2. WORKFORCE DEVELOPMENT

2.1. PROGRAM DESCRIPTION

The aggressive goals of the EEPS will benefit from a readily-available pool of qualified workers to install, operate, and maintain energy efficiency measures. This workforce can minimize barriers to program implementation are minimized and further ensure that sustained, long-term energy savings gained through the EEPS programs are realized. An energy efficiency training network has begun to address this need, however the consensus of the Workforce Development Working Group (convened by the Department of Public Service) and the Governor's Renewable Energy Task Force is that efforts must be rapidly expanded to adequately fulfill the EEPS requirements.

The energy efficiency industry is facing with a shortage of competent and certified workers across the job spectrum. There is limited access to on-the-job training opportunities and accredited training facilities to provide initial and continuing education courses in energy systems and efficiency practices. Workers, particularly those just entering the field, often lack the financial resources to pursue the training and certification opportunities needed to move along the training continuum that provides the assurance of the ability to earn a living wage through participation in the energy efficiency job market. Discussions at Working Group meetings suggest that, while market forces will begin to address the need for qualified workers as the demand grows, the goals of the EEPS require some level of interim initiative. Resources to develop the infrastructure and encourage larger numbers of candidates are needed immediately to "jump start" these efforts so they coincide with the ramp up of efficiency programs.

NYSERDA has joined with the New York State Department of Labor (DOL) to develop this comprehensive workforce development (WFD) proposal that will enable the strategic expansion of a qualified energy efficiency workforce, drawing from existing workers, emerging workers, and underemployed or idle workers, that will be trained and deployed to help meet the EEPS goals.

At approximately $7.4 million per year, this Program budget is approximately $22,255,050 for the 2009-2011 period. This level of investment to support workforce development strategies will leverage an additional $11 million of funding being provided by the DOL that will help identify, screen, recruit, and place trained workers in jobs that follow clear career pathways and will strengthen the ability to develop and retain these workers in New York State. The potential workforce need created by the EEPS can be illustrated by U.S. DOE research which estimates that 52 jobs are created for every $1 million invested in weatherization programs. While only illustrative, this result would extrapolate to the creation of a skilled workforce of approximately 17,000 jobs per year to support a $330 million annual investment in energy efficiency.

There is a distinction between program the training outlined under the utility EEPS proposals and the Workforce Development training now proposed. Utilities participating on the DPS Workforce Development Working Group have expressed that the Program Marketing and Trade Ally component of their program proposals represent only a minimum level of programmatic and trade ally training necessary to support program implementation.

Comprehensive Training Initiatives. This proposal seeks to establish a comprehensive training agenda for New York State, supporting energy efficiency programs already approved by DPS, while building in the flexibility to support additional approved programs. In addition to the strategies described below, NYSERDA will issue an open solicitation through which projects and partnerships that respond to specific market needs will be supported.

NYSERDA will work closely with all EEPS program implementers and the DPS Workforce Development Working Group to identify opportunities to expand training and provide training subsidies where appropriate. NYSERDA plans to immediately:

- Expand the Hudson Valley Community College (HVCC) Center for Energy Efficiency and Building Science (CEEBS) training network which currently comprises 10 learning centers by adding several more training locations - especially in New York City, and develop additional training courses and curriculum;
- Work closely with partners such as the City University of New York, Lighting Research Center (LRC), and others to expand the commercial and industrial efficiency training for contractors, providers, architects and engineers, building operators, and facility managers;
- Develop and launch on-line courses and distance learning offered through training partnerships with colleges and universities and other third-party providers;
- Collaborate with the U.S. EPA and other partners to deploy "train-the-trainer" programs to support statewide building performance benchmarking, and new residential energy efficiency technology-based training; and
- Work with manufacturers to develop supplemental curriculum to enhance existing customer training programs, and emphasize energy efficiency, quality installation, and efficient operations and maintenance practices.

