

**NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY
WORKFORCE DEVELOPMENT PROGRAM
MARKET CHARACTERIZATION AND ASSESSMENT REPORT**

Final Report

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

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ABSTRACT

This report provides information on the market and context within which the New York State Energy Research and Development Authority’s (NYSERDA’s) Workforce Development Program (the Program) operates. Given that the Energy Efficiency Portfolio Standard (EEPS) - funded component of this Program is relatively new, this Market Characterization and Assessment (MCA) report assesses Program assumptions regarding market characteristics, provides additional details regarding market structure and opportunities, and establishes baseline measurements of key indicators. In particular, the report includes a compilation and analysis of data regarding the extent to which market actors are aware of and promoting the Program’s energy efficiency goals including: overcoming barriers, expanding existing energy efficiency training infrastructure, increasing energy efficiency employment opportunities, populating EEPS Programs with trained workers, supporting past SBC initiatives, and helping to increase the supply of trained energy efficiency workforce for the broader marketplace. Results can be used in subsequent evaluations to assess progress towards meeting the Public Service Commission (PSC) public policy goals under which NYSERDA operates, as well as the institutional goals NYSERDA has established in the energy efficient workforce development areas. In addition, the MCA evaluation results presented in this report can be used by other evaluators and by NYSERDA program staff and managers to consider adjustments to Program implementation, as needed, to ensure maximum market interest and uptake of Program offerings.

Table of Contents

SECTION 1. EXECUTIVE SUMMARY	1-1
1.1 Program Description	1-2
1.2 Research Approach	1-3
1.3 Market Characterization – Key Findings	1-5
1.3.1 Employers	1-5
1.3.1.1 Employment Trends	1-5
1.3.1.2 Job Types, Numbers and Locations	1-7
1.3.1.3 Program-Targeted Jobs Quantification.....	1-7
1.3.2 Employees (the Potential Program “Trainees”)	1-8
1.3.2.1 Educational Attainment	1-8
1.3.2.2 Aging Workforce.....	1-8
1.3.2.3 Unemployed and Under-Employed.....	1-9
1.3.2.4 Hard-to-Reach and Hard-to-Serve Populations’	1-10
1.3.3 Training Organizations.....	1-11
1.3.3.1 Entry-Level Training.....	1-11
1.3.3.2 Mid- to High-Level Training.....	1-12
1.3.3.3 Linkage between Training Organizations and Targeted Employee (Trainee) Groups..	1-12
1.4 Market Assessment	1-13
1.4.1 Employers	1-13
1.4.1.1 Energy Efficiency Workforce Skills baseline	1-14
1.4.1.2 General Awareness of Job-Skills Related Training	1-15
1.4.1.3 Training Infrastructure Usage and Satisfaction	1-16
1.4.1.4 Energy Efficiency Employment Plans and Practices.....	1-16
1.4.1.5 Awareness of NYSERDA and/or Broader Workforce Development Efforts	1-17
1.4.1.6 Participation in Other NYSERDA and New York State Utility-Funded Initiatives	1-18
1.4.2 Training Organizations.....	1-18
1.4.2.1 Firmographics and Training Practices	1-18
1.4.2.2 Training Trends and Plans	1-22
1.4.2.3 Energy Efficiency Employment Placement and Opportunities	1-23
1.4.2.4 Awareness of NYSERDA and/or Broader Workforce Development Efforts	1-24
1.5 Relationship to Select Indicators and Researchable Issues.....	1-25
SECTION 2. INTRODUCTION AND PROGRAM DESCRIPTION	2-1
2.1 Program Description	2-2
Program Logic and Measurement Indicators.....	2-10
SECTION 3. SECONDARY AND PRIMARY DATA SOURCES AND METHODS.....	3-1
3.1 Secondary Data Sources	3-1
3.2. Primary Data Collection	3-3
3.2.1 Sample.....	3-4
3.2.1.1 Non-Participating Employers	3-4
3.2.1.2 Non-Participating Employers – Real Estate Developers and Property Managers	3-6
3.2.1.3 Non-Participating Training Organizations	3-7
3.2.2 Data Collection.....	3-9
3.2.2.1 Non-Participating Employers	3-9
3.2.2.2 Non-Participating Employers – Real Estate Developers and Property Managers	3-15

3.2.2.3 *Non-Participating Training Organizations* 3-16
 3.2.3 *Data Processing*..... 3-28
 3.2.3.1 *Non-Participating Employers* 3-28
 3.2.3.2 *Non-Participating Employers – Real Estate Developers and Property Managers* 3-32
 3.2.3.3 *Non-Participating Training Organizations* 3-32

SECTION 4. MARKET CHARACTERIZATION 4-1

4.1 *Market Characterization Approach*..... 4-2
 4.2. *Energy Efficiency Services, Consulting and Weatherization Jobs* 4-2
 4.2.1. *Employment Trends by Job Skills 2008 – 2018; entry-, mid- and high-level* 4-8
 4.2.2. *Energy Efficiency Workforce Development Jobs: Where and How Many?* 4-11
 4.2.3. *Targeted Employer Population for Workforce Development Program*..... 4-14
 4.3. *Targeted Employee Populations* 4-18
 4.3.1. *Educational Attainment of New York State Population*..... 4-18
 4.3.2. *The Aging Workforce – An Employment Trend*..... 4-20
 4.3.3. *Population 18 to 24, and 25 Plus*..... 4-21
 4.3.4. *Unemployed and Under-Employed*..... 4-21
 4.3.5. *Hard-to-Reach and Hard-to-Serve Population*..... 4-24
 4.4. *Training Organizations* 4-34
 4.4.1. *Entry-Level Training*..... 4-34
 4.4.2. *Mid- to High-level Training*..... 4-35

SECTION 5. MARKET ASSESSMENT 5-1

5.1 *Employers* 5-2
 5.1.1 *Energy Efficiency Workforce Skills Baseline*..... 5-2
 5.1.1.1 *Involvement with Energy Efficiency Activities*..... 5-2
 5.1.1.2 *Types of Skilled and Unskilled Positions Being Hired* 5-6
 5.1.1.3 *Energy Efficiency-Specific Hiring Practices* 5-8
 5.1.1.4 *Hiring Practices – Hard-to-Reach and Underserved Populations*..... 5-12
 5.1.2 *General Awareness of Job-Skills Related Training* 5-14
 5.1.3 *Training Infrastructure Usage and Satisfaction*..... 5-15
 5.1.3.1 *Usage of New York’s Energy Efficiency Training Infrastructure*..... 5-16
 5.1.3.2 *Satisfaction with New York’s Energy Efficiency Training Infrastructure* 5-20
 5.1.4 *Energy Efficiency Employment Plans and Practices*..... 5-25
 5.1.4.1 *likelihood of Hiring New Energy Efficiency-Related Positions*..... 5-25
 5.1.4.2 *Barriers Preventing Companies from Hiring More Energy Efficiency Positions* 5-25
 5.1.5 *Awareness of NYSERDA and/or Broader Workforce Development Efforts* 5-26
 5.1.5.1 *Awareness of NYSERDA and its Energy Efficiency Training Efforts*..... 5-26
 5.1.5.2 *Awareness of and Satisfaction with Non-NYSERDA Energy Efficiency Training Efforts* 5-29
 5.1.6 *Participation in Other SBC-Funded Initiatives* 5-31
 5.2 *Training Organizations* 5-34
 5.2.1 *Firmographics and Training Practices* 5-34
 5.2.1.1 *Training Organization Firmographics* 5-34
 5.2.1.2 *Skills and Areas of Training Offered*..... 5-35
 5.2.1.3 *Potential Factors Motivating New Trainees to Learn Energy Efficiency Job Skills* 5-37
 5.2.1.4 *Factors Limiting Organizations’ Ability to Expand Energy Efficiency Training* 5-38
 5.2.1.5 *Importance of Energy Efficiency-Related Training Materials*..... 5-40
 5.2.1.6 *Training Promotion Approaches* 5-41
 5.2.1.7 *Targeted Training Audiences – Hard-to-Reach and Underserved Populations*..... 5-43

5.2.1.8	<i>Financial Aid Offerings, Sources and Utilization</i>	5-46
5.2.2	<i>Training Trends and Plans</i>	5-46
5.2.2.1	<i>Need for Additional Energy Efficiency Trainings</i>	5-46
5.2.2.2	<i>Changes in the Number of Training Requests of Last 12 Months</i>	5-49
5.2.2.3	<i>Likelihood of Expansion or Development of New Training Programs</i>	5-52
5.2.2.4	<i>Trainee Interest in Energy Efficiency – Post Training</i>	5-52
5.2.3	<i>Energy Efficiency Employment Placement and Opportunities</i>	5-54
5.2.3.1	<i>Trainees Finding Employment in Energy Efficiency-Related Fields</i>	5-54
5.2.3.2	<i>Internships and Job Placement Arrangements</i>	5-56
5.2.3.3	<i>Energy Efficiency Employment Opportunities Growth Projections</i>	5-58
5.2.4	<i>Awareness of NYSERDA and/or Broader Workforce Development Efforts</i>	5-59
5.2.4.1	<i>Awareness of NYSERDA and its Energy Efficiency Training Efforts</i>	5-59
5.2.4.2	<i>Training Organizations’ Awareness of Non-NYSERDA Energy Efficiency Training Efforts</i>	5-61

SECTION 6. SUMMARY OF FINDINGS AND ACTIONS FOR CONSIDERATION ... 6-1

6.1	Market Characterization Findings.....	6-1
6.1.1	<i>Employers</i>	6-1
6.1.1.1	<i>Employment Trends</i>	6-1
6.1.1.2	<i>Job Types, Numbers and Locations</i>	6-3
6.1.1.3	<i>Program-Targeted Jobs Quantification</i>	6-3
6.1.2	<i>Employees (the Potential Program “Trainees”)</i>	6-4
6.1.2.1	<i>Educational Attainment</i>	6-4
6.1.2.2	<i>Aging Workforce</i>	6-4
6.1.2.3	<i>Unemployed and Under-Employed</i>	6-5
6.1.2.4	<i>Hard-to-Reach and Hard-to-Serve Populations</i>	6-6
6.1.3	<i>Training Organizations</i>	6-7
6.1.3.1	<i>Entry-Level Training</i>	6-7
6.1.3.2	<i>Mid- to High-Level Training</i>	6-7
6.1.3.3	<i>Linkage between Training Organizations and Targeted Employee (Trainee) Groups</i>	6-7
6.2	Market Assessment Findings	6-8
6.2.1	<i>Employers</i>	6-8
6.2.1.1	<i>Energy Efficiency Workforce Skills baseline</i>	6-8
6.2.1.2	<i>General Awareness of Job-Skills Related Training</i>	6-10
6.2.1.3	<i>Training Infrastructure Usage and Satisfaction</i>	6-11
6.2.1.4	<i>Energy Efficiency Employment Plans and Practices</i>	6-11
6.2.1.5	<i>Awareness of NYSERDA and/or Broader Workforce Development Efforts</i>	6-12
6.2.1.6	<i>Participation in Other NYSERDA and New York State Utility-Funded Initiatives</i>	6-13
6.2.2	<i>Training Organizations</i>	6-13
6.2.2.1	<i>Firmographics and Training Practices</i>	6-14
6.2.2.2	<i>Training Trends and Plans</i>	6-17
6.2.2.3	<i>Energy Efficiency Employment Placement and Opportunities</i>	6-18
6.2.2.4	<i>Awareness of NYSERDA and/or Broader Workforce Development Efforts</i>	6-19
6.3	Actions for Consideration by Program Staff.....	6-20

- Appendix A – Workforce Development Program Non-Participating Trainee Survey Memo
- Appendix B – Non-Participating Employers Survey Instrument
- Appendix C – Non-Participating Employers Survey Instrument – Real Estate/Property Managers
- Appendix D – Non-Participating Training Organizations Survey Instrument
- Appendix E – Sample Design Memo – Non- Participating Employer Surveys
- Appendix F – Sample Design Memo – Non-Participating Training Organizations Survey

LIST OF FIGURES

Figure 1. EEPS Workforce Development Program Logic Model Diagram.....	2-11
Figure 2. Employment Trend for Energy Efficiency Entry Level Skill Jobs, 2008 to 2018.....	4-9
Figure 3. Employment Trend for Middle-Level Skill Jobs, 2008 to 2018.....	4-9
Figure 4. Employment Trend for High-Level Skill Jobs, 2008 to 2018	4-10
Figure 5. Total Energy Efficiency-Related Jobs in New York State - Excluding Long Island, 2009	4-12
Figure 6. Total Energy Efficiency Jobs in New York State, including Long Island (2009).....	4-13
Figure 7. Total Number of Energy Efficiency/Weatherization Jobs in New York State (2009)	4-13
Figure 8. Mid- to High-Level Jobs in New York State (2009)	4-14
Figure 9. Educational Attainment, 18 to 24 and 25 plus, in New York State (2008)	4-19
Figure 10. Educational Attainment of New York State Population by Age 2008	4-19
Figure 11. Number of Unemployed in New York State, 2011 (in 1,000s)	4-22
Figure 12. Unemployment Rate in New York State, 2011	4-23
Figure 13. Number Living at or Below Poverty in New York State, 2006 to 2010 (in 1,000s)	4-25
Figure 14. Percent in Poverty in New York State, 2006 to 2010.....	4-26
Figure 15. Labor Force Status of 16- 24 Year Olds in NY State, 2006- 2010 (in 1,000s).....	4-32
Figure 16. Labor Force Status of 25-64 Year Olds in New York State, 2006-2010 (1000’s)	4-33
Figure 17. Entry-Level Skills Training Locations by Type and Region, 2011	4-37
Figure 18. Percent of Entry-Level Skills Training Locations Contracted by Region, 2011	4-38
Figure 19. Workforce Development Entry-Level Skills Training Organizations in New York	4-38
Figure 20. Entry-Level Skills Training Locations by Type and Region (2011)	4-40
Figure 21. Contracted vs. Non-Contracted Entry-Level Skills Training Locations (2011)	4-41
Figure 22. Mid to High-Level Skills Training Organizations by Type and Region, 2011	4-41
Figure 23. Contracted vs. Non Contracted Mid- to High-Level Training Locations, by Region (2011)	4-42
Figure 24. Total Number of Workforce Development Mid- to High-Level Skills Training Locations..	4-42
Figure 25. Percentage of Employees Involved in Energy Efficiency Activities.....	5-3
Figure 26. Percent of Company’s Work That Was Energy Efficiency-Related in Past Year.....	5-5
Figure 27. Employee Experience with EE Related Work.....	5-5
Figure 28. Percent “Yes” - Employees Sent To Energy Efficiency Training in Past Year.....	5-6
Figure 29. New Employees Hired for Energy Efficiency Positions	5-9
Figure 30. Difficulty Finding New Energy Efficiency-Skilled Employees	5-10
Figure 31. Percent of Unskilled Employees In Need Of Additional Training	5-11
Figure 32. Percent of Skilled Employees In Need Of Additional Training	5-12
Figure 33. Hiring New Employees From Hard-to-Reach and Underserved Populations	5-13
Figure 34. Preparedness of New Hires From Hard-to-Reach and Underserved Populations	5-13
Figure 35. Percent of Company Employees From Hard-to-Reach and Underserved Populations	5-14
Figure 36. Percentage of Employees Participating in Skills-Based Training	5-17
Figure 37. Percentage of Workforce in On-The-Job Training	5-18
Figure 38. Important Factors When Hiring for Unskilled Positions	5-19
Figure 39. Percent Responses of Somewhat or Very Important Factors for Hiring Skilled Positions ...	5-19
Figure 40. Major Reason More Employees Are Not Sent For Energy Efficiency Skills Training.....	5-20

Figure 41. Value of Training Programs	5-23
Figure 42. Likelihood of Hiring Employees for Energy Efficiency Positions in Next 12 Months.....	5-25
Figure 43. Awareness of NYSERDA Among Respondents	5-26
Figure 44. Awareness of NYSERDA's Energy Efficiency Skills Training and Certification Programs	5-27
Figure 45. Familiarity with NYSERDA's Supported Energy Efficiency Training Efforts	5-28
Figure 46. Knowledge of Non-NYSERDA Energy Efficiency Related Job Training Programs.....	5-29
Figure 47. Satisfaction with Availability of Training Programs in Geographical Area.....	5-30
Figure 48. Participation in NYSERDA or Other Programs By Sector	5-32
Figure 49. Entry-Level Training Incorporating Energy Efficiency Elements	5-36
Figure 50. Mid- to High-Level Training Including Energy Efficiency Elements.....	5-37
Figure 51. Factors Driving Trainees to Enroll in Training – Entry-Level	5-38
Figure 52. Factors Driving Trainees to Training – Mid- to High-Level	5-38
Figure 53. Factors Limiting Ability To Provide Energy Efficiency Training – Entry-Level	5-39
Figure 54. Factors Limiting Ability To Provide Energy Efficiency Training – Mid/High-Level	5-39
Figure 55. Importance of Training Materials As Rated By Training Organizations	5-41
Figure 56. Effectiveness of Approaches Used To Promote Training Programs – Entry-Level	5-42
Figure 57. Effectiveness of Approaches Used To Promote Training Programs – Mid- to High-Level..	5-42
Figure 58. Percentage of Training Firms Targeting Hard-to-Reach and Underserved Populations	5-43
Figure 59. Hard-To-Reach and Underserved Groups Targeted For Training.....	5-44
Figure 60. Population’s Awareness of Energy Efficiency Employment Opportunities Prior to Training	5-45
Figure 61. Training Organizations Offering Financial Aid	5-46
Figure 62. Need For Additional EE Training Opportunities.....	5-47
Figure 63. Ability to Handle Increased Demand for Training	5-49
Figure 64. Change in Requests for Training over Last 12 Months - Total	5-50
Figure 65. Change in Requests for Training over Last 12 Months – Entry-Level.....	5-50
Figure 66. Change in Requests for Training over Last 12 Months – Mid- to High-Level.....	5-51
Figure 67. Employer Request for Training As A Factor Of Increased Demand.....	5-51
Figure 68. Percent of Organizations Likely to Expand in the Next Twelve Months	5-52
Figure 69. Trainees’ Interest in Seeking or Continuing Energy Efficiency Employment – Entry-Level	5-53
Figure 70. Trainees’ Interest in Seeking or Continuing Energy Efficiency Employment – Mid/High ..	5-54
Figure 71. Trainees Who Have Found Work In Energy Efficiency-Related Field Post Training	5-55
Figure 72. Internship Placement by Training Organization.....	5-56
Figure 73. Effectiveness of Internships in Supplementing Training to Promote Job Placement	5-57
Figure 74. How Many Additional Trainees Could Be Placed Each Year.....	5-58
Figure 75. Expected Change In EE Employment Opportunities Over Next Twelve Months.....	5-59
Figure 76. Awareness of NYSERDA support for skills development.....	5-59
Figure 77. Familiarity with NYSERDA’s Supported Energy Efficiency Training Efforts	5-61
Figure 78. Awareness of Other New York State Energy Efficiency Related Training Programs	5-61

LIST OF TABLES

Table 1. Workforce Development Program Activities	2-8
Table 2. Key Data Sources.....	3-2
Table 3. Target Sectors	3-4
Table 4. Initial Sample Released by Sector	3-5
Table 5. Total Sample Released.....	3-5
Table 6. Targeted Number of Completes by Quota	3-5
Table 7. Target Sectors	3-6
Table 8. Initial Sample by Sector.....	3-6
Table 9. Targeted Number of Completes by Quota	3-7

