the clean energy workforce in New York State that WFD programs are designed to address. These barriers include:

- **A shortage of skilled workers entering the clean energy industry.** Clean energy firms require workers with (specialized skills to work with emerging technologies including solar, wind, heat pumps, and microgrids. Firms not only have to replace retiring workers, but also hire new workers as their businesses expand. Additionally, skilled worker shortages increase the costs for firms seeking qualified workers. About 77% of New York State clean energy firms reported difficulty hiring in 2019, primarily due to a lack of suitable candidates.⁵
- **Changing technology demands upgrades in worker skills.** As market demand for clean energy technology increases, new technologies continue to be developed (e.g., solar, heat pumps, wind, smart meters and devices, applications for managing equipment/building systems). This requires new training for both new and existing workers on an ongoing basis.
- **Training programs are not aligned with business needs.** The cost of revising curricula is a barrier to updating existing training programs on the newest technologies. Additionally, generalized training programs may not address relevant technologies or specific business needs.

⁴ Footnote 2 provides NYSERDA’s definition of priority populations.

⁵ NYSERDA. 2020 Clean Energy Report. August 17, 2020. Available at https://www.nyserdera.ny.gov/-/media/Files/Publications/Clean-energy-industry/2020-CEIR_GEN-report.pdf.

- **Cost of training new workers.** The process of training new skilled workers is a significant cost for firms, particularly small firms. The process typically takes 6-12 months and costs \$15,000 per worker.⁶
- **Lack of diversity in the clean energy workforce.** Compared to the State’s overall labor market, women, Hispanic or Latinx, Asian, and Black or African American workers are underrepresented in clean energy positions. Workers in these groups are less likely to apply and be hired for clean energy jobs. Fewer than 40% of New York State’s clean energy firms report having strategies to increase representation of these groups in their workforce.⁷

Climate Leadership and Community Protection Act

Introduced in 2019, New York State’s Climate Leadership and Community Protection Act (The Climate Act) is a comprehensive energy strategy for New York State that lays out a path to carbon neutrality to make the energy system cleaner, more resilient, and more affordable, while committing to environmental justice, benefiting disadvantaged communities, and ensuring a just transition to zero carbon electricity. The programs and initiatives directed by The Climate Act are designed to help the state achieve these energy goals:

- 85% reduction in greenhouse gas emissions from 1990 levels by 2050
- 70% of electricity generation from renewable sources by 2030 and 100% zero-carbon electricity by 2040

3 Benefits of WFD Program

WFD projects provide many benefits for workers, firms, property owners, residents, and society. Increasing workers’ skills enhances their careers and economic prospects. Firms benefit from a larger labor pool of high-quality candidates and skilled employees. Property owners and their tenants benefit from a well-trained, highly skilled workforce that can efficiently deliver clean energy products and services (e.g., energy-efficiency solutions in buildings). Also, a skilled workforce is essential for creating a stronger New York State clean energy industry. Strengthening the clean energy industry facilitates the transition towards a clean energy economy in New York State. The emphasis on disadvantaged communities (DACs) and priority populations ensures a just transition, providing equity benefits and increasing the diversity of the clean energy industry.^{8,9} All WFD projects are expected to contribute economic, environmental, and equity benefits for New York State.

Building Operations and Maintenance Partnerships (“Partnerships”)

Partnerships uses an “industry partnership” approach to promote skills training and career advancement for building operations and maintenance workers. Partnerships dedicated \$33.3 million to building operations and maintenance training and leveraged existing training infrastructure to develop customized training for building operations and maintenance workers that aligns with clean energy needs.

⁶ NYSERDA. Clean Energy Fund: Workforce Development and Training Chapter. May 7, 2021. Available at <https://www.nyserd.ny.gov/-/media/Files/About/Clean-Energy-Fund/CEF-Workforce-Development-and-Training.pdf>.

⁷ NYSERDA. 2021 Clean Energy Report. Available at <https://www.nyserd.ny.gov/-/media/Files/Publications/Clean-energy-industry/2021-CEI-GEN-report.pdf>.

⁸ New York State Climate Action Council. Draft Scoping Plan. December 30, 2021. Available at <https://climate.ny.gov/-/media/Project/Climate/Files/Draft-Scoping-Plan.ashx>.

⁹ DACs must meet the DAC criteria for New York State, approved and adopted on March 27, 2023. Refer to <https://climate.ny.gov/resources/disadvantaged-communities-criteria/> for a map of areas that meet the criteria as defined by the State.