Internships and Apprenticeships. On-the-job training will be supported through a significant expansion of internship and apprenticeship programs. NYSERDA will work with colleges, universities, community colleges, labor unions, energy service companies, and others to promote internships within the energy efficiency industry and private sector.[1] These internship and apprenticeship programs give newcomers to the energy efficiency job market the opportunity to work with experienced energy professionals, and obtain "real life" experience. Internships serve as a job-placement mechanism giving energy firms and private-sector businesses the opportunity to hire experienced and trained workers who can quickly help the organizations be more productive and effective.

NYSERDA will build on its work with NYSDOL and the Workforce Development Institute to develop and implement new internships, apprenticeships, and job placement initiatives, particularly through the New York State Apprenticeship program. This program is a national training system administered by NYSDOL that combines paid on-the-job learning and related technical and theoretical instruction in a skilled occupation.

Professional Development and Continuing Education. Continued professional training is needed to support those already in the workforce, increase awareness of new technologies, and support the development of marketable skill sets in a wide variety of new technologies. Expanded technical skills in building systems that affect energy use (heating, cooling, lighting, and ventilation) and tenant comfort (temperature, air quality and illumination) are necessary. As a registered provider under the American Institute of Architects Continuing Education System, NYSERDA administers Continuing Education Units (CEU) credit for courses in high performance design, effective lighting, green building operations and maintenance, classes taught at CEEBS learning centers, and other energy efficiency (and renewable

[1] For example, NYSERDA has funded the development of the CUNY Building Performance Laboratory internship program to support the development of a skilled workforce for the building performance sector. Students learn to tailor technical solutions to individual buildings and equipment, determine and document optimum building and energy-system performance, monitor ongoing operations, and analyze data to maintain optimum building and systems performance.

energy) technologies. To further expand career development efforts, NYSERDA will support curriculum development for courses offered through AEE, AIA, BOMA/BOMI, and others, and is working with the Practicing Engineers Institute (PIE) to secure CEUs for the classes currently taught at CEEBS learning centers.

Promoting National Certifications and Standards. The workforce development initiatives described in this proposal will promote a standard level of competency to achieve the level of quality installation, operation, and maintenance of energy efficiency measures likely needed to support EEPS. Certification programs requiring written and field performance tests ensure quality assurance of the performance capability of industry professionals. Many EEPS-funded programs will require that individuals are able to demonstrate a specific competency level and will require minimum levels of quality assurance to ensure that installed measures perform as expected. NYSERDA will work with the DPS Workforce Development Working Group and other parties to determine the areas where certification is needed, and consider certification strategies that facilitate required levels of quality assurance without limiting the number of available workers supporting new programs. The cost of pursuing certification is a significant barrier to expanding the base of qualified professionals that pursue standard certification. Cost-sharing for training and certification will be provided to encourage a greater number of practitioners to participate.[2] NYSERDA will collaborate with professors and other professional trainers interested in pursuing certification or accreditation to quickly establish trainers to support specific EEPS programs.[3]

NYSERDA will work with the DPS Workforce Development Working Group and others to evaluate existing certifications and develop new certifications as needed. NYSERDA will collaborate with the NYC Office of Long Term Planning and Sustainability, and other entities around the State to evaluate and determine certification needs that support green and energy efficiency policy objectives. For example, NYSERDA has identified the need for development of two new certifications: Quality Building Modeler and Quality Energy Auditor to support high efficiency buildings for new construction and energy auditing, respectively.

Career Pathways in Energy Efficiency. The EEPS provides a unique opportunity to align the activities designed to achieve energy efficiency targets, with the mission of DOL to provide opportunities for New York's existing and emerging workforce, as well as the unemployed and underemployed workers. In particular, DOL's One-Stop Workforce Development System will be used to target workers to participate in the training and certification programs defined in this proposal.[4]

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[2] Examples include BPI certification, Association Energy Engineers (AEE) Certified Energy Manager, NCQLP Lighting Certification, USGBC Leadership in Energy and Environmental Design Accredited Professional (LEED AP), North American Technician Excellence (NATE) HVAC certification, and National Association Energy Service Companies (NAESCO) certifications in HVAC and building envelope.