Table 10. Sample Frame by Sector	3-8
Table 11. Released Sample Records by Sector	3-8
Table 12. Adjusted Quota by Sector	3-9
Table 13. Survey Sample Disposition (Total).....	3-10
Table 14. Survey Sample Disposition (Builders).....	3-11
Table 15. Survey Sample Disposition (HVAC Contractors)	3-11
Table 16. Survey Sample Disposition (Engineers/Consultants and Electrical Contractors).....	3-12
Table 17. Sample Eligibility and Estimated Eligibility Rate (Total)	3-13
Table 18. Sample Eligibility and Estimated Eligibility Rate (Builders).....	3-13
Table 19. Sample Eligibility and Estimated Eligibility Rate (HVAC Contractors).....	3-14
Table 20. Sample Eligibility/Estimated Eligibility Rate Engineers/Consultants/Electrical Contractors	3-14
Table 21. Survey Sample Disposition.....	3-15
Table 22. Sample Eligibility and Estimated Eligibility Rate	3-16
Table 23. Completes by Sector	3-17
Table 24. Survey Sample Disposition.....	3-18
Table 25. Survey Sample Disposition (Community Training Agencies).....	3-19
Table 26. Survey Sample Disposition (Vocational & Coop Training Centers).....	3-20
Table 27. Survey Sample Disposition (Entry Level Union Training Centers)	3-21
Table 28. Survey Sample Disposition (Certification Training/2-4 Year Colleges)	3-22
Table 29. Survey Sample Disposition (Mid-High Level Union Training Centers)	3-23
Table 30. Survey Sample Disposition (Industry Associations)	3-24
Table 31. Sample Eligibility and Estimated Eligibility Rate	3-25
Table 32. Sample Eligibility and Estimated Eligibility Rate (Community Training Agencies).....	3-25
Table 33. Sample Eligibility and Estimated Eligibility Rate (Vocational & Coop Training Centers) ...	3-26
Table 34. Sample Eligibility and Estimated Eligibility Rate (Entry Level Union Training Centers).....	3-26
Table 35. Sample Eligibility and Estimated Eligibility Rate (Certification Training/2-4 Year Colleges)	3-27
Table 36. Sample Eligibility and Estimated Eligibility Rate (Mid-High Level Union Training Centers)	3-27
Table 37. Sample Eligibility and Estimated Eligibility Rate (Industry Associations).....	3-28
Table 38. Actual Completed Surveys: Avg. Number of employees [# of firms].....	3-29
Table 39. Total Eligible Sample: Avg. Number of employees [# of firms].....	3-30
Table 40. Weighting Factors for Each Sector and Size Category, Weighted by Share of Employees ...	3-31
Table 41. Weighting Factors for Each Sector and Size Category, Weighted by Establishment Counts	3-31
Table 42. Confidence/Precision Within Each Business Sector.....	3-31
Table 43. Completes by Sector	3-33
Table 44. Targeted Population for Training Organizations Survey	3-34
Table 45. Initial Population of Employers That Hire For Energy Efficiency Jobs In New York State..	4-15
Table 46. More Detailed and Refined Sample Population – Statewide and by Region.....	4-17
Table 47. Averaged Unemployment Rate vs. Underemployment Rate, Q2 2010 to Q1 2011	4-24
Table 48. Top Ten Poverty Rate Counties, General and Age Specific Unemployment, 2006 to 2010..	4-27
Table 49. Top Ten Counties with Greatest Percent 16-24 Year Olds Not in Labor Force, 2005-2009..	4-32
Table 50. Top Ten Counties with Greatest Percent 25-64 Year Olds Not in Labor Force, 2005-2009..	4-33
Table 51. Initial Targeted Population for Training Organizations Survey	4-36
Table 52. Revised Targeted Population for Training Organizations Survey	4-39
Table 53. Percent of Firms Hiring Unskilled Positions By Industry	5-7
Table 54. Percent of Firms Hiring Skilled Positions By Industry.....	5-7
Table 55. Other Skilled Positions Offered, by Company Category	5-8
Table 56. Sources for Finding New Employees.....	5-9
Table 57. Verbatim Responses for Other Sources for Finding New Employees	5-10
Table 58. Awareness of New York Job Skills Training Programs	5-15
Table 59. Awareness of Internship/Apprenticeship Programs.....	5-15

Table 60. Programs Used By Firms	5-16
Table 61. Satisfaction Ratings by Training Program Type.....	5-21
Table 62. Verbatim Responses on Ways to Increase Satisfaction	5-22
Table 63. Verbatims for Increasing Value of Training Programs.....	5-24
Table 64. Barriers to Additional Hiring	5-26
Table 65. Sources of Awareness Regarding NYSERDA’s Training Support Efforts	5-28
Table 66. Ways to Increase Satisfaction with Training Locations.....	5-31
Table 67. Program Participation Reported By Respondents.....	5-32
Table 68. Program Participation Verbatims.....	5-33
Table 69. Number of Training Classes Held In The Past Twelve Months	5-34
Table 70. Number of Job Placements In The Past Twelve Months	5-35
Table 71. Number of Job Placements in Energy Efficiency Positions	5-35
Table 72. Skills and Areas of Training Offered.....	5-36
Table 73. Verbatim Responses.....	5-40
Table 74. Percent of Targeted Groups That Received Training in the Past Two Years – Entry-Level ..	5-44
Table 75. Percent of Targeted Groups That Received Training in the Past Two Years – Mid/High	5-45
Table 76. Verbatim Reasons Why There Is or Is Not a Need for More Training.....	5-48
Table 77. Job Types Where Trainees Have Found Employment.....	5-55
Table 78. How Training Organizations Heard about NYSERDA’s Training Program Support	5-60

LIST OF MAPS

Map 1. New York State Poverty Rates, by County.....	4-27
Map 2. Upstate Hard to Reach/Serve and Economically Disadvantaged, Ages 16 to 24, by County	4-28
Map 3. Downstate and Long Island Hard to Reach/Serve Population, Ages 16 to 24, by County.....	4-29
Map 4. Upstate Hard to Reach/Serve and Economically Disadvantaged, Ages 25 to 64, by County	4-30
Map 5. Downstate and Long Island Hard to Reach/Serve Population, Ages 25 to 64, by County.....	4-31
Map 6. Distribution of Training Centers in Upstate New York.....	4-43
Map 7. Distribution of Training Centers in Downstate New York.....	4-44
Map 8. Upstate Training Organizations vs. Targeted Population Aged 16 to 24, by County.....	4-45
Map 9. Downstate Training Organizations vs. Targeted Population Aged 16 to 24, by County.....	4-46
Map 10. Upstate Training Organizations vs. Targeted Population Aged 25 to 64, by County.....	4-47
Map 11. Downstate Training Organizations vs. Targeted Population Aged 25 to 64, by County.....	4-48

SECTION 1. EXECUTIVE SUMMARY

This report provides detailed results and discussion of the market characterization and assessment (MCA) evaluation conducted for the Workforce Development Program.

This evaluation contains two components:

1. **Market Characterization** – This component presents an initial characterization of the market within which NYSERDA’s Workforce Development Program operates, separate from the SBC Workforce Development Program, which includes renewable energy jobs, or the Green Jobs Green New York Workforce Development Program. Specifically, this entails identification and quantification of New York State (NYS) firms and organizations that currently have or plan to hire employees with electric energy efficiency-related skills. In addition, New York State’s workforce training organizations are characterized along with the Program’s targeted trainee audiences, including quantification of unemployed, underemployed, hard-to-serve, and underserved populations. Key information is broken out by regions of the state, including upstate and downstate comparisons where applicable.
2. **Market Assessment** – This component provides baseline information on key indicators that can be tracked over time to assess movement in New York State’s workforce development market and progress toward achievement of key Program goals. For this report, two market actor groups are assessed:
 - a. **Employers** – companies located within New York State that have employees or hire contractors who perform jobs that are directly or indirectly involved with energy efficient building construction or the design, specification, delivery, installation, or servicing of electric energy using products or equipment within homes or businesses in the State; and
 - b. **Training Organizations** – organizations that may, or may not currently include energy efficiency components within their training efforts, but are all viewed as having the potential to include these components in the future.

The primary goals of this MCA evaluation effort are to:

1. Develop and document a comprehensive understanding of current and emerging markets (e.g., market structure and market actors)
2. Provide baseline and background information required by NYSERDA to define and deliver Programs to target markets
3. Track changes in markets over time with a specific focus on market indicators that are likely to be impacted by Program offerings

The focus of the MCA research is on the market and context within which the Workforce Development Program operates. Given that the Energy Efficiency Portfolio Standard (EEPS)-funded component of this Program is relatively new, this MCA research will help assess or validate Program assumptions regarding market characteristics, provide additional details regarding market structure and opportunities, and establish baseline measurements of key indicators. In particular, within this report, the MCA Team has compiled data regarding the extent to which market actors are aware of and promote the Program’s energy efficiency goals; including overcoming barriers, expanding existing energy efficiency training infrastructure, increasing energy efficiency employment opportunities, populating EEPS Programs with trained workers, supporting the State’s past System Benefits Charge (SBC) initiatives, and helping increase the supply of a trained energy efficiency workforce to meet the future employment needs of the broader marketplace.

These results can be used in subsequent evaluations, as a means of comparison to assess progress towards meeting the New York Public Service Commission (PSC) public policy goals under which NYSERDA operates, as well as to track progress of meeting established institutional Program goals. In addition, the MCA evaluation results can be used by other evaluators and NYSERDA program staff and managers when considering adjustments to Program implementation to ensure maximum market interest and uptake of Program offerings.

1.1 PROGRAM DESCRIPTION

In its June 2009 *Order Authorizing Workforce Development Initiatives*, the PSC approved an Energy Efficiency Portfolio Standard (EEPS)-funded Workforce Development Program to be administered by NYSERDA.¹ New York State's EEPS Program was created to augment near-term efficiency measures and to develop and encourage cost-effective energy efficiency over the long term. To meet these goals, NYSERDA is implementing a variety of programs to improve energy efficiency throughout the State, including this Workforce Development Program.

The goals of the EEPS-funded Workforce Development Program are focused on overcoming barriers to workforce training, expanding the existing energy efficiency training infrastructure across the State (in both the residential and commercial/industrial sectors), and help create a potential workforce, particularly among unemployed, underemployed, hard-to-serve, and under-served populations with skills ready to meet the employment needs of a growing energy efficiency industry. The aim is to provide the State's present and future workforce with technical skills that will be important to meet the needs of programs funded through the broader EEPS efforts – both NYSERDA's portfolio of EEPS-funded Programs as well as utility programs funded by EEPS.

The Workforce Development Program collaborates with other entities that carry out related activities to leverage resources and maximize achievement of common goals. These activities include:

- Coordinating with union and professional trade groups and organizations to add more training locations and energy efficiency and building science classes (supporting certification and professional development through instructor-led and on-line training programs)
- Coordinating with community colleges and vocational training providers to add and expand the capacity and offerings of training centers, (including increasing the number of skilled trainers through train-the-trainer initiatives)
- Providing internship and apprenticeship opportunities to provide on-the-job training for energy efficiency services
- Coordinating closely with the New York State Department of Labor (NYSDOL) Career One-Stop System
- Working closely with community-based organizations and environmental justice communities and organizations to develop basic skills courses to provide pathways out of poverty (supporting

¹ New York State Public Service Commission Case 07-M-0548 – Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio Standard. Order Authorizing Workforce Development Initiatives, Issued and Effective June 22, 2009.

certification, professional development, and basic skills training as a foundation for continued technical training along a defined career path in energy efficiency)

The Workforce Development Program is projected to train and certify approximately 6,200 workers by October 30, 2012. To meet this goal, the Program has authorized over \$6.6 million in EEPS funding for an incentive pool for Workforce Development initiatives, currently awarded through PON 1816 and PON 1817. Additionally, EEPS funds are leveraged by existing efforts under the SBC and the 2009 Green Jobs Green New York (GJGNY) Act which includes multiple workforce development activities funded by the Regional Greenhouse Gas Initiative (RGGI).²

1.2 RESEARCH APPROACH

The overarching goals of NYSERDA's EEPS Program evaluation efforts are to conduct credible and transparent evaluations, and provide NYSERDA, the NYS Public Service Commission (PSC), NYS Department of Public Service (DPS) staff, and other stakeholders with timely and unbiased information regarding Program implementation. One component of this effort includes conducting an MCA evaluation of NYSERDA's Workforce Development Program. The MCA evaluation will provide a baseline assessment of market needs among market actors in the energy efficiency services industry, exploring topics related to staffing needs, required skills sets, availability of skilled labor, and employers (market actors) view of anticipated evolution of the marketplace. In addition, where applicable, connections will be made between this MCA effort and NYSDOL's Labor Market Intelligence (LMI) research efforts to further outline market needs in the energy efficiency services industry.

The goals of the MCA evaluation are to:

1. Articulate the Program theory and logic
2. Describe and document the market structure and market actors. Include description of training and employment issues in the electric energy efficiency workforce, among utility and NYSERDA program staff, and the needs of energy service companies (ESCOs) serving the energy efficiency market. Describe other market actors including labor/trade unions, contractors serving NYSERDA's Home Performance with ENERGY STAR[®] (HPwES) Program, architects and engineering firms serving new construction and design/build markets, Program participants

² It is important to note that some overlap exists between NYSERDA's Workforce Development Program and the State's broader GJGNY activities. This overlap is mainly limited to the interactions with community based organizations (CBOs). GJGNY activities include work with CBOs that are designed to provide employment opportunities for disadvantaged workers, the long-term unemployed and new workforce entrants for green job opportunities. A component of NYSERDA's Workforce Development Program, the Career Pathways for Disadvantaged Workers component, also engages and coordinates through CBOs to target hard to reach and under-served populations. Both programs also leverage funding to help build New York's training infrastructure through expanding programs in well-established training centers, furnishing new training equipment and tools, and increasing field training and certification examination capacity and delivery protocols to help ramp up workforce participation in training and certification. In addition, both programs work in cooperation with the NYSDOL in the design and implementation of effective workforce development initiatives and NYSERDA's training partners work directly with the NYSDOL Career One-Stop system in order to maximize the impact that combined efforts have on the long term unemployed, underemployed and disadvantaged populations of New York State.

(commercial real estate owners/managers, multifamily owners, etc.), and utility providers and transmission/distribution companies in the State

3. Provide baseline and background information required by NYSERDA to define and deliver Programs to target markets
4. Provide data from market actors (representatives of energy efficiency industry) regarding hiring goals, training needs, and training/employment barriers including issues associated with the aging workforce that exists in the utility industry
5. Track changes in markets over time with a specific focus on market indicators that are likely to be affected by NYSERDA's Program offerings

This MCA evaluation used a variety of primary and secondary data sources to generate information on topics relevant to the Workforce Development Program. The approach was driven by elements identified in the Program's Logic Model Report³, and by key research findings related to the outputs and outcomes anticipated by the Program Logic Model. In addition, the approach was implemented in a manner that encouraged interaction between the MCA Team and NYSERDA program and evaluation staff, as well as DPS staff and other project stakeholders via project planning activities and deliverable review cycles.⁴ The following steps were taken to conduct this evaluation of the Workforce Development Program, as described in more detail in the Methodologies Section presented further in this report:

- Project Planning – Including review of Program documentation and prior evaluation results of other programs; meetings and discussions with NYSERDA staff and other contractors; a project kick-off meeting with Workforce Development Program staff and other project stakeholders; and the development of a combined Process evaluation and MCA Final Project Work Plan
- Review of the Program Logic Model – to ensure the document accurately reflects the current Program design and state of the market. Results of this review provided a prioritization of measurement indicators and researchable issues that was used to guide the rest of this MCA evaluation effort
- Market Characterization – generated from secondary data sources, supplemented by information gathered during primary data collection efforts and discussions with multiple stakeholders involved in the Workforce Development Program and the State's broader energy efficiency skills training effort (including NYSDOL and Pace University staff)⁵

³ *Energy Efficiency Portfolio Standard Workforce Development Program Logic Model Report*, Final Report Prepared for NYSERDA by GDS Associates, Inc., December 2010, Section III.

⁴ This MCA evaluation was implemented through a collaborative effort among NYSERDA's Energy Analysis and program staff, Research Into Action (NYSERDA's process evaluation contractor), APPRISE (NYSERDA's evaluation survey data collection contractor), the MCA evaluation contractor, and other NYSERDA evaluation contractors.

⁵ MCAC Team met with representative of NYSDOL to review target industry cluster findings of 2010 Green Jobs study. Pace University staff provided GDS Associates a list of training organizations in New York State that offer energy efficiency training and worker readiness skills, to supplement the MCA teams list of non-participating training organization for the survey sample.

- Market Assessment – generated through primary data collection efforts (i.e., telephone interviews) with employers including: builders, HVAC contractors, engineers/consultants, electrical contractors, real estate developers and property management firms; and with training organizations in the State that are eligible to, but currently do not participate in the Program
 - The data collection instruments for this effort were structured around the measurement indicators and researchable issues identified and prioritized during review of the Workforce Development Program Logic Model Report
 - Care has been taken to ensure that questions were structured in a manner that allows them to be consistently used in subsequent program evaluations so that temporal trends in the measurements can be assessed.⁶
- Analysis and Reporting – Conducted by the MCA Team using NYSERDA-approved methods

1.3 MARKET CHARACTERIZATION – KEY FINDINGS

Market Characterization results help to describe relevant energy efficiency employment, workforce, and job skills training markets in New York State, including background and baseline information regarding the number and types of market actors, energy efficiency-related jobs, and associated training infrastructure makeup and trends, by geographic region throughout the State. Following is a summary of key findings. See Section 4, for more detailed market characterization results.

1.3.1 Employers

Energy efficiency jobs exist in virtually every industry. They occur in high numbers in utilities, state government, builder and contractor firms (including mechanical, electrical and general contractors, and home performance, weatherization and other efficiency delivery contractors), energy service companies (ESCOs), in consulting, architectural and engineering firms. Companies from all industries hire employees for energy efficiency positions, or for jobs that have energy efficiency as a component of their work. The State’s labor unions also sign on workers and provide training and jobs for individuals seeking employment in energy efficiency-related positions. Job positions that exist within all of these organizations are categorized by skill level and education requirement, and are typically identified as entry-level jobs and mid- to high-level jobs.

1.3.1.1 Employment Trends

The following paragraphs highlight key findings regarding employment trends. But, it is important to note that existing employment trend data is only a snapshot of quantitative information available, and does not take into consideration the influence or impact of policy, market forces or investment for development of an industry in the short or long term.

In response to both economic concerns and climate change, legislators and regulators in the State and across the country have supported energy efficiency at unprecedented levels. According to the American

⁶ The MCA Team worked closely with, and obtained input from NYSERDA program staff, the Process Evaluation Team and other NYSERDA evaluation contractors, throughout the survey instruments development process and the MCA Team endeavored to incorporate such input balancing against the need to collect data on key measurement program indicators and minimize impacts on survey respondents.

Council for an Energy Efficient Economy (ACEEE), the total budgets for electricity efficiency programs alone in the U.S. have increased to \$4.5 billion in 2010, up from \$3.4 billion in 2009. Given the increasing regulatory commitments to energy efficiency, this growth will likely continue over the next decade.⁷ According to the 2011 ACEEE *Scorecard*,⁸ New York State ranks #3 in the U.S., behind Massachusetts (taking the #1 position for the first time) and California (slipping from the top spot it held for the first four editions of the ACEEE Scorecard) for its comprehensive policies and programs that improve energy efficiency in residential, businesses, industry, and transportation sectors. Therefore, the number of energy efficiency-related jobs in New York State is expected to increase in the future based on elevated investment and associated local, regional and state-wide targets.