Partnerships projects result in environmental benefits from improved efficiency and operations in participating buildings. Enhanced operations and maintenance have the potential to avoid carbon emissions, increase energy efficiency and provide economic benefits by reducing building operating costs.

As of June 2024, Partnerships projects include 3,012 buildings covering 585 million square feet;¹⁰ this includes both completed and active/planned projects in the pipeline. Exhibit 1 summarizes the types of buildings impacted.

Exhibit 1. Buildings Impacted by Partnerships Projects¹¹

Building Type	Count
College / University	241
Commercial	239
Healthcare	30
Hospital	41
Industrial	1
K-12 School	165
Mixed Use	17
Multifamily	2,277
Residential	1
Total Buildings Impacted	3,012

Partnerships projects provide equity benefits by serving buildings located within DACs: 42% of Partnerships expenditures to date and 38% of committed funds have gone to DACs/Low-income areas.¹²

The Partnerships program also generates economic benefits through a more skilled workforce. Through March 31, 2024, Partnerships projects have trained 5,703 workers.¹³ Skills development strengthens the workers’ employment and earning potential, providing career advancement opportunities, and enhancing their economic prospects.

NYSERDA’s \$14.5 million in funding has leveraged \$17.4 million of additional funding from participating businesses and building owners.¹⁴ Leveraged funds include funding contributions from building owners as well as the calculated labor costs of operators’ time spent in training.

Talent Pipeline

Talent Pipeline focuses on developing the clean energy workforce (rather than impacting buildings) and is funded by various WFD PONs; refer to the **Appendix**, Table 1 for a detailed breakdown of Talent Pipeline funding. Talent Pipeline seeks to attract, train, and support workers in New York State’s clean energy industry. NYSERDA WFD funding recipients can leverage one or multiple PONs depending on their needs.

¹⁰ NYSERDA Staff, July 1, 2024.

¹¹ NYSERDA Staff, July 1, 2024.

¹² Building O&M DAC data from NYSERDA’s DAC Dashboard, provided by NYSERDA staff on April 25, 2024.

¹³ NYSERDA Staff, July 1, 2024.

¹⁴ NYSERDA Staff, BOM Address Data – DAC Mapping Spreadsheet.

The diversity of funding opportunities associated with Talent Pipeline makes it challenging to assess the benefits of the entire initiative. Through March 31, 2024, Talent Pipeline has trained 23,943 new and existing workers. Like Partnerships, Talent Pipeline produces equity benefits through training individuals from priority populations and through projects located in DACs, contributing to a more diverse clean energy workforce. Roughly 12% of Talent Pipeline trainees overall have been from priority populations or involved in a project focused on DACs.^{15,16} Additionally, Career Pathways projects funded through the Talent Pipeline initiative that prepare new workers for clean energy jobs must include at least 50% of their trainees from priority populations and/or disadvantaged communities.

Talent Pipeline provides funding to clean energy firms to hire new workers, removing some of the financial burden and risk of training new employees. One example of this is On-the-job Training (“OJT”), which represents \$21.2 million of Talent Pipeline funding. OJT provides training to develop a workforce equipped to perform jobs in various energy efficiency and clean technology areas. Through new-hire wage reimbursement, OJT funding has supported 179 clean energy contractors in hiring 1,808 individuals at an average hourly wage of \$22.47.¹⁷ Exhibit 2 breaks out OJT trainees by technology type. Additionally, OJT projects contribute to a more diverse clean energy workforce, with 34% of hires from priority populations.¹⁸

Exhibit 2. OJT Participants by Technology Type¹⁹

Technology Type	Count
Building Automations & Controls	26
Energy Efficiency	719
Energy Storage	104
EV Charging Stations	25
Heat Pumps	642
High Efficiency HVAC	102
Lighting & Controls	61
Other	35
Smart Grid	35
Solar Electric	58
Land Based Wind	1
Total OJT Participants	1,808

Other Talent Pipeline projects focus on providing workers with the skills necessary to eventually enter clean energy positions. For example, Clean Energy Internships (Internships) support the development of the clean energy industry by providing workforce internships and building a pool of qualified candidates for full-time positions. Internships provides \$11.1 million to lower the financial burden to firms of hiring

¹⁵ Note that not all projects track priority populations or DAC demographics, so this is a conservative estimate.

¹⁶ NYSERDA Staff, Metrics August 2023 Spreadsheet, provided August 22, 2023. More recent data for this metric was unavailable.

