

WORKFORCE DEVELOPMENT

Final Program Theory and Logic Model Report

Prepared for

**The New York State
Energy Research and Development Authority**

Todd French
Project Manager

Prepared by

Research Into Action, Inc.
P.O. Box 12312
Portland, Oregon 97212
503 / 287-9136

Principal Investigator:
Jane Peters
Research Into Action, Inc.

Project Staff:
Robert Russell
Kirsten Midura
Navigant, Inc.

Project Number 9835

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INTRODUCTION

The System Benefits Charge (SBC) funds public policy initiatives not expected to be adequately addressed by New York's competitive electricity markets including energy programs targeting efficiency measures, research and development (R&D), and the low-income sector. The New York Public Service Commission (PSC) issued the Order Continuing Systems Benefit Charge and Approving the Operating Plan for a Technology and Market Development (T&MD) Portfolio of SBC Funded Programs (The Order) on October 24, 2011. The Order approved the T&MD portfolio proposed by the New York State Energy Research and Development Authority (NYSERDA) for the five-year period of January 1, 2012 through December 31, 2016, and allocated a total budget of \$70.4 M to fund programs comprising the Clean Energy Infrastructure Initiative. Within this overall budget, \$39 M has been allocated for the Workforce Development (WFD) initiative.¹

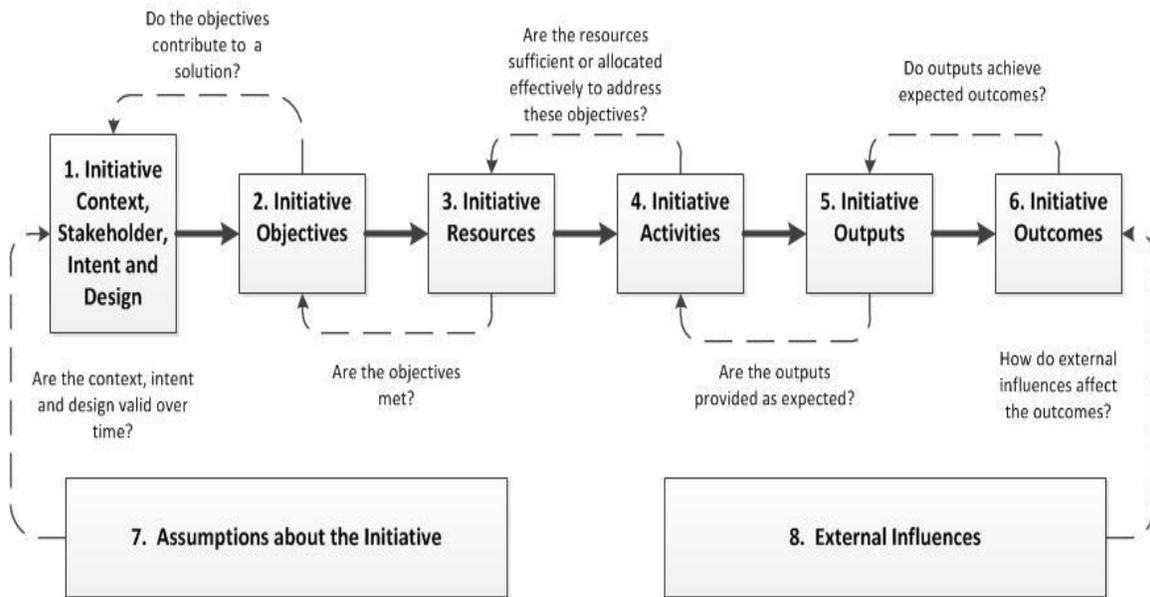
The purpose of this document is to present the overarching logic model for the elements comprising the 2012-2016 T&MD-funded WFD initiative. This document's organization is as follows:

1. **Initiative Context, Stakeholders, Intent and Design:** Describes the problem(s) the initiative is attempting to solve, or issues it will address, and the regulatory and stakeholder environments (context) within which the Initiative is working.
2. **Initiative Objectives:** Describes, at a high level, the Initiative's ultimate purpose and targets.
3. **Initiative Resources:** Identifies the funding, workforce, partnership, and other resources the Initiative is providing.
4. **Initiative Activities:** Describes the Initiative's various researches, product development, demonstration and commercialization progress, and support activities.
5. **Initiative Outputs:** Describes the anticipated immediate results associated with Initiative activities.
6. **Initiative Outcomes:** Describes expected achievements in the near, intermediate and longer term.
7. **Assumptions about Initiative:** Describes assumptions about how Initiative activities and outputs will lead to the desired near, intermediate and longer-term outcomes.
8. **External Influences:** Describes factors outside the Initiative that may drive or constrain the achievement of outcomes.

Figure T-1 on the next page details the relationships among these eight items:

¹ This budget reflects the December 17, 2012 Order in Case 10 M-0457, *Order Modifying Budgets and Targets for Energy Efficiency Portfolio Standard Programs and Providing Funding for Combined Heat and Power and Workforce Development Initiatives*, which authorized NYSERDA to use \$24 million of EEPS program funds that were uncommitted as of December 31, 2011 for a Workforce Development Initiative focusing on energy efficiency. The budget also reflects \$15 million of T&MD funds previously included in the Market Development Initiative, which focuses on workforce development activities related to renewable energy and advanced technologies.

Figure T-1: Initiative Design Template



INITIATIVE CONTEXT, STAKEHOLDERS, INTENT, AND DESIGN

1.1 NYSERDA EARLY WORK FORCE DEVELOPMENT EFFORTS

Since 2003, NYSERDA has funded WFD through a variety of training offerings in energy efficiency (EE) and renewable energy (RE). Training for EE was primarily directed toward Home Performance contractors working with NYSERDA's residential Home Performance with Energy Star, Energy Star homes, and Multifamily Performance Programs. Renewable training also supported residential programs, primarily targeting solar photovoltaic (PV) installers serving the NYSERDA's programming for end-use RE. Training was provided largely through 13 Center for EE and Building Science (CEEBS) locations, 32 RE learning centers, and other training partners.²

1.2 EEPS WFD

In its June 2009 *Order Authorizing Workforce Development Initiatives*,³ the New York State PSC approved an Energy Efficiency Portfolio Standard (EEPS) funded WFD Initiative to be administered by NYSERDA.⁴ This initiative enabled NYSERDA to use newly acquired EEPS funding to train existing and emerging workers to enter New York State's clean energy-related workforce. Specifically, EEPS WFD activities supported the development of training offerings to promote and sustain EE programs for New York ratepayers, while building workforce capacity to support EEPS initiatives. EEPS WFD efforts were intended to support and develop the EE training infrastructure; recruit training partners; train new instructors; develop curriculum and purchase equipment to support course related fieldwork.