In the near term, growth in New York State's energy efficiency jobs is expected to be limited due to the slow overall economic recovery. However, three industry clusters show a high concentration of green jobs today (including energy efficiency-related jobs) and are expected to continue to be in demand in the future: construction, building services, and professional services. Jobs in the construction cluster include residential and commercial construction, and electric power construction. Jobs in the business services cluster include some positions in the real estate development and property management industries and services to buildings. Jobs in the professional services cluster include architects, electrical, mechanical and drafting engineers that provide a consulting service to facilitate the installation of energy efficiency products, processes and participation in programs.⁹

Over the longer term (for the period ending 2018), future demand for high-level energy efficiency-related jobs in New York State is projected to range from an increase of 13% in Training and Development Specialists, to a 10% decrease in General Managers and Operations. Future demand for mid-level energy efficiency jobs during this same period ranges from an increase of 5% in areas including HVAC, Maintenance and Repair, to a decrease of up to 10% in areas of Weatherization Installers and Insulation Workers. For entry-level energy efficiency-related jobs, future demand in the State shows a slight decline, ranging from -1% to -11%, with the largest decline seen in the number of laborers and material mover jobs. The construction industry, however, appears to have solid growth potential in the State for energy efficiency-related jobs. Construction trade jobs offer moderate to long-term, on-the-job training and provide entry-level skills employment opportunities. Additionally, in 2012 three job categories in the construction industry – carpenters, construction laborers, and electricians – are listed in the top fifty jobs with the most openings in New York State, at 31st, 38th and 50th place respectively.¹⁰

Two of the challenges the energy efficiency industry will face in the coming years is the issue of employee retention and migration. Trends show, regardless of where workers are trained or attend school, they often migrate to areas where job opportunities exist. For this reason, when relevant, this report includes information on the number of energy efficiency training and job opportunities on Long Island. It is important to note, approximately 20% of the total number of the energy

⁷ ACEEE, Article "Utility Regulation and Policy", May 23, 2012. <http://aceee.org/sector/state-policy/toolkit/utility-regulation>

⁸ ACEEE *Scorecard* provides a comprehensive assessment of policy and programs that improve energy efficiency in our homes, businesses, industry, and transportation sectors. The *Scorecard* examines six energy efficiency policy areas: (1) utility and public benefits programs and policies; (2) transportation policies; (3) building energy codes; (4) combined heat and power; (5) state government initiatives; and (6) appliance efficiency standards.

⁹ The New York City Labor Market Information Service, along with the New York State Department of Labor, New York State Green Jobs Study, September 2011.

¹⁰ America's Career Infonet, Occupation Profile for New York State 2008, <https://acinet.org>.

efficiency/weatherization and energy efficiency services and consulting jobs in all of New York State are located on Long Island, as are 12% of the entry-level, and 7% of the mid- to high-level skill training organizations.

1.3.1.2 Job Types, Numbers and Locations¹¹

In 2009, four industries accounted for nearly 72% of the energy efficiency-related jobs in New York State (including Long Island): HVAC (23%), Electrical Contracting (21%), Engineering Services (14%) and Commercial and Industrial Construction (14%). This finding is supported by conclusions in the NYSDOL, Green Jobs Study, 2011, which identified a high concentration of “Green” and specifically energy efficiency related jobs in the construction industry.

Mid –to-high-level jobs accounted for 63% of all energy efficiency related jobs in New York State in 2009. In that year, there were over 148,500 mid- to high-level energy efficiency services and consulting jobs in the State (47% upstate, 38% downstate and 15% in Long Island).

In total, there were more than 85,000 basic skills/entry-level weatherization and energy efficiency services jobs in the State in 2009 (40% upstate, 38% downstate and 22% in Long Island). Across these three regions, the greatest percent of entry-level jobs was found in the HVAC industry (over 53,000 jobs total – nearly 22,500 upstate, 20,500 downstate, and approximately 11,000 in Long Island).

1.3.1.3 Program-Targeted Jobs Quantification

The population of employers targeted for this market assessment comprises companies that either support or directly provide building/contractor services (i.e., single/multifamily builders, commercial/office builders, HVAC contractors, other building equipment contractors, real estate developers and property managers), or engineering and consultant services (i.e., industrial and mechanical engineers, architects and other building design/construction consultants, HVAC engineers, energy conservation engineers and consultants, and lighting consultants and electrical contractors). A significant number of these firms (over 15,000) and jobs (over 130,000) fall within these business categories. However, a majority of these firms and jobs have little to no direct relationship with electric energy efficiency improvement efforts – the focus of NYSERDA’s EEPS Workforce Development Program.

The energy efficiency jobs targeted by the Workforce Development Program are concentrated in Single Family (nearly 18,500 jobs -14%), Multifamily (nearly 5,000 jobs - 4%) and Commercial/Office Building (over 2,600 jobs - 20%) construction – totaling nearly 8,500 firms across the State. Given the magnitude of this number, NYSERDA is wise to include construction employers as one of its Program’s targeted areas. Other business categories targeted by NYSERDA’s Workforce Development Program include: architects and engineers, energy service companies, utilities and NYSERDA itself (all part of the contractors, engineers and consultants business categories).¹²

¹¹ US Census Bureau, 2009 County Business Pattern Data, <http://www.census.gov/#>.

¹² It is important to note that other business categories were also considered for inclusion within the refined targeted population for employers, including energy efficient equipment distributors, manufacturers, weatherization agencies and auditors. Based on input and discussion with NYSERDA program staff and others during the filtering process, distributors and manufacturers were removed from the sample since employees in these categories are not the target of NYSERDA’s Workforce Development training efforts. Weatherization agencies were also considered for inclusion in the final employer population sample, but eliminated primarily because these organizations will be the target of an upcoming PACE evaluation.

1.3.2 Employees (the Potential Program “Trainees”)

A key Workforce Development Program goal is to increase employment opportunities in entry-level skill and mid-to high-level skill energy-efficiency occupations in New York State. Focus is on the employer and industry types noted earlier including contractors, energy services providers, architects and engineers, building operators, and facility managers for jobs in all areas of design, sales, installation, operation and maintenance of energy efficient technologies and services. In addition, the Commission approved \$2 million to provide energy efficiency training to low-income populations, in conjunction with the NYSDOL “pathways out of poverty” Program to engage disadvantaged communities. As such, characterizing the types of employees that might be targeted for skills training to work in these energy efficiency-related jobs has been an important component of this MCA evaluation effort.

1.3.2.1 Educational Attainment

New York State ranks 5th in the nation for the number of men and women with advanced degrees, 8th for those with Bachelors’ degrees, but only 34th for the number of high school graduates (just over 191,000 graduates from the State’s high schools in 2010).¹³ In most cases, even for entry level skill jobs, employers seek workers with some relevant education and training. There are a significant number of high school graduates who will not seek advanced training, and could benefit from the entry-level/worker readiness skills training that NYSERDA’s Workforce Development Program has to offer. Additionally, there are men and women not represented in educational attainment statistics, who did not complete high school, and would also benefit from participating in Workforce Development Program training,

As compared to other states across the country, a larger percentage of New York State residents 55 years and older have at least a high school diploma.

1.3.2.2 Aging Workforce

Nationwide, about 76 million baby boomers--those born between 1946 and 1964--are approaching retirement age. Boomers make up nearly one-third of the U.S. workforce, and statistics show there are not enough younger workers to replace them. In 2010, the number of workers in the United States aged 35 to 44, or those typically moving into upper management, declined by 19%. Additionally, the number of workers aged 45 to 54 increased 21%, and the number of workers aged 55 to 64 increased by 52%.¹⁴ Energy workers are becoming eligible to retire in large numbers, and the energy industry anticipates a serious labor shortage. For example, according to the Center for Energy Workforce Development, by the year 2012, more than half of all power plant workers and over 40% of power line workers and engineers could need to be replaced.¹⁵

In 2000, New York State had approximately equal numbers of residents under age 18 and over age 64. However, it is projected that by 2030, the state will have nearly twice as many residents over age 64 as under age 18. The median age of New York State population is 37.4 years, while the median age of the State’s workforce is 41.6 years (slightly older than that of the average U.S. workforce). Nearly 24% of

¹³ Projections of High School Graduates, The University of The State of New York, The New York State Education Department, Albany 2007-08 to 2018-19, www.highered.nysed.gov/oris/demographics/hsgprojections.pdf.

¹⁴ .Projections of High School Graduates, The University of The State of New York, The New York State Education Department, Albany 2007-08 to 2018-19, www.highered.nysed.gov/oris/demographics/hsgprojections.pdf.

¹⁵ Population Bulletin, U.S. Labor Force Trends, June 2008, www.prb.org/pdf08/63.2uslabor.pdf.

the State's population is 55 years old or older, and over half (nearly 60%) of those aged 55 to 64 are employed.¹⁶

Reports on the aging workforce show the energy and health care industries are already suffering from a skills shortage.¹⁷ In addition, the National Association of Manufacturers predicts there will soon be a labor shortage in technical and scientific fields. This means that career opportunities will become available in the electric utility and other energy efficiency and related fields for job-seekers in the very near future.¹⁸ These opportunities will include such positions as energy auditors, electric utility jobs, pipe-fitters and pipe layers, electrical line installers and line-workers, generation technicians, power engineers, electrical, mechanical, civil, and chemical engineers.

It is important to temper these opportunities by noting some interesting findings from a recent Pew Research national study regarding the views of people 18 to 24 year olds and 25 and older on education, training and the impact of the economy on their careers and how prepared they believe they are for the future.¹⁹ As identified in the study: young adults (ages 18 to 34) say that the sluggish economy has had an impact on a wide array of coming-of-age decisions including career and schooling. In addition, young adults have been hit hard by the recession and few see their current job as a "career." According to the study, most young workers say they don't have the education and training to get ahead, and get a job and start a career path. Combined, these findings support the need for the Workforce Development Program to remain focused on providing outreach and training support to this younger group of potential employees.

1.3.2.3 Unemployed and Under-Employed

As of 2011, nearly 1.3 million people were unemployed in New York State (49.1% upstate, 50.9% downstate).²⁰ This translates into an overall unemployment rate in the State of 8.6% (8.4% upstate and 8.8% downstate). In August 2011, during this most recent recession more men are unemployed than women (21% of men ages 16 to 24 were unemployed vs. 15% of women ages 16 to 24). Over one-fifth of the State's unemployed population is comprised of young minority men in their 20's.²¹

It is important to note that the unemployment rate does not include or count parts of the population that are discouraged, and are no longer looking for work, or those who are underemployed, working in jobs well below their skill levels or less than the number of desired hours.²² In 2010, the underemployment rate in New York State was 14.9%. This is over six percentage points higher than the State's

¹⁶ Population Bulletin, U.S. Labor Force Trends, June 2008, www.prb.org/pdf08/63.2uslabor.pdf.

¹⁷ An Aging Workforce Effect on US Employers, Scott Reeves, Forbes Business Basics, September 29, 2005 www.forbes.com > Leadership > Careers.

¹⁸ About.com: Energy, "Aging Workforce Creates Job Opportunities in Energy: Retiring Employees Will Need To Be Replaces Labor Shortage Expected", Wendy Lyons-SunShine, May 24, 2012, www.about.com.

¹⁹ Pew Research Center, Social and Demographic Trends Report, "Young, Underemployed and Optimistic, coming of Age, Slowly, in a Touch Economy". February 9, 2012, www.pewsocialtrends.org/files/2012.

²⁰ US Census Bureau, American Community Survey Unemployment in New York State, 2011, www.census.gov.

²¹ Pew Research Center, Social and Demographic Trends Report, "Young, Underemployed and Optimistic, coming of Age, Slowly, in a Touch Economy". February 9, 2012, www.pewsocialtrends.org/files/2012.

²² Partnership for Public Good, Policy Brief, April 2010. www.ppgbuffalo.org/ppg-policy-brief-the-federal-budget-and-wny/.

unemployment rate and indicates the presence of a substantial population not represented in the traditional unemployment statistics.

1.3.2.4 Hard-to-Reach and Hard-to-Serve Populations^{23, 24}

In 2010, over 2.5 million people (15% of the State's total population) were living at, or below the poverty level²⁵ in New York State (66% downstate and 34% upstate). The number of these individuals not included in labor force statistics (*i.e.*, persons who are not working, not receiving unemployment benefits and are not actively looking for work) is substantial.²⁶ Combined, those living at or below the poverty level, unemployed or underemployed, or not included in the labor force, make up what is defined as the hard-to-reach and hard-to-serve population.²⁷ In New York State, this population represents an important target market for potential Workforce Development Program energy efficiency skills training. Since the US Census Bureau defines poverty at 100% of the threshold, based on income and family size, and NYSERDA defines poverty, according to the HEAP guidelines, as at or below 60% of medium household income, findings on poverty presented are conservative estimates.

For this report, information on the hard-to-reach/hard-to-serve populations in New York State was separated into two age groups: 16 to 24 and 25 to 64 year olds, as categorized by poverty information sources. Maps were developed to help quantify and assess the magnitude of this target population, by county, and across the State. By comparing the population of individuals within these two age groupings that are currently unemployed (including persons who are not working, not receiving unemployment benefits and are not actively looking for work) with the same age group's population that is currently in the labor force (employed), it becomes clear that there is a large and broadly distributed population of

²³ Hard to Reach and Serve populations, for the purpose of this study are defined as disadvantaged populations and those living at or below the poverty level in New York State. The definition of disadvantaged workers are individuals at least 17 years of age that fall within one of the following two categories: unemployed workers and incumbent workers. Within these two categories a wide variety of population groups exist, including individuals with barriers to employment, such as limited English proficiency; youth 17 years of age and older who have dropped out of school and are seeking employment; persons with disabilities; and ex-offenders. In-school high school students and other students enrolled in secondary education programs are not included in this definition. Included in the definition of unemployed is those group who are underemployed, or not included in the labor force.

²⁴ For the purposes of this report poverty statistics used for analysis are from the US Census Bureau, American Fact Finder 2010 Poverty in New York State, which uses 48 thresholds of income and family size to establish poverty. NYSERDA's definition of poverty, according to HEAP program guidelines, is total household income of 60% or below of median household income. <http://www.nyserda.ny.gov/en/Page-Sections/Residential/Programs/Low-Income-Assistance/EmPower-for-Residents/Eligibility-Guidelines.aspx>.

²⁵ US Census Bureau follows the Office of Management and Budget's (OMB) Statistical Policy Directive 14, to define poverty and uses a set of money income thresholds that vary by family size to determine poverty. If a family's total income is less than the family's threshold, then that family and every individual in it is considered in poverty. The official poverty thresholds do not vary geographically, but they are updated for inflation using Consumer Price Index (CPI-U). The official poverty definition uses money income before taxes and does not include capital gains or noncash benefits (such as public housing, Medicaid, and food stamps).

²⁶ Even though the definition of disadvantaged states individual must be 17 years of age or older, the data available for economically disadvantaged population includes information on ages 16 to 24 years and ages 25 to 64 years.

²⁷ International Food Policy Research Institute, Discussion Paper Briefs, Living Life: Overlooked Aspects of Urban Employment, 2012, www.ifpri.org/sites/default/files/publications/fcnbr171.pdf.

hard-to-reach/hard-to-serve and unemployed workers in the State. More than 462,000 (42%) of the employment eligible 16 to 24 year olds in upstate New York, over 500,000 (52%) downstate, and nearly 250,000 (57%) on Long Island are not in the labor force. For the population of 25 to 64 year olds that are not in the labor force 969,000 (26%) are located upstate, over 1,089,000 (23%) downstate, and nearly 208,000 (16%) in Long Island.

Upstate counties with the highest poverty rates for 16 to 24 year olds include: Allegany, Essex, St. Lawrence, Oswego, Chemung, Franklin, and Fulton. Upstate counties with the greatest percent of unemployed 16 to 24 year olds include: Schuyler, St. Lawrence, Greene, Rockland and Cortland. In the downstate region Bronx and Kings Counties have the highest percent of unemployed populations, followed by Queens, New York and Richmond Counties. New York County represents the greatest downstate population of unemployed 16 to 24 year olds. In fact, all of the downstate counties appear in the top twenty counties State-wide with the highest population of hard-to-reach/hard-to-serve 16 to 24 year olds.

Counties in upstate New York with the highest poverty rates for 25 to 64 year olds include: Livingston, Fulton, Oswego, Chautauqua, Allegany, Franklin, Wyoming, St. Lawrence, Orleans and Seneca. St. Lawrence and Orleans counties have the greatest percent of 25 to 64 year olds not in the workforce (unemployed). While all of the downstate counties appear in the top twenty counties with the highest percent of populations at or below the poverty level, Bronx, Kings and New York counties have a greater percent of this target population than Queens and Richmond. Among all the downstate counties, New York County has the greatest percent of unemployed 25 to 64 year olds.

1.3.3 Training Organizations

The training component of the Workforce Development Program is designed to help build energy efficiency knowledge and skills among potential and new job entrants, trades people and professionals who work, or have a desire to work or advance their career in energy-related jobs and industries. For this report, training organizations have been separated into groups that provide mainly entry-level skills training, or those that provide mid- to high-level training and related support services²⁸.

1.3.3.1 Entry-Level Training

As of March 1, 2012, of the 175 total entry-level training organization locations in New York State, 25% (44) are contracted with NYSERDA as Workforce Development training organizations.²⁹ Thirty-eight of the contracted entry-level Training Partners (over 86%) are Vocational/Cooperative training organizations, such as BOCES organizations.. These vocational/cooperative training organizations however, represent 38% (67 of 175) of the total entry-level training organization locations identified in New York State. Eleven percent (5) of the contracted training partners are Community Based and

²⁸ Entry level training includes basic math, writing skills and introduction to energy efficiency curriculum that prepares participants to qualify and apply for an entry level position. Mid to high level skills training includes more advanced courses that lead to certification, degree or licensure in energy efficiency related disciplines.

²⁹ Entry level training organization locations providing basic worker readiness skills training in New York State were identified through extensive internet searches, information gathered through association lists, and from a list provided by Pace University. Our objective was to identify where and how many organizations and individual locations exist in New York State, and through this process 175 entry level training organization locations were identified.

Weatherization agencies, accounting for 47% of the State's total identified entry-level training organization locations.

Unions have also been identified as offering entry level skills training and represent 14% of the State's entry-level skills-based training organizations. None of these union training organizations, however, have contracted with NYSERDA to provide entry-level skills training.

With 75% of the identified entry-level training organization locations not yet participating, there appears to be opportunity to increase the number of training partner locations in targeted areas of need statewide. Tapping this opportunity would require a program staff determination that additional contracted training organization locations would benefit the Program, and that budgets allow for expansion.

1.3.3.2 Mid- to High-Level Training

As of March 1, 2012, a total of 100 mid- to high-level training organization locations have been identified in the State, including those already under contract with NYSERDA.³⁰ These organizations represent a mix of colleges, union training organization locations, industry associations, industry training and certification programs and consultants. Of these, 29 (29%) are located downstate, 63 (63%) are upstate and 8 (8%) are located in Long Island. Forty-four percent (44) of these 100 mid- to high-level skills training organizations have contracted with NYSERDA as Workforce Development training partners. Of these contracted organizations, 66% are located upstate, 32% downstate, and approximately 2% in Long Island.³¹ Additionally, two NYSERDA contracted Workforce Development Training Partners are located out of State, but travel to New York State to deliver training. Given the number of identified mid- to high-level training organization locations, if deemed appropriate by program staff, NYSERDA has an opportunity to expand the number of these training partner locations in targeted areas of need statewide.