¹⁷ NYSERDA Staff, OJT Program Data, April 25, 2024.

¹⁸ NYSERDA Staff, OJT Program Data, April 25, 2024

¹⁹ NYSERDA Staff, OJT Program Data, April 25, 2024.

interns. Internships has supported 300 firms to hire 2,096 interns at an average wage of \$18.52 per hour, reimbursing up to 75-90% of the cost of each intern.²⁰

4 Partnerships and Talent Pipeline Participating Organizations

IEc conducted an in-depth analysis of four organizations that have participated in Partnerships and Talent Pipeline. IEc used the following selection criteria to identify organizations to interview:

- Representation of all PONs funded by WFD, with emphasis based on greater levels of funding;
- Number of workers trained/hired;
- Projects involve DACs and/or priority population;
- Organizations that have completed multiple NYSERDA WFD projects;
- Organizations that have participated in both Partnerships and OJT programs.

We provide an overview of five organizations and their projects that met these criteria and were selected and available for a case study.

City College of New York²¹

City College of New York (“City College”) is a public university located in the heart of New York City. Founded in 1847, the university’s mission is to provide high-quality, yet affordable education to New Yorkers. City College offers a variety of certification and job training programs, including a green energy training (through Partnerships). The Program Manager and Coordinator at the Office of Continuing and Professional Studies were both interviewed.

The Green Energy Training project was designed as a pilot project to develop the West Harlem region of New York City as a hub for green energy and energy efficiency training for building staff and energy-efficiency training for providers across the city. The project location was intentionally chosen to benefit an underserved community in West Harlem. To complete this project, City College partnered with West Harlem Group Assistance, Inc. (“WHGA”), which provided the trainees, as well as a trainer (3Q Innovation) to provide all in-person class training to WHGA’s staff and partners.

Steven Winter Associates, Inc.²²

Steven Winter Associates, Inc. (“Steven Winter”) is a consulting firm that specializes in improving energy efficiency and sustainability in buildings of all types. Steven Winter was founded in 1972 with the aim of developing best practices for high performance buildings. They have experience providing building efficiency training to different groups, including building residents, maintenance staff, architects, and developers. IEc interviewed a Principal Building Systems Consultant with Steven Winter focused on three projects under Training Capacity and Delivery: a partnership with the New York City Housing Authority to train their heating plant technicians in identified skills gaps; a heat pump water heater training program in collaboration with Sanden; and an advanced building automation system in

²⁰ NYSERDA Staff, Hired Interns, April 25, 2024.

²¹ O&M: PON 3715

²² O&M and Training Capacity and Delivery: PONs 3715 and 3981

collaboration with Sentient Buildings, a technology company specializing in intelligent building management systems.²³ Additionally, the interview discussed 22 Partnerships projects.²⁴

Hudson Valley Community College²⁵

Hudson Valley Community College (“HVCC”) is a public community college based in Troy, NY. The goal of the school is to offer high-quality educational opportunities to residents of the Capital Region and beyond.²⁶ HVCC offers a variety of certificate and associate degree programs including Associates in Occupational Studies for Heating/Air Conditioning/Refrigeration Technical Services and Welding and Fabrication (supported by NYSERDA WFD Training Capacity and Delivery and Off-shore Wind Institute program areas respectively). IEC interviewed the Dean of Economic Development Workforce Initiatives at HVCC, who serves as the program manager for both NYSERDA-funded projects. The Heating/Air Condition/Refrigeration Technical Services (Training Capacity and Delivery) project began in 2019 with the goal of creating a pipeline of employees trained in HVAC and construction. The Welding and Fabrication (Off-shore Wind Institute) project was started in 2021 to train workers in the Capital Region on welding in anticipation of the need for skilled workers for offshore wind development in the State of New York.

HOPE Program²⁷

Based out of Brooklyn, New York, the HOPE Program (“HOPE”) provides job training and career support to support climate justice and the social causes of climate change. HOPE offers several training programs designed to create and further careers with a focus on individuals from priority populations. We interviewed the former Director of the Sustainable South Bronx project with NYSERDA WFD support (Training Capacity and Delivery). We also interviewed the Director of HOPE’s Brooklyn projects including the Green and Clean HVAC project (Training Capacity and Delivery). HOPE also uses NYSERDA WFD Clean Energy Internships funding to provide post-program job and internship placements for trainees through Smart Roofs, LLC.

Exhibit 3 summarizes the interviewed organizations, funding PONs, funding award amounts, and key success metrics from relevant projects.