1.3 GREEN JOBS-GREEN NEW YORK

In October of 2009, then Governor Patterson signed the Green Jobs-Green New York (GJGNY) Act into law, creating the GJGNY program. Among its 10 principle goals, the GJGNY was directed to provide training to current and underemployed/unemployed/displaced workers. It also offered incentives for On-The-Job training (OJT), internships, and apprenticeships. GJGNY activities focused on existing buildings and included residential, multifamily and small commercial buildings only. GJGNY also covered Long Island. As a result, GJGNY workforce initiatives were limited in scope and GJGNY is the only source of funding for WFD initiatives on Long Island. Operating concurrently with the EEPS WFD, GJGNY provided training in EE and some RE areas (notably Solar Thermal) and used some of the same training partners as the EEPS WFD. However, GJGNY is funded through the Regional Greenhouse Gas Initiative (RGGI) and implements most of its activities separately from the WFD initiative. For more information on the GJGNY program and for access to its logic model and reports, see Appendix A

² Green Jobs Green New York: Workforce Development plan. Presented to NYSERDA Senior Management, March 2010.

³ Case 07-M-0548, Order Authorizing Workforce Development Initiatives, issued June 22, 2009.

⁴ Case 07-M-0548, Order Authorizing Workforce Development Initiatives, issued June 22, 2009.

1.4 T&MD WFD INITIATIVE

In early 2013, NYSERDA consolidated training funding from EEPS and SBC3 programs with new T&MD funds to create the T&MD WFD Initiative. By placing all training under the same funding umbrella the T&MD WFD initiative supports a broad array of training programs targeting EE, RE, and advanced technology and emerging technology (AT/ET).⁵ The T&MD WFD Initiative will continue to broaden training offerings with partners under contract for the EEPS and SBC3 programs, while contracting with new partners as needs are identified. The goal of the initiative is to advance the skills of existing and emerging workers in the EE, RE and AT fields through classroom, online, and OJT, and to support individual certifications in advanced fields. The initiative also helps facilitate the adoption of new and underused technologies into the marketplace through training in AT/ET. Through the WFD, existing workers will have ample opportunities to further develop their skills, earn industry certifications, and perhaps advance in their careers. WFD also supports emerging workers along the career pathways continuum through paid internships, apprenticeships, and OJT designed to bridge gaps between training and entry-level employment. At the same time, these training and skill building efforts will provide NYSERDA customers and all ratepayers with a more skilled workforce.

As technology of efficiency and energy advances, this initiative will support the efforts of workers to enhance their skills and become more effective professionals. This will address the needs of the clean energy economy and increase the competitiveness of both employees and employers in the State of New York.

1.4.1 Targeted Problem

Advances in technology and emerging fields occur rapidly in the clean energy economy. For industry professionals to keep abreast of the changing industry, new and updated curriculum must be developed, and professional development opportunities must be identified throughout education and training networks. To meet the advancements of the industry, the WFD Initiative seeks to train architects, engineers, contractors, services providers and other practitioners who are critical to ensuring that quality services are provided in these areas. The WFD is designed to support training offerings that provide these practitioners with updated technical skills in three primary areas:

Renewable Energy – RE is generated by non-fossil fuels, such as the sun, wind and biogas. Goals for use of these resources in New York State are addressed in the State's Renewable Portfolio Standard (RPS).⁶ Activities under WFD will help achieve the clean energy goals put forth by the RPS by addressing, among other things, the demand for advanced training and skilled labor to keep pace with new technologies and certifications. WFD offerings for RE focus on existing practitioners looking for certification-based training, as well as on new entrants to the workforce seeking skills-based training to better compete for employment opportunities.

Advanced Technologies –AT/ET include emerging RE and EE, and AT that are proven (or that emerge over the next 3-5 years), that are not yet commercialized, that typically result from R&D efforts, and that show potential benefits such as efficiency gains or performance and reliability improvements. AT/ET can

⁵ Some training is still being done under RGGI Funds through GJGNY. This is winding down in 2013.

⁶ A RPS is a policy that seeks to increase the proportion of renewable electricity used by retail customers. More information can be found at <http://www.nysERDA.ny.gov/Energy-Data-and-Prices-Planning-and-Policy/Program-Planning/Renewable-Portfolio-Standard.aspx?p=1&p=1>

include either improvements to existing technologies, or new applications of existing technologies. WFD activities that address AT/ET may include pilot-scale trainings focused on specific technologies. Once the technology or practice takes hold in the market, training courses would be included in the more traditional EE or RE training components. WFD offerings for AT/ET focus on existing practitioners looking for certification-based training, as well as on new entrants to the workforce seeking skills training to better compete for employment opportunities.

Energy Efficiency – EE measures help consumers and businesses use less energy while providing the same or an improved level of system performance, comfort and convenience. EE can provide savings related to the building shell, lighting, HVAC systems, insulation, motors, building controls, appliances, or system operation and maintenance. WFD offerings for EE focus on existing practitioners looking for certification-based training, as well as on new entrants to the workforce seeking skills training to better compete for employment opportunities.

To improve the skills of New York State’s workforce in these areas, the WFD funds third-party training organizations to meet Initiative objectives. These organizations offer trainings that assist in the development of work standards and certifications, course curricula, training for trainers, training institution accreditation, practitioner certification, and tuition support. The resulting trainings include workshops, seminars, credit-bearing courses, degrees (two- and four-year) and certification offerings or professional development courses providing continuing education credits. Courses may be delivered in classrooms, at the jobsite and on-line. WFD also supports emerging workers along the career pathways continuum through paid internships, apprenticeships, and OJT designed to bridge gaps between training and entry-level employment.

The following efforts are being implemented as part of the WFD Initiative to provide the State’s present and future workforce with updated technical skills that are considered important to meet the needs of NYSERDA’s portfolio of offerings funded through the T&MD. The current solicitations relating to each of these targeted skills are listed in Appendix A.⁷

Technical Training courses are intended to improve the production, output, or performance of a measure or system that ultimately ensures that a technology will meet or exceed consumer and manufacturer expectations. For Technical Training courses, WFD solicits and funds training organizations (Partners) that offer technical trainings, internships and apprenticeships. In addition, the WFD offers certification reimbursements for technicians, building operators, and other professionals supporting the building efficiency trades. Competitive solicitations are awarded funding for technical training courses offered by established organizations. Technical training courses are designed to provide:

1. Practitioners (i.e., lighting, HVAC, PV, wind, building operator, inspector, etc.) with the technical skills to obtain or retain certifications, build or advance skills specific to their industry and/or trade, or to adapt to technological change. These workers could also advance their careers through such technical training.
2. New, transitional or emerging workers with basic principles and the applied science and math skills necessary for trades such as building and construction. With additional technical training,

⁷ The solicitations listed in Appendix A were current as of September 2013. Other solicitations may have been issued since that date.

these workers could advance in occupations including energy auditors or RE system installation assistants and salespeople.

