

Matter Number 16-00681, In the Matter of the Clean Energy Fund
Investment Plan

Clean Energy Fund:
Workforce Development and Training
Chapter

Portfolio: Market Development

Submitted by:

The New York State Energy Research and Development Authority

Revised May 7, 2021

Clean Energy Fund: Workforce Development and Training Chapter		
Revision Date	Description of Changes	Revision on Page(s)
August 18, 2016	Original Issue	Original Issue
September 9, 2016	Revised Table 3	10
September 15, 2017	Expanded eligibility, and increased funding to allow for additional solicitations. Tables 1-6 have been revised, and Milestones have been updated accordingly.	Multiple
November 1, 2017	Corrected chapter number.	Multiple
June 8, 2018	<u>Industry Partnerships</u> : Increased funding to allow for additional projects, revised Tables 1-6 and updated text and milestones accordingly. <u>Clean Technology and Energy Efficiency Talent Pipeline</u> : Original Issue	Multiple
April 19, 2019	<u>Industry Partnerships</u> : Updated initiative name to Workforce Development Industry Partnerships. As part of the Annual Investment Plan & Performance Report (IPPR) process, NYSERDA has updated budget and benefit values to align with actuals for past years and adjusted budget and benefit forecasts for future years, as appropriate, based on experience to date. Budget and benefit tables have been moved to Appendix B of this chapter and output/outcome tables have been moved to Appendix C of this chapter. Updated rounding convention has been applied to budget and benefit tables.	Multiple
May 15, 2020	As part of the Annual Investment Plan & Performance Report (IPPR) process, NYSERDA has updated budget and benefit values to align with actuals for past years and adjusted budget and benefit forecasts for future years, as appropriate, based on experience to date. Updated initiative names: Workforce Development and Industry Partnerships is now Building Operations and Maintenance Partnerships. Clean Technology and Energy Efficiency Talent Pipeline is now simply Talent Pipeline. Revised both plans to increase funding and add activities that grow the workforce that can design, install, maintain, sell, and distribute building electrification as part of the NY Clean Heat Market Development Plan and in support of New Efficiency New York goals. In addition, a career pathway solicitation will be developed for new HVAC/heat pump workers, training programs for workers and professional services throughout the HVAC/heat pump supply chain and incentives will be increased for NY Clean Heat workers hired through on-the-job training.	Multiple within the plan. Appendix A, B, & C
June 5, 2020	Plan was recently updated and is being refiled here as part of the Annual Investment Plan & Performance Report (IPPR) process in which all plans are collectively filed. No changes to plan documents.	None

<p>May 7, 2021</p>	<p>As part of the Annual Investment Plan & Performance Report (IPPR) process, NYSERDA has updated budget and benefit values to align with actuals for past years and adjusted budget and benefit forecasts for future years, as appropriate, based on experience to date.</p> <p>The investment plans have been updated to provide a bridge between committed and acquired planning. Committed budget and benefits summaries have been added to plan text, while Appendix B has been updated to reflect expenditure & acquired benefits plans.</p>	<p>Appendix B</p> <p>9, 15-16, Appendix B</p>
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Workforce Development and Training

The New York State Energy Research and Development Authority (NYSERDA) seeks to build on its long history of working in partnership with education and training systems to deliver the workforce skills employers need. With many of the state's most skilled employees approaching retirement age, an insufficient pipeline of skilled workers to fill the gap, and technologies that are evolving rapidly, New York needs a readily available workforce that is skilled and adaptable. Many initiatives will target incumbent workers but, whenever possible, efforts will seek to identify and support future workforce needs and increase economic opportunity for unemployed, underemployed, and disadvantaged workers by developing and promoting middle - skill jobs¹.

In the first initiative described in this Chapter, NYSERDA is utilizing an industry partnership (i.e., an ongoing dialogue among industry leaders on common workforce issues and opportunities) to address building operations and maintenance workforce needs. Building Operations and Maintenance Partnerships (formerly referred to as Industry Partnerships) are intended to: help identify worker skill needs; inform investments in skills and talent development; support career pathways; and develop the training infrastructure needed to better link supply and demand in the labor market. The initiative was modified in September 2017 to expand the eligibility of who can lead a building operations and maintenance project, as well as adding funding for additional solicitations. Funding was added in May 2018, and again in March 2020. The new modification will provide more funding for additional projects serving workforce training needs for large building portfolios, including operations and maintenance of building electrification systems as appropriate. The benefits were increased, and milestones were updated accordingly to account for the additional funding.

The second initiative described in this chapter will create a Talent Pipeline, a proactive approach to defining, attracting and developing the right mix of critical talent that is responsive to industry needs and market demand. Through increasing training capacity, incenting businesses to train new hires through on-the-job training, and supporting an internship program, the initiative will ensure that New York has the skilled workers necessary to meet clean energy and energy efficiency business needs. Funding was added in March 2020 to support NY Clean Heat and energy efficiency market enablement strategies, and associated benefits and milestones were updated. A total of \$38 million will be targeted at training needs to support NY Clean Heat including targeted training to address critical needs related to NY Clean Heat incentive programs, a new career pathway training program for new workers from priority populations, new building electrification training programs and increased training capacity for designers, installers, technical sales staff and associated professional service workers and, increased incentives for companies hiring new heat pump workers. Working in partnership with businesses, training providers, and communities, this investment will provide training support for over 14,000 building industry professionals – helping New York State meet the labor needs associated with the 2025 NY Clean Heat goal and positioning

^{1 1} Disadvantaged workers include, but are not limited to those residing in low and moderate-income communities, underrepresented populations including women and people of color, and disconnected youth

New York’s vocational and training institutions for the long-term transformation needed to fundamentally change the way we heat and cool buildings.

The Building Operations and Maintenance Partnerships and Talent Pipeline initiatives complement each other. Both initiatives are designed to address the skills gaps that employers are experiencing with both existing workers and for new hires. The Building Operations and Maintenance Partnerships program is focused on a specific job category/function (building O&M) and spans several sectors (e.g., commercial, institutional, multifamily). In comparison, the Talent Pipeline initiative is a broader capacity building effort which will allow for greater flexibility to develop more varied industry collaborations tailored to specific technologies, sectors, or critical job functions across various supply chains.

Program investments and activities will be informed via engagement with stakeholders and subject matter experts.

16.1 Building Operations and Maintenance Partnerships

NYSERDA will leverage existing training infrastructure and focus on job skills and training that lead to job placement and career advancement through an “industry partnership” approach targeted at building operations and maintenance workers. This approach involves obtaining stakeholder input and developing channel partnerships to help identify, implement, and replicate workforce development and training initiatives designed to match industry workforce needs with a supply of skilled workers. NYSERDA will issue competitive solicitations targeting large entities with multiple buildings and sites to support development of on-the-job building operation and maintenance training initiatives. Employers will commit to replicating the results throughout their buildings.