²³ SmartCon Solutions, a provider of innovative smart building solutions, acquired Sentient Buildings in August 2023. SmartCon Solutions, LLC, “SmartCon Solutions Acquires Sentient Buildings, Expanding Its Leadership in Smart Building Technology.” August 21, 2023. <https://www.prweb.com/releases/smartcon-solutions-acquires-sentient-buildings-expanding-its-leadership-in-smart-building-technology-301905943.html>

²⁴ The 22 projects funded under PONs 3715 and 3981 include: 124464, 128858, 134553, 134554, 134556, 134557, 139616, 139618, 139619, 139620, 152962, 152968, 154924, 156070, 156071, 164578, 164579, 164580, 168552, 168553, and 168554.

²⁵ Training Capacity and Delivery and Off-shore Wind Institute: PONs 3981 and 4595

²⁶ Hudson Valley Community College website, accessed February 2023.

²⁷ Training Capacity and Delivery and Clean Energy Internships: PONs 3981, 4463 and 4000

Exhibit 3. Summary of Interviewed Organizations

Program	PON(s)	Funding	Key Success Metrics
City College of New York	3715	\$232,875	Trained 170 staff and 11 teachers
Steven Winter Associates, Inc.	3715; 3981	\$5,461,510 ²⁸	Impacted 841 buildings across 22 projects (Name)
Hudson Valley Community College	3981; 4595	\$226,212 ²⁹	Trained 144 individuals across Names
HOPE Program	3981; 4463; 4000	\$854,228	Trained 44 students on HVAC and 53 students on air leakage control across Names

Foam It³⁰

Foam It Insulation (“Foam It”) was contacted for an interview, but instead provided correspondence including project data and additional narrative information to include in this case study.

Foam It was founded in 2006 to provide insulation services to residents of Binghamton and the surrounding NY counties. Through insulation services, Foam It is able to provide energy savings and comfort to its customers. Foam It participates in NYSERDA’s OJT, in which NYSERDA funding subsidizes the cost for Foam It to hire and train new individuals.

5 Overall Project Experience

Interviewees with businesses and individuals receiving WFD training funding reported high levels of satisfaction; overall, the interviews indicate that the NYSERDA-funded WFD projects reported on are providing high-quality training to the target audiences.

Specifically, interviewees expressed appreciation for NYSERDA’s flexibility when it came to budget changes and modifications. Given unforeseen project impacts from COVID-19 (see below) and other external factors, it was important that the NYSERDA WFD recipients be able to adjust their project scope and associated budget as needed. HVCC, indicated that they plan to continue the NYSERDA-funded initiatives, with the caveat that it may be difficult to sustain non-credit programs due to limited funding. HOPE also indicated that they would be interested in continuing the NYSERDA-funded initiative, if possible, in the absence of additional funding.

COVID-19 Impacts

The COVID-19 pandemic had significant, and unexpected impacts on WFD projects. Many interviewees cited challenges associated with the pandemic, however, it also prompted new training methods that may have benefited program participants.

Challenges brought on by COVID-19 included delays in program start dates and the loss of hands-on training opportunities. For example, HVCC cited the inability to conduct in-person activities during COVID, noting the challenge of teaching hands-on skills without the ability to meet in-person. Steven

²⁸ Represents funding for Name projects only – information for funding on PON 3981 is not available.

²⁹ Represents funding for Heating/Air Condition/Refrigeration Technical Services Name project only – information for Welding and Fabrication Name project is not available.

³⁰ On-the-Job Training: PON 3982

Winter also noted that digital literacy was a major barrier; specifically looking at disadvantaged populations because many trainees did not have reliable internet access or a laptop to access online training. HOPE noted that an additional challenge of recruiting during COVID was lack of participant comfort with remote instruction. City College observed that they had to work with their training provider to reconstruct the entire curriculum to be a remote training program.

However, as the pandemic forced organizations to rethink how they delivered training, there were also some unexpected benefits. Many interviewees noted that online training allowed for increased access and availability, reducing geographic, transportation, and other access barriers. Steven Winter even used this as an opportunity to develop a series of online videos which deliver the content virtually, and that are accessible any time. Additionally, interviewees noted the capability to use Spanish and English through zoom training, reducing language barriers.

6 Environmental Benefits

Improvements in building operations and maintenance create environmental benefits including reduced energy consumption and reduced emissions, and also strengthen the clean energy workforce's awareness of environmental considerations which can lead to environmental benefits. (Note that NYSERDA's WFD projects focus on different outcomes; some focus on emission and energy reduction benefits through improved operations and maintenance, while others are focused on increased awareness and potential indirect project impacts associated with a more skilled clean energy workforce.)