On-The-Job Training (OJT) offerings are designed to help new or transitioning workers acquire technical work skills through hands-on, experiential learning under normal working and salary conditions. OJT can also be used to help incumbent employees advance their careers to the next step on a career ladder (i.e., team lead, crew chief, or supervisor) through technical training leading to proficiency in a new skill or technology. Potential employers can also benefit from OJT through wage and training subsidies that reduce the financial burden and risk associated with hiring and training workers. OJT typically includes a written training plan and workplace training of inexperienced workers led by a more experienced worker or supervisor. The workplace training is often supplemented by additional classroom technical training as needed.

Internships are supported, in some cases as part of a Career Pathways offering, to provide supervised practical work for beginners in an occupation to help them gain experience for a limited duration. Typically an internship will follow basic level technical training, at a minimum.

Career Pathways offerings are intended to offer industry experience and training for underemployed or temporarily displaced workers, as well as higher levels of certification for skilled workers. The offerings are also designed to increase student access to postsecondary, credentialing, and college certificate courses, as well as apprenticeships or job placement. Career Pathways offerings are designed to provide a clear progression of training and other services for students and workers preparing for employment or advancement in a field or occupation. This WFD component includes career planning and entry-level technical education for emerging workers or high school students, or could include technical training (as described for new/emerging workers above), internships, apprenticeship courses, and OJT (as described above). Ideally, a new entrant to the clean energy workforce receives technical training as part of a Career Pathways plan.

As of September 2013, a number of recent and current solicitations relate to Career Pathways. A list of these solicitations can be found in Appendix A.

These WFD offerings address the need for clean energy technology-based training as identified by reports and data promulgated by a number of prominent State and federal entities. The initial impetus was the NYSDOL's May 2009 report, *New York State' Clean Energy Industry: Labor Market and Workforce Intelligence (LMI) Report*.⁸ It is important to note that although each of the WFD courses can be offered independently, they can also tie into one another. For instance, Technical Training is a constant thread in all the offerings; while technical training can be a stand-alone offering for a skilled practitioner (i.e., an advanced lighting course for an electrician) it can also serve as an important step in a Career Pathways offering, and it is typically among the main channels for OJT. Similarly, a Career Pathway can result in a placement of participants into a permanent job through OJT.

For each offering, WFD staff is working closely with the NYSDOL to leverage other state and federal funds and training courses in order to develop training for existing and emerging workers through the

⁸ Other key documents include the follow up to the LMI report: *New York State Green Jobs Study*. 2011 Results available at <http://www.labor.ny.gov/stats/green/> Among other prominent resources describing green jobs and their importance in the new green economy (see Appendix A).

NYSDOL's New York State Career Centers and the State's Workforce Investment Boards (WIBs).⁹ Other strategies that focus on key components of the supply chain are addressed in the Market Development Initiative section of NYSERDA's *2013 Operating Plan for Technology and Market Development Programs (T&MD Operating Plan)*.¹⁰

NYSERDA's T&MD WFD efforts are part of broader WFD activities being implemented in coordination with numerous statewide organizations outside of NYSERDA. These activities include, but are not limited to:

- Coordinating with union and trade groups to offer new training
- Working with community colleges to add and expand training centers (including train-the-trainer courses)
- Developing internship and apprenticeship opportunities to provide on-site training for EE, RE, and AT/ET services
- Continue technical training where demand can be demonstrated

To the greatest extent practicable, NYSERDA is working in collaboration with these other organizations to leverage resources and maximize achievement of common goals.¹¹

1.4.2 Initiative Barriers

The WFD Initiative is designed to overcome barriers to workforce training; expand the advanced energy technologies training infrastructure across the State in the residential, commercial and industrial sectors; and increase employment in EE and RE occupations in New York State. To this end, the T&MD-funded WFD Initiative works to overcome a variety of market barriers, including but not limited to:

- The lack of specialized education in RE, EE, and AT/ET, and the need for existing workers to continually upgrade skills in order to keep pace with technology and to obtain and retain valuable certifications
- Lack of EE training opportunities available in local communities; a lack of visibility and marketing of training opportunities, and under-enrollment in workforce training courses due to the

⁹ New York State Career Centers are career placement offices located around the state to help job seekers with a number of job seeking and placement services. These centers and WIBs were established as part of the Federal Workforce Investment Act of 1998. WIBs are located regionally by state and are comprised of local private sector business representatives. Their function is to represent local business interests and assist in identifying work opportunities in each region. In New York State the One-stop network and WIBs are administered through the NYSDOL. In the WFD, the New York State Career Centers and WIBs will collaborate with NYSDOL to help target workers to participate in EE training and certification courses through NYSDOL Pathways or NYSERDA initiatives.

¹⁰ Operating Plan for Technology and Market Development Programs (Chapter 9.3.3: Workforce Development). NYSERDA, February 2013.

¹¹ NYSERDA, *New York's System Benefits Charge Programs Evaluation and Status Report*, Quarter Ending March 31, 2010, Final Report May 2010. Section 2.3, page 2-18.

- loss of American Recovery and Reinvestment Act (ARRA) funding, economic conditions, and the loss of NYSERDA tuition subsidies provided in earlier SBC funding
- The lack of trained workers – particularly those with specialized skills – who are capable of designing, installing, maintaining, and servicing new technologies
 - The lack of “train the trainer” programming or curricula to prepare the educators or mentors who will disseminate skills throughout the workforce
 - Economic barriers to affording training courses and certification exams on the part of either student or employer
 - The lack of widespread recognition of new job descriptions that have accompanied technological advancements in the design and construction field
 - Consumer resistance to new and or innovative technologies and or contractors
 - Lack of awareness, knowledge, and understanding of EE, RE and AT/ET products and services, both for workers and consumers
 - Limited service availability (due to a lack of trained workers and a lack of sufficient training capacity to meet training needs)
 - Lack of adequate information and lack of good (effective) skills developing EE tools and curriculum, (need to see results of contractor study on curriculum design)
 - Lack of online training opportunities
 - Lack of information related to the value and benefits of certified workers and accredited companies

Table 1-1 lists specific barriers related to market actors (not ordered by priority) for the T&MD-funded WFD Initiative. Note:

Table 1-1 is meant to act as a comprehensive list of market barriers that could potentially impact achievement of key WFD goals. Each of these potential barriers would need to be tested and evaluated in order to determine to what extent they impact the WFD market.