16.1.1 Theory of Change

<p>Market Barriers Addressed</p>	<ul style="list-style-type: none"> • Shortage of skilled workers due to attrition from retirements: There is an opportunity for NYSERDA to assist industry partners to leverage existing training infrastructures, develop internal training systems to impact more buildings and workers, support entry-level workers, and advance the skills of existing workers. Career pathway development and career advancement for building operations and maintenance will be a priority. • Changing technology demands requiring upgraded skills for new and existing workers: The industry is faced with the integration of clean energy resources such as solar, heat pumps, wind, storage technologies, micro-grids, smart meters and devices, network-connected systems, applications for managing equipment and building systems, and the availability of real-time data. These new technologies, devices, and systems will have significant impacts on building operations and maintenance and the workforce. There is a critical need to upgrade the skills of new and existing workers on a systematic and on-going basis. • Lack of information and tools needed to address skills gaps from the demand side: Most workforce interventions in New York State focus on the labor supply and are measured by the number of workers being trained or certified. New interventions demonstrated through this initiative will balance labor demand with supply. Past industry-based efforts in the advanced manufacturing sector, have
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	shown some of the most successful workforce interventions are those driven by regional employer demand ² .
Testable Hypotheses	<ul style="list-style-type: none"> • If industry partners implement operations and maintenance best practices, then energy savings could exceed five percent within the first two years of implementation. • If industry partners institutionalize a culture of continuing professional development among operations and maintenance staff, then they can expect to see improved worker retention and knowledge transfer as aging workers approach retirement. • If NYSERDA demonstrates the impacts of a trained workforce to prove the business case for training, then other decision makers (property owners, employers, institutional administrators, etc.) will adopt similar strategies.
Activities	<ol style="list-style-type: none"> 1) Industry Partnerships to Identify Barriers and Skills - develop two to four regional industry partnerships of five to 10 employers to identify labor-related barriers and skills gaps based on labor market analysis. 2) Business Case Demonstrations - conduct six business case demonstrations to prove the impact and value of technical training. <ol style="list-style-type: none"> a) Evaluate technical training available in the market, utilizing an industry recognized evaluation model that goes beyond immediate reactions to training to measure the impacts of training. b) Present business case and evaluation findings in case studies and other tools for dissemination to others in the industry who may be considering an investment in workforce training and development. 3) Identify Training Intervention to Address Skills and Barriers - work with industry partners to identify specific building operations and maintenance training needs and best practices to address barriers. Interventions will be targeted at developing sustainable in-house training infrastructure and practices and will include but will not be limited to, the following: <ol style="list-style-type: none"> a) Train-the-trainer initiatives to develop internal capacity for knowledge transfer b) Partnerships with manufacturers to ensure that training providers have equipment that meets or exceeds industry standards c) Curriculum development d) On-the-job training, internships, and apprenticeship enhancement in support of career pathways 4) Competitive Solicitations - Issue a minimum of 3 competitive solicitations, with revisions and reissuing as needed, with multiple due dates or “rounds” through 2024 (open to all eligible New York entities) in support of innovative approaches and interventions, as identified above, with entities with multiple buildings and sites). Two open enrollment solicitations have been issued to date, with a total of nine due dates for submission through December 2019, resulting in 41 projects. Additional projects will be solicited to develop workforce training initiatives that leverage existing resources while moving organizations toward a culture that promotes more routine training, including the advancement of skills for existing workers and the development of career pathways for new workers. <ol style="list-style-type: none"> a) Make contract awards – Award a total of approximately 120 contracts. Performance metrics may include but are not limited to number of workers trained, funds leveraged, energy and emissions reductions, new hires from LMI and other targeted communities, and number of trainers trained.

² Groves Garrett and Woolsey, Lindsey. (2013) *Sector Strategies Coming of Age: Implications for State Workforce Policy Makers*. Ann Arbor, Michigan and Washington DC: Corporation for a Skilled Workforce, National Governors Association, and National Skills Coalition.

	<p>5) Curriculum Development - Where gaps are identified, invest in curriculum development and assess the need for new industry standards to address technological changes.</p> <p>6) Case Studies - Develop case studies to identify best practices and to illustrate career pathways in energy efficient building operations and maintenance and to identify interventions and combinations of interventions that can serve as a road map to advance skills and provide easy paths to entry-level jobs.</p> <p>7) Outreach Strategy – Implement an outreach and marketing strategy to disseminate building operations and maintenance training project results and case studies and cultivate new partnerships. Activities will need to be tailored to the various sectors that can benefit from the results and lessons learned.</p>
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16.1.2 Target Market Characterization

<p>Target Market Segment(s)</p>	<p>The target market is employers, managers, service providers, unions, new hires and staff involved in building operations and maintenance across the commercial and multifamily building sectors. NYSERDA will seek to partner with large organizations and institutions with high potential for large scale energy savings as a result of training building operations and maintenance staff, and for replication of training practices across large portfolios of buildings.</p>
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16.1.3 Stakeholder and Market Engagement

<p>Stakeholder/Market Engagement</p>	<ul style="list-style-type: none"> • Over the past three years, NYSERDA has conducted extensive outreach to stakeholders through stakeholder meetings, focus groups, presentations at various industry forums, webinars, etc. • Through its outreach, NYSERDA has engaged with employers across a variety of market segments: solar electric; renewable thermal; existing trades (e.g., heating, ventilation and air conditioning, plumbing, carpentry, and weatherization); equipment and component manufacturers; architects and engineers; investor-owned and private utilities; and building operations and maintenance staff serving multifamily and commercial buildings. • As a result of stakeholder input, building operations and maintenance quickly emerged as a focus area with the potential for a large impact in the near term: advancing skills for existing workers, better preparing new entrants to the workforce, and achieving energy efficiency and greenhouse gas reduction goals. • In response to the building operations and maintenance solicitations issued to date, NYSERDA spoke with more than 100 potential proposers about project concepts and ideas. Inquiries from potential applicants continue. • NYSERDA coordinates with the workforce activities of other State agencies, such as NYPA, DOL, Empire State Development (ESD), CUNY and SUNY, the Governor’s Office of Workforce Development, the New York City Mayor’s Office, and the state’s investor-owned utilities.
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<p>Relationship to Utility Programs and REV Initiatives</p>	<ul style="list-style-type: none"> • NYSERDA is coordinating sector strategy work with NYPA’s training activities to share best practices and lessons learned and intends to engage other utilities through the stakeholder engagement process. • Many building O&M training partners already work closely with the utilities. Commercial building partners often have close relationships with their utilities and participate in energy efficiency incentive programs administered by their utilities. NYSERDA will seek to engage utility key account managers to coordinate outreach to potential end users, including participants in the NY Clean Heat incentive programs.
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	<ul style="list-style-type: none"> • NYSERDA will continue to partner with Consolidated Edison and Rochester Gas and Electric on workforce training projects (heat pumps) and utility programs supporting workforce training (including on-the-job training).
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Key Implementation Milestones

Key Milestones	<p><u>Milestone 1 - completed-</u></p> <ul style="list-style-type: none"> • Convened industry partners for building operation and maintenance. <p><u>Milestone 2 - completed</u></p> <ul style="list-style-type: none"> • Identified employer champions, those who will help NYSERDA to lead the initiative, for building operations and maintenance. <p><u>Milestone 3 -completed</u></p> <ul style="list-style-type: none"> • Conduct stakeholder research to identify common labor-related barriers and potential training interventions to help inform program offerings. <p><u>Milestone 4 - completed</u></p> <ul style="list-style-type: none"> • Identified and implemented six business demonstrations. Collected performance data from demonstration sites for case studies and sharing results. Two case studies are completed, distributed at outreach events and available on NYSERDA’s website. <p><u>Milestone 5 (2020) - Complete</u></p> <ul style="list-style-type: none"> • Issue and periodically modify solicitations to support the development of building operations and maintenance training initiatives that address skills gaps and facilitate career paths with multiple due dates, as appropriate <p><u>Milestone 6 (2021)</u></p> <ul style="list-style-type: none"> • Reconvene industry partners for building operation and maintenance to disseminate learnings and best practices. <p><u>Milestone 7 (2022)</u></p> <ul style="list-style-type: none"> • Data collected from project sites will be used to help develop case studies. <p><u>Milestone 8 (2022)</u></p> <ul style="list-style-type: none"> • Issue and periodically modify solicitations to support the development of building operations and maintenance training initiatives that address skills gaps and facilitate career paths with multiple due dates, as appropriate.
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16.1.4 Fuel Neutrality