[3] For example, USGBC LEED Accredited Professional training is currently being cost-shared for students and educators in a pilot with Rensselaer Polytechnic Institute (RPI) and will be expanded under this proposal to a network of colleges and universities that have strong building science and engineering programs. Trained students will be placed on internships with contractors, technical assistance providers, and customers working with NYSERDA to implement new construction projects. Another example of effective train-the-trainer efforts to promote national standards in building science for building operators has been NYSERDA's sponsorship of CUNY as an approved provider for Building Operator Certification (BOC) training developed by the Northwest Energy Efficiency Council. As an approved provider, CUNY is able to reach out to local government staff, trade unions, and commercial building owners and managers to deliver BOC training for building operators.

[4] The DOL System currently includes: 33 Local Workforce Investment Areas aligned with the State's 10 economic development regions. Each area is overseen by a Local Workforce Investment Board; 79 One-Stop Centers; a

The programs administered by DOL through the One-Stop System largely provide skills development and occupational training services to individuals to meet the demand of businesses. DOL has identified renewable energy, energy efficiency and weatherization, as a priority, and directs resources to address the these workforce development. Up to $9 million in One-Stop resources would be directed at serving this sector over the next three years, with an additional $2 million directed to address specific workforce development needs associated with implementing EEPS workforce training initiatives.

DOL, in collaboration the New York State Division of Housing and Community Renewal and NYSERDA, will work with Local Workforce Investment Areas to develop entry level training initiatives. Potential trainees will be screened for skill, proficiency and interest, and then assessed for program readiness (including math ability, knowledge of basic carpentry, etc.). Strong candidates would be recruited and provided training at CEEBS, with the goal of providing Building Analyst training to 1,000 individuals es over a three-year period. At the same time, the One-Stop Workforce Development System would provide training in the entry level skills necessary for entry level employment in the energy efficiency sector, and as a beginning for a career pathway to higher skilled employment. This training will be developed to assist individuals with limited energy efficiency experience or training get the basic skills support needed to obtain entry level positions, as well as providing basic efficiency training to skilled practitioners such as carpenters, electricians, window installers, heating and air conditioning technicians.

Engaging Disadvantaged Communities. Creating opportunities for individuals in economically and environmentally disadvantaged communities to work in jobs that pay family-sustaining wages is a priority in New York State. This priority is articulated in the recommendations of the Governor's Renewable Energy Task Force and the Environmental Justice Interagency Task Force.

Training and job placement for residents in economically and environmentally disadvantaged communities is relevant and necessary. EEPS target reductions from dense urban settings are in many cases economically and environmentally disadvantaged communities. The individuals in these communities represent an emerging worker capacity (i.e., supply of labor) that will be needed to achieve the EEPS goals. In addition, people in economically and environmentally disadvantaged communities are in many cases disconnected from the workforce. The wages these individuals earn through the jobs created by advancing the goals of the EEPS (labor demand) represent a significant source of economic development in their communities.

NYSERDA will target $6.0 million over three years to partner and leverage workforce development and training activities of State Agencies and community-based organizations to strengthen the State's ability to draw upon the State's potential labor supply in economically and environmentally disadvantaged communities. This funding would significantly expand NYSERDA's effort to address basic skills training.

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customer base of over 600,000 individuals a year (about 7% of the State's workforce) possessing a wide range of occupational skills across most industries in the state; a statewide web-based inventory of training programs to enhance and develop occupational skills of the State's workforce (encompassing 1,329 training locations and 13,033 training courses); and the New York State Apprenticeship Program, a national training system that combines paid on-the-job learning and related technical and theoretical instruction in a skilled occupation.

2.2. DEMAND REDUCTION AND SYSTEM BENEFITS.

Workforce development and training will ensure systems are designed, operated and maintained properly and will contribute to the EEPS program impacts as designed and estimated. As indicated in several studies and reports, there is a significant potential to increase energy savings with training that addresses proper system sizing, installation, and proper matching of components.[5]

2.3. MARKET SEGMENT NEED

Collaboration with the New York City Office of Long Term Planning and Sustainability and the New York City Economic Development Council has identified a great need to support benchmarking and audit and retrofit legislation.[6] That legislation will affect over 9,000 multifamily buildings representing over 1.4 billion square feet, and 2,100 commercial buildings representing over 600 million square feet. There will be a substantial impact the energy efficiency community in New York City and has the potential to establish a replicable model for enactment throughout New York State.