Table 1-1: Residential, Commercial, Industrial and Institutional Workforce Market Barriers and Actors

Problem Area and Barrier Details	Stakeholders Impacted and/or Involved
1. Technical Barriers	
<ul style="list-style-type: none"> a. Limited availability of RE and energy efficient equipment, products and services (including curriculum and training tools) b. Uncertainty of the functionality and performance of certain technologies c. Lack of expertise among equipment sales staff and installers when installing renewable or energy efficient equipment d. Lack of sales staff and installers able to provide the analysis of quality installation required by commercial and industrial customers when choosing high efficiency products 	<ul style="list-style-type: none"> Manufacturers, distributors and suppliers of energy efficient equipment State Universities Community Colleges Contractors, service providers, engineers, equipment suppliers and others capable of providing accurate information in an energy audit Builders, contractors, retailers, sales staff, and installation contractors Sub-contractors and building trades HERS providers HERS raters Trade Unions, and third-party training organizations Multifamily property managers and building owners Commercial and industrial business owners and managers
2. Economic Barriers	
<ul style="list-style-type: none"> a. Performance uncertainties (uncertainty of savings, efficiency) b. Cost of training – expense of the worker and business that hires the individual c. Lack of time and income to attend training and certification exams; lack of school time and teacher time to incorporate EE or RE into lesson plans, curriculum and classroom activities d. Competing priorities for allocation of resources by firms that could sell, install or support renewable or energy efficient technologies and services. e. Lost opportunity costs or wages to workers/employers while completing training/taking certification exams 	<ul style="list-style-type: none"> Manufacturers, distributors and suppliers of energy efficient equipment Contractors, service providers, engineers, equipment suppliers and others capable of providing accurate information in an energy audit Builders, contractors, retailers, sales staff, and installation contractors Sub-contractors and building trades HERS providers HERS raters Multifamily property managers and building owners Low-income, unemployed and under-served populations Commercial and industrial business owners and managers School districts

Problem Area and Barrier Details	Stakeholders Impacted and/or Involved
3. Informational Barriers	
<ul style="list-style-type: none"> a. Lack of information on who the skilled workforce is and where to locate workers with specialized technical skills b. Lack of information and awareness of AT/ET among upstream market actors regarding the benefits and business opportunities for energy-efficient homes, efficient equipment and load management products, RE technologies, and related services c. Perceived lack of demand for renewable or energy efficient equipment and other products and services d. Uncertainty about profit potential for providing renewable or EE services e. Lack of adequate curriculum (i.e., in math and science) f. Lack of awareness, knowledge and understanding of renewable/energy efficient products and services, billing service, energy competition and choice, energy conservation g. Lack of knowledge and access to information about market prices, trends, and market volatility needed to participate in dynamic pricing, and wholesale bidding h. Lack of consumer experience with new RE efficient products, services and technologies, and lack of knowledge of their value i. Limited service availability; Subcontractors have limited training and experience necessary for renewable or energy efficient equipment installation, application of specific building techniques and designing for optimum energy performance j. Lack of market actors' experience in determining the best way to create a profitable business model in RE or EE services for long-term k. Information/transaction costs associated with understanding the energy-related features and associated benefits of RE or EE 	<p>Manufacturers, distributors and suppliers of energy efficient equipment</p> <p>State Universities</p> <p>Community Colleges</p> <p>Contractors, service providers, engineers, equipment suppliers and others capable of providing accurate information in an energy audit</p> <p>Builders, contractors, retailers, sales staff, and installation contractors</p> <p>Low-income, unemployed and under-served populations</p> <p>Commercial and industrial business owners and managers</p> <p>Sub-contractors and building trades</p> <p>HERS providers</p> <p>HERS raters</p> <p>Trade Unions, and third-party training organizations</p> <p>School districts</p> <p>Multifamily property managers and building owners</p>

Problem Area and Barrier Details	Stakeholders Impacted and/or Involved
4. Institutional Barriers	
<ul style="list-style-type: none"> a. Lack of recognition of new job descriptions and skills that accompany technological advancements b. Lack of basic skills training (prerequisites) to prepare workers for technical training c. Lack of further RE or EE training opportunities available in local community d. Confusion caused by overlapping NYSERDA and other New York State initiatives or other trade groups offering trainings e. Undervaluing RE or EE and sustainable practices f. Contractors unwilling/reluctant to learn and perform services outside of their specific trade, or unaware of the benefits of these services g. Certification requirements vary from state program to state program, creating confusion among participants and potential participants 	<ul style="list-style-type: none"> Manufacturers, distributors and suppliers of energy efficient equipment Codes and standards officials Policy makers Trade Unions and third party training organizations Contractors, service providers, engineers, equipment suppliers and others capable of providing accurate information in an energy audit Builders, contractors, retailers, sales staff, and installation contractors Sub-contractors and building trades HERS providers HERS raters Teachers and teachers unions Community leadership Multifamily property managers and building owners

Section 2:

INITIATIVE OBJECTIVES (HIGH LEVEL)

NYSERDA's WFD Initiative has the following objectives:

2.1 SHORT-TERM/INTERMEDIATE-TERM (1-4 YEARS)

- Roll out a comprehensive portfolio of technical training programs and courses that are offered routinely throughout the year and across the state, focusing on established courses at training facilities
- Add new community and four year colleges to the training network that can demonstrate linkages to businesses and job placement success
- Support the development of advanced courses for RE that can be offered as continuing education to practitioners and as integrated components of college certificate and degrees, trades training, etc.
- Support the expansion of OJT, internship, and apprenticeship offerings
- Identify and develop necessary certifications with third-party professional certifying organizations
- Provide the clean energy workforce with the skills necessary for proper installation, operation, and maintenance of energy systems in order to realize anticipated energy savings and energy production, targeting professional services and construction industries (contractors, builders, energy engineers, design engineers, architects, and LEED supervisors and coordinators, etc.)
- Support the creation of a better-defined career path related to trainings with a clear direction leading to a job or national certification in EE, AT/ET, or RE
- Connect training participants with employers that can support careers in the EE, AT/ET or RE areas

2.2 LONG-TERM (5+ YEARS)

- Expand on existing relationships between training organizations and companies such as HVAC contractors, electricians, plumbers, builders, and general contractors, etc. to ensure successful linkages between training and jobs
- Fully integrate RE and EE training into certificate and college degree programs
- Create stackable credentials which are portable, (i.e., recognized and accepted across the industry)
- Create self-sustaining training programs

Section 3:

RESOURCES

The average annual budget for WFD is \$7.8 million, as well as an additional \$8 million for GJGNY activities. Activities for the RE/AT/ET component were initiated in 2012, while activities related to the EE component began in 2013.

Table 3-1: Workforce Development Budget

Budget (committed funds)					
	Average Annual (\$million)	2012-2013 (\$)	2014-2015 (\$)	2016 (\$)	Total (\$)
Renewable Energy and Advanced Technologies	3.0	7,000,000	5,000,000	3,000,000	15,000,000 ¹²
Energy Efficiency	4.8 ¹³	12,630,000	11,370,000	0	24,000,000
Total: Workforce Development	7.8	19,630,000	16,370,000	3,000,000	39,000,000¹⁴

Source: *Operating Plan for Technology and Market Development Programs (Chapter 9.3.3: Workforce Development)*. NYSERDA, February 2013.