Fuel Neutrality	<ul style="list-style-type: none"> • NYSERDA intends to offer this initiative in a fuel neutral manner to encourage more efficient use of all fuel types. Offering the initiative on a fuel neutral basis will allow NYSERDA to achieve savings at a cost of \$9.6 per ton of carbon lifetime, compared to a cost of \$18.22 per annual ton of carbon in an electric only scenario.
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16.1.5 Performance Monitoring and Evaluation Plans

<p>Performance Monitoring & Evaluation Plan</p>	<p>NYSERDA’s approach to monitoring and assessing the effectiveness of the initiative and overall market development is described below. Where appropriate, evaluation efforts for this initiative may be combined with other NYSERDA evaluation studies to optimize resources where technologies, market actors, strategy or geographical regions overlap. While serving to reduce and mitigate potentially duplicative evaluation efforts, this approach will also reduce uncertainty in evaluation findings where discrete, initiative-level assessments are otherwise difficult to discern due to such overlaps.</p> <p><u>Test-Measure-Adjust Strategy</u> NYSERDA will continually assess the effectiveness of the program and will adjust program strategy and/or funding levels as needed. NYSERDA will monitor market response to the building operations and maintenance industry partnership approach through project reporting and direct communications with contractors. Data on the following indicators will also be evaluated:</p> <ul style="list-style-type: none"> • building energy consumption and spend for all fuel sources, gathered bi-annually from contractors for properties impacted by training • non-energy benefits, such as increase in number of curricula developed or staff promoted, included in contractors’ final reports, submitted one year after the completion of training <p>In addition, NYSERDA will ongoingly assess project effectiveness in encouraging the adoption of an energy-efficiency culture within individual facilities and across portfolio facilities. As specific activities which encourage energy-efficient cultures are identified, NYSERDA will share best practices throughout the State.</p> <p><u>Market Evaluation</u></p> <ul style="list-style-type: none"> • Market Evaluation will draw on the logic model and will include baseline and longitudinal measurement of key indicators of programmatic and broader market success. • Baseline measurements of key market indicators occurred in 2018 and provided additional insights that allowed NYSERDA to adjust the strategy. The market indicators investigated included but were not limited to increased wages for trainees, increase in number of workers trained, and employee retention. • Regular (e.g., annual or biennial) updates to key performance indicators and measurement of market change, including but not limited to number of industry partnerships established, number of workers who participate in an internship or apprenticeship, and disadvantaged workers (LMI) entering building operations and maintenance careers. • Sources of data include intervention data, public and commercially available data, and primary data collection through surveys of key market actors. <p><u>Impact Evaluation/Field Verification</u></p> <ul style="list-style-type: none"> • Evaluation M&V will be conducted for a sample of participating spaces/buildings, according to the International Performance Measurement & Verification Protocol (IPMVP) method(s) most appropriate given the improvements made. Initiative-specific details regarding the gross savings approach can be found in the Verified Gross Savings Specifications form. Data from Field Verification/Impact Evaluation can be used to help lend confidence in the market, especially among other end users.
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16.1.6 Budgets

The commitment budget for all activities included in this investment plan is as follows:

Funding Commitments		----- Commitments Plan -----						
Budget	Plan Total	Previously Committed	2020	2021	2022	2023	2024	2025
Incentives and Services	31,006,924	9,074,470	2,110,493	2,500,000	6,075,000	5,100,000	6,146,961	-
Implementation	1,705,581	664,451	555,007	210,000	215,000	50,000	11,123	-
Research and Technology Studies	-	-	-	-	-	-	-	-
Tools, Training and Replication	632,495	437,887	-	75,000	69,609	50,000	-	-
Business Support	-	-	-	-	-	-	-	-
Total	33,345,000	10,176,808	2,665,500	2,785,000	6,359,609	5,200,000	6,158,084	-

An annual expenditure budget for all activities included in this investment plan is shown in Appendix B alongside expected acquired benefits. Budgets do not include Administration, Evaluation, or Cost Recovery Fee; these elements are addressed in the Budget Accounting and Benefits chapter filing. The budget as presented in the Budget Accounting and Benefits Chapter will serve as the basis for any subsequent reallocation request. The additional level of detail presented within Appendix B is intended for informational purposes only.

16.1.7 Progress and Performance Metrics

The anticipated commitment benefits totals for the initiative with respect to CEF Order target metrics is as follows:

Benefit Commitments		Benefit Commitments	
Direct Benefit (2016-2025)	Plan Total	Indirect Benefit (2016-2030)	Plan Total
Energy Efficiency MWh Annual	389,661	Energy Efficiency MWh Annual	823,258
Energy Efficiency MMBtu Annual	3,882,317	Energy Efficiency MMBtu Annual	7,211,200
Renewable Energy MWh Annual	-	Renewable Energy MWh Annual	-
CO2e Emission Reduction (metric tons) Lifetime	3,210,727	CO2e Emission Reduction (metric tons) Lifetime	6,361,937
Participant Bill Savings Lifetime	586,042,755		
Leveraged Funds	31,027,782		

Benefits summarized in Appendix B represent the plan for acquiring impacts through completed projects or activities.

Benefits listed as direct, are near term benefits directly associated with this initiative's projects. These benefits will be quantified and reported on a quarterly basis and will be validated through later evaluation.

Benefits listed as indirect represent the estimated indirect market effects expected to accrue over the longer term as a result of this investment and follow on market activity. The indirect benefits that accrue from this investment will be quantified and reported based on periodic Market Evaluation studies to validate these forecasted values. Market Evaluation may occur within one year (-/+) of the years noted in the Appendix and projected future indirect benefits and/or budgets necessary to achieve them may be updated based on the results of market evaluation. Indirect impact across NYSEERDA initiatives may not be additive due to multiple initiatives operating within market sectors. The values presented above and in Appendix B are not discounted, however

NYSERDA has applied a discount of 50% to the overall portfolio values in the Budget Accounting and Benefits chapter.

Appendix C provides program Activity/Output indicators representing measurable, quantifiable direct results of activities undertaken in the initiative. Outputs are a key way of regularly tracking progress, especially in the early stages of an initiative, before broader market changes are measurable. Outcome indicators can encompass near-term through longer-term changes in market conditions expected to result from the activities/outputs of an intervention. Outcome indicators will have a baseline value and progress will be measured periodically through Market Evaluation.

In addition, NYSERDA will also assess:

- Increase in square footage of buildings whose owners invest in training infrastructure without NYSERDA funding
- Improved employee retention
- Decreased time for employer to find and hire new talent with the appropriate skills.