Expansion of low-income and weatherization programs will require thousands of new practitioners. New programs aimed at increasing the efficiency of new and existing homes and multifamily buildings will require training for new contractors, continuing education for existing contractors, training for building operators, training for code officials and home energy raters.

2.4. COORDINATION

NYSERDA works closely with the Governor's Task Force on Renewable Energy and its Green Jobs initiatives, the DPS Working Group on Workforce Development and many others in identifying

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[5] As early as 1999, program evaluators examining the energy savings potential associated with proper installation of energy efficiency equipment have associated quality installation practices and training with greater operating efficiency and performance. The US EPA commissioned a report (Neme, Proctor, and Nadel, 1999) looking at the *"Energy Savings Potential From Addressing Residential Air Conditioner and Heat Pump Installation Problems"*. The report demonstrated that equipment installed by properly-trained HVAC technicians could save an average of 24 percent of energy use in existing homes and 35 percent in new construction. The report also states that the manner in which equipment is installed may have a much greater impact on actual operating efficiency that whether or not it has a high-efficiency rating. Further, Neme, Proctor and Nadel point out that studies conducted in 10 different states or regions of the U.S. have found that the average air conditioner or heat pump is oversized by about 50% and nearly one ton of capacity compared to properly-sized systems.

A TXU Electric Delivery Study (Stockard, Audet, Zarnikau, 2007) of installation practices of air conditioner installers between the years 2004-2006 demonstrates that significant savings can be obtained by promoting better installation and sizing practices. This report quantifies the impacts training has on proper duct sealing, attributing deemed energy savings of 17,129 MWh and 11.6 MW in demand savings with proper sealing techniques in 126,500 installations.

A report commissioned by the New York City Mayor's Energy Conservation Steering notes that quality assurance at installation and at regular intervals facilitates the sustainability in savings of energy efficiency measures. The report asserts that training of existing and newly-hired maintenance and facility management personnel on how to recognize and address energy-related equipment and maintenance needs is necessary and that training should address topics such as energy consumption monitoring, and proper operation and maintenance of particular pieces of equipment.

[6] Proposed Local Law Int. No. 476-A to amend Chapter One of Title 27 the administrative code of the City of New York, in relation to benchmarking the energy and water efficiency of buildings.

workforce training needs and developing the workforce training infrastructure needed to meet these needs.

NYSERDA leveraged millions of dollars in training partner co-funding. Current energy efficiency training partners include Onondaga-Cortland-Madison County BOCES, Broome Community College, Erie Community College, Bronx Community College, Fulton-Montgomery Community College, the Association for Energy Affordability, Westchester Community College, Onondaga Community College, and SUNY Canton. The existing residential energy efficiency training supported by NYSERDA takes place at educational institutions that have quality building trades programs and utilizes existing technical instructional staff to deliver the energy efficiency classes. This arrangement also provides the opportunity for matriculated students to take advantage of these classes. For example, NYSERDA is working with the Center for Sustainable Energy at Bronx Community College to provide a hub for energy efficiency training activities in the metro-New York area using the City University of New York system as a training platform. The training activities will include not only the delivery of energy efficiency training, but also instructor development activities to increase the number of qualified energy efficiency instructors in the region.

NYSERDA also established a partnership with the New York State Weatherization Directors' Association (NYSWDA). Many technicians working for weatherization agencies enroll in NYSERDA-funded energy efficiency classes. This partnership ensures that efforts are not duplicated and that resources are leveraged. It also provides an opportunity for other building technicians to improve their skills at NYSWDA's training facility that includes a classroom, heating lab, and laboratory house. The LRC, headquartered at RPI, provides technical instruction to contractors in the Multifamily Partner Program as well as contractors in NYSERDA commercial programs. Erie Community College (ECC) has applied to have BPI-recognized energy efficiency classes approved at the DOL's One-Stop Center at ECC. If approved, students enrolling in energy efficiency classes will have access to tuition support and job placement assistance.