Table 3-2 shows the financial, staff, organizational and intangible resources available to help overcome the barriers indicated earlier in this document.

¹² It is estimated that approximately 20-25% of the total Renewable Energy and Advanced Technologies budget will be spent on WFD Initiatives targeting Advanced Technologies.

¹³ This calculation is based on average over 5 years; however, the Energy Efficiency funding approved in the December 17, 2012 Order provided four year funding.

¹⁴ This budget reflects the December 17, 2012 Order in Case 10-M-0457, Order Modifying Budgets and Targets for Energy Efficiency Portfolio Standard Programs and Providing Funding for Combined Heat and Power and Workforce Development Initiatives, which authorized NYSERDA to use \$24 million of EEPS program funds that were uncommitted as of December 31, 2011 for a Workforce Development Initiative in the T&MD Program, focusing on EE. The budget also reflects \$15 million of T&MD funds previously included in the Market Development Initiative of the T&MD Operating Plan, which focus on workforce development activities related to renewable energy and advanced technologies.

Table 3-2: Initiative Resources

T&MD Funding	
•	• \$39 Million to fund contracted activities
NYSERDA Staff Resources	
•	4 to 6 FTE
External Resources	
•	New York Department of State
•	New York Department of Public Services
•	New York Department of Labor
•	Green Jobs-Green New York
•	Federal funding through the ARRA
Intangible Resources	
•	NYSERDA reputation for effective management in the WFD field
•	New York Department of Public Services reputation for effective advocacy of EE policy

INITIATIVE ACTIVITIES

This section provides a description of NYSERDA’s WFD activities.

NYSERDA has designed and published eight solicitations to expand the existing training network of over 70 Training Partners in targeted areas and to integrate new technology education into existing partners and programs. These solicitations cover EE, AT/ET and RE. This expansion will help to increase the number of training opportunities delivered by established, workforce training organizations state-wide. To accomplish this, WFD will engage in activities that fall into four major categories:

4.1 SOLICITATION OF PROPOSALS

WFD offers competitive solicitations to seek and select organizations that can provide training and, where necessary, develop curricula. In order to meet the terms and conditions of the solicitations, organizations must demonstrate competence in the training area and be consistent with WFD goals, objectives, priorities, and within available funding levels. Solicitations must also be consistent with NYSERDA's Strategic Program Plan, as well as the T&MD Operating Plan. NYSERDA project managers develop, negotiate and execute agreements with organizations that provide competitive proposals.

WFD has primarily relied upon Public Opportunity Notices (PONs) or Requests for Proposals (RFPs) to seek proposals, offering either competitive or open enrollment funding opportunities. This funding vehicle allows the program to recruit a wide variety of training providers that meet the specific needs of each training area.

4.2 COURSE FUNDING

T&MD WFD funds are available to expand offerings among the current network of training partners, comprised of unions, academic institutions¹⁵ and other accredited training entities. Trainings may include the following topics: benchmarking, lighting design, lighting retrofits, green motors, HVAC, retro-commissioning, building envelope, hydronic systems, heat pumps, ENERGY STAR® Homes, weatherization, business support and related training. Financial assistance is provided to training institutions to offset the cost of delivering training such that the cost to the training participant is reduced. Training courses must demonstrate a link to industry needs and market demand. The courses promote practical training, where students learn with equipment relative to the trade or industry.

4.3 PROJECT AND CONTRACT MANAGEMENT

Once training courses are selected for funding, WFD staff will work closely with the contracting and legal departments to develop contract documents, which identify key deliverables, milestones, and metrics. Reports summarizing project results and detailing metrics and other deliverables are required before contract payments are made.

¹⁵ One predominant network of colleges is the Center for Energy Efficiency and Building Science (CEEBS) Network, a division of the Workforce Development Institute at Hudson Valley Community College. CEEBS delivers EE and building science courses that are designed to prepare students for the Building Performance Certification Exams.

Throughout the duration of each course's funding period, NYSERDA staff works with training organizations to improve the design, installation, inspection, operation, maintenance, control and monitoring of systems, technologies, or measures on the customer side of the meter, across the RE, AT/ET, and EE areas. To accomplish this, NYSERDA staff will share responsibilities with the Implementation Contractor in order to conduct a number of regular contract management tasks, including maintaining regular communication with contractors, reviewing project deliverables and course rosters, tracking the progress of training courses, vetting contractor invoices, and working with contractors to ensure that metrics are delivered in a timely manner. WFD staff and/or the Implementation Contractor may also hold contractor meetings, webinars, contractor site visits, and other such meetings as needed.

To automate some of these tasks and to ensure the highest level of data quality and security, NYSERDA staff is currently creating a dashboard portal with which course metrics and information can be collected directly from training providers. While this dashboard is being developed, NYSERDA staff is employing data collection templates on a temporary basis. With these tools, NYSERDA is collecting information regarding training courses, instructors, training providers, and course rosters. NYSERDA staff is also collecting pre- and post-training surveys, which are administered directly to students on the first and last day of training respectively, and are designed to collect participant-level information from NYSERDA training providers. These responsibilities will also be shared with the Implementation contractor throughout the duration of WFD.

4.4 MARKETING AND COMMUNICATIONS

The NYSERDA website serves as an important marketing and communications vehicle for the program. The website offers notifications of funding opportunities (PONs and RFPs), tools for career support, curriculum that is currently available for licensing, and a partner portal for training partners. The website is intended to serve both training partners and students, alike. As the program ramps up, staff will delegate more marketing through the Implementation Contractor, including webinars, targeted advertising, and other media.¹⁶

In addition to online marketing, NYSERDA offers funding for marketing of training courses. Training partners are required to carry out their own enrollee recruitment efforts. However, training partners are eligible to receive a limited amount of marketing funding to promote their trainings online, in print, or in any other acceptable format.

The goal of this effort is to maximize potential impact by implementing an integrated marketing platform that will support overarching WFD and Training initiatives among priority audiences and specific marketing activities/tactics against individual program marketing plans under a unified, NYSERDA-wide campaign umbrella.

¹⁶ The Implementation contractor, solicited through RFP 2690, is currently in final stages of contract negotiation.

Section 5:

INITIATIVE OUTPUTS

This section describes the anticipated short term results (i.e., outputs) associated with WFD activities. Pursuant to the December 17, 2012 Order, NYSERDA worked in consultation with DPS staff to develop enhanced reporting protocols and a revised reporting scheme to provide a greater level of information on the results of these efforts. Table 5-1 describes the outputs for the RE, EE, and AT/ET areas.