16.2 Talent Pipeline

16.2.1 Theory of Change

NYSERDA will create a talent pipeline to ensure that New York State clean energy, electrification and energy efficiency businesses have a robust supply of new and existing workers with the required occupational skills, credentials and experience. This will ensure workers are trained to provide the professional services (including A&E and research) and technical skills necessary to design, manufacture, specify, sell, distribute, install, operate, maintain, repair, and inspect clean energy technology and systems. Focus areas include:

- Offshore wind (OSW)
- Energy efficiency
- Electrification; air- and ground-source heat pumps in support of NY Clean Heat
- Cleantech companies, including startups
- Energy storage

Activities will focus on expanding training infrastructure and capacity and offsetting the cost of hiring and training new workers, which can lead to soft cost reductions by decreasing the time and costs associated with getting a worker to full productivity. All training for new workers will be directed by specific business training and hiring needs and include direct involvement of businesses in activities such as providing internships, job cooperatives, site visits and interviewing graduates to ensure job placement.

Market Barriers Addressed	<ul style="list-style-type: none"> • Insufficient supply of skilled workers. In addition to the expected growth of clean energy business, large numbers of skilled workers are expected to retire, exacerbating an existing shortage of workers with the required skills and relevant experience to
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	<p>work in clean energy jobs. NYSERDA programs will focus on building the infrastructure to train more workers on heat pumps, energy efficiency, energy storage, offshore wind and other priority clean technologies.</p> <ul style="list-style-type: none"> • Training programs are not aligned with business needs. Due to high costs to update training programs and provide practical experience, curricula are not keeping pace with innovations in the clean energy space. Financial support for targeted trainings, new curriculum and practical experience driven by business training and hiring needs will address training gaps. • Business risk aversion. There are costs and risks for both businesses and training partners associated with developing partnerships to expand and improve curriculum and facilitate opportunities for internships, apprenticeships and job placements. Wage support through OJT and an internship program will reduce risks to businesses. • High costs to hire workers. Data has shown that 60% of employers have vacancies that last up to three months, and that it can take 6-12 months and an estimated \$15,000³ to bring a new hire up to full productivity if they do not have the right skills. The OTJ program and internships will help offset the costs of hiring workers and result in reducing soft costs associated with energy efficiency work.
<p>Testable Hypotheses</p>	<ul style="list-style-type: none"> • If NYSERDA supports business-driven skills training in the highest need markets and increases the State’s training capacity, then building electrification, energy efficiency, energy storage, and other clean energy businesses will spend less time filling open positions and bringing workers to full productivity (new and existing workers). • If businesses have access to workers with the right skills, then overall soft costs for energy efficiency and electrification projects will go down. • If soft costs are reduced, then businesses will expand building electrification, energy efficiency, and clean energy and related sales and services, increasing career opportunities for workers.
<p>Activities</p>	<p><u>Expand Training Infrastructure</u></p> <p>NYSERDA will partner with training organizations and businesses to expand training capacity in New York State and update training content to prepare workers for jobs working with clean energy technologies,⁴ to increase the number of people they are able to train, and to increase access to practical experience. A new career pathway program will be developed to support entry level heat pump workers from priority populations. New targeted trainings will be offered in coordination with utilities’ NY Clean Heat incentive programs. Additional training programs will be developed and training capacity will be increased for heat pump designers, installers, technical sales staff and associated professional service workers in partnership with clean energy businesses. On-the-job training incentives will be increased for companies hiring new heat pump workers.</p> <p>The training efforts will be employer-led and based on the occupational skills new hires and existing workers need to support business demands. NYSERDA will:</p> <ul style="list-style-type: none"> • Issue competitive solicitations to select training providers and deliver training that is directly tied to meeting employers’ skills and hiring needs. Training providers may include colleges and universities, trade associations, manufacturers, unions, technical high schools and Boards of Cooperative Educational Services (BOCES). • Support training activities that will include job preparation and job placement initiatives. The solicitations will provide funding to training providers for a variety of activities, including curriculum development, training trainers, equipment purchases, job placement services and business partnerships to offer internships, pre-apprenticeships, and apprenticeships.

³ CareerBuilder

⁴ Initial focus areas include offshore wind, energy storage electrification/heat pumps and energy efficiency. However, NYSERDA will consider other clean technology areas as the need arises.

	<ul style="list-style-type: none"> • Support business-facing intermediaries, such as community-based organizations, who work closely with clean energy businesses and potential employees to better prepare and place workers for new clean energy job openings. • Develop strategic partnerships with industry organizations, trade associations, manufacturers, unions, universities and others to inform and deliver training at greater scale. <p><u>Offset the cost of hiring and training new workers</u></p> <p>Provide businesses with incentives to hire and train new workers, reducing the time needed to get workers to full productivity and improve job retention. NYSERDA will:</p> <ul style="list-style-type: none"> • Issue an open enrollment program for which clean energy businesses are eligible to apply for funding to offset the cost to hire new workers through OJT. The program will focus on cleantech, energy efficiency, energy storage and heat pumps. If other areas in need of OJT support are identified, NYSERDA will assess whether the open enrollment program should be expanded. • Develop and implement an internship program to match college and technical high school students with businesses. The internship program modelled after Massachusetts CEC's successful program, will be an open enrollment application program for businesses to apply for funding for interns hired through the program. Eligible student resumes will be submitted to NYSERDA and made available to businesses. • Issue a solicitation for new job pathway programs across the state for HVAC/heat pump careers focusing on job preparedness/placement and support for disadvantaged communities and priority populations. • Support regional and local training that is driven by business needs, including targeted contractor and no- or low-cost practitioner training where there are market gaps. Provide tailored training in support of utilities' heat pump programs.
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16.2.2 Target Market Characterization

<p>Target Market Segment(s)</p>	<p>Focus areas will include electrification including air-and ground-source heat pumps, energy storage, offshore wind, energy efficiency, and cleantech. Efforts will target businesses, manufacturers, distributors, contractors, and training providers, serving the focus areas. Workers include professionals and practitioners along the clean energy value chain that provide clean energy and energy efficiency related services and solutions including, but not limited to, professional services (architecture, engineering, R&D and other related services), installation, technical sales, manufacturing, and operation and maintenance. To support a just and equitable clean energy transition, efforts will encourage participation by and job placement for disadvantaged workers, including but not limited to, residents of low-income communities and environmental justice areas, displaced and dislocated workers, veterans, and people of color.</p>
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16.2.3 Stakeholder and Market Engagement

<p>Stakeholder/Market Engagement</p>	<ul style="list-style-type: none"> • NYSERDA has convened many stakeholder sessions to obtain input on OSW and has completed an assessment of training needs as part of OSW Master Plan⁵. The assessment has been shared with stakeholders and is available on NYSERDA's website. Technical working groups have been established, including a group related to jobs and training.
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⁵ New York State Offshore Wind Master Plan, The Workforce Opportunity of Offshore Wind in New York, NYSERDA Report 17-25t, December 2017