Steven Winter and City College did not provide building level data that would allow the calculation of energy efficiency or carbon emissions savings as a result of WFD funding. IEc is unable to independently confirm these environmental benefits of the NYSERDA WFD projects, but a prior independent evaluation did assess impacts such as these for the program as a whole.³¹

HVCC cited increased awareness as an environmental benefit stemming from the NYSERDA projects. Specifically, HVCC noted a focus on raising awareness for energy efficiency within their Heating/Air Conditioning/Refrigeration Technical Services. HVCC hosted a "Winter Blitz," partnering with another SUNY institution to teach environmental students about energy efficiency.

Additionally, interviewees identified future energy efficiency benefits in buildings operated by workers trained under WFD programs. Energy efficiency benefits include increasing general efficiency of buildings as well as installing new technologies. Specifically, Steven Winter cited increased energy efficiency through training workers on more efficient heating systems and building automation system technologies. A more skilled workforce also leads to indirect environmental benefits through the impact of future work completed by new workers in the clean energy sector.

HVCC also cited indirect environmental benefits through introducing new workers to emerging clean energy fields, increasing the capacity of the New York State clean energy industry. The HVCC Welding and Fabrication project graduates trained welders which help manufacture wind towers, providing environmental benefits by producing clean, offshore wind energy. While difficult to quantify these indirect benefits, it is an important part of how WFD creates a pipeline that feeds the clean energy workforce and produces broad environmental benefits.

³¹ NYSERDA. 2022. Workforce Development BOM and Industry Partnerships Impact and Market Evaluation. Available at: <https://www.nyserdera.ny.gov/-/media/Project/Nyserda/Files/Publications/PPSER/Program-Evaluation/2022-12-MatterNo-16-02180-NYSERDA-WFD-Impact-and-Market-Report.pdf>.

7 Economic Benefits

Economic benefits from NYSERDA WFD projects can be broken into three categories: economic benefits for trainees, economic benefits for the clean energy industry, and economic benefits for impacted buildings.³²

Economic benefits for trainees

Expected economic benefits for trainees as a result of NYSERDA WFD projects include decreased financial burdens associated with no cost training, skills development, higher salaries, and career advancement.

Interviewees indicated NYSERDA funding decreases the financial burden for trainees through subsidizing the cost of training and equipment. Notably, HVCC stressed the importance of NYSERDA funding for reducing the financial burden for welding trainees in their Welding and Fabrication program. HVCC explained that welding equipment is very expensive, creating a barrier to entry into the field that was eliminated by NYSERDA WFD funding, which covered the cost of welding equipment and education.

Generally, interviewees indicated that WFD funding subsidized the cost of training, reducing financial barriers into the clean energy industry. For example, HOPE indicated that WFD funding provides stipends to help subsidize the costs of dedicating 14 weeks to the training, which would otherwise be cost-prohibitive for many trainees. Foam It information indicates that the OJT payroll reimbursement funding decreases financial burden for employers, allowing them to hire workers with little to no experience and provide them with trade skills.

Interviewees also reported benefits associated with developing worker skills. One indicator of improved skills is trainees being able to obtain certification. HOPE discussed that trainees were able to obtain various certificates through their projects, such as OSHA 30 Construction Training, which are required for most positions on construction sites. HVCC partnered with organizations that certify trainees to encourage students to test for certificates. As of September 2021, trainees in the HVCC Heating/Air Conditioning/Refrigeration Technical Services project had earned 27 BPI Building Science Principles certificates.³³ HVCC noted that NYSERDA WFD funding pays for BPI accreditation which encourages more students to take the certification tests. For HVCC's Welding and Fabrication project, students can obtain up to five highly sought-after Lincoln Welding certificates on a rolling basis based on skill level and ability. City College indicated that 38 Certified Professional Supervisor ("CPS") certifications have been earned across 170 trained staff as of November 2022.

HOPE reported the inclusion of "soft skills" in its Green and Clean HVAC project by providing six weeks of training on conflict management, networking, resume development, digital literacy and interview skills. HOPE partners with Solar One to deliver six weeks of "hard skills" dedicated HVAC training; trainees can earn up to five certificates to prepare them for clean energy employment, as well as gain transferable soft skills that will assist their general transition into the job market.