Table 5-1: Outputs, Indicators, and Potential Data Sources for Renewable Energy and Advanced Technologies and Energy Efficiency Areas

Outputs	Leading Indicators	Data Sources and Potential Collection Approaches
Outputs from Solicitation of Proposals		
Additional Community Colleges and training organizations added to the network of training partners ¹⁷ Unions, trade orgs, etc.	Number of Community Colleges and organizations added to the network	Review of initiative tracking database
Outputs from Program and Course Funding		
Programs and courses reviewed, vetted, and approved for funding based on individual PON criteria	Number and type of courses and trainings offered	Review of initiative tracking database
Funding awarded to individual courses for advanced trainings and certifications	Number of advanced courses and new certifications offered	Review of initiative tracking database
Outputs from Projects and Contract Management		
Monitoring training programs and courses' performance and offering support and guidance where necessary	Number of unique trainees completing coursework (both incumbent and high school students) Number of trainees proceeding on to upper levels Number of students obtaining internships/apprenticeships as result of training, or obtaining and retaining certifications or degrees	Review of initiative tracking database Pre and Post surveys
Enforcement of training targets for individual offerings	Number of trainees completing coursework (both incumbent and high school students)	Review of initiative tracking database

¹⁷ Community Colleges may offer RE, AT and EE courses.

Outputs	Leading Indicators	Data Sources and Potential Collection Approaches
Outputs from Marketing and Communications		
Enhancement of NYSERDA's WFD website, initiative marketing, and public contact	Amount of new marketing materials produced, number of hits on website	Review of marketing materials, website analytics

Section 6:

INITIATIVE OUTCOMES AND LOGIC DIAGRAM

Table 6-1 details expected achievements (i.e., outcomes) of the WFD Initiative, as well as the observable indicators that would signify the presence of these achievements. In addition, the table shows the data sources and potential collection approaches that an evaluation effort might undertake to determine the achievement of the expected outcomes.

Table 6-1: Outcomes, Indicators, and Potential Data Sources for Workforce Development Activities

Outcomes	Indicators	Data Sources and Potential Collection Approaches
Short-Term Outcomes from Solicitation of Proposals		
More robust network of third-party training institutions	Number of training institutions added to network New courses added by existing partners	Contracts data
Short-Term Outcomes from Course Funding		
Curriculum development for advanced training offerings	Number and type of advanced training course offerings Number of trainings with official certification criteria	Contracts data, Pace Report
Increased enrollment in training courses	Number of unique trainees completing training courses	Tracking documents Data from Third Party Contractor on processed invoiced incentives
Short-Term Outcome from Project and Contract Management		
Increased enrollment in training courses	Number of individuals completing training courses	Tracking documents Data from Third Party Contractor on processed invoiced incentives
Increased diversity of training offerings	Number of new certificate courses in AT, RE	Program tracking data Contracts data showing new curriculum Data from Third Party Contractor on processed invoices for incentives
Increased recruitment for training courses	Number of individuals actively recruited for training courses	Marketing collateral delivered to participants who eventually enroll in training Course Rosters Interviews with Partners
Increased number of individuals certified in the energy workforce	Number of individuals that achieve certification as training milestone or are certified in the RE, AT, and EE areas	Pre and Post surveys (post done after certain time has passed) Numbers of incentives processed for certifications

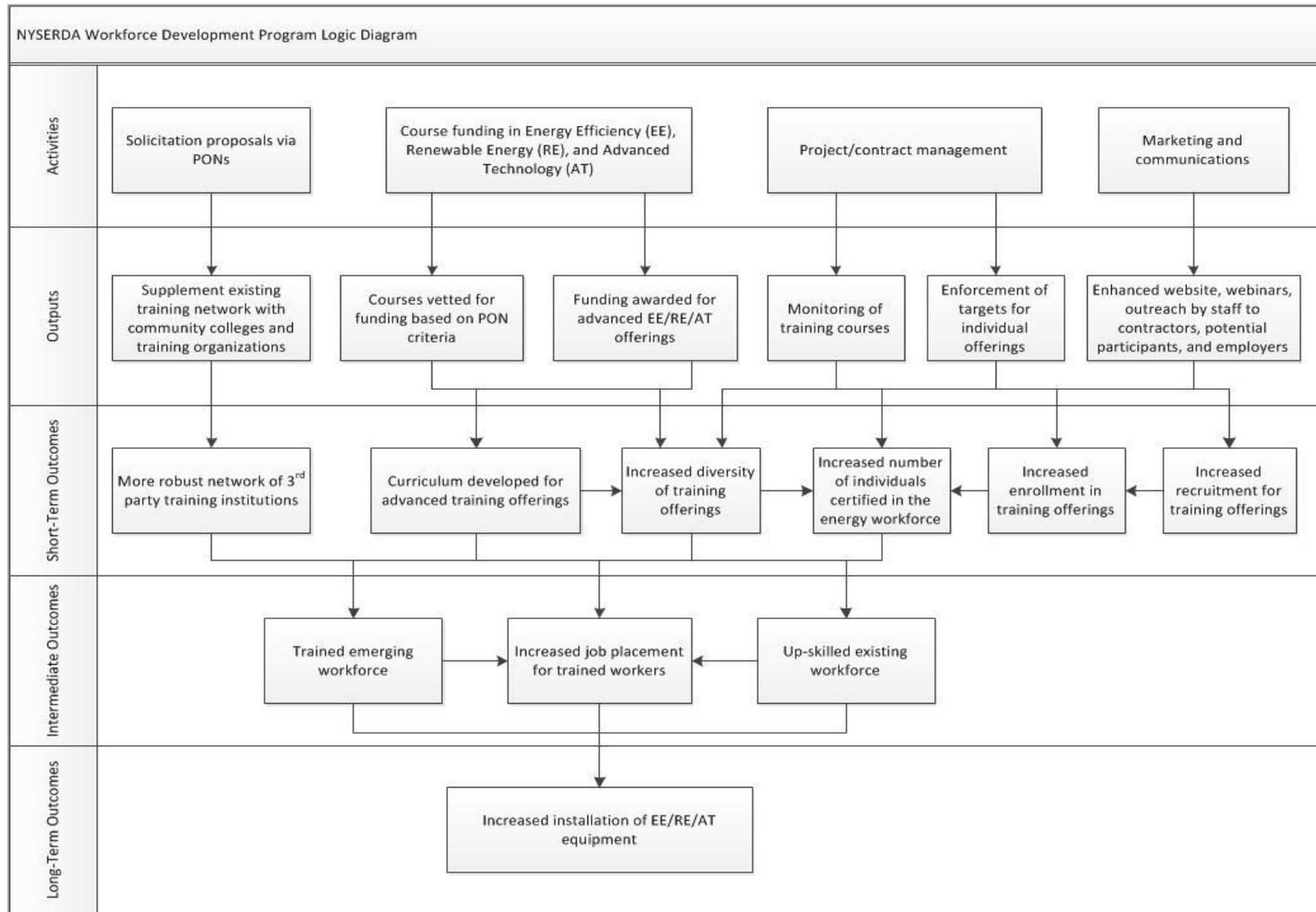
Outcomes	Indicators	Data Sources and Potential Collection Approaches
Short-Term Outcome from Marketing and Communications		
Increased recruitment for training courses	Number of individuals actively recruited for training courses	Marketing materials, number of information sessions held, webinars, etc.
Intermediate Outcomes from Solicitation of Proposals		
Trained emerging workforce	Number of training recipients who properly apply new trained skills to workforce participation	Pre and Post surveys NYSDOL data on placements WFD dashboard
Intermediate Outcomes Course Funding		
Increased job placement for trained workers	Number of individuals placed into the advanced energy workforce	Pre and Post Surveys NYSDOL data on placements
Intermediate Outcomes from Project and Contract Management		
Upskilled existing workforce	Number of incumbent workers who are able to apply high-level, energy-related knowledge	Pre and Post surveys NYSDOL data on placements Employee Interviews
Trained emerging workforce	Number of new workers who are able to apply high-level energy-related knowledge	Pre and Post surveys Employee and Employer interviews
Intermediate Outcomes from Marketing and Communications		
Upskilled existing workforce	Number of incumbent workers who are able to apply high-level energy-related knowledge	Pre and Post surveys Employer interviews
Trained emerging workforce	Number of new workers who are able to apply high-level, energy-related knowledge Perhaps also number who become certified in area of demand with higher pay scale	Pre and Post surveys Certification data (if available) from program records. Employer interviews
Longer-Term Outcomes		
Increased quality installations of EE/RE/AT equipment	Number of quality installations across New York State	Pre and Post surveys Quality Assurance Data