1.3.3.3 Linkage between Training Organizations and Targeted Employee (Trainee) Groups

To provide some insight into alignment of training organization locations with targeted employee groups included in Section 4 of this report, a series of maps are presented that overlay county-specific locations of training organizations against targeted hard-to-reach/hard-to-serve populations. These maps are presented separately for upstate and downstate regions, and for targeted populations ages 16 to 24 years old and 25 to 64 years old. Results show a number of upstate counties where there is a greater percentage of hard-to-reach/serve populations than there are training organization locations to serve them. These counties include: St. Lawrence, Allegany, Essex, Jefferson, Chautauqua, Franklin, Fulton, Montgomery and Steuben. Similarly downstate, there appears to be a shortage of training organization locations in Kings, Bronx and New York Counties. Through NYSERDA's CEEBS³² training, which is funded under a different funding source, established training hubs in St. Lawrence and Bronx counties, training is offered at multiple locations to address a portion of the training needs of these regions. If further program

³⁰ Mid- to high-level training organization locations providing advanced courses in New York State were identified through extensive internet searches, information gathering from association lists and from a list provided by Pace University. An objective was to identify where and how many organization locations exist in New York State, and through this process 100 mid- to high-level training organization locations were identified.

³¹ Although 2% of the contracted mid to high level training organizations are located on Long Island, EEPS Workforce Development Program does not cover Long Island.

³² CEEBS are NYSERDA renewable training partners funded through a different SBC funding source, located in St. Lawrence and Bronx counties.

expansion is deemed appropriate, contracting with additional Program partner training resources and locations in these counties could yield increased employment opportunity benefits for hard-to-reach/underserved population groups.

1.4 MARKET ASSESSMENT

Market Assessment results help identify Program perceptions and market trends from the perspective of relevant market actors. For this specific study, baseline measurements of key indicators were identified and assessed through telephone surveys with employers in New York State, and with training organizations in the State that, at the time of our surveys, were eligible, but not participated in NYSERDA's Workforce Development Program.³³

The following is a summary of key findings. Section 5 provides more detailed results.

1.4.1 Employers

The population of employers targeted for this market assessment was comprised of companies located within New York State that have employees or hire contractors who perform jobs that are directly or indirectly involved with energy efficient building construction or the design, specification, delivery, installation, or servicing of electric energy using products or equipment within homes or businesses in the State. Such companies could either support or directly provide: (1) building/contractor services (*i.e.*, single/ multifamily builders, commercial/office builders, HVAC contractors, other building equipment contractors, real estate developers and property managers), or (2) engineering and consultant services (*i.e.*, industrial and mechanical engineers, building construction consultants, HVAC engineers, energy conservation engineers and consultants, lighting consultants and electrical contractors). These company categories were chosen because they tend to have a higher concentration of energy efficiency related jobs, as documented by the NYSDOL Green Jobs Report, Brookings and GJGNY Reports.

The types of information gathered through telephone surveys with this market actor group included:³⁴

- Energy efficiency workforce skills
- General awareness of job skills-related training
- Training infrastructure awareness and satisfaction
- Energy efficiency employment plans and practices
- Awareness of NYSERDA and/or broader workforce development efforts

³³ The original work plan for this MCA evaluation effort included assessment of baseline measurement indicators from one additional market actor group, potential employees (*i.e.*, individuals eligible to participate in Workforce Development-support training efforts). For reasons specified in a memo to NYSERDA's Energy Analysis Department Manager for this project, dated December 14, 2011, planned efforts to interview this group were halted. See Appendix A for a copy of the 12/14/11 Halt memo.

³⁴ It is important to note that there was a limited budget for implementing the employer telephone survey component of this Workforce Development Program market characterization and assessment (MCA) effort – \$15,000 of a total \$150,000 MCA project budget. A major objective of this employer telephone survey, therefore, was to collect baseline information from targeted groups of businesses that might make use of the program's training support activities.

- Participation in other SBC-funded initiatives

1.4.1.1 Energy Efficiency Workforce Skills baseline

Involvement with Energy Efficiency Activities

Heating, Ventilation and Air Conditioning (HVAC) contractors, along with Engineers and Consultants, and Builders appear to have the greatest percentage of employees involved in energy efficiency. Eighty-one percent of HVAC firms reported that more than 40% of their employees are involved with energy efficiency activities. Engineers and Consulting firms and Builders also noted that high percentages of their employees are involved with energy efficiency activities. These same employer types reported that high percentages of their company's work is energy efficiency related. A majority of HVAC respondents noted that more than 40% of their firm's work could be categorized as energy efficiency-related. Similarly, more than half of the Engineering and Consulting firms, and 38% of Builders also responded this way.

Although most of these firms report solid levels of involvement with energy efficiency activities, 39% of the Engineers and Consultants, 37% of the Builders, and 55% of the Real Estate Developers and Property Managers reported that energy efficiency activities represented 10% or less of their company's previous year's activities. This may be a potential area of focus for NYSERDA's efforts, where these three employer groups could be targeted with information regarding the value of including energy efficiency as part of their work products and services, or could participate in campaigns to help educate their consumers about energy efficient products.

Similarly, although a majority of HVAC Contractors and Engineers/Consultants report having a lot of experience with energy efficiency-related work, there still remains a substantial percentage of respondents claiming "no," "not much" or only "some" experience. Therefore, from these responses it appears additional skills development and training opportunities remain for a large number of Builders, Real Estate Developers/Property Managers, Engineers/Consultants, and HVAC Contractors.

When asked if their companies attended (or sent employees to) any job training courses related to energy efficiency in the last 12 months, except for Real Estate Developer and Property Manager respondents (where 100% of the limited number the State's largest firms said "yes"), there remains a substantial number of companies in the State that have yet to take advantage of such trainings (46% of HVAC contractors, 55% of Engineers/Consultants and nearly 90% of Builders).

Types of Skilled and Unskilled Positions Being Hired

The most common unskilled (entry-level) positions hired vary by firm type. For Builders, it is laborers, followed by entry-level office support. For HVAC Contractors, residential and commercial construction positions are the most common entry-level jobs their firms fill. Engineers and Consultants identified entry-level office support and commercial construction positions most often. For Real Estate Developer and Property Managers identified entry-level office support as the most common unskilled position they fill.

When asked about skilled positions they filled, building firms identified residential construction, building shell improvement and electrical contractor positions. HVAC contractors identified mechanical and other equipment installation positions. Engineers and Consultants identified energy consultant and building shell improvement positions, and Real Estate Developers and Property Managers identified architectural and engineering services positions.

Energy Efficiency-Specific Hiring Practices

In the last 12 months, 26% of Engineering/Consulting firms, 11% Building firms, and 6% HVAC firms reported hiring new employees for one or more energy efficiency-related positions, along with 67% of the

targeted sample of Real Estate Development and Property Management respondents. The primary source for finding these new employees varied by company type. For Builders and HVAC contractors, word-of-mouth was the most common source. In contrast, Engineers/Consultants and Real Estate Developers/Property Managers relied more on ads and postings. Other sources offered by respondents were web postings, internships and unions.

Of companies that hired employees for new energy efficiency positions in the last 12 months, a majority of respondents said it was either “somewhat difficult” or “very difficult” to find these new energy efficiency-skilled employees. This group was also asked what percent of their skilled and unskilled employees needed additional training.

With respect to unskilled employees, most respondents felt that less than half their entry level (unskilled) employees in energy efficiency-related positions needed more training. Similarly for skilled positions, most said that less than half their skilled employees in energy efficiency-related positions needed additional training. Interestingly however, 63% of HVAC respondents estimated that more than half of these employees needed such training, followed by 36% of Engineers/Consultants, 20% of Real Estate Developers/Property Managers, and 18% of Builders. This could confirm that a demand exists for additional higher-level energy efficiency job skills training, especially among HVAC employees. A similar conclusion for entry-level training can be reached given the fact that 34% of Engineer/Consultants, 30% of Builders and 28% of HVAC respondents identified a need for such training for a large majority of their employees.

Hiring Practices – Hard-to-Reach and Underserved Populations

Respondents were asked a number of questions regarding hiring and employment practices associated with hard-to-reach and underserved populations including: single mothers who are the primary wage-earner in their household, disabled veterans, individuals who were previously unemployed or underemployed and living below the poverty level individuals previously incarcerated, and individuals ranging from 18 to 24 years of age. Results showed that 75% of Real Estate Development and Property Management firms, 56% of Engineering/Consulting firms, 49% of Builders and 40% of HVAC respondents noted hiring from these populations.

Of those respondents that noted hiring employees from these populations, an overwhelming percentage found these new hires either “somewhat prepared” or “very prepared. When asked what percentage of their companies’ employees fell into one, or more of these population groups, Engineers/Consultants had the highest percentage (with 30% of respondents saying that more than 20% of their employees were from these populations). This was followed by Builders (27%), Real Estate Developers/Property Managers (17%), and HVAC (13%).

1.4.1.2 General Awareness of Job-Skills Related Training

Respondents were read a list of job skills training programs in the State including: worker readiness, vocational and technical, sector-based (such as building science and whole-house approach), advanced technical training (including lighting design and retrofits, heat pumps, energy management systems, indoor air quality and ventilation, advanced insulation and air sealing, and commercial cooling systems), and training to address certification and accreditation needs; for example through the Building Performance Institute (BPI), the New York State Builders Association (NYSBA) and Building Operators Certification (BOC) programs. Awareness of these types of programs is high, especially among Engineers/Consultants and Real Estate Developers/Property Managers. The lowest area of awareness was for sector-based training. This could indicate an opportunity area for more targeted outreach and support.

A similar question was asked regarding internships, apprenticeships and other on-the-job training opportunities in the State. Again, respondents reported fairly high levels of awareness for these types of

programs – ranging from 39% to 59% for HVAC Contractors, Builders, and Engineers/ Consultants to 100% for Real Estate Developers and Property Managers.

1.4.1.3 Training Infrastructure Usage and Satisfaction

Usage of New York State’s Energy Efficiency Training Infrastructure

Except for the limited/targeted number of large Real Estate Developer/Property Management respondents (where responses ranged from 33% to 100% usage), training infrastructure usage levels were quite low among Builders, HVAC and Engineers/Consultants. Builders tended to be the group least likely to use training programs, which could provide a targeted market actor audience for additional outreach and awareness efforts.

Participation in one or more skills-based or on-the-job type training programs across respondent company types was fairly low. For skills-based trainings, only the Engineers/Consultants answered that more than 50% of their employees participated in these types of skills-based trainings. Similar low employee participation levels existed across all respondent companies for on-the-job training programs. One reason for low training program participation could be the hiring employers’ belief that training is not important. However, for both unskilled (entry-level) and skilled (mid- to high-level) positions, sufficient training was identified as an important factor respondent companies consider when making hiring decisions. This means that among hiring employers there must be other factor(s), beyond lack of importance, that result in low levels of participation in the State’s training program.

For Builders, lack of information about the training opportunities was identified as the most significant reason why more of their companies’ employees do not participate in energy efficiency skills-related training programs. The second and third most common reasons among Builders were lack of financial aid and high costs of the training programs. For HVAC Contractors, the top three reasons for limited employee participation were time constraints, high cost, and lack of information. Time constraints, lack of demand and high costs were the highest rated reasons for Engineers/ Consultants. Finally, for Real Estate Developers and Property Managers, lack of financial aid was the highest rated reason. Targeting outreach efforts to each of the company types that these respondent groups represent, with messages that address their individual highest priority reasons for limited participation could help improve the uptake and effectiveness of these training programs.

Satisfaction with New York State’s Energy Efficiency Training Infrastructure

In general, respondents overwhelmingly reported that the trainings provided were very valuable or somewhat valuable. It is important to note though, that the only a small number of respondents participated in the various training programs. Similarly, an overwhelming majority said their companies considered the training provided through these types of training programs to be either “somewhat” or “very valuable.” Suggestions offered by respondents to increase the value of the State’s energy efficiency- related training programs included; “make training hands on, specific and targeted,” “advertise training opportunities to increase awareness,” “subsidize the cost and incent companies to send employees for training,” “make more funds available,” and “introduce this to unions in New York (State), because New York is a big union state. ”

1.4.1.4 Energy Efficiency Employment Plans and Practices

Likelihood of Hiring New Energy Efficiency-Related Positions

More than half of the Engineering and Consulting firm respondents indicated that they were either somewhat or very likely to hire employees for energy efficiency related positions. Less than half of all other respondent groups responded this way.

The top four job areas where respondents thought their companies might be planning to increase their energy efficiency hiring were HVAC installation/technicians; energy conservation consultants; equipment installation, maintenance and repair; and skilled commercial construction. Other job areas mentioned include, skilled residential construction, plumbers, project managers, consultants, skilled data analysts, skilled energy efficiency trainers, skilled lighting designers and energy auditors. This information might be useful in guiding the focus of energy efficiency-related job training programs over the next few years.

Barriers Preventing Companies from Hiring More Energy Efficiency-Related Employees

The most common barrier to hiring more energy efficiency-related employees varied somewhat by respondent company type. For Builders, work flow (the current and near future demand for their services) was identified as the most common barrier, followed by money/cost. For HVAC respondents, money/cost was identified as the most common barrier, followed by work flow. Engineers and Consultants also identified money/cost and work flow as the two most common barriers. For Real Estate Developers and Property Managers, no demand or need was identified as the most common barriers, followed by money/cost.

1.4.1.5 Awareness of NYSERDA and/or Broader Workforce Development Efforts

Awareness of NYSERDA and its Energy Efficiency Training Efforts

Awareness of NYSERDA is high, ranging from 56% for Builders to 88% for Engineers/Consultants. But there still remains room for additional outreach, as 44% of Builders and 33% of Real Estate Developers are still unaware. Awareness of NYSERDA's support efforts in the areas of basic skills development through advanced-level energy efficiency training and certifications was substantially lower than the awareness of NYSERDA alone (Engineers and Consultants, only 58% of respondents reported awareness of the training efforts vs. 88% awareness of NYSERDA in general). This drop off in awareness of training efforts vs. NYSERDA in general was even more dramatic for HVAC, Builders and Real Estate Developers/Property Managers. Although NYSERDA supports the training efforts of many training providers, one likely reason for the lack of awareness of this support is the fact that NYSERDA does not "brand stamp" its training support, thus making it invisible from an outsiders' non-NYSERDA program partner perspective. Only a small percentage of the Workforce Development Program's funding is used to provide direct tuition reimbursements (most of the funding goes toward equipment, venue, materials, etc.), therefore it is quite understandable why NYSERDA's training support would not be visible to the targeted organizations and individuals.

When asked how they heard about NYSERDA's energy efficiency training support, the most frequent response was from a past NYSERDA program participant, followed by networking and NYSERDA's web site. Other responses included: direct/live marketing, indirect marketing, internet ads, print ads, from a Workforce Development Program participant they employ, and from vendors and utilities. Although the number of aware respondents was small, this information can help identify potential outreach sources NYSERDA might use to ramp up awareness and marketing efforts.

Awareness of and Satisfaction with Other Energy Efficiency Training Efforts

There is low awareness of other energy efficiency focused training programs in New York State. This is consistent with awareness levels identified regarding NYSERDA-supported training efforts and could point to an opportunity to achieve additional Program uptake through increased outreach. NYSERDA is a resource for information on energy efficiency training and education, and increased outreach to target populations could increase the demand for training. The one exception to this low awareness level was with the limited/targeted group of Real Estate Developers and Property Managers among whom 78% of respondents noted awareness of these programs.

Concerning satisfaction with the availability of conveniently accessible energy efficiency-related training programs in their company's general geographic area, a majority of respondents noted that they were either "somewhat satisfied" or "very satisfied." These responses suggest, however, that there remains substantial opportunity for improvement. Suggestions offered to improve satisfaction included: providing more information/awareness, offering more convenient time slots and increasing availability, providing more local/accessible sites, and making training for affordable or increasing available funding.

1.4.1.6 Participation in Other NYSERDA and New York State Utility-Funded Initiatives

Slightly more than half the HVAC Contractors and Engineers/Consultants, and 78% of the Real Estate Developers/Property Managers reported having worked with NYSERDA or other New York State utilities on energy efficiency projects prior to the survey. Only 18% of the Builders interviewed said they had done so. This means there remains a substantial population of Builders and nearly half of the HVAC Contractors and Engineers/Consultants that have not taken advantage of any of the available NYSERDA or utility energy efficiency program support. When asked to identify the specific programs they participated in, most recalled Con Edison or NYSERDA in general, or the specific FlexTech and Existing Facilities initiatives.

1.4.2 Training Organizations

The population targeted for this market assessment was made up of training organizations not currently under contract with NYSERDA as Workforce Development Program training partners. These organizations may or may not currently include energy efficiency components within their training curriculum, but are all viewed as having the potential to include these components in the future.

The types of information gathered through telephone surveys with this market actor group included:

- Training practices – types offered, energy efficiency inclusion, tuition aid offered/used, hard-to-serve/underserved populations trained, pre-training interest in energy efficiency of training participants, barriers to expansion of existing and development of new training efforts, need for more energy efficiency materials and training venues
- Training trends and plans – assess change in demand for energy efficiency training, drivers of change, planned response to change
- Trainee interest in energy efficiency – post training (from training organization perspective)
- Energy efficiency employment placement and opportunities for trainees – jobs found, job types, specific training organization outreach and trainee placement activities, job opportunity trends
- Awareness of NYSERDA and/or broader energy efficiency training infrastructure and associated workforce development efforts – general awareness, source of awareness and level of awareness

1.4.2.1 Firmographics and Training Practices

Training Organization Firmographics

Forty-one training organizations participated in the market assessment telephone surveys including 28 entry-level, and 13 mid-to high-level organizations. A majority of these organizations report having only one single location. Of those organizations having more than one location, 30% of the entry-level respondents report having two to four locations, none report having five or more, and 14% of the mid-to high-level organizations report having three locations and the remainder reported having between 5 and 13 locations.

When asked approximately how many training classes respondent organizations offered across all their New York State locations during the past twelve months, a majority of entry-level respondents said they

offered 20 or less. The mid- to high-level training organization respondents typically offered 21 or more classes.

Respondents were asked to estimate the number of job placements made by their organizations statewide over the past 12 months. They were also asked, of those job placements, how many were for energy efficiency-related positions. A majority of both entry-level and mid- to high-level respondents said they had 20 or fewer job placements over the past 12 months. Of those job placements, most were not in energy efficiency-related positions. The mid- to high-level training organizations reported having made more energy efficiency-related job placements than the entry-level respondents (42% of mid- to high-level respondents reported making 21 or more of such placements during the past 12 months vs. only 16% of the entry-level respondents).

Skills and Areas of Training Offered

Respondents were asked to identify the types of skills and areas that their organizations offer training in. The top four offerings among entry-level training respondents were worker readiness, certification/ accreditation, sector training, and vocational/ technical skills. For mid-to high-level training organizations, 100% offered certification/ accreditation training, 93% offered sector training, and 82% offered advanced technical and vocational/ technical skills training. For each type of training offered, respondents were asked how often they included energy efficiency elements within their training materials.

For entry-level training organizations, a majority of respondents stated that their materials either “sometimes” or “always” include energy efficiency elements. This is most prevalent with field training and sector training. However, there remains a large percentage, across all entry-level training types, where energy efficiency elements are lacking. For mid- to high-level training organizations, a majority of respondents believed that energy efficiency elements are “always” incorporated within training activities. Looking across both “sometimes” and “always” responses, nearly all training activities received responses that added to 100% of the time. One exception is with worker readiness training, for which respondents stated that only 42% “always” and 48% “sometimes” include energy efficiency elements (and just under 10% “never” include such elements).