Generally, all interviewees indicated that NYSERDA WFD projects provided career advancement benefits to trainees. Skills development and training certificates in high-demand clean energy fields are expected to launch successful careers for trainees. HVCC noted that the career pipeline for its Welding and Fabrication project has been particularly robust, with trainees in the program often getting multiple job offers before graduation. Additionally, Foam It indicated that the employees hired through OJT often

³² Note that not all benefits are applicable to every PON.

³³ PON 3981 Quarterly Report. Hudson Valley Community College. 07/01/2021 – 09/30/2021.

come from minimum wage jobs, such as retail and fast food; OJT funding allows Foam It to provide these workers with the skills to build a clean energy career. However, despite general discussion of career advancement benefits, due to lack of resources for follow up, none of the interviewees were able to provide data on higher salaries or promotions resulting from NYSERDA WFD-funded training.

Economic benefits for the New York State clean energy industry

The New York State clean energy industry benefits through NYSERDA WFD projects by the introduction of trained workers, enhanced worker retention, firm investments and a stronger overall industry.

Interviewees cited economic benefits from the introduction of qualified workers into the clean energy industry. For HOPE's Green and Clean HVAC project, 22 out of 44 participating trainees were placed in full- or part-time jobs, or internships by the end of the third quarter of 2022.³⁴ HOPE has nine dedicated HVAC partners that employ trainees. For this project, HOPE noted that 91% of students in the first training cohort had no experience in a relevant field and 82% were unemployed at the start of the program, indicating the training provided skilled employment opportunities in the clean energy industry.³⁵ HOPE's Sustainable South Bronx project has placed 38 trainees in internships or jobs, most of which are closely related to clean energy and construction. For this project, HOPE also partnered with the Green Jobs Training Center to facilitate post program job placements. Generally, HOPE noted extensive job search support for trainees to assist their entry into the market.

Although HVCC does not track trainees' post-training employment, based on degree program statistics, HVCC noted that about 90% of people that graduate with an HVAC or construction degree will enter the workforce. In the statement of work for its Heating/Air Conditioning/Refrigeration Technical Services project, HVCC agreed to place a minimum of 56 trainees in clean energy related jobs.³⁶ Additionally, HVCC noted that they provide extensive job search support for both projects, including job fairs, hosting employers in classrooms, circulating job descriptions and obtaining industry contacts from training instructors.

Interviews confirmed the benefits of training and adding workers to the clean energy industry but did not cite benefits of enhanced worker retention as a result of WFD training. This is due to the lack of metrics and post-training tracking necessary to evaluate worker retention.

All interviewees noted the economic benefit of a stronger clean energy industry. HVCC discussed how its Welding and Fabrication project has built a robust pipeline of workers with necessary skills for the offshore wind industry. HVCC noted a high demand for trainees within this program, as offshore wind represents a critical need for the economy and for the region. Steven Winter noted that its Heat Pump Water Heater project will expand the pool of contractors capable of installing technology necessary to electrify water heaters (expected implementation in 2023). HOPE mentioned anticipated graduates from their Sustainable South Bronx project would incorporate clean energy and energy efficiency considerations in construction due to their training.

³⁴ Note that while most are hired into HVAC field, the interviewee noted that some trainees go into other jobs such as hospitality or retail while they wait for an HVAC job placement. It is not clear how many of these 22 placements are HVAC-specific.

³⁵ Green and Clean HVAC PON 4463 Quarterly Report. The HOPE Program. 10/1/21 – 12/31/2021.

³⁶ Heating/Air Conditioning/Refrigeration Technical Services PON 3981 Statement of Work. Hudson Valley Community College.

Economic benefits for building operations and maintenance

Economic benefits for building operation and maintenance expected through WFD projects include reduced operating costs, increased productivity of Partnerships workers, increased occupant comfort, and general improved operations and maintenance resulting from greater efficiency.

City College and Steven Winter discussed economic benefits from improved operations in buildings. In total, City College indicated that it has placed WFD trainees in 59 buildings, covering a total of 843,352 square feet. Within these buildings, the City College interviewee indicated 170 total staff were trained through WFD as of Q3 2022.

Steven Winter reported that 22 WFD projects involved 841 buildings; this number increases to 1,930 buildings when proposed projects are included. Additionally, Steven Winter noted enhanced comfort for residents through improved operations.