	<ul style="list-style-type: none"> • NYSERDA teams have met with or surveyed hundreds of stakeholders, including businesses, manufacturers, training providers and utilities, throughout 2019 to determine workforce training needs and to develop strategic workforce training plans for electrification (heat pumps) and energy storage. • NYSERDA has engaged extensively with the New York State Department of Labor (NYSDOL), unions, HVAC companies, trade associations, renewable heating and cooling and other energy efficiency service providers who have indicated that they are having difficulty finding workers with the right skills (professional and technical) and practical experience. They noted that it takes months and thousands of dollars to recruit, hire and train a new worker. NYSERDA is working closely with clean energy businesses looking to hire and NYSDOL to implement job fairs across the state. Additional engagement will be ongoing to assist in the modification of solicitations, identify the need to develop new solicitations and intervention testing. • Clean technology companies indicated through interviews that they are facing difficulty hiring new workers and workers with some experience. Clean technology startups indicated that training is needed to address the shortage of experienced, high-skilled individuals that can provide much needed guidance and mentorship to less experienced individuals. Additional stakeholder engagement will be conducted to test interventions to determine the best approach to meet the cleantech startup needs.
<p>Relationship to Utility Programs and REV Initiatives</p>	<ul style="list-style-type: none"> • This initiative a critical component of the NY-Clean Heat Market Development Plan, will build workforce capacity and help drive reductions in installed cost by training workers to sell, design, install, and perform quality heat pump and energy efficiency installations, enabling utilities to achieve their New Efficiency: New York electrification and efficiency targets. • Through this effort, NYSERDA will work with the joint utilities to deliver tailored training for contractors and other market partners in utilities’ energy efficiency and heat pump incentive programs and continue to solicit utility feedback on training needs and gaps. Training will be implemented through manufacturers, trade associations, unions, BOCES and technical high schools and universities, and will be responsive to consumer and contractor feedback. • NYSERDA is working with Con Edison on a training demonstration for contractors working on steam distribution systems in multifamily buildings and a second project to train contracts on heat pump technologies for water heating in multifamily buildings in Con Edison’s service territory. NYSERDA is also helping Rochester Gas and Electric on planning for workforce training programs to support contractors hiring new workers in their Business Energy Efficiency Program. NYSERDA will continue to engage utilities through the stakeholder engagement process and through coordination with the Joint Utilities.

16.2.4 **Key Implementation Milestones**

<p>Key Milestones</p>	<p><u>Milestone 1 - completed</u></p> <ul style="list-style-type: none"> • Issued clean energy training infrastructure and capacity building solicitation, Multiple rounds and due dates are anticipated through 2024 <p><u>Milestone 2 - completed</u></p> <ul style="list-style-type: none"> • Issued open enrollment OJT program. <p><u>Milestone 3 - completed</u></p> <ul style="list-style-type: none"> • Issued open enrollment internship program. <p><u>Milestone 4 (2020)</u></p>
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	<ul style="list-style-type: none"> • Work with SUNY, NYSDOL and Empire State Development to issue training infrastructure and capacity building solicitation focused on OSW. <p><u>Milestone 5 (2020) - Complete</u></p> <ul style="list-style-type: none"> • Issue an open enrollment program(s), or address needs through training providers under umbrella agreements, to provide financial incentives to offset training and certification costs related to heat pump and other high priority energy efficiency technologies, including support for manufacturer training. <p><u>Milestone 6 (2020) - Complete</u></p> <ul style="list-style-type: none"> • Issue a career pathway solicitation, with multiple due dates, if needed, focused on heat pump training that places a priority on training for disadvantaged communities, low-income workers and veterans. <p><u>Milestone 7 (2021)</u></p> <ul style="list-style-type: none"> • Work with SUNY, NYSDOL and Empire State Development to issue training infrastructure and capacity building solicitation focused on OSW.
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16.2.5 Fuel Neutrality

Fuel Neutrality	<ul style="list-style-type: none"> • NYSERDA will offer this initiative in a fuel neutral manner to encourage training on technologies and practices supported by all fuel types.
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16.2.6 Performance Monitoring and Evaluation Plans

Performance Monitoring & Evaluation Plan	<p>NYSERDA’s approach to monitoring and assessing the effectiveness of the initiative and overall market development is described below. Where appropriate, evaluation efforts for this initiative may be combined with other NYSERDA evaluation studies to optimize resources where technologies, market actors, strategy or geographical regions overlap. While serving to reduce and mitigate potentially duplicative evaluation efforts, this approach will also reduce uncertainty in evaluation findings where discrete, initiative-level assessments are otherwise difficult to discern due to such overlaps.</p> <p><u>Test-Measure-Adjust Strategy</u> NYSERDA will continually assess the effectiveness of the program and will adjust program strategy and/or funding levels as needed. NYSERDA will monitor market response to the clean energy, electrification and energy efficiency talent pipeline approach through project reporting and direct communications with contractors and partner businesses. Data on the following indicators will also be collected from contractors:</p> <ul style="list-style-type: none"> • training curriculum developed or modified • trainers trained and workers trained • businesses engaged and participating in training, interns placed, jobseekers placed by job category <p>In addition, NYSERDA will ongoingly assess project effectiveness in reducing the time and cost to recruit, hire and train new workers, and the time for new workers to reach full productivity. NYSERDA will share best practices throughout the State as successful</p>
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approaches to improve the talent pipeline for clean energy, electrification and energy efficiency are identified.

Market Evaluation

- Market Evaluation will draw on the logic model and will include longitudinal measurement of key indicators of programmatic and broader market success, including but not limited to new hires through the OJT Program and interns hired directly by businesses through Internship Program. Market evaluation activities will also focus on the effectiveness of training efforts and associated trainee learning; the Kirkpatrick Model⁶ serves as a proven methodology to conduct such assessments and will be incorporated into the evaluation. In applying the Kirkpatrick model, the evaluation will include surveys to trainees to understand their current job placement and examine how trainees change their behavior and apply the training in their job.
- NYSERDA did not obtain baseline measurements for indicators that were listed as a zero for the baseline value (i.e., did not exist in the market). However, in 2020, the first regular (e.g., annual or biennial) update to key performance indicators and measurement of market change, including but not limited to: decreasing the time for a new worker to reach full productivity including the impact on soft costs and creating new businesses and training provider partnerships through this initiative will occur.
- Market evaluation will leverage data from the 2017 New York Clean Energy Industry Report, as well as the 2018 and 2019 updates to the report, that focuses on the size, scope and potential growth of the State’s clean energy economy. Other sources of data include intervention data, public and commercially available data, and primary data collection through surveys of key market actors.

16.2.1 Budgets

The commitment budget for all activities included in this investment plan is as follows:

Funding Commitments		----- Commitments Plan -----						
Budget	Plan Total	Previously Committed	2020	2021	2022	2023	2024	2025
Incentives and Services	68,203,790	5,583,259	6,563,771	13,149,905	17,755,176	16,970,076	7,698,302	483,302
Implementation	4,096,210	711,470	811,616	475,399	719,985	560,000	500,000	317,740
Research and Technology Studies	-	-	-	-	-	-	-	-
Tools, Training and Replication	2,700,000	-	-	-	1,050,000	1,150,000	500,000	-
Business Support	-	-	-	-	-	-	-	-
Total	75,000,000	6,294,728	7,375,386	13,625,303	19,525,161	18,680,076	8,698,302	801,042

An annual expenditure budget for all activities included in this investment plan is shown in Appendix B alongside expected acquired benefits. Budgets do not include Administration,

⁶ The four levels of the Kirkpatrick Model are Level 1: Reaction – the degree to which participants find the training favorable, engaging and relevant to their jobs; Level 2: Learning – the degree to which participants acquire the intended knowledge, skills, attitude, confidence and commitment based on their participation in the training; Level 3: Behavior – the degree to which participants apply what they learned during training when they are back on the job; and Level 4: Results – the degree to which targeted outcomes occur as a result of the training and the support and accountability package (<https://www.kirkpatrickpartners.com/Our-Philosophy/The-Kirkpatrick-Model>). In the past, NYSERDA has evaluated Workforce Development activities using an adapted version of this model.