2.5. CO-BENEFITS

Economic development is a significant co-benefit of new investment in workforce development. For example, some participating contractors in the Home Performance with ENERGY STAR® Program have grown their businesses significantly, adding both technicians and office staff. Also, a large number of BPI-certified technicians support NYSERDA's low-income programs, such as Assisted Home Performance with ENERGY STAR and EmPower New York℠, as they require certified technicians. In particular, EmPower New York℠, has seen a large increase in demand for its services and more certified technicians are needed to accommodate the demand.

Training centers have realized economic development benefits as they attract new students to participate in new workforce training and certification programs, and several institutions have reported waiting lists for their training and continuing education initiatives. BPI, located in New York, has seen significant growth as it develops new certifications and certifies more practitioners.

2.6. PORTFOLIO BALANCE

All programs, regardless of program administrator or source of funding, will benefit from an expanding and qualified workforce. This component is necessary to achieve a complete program portfolio and the level of funding requested (1.5% of total EEPS funds) is appropriate.

NYSERDA will continue to work with its training and business partners to ensure a balanced portfolio of training across all sectors. In areas where there is a need for additional training areas, NYSERDA can use the annual solicitation to meet those needs. Tuition and certification reimbursements can be adjusted to

ensure that the portfolio of training options is balanced to meet the needs of the EEPS. Finally, marketing strategies, placement, and frequency can be adjusted as needed.

2.7. DEPTH OF SAVINGS

Properly trained technicians specify higher efficiency equipment, promote efficiency standards, maximize operations and equipment performance, and facilitate long-term accruals of energy savings. With proper training, practitioners will be better prepared to properly design, install, operate and maintain energy efficiency measures to help ensure that that energy savings are realized. By properly training practitioners how to design, build, or evaluate the "whole building", opportunities will be identified and measures recommended or implemented to improve the performance of the entire home, building, or facility as opposed to looking at single measures. Without proper training, these savings will be lost.

2.8. UNDERSERVED MARKETS

NYSERDA's workforce development plan will address issues of social and environmental justice, in that the jobs created by advancing the goals of the EEPS will clear career pathways out of poverty for low-income individuals and communities of color, from low-skill entry level positions into family-sustaining wage positions.

NYSERDA is working closely with DOL, New York City Economic Development Corporation (NYCEDC), CEEBS, the Association for Energy Affordability and others to ensure that training is available to dislocated workers as well as disadvantaged adults and youths. NYSERDA will also align its programs with the DOL's One-Stop System Workforce Development System to build upon the success of this program in targeting underserved populations. Market needs will be better assessed when the Commission approves the full portfolio of Fast Track Proposals.

2.9. COMMITMENT

Using its existing workforce development programs as a foundation, NYSERDA will ramp up its expanded workforce development programs immediately upon approval and expects to continue these activities through 2011. It is anticipated that the number of students will increase over the entire three-year period and that the need for a trained qualified workforce to meet EPS goals will continue to drive training for existing contractors. The expanded energy efficiency programs will create a need for more trained building trades' technicians providing strong job opportunities for those students and workers seeking to enter the energy conservation field. This emerging workforce will provide large numbers of students seeking quality energy efficiency training. Based on the infrastructure developed for its existing workforce development programs, NYSERDA will quickly and appropriately respond to meet increased student demand for this technical training.

2.10. CUSTOMER OUTREACH

NYSERDA marketing efforts for workforce training will be significantly ramped up to promote workforce training initiatives and opportunities. NYSERDA will work closely with its partners, such as DPS Staff, the Department of Labor, and others, to market the EEPS training programs and will be a multi-media approach.

A comprehensive workforce training and education web portal will be developed to serve as a central location for information on all residential and commercial training programs and job opportunities within the State. The portal will link to resources offered through the www.GetEnergySmart.org website to recruit students, market training programs, market partnerships with colleges, universities and private companies participating in the internship and apprenticeship programs, and coordinate with entities such as the NYC EDC to educate consumers about the benefits of working with nationally certified contractors and other trained providers.

NYSERDA plans to coordinate with New York City's marketing and customer outreach efforts underway associated with its plaNYC to address energy efficiency workforce issues. The Mayor's Office of Long Term Planning and Sustainability, NYC & Company and the Economic Development Corporation's Energy Policy Department will work with NYSERDA to incorporate workforce issues in their ongoing energy efficiency campaign.