Regarding Pre and Post surveys referenced in Table 6-1, current survey instruments do not capture many of these indicators and would have to be revised.

The following page presents NYSEDA's WFD logic model diagram (Figure 6-1), showing the linkages between activities, outputs and anticipated outcomes. The diagram presents key WFD features including Initiative Resources (Inputs) and potential External Influences. The logic diagram presented here is at a

slightly higher level than the tables in this report, aggregating some of the outcomes in order to provide an easier-to-read logic model.

Figure 6-1: Workforce Development Initiative Logic Diagram



ASSUMPTIONS ABOUT STRATEGIES

The testable hypotheses, for the WFD Initiative include the following:

1. If NYSERDA supplements the existing training network with community colleges and other training organizations, a more robust network of third-party training institutions will develop.
 - a. Did NYSERDA solicit PONs as planned?
 - b. Did NYSERDA contract with community colleges and other training organizations?
 - c. Did the community colleges and training facilities offer the contracted training?
2. If NYSERDA vets courses and funds advanced EE/RE/AT courses, then training vendors will develop diverse and advanced training offerings.
 - a. Did the training organizations develop advanced course training offerings?
 - b. Did the training organizations increase the diversity of training offerings?
 - c. Did training activities and outputs occur as planned?
3. If NYSERDA monitored training courses and enforced targets of individual trainings, then enrollment will increase and the number of certified individuals in the workplace increase.
 - a. Did monitoring activities take place?
 - b. Did enforcement activities take place?
 - c. What were the results of enforcement activities?
 - d. Did enrollment increase?
 - e. How many individuals were certified?
 - f. Of the individuals certified, how many entered the workplace within one year of completing training?
4. If NYSERDA conducts marketing and communication efforts, then more training vendors will offer courses and more trainees will enroll.
 - a. Did the marketing and communication activities occur?
 - b. Were training vendors recruited?
 - c. Did enrollment increase?
5. If a more robust network of third-party training institutions emerges; more diverse and advanced training offerings are available; and enrollment in these trainings increases, then a trained workforce will emerge along with an up-skilled existing workforce leading to increased placement of trained workers.
 - a. Did existing workers gain skills through NYSERDA-sponsored training?
 - b. Were new workers trained to offer skills valued in the market?

- c. Were both new and existing workers placed into the job market?
- 6. If new and existing workers are trained and up-skilled, then more EE/RE/AT equipment will be installed leading to increased energy savings.
 - a. Did the new and existing workers find jobs where they could apply their training or new skills?
 - b. Did they install EE/RE/AT equipment?
 - c. Did the installation of EE/RE/AT equipment lead to energy savings?

Section 8:

EXTERNAL INFLUENCES

Economy – National and international economic upturns and crises will have direct effects on employment prospects in New York State. These trends are outside the influence of this initiative but any efforts to quantify its success will need to explain the economic context in which the activities occur.

Federal and State Legislation – Federal and state legislation regarding the value of green jobs or the cost of labor will likewise be an influence on the success of this initiative.

Competing Initiatives – As stated at the start of this document, other programs and initiatives offer job training and placement to workers in New York State. It is possible that the success of these programs and initiatives may limit the success of NYSERDA’s WFD Initiative. Any evaluation of WFD should take into account the effect of these programs and initiatives.

REFERENCES

1. New York State Energy Research and Development Authority Workforce Development Program Market Characterization and Assessment Report. GDS Associates, Inc., September 2012.
2. Operating Plan for Technology and Market Development Programs (Chapter 9.3.3: Workforce Development). NYSERDA, February 2013.
3. NYSERDA, New York's System Benefits Charge Programs Evaluation and Status Report, Quarter Ending March 31, 2010, Final Report May 2010. Section 2.3, page 2-18.
4. New York Energy \$Mart Products Program Market Characterization And Assessment Evaluation, The Cadmus Group, Inc., February 2012.
5. Energy Efficiency Portfolio Standard Workforce Development Program Logic Model Report, GDS Associates, December 2010.
6. Case 07-M-0548, Order Authorizing Workforce Development Initiatives, issued June 22, 2009.
7. Case 07-M-0548 Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio Standard, Order Authorizing Workforce Development Initiatives, issued June 22, 2009.
8. NYSERDA, Workforce Development and Training for Renewable Energy and Advanced Technologies (PON 2673).
9. NYSERDA, Incentives to Support Energy Efficiency and Renewable Energy Training Program Accreditation, PV and Solar Thermal Installer Certifications, and PV Company Accreditation (PON 2397).
10. NYSERDA, NY-Sun PV Balance of System Training and Education Program (PON 2697).
11. NYSERDA, NYS Registered Apprenticeship and Building Trades Training and On-The-Job Training (PON 2033).
12. Case 07-M-0548, Petition for Allocation of Uncommitted EEPS Funds for Workforce Development Initiatives.
13. NYSERDA, Response to DPS Inquiries regarding Petition for Allocation of Uncommitted EEPS Funds for Workforce Development Initiatives, issued June 15, 2012.
14. NYSERDA, Workforce Training for Energy Efficiency (PON 2762).
15. NYSERDA, Implementation Support for Workforce Development and Training (PON 2690).
16. NYSERDA, Career Pathways Training Partnerships for Energy Efficiency & Renewable Energy (PON 2774).
17. NYSERDA, Clean Energy Training for High School Students (PON 2664).