Evaluation, or Cost Recovery Fee; these elements are addressed in the Budget Accounting and Benefits chapter filing. The budget as presented in the Budget Accounting and Benefits Chapter will serve as the basis for any subsequent reallocation request. The additional level of detail presented within Appendix B is intended for informational purposes only.

16.2.2 Progress and Performance Metrics

The anticipated commitment benefits totals for the initiative with respect to CEF Order target metrics is as follows:

Benefit Commitments

Direct Benefit (2016-2025)	Plan Total
Energy Efficiency MWh Annual	-
Energy Efficiency MMBtu Annual	-
Renewable Energy MWh Annual	-
CO2e Emission Reduction (metric tons) Lifetime	-
Participant Bill Savings Lifetime	-
Leveraged Funds	55,581,855

Indirect Benefit (2016-2030)	Plan Total
Energy Efficiency MWh Annual	-
Energy Efficiency MMBtu Annual	-
Renewable Energy MWh Annual	-
CO2e Emission Reduction (metric tons) Lifetime	-

Benefits summarized in Appendix B represent the plan for acquiring impacts through completed projects or activities.

Benefits listed as direct, are near term benefits directly associated with this initiative’s projects. These benefits will be quantified and reported on a quarterly basis and will be validated through later evaluation.

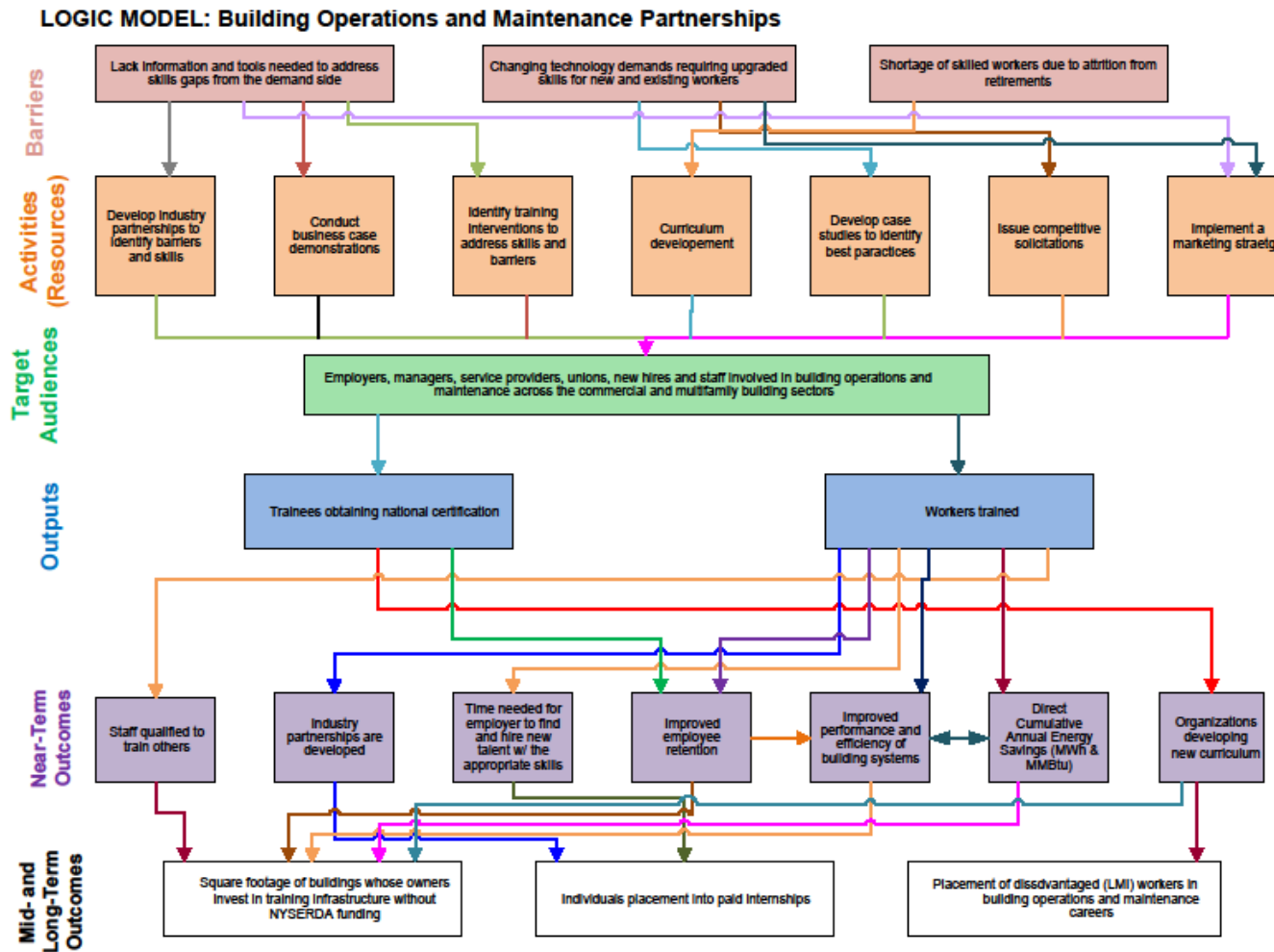
Appendix C provides program Activity/Output indicators representing measurable, quantifiable direct results of activities undertaken in the initiative. Outputs are a key way of regularly tracking progress, especially in the early stages of an initiative, before broader market changes are measurable. Outcome indicators can encompass near-term through longer-term changes in market conditions expected to result from the activities/outputs of an intervention. Outcome indicators will have a baseline value and progress will be measured periodically through Market Evaluation.