Based on survey results, there appears to be a greater need to work with entry-level training organizations to explain the value and need to incorporate energy efficiency elements into training curriculum, than with mid- to high-level organizations. One reason for this need for entry-level training organization support could be the substantial reduction in NYSDOL funding in recent years for additional entry-level training support. Although this market characterization and assessment evaluation looked at a broad range of non-NYSERDA supported training providers, discussion with current participating entry-level training partners could prove beneficial in identifying barriers and effective strategies for incorporating energy efficiency components into the trainings of their targeted participants. A closer look at the actual energy efficiency components incorporated into higher level training curriculum might reveal a need and strategies for outreach to this mid- to high-level group as well.

Potential Factors Motivating New Trainees to Learn Energy Efficiency Job Skills

According to entry-level training organization respondents, the top three factors motivating or driving new trainees to come to learn energy efficiency-related job skills include: 1) a perceived need for more skilled workers for energy efficiency jobs in New York State, 2) a general increased awareness and demand for energy efficient products and services, and 3) an existing employer’s (for trainees currently employed) request to take training. When asked which of these factors was the single most important reason new trainees may be interested in learning energy efficiency related skills, respondents identified their employer’s request.

The top three motivators noted by mid- to high-level training organization respondents were: 1) existing employers' (for trainees currently employed) request to take training, 2) a general increased awareness and demand for energy efficient products and services, and 3) a perceived need for more skilled workers for energy efficiency jobs in the State. Availability of training/tuition subsidies was also mentioned as a major motivator by more than half the respondents. When asked which the single most important reason was, respondents identified training/tuition subsidies.

Potential Factors Limiting Organizations' Ability to Expand Energy Efficiency Training

According to entry-level respondents, the top three factors that might be limiting their training organizations' ability to maintain or expand training programs that include energy efficiency-related components include: a lack of funding to hire and train trainers, lack of financial aid, and higher priority of other topics. The top three items identified as not being factors at all include: "too many competing organizations offering similar training programs," "lack of demand for energy efficiency-related training services," and "lack of qualified trainers available."

The top three major factors identified by the mid- to high-level skill training organizations respondents are: 1) lack of financial aid, 2) too many competing organizations offering similar training programs, and 3) lack of funding to hire and train trainers. Similar to the entry-level respondents, neither "lack of demand" nor "lack of qualified trainers," are identified as factors at all.

The single most important factor limiting both entry-level and mid- to high-level training organizations' ability to maintain or expand training programs that include energy efficiency-related components is "lack of available funding to hire and train trainers." Through careful review and prioritization of the factors identified by respondents in this section, the Program may be able to develop strategies to help organizations overcome key barriers preventing them from expanding their energy efficiency training efforts.

Importance of Energy Efficiency-Related Training Materials

When asked to rate the importance of having energy efficiency-related training materials (including curricula) available for their organizations' use, both entry- level and mid- to high-level training organization respondents rated the importance of having these materials as at least moderately high.

Training Promotion Approaches

For entry-level training organizations, presentations to potential trainees or organizations representing such trainees, and referrals or relationships with One-Stops³⁵ were identified as being the most effective approaches being used to promote their training programs. Web sites and print ads were reported as the least effective. This may suggest more effective targets for web sites and print ads could be One Stops, career counselors, guidance counselors, etc., instead of the consumer.

Similar to entry-level respondents, mid- to high-level training respondents identified presentations as the most effective approach for promoting their training programs. However, although web sites were identified as being the least effective promotion approach for entry-level organizations, they were

³⁵ New York State, Department of Labor One Stop Career Centers protect workers, assist the unemployed, and connect job seekers to jobs. The NYSDOL has information and free services for job seekers and workers. One Stop's offer resume help, career guidance, job placement training referrals and apprenticeships, www.labor.ny.gov/.

identified as an extremely effective promotion venue for mid- to high-level respondents. Print ads were identified by this group, similar to entry-level respondents, as being the least effective.

Targeted Training Audiences – Hard-to-Reach and Underserved Populations

Respondents were asked a series of questions relating to their organization's training activities for hard-to-reach and underserved populations, as previously defined above. Less than half of the training organization respondents said that their organizations specifically targeted any of these hard-to-reach and underserved populations for training that includes energy efficiency components. Of those respondents that reported targeting these populations, the top three groups identified by entry-level training organization respondents were "the unemployed," "previously incarcerated" and "18 to 24 year olds." For mid- to high-level respondents, the top two responses were "18 to 24 year olds" and "disabled veterans". The top two course types identified by entry-level respondents as being offered to these targeted populations were "worker readiness" and "weatherization." For mid- to high-level respondents, "apprenticeships" was the most reported course type, followed by "weatherization" and "energy auditing, "building analysis and multi-family auditing."

When asked what percentage of their courses' total number of trainees came from each of the targeted hard-to-reach populations, entry-level respondents said that 81% of "unemployed," 59% of "18-24 year olds," and 32% of "previously incarcerated" populations fell into the "20% or more category." This is consistent with the populations targeted for these classes. For mid- to high-level respondents, 81% of "18 to 24 year old" and 31% of the "unemployed" populations fell into the "20% or more category." When compared against the targeted populations, it is noteworthy that "disabled veterans" are not mentioned as one of the populations that fell into the "20% or more" category – meaning additional outreach to this hard-to-reach population group might be important, since returning veterans are a target group that is a top priority for the Department of Labor.

Finally, regarding the hard-to-reach populations, respondents were asked, prior to participation in their organizations training programs, to assess how aware they thought that people from these groups were about employment opportunities in an energy efficiency-related field. Opinions on the awareness of employment opportunities in energy efficiency varied greatly among the interviewed training organization managers. Respondents perceived that awareness by hard-to-reach populations was very low across both the entry-level and mid- to high-level with only 8% of entry-level respondents and 0% of the mid- to high-level respondents saying "very aware." Given that these populations are considered "hard-to-reach," this result is not surprising. However, it does suggest that additional efforts should be made to increase awareness among these groups if the Program is to succeed in its efforts to serve these populations.

Financial Aid Offerings, Sources and Utilization

Overall, 27% of training organizations offer financial aid to individuals who may not otherwise be able to afford training.

The most common source of financial aid for entry-level training comes from federal or state funding (48%). Federal and State funding was also the most common source of financing noted by mid-to high-level respondents (27%). Forty percent of the entry-level and 27% of the mid- to high-level respondents also said that the aid comes directly from the training organization itself. Another source, identified by 45% of the mid- to high-level respondents is a "joint labor management fund."

1.4.2.2 Training Trends and Plans

Need for Additional Energy Efficiency Trainings

A large majority of non-participant training organization respondents believe that there is a need for additional energy efficiency training opportunities in the area(s) their organizations serve. The most common reason why respondents feel this way is that there is “not enough training to meet demand.”

When asked if more students were brought to their organization, would they be able to handle the increased demand, 100% of the mid- to high-level training organizations said “yes.” However, less than half of the entry-level respondents said “yes” and 40% of them said “no.” This means that additional training infrastructure development support may be needed within the entry-level organizations for sufficient supply of training to be maintained and meet the Program’s anticipated increased demand for energy efficiency training opportunities among basic skills/new job entrants.³⁶ As noted previously, one reason for this greater need for entry-level training organization support could be due to a substantial reduction in funding from the NYSDOL in recent years to support additional training.

Changes in the Number of Training Requests of Last 12 Months

Across both entry-level and mid- to high-level respondents, increased demand has been seen within every training type. The greatest increases occurred in requests for internships and apprenticeships, followed by advanced technical training, training to meet certification/accreditation needs, and for vocational/technical skills. Interestingly, a number of respondents also reported “no change” or even a decrease in requests for their training services – especially in the “train-the-trainer” area for entry-level organizations, and the “sector-based training” area for mid- to high-level organizations.

Of respondents indicating requests have increased for at least one of their organizations’ training programs, 58% of mid- to high-level and 49% of entry-level respondents the major source for these increased requests were from employers.

Likelihood of Expansion or Development of New Training Programs

Seventy-six percent of the mid- to high-level and 54% of the entry-level respondents said they were “very likely” to expand or develop new training programs to meet increased demand they have seen in the last 12 months. Interestingly, 27% of the entry-level respondents said they were “not likely” to expand. For those that said they were not likely to expand, reasons for this response included: budget constraints, insufficient increase in demand, and lack of jobs in which to place trainees.

Trainee Interest in Energy Efficiency – Post Training

Looking across all training organization respondents, there appears to be a high level of interest in energy efficiency-related jobs among trainee that completed their programs.

The percent of entry-level skill trainees interested in seeking or continuing energy efficiency-related employment ranged from a low of 47% (worker readiness trainees) to a high of 69% (field trained trainees). Respondents whose organizations offered worker readiness training reported the greatest percent of trainees “not interested” (27%) in energy efficiency-related employment.³⁷ This potentially identifies an area where NYSERDA’s Workforce Development Program could provide additional

³⁶ Actual demand for training may not match the perceived demand posited by survey respondents.

³⁷ Note – the “not interested” category includes “not too interested” and “don’t know” responses.

information regarding the benefits and opportunities available for incumbent worker training within the energy efficiency jobs field.

The percent of mid- to high-level respondents that said trainees completing their organizations' programs were interested in seeking or continuing employment in an energy efficiency-related field was quite high, ranging from 76% (internship or apprenticeship trainees) to 100% (advanced technical trainees). Respondents whose organizations offered internship training reported the greatest percent of trainees "not interested" (24%) in energy efficiency-related employment. This suggests that a closer look at the internship and apprenticeship positions might be warranted.

1.4.2.3 Energy Efficiency Employment Placement and Opportunities

Trainees Finding Employment in Energy Efficiency-Related Fields

A majority of respondents believe that of their organizations' trainees not previously employed in an energy efficiency-related field were able to find jobs in energy efficiency in the last 12 months. Positions that respondents report these trainees were hired into included jobs in the areas of office support, various skill levels of construction, equipment installation and repair. These job types have been identified as growing occupations by the US Census and NYSDOL Green Jobs Report.³⁸ Positions in "building shell improvement" were mentioned most by both entry-level and mid- to high-level respondents as a job type where trainees have found employment, followed by "equipment installation, maintenance and repair." For mid- to high-level respondents, other common job types included "HVAC installation/technician," and "general residential construction/skilled" and general commercial construction/skilled." While it is difficult to say all these jobs are energy efficiency related, the construction industry has the highest concentration of energy efficiency jobs compared to other industries.

Internships and Job Placement Arrangements

Only 29% of mid- to high-level and 17% of entry-level respondents said their organizations have specific internships or job placement arrangements with businesses or organizations involved in the energy efficiency field. Since employers often look for experience and frequently hire interns for permanent employment, the fact that most training organizations do not have active internship or job placement arrangements with businesses in the State provides a potential focus point for the Program.

For those entry-level respondents that said their organization has specific internship or job placement arrangements, such arrangements include: on-the-job training work for window replacement and construction companies, property management firms, weatherization and building management companies and with utilities. Arrangements described for mid- to high-level skill trainees include: those available through union labor management agreements, electrical contractors, and equipment installation firms. In cases where NYSERDA is not already familiar with these arrangements, additional research could be conducted to identify and leverage the strengths of each so that additional targeted internships and job placement arrangements can be developed.

When asked how effective these arrangements were, 77% of the mid- to high-level training organization respondents that had internship arrangements said they were "very effective." In contrast, only 19% of

³⁸ New York State Department of Labor- Division of Research & Statistics. 2011. "New York State Green Jobs Study, a Report for New York State", <http://www.labor.ny.gov/stats/green/index.shtm>.

the entry-level respondents reported that these arrangements were “very effective,” while 61% reported that they were “somewhat effective.”

Respondents whose organizations had internship or job placement arrangements were asked if they would be able to expand these arrangements if resources and funding were made available to their organization for on-the-job skills training, and all responded “yes.” When asked to estimate how many more workers they might be able to place each year in energy efficiency-related jobs, 77% of mid- to high-level and 61% of entry-level respondents said each of their organizations could place between 11 to 25 additional trainees. On either end of this range, 19% of the entry-level respondents said they could place more than 50 trainees and 19% said they could place between 6 and 10, and 23% of the mid- to high-level training organization respondents said they could only place between three and five. The most common areas identified by entry-level respondents where these additional job placements would occur include: general commercial construction, general office and project administrative support, building shell improvement, HVAC installation/technician, electrical contractor, and property management/real estate development positions. For mid-to high-level respondents, the most common areas are residential and commercial construction. According to the US Census and NYSDOL Green Jobs Report, these job areas are all expected to grow nearly 6% in the next few years.

Energy Efficiency Employment Opportunities Growth Projections

More than half of all mid- to high-level respondents and 46% of entry-level respondents believe that employment opportunities in energy efficiency-related fields will increase over the next twelve months. Only 7% of mid- to high- level and 17% of entry-level respondents felt there will be a decrease and approximately a third said there would be no change. One could view this as a positive outlook and an opportunity for the Program to continue its skills development efforts to meet this perceived increase in need.

1.4.2.4 Awareness of NYSERDA and/or Broader Workforce Development Efforts

Awareness of NYSERDA and its Energy Efficiency Training Efforts

Awareness of NYSERDA was extremely high among all non-participating training organization respondents (100% of both entry-level and mid- to high-level respondents were aware of NYSERDA before their participation in this project’s telephone survey effort). Similarly, a large majority of respondents were also aware that NYSERDA provided support for basic skills development through advanced-level energy efficiency training and certifications (93% of mid- to high-level and 76% of entry-level).

When asked how these entry-level respondents heard about NYSERDA’s energy efficiency training support, being a past NYSERDA participant, networking, and NYSERDA’s website are the top three sources identified. For mid- to high-level respondents, the top three sources include: NYSERDA’s website, past NYSERDA program participation, and information from the NYS Department of Labor.

Although a large majority of training organization respondents are aware that NYSERDA provides support for energy efficiency skills development, a much smaller percentage said they are “very familiar” with those efforts. Slightly more said that they are “somewhat familiar, indicating that there remains substantial opportunity to inform and recruit an increased number of training organizations as partners with NYSERDA’s Workforce Development Program efforts.

Awareness of Other Energy Efficiency Training Efforts

Entry-level respondents are substantially more aware of other programs in New York State that provide training in basic or advanced job skills in the energy efficiency field than are mid- to high-level training organization respondents. Some of the programs mentioned by both entry-level and mid- to high level training respondents include: The New York State Weatherization Directors Association (NYSWDA), the

Building Performance Institute (BPI), Association for Energy Affordability, Mason Tenders Training Fund Labor's Local 10, Green Jobs Training Center, Community Colleges, and National Grid. Wherever possible, NYSERDA's Program should continue to coordinate and leverage resources within and across these other programs. It is interesting to note that many of these efforts are funded through NYSERDA's Program, but were identified by these non-participating training organization respondents in the category of "other (non-NYSERDA) programs". Since NYSERDA's intention is to support training and not necessarily highlight NYSERDA's involvement, the lack of awareness among non-participants of NYSERDA is understandable.

1.5 RELATIONSHIP TO SELECT INDICATORS AND RESEARCHABLE ISSUES

Results generated during the market characterization and market assessment efforts can typically be related back to relevant outputs and outcome indicators and researchable issues presented in the Program logic model. Results can be used to help validate the reasonableness of Program design and inform Program staff and stakeholders of Program progress achieved to date. In addition, results can be used to identify potential areas for Program refinement. At this point in the evaluation cycle of NYSERDA's Workforce Development Program, important *baseline* information has been collected (as highlighted above and presented in more detail in the remainder of this report). Overall, results from this initial study seem to indicate that the Workforce Development Program, operating in concert with other NYSERDA and broader statewide training efforts, is effectively providing the State's present and future workforce with technical skills that will be important to meet the expanding needs of programs funded through the broader EEPS efforts – both NYSERDA's portfolio of EEPS-funded Programs as well as utility programs funded by EEPS. Activities supported through NYSERDA's Workforce Development Program-funded efforts appear to identify and address barriers to workforce training. These efforts also appear to be expanding the existing energy efficiency training infrastructure across the State (in both the residential and commercial/industrial sectors), and helping to create a workforce in the State that is skills-ready to meet the employment needs of the energy efficiency industry. In addition, they are providing support to the unemployed, underemployed, hard-to-serve, and under-served populations. However, actual *changes* in the availability and market for skilled resources, and associated awareness, practices, perceptions, satisfaction, and impacts, etc. will need to be determined in subsequent evaluations, building off the baseline findings compiled herein.

SECTION 2. INTRODUCTION AND PROGRAM DESCRIPTION

The New York State Energy Research and Development Authority (NYSERDA) is a public benefit corporation established in 1975 that administers System Benefit Charge (SBC) funds, including the **New York Energy \$martSM** Program (since 1998) and a number of more recent Energy Efficiency Portfolio Standard (EEPS) Programs under an agreement with the New York State Public Service Commission (PSC). It also oversees the evaluation of the effort on behalf of an SBC Advisory Group that, pursuant to PSC Order, is the independent evaluator of these Programs.

During 2008, several changes arising from the PSC's EEPS proceeding have affected NYSEDA's **New York Energy \$martSM** Program portfolio and evaluation efforts. The PSC's June 23, 2008, EEPS Order called for an increase in SBC collections and a ramp-up of program efforts by NYSEDA and the State's six investor-owned electricity transmission and distribution utilities to meet New York State's "15-by-15" electricity reduction goal. NYSEDA complied with the PSC's Order by submitting a Supplemental Revision to the SBC Operating Plan, incorporating approximately \$6.6 million per year in additional funds for workforce development efforts.

In the past, NYSEDA provided workforce training largely on a per-program basis, with training funds contained within efficiency program budgets. The additional funds available by the EEPS allowed training to be available outside of specific program budgets.³⁹ This additional funding is in line with actions taken by other public administrators to start or enhance training programs to increase the size of the energy efficiency workforce to meet the demand for skilled workers in energy efficiency created by increases in funding for energy efficiency work.⁴⁰

NYSERDA's EEPS funded Workforce Development Program works in tandem with the SBC funded Workforce Development Program and with the New York State's Green Jobs Green New York training program, to enhance the skill level of men and women to meet the needs of the energy efficiency job market. NYSEDA's Workforce Development Program focuses on electric energy efficiency jobs and differs from the other training programs, which promote training efforts for "Green" jobs including renewables.

NYSERDA contracted with a team under the direction of Navigant Consulting to conduct Market Characterization and Market Assessment (MCA) studies for the SBC and EEPS-funded Programs. NYSEDA has also contracted with Research Into Action as prime contractor for SBC and EEPS-funded Process evaluation studies. GDS Associates, Inc., as part of the Navigant team and in conjunction with Research Into Action, has been the lead contractor for this current MCA study for the Workforce Development Program as part of a combined Process and MCA evaluation work plan for this program. APPRISE Research, NYSEDA's project evaluations survey contractor, also provided assistance with this MCA evaluation effort, specifically with respect to telephone survey sample design, instrument testing and implementation.

³⁹ New York Public Service Commission, "Order Authorizing Workforce Development Initiatives." State of New York Public Service Commission. Session held in Albany, New York on June 18, 2009. Issued and effective on June 22, 2009.

⁴⁰ Goldman, C. et al. (2010). Energy Efficiency Services Sector: Workforce Size and Expectations for Growth. Lawrence Berkeley National Laboratory. Accessed on July 28, 2011 from <http://eetd.lbl.gov/ea/ems/reports/lbnl-3987e.pdf>.