Both City College and Steven Winter noted that operating cost savings are an economic benefit from NYSERDA WFD training projects. This includes benefits of increased worker productivity. In its New York City Housing Authority project, Steven Winter cited savings in operating costs result through less reliance on outside vendors for services as a result of a better trained workforce. Steven Winter noted it is in the process of collecting data for one year of post-project savings that could be attributed to WFD project improvements. Current data are distorted by COVID-19 impacts; however, Steven Winter projects a 3 – 15% target reduction in operating costs as a result of Partnerships training projects; future independent evaluations may assess operating costs.

8 Equity Benefits

WFD advances equity by funding up to 70% of Partnerships project costs when more than 75% of the project buildings are in a DAC and giving preference to Talent Pipeline participants within priority populations.

Specifically, HVCC and HOPE indicated they used NYSERDA's network of community partners to recruit trainees from organizations that focus on marginalized groups, e.g., community action organizations, youth groups, shelters, and criminal justice organizations. For example, HOPE noted that for its Green and Clean HVAC project, 27% of the first cohort had less than a high school education. City College specifically recruits 8-10 workers experiencing long-term unemployment to be hired as trainers.³⁷ Foam It reported that the OJT funding allowed them to hire more diverse candidates from non-traditional backgrounds; they hire primarily from priority populations using OJT funding.

One of the challenges with engaging individuals from priority populations is barriers to access, such as transportation, housing, mental health/substance issues, and general financial barriers. To address these barriers, additional support services are offered to trainees from priority populations to help them complete the training. HVCC provided additional funding for individuals from priority populations; and the Heating/Air Conditioning/Refrigeration Technical Services project covers enrollment costs for qualified students. As of September 2021, almost 50% of trainees from this project were from priority populations (30 of 62 trainees). HVCC's Welding and Fabrication project includes 60 full and partial scholarships for trainees from priority populations.

HOPE offered special assistance to address common barriers experienced by individuals from priority populations, including driver's license support, wellness classes, counseling, childcare services,

³⁷ NYSERDA Building O&M Quarterly Training Report. City College of New York. 04/01/2022 – 06/30/2022.

transportation credits, and assistance for food insecurity. Student testimonials indicated that these additional services helped them participate in WFD training.

Interviewees indicated that some Partnerships projects provide equity benefits through improvements of buildings located in DACs and/or improvements of multifamily housing. Both City College and Steven Winter noted that while they do not intentionally target buildings in DACs, this may be a focus for future projects. City College detailed that it has targeted real estate owned by its partner organization, WHGA, which includes multiple multifamily residences that may qualify as low-income housing or may be located in DACs. Steven Winter stated that while some buildings may be in DACs, they are not being actively sought out as they historically work primarily with existing clients; this will be a focus in future solicitations. Thus, while the expected benefits for the Partnerships program of building improvements in DACs and improved maintenance of multifamily housing may be realized, interviewees did not indicate explicit targeting or monitoring of these benefits.

Overall, equity benefits from case study organizations contribute to Partnerships program-wide metrics of 42% of expenditures to date going to DACs; and Talent Pipeline program-wide metrics of roughly 12% of trainees being from priority populations or involved in a project focusing on disadvantaged communities.³⁸

The Climate Action Council's Scoping Plan emphasizes the need to prioritize efforts for disadvantaged communities (DACs) when considering an equitable industry transition. WFD programs are designed to promote inclusion of individuals from PPs and projects within a DAC.

The Partnerships program prioritizes DACs by funding up to 70% of the project when more than 75% of the project buildings are in a DAC, exceeding the 50% funding cap for all other proposals. 42% of NYSERDA Partnerships expenditures to date and 38% of committed funds have gone to DACs.

The Talent Pipeline program gives preference to individuals within priority populations or residing in DACs through its clean energy training, internships, and workforce development initiatives. About 12% (2,623) of Talent Pipeline trainees were from priority populations.

9 Conclusions

NYSERDA WFD provides environmental, economic and equity benefits through over \$118 million in funding, spread across Partnerships and Talent Pipeline projects. Through March 31, 2024, Partnerships projects have trained 5,703 workers and impacted 3,012 buildings with 585 million square feet.³⁹ Additionally, Talent Pipeline has trained 23,943 workers through March 31, 2024.

Interviews and project file reviews with City College, Steven Winter, HVCC, HOPE and Foam It confirmed many of the expected environmental, economic, and equity benefits from NYSERDA WFD funding:

- Environmental benefits include increased awareness, future energy efficiency benefits, and indirect environmental benefits through introducing new workers to clean energy fields.
- Economic benefits:
 - Economic benefits for trainees include decreased financial burden, skills development including certificate obtainment, and career advancement.