Verified Gross Savings Specifications

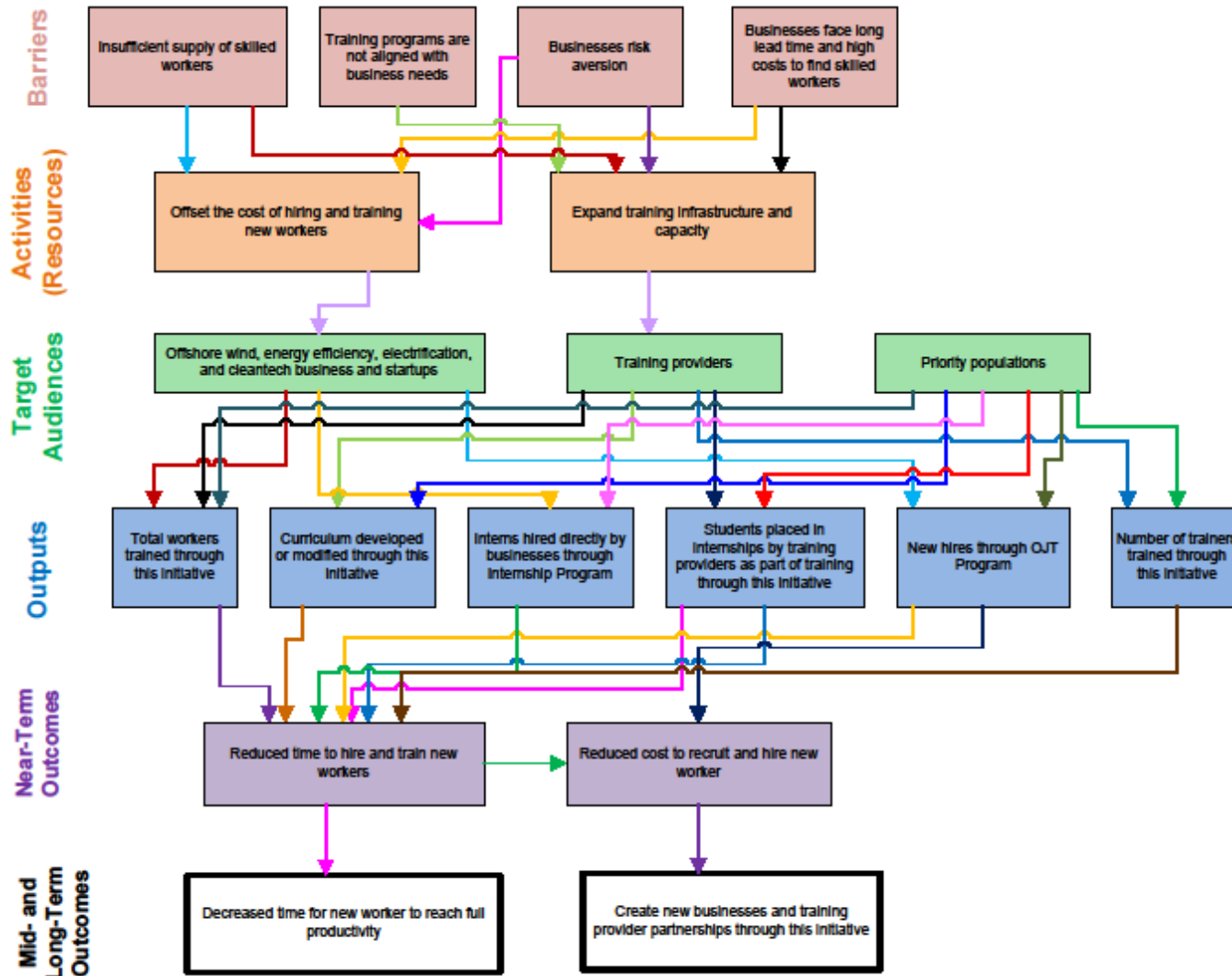
Verified Gross Savings Specification	
Date of CEF filing: <i>see cover page</i>	
CEF Chapter Name: Workforce Development and Training	
Initiative Name	Building Operations and Maintenance Partnerships
Initiative Period	This initiative was originally launched as Workforce Development and Industry Partnerships in January 2017.
Initiative Description	This initiative seeks to reduce energy use and associated carbon emissions while saving building operators and owners money by building the skills of operations and maintenance staff and managers across the state. The goal is to provide support to help employers and building owners with workforce development and training projects that create the talent development strategy, corporate culture, on-site training framework, and training tools needed to support building operations and maintenance workers beyond classroom training
Gross Savings Methodology	The initiative estimates savings using a model that identifies a projected savings value per project multiplied by the projected number of partners in the initiative. The per-project savings value is based on data from the initial 41 projects participating in the program. These initial 41 projects submitted projected energy savings values expected based on their baseline energy use and training scope of work. The average projected electric and fuel savings values from these sample projects (excluding high and low outliers) is used as an assumption for average savings to be achieved for future projects enrolled. The projected savings values averaged 7% annual savings, which is within the DOE estimate of 5-20% for building operations and maintenance training.
Realization Rate (RR)	No RR has been determined for this initiative within the preceding five-year time frame.
Planned VGS Approach	An independent evaluation contractor is anticipated to be procured by NYSERDA in 2020 to perform gross savings analyses. Details related to the Gross Savings Analysis methodology will be submitted in an Evaluation, Measurement & Verification Plan in late 2020. Evaluation, measurement & verification will be conducted for a sample of the projects being used to estimate savings for the remaining projects and is anticipated to include a desk review of project data, surveys of participants and billing analysis, where applicable, and in accordance with the International Performance Measurement & Verification Protocol (IPMVP).
Exemption from EAM Status	N/A

Verified Gross Savings Specification	
Date of CEF filing: <i>see cover page</i>	
CEF Chapter Name: Workforce Development and Training	
Initiative Name	Talent Pipeline
Initiative Period	This initiative was initially offered as Clean Technology and Energy Efficiency Talent Pipeline in September 2018.
Initiative Description	This initiative will create a clean energy, electrification, and energy efficiency talent pipeline, through a proactive approach of defining, attracting and developing the right mix of critical talent in a pool of internal and external candidates. Through increasing training capacity, incenting businesses to train new hires through on-the-job training, and an internship program, the initiative will ensure that New York has the skilled workers necessary to meet clean energy and energy efficiency business needs.
Gross Savings Methodology	Energy savings are not calculated for the Talent Pipeline initiative.
Realization Rate (RR)	No RR will be determined for this initiative as there are no energy savings.
Planned VGS Approach	Impact evaluation/field verification will not occur for the Talent Pipeline initiative.
Exemption from EAM Status	N/A

Appendix A – Logic Models



LOGIC MODEL: Talent Pipeline



Appendix B | Initiative Budget and Benefits Summary

Building Operations and Maintenance Partnerships

		Benefits Acquisition Plan														
	Plan Total	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Direct Benefit																
Energy Efficiency MWh Annual	389,661	-	-	-	415	13,372	33,430	71,512	17,806	35,156	84,376	70,313	63,282	-	-	-
Energy Efficiency MWh Lifetime	3,117,290	-	-	-	3,317	106,980	267,437	572,096	142,448	281,252	675,004	562,504	506,253	-	-	-
Energy Efficiency MMBtu Annual	3,882,317	-	-	-	3,695	164,294	390,397	856,608	211,571	313,299	751,917	626,598	563,938	-	-	-
Energy Efficiency MMBtu Lifetime	31,058,537	-	-	-	29,564	1,314,355	3,123,174	6,852,864	1,692,568	2,506,391	6,015,338	5,012,781	4,511,503	-	-	-
Renewable Energy MWh Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Renewable Energy MWh Lifetime	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Renewable Energy MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2e Emission Reduction (metric tons) Annual	401,341	-	-	-	404	15,424	37,479	81,317	20,156	34,245	82,187	68,489	61,640	-	-	-
CO2e Emission Reduction (metric tons) Lifetime	3,210,727	-	-	-	3,231	123,396	299,833	650,533	161,247	273,956	657,495	547,913	493,121	-	-	-
Participant Bill Savings Annual	73,255,344	-	-	-	75,552	2,685,442	6,601,124	14,239,572	3,536,070	6,405,220	15,372,528	12,810,440	11,529,396	-	-	-
Participant Bill Savings Lifetime	586,042,755	-	-	-	604,415	21,483,533	52,808,991	113,916,577	28,288,559	51,241,761	122,980,226	102,483,522	92,235,170	-	-	-
Leveraged Funds	31,027,782	-	-	-	1,157,269	1,616,764	3,833,883	4,243,365	1,740,100	2,500,000	6,075,000	5,100,000	4,761,401	-	-	-
Indirect Benefit																
Energy Efficiency MWh Annual	823,258	-	-	-	-	-	4,219	46,841	85,771	114,682	145,175	84,189	90,517	90,517	85,947	75,400
Energy Efficiency MMBtu Annual	7,211,200	-	-	-	-	-	37,596	417,424	764,355	1,021,997	1,293,736	750,257	806,651	806,651	703,262	609,272
Renewable Energy MWh Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Renewable Energy MW Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2e Emission Reduction (metric tons) Annual	795,242	-	-	-	-	-	4,109	45,626	83,546	111,707	141,409	82,005	88,169	88,169	80,387	70,113
CO2e Emission Reduction (metric tons) Lifetime	6,361,937	-	-	-	-	-	32,875	365,006	668,371	893,659	1,131,275	656,043	705,355	705,355	643,092	560,905
Energy Usage																
Direct Energy Usage MWh Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Direct Energy Usage MWh Lifetime	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Direct Energy Usage MMBtu Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Direct Energy Usage MMBtu Lifetime	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indirect Energy Usage MWh Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indirect Energy Usage MWh Lifetime	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indirect Energy Usage MMBtu Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indirect Energy Usage MMBtu Lifetime	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Participants																
Participants	120	-	-	-	1	8	16	17	6	10	24	20	18	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	120	-	-	-	1	8	16	17	6	10	24	20	18	-	-	-
Budget																
Incentives and Services	31,006,924	-	189,823	1,059,601	1,313,736	1,339,265	2,625,000	3,928,750	6,146,289	5,103,598	5,462,382	2,916,436	922,044	-	-	-
Implementation	1,705,581	-	58,112	80,748	445,476	349,398	224,212	184,212	112,106	112,106	82,106	57,106	-	-	-	-
Research and Technology Studies	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tools, Training and Replication	632,495	-	-	52,351	315,173	66,178	18,448	43,448	68,448	68,448	-	-	-	-	-	-
Business Support	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	33,345,000	-	247,935	1,192,699	2,074,385	1,754,840	2,867,660	4,156,410	6,326,843	5,284,152	5,544,488	2,973,542	922,044	-	-	-