The focus of this MCA report is on the market and context within which the Workforce Development Program operates. Results from this report assess the validity of Program assumptions regarding market characteristics, provide details regarding market structure and opportunities, and establish baseline measurements of key indicators. These results can be used in subsequent evaluations to assess progress towards meeting the PSC's public policy goals under which NYSERDA operates, as well as the institutional goals NYSERDA has established to move markets toward improved energy efficiency. In addition, the evaluation results can be used by NYSERDA program staff and managers to adjust program implementation as needed to ensure maximum market interest and uptake of Program offerings.

The remainder of this report is organized in the following manner

- Section 2.1 provides a more detailed description of NYSERDA's Workforce Development Program
- Section 3 discusses the primary and secondary data sources used to evaluate the Workforce Development Program, sample selection, and data collection implementation processes
- Section 4 presents findings regarding the basic characteristics of the Workforce Development Program market and associated market actors
- Section 5 examines the key market assessment indicators and researchable issues developed for the Workforce Development Program including identification of key baseline values from which changes can be assessed over time
- Section 6 presents a summary of findings and identifies potential actions for consideration by program staff derived from the MCA evaluation

2.1 PROGRAM DESCRIPTION

In its June 2009 *Order Authorizing Workforce Development Initiatives*, the New York State Public Service Commission (Commission) approved an Energy Efficiency Portfolio Standard (EEPS)-funded Workforce Development Program to be administered by NYSERDA.⁴¹ More broadly, EEPS is a statewide energy efficiency initiative (one of the most aggressive in the nation) that seeks to reduce electricity usage in the State by 15% from a base year of 2007, by the year 2015. New York State's EEPS Program was created with both immediate and long-term goals in mind: to augment near-term efficiency measures and to develop and encourage cost-effective energy efficiency over the long term. To meet these goals, NYSERDA is implementing a variety of programs to improve energy efficiency throughout the State, including the Workforce Development Program. Creating a workforce that can implement energy efficiency measures in residential and commercial markets is an important part of meeting EEPS goals.⁴²

Goals of the EEPS-funded Workforce Development Program are focused on: overcoming barriers to workforce training, expanding the existing energy efficiency training infrastructure across the State in both the residential and commercial and industrial sectors, and increasing employment opportunities in energy-efficiency occupations, especially among the State's unemployed and underemployed populations.

⁴¹ Case 07-M-0548 Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio Standard, *Order Authorizing Workforce Development Initiatives*, issued June 22, 2009.

⁴² NYSERDA PON 1817 – Energy Efficiency Career Pathways Training and Technical Training.

These efforts are being implemented to provide the State's present and future workforce with technical skills that will be important to meet the needs of NYSERDA's portfolio of programs funded through the broader Energy Efficiency Portfolio Standard. In addition, NYSERDA's EEPS-funded Workforce Development efforts are part of broader workforce development activities implemented in cooperation with numerous other organizations across the State. These other organization activities include, but are not limited to, coordinating with union and trade groups to add more training locations and energy efficiency and building science classes (and on-line training), working with community colleges to add and expand training centers (including train-the-trainer initiatives), developing internship and apprenticeship opportunities to provide on-the-job training for energy efficiency services, and working closely with community-based organizations and environmental justice communities and organizations to develop basic skills courses to provide pathways out of poverty (supporting certification and professional development).⁴³ To the greatest extent practicable, NYSERDA is working in collaboration with these other activities to leverage resources and maximize achievement of common goals.⁴⁴ Additionally, EEPS funds are leveraged by existing efforts under the System Benefits Charge (SBC) as well as under the 2009 Green Jobs Green New York (GJGNY) Act which includes workforce development funded under the Regional Greenhouse Gas Initiative (RGGI).

The NYSERDA, EEPS-funded Workforce Development Program began in 2010 and consists of two main components: 1) Career Pathways for Disadvantaged Workers (including basic skills training, train-the-trainer, and internships and apprenticeships), and 2) Technical Training (including certifications and reimbursements, cooperative advertising, and internships and apprenticeships). These program components are funded through both Program Opportunity Notice (PON) 1816 – Workforce Development Training Partnerships for Energy Efficiency, which includes up to \$3,812,410 in EEPS funding for technical energy efficiency training, internships and apprenticeships, limited cooperative advertising, and certification reimbursements for technicians, building operators, and other professionals supporting the building efficiency trades; and PON 1817 – Energy Efficiency Career Pathways Training and Technical Training, which includes \$1,250,000 in EEPS funding for “Career Pathways for Disadvantaged Workers” training to help develop the necessary basic skills to prepare new and displaced workers for more technical energy efficiency classes, courses and career pathways.

The “Career Pathways for Disadvantaged Workers” Program⁴⁵ component offers “worker readiness skills” training, including workplace preparation, teamwork, problem solving, time management and, conflict resolution. In addition, Career Pathways provides basic education, vocational and technical skills training, in the context of training for advancement to better jobs, the next training step, and certification, to serve low-income applicants with a priority to serve unemployed and underemployed individuals

⁴³ NYSERDA, EEPS Workforce Development Operating Plan, Supplemental Revision August 21, 2009.

⁴⁴ NYSERDA, New York's System Benefits Charge Programs Evaluation and Status Report, Quarter Ending March 31, 2010, Final Report May 2010. Section 2.3, page 2-18.

⁴⁵ Description of Career Pathways and Bridge Programs, as stated in the US DOL Solicitation for Grant Applications (SGA) for Career Pathways, as noted in the recent report, Funding Career Pathways and Bridge Programs, “Ideally, career pathways are not a separate program, but a framework for weaving together adult education, training, and college programs that are currently separated into silos and connecting those services to employers' workforce needs” (CLASP, May 2010). According to the Bureau of Labor Statistics, one third of all job openings and nearly half of all new jobs that will be created between 2008 and 2018 will require a postsecondary degree or credential. Career pathways are an approach to linking and coordinating education and training services in ways that enable students to attain such credentials, and which support students in obtaining employment.

(“hard-to-serve” and “under-served”), increasing student access to postsecondary programs, credential programs, college certificate programs, apprenticeships or job placement.⁴⁶ NYSERDA works closely with the New York State Department of Labor (NYSDOL) to leverage other state and federal funds and training programs to develop training for workers and emerging workers through the DOL’s One Stop Career Centers and the State’s Workforce Investment Boards (WIBS).⁴⁷

The Technical Training program component funds technical energy efficiency training, internships, apprenticeships, limited cooperative advertising, and certification reimbursements for technicians, building operators, and other professionals supporting the building efficiency trades. Competitive solicitations are issued to award funding for new training initiatives with new organizations for innovative programs and expanding curriculum development. In addition, Training Partnership Programs are funded to quickly increase the number of energy efficiency training opportunities currently being delivered by established workforce training organizations across the state.⁴⁸ Funding is available through this program component for cooperative advertising to effectively market training programs, and for new and incumbent workers (potential students) to fund expenses associated with first-time certification examinations or to fund preparatory courses for certification exams.

More detail in regards to each Program component is provided below. Overall, NYSERDA’s Workforce Development efforts funded through EEPS include the following initiatives:⁴⁹

Career Pathways for Disadvantaged Workers Program Components:

- 1) Career Pathways for Disadvantaged Workers (Basic Skills Training) – EEPS Workforce Development funds were available for “worker readiness skills” training, including workplace preparation, teamwork, problem solving, time management, conflict resolution, as well as basic education, and vocational and technical skills training with a specific vocational objective. Each proposal needed to demonstrate a “Pathway” toward continued technical training, showing the transition to the next step and increasing student access to postsecondary programs, credential

⁴⁶ The terms “hard-to-serve” and “under-served” populations are defined by the Workforce Investment Act (WIA). These terms include individuals with language barriers, the homeless, offenders, etc. If a local area has a priority of service and limited funding, these populations would be served first. The low income designation refers to households with an income equal to or lower than 80% of state or area median income, whichever is greater. This equals an income of nearly \$60,000 per year for a family of 4 in most NYS counties and higher in some downstate counties.

⁴⁷ NYSDOL One Stop Career Centers are career placement offices located around the state to help job seekers with a number of job seeking and placement services. These centers and Workforce Investment Boards (WIBS) were established as part of the Federal Workforce Investment Act of 1998. WIBS are located regionally by state and are comprised of local private sector business representatives. Their function is to represent local business interests and assist in identifying work opportunities in each region. In New York State the One-stop network and WIBS are administered through the NYSDOL. In the Workforce Development, the One Stop Centers and WIBS will collaborate with NYSDOL to help target workers to participate in energy efficiency training and certification programs through NYSDOL Pathways or NYSERDA programs.

⁴⁸ Training Partners willing to also serve Career Pathways.

⁴⁹ PON 1816 and PON 1817.

programs or occupations. Funds under this initiative were provided to serve low-income applicants with a priority to serve “hard-to-serve” and “under-served” populations, supporting the broader goals of EEPS.

- 2) Train-the-Trainers for Career Pathways – EEPS Workforce Development funds were available for “train-the trainer” initiatives including training existing trainers and additional trainers at two- and four-year colleges, Boards of Cooperative Educational Services (BOCES) and technical high schools, union training facilities, and trainers working with various energy efficiency trades. Topics included field training and support for HVAC, plumbing, motors, lighting, electricians, and sector based training such as building science and “whole-house approach” training, and training to address certification and accreditations needs.
- 3) Internships and Apprenticeships Programs (both Career Pathways and Technical Training) – EEPS Workforce Development funds were available for the related instruction component of existing apprenticeship training programs registered under the NYSDOL. Internships were intended to link academic and work experience. In order to qualify for EEPS Workforce Development funds, internships had to be paid by businesses for a minimum of six weeks providing workplace learning in an area of student career interest or preparation. The internships and apprenticeships funded had to help meet the expanding market and labor needs in support of EEPS goals. Pre-apprenticeship programs, On Job Training (OJT), and other skill-based progressive learning programs sponsored by prospective employers may also be funded.

Technical Training Program Components:

- 1) Technical Training Programs (New and Existing) – EEPS Workforce Development funds were available for new and currently certified technical training programs needed to support energy efficiency goals under EEPS. Training could also complement existing training programs. Some examples of technical training needs in both the commercial and residential sectors included, but were not limited to: lighting design and retrofits, heat pumps, steam and hot water system diagnostics, temperature control systems, energy management systems, indoor air quality and ventilation, high efficiency smart appliances, advanced insulation and air sealing techniques, commercial cooling systems, and motors, among others. A number of certification courses were also currently offered by the Center for Energy Efficiency and Building Science (CEEBS) network in Building Analyst, Envelope Professional, Heating and Cooling Professional, Home Energy Rating System Rater (HERS), among others.⁵⁰

⁵⁰ The CEEBS Network is group of 11 community colleges and other groups that have a number of contracts with NYSERDA to provide training programs in the building sciences. The group is discussed in more detail in section 2.1.1.

- 2) Curriculum Development – EEPS Workforce Development funds were available for expanding current building science curriculum delivered through the CEEBS network and other certified training entities and may include the following topics: benchmarking, lighting design, lighting retrofits, green motors, HVAC, retro-commissioning, building envelope, hydronic systems, heat pumps, kitchen equipment efficiency, ENERGY STAR[®] Homes, weatherization, business support and related training.
- 3) Continuing Education Courses (PON 1816) – EEPS Workforce Development funds under this initiative were available for approved continuing education courses, delivered through the CEEBS network and other certified training entities.
- 4) Certification and Certification Review Courses (PON 1816) – EEPS Workforce Development funds were available to support training organizations that teach curriculum accredited and approved by a third party and leading to certification. Partial certification fee reimbursement for individuals were available for successful completion of all certification requirements for certifications and accreditations relevant to energy efficiency skills and competencies necessary to support EEPS. Cost-sharing expenses associated with first-time certification examinations for new and incumbent workers, and certification exam preparation courses were also available.

NYSERDA's EEPS-funded Workforce Development Program is projected to train and certify approximately 6,200 workers by October 31, 2012.⁵¹

⁵¹ See [http://www.getenergysmart.org/Files/GreenJobs/Workforce DevelopmentOperatingPlan.pdf](http://www.getenergysmart.org/Files/GreenJobs/Workforce%20DevelopmentOperatingPlan.pdf) for a copy of the Operating Plan. Accessed on October 25, 2011. EEPS extension granted from June 30, 2012 to October 31, 2012.

Table 1 below presents a more detailed list of the Workforce Development Program activities that are being implemented within and across the Program's Career Pathways and Technical Training component areas. These activities are grouped into five main areas: 1) Coordination and Collaboration Activities, 2) Marketing, Outreach and Education Activities, 3) Activities Associated with Expanding and Leveraging New and Existing Programs, 4), Financial Incentives Activities, and 5) Monitoring, Evaluation, and Verification Activities.⁵²

⁵² Energy Efficiency Portfolio Standard Workforce Development Program Logic Model, Final Report, Prepared by GDS Associates, Inc., December 2010.

Table 1. Workforce Development Program Activities

Coordination and Collaboration Activities
<p>Work closely with NYSDOL, Local Workforce Investment Boards (WIBS), One Stop Career Centers and other EEPS Working Group members on workforce development efforts to establish a comprehensive training agenda for New York State that supports existing and planned energy efficiency programs</p> <p>Work with NYSDOL, in coordination with broader GJGNY efforts, to target employers facing job reductions and work with human resource departments and local partners such as community-based organizations (CBOs) to deliver training on basic skills and technical and advanced skills</p> <p>Work with WIBs and One Stop Centers to potentially identify training matches for underserved populations</p> <p>Work with unions and trade groups to add more training locations, and provide additional energy efficiency and building science classes and certification opportunities</p> <p>Work, in coordination with broader GJGNY efforts, with CBOs, state agencies, Community Development Organizations (CDOs), housing advocates and energy service providers to encourage participation in energy efficiency programs, facilitate awareness of workforce training opportunities, and assist with enrollment</p> <p>Coordinate with any statewide marketing implemented by the Commission as well as other initiatives</p> <p>Attend regular meetings with all EEPS implementors, including State agencies and utility representatives</p> <p>Coordinate with other NYSERDA programs to employ newly skilled, trained, or certified workers through energy efficiency projects</p>
Marketing, Outreach and Education Activities
<p>Develop new creative marketing materials to promote the Workforce Development Program, through multi-media approach using TV and radio broadcasts, print materials, home shows, career fairs, online websites, search engines, high-traffic websites, press releases</p> <p>Enroll participants in workforce training programs through these various avenues</p> <p>Create a clear vision of the opportunities related to green collar careers by developing profiles of the “new workforce”</p> <p>Identify opportunities to target “under-served” populations, focusing efforts through community centers, Local Workforce Investment Boards (WIBS), and One Stop Career Centers</p> <p>Educate new participants on lessons learned (best practices) from successful participants to gain insight on successful messages, mechanisms, and training programs</p> <p>Develop online training and distance learning opportunities, through Training Partnership Agreements (TPA’s)</p> <p>Continue to expand and promote education opportunities through development of a comprehensive workforce training and education web portal, working closely with the Commission and its marketing contractor as well as the NYSDOL</p> <p>Reach out to past Workforce Development trained participants – people who were trained through NYSERDA’s EEPS-funded Workforce Development Program and not certified - to determine if other career pathways mechanisms are needed for participants to obtain certification and ultimately employment</p>

Table 1. Workforce Development Program Activities – Continued

Activities Associated with Expanding and Leveraging New and Existing Programs
<p>Leverage networks and outreach activities of existing and new partnerships, including the development of a plan to align messages based upon a comprehensive analysis of the current marketing and outreach activities of new and existing training partners. These partners include, but are not limited to: Center for Energy Efficiency and Building Science (CEEBS), New York State Builders Association Research and Education Foundation (NYSBA-REF), Building Performance Contractors Association (BPCA), New York State Weatherization Directors' Association (NYSWDA), Lighting Research Center (LRC), City University of New York (CUNY), Northeast Energy Efficiency Council (NEEC), Service Employees International Union (SEIU), International Union of Operating Engineers (IUOE), Leadership in Energy and Environmental Design (LEED), among others</p> <p>Leverage additional funding when available (State, Federal, ARRA, DOL, GJGNY, RGGI, etc.)</p> <p>Expand opportunities for internships and apprenticeships (including hands-on workshops and skills development and continuing education credits) to provide on-the-job training for energy efficiency services for both existing and emerging practitioners, with a priority for under-served populations</p> <p>Expand the Hudson Valley Community College (HVCC) CEEBS network to ramp up training for residential and multifamily markets</p> <p>Support training organizations that teach curriculum accredited and approved by a third party and leading to certification</p> <p>Develop and provide basic skills and “worker readiness skills” courses to provide pathways out of poverty and career pathways, working closely with CBOs and environmental justice communities and organizations</p> <p>Expand training and add trainers at two- and four-year colleges, BOCES and technical high schools, union training facilities, and among various trade organizations</p> <p>Leverage and expand additional certification and professional development initiatives</p> <p>Develop new technical training programs needed to support energy efficiency goals of EEPS</p>
Financial Incentives Activities
<p>Provide partial certification fee reimbursements for individuals who successfully complete all certification requirements for certifications and accreditations relevant to energy efficiency skills and competencies</p> <p>Provide incentives for training funds to be awarded directly through TPA's with eligible training organizations</p> <p>Provide equipment incentives for training facilities through TPA's with eligible training organizations</p> <p>Provide funds for expanding current building science curriculum, continuing education certifications, train-the-trainer courses, internships, apprenticeships and new technical training programs</p>
Monitoring, Evaluation and Verification Activities
<p>Conduct market research, evaluation and reporting activities (monthly and quarterly status reports)</p> <p>Conduct process and impact evaluations, counting the number of jobs as a result of Workforce Development initiatives</p> <p>Monitor workforce training benefits to utility program implementers, engineering firms, home performance contractors, unemployed and emerging workers, and retrained workers</p> <p>Conduct evaluations of workforce training efforts to assess training effectiveness including: response of the trainee to the training, what was learned, performance in the workplace, and estimating the effects of the training on the workplace – ensuring that sufficient feedback is provided such that the program curriculum can evolve effectively</p> <p>Monitor and verify participant performance on certification exams and career and employment placement</p> <p>Conduct curriculum inventories and contractor needs assessments</p>