2.11. COLLABORATIVE APPROACH

. NYSERDA works closely with the members of the Governor's Renewable Energy Task Force and the EEPS Workforce Development Working Group and relied on their input in developing this Program. Representatives of the EEPS Workforce Working Group have provided information on training needs, available resources, job placement, student population issues, and funding needs. NYSERDA is a Co-Convener of the EEPS Workforce Working Group.[7]

2.12. FUEL INTEGRATION

. Much of the training for this Program supports a comprehensive, whole- building approach. As students learn to identify and address energy conservation opportunities for both electric and gas utilities, benefits accrue across customer classes and fuel sources.

2.13. TRANSPARENCY

Training evaluation reports, including attendee lists, training schedules, instructor performance evaluations, and other supporting data are available for public review and accessible to other program administrators.

2.14. PROCUREMENT

. Workforce development tasks described in this proposal will primarily be implemented by third-party providers that are competitively procured by NYSERDA. New training programs and initiatives that meet new or changing EEPS needs will also be competitively procured.

2.15. BUDGET.

The table below shows the projected Workforce Development Program budget for 2009-2011.

Table V-1. Workforce Development: Budget (Projected) 2009-2011

EEPS	2009	2010	2011	Total
Workforce Development	$8,176,919	$7,526,717	$6,551,414	$22,255,050

	2009	2010	2011	Total
Marketing	710,619	635,817	523,614	1,870,050
Implementer	3,929,231	3,726,154	3,421,539	11,076,924
Incentives	3,537,069	3,164,746	2,606,261	9,308,076

[7] The EEPS Working Group VII members are: the New York State Department of Labor, SUNY Alfred, New York State Department of Public Service, Hudson Valley Community College, Association for Energy Affordability, New York Energy Consumers Council, investor-owned utilities, Siemens, ACE-NY, Conservation Services Group, New York City Economic Development Corporation, and NYSERDA.

2.16. EVALUATION.

Evaluation Goals: Evaluation goals related to this effort include conducting a joint process and market study to assess awareness of trainings, perceptions of trainings by training participants as well as employers, program penetration, number of jobs created, satisfaction and barriers to participation. An impact evaluation is not planned with evaluation funds set aside for this program, but energy savings impacts resulting from work force training efforts can be examined through evaluations conducted on the associated end-use programs (e.g., Home Performance, Multifamily Performance, etc).

Brief Overview of the Evaluation Approach: The evaluation approach presented in this section was designed based on NYSERDA's current plans for the design and implementation of the Workforce Development Program, and in the absence of complete knowledge about final evaluation protocols, and potential funding set-asides and plans for overarching evaluation projects that would serve the needs of all EEPS program administrators. Thus, these plans have been prepared in order to afford NYSERDA and its independent contractors flexibility to adapt the evaluation approaches that best suit the program as implemented once a greater understanding is in place regarding final evaluation protocols and funding. NYSERDA's estimated evaluation budget for this program includes a set-aside for developing a full evaluation plan, an effort that will involve DPS Staff and the EEPS Evaluation Advisory Group.

Evaluation Budget: NYSERDA expects the evaluation budget for the Work Force Development Program to be approximately equal to 5% of the program funding level, less yet-to-be determined funds set aside for Statewide studies and other overarching costs borne by program administrators. As the Work Force Development Program is not expected to separately count direct energy savings, evaluation funding will be designed to account for the specific needs of the program, and allocated roughly equally to process and market evaluation. Should funding be provided by the NYS Department of Labor, discussions should determine what portion, if any, will be allocated to evaluation. If funds are added for evaluation, they could be used to supplement the proposed activities presented in this plan.

Evaluation Schedule: Process evaluation is expected to occur during each year that the program is operating. During 2009 and 2010, NYSERDA's independent evaluation contractors will work with NYSERDA evaluation and program staff to develop post-training survey questions for assessing curriculum usefulness and effectiveness for each training program funded by NYSERDA. These surveys will be implemented at the close of each training effort. The evaluation will likely also involve phone interviews with a sample of training participants each year to assess response to the training and assess the level of learning. In 2011, NYSERDA's independent evaluation contractors will conduct a full evaluation of the training effort, including interviews with program staff, trainers, and surveys of a sample of participants and their employers regarding their post-training experience.