Table Notes:
 * With the May 2021 IPPR filing of all investment plans, each Appendix B table that accompanies an investment plan was transitioned from yearly commitment-based budget and benefit plans to plans that forecast expenditures and acquired benefits.

- a. Assumes an 8-year measure life. Customer Bill Savings are calculated as direct energy bill savings realized by customers participating in NYSERDA's programs.
- b. Participants are defined as contracts with employers.

Appendix B | Initiative Budget and Benefits Summary

Talent Pipeline

		Benefits Acquisition Plan														
Direct Benefit	Plan Total	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Energy Efficiency MWh Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Energy Efficiency MWh Lifetime	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Energy Efficiency MMBtu Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Energy Efficiency MMBtu Lifetime	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Energy Efficiency MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Renewable Energy MWh Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Renewable Energy MWh Lifetime	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Renewable Energy MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2e Emission Reduction (metric tons) Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2e Emission Reduction (metric tons) Lifetime	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Participant Bill Savings Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Participant Bill Savings Lifetime	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leveraged Funds	55,581,855	-	-	-	1,216,093	3,417,507	6,002,414	11,721,765	19,242,838	11,490,825	2,490,413	-	-	-	-	-

Indirect Benefit	Plan Total	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Energy Efficiency MWh Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Energy Efficiency MMBtu Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Renewable Energy MWh Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Renewable Energy MW Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2e Emission Reduction (metric tons) Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2e Emission Reduction (metric tons) Lifetime	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Energy Usage	Plan Total	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Direct Energy Usage MWh Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Direct Energy Usage MWh Lifetime	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Direct Energy Usage MMBtu Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Direct Energy Usage MMBtu Lifetime	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indirect Energy Usage MWh Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indirect Energy Usage MWh Lifetime	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indirect Energy Usage MMBtu Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indirect Energy Usage MMBtu Lifetime	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Participants	Plan Total	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Participants	31,841	-	-	-	219	3,050	5,077	6,365	7,376	6,711	3,043	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	31,841	-	-	-	219	3,050	5,077	6,365	7,376	6,711	3,043	-	-	-	-	-

		Budget Expenditures Plan														
Budget	Plan Total	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Incentives and Services	68,203,790	-	-	1,089	1,384,316	4,551,779	5,832,553	9,949,299	16,020,724	15,775,603	6,098,927	8,539,501	50,000	-	-	-
Implementation	4,096,210	-	-	-	31,355	331,891	773,525	724,988	681,246	617,500	522,486	243,079	170,140	-	-	-
Research and Technology Studies	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tools, Training and Replication	2,700,000	-	-	-	-	-	-	235,000	1,085,000	900,000	480,000	-	-	-	-	-
Business Support	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	75,000,000	-	-	1,089	1,415,671	4,883,670	6,606,078	10,909,287	17,786,970	17,293,103	7,101,413	8,782,580	220,140	-	-	-

Table Notes:
 * With the May 2021 IPPR filing of all investment plans, each Appendix B table that accompanies an investment plan was transitioned from yearly commitment-based budget and benefit plans to plans that forecast expenditures and acquired benefits.
 a. Participants will include professionals and practitioners that provide cleantech and energy efficiency related services and solutions including, professional services (architecture, engineering, R&D and other related services), audits, system installation, sales and distribution, installation, commissioning, inspections, manufacturing, operation and maintenance.

Appendix C | Initiative Outputs and Outcomes Summary

Building Operations and Maintenance Partnerships

	Indicators	Baseline	2019 Target	2024 Target
		(Before/Current)	(cumulative)	(cumulative)
Outputs	Increase in number of workers trained (note: electrification target shown in parenthesis)	20	435	9600 (1000)
	Increase in the percent of trainees obtaining national certifications	15%	20%	30%
Outcomes	Increase number of staff qualified to train others	4322	90	200
	Increase in number of industry partnerships	1	3	3
	Increase number of organization developing new curricula	370 organizations	3	20
	Improve performance and efficiency of building systems	0%	5%	10%
	Increase square footage of buildings whose owners invest in training infrastructure without NYSERDA funding	0		125 million sqft
	Number of individuals placed into paid internships/OJT/apprenticeships	3169	136	210
	Number of disadvantaged (LMI) workers placed in building operations and maintenance jobs	263	35	60

Table notes

a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

Appendix C | Initiative Outputs and Outcomes Summary

Talent Pipeline

	Indicators	Baseline (Before/Current)	2022 Target	2025 Target
			(cumulative)	(cumulative)
Outputs	Students placed in internships by training providers as part of training through this initiative (note: electrification targets are shown in parenthesis)	0	400 (150)	600 (300)
	Interns hired directly by businesses through Internship Program (electrification target in parenthesis)	0	900 (200)	2000 (500)
	New hires through OJT Program (electrification target in parenthesis)	0	950 (500)	2050 (1200)
	Existing workers up-skilled through this initiative (electrification target in parenthesis)	0	10000 (3500)	16000 (8000)
	Individuals trained for new job placement through this initiative (electrification target in parenthesis)	0	4000 (1500)	9000 (3000)
	Curriculum developed or modified through this initiative	0	12	16
	Number of trainers trained through this initiative	0	80	120
Outcomes	Reduced time to hire and train new workers	0	20%	20%
	Reduced cost to recruit and hire new workers	0	30%	30%
	Decreased time for new workers to reach full productivity (i.e. work independently, fewer errors, increased job retention)	0	20%	20%
	Create new businesses and training provider partnerships through this initiative	0	20	25

Table notes

a. NYSERDA will update the information in this table as the information becomes available. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

b. Interns hired directly by business through the Internship Program will be separate and unique from students placed in internships by training providers.

c. The total number trained in electrification through the Talent Pipeline Program is 13,000. This includes training for 4,200 heat pump designers/installers with 1200 trained through the On-The-Job Training Program and 3,000 trained ("total workers trained") through programs designed to deliver targeted training (working with manufacturers, targeting specific skills, etc.) and capacity building programs with the trades, colleges, trade associations, BOCES, etc. Another 1,000 building operators will be trained on electrification technologies through the Building O&M Partnership Program.