Program Logic and Measurement Indicators

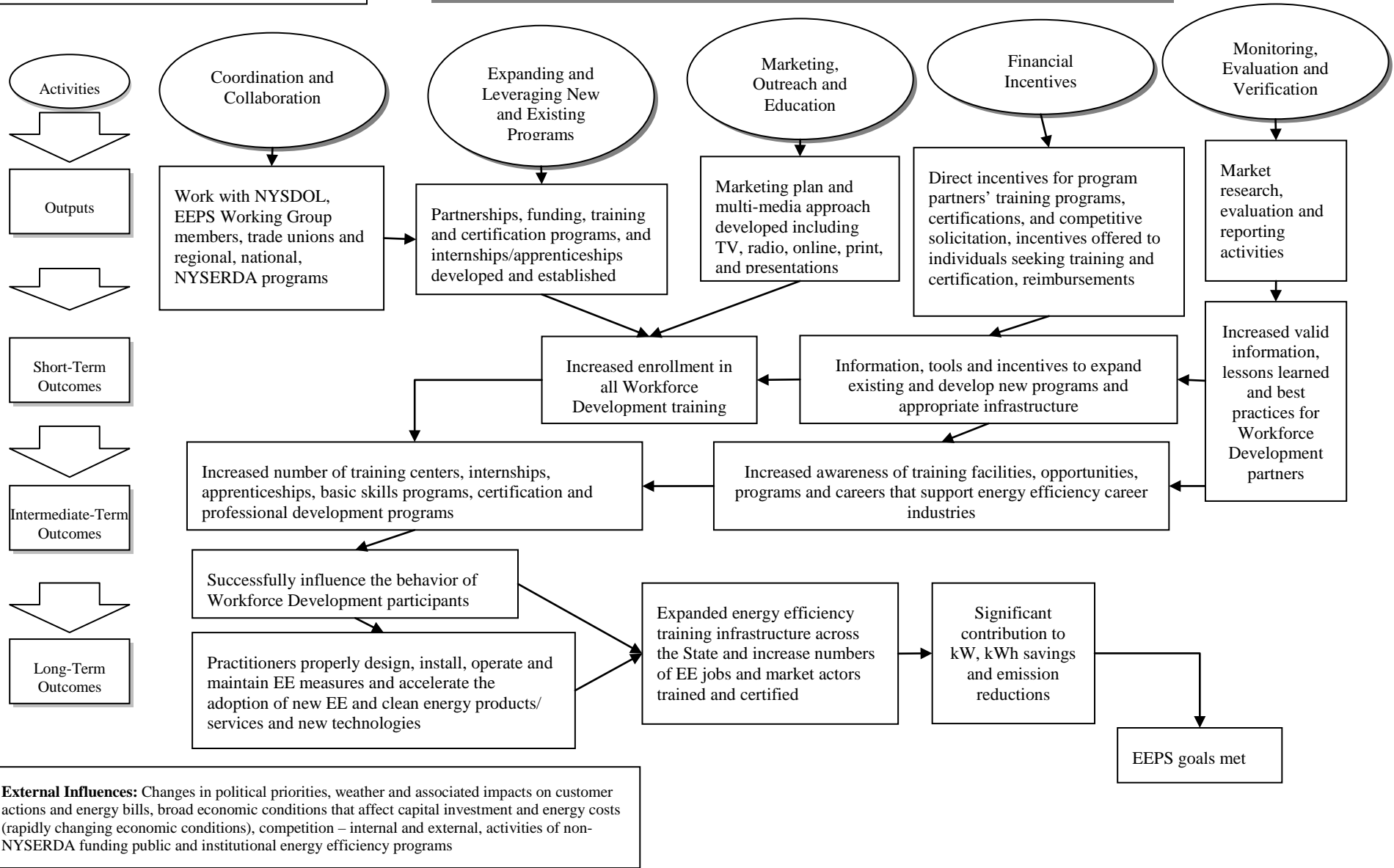
The overall goals of NYSERDA's EEPS funded Workforce Development Program include:

- 1) Overcoming barriers to workforce training, especially in regards to unemployed and underemployed individuals
- 2) Expanding the existing energy efficiency training infrastructure across the State in both the residential and commercial and industrial sectors
- 3) Increasing employment opportunities in energy-efficiency occupations in New York, especially among underserved populations
- 4) Meeting the demand for skilled, trained and certified workers created by NYSERDA's comprehensive portfolio of energy efficiency programs, providing the present and future workforce with the technical skills necessary to serve the needs of NYSERDA's portfolio of programs funded through both EEPS and non-EEPS funding sources

To this end, the Program seeks to develop new, and build upon existing partnerships with upstream and midstream market allies in order to bring high quality training programs to the market and effectively deploy overall workforce development initiatives, supporting other NYSERDA EEPS-funded initiatives, populating EEPS Programs with trained workers, supporting past SBC initiatives, and helping to increase the supply of trained energy efficiency workforce for the broader marketplace. The Program's success will be measured by a number of indicators, including: number of: Program Partners, trainings held, participants trained, programs completed, qualified workers entering the energy efficiency workforce, in addition to other Program indicators. Figure 1 shows the linkages between the Workforce Development Program's activities, outputs and outcomes, and identifies key program inputs and potential external influences.

Inputs: Funding sources (EEPS), Staff's resources and experience, Coordination and cross promotion with other programs, Expertise of trade allies and contractor, and Existing awareness of NYSERDA among market actors, NYSERDA's ability to recruit effective EEPS Workforce Development Program Partners

Figure 1. EEPS Workforce Development Program Logic Model Diagram
December 2010



SECTION 3. SECONDARY AND PRIMARY DATA SOURCES AND METHODS

3.1 SECONDARY DATA SOURCES

The MCA Team used a variety of secondary sources including results of earlier research efforts to help inform the current study. These sources include:

- The NYSERDA EEPS Program Logic Model Report
- Discussions with internal NYSERDA staff that interfaces with participants in the Workforce Development target market segments
- Discussions with key external stakeholders that interface with participants in the Workforce Development target market segments (i.e., union and professional trade groups, community colleges and vocational training providers, community-based organizations and environmental justice communities, and public/private companies providing on-the-job-training and internship and apprentice opportunities)
- The Comprehensive RES Information Systems (CRIS) database
- U.S. Department of Labor and Statistics data
- The NYSDOL's⁵³ federally funded Labor Market Intelligence Reports, 2009 Clean Energy Industry Report and 2011 Green Jobs Report, related research including discussions with DOL research staff and individuals involved with recently initiated Pace University research project⁵⁴
- The Brookings Institute, Metropolitan Policy Program, 2011 - *Sizing the Clean Economy – A National and Regional Green Jobs Assessment*
- U.S. Census Data, including County Business Patterns Reports and other relevant data tables
- Membership lists and other publicly-available data from relevant professional organizations (e.g., the Center for Energy Efficiency and Building Science, One Stop Career Centers, Workforce Investment Boards, NY Boards of Cooperative Educational Services, NY State Builders Association Research and Education Foundation, International Union of Operating Engineers, etc.)
- The Green Jobs/Green New York (GJGNY) curriculum inventory, assessment, and updates research funded under RFP 2034 and awarded to Pace University
- Previous potentially relevant program evaluation reports prepared for NYSERDA and for similar programs operating in other jurisdictions

⁵³ The mission of the New York State Department of Labor (NYSDOL) is to protect workers, assist the unemployed, and connect job seekers to jobs. This organization serves the people of New York who are seeking information, training or a job, and also collects and disseminates information on labor and market statistics.

⁵⁴ Pace Energy and Climate Center, School of Law, Pace University. Pace University was competitively awarded Green Jobs Green New York PON 2034. Per their NYSERDA agreement the Contractor, “shall conduct a comprehensive curriculum inventory and needs assessment in the interest of the Green Jobs Green New York (GJGNY) Act. The goal of the research will be to product an inventory of green jobs training across the State as we as to identify skills gaps that must be address to ensure the success of the GJGNY program.

- Information gathered through ongoing information sharing with Navigant Consulting
- Information gathered through ongoing information sharing with the Process Team
- In addition, information was collected and considered regarding contractor types that typically provide electric energy efficiency-related services throughout the region, including participating contractors from NYSERDA’s existing EEPS-funded Programs (*i.e.*, Home Performance with ENERGY STAR®, ENERGY STAR Homes, Empower, Existing Facilities, New Construction and FlexTech). Much of this information was available through directly relevant experience of GDS Associates, APPRISE, Navigant Consulting, and other NYSERDA evaluation contractor or program staff
- Finally, Manta.com and NAICS.com were used to identify North American Industry Classification System (NAICS) and Standard Industrial Classification (SIC) codes and associated industry definitions

Table 2 below provides a formal list of the some of the key documents and data sources used in this effort.

Table 2. Key Data Sources

The Five Ws of Downstate New York, Characterizing the Market for Energy Efficiency, Summit Blue Final Report, July 1, 2009.
Sizing the Clean Economy – A National and Regional Green Jobs Assessment, The Brookings Institution, Metropolitan Policy Program, 2011.
New York State Green Jobs Study, New York State Department of Labor, 2010
Energy Efficiency Portfolio Standard Workforce Development Program Logic Model, Final Report, Prepared by GDS Associates, Inc., December 2010.
Alternative Measures of Labor Underutilization for States, Bureau of Labor Statistics, Second Quarter of 2010 through First Quarter of 2011.
Building Professional Institute (BPI) Website: http://bpi.org/ .
New York State’s Clean Energy Industry: Labor Market and Workforce Intelligence, New York State Department of Labor, May 2009.
NY DOL’s Clean Energy Report List of Common Occupations and Associated Skills in NYS.
Creative Partnership and Support Inmate Re-entry Program, Charles Walter, Orange County Sheriff’s Department and Lilya Wagner, Counterpoint International, Washington, D.C.
Living Life: Overlooked Aspects of Urban Employment, Food Consumption and Nutrition Division of the International Food Policy Research Institute, 2004.
New York State, Division of Veterans’ Affairs, 2006.
New York State, Office of the Aging, 2010.
New York State Public Service Commission Case 07-M-0548 – Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio Standard. Order Authorizing Workforce Development Initiatives, Issued and Effective June 22, 2009.
The Oneida County Reentry Task Force, December 2007.
ONet Website: http://www.onetonline.org/ .

Partnership for Public Good, Policy Brief, April 2010.
Pathways Out of Poverty Grant Recipient Press Release, US Department of Labor, January 2010.
Raphael, Professor Steven "Improving Employment Prospects for Former Prison Inmates: Challenges and Policy" (NBER Working Paper 15874, April 2010).
U.S. Census Data, American Community Survey 1-Year Estimates, 2009.
U.S. Census Data, American Community Survey 3-Year Estimates, 2006 to 2008.
U.S. Census Data, Civilian Population Estimates by Demographic Characteristics, 2008.
U.S. Census Data, County and Business Pattern, 2008.
U.S. Bureau of Labor and Statistics, September 2009 – Green Goods and Services Industries by NAICS Code.

The information gleaned from these secondary data sources is presented in subsequent sections of this report. Much of the secondary data (e.g., US Census Data) is more than two years old, but is the most recent data available at the time of this evaluation effort.

3.2. PRIMARY DATA COLLECTION

The MCA Team’s primary data collection activities consisted of telephone surveys with a number of key Workforce Development Program market actor groups including:⁵⁵

- Non-Participating Employers – comprised of builders, HVAC contractors, and engineers/consultants
- Non-Participating Employers – comprised of real estate developers and property managers
- Non-Participating Training Organizations – comprised of energy-level and mid- to high-level skills training groups

The purpose of each survey is summarized briefly below. Copies of the telephone survey instruments are included in Appendix B, C, and D respectively.

1. Non-Participating Employers Surveys (including real estate developer and property manager surveys) – The MCA Team designed the Employers Surveys to gather information from employers in New York State that have staff engaged in energy efficiency occupations. Types of information to be gathered were derived from the Program’s Logic Model and through discussion with NYSERDA program staff, review of other relevant materials, input from other members of NYSERDA’s evaluation contractor teams, the NYSDOL and Pace University researchers. The surveys included questions about energy efficiency workforce skills, general awareness of job skills-related training, training infrastructure awareness and satisfaction, energy efficiency

⁵⁵ A third market actor group, non-participating potential future trainees, was also considered for surveys, but ultimately dropped from this evaluation project’s primary research activities work plan. Appendix A provides more details regarding the evaluation team’s recommendation to halt non-participating trainee survey plans (dated December 14, 2011).

employment plans and practices, awareness of NYSERDA and/or broader workforce development efforts, and participation in other SBC-funded initiatives.

2. Non-Participating Training Organizations Survey – The MCA Team designed the Training Organization Survey to gather information from organizations that may, or may not have included energy efficiency components within their training efforts, but were all viewed as having the potential to include these components in the future. The survey included questions about training practices, training trends and plans, trainee interest in energy efficiency, energy efficiency employment placement and opportunities for trainees, and awareness of NYSERDA and/or broader energy efficiency training infrastructure and associated workforce development efforts.

All surveys were designed by GDS Associates with assistance from APRISE Incorporated and Opinion America Group. Survey implementation activities were managed by APPRISE Incorporated. Interviews were conducted by Opinion America Group.

The sections below provide information on the sample, data collection and data processing methodologies used for each market actor group surveyed.

3.2.1 Sample

3.2.1.1 Non-Participating Employers

Target Population

To compile the sample frame for this survey, the MCA Team targeted organizations located within New York State that have employees or hire contractors who perform jobs that are directly or indirectly involved with energy efficiency. This included the construction, design, specification, delivery, installation, or servicing of electric energy using products or equipment within homes or businesses in the State. Within this population, after extensive discussion and iteration with NYSERDA program staff and other key stakeholders, the MCA Team targeted organizations from three categories – builders, HVAC contractors, and electricians. Appendix E provides more information on the sample design and employer identification and screening process.

Sample Frame

The specific SIC codes by target categories are listed in Table 3.

Table 3. Target Sectors

Employer Sector	SIC Codes
Builders	15210000, 15210101, 15220107, 15420100, 15420101
Engineers/Consultants and Electrical Contractors	17310202, 17319904, 87110200, 87110202, 87110401, 87110403, 87119906, 87489904, 87489907
HVAC Contractors	17110000, 17110103, 17110400, 17110401, 17110405, 17119901

APPRISE purchased the sample from Marketing Systems Group. The original sample frame consisted of 2,290 records across the three categories. APPRISE initially screened out duplicates and any records from Long Island. After this processing step, the frame contained 2,284 cases. After pretesting, APPRISE removed the 90 records used for this task, leaving 2,194 cases.

Sample Selection

APPRISE initially released 1,830 records on December 14th, 2011. Table 4 shows the number of initial records released for each sector.

Table 4. Initial Sample Released by Sector

Sector	Total
Builders	660
HVAC Contractors	660
Engineers/Consultants and Electrical Contractors	510
Total	1,830

In an effort to meet the quota for the Builders sample, APPRISE released 189 additional Builder records on January 23rd, 2012. Table 5 shows the total number of records released for each sector.

Table 5. Total Sample Released

Sector	Total
Builders	849
HVAC Contractors	660
Engineers/Consultants and Electrical Contractors	510
Total	2,019

Advance Letters

NYSERDA sent advance letters to each organization prior to the start of full-scale interviewing. The letter explained the study to the potential respondent, introduced the phone center that would be calling, provided a toll-free number for respondents to call in to complete a survey at their convenience, provided NYSERDA contact information if a potential respondent wanted to learn more about the survey effort, reassured potential respondents about maintaining the confidentiality of their responses, and recommended participation in the study.

Target Completes

The target number of completes was 132 interviews. Specific targets by sector are presented in Table 6.

Table 6. Targeted Number of Completes by Quota

Sector	Target N	Actual N
Builders	44	43
HVAC Contractors	44	44
Engineers/Consultants and Electrical Contractors	44	47
Total	132	134

Non-Participating Employers – Real Estate Developers and Property Managers

Target Population

To compile the sample frame for the Real Estate Developers and Property Management firms component of this survey, the MCA Team targeted the largest Real Estate Development and Property Management firms, primarily located in New York City that were identified in a downstate market characterization study completed for NYSERDA in 2009.⁵⁶ These firms were considered an important subset of the non-participating employers’ market actor group and typically consult, design, specify, construct, service, manage and maintain electric energy using products or equipment in the largest residential and business properties in New York City.

Sample Frame

The specific SIC codes by target categories are listed in Table 7.

Table 7. Target Sectors

Employer Sector	SIC Codes
Real Estate Development Firms	41102, 5131, 653118, 655202, 821103, 8399
Property Management Firms	6531, 653118, 8742

GDS received the sample list of Real Estate Development and Property Management firms from NYSERDA, which were identified in the 2009 Downstate Market Characterization Report. The sample contained 20 records across these two categories. GDS researched each firm to gather contact information, and then cross referenced this list with a list of Property Managers in the State provided by APPRISE. Through this process two firms were eliminated from this list of 20 firms because contact information could not be obtained, and twelve firms were added to this sample. The final sample frame consisted of 30 records

Sample Selection

GDS used the entire sample population of 30 records, shown in Table 8 for its data collection efforts.

Table 8. Initial Sample by Sector

Sector	Total
Real Estate Development Firms	9
Property Management Firms	21
Total	30

⁵⁶ The Five W’s of Downstate New York, Characterizing the Market for Energy Efficiency, prepared by Summit Blue Consulting LLC, for NYSERDA, July 2009.

Advance Letters

NYSERDA sent advance letters to each organization prior to the start of full-scale interviewing. The letter explained the study to the potential respondent, introduced the GDS employee that would be calling over the next couple of weeks, provided a toll-free number for respondents to call in to complete a survey at their convenience, provided NYSERDA contact information if a potential respondent wanted to learn more about the survey effort, reassured potential respondents about maintaining the confidentiality of their responses, and recommended participation in the study.

Target Completes

The total number of interviews targeted for completes was eight, and the actual number of completes was nine. Specific targets vs. actual completes, by sector, are presented in Table 9.

Table 9. Targeted Number of Completes by Quota

Sector	Target N	Actual N
Real Estate Development Firms	4	5
Property Management Firms	4	4
Total	8	9

3.2.1.2 Non-Participating Training Organizations

Target Population

To compile the sample frame for the Training Organizations survey, the MCA Team targeted organizations, including those with more than one location within New York State that conducted training which prepared trainees to work in an energy efficiency-related field. This included indirect training (basic job skills, plumbing or electric repair), direct training (energy auditing, weatherization, or green building techniques), and higher level training (for engineers, designers, building operators, program administrators, as well as training for career advancement, professional development or certification/accreditations and licensure). Appendix F provides more information on the sample design and employer identification and screening process.

Sample Frame

The sample frame was provided by the MCA Team. The original sample frame for this study consisted of 238 records. After APPRISE screened out the duplicates, the sample frame consisted of 230 records.

Sample Selection

APPRISE used the whole sample frame of 230 records as the selected sample. The sample frame was divided into the following six sectors as shown in Table 10.

Table 10. Sample Frame by Sector

Sector	Number of Records
One-Stop	78
Community	69
Vocational & Coop	15
Entry Level Union	23
Certification/2-4 Year Colleges	23
Mid-High Level Union	22

After two weeks of fielding it was confirmed that, because none of the organizations in the One-Stop sector conducted in-house training, this sector was deemed ineligible for the survey. To make up for this dropped sector, an additional 28 pieces of sample, including records in a new sector (categorized as *Industry Associations*), were released on February 14, 2012. Thus, the total number of sample records released for this study (excluding the dropped One-Stops) is 179. The final breakdown of released sample records is shown below in Table 11.

Table 11. Released Sample Records by Sector

Sector	Number of Records
Community	73
Vocational & Coop	28
Entry Level Union	24
Certification/2-4 Year Colleges	26
Mid-High Level Union	22
Industry Association	6

Advance Letters

To encourage participation in the study, NYSERDA sent advance letters to all potential respondents on January 23, 2012, one day before the phone center began calling. NYSERDA sent advance letters to the additional sample on February 15, 2012. APPRISE drafted the advance letters and after they were approved by the MCA Team, they were printed and mailed on NYSERDA letterhead. The letter explained the study to the potential respondent, introduced the phone center that would be calling, provided contacts for the potential respondent if they wanted to learn more about the survey effort or call in to complete the interview at their convenience, reassured potential respondents about confidentiality issues, and urged participation in the study.

Target Completes

The initial goal was to complete 70 interviews. After the One-Stops were removed and additional sample was released, the goal was still 70 interviews, but the sector quotas were adjusted to the following. The initial and revised targets are shown in Table 12.

Table 12. Adjusted Quota by Sector

Sector	Initial Target	Revised Target
One-Stop	17	0
Community	17	29
Vocational & Coop	11	11
Entry Level Union	5	9
Certification/2-4 Year Colleges	15	10
Mid-High Level Union	5	9
Industry Association	0	2

3.2.2 Data Collection

3.2.2.1 Non-Participating Employers

Overview of Data Collection Procedures

The Workforce Development Employers survey was administered as a telephone interview. Interviewers from Opinion America conducted the survey using a computer-assisted telephone interview (CATI) survey instrument. The respondent was the person at the organization responsible for hiring and training decisions.