Market evaluation is expected to occur in 2009 and again in 2011. In 2009, NYSERDA's independent evaluation contractors will conduct an initial assessment of market needs among energy efficiency services industry employers exploring topics related to staffing needs, required skillsets, availability of skilled labor, and anticipated evolution of the marketplace. In 2011, a follow-up study is expected to assess the degree to which the training efforts have affected the market needs of energy efficiency services industry employers examining time-series trends in the data collected during the first year evaluation effort as well as additional researchable issues identified by earlier evaluation work.

Table V-2. Workforce Development: Evaluation Schedule

Evaluation Element	Expected Completion		
	2009	2010	2011
Process Evaluation	X	X	X
Market Evaluation	X		X

Measurement and Verification and Net-to-Gross: Impact evaluations are not planned for this program. Energy savings impacts resulting from work force training efforts can be assessed through evaluations conducted on the associated end-use programs (e.g., Home Performance, Multifamily Performance, etc). Interviews with market actors who participated in the workforce development training and with those who did not can be used to estimate energy savings impacts due to these efforts.

Process and Market Evaluation. Evaluations of work force training efforts should be grounded in Kirkpatrick's four levels of evaluation for assessing training effectiveness[8]. The four levels address response of the trainee to the training, assessing what was learned, assessing performance in the workplace and estimating the effects of the training on the work place. Addressing these four levels requires both process and market evaluation activities such as surveys and interviews with program implementation staff, NYSERDA program staff, trainers, participating and nonparticipating technicians, and actual and potential employers in the market place and broadly examining the market response to the efforts.

The planned evaluation efforts will assess awareness and knowledge of NYSERDA and other related training efforts in New York, perceptions of the NYSERDA-funded training effectiveness and usefulness, recruitment vs. certification rates, and participant and employer satisfaction. A key component of the efforts will be to assess the first year for each training effort and provide feedback to the trainers on student response to the curriculum. As each training effort matures, the evaluation efforts will shift toward examining market response to the training, exploring topics related to employer staffing needs, availability of skilled labor, and anticipated evolution of the marketplace.

The breadth of impact anticipated from workforce training requires a variety of data collection efforts. Sampling strategies will be developed for each training activity to ensure that sufficient feedback is provided such that the program curriculum can evolve effectively. Timing is also critical in that input should be provided to trainers as soon as possible after training efforts are initiated so trainers can improve their curricula based on initial market feedback and also develop a mindset founded on the concept of continual improvement. As the workforce training effort grows, sampling of participants and targeted employers can be conducted at the 90/10 confidence/precision level. Information will be collected from market actor surveys and interviews by NYSERDA's independent evaluation contractors. Data analysis will be conducted by NYSERDA's evaluation contractors following established protocols.

[8] Kirkpatrick. D. *Techniques for Evaluating Training Programs.* Journal for the American Society of Training Directors, 13. 21-26, (1959b).

The process evaluation will be conducted at a modest level for 2009 and 2010 to provide on-going feedback regarding the curriculum and training effort implementation and associated participant response. A full scale process evaluation will be completed in 2011. A baseline market study with energy efficiency services industry employers will be conducted in 2009 with a follow-up study conducted in 2011 to examine the effects of the training efforts on the energy efficiency services industry needs and examine longitudinal trends in the baseline parameter measurements.

Evaluation Plan Variations. Given the level of uncertainty regarding final evaluation protocols, statewide studies to be conducted by all program administrators, and funding levels needed to support overarching evaluation studies and activities, the evaluation plan presented in this section should be viewed as scalable and flexible. With reduced funds, NYSERDA would likely reduce the number of evaluation cycles. With enhanced funds, the market assessment anticipated for this project could be conducted at a much broader level to include traditional, non-energy efficiency services industry employers (e.g., architects, engineers, contractors, unions, etc.), but such a study would require statewide participation.