³⁸ Building O&M DAC data from NYSERDA's DAC Dashboard, provided by NYSERDA staff on April 25, 2024; and NYSERDA Staff, July 1, 2024.

³⁹ As previously noted, the numbers of buildings and square footage include where operators have been trained and where they will be trained through the program based on contracted projects.

- Economic benefits for the NYS clean energy industry include introduction of qualified workers, and a stronger clean energy industry.
- Economic benefits for Partnerships include generally improved operations and maintenance, and operating cost savings.
- Equity benefits include skills development for disadvantaged workers, improvements of buildings located in DACs, and/or improvements of multifamily housing.

10 Sources

Foam It narrative information, provided by NYSERDA on January 25, 2023.

Green and Clean HVAC PON 4463 Quarterly Report. The HOPE Program. 10/1/21 – 12/31/2021.

Interview with City College of New York.

Interview with HOPE Program.

Interview with Hudson Valley Community College.

Interview with Steven Winter Associates, Inc.

New York State Climate Action Council. Draft Scoping Plan. December 30, 2021. Available at <https://climate.ny.gov/-/media/Project/Climate/Files/Draft-Scoping-Plan.ashx>.

NYSERDA. 2020 Clean Energy Report. August 17, 2020. Available at https://www.nyserderda.ny.gov/-/media/Files/Publications/Clean-energy-industry/2020-CEIR_GEN-report.pdf.

NYSERDA. 2021. Clean Energy Fund: Workforce Development and Training Chapter. May 7, 2021. Available at <https://www.nyserderda.ny.gov/-/media/Files/About/Clean-Energy-Fund/CEF-Workforce-Development-and-Training.pdf>.

NYSERDA. 2021 Clean Energy Report. Available at <https://www.nyserderda.ny.gov/-/media/Files/Publications/Clean-energy-industry/2021-CEI-GEN-report.pdf>.

NYSERDA. 2022. Investment Plan: Workforce Development and Training Spreadsheet, provided April 26, 2022.

NYSERDA. 2022. Workforce Development BOM and Industry Partnerships Impact and Market Evaluation. Available at: <https://www.nyserderda.ny.gov/-/media/Project/Nyserda/Files/Publications/PPSER/Program-Evaluation/2022-12-MatterNo-16-02180-NYSERDA-WFD-Impact-and-Market-Report.pdf>.

NYSERDA Building O&M Quarterly Training Report. City College of New York. 04/01/2022 – 06/30/2022.

NYSERDA Staff, BOM Address Data – DAC Mapping Spreadsheet, provided May 17, 2022.

NYSERDA Staff, Building O&M DAC data from NYSERDA’s DAC Dashboard, provided April 25, 2024.

NYSERDA Staff, Metrics May 2022 Spreadsheet, provided May 17, 2022.

NYSERDA Staff, Hired Interns, April 22, 2022.

NYSERDA Staff, O&M Website Data, accessed March 15, 2023, at <https://www.nyserderda.ny.gov/All-Programs/Building-Operations-and-Maintenance-Workforce-Development-Training-Program>.

NYSERDA Staff, OJT Program Data, April 25, 2022.

NYSERDA Staff, Outputs Outcomes Tracker 2023, provided April 25, 2024.

NYSERDA Staff, data updates, provided July 1, 2024.

NYSERDA Staff, data updates, provided July 23, 2024.

PON 3981 Quarterly Report. Hudson Valley Community College. 07/01/2021 – 09/30/2021.

Appendix

Table 1. NYSERDA WFD Awards, 2018 - 2025⁴⁰

Program	PON(s)	Funding Level
Building O&M		
Industry Partnerships (Partnerships)	3715	\$33.3 million
Building O&M Total Awards		\$33.3 million
Talent Pipeline		
On-the-Job Training	3982	\$21.2 million
Training Capacity and Delivery	3981, 4463	\$27.2 million
Clean Energy Internships	4000	\$11.1 million
Off-shore Wind Institute	4595	\$10 million
Climate Justice Fellowships and Other	4772	\$5.5 million
Additional funds added as part of budget reforecasting		\$10.0 million
Talent Pipeline Total Awards		\$85 million
NYSERDA WFD Total Awards		\$118.3 million

⁴⁰ Investment Plan: Workforce Development and Training Spreadsheet, provided April 26, 2022; updated July 23, 2024 based on information provided by NYSERDA Staff.

Figure 1. NYSERDA WFD Program Solicitation Timeline