APPENDIX A:

RECENT AND CURRENT WFD INITIATIVE PUBLIC OPPORTUNITY NOTICES (PONS) AS OF SEPTEMBER 2013

PON ID	PON Title	Description
Technical Training		
PON 2762	Workforce Training for Energy Efficiency	Competitive solicitation seeks proposals for the marketing and delivery of training programs across NYS for practitioners focusing on end-use EE in the residential, multifamily, and commercial/industrial sectors. Proposers must demonstrate the ability to implement comprehensive and dynamic training programs of the highest quality that capitalize on the existing workforce training infrastructure, target specific regions of the state, and address identified training needs and gaps.
PON 2673 ¹⁸	Workforce Development (WFD) and Training for Renewable Energy and Advanced Technologies	Funds for the development and/or delivery of technical training to develop a qualified workforce to design, install, operate, maintain and inspect customer-sited RE systems and AT. Costs of training trainers and training delivery are eligible for funding.
RFP 2697	NY-SUN PV Balance of System Training and Education Program	Competitive solicitation sought proposals to support education and training on photovoltaic (PV) or solar electric systems. Comprehensive and continuous statewide education and training on PV is needed for decision-makers and authorities having jurisdiction in New York State municipalities. Targeted audiences include code enforcement officers, building and electrical third party inspectors, fire inspectors, commissioners of public safety, building department plan examiners, village engineers and other public officials who might have a role in the permitting, inspection or approval process for a PV system or who might encounter a PV system in their work environment (e.g., firefighters and other first responders). This solicitation is part of a comprehensive strategy to streamline the permitting and approval process and ultimately reduce the costs of purchasing and installing PV systems.
PON 2397	Incentives to Support EE and RE Training Program Accreditation, PV and Solar Thermal Installer Certifications, and PV Company Accreditation	Open enrollment solicitation offering financial incentives for EE training organizations in NYS to help offset the costs associated with obtaining IREC ISPQ accreditation for EE training programs. The PON also includes financial support for Renewable Energy training program accreditation, PV and solar thermal installer certification, and PV company accreditation.

¹⁸ Also listed under Internship PONS.

PON ID	PON Title	Description
RFP 2690	Implementation Support for WFD and Training	Competitive solicitation for implementation and support services for WFD Initiative. The Implementation Contractor, in coordination with NYSERDA, is responsible for various implementation activities to help clean energy training and standards to gain wide-scale market acceptance. These activities include, but are not limited to: coordination and effective communication across a statewide network of training providers; assisting with reviewing and processing NYSERDA training incentives and open enrollment program applications; collecting, analyzing and reporting a wide range of WFD Initiative metrics; assisting with coordinating NYSERDA WFD Initiatives; conducting informational sessions and webinars for training providers; identifying case studies and testimonials; and evaluating and updating training partner information that is available on the NYSERDA website.
OJT Training		
PON 2033	Clean Energy On the Job Training (OJT)	Funds for eligible businesses to implement energy efficiency, renewable energy (RE), and AT/ET OJT
Internships		
PON 2673 ¹⁹	WFD and Training for Renewable Energy and Advanced Technologies	Competitive solicitation sought proposals for training to support installation and operation of RE systems and advanced or emerging energy technologies (AT) in the State. Programs designed to train workers to better design, install, inspect, operate, maintain, and monitor systems, technologies, and measures on the customer side of the meter are requested. Funding was available in three categories including new certifications and credentials, and for training solar thermal inspectors.
Career Pathways		
PON 2774	Career Pathways Training Partnerships for Energy Efficiency & Renewable Energy	Competitive solicitation seeks proposals for the deployment of hands-on, entry level, technical training programs in clean energy that enhance the skills of unemployed or underemployed adults and provide paid, experiential learning opportunities such as an internship or placement in a New York State Registered Apprenticeship program.

¹⁹ Also listed under Technical Training PONs.

PON ID	PON Title	Description
PON 2664	Clean Energy Training for High School Students	<p>Competitive solicitation seeking proposals for the development and implementation of educational training programs in EE, RE, and AT/ET for high school students.</p> <p>Proposers were asked to develop and implement programs that prepare students for careers and/or post-secondary education, with a focus on Science, Technology, Engineering, and Mathematics skills.</p>

Additional resources on Green Jobs that influenced this report:

1. Greener Reality: Jobs, Skills, and Equity in a Cleaner U.S. Economy, Sarah White, Laura Dresser, Joel Rogers. Center on Wisconsin Strategy, September 2012 (AKA Cows report)
2. NYSDOL, New York State’ Clean Energy Industry: Labor Market and Workforce Intelligence Report. 2009. NYSDOL. Division of Research and Statistics. New York State Green Jobs Study: Statewide findings. Accessible at <http://www.labor.ny.gov/stats/green/>
3. Muro, Mark et al., 2011. Sizing the Clean Economy: A National and Regional Green Jobs Assessment. Available at Brookings Institute Website: http://www.brookings.edu/~media/series/resources/0713_clean_economy.pdf

APPENDIX B:

GLOSSARY OF TERMS FOR NYSERDA CONTRACTING

The following contracting activities support the Initiative's goals. WFD offers three types of competitive solicitations. These are:

- **Competitive Solicitations:** These solicitations comprise most of the WFD PONs, are more targeted toward very specific skills and audiences, and therefore list very specific criteria required by applicants. These solicitations have a hard deadline and all applications are reviewed and scored against one another. Because of this, a number of proposals are deemed as “fundable” after the TEP process.
- **Open Enrollment:** These solicitations specify criteria of skills/experience sought from the applicant and accept and review applications on a rolling basis until the end of their funding cycle (usually a hard deadline). The budgets for these PONs are revised several times over the course of the solicitation to reflect the amount still available. This type of solicitation is usually broadly defined to attract a wide variety of applicants to represent the current state of the market.
- **Open Competitive Solicitations:** These solicitations have an ongoing approval process; the open competitive solicitations allow for applications to be approved on a rolling basis during the set funding period. Instead of a TEP, staff holds discussions in which they discuss the merits of each application to determine if it can be funded.

Solicitations are offered through two methods of procurement:

- **Program Opportunity Notices (PONs)** are solicitations that are appropriate if resulting projects are expected to demonstrate the technical, economic, environmental, and other aspects within a particular area. PONs act as funding opportunities that offer incentives within an available budget to individual training courses. They are used when seeking a variety of approaches or ideas falling within a particular interest area. Multiple awards and cost sharing generally are expected.
- **Requests for Proposals (RFPs)** are solicitations that are appropriate for a specific area of interest, when it is possible to describe in a Statement of Work to a high degree of specificity the work contemplated and the evaluation criteria to be used. A single award with no cost sharing is typically expected, although multiple awards may be made as appropriate.