Survey Instrument

The survey instrument was designed by NYSERDA’s MCA Team. Three pretest interviews were conducted by APPRISE staff to assess the clarity, consistency and skip pattern logic of the draft survey instrument. Changes as a result of these pretest efforts were discussed with the MCA Team and implemented where necessary. APPRISE formatted the survey instrument for CATI programming.

Survey Administration

Interviewer training and initial calling began on December 14, 2011. Prior to the start of dialing, APPRISE provided interviewers with training materials that addressed general interviewing techniques, the targeted respondent for this survey and instructions specific to this questionnaire. On the first day of fielding, the APPRISE survey manager conducted extensive interviewer and supervisor training as well as monitoring of the initial interviews. This was done to ensure that the staff and interviewers were fully knowledgeable and able to administer the survey properly.

All interviews were completed in English. Interviewers called during daytime weekday hours and were available on weeknights if the respondent wished to schedule a call-back for that time. Calls were rotated between the morning and afternoon on different days of the week. If the interviewer reached the correct company or respondent voicemail, he or she left messages. Near the end of the field period, Todd French of NYSERDA called ten builders in an effort to incent them to take the survey. This resulted in six

builders calling in to complete the survey which closed the interviewing. The average length of the survey was 17.5 minutes. Survey fielding ended on February 16th, 2012 with 134 completed interviews.

Sample Disposition and Survey Response Rate

Table 13 shows the disposition of all sampled cases and provides the contact, cooperation, and overall response rates for this survey. The response rate estimates the fraction of all eligible respondents in the sample that were ultimately interviewed. The contact rate is the percentage of the working numbers where a request for an interview was made. The cooperation rate is the percentage of contact numbers where consent for an interview was not refused.⁵⁷ The contact rate for the study was 47.57%, the cooperation rate was 44.08%, and the overall response rate was 19.43%.

Table 13. Survey Sample Disposition (Total)

TOTAL SAMPLE USED		Number	Percent
		2,019	100%
Excluded Sample	Not working/Unusable number	478	23.68%
Not Contacted	Respondent never available	335	16.59%
Unknown Eligibility	No Answer/Busy Screener not complete	148	7.33%
Not Eligible	Not Eligible/Not Qualified/Quota Closed	754	37.35%
Refused/Break-off	Refused/Break-off	170	8.42%
COMPLETED INTERVIEW		134	6.64%
Contact rate⁵⁸ = (304/639 =.4757)			47.57%
Cooperation rate⁵⁹ = (134/304 =.4408)			44.08%
Response rate⁶⁰ = (134/[639+(.342*148)] =.1943)			19.43%

⁵⁷ These disposition codes and rate formulae are consistent with the standards of the American Association for Public Opinion Research (AAPOR). The contact, cooperation and response rates are the AAPOR #3 rates.

⁵⁸ Contact rate = (Completes+refusals+break-offs)/(Completes+refusals+break-offs+not contacted).

⁵⁹ Cooperation rate = Completes/(Completes+refusals+breakoffs).

⁶⁰ Response rate = Completes/[Completes+refusals+breakoffs+not contacted+ (e*(unknown eligibility))]. For this study, e =0.342.

Table 14 shows the disposition of all sampled Builders and provides the contact, cooperation, and overall response rates for this business type. The contact rate for the Builders sector was 78.52%, the cooperation rate was 36.75%, and the overall response rate was 28.79%.

Table 14. Survey Sample Disposition (Builders)

TOTAL SAMPLE USED		Number	Percent
		849	100%
Excluded Sample	Not working/Unusable number	229	26.97%
Not Contacted	Respondent never available	32	3.77%
Unknown Eligibility	No Answer/Busy, Screener not complete	2	0.24%
Not Eligible	Not Eligible/Not Qualified/Quota Closed	469	55.24%
Refused/Break-off	Refused/Break-off	74	8.72%
COMPLETED INTERVIEW		43	5.06%
Contact rate⁶¹ = (117/149 =.7852)			78.52%
Cooperation rate⁶² = (43/117 =.3675)			36.75%
Response rate⁶³ = (43/[149+(.176*2)] =.2879)			28.79%

Table 15 shows the disposition of all sampled HVAC Contractors and provides the contact, cooperation, and overall response rates for this business type. The contact rate for the HVAC Contractors sector was 44.50%, the cooperation rate was 45.36%, and the overall response rate was 18.74%.

Table 15. Survey Sample Disposition (HVAC Contractors)

TOTAL SAMPLE USED		Number	Percent
		660	100%
Excluded Sample	Not working/Unusable number	170	25.76%
Not Contacted	Respondent never available	121	18.33%
Unknown Eligibility	No Answer/Busy Screener not complete	47	7.12%
Not Eligible	Not Eligible/Not Qualified/Quota Closed	225	34.09%
Refused/ Break-off	Refused/ Break-off	53	8.03%
COMPLETED INTERVIEW		44	6.67%

⁶¹ Contact rate = (Completes+refusals+break-offs)/(Completes+refusals+break-offs+not contacted)

⁶² Cooperation rate = Completes/(Completes+refusals+breakoffs)

⁶³ Response rate = Completes/[Completes+refusals+breakoffs+not contacted+ (e*(unknown eligibility))]. For this study, e = 0.176.

TOTAL SAMPLE USED	Number	Percent
Contact rate ⁶⁴ = (97/218 =.4450)		44.50%
Cooperation rate ⁶⁵ = (44/97 =.4536)		45.36%
Response rate ⁶⁶ = (44/[218+(.356*47)] =.1874)		18.74%

Table 16 shows the disposition of all sampled Engineers/Consultants and Electrical Contractors and provides the contact, cooperation, and overall response rates for this business type. The contact rate for the Electricians sector was 33.09%, the cooperation rate was 52.22%, and the overall response rate was 13.92%.

Table 16. Survey Sample Disposition (Engineers/Consultants and Electrical Contractors)

TOTAL SAMPLE USED		Number	Percent
		510	100%
Excluded Sample	Not working/Unusable number	79	15.49%
Not Contacted	Respondent never available	182	35.69%
Unknown Eligibility	No Answer/Busy Screener not complete	99	19.41%
Not Eligible	Not Eligible/Not Qualified/Quota Closed	60	11.76%
Refused/ Break-off	Refused/ Break-off	43	8.43%
COMPLETED INTERVIEW		47	9.22%
Contact rate ⁶⁷ = (90/272 =.3309)			33.09%
Cooperation rate ⁶⁸ = (47/90 =.5222)			52.22%
Response rate ⁶⁹ = (47/[272+(.662*99)] =.1392)			13.92%

⁶⁴ Contact rate = (Completes+refusals+break-offs)/(Completes+refusals+break-offs+not contacted).

⁶⁵ Cooperation rate = Completes/(Completes+refusals+breakoffs).

⁶⁶ Response rate = Completes/[Completes+refusals+breakoffs+not contacted+ (e*(unknown eligibility))]. For this study, e = 0.356.

⁶⁷ Contact rate = (Completes+refusals+break-offs)/(Completes+refusals+break-offs+not contacted).

⁶⁸ Cooperation rate = Completes/(Completes+refusals+breakoffs).

⁶⁹ Response rate = Completes/[Completes+refusals+breakoffs+not contacted+ (e*(unknown eligibility))]. For this study, e = 0.662.

Table 17 shows the eligibility status and the estimated eligibility rate (e) for the sample. The estimated eligibility rate is the proportion of eligible units among all units in the sample for which a definitive determination of status was obtained. The estimated eligibility rate is used in the calculation of the overall response rate. Of the total 2,019 pieces of sample used for the study, 1,871 pieces of sample had a definitive eligibility status. Of the 1,871 pieces that had definitive eligibility 639 pieces were eligible so the eligibility rate for this study is $639/1,871 = 0.342$.

Table 17. Sample Eligibility and Estimated Eligibility Rate (Total)

	Number	Percent
Total Sample	2,019	100%
Known eligibility	1,871	92.67%
<i>Not eligible</i>	1,232	61.02%
<i>Not working</i>	478	23.68%
<i>Not eligible respondent</i>	754	37.35%
<i>Eligible</i>	639	31.65%
Unknown Eligibility	148	7.33%
Estimated Eligibility rate (e) = eligible/known eligibility	$639/1,871 = .3415$	34.15%

Table 18 shows the eligibility status and the estimated eligibility rate (e) for the Builders. Of the total 849 pieces of sample in this sector, 847 pieces of sample had a definitive eligibility status. Of the 847 pieces that had definitive eligibility 149 pieces were eligible so the eligibility rate for this study is $149/847 = .176$.

Table 18. Sample Eligibility and Estimated Eligibility Rate (Builders)

	Number	Percent
Total Sample	849	100%
Known eligibility	847	99.76%
<i>Not eligible</i>	698	82.21%
<i>Not working</i>	229	26.97%
<i>Not eligible respondent</i>	469	55.24%
<i>Eligible</i>	149	17.55%
Unknown Eligibility	2	0.24%
Estimated Eligibility rate (e) = eligible/known eligibility	$149/847 = .1759$	17.59%

Table 19 shows the eligibility status and the estimated eligibility rate (e) for the HVAC Contractors. Of the total 660 pieces of sample in this sector, 613 pieces of sample had a definitive eligibility status. Of the 613 pieces that had definitive eligibility 218 pieces were eligible so the eligibility rate for this study is $218/613=.356$.

Table 19. Sample Eligibility and Estimated Eligibility Rate (HVAC Contractors)

	Number	Percent
Total Sample	660	100%
Known eligibility	613	92.88%
<i>Not eligible</i>	395	59.85%
<i>Not working</i>	170	25.76%
<i>Not eligible respondent</i>	225	34.09%
<i>Eligible</i>	218	33.03%
Unknown Eligibility	47	7.12%
Estimated Eligibility rate (e) = eligible/known eligibility	$218/613=.3556$	35.56%

Table 20 shows the eligibility status and the estimated eligibility rate (e) for the Engineers/Consultants and Electrical Contractors. Of the total 510 pieces of sample in this sector, 411 pieces of sample had a definitive eligibility status. Of the 411 pieces that had definitive eligibility 272 pieces were eligible so the eligibility rate for this study is $272/411=.662$.

Table 20. Sample Eligibility/Estimated Eligibility Rate Engineers/Consultants/Electrical Contractors

	Number	Percent
Total Sample	510	100%
Known eligibility	411	80.59%
<i>Not eligible</i>	139	27.25%
<i>Not working</i>	79	15.49%
<i>Not eligible respondent</i>	60	11.76%
<i>Eligible</i>	272	53.33%
Unknown Eligibility	99	19.41%
Estimated Eligibility rate (e) = eligible/known eligibility	$272/411=.6618$	66.18%

3.2.2.2 Non-Participating Employers – Real Estate Developers and Property Managers

Overview of Data Collection Procedures

The Workforce Development Employers survey for Real Estate Developers and Property Managers was administered as a telephone interview, and was conducted by GDS staff. The respondent was the person at each firm responsible for hiring and training decisions of employees involved in energy efficiency.

Survey Instrument

The survey instrument was designed by NYSERDA’s MCA Team. One pretest interview was conducted by GDS staff to assess the clarity, consistency and skip pattern logic of the draft survey instrument. Changes as a result of this pretest effort were discussed and implemented where deemed appropriate.

Survey Administration

Initial calling began on January 6, 2012. Prior to the start of dialing, GDS reviewed the phone activity documentation protocol, prepared a daily activity report, reviewed general interviewing techniques and instructions and rehearsed the questionnaire. Also, prior to fielding, interviewer training was conducted to ensure that the staff interviewer was fully knowledgeable and able to administer the survey properly, and document calling activity accurately.

All interviews were completed in English. The GDS interviewer called during various daytime and early evening weekday hours and was available on weeknights if the respondent wished to schedule a call-back for that time. At respondent’s request, appointments were scheduled for call backs to complete surveys. Calls were rotated between the morning, afternoon and early evening on different days of the week. If the interviewer reached the correct company or respondent voicemail or secretary, she left a message that included a call back number and a date a call back would be made. The average time to complete a survey was 17.44 minutes. Survey fielding ended on February 17, 2012.

Sample Disposition and Survey Response Rate

Table 21 shows the disposition of all sampled cases and provides the contact, cooperation, and overall response rates for this survey. The contact rate for the study was 57.14%, the cooperation rate was 56.25%, and the overall response rate was 16.07%.

Table 21. Survey Sample Disposition

		Number	Percent
TOTAL SAMPLE USED		30	100%
Excluded Sample	Not working/Unusable number	0	0%
Not Contacted	Respondent never available/Left Message and Call Back Number	68	79.07%
Unknown Eligibility	No Answer/Busy, Screener not complete	2	2.33%
Not Eligible	Not Eligible/Not Qualified	0	0%
Refused/Break-off	Refused/Break-off	7	23.33%

	Number	Percent
COMPLETED INTERVIEW	9	30.00%
Contact rate⁷⁰ = (16/(16+12) =.5714)		57.14%
Cooperation rate⁷¹ = (9/16 =.5695)		56.25%
Response rate⁷² = (9/[28(2)] =0.1607)		16.07%

Table 22 shows the eligibility status and the estimated eligibility rate (e) for the sample. Of the total 30 pieces of sample used for the study, 28 pieces of sample had a definitive eligibility status. Of the 28 pieces that had definitive eligibility, all 28 pieces were eligible so the eligibility rate for this study is 28/28=1.0.

Table 22. Sample Eligibility and Estimated Eligibility Rate

	Number	Percent
Total Sample	30	100%
Known eligibility	28	93.33%
<i>Not eligible</i>	0	0%
<i>Not working</i>	0	0%
<i>Not eligible respondent</i>	0	0%
<i>Eligible</i>	28	93.33%
Unknown Eligibility	2	6.66%
Estimated Eligibility rate (e) = eligible/known eligibility	28/28=1.0	100%

3.2.2.3 Non-Participating Training Organizations

Overview of Data Collection Procedures

The questionnaire was administered as a telephone interview with the person identified in the sample frame or another person who is familiar with their organization’s training programs. Interviewers from IC International conducted the interviews using a computer-assisted telephone interview (CATI) survey instrument.

⁷⁰ Contact rate = (Completes+refusals+break-offs)/(Completes+refusals+break-offs+not contacted).

⁷¹ Cooperation rate = Completes/(Completes+refusals+breakoffs).

⁷² Response rate = Completes/[Completes+refusals+breakoffs+not contacted+ (e*(unknown eligibility))]. For this study, e = 0.80.

Survey Instrument

The MCA Team designed the survey instrument in consultation with DPS Staff. APPRISE conducted pretests to test the instrument for length, respondent comprehension, and interview flow. The pretests also helped inform the survey manager of issues to discuss and highlight during interviewer training. Changes as a result of this pretest effort were discussed with the MCA Team and implemented where necessary.

Survey Administration

The survey was fielded from January 24, 2012 to February 24, 2012. Prior to the start of dialing, APPRISE provided interviewers with training materials that addressed general interviewing techniques, described the targeted respondent for this survey and contained instructions specific to this questionnaire. On the first day of fielding, the APPRISE survey manager conducted extensive interviewer and supervisor training as well as monitoring of the initial interviews. This was done to ensure that the staff and interviewers were fully knowledgeable and able to administer the survey properly and respondents understood the questions.

All interviews were completed in English. Interviewers called during daytime weekday hours and were available on weeknights if the respondent wished to schedule a call-back for that time. Calls were rotated between the morning and afternoon on different days of the week. If the interviewer reached the correct company or respondent voicemail, he or she left messages. The average length of the survey was 28 minutes. There were a total of 42 completed interviews, excluding the 2 ineligible One-Stop completes. The distribution of completes is shown in Table 23.

Table 23. Completes by Sector

Sector	Completes
Community	17
Vocational & Coop	6
Entry Level Union	6
Certification/2-4 Year Colleges	10
Mid-High Level Union	2
Industry Association	1

Sample Disposition and Survey Response Rate

Table 24 shows the disposition of all sampled telephone numbers dialed for this survey and provides the contact, cooperation, and overall response rates. The contact rate for the study was 100.0%, the cooperation rate was 89.36%, and the overall response rate was 51.92%.

Table 24. Survey Sample Disposition

		Number	Percent
TOTAL SAMPLE USED		179	100%
Excluded Sample	Not working/Unusable number	1	0.56%
Not Contacted	Respondent never available	0	0.00%
	Answer Machine	0	0.00%
	Call back/Left 800#		
Unknown Eligibility	No Answer/Busy Records not yet called/Scr. Not complete	75	41.90%
Not Eligible	Not Eligible/Not Qualified	56	31.28%
Refused/ Break-off	Refused/ Break-off	5	2.79%
COMPLETED INTERVIEW		42	23.46%
Contact rate⁷³ = (47/47 =1.000)			100.0%
Cooperation rate⁷⁴ = (42/47 =.8936)			89.36%
Response rate⁷⁵ = (42/[47+(.452*75)] =.5192)			51.92%

⁷³ Contact rate = (Completes+refusals+break-offs)/(Completes+refusals+break-offs+not contacted).

⁷⁴ Cooperation rate = Completes/(Completes+refusals+breakoffs).

⁷⁵ Response rate = Completes/[Completes+refusals+breakoffs+not contacted+ (e*(unknown eligibility))]. For this study, e = 0.452.

Table 25 shows the disposition of all sampled Community Training Agencies and provides the contact, cooperation, and overall response rates. The contact rate for the Community Training Agencies was 100.0%, the cooperation rate was 89.36%, and the overall response rate was 51.92%.

Table 25. Survey Sample Disposition (Community Training Agencies)

		Number	Percent
TOTAL SAMPLE USED		75	100%
Excluded Sample	Not working/Unusable number	0	0.00%
Not Contacted	Respondent never available	0	0.00%
	Answer Machine	0	0.00%
	Call back/Left 800#		
Unknown Eligibility	No Answer/Busy Records not yet called/Scr. Not complete	26	34.67%
Not Eligible	Not Eligible/Not Qualified	29	38.67%
Refused/ Break-off	Refused/ Break-off	3	4.00%
COMPLETED INTERVIEW		17	22.67%
Contact rate⁷⁶ = (20/20 =1.000)			100.0%
Cooperation rate⁷⁷ = (17/20 =.8500)			85.00%
Response rate⁷⁸ = (17/[20+(.408*26)] =.5554)			55.54%

⁷⁶ Contact rate = (Completes+refusals+break-offs)/(Completes+refusals+break-offs+not contacted)

⁷⁷ Cooperation rate = Completes/(Completes+refusals+breakoffs)

⁷⁸ Response rate = Completes/[Completes+refusals+breakoffs+not contacted+ (e*(unknown eligibility))]. For this sector, e =.408

Table 26 shows the disposition of all sampled Vocational & Coop Training Centers and provides the contact, cooperation, and overall response rates. The contact rate for the Vocational & Coop Training Centers was 100.0%, the cooperation rate was 100.0%, and the overall response rate was 53.57%.

Table 26. Survey Sample Disposition (Vocational & Coop Training Centers)

		Number	Percent
TOTAL SAMPLE USED		28	100%
Excluded Sample	Not working/Unusable number	1	3.57%
Not Contacted	Respondent never available	0	0.00%
	Answer Machine	0	0.00%
	Call back/Left 800#		
Unknown Eligibility	No Answer/Busy Records not yet called/Scr. Not complete	13	46.43%
Not Eligible	Not Eligible/Not Qualified	8	28.57%
Refused/ Break-off	Refused/ Break-off	0	0.00%
COMPLETED INTERVIEW		6	21.43%
Contact rate⁷⁹ = (6/6 =1.000)			100.0%
Cooperation rate⁸⁰ = (6/6 =1.000)			100.0%
Response rate⁸¹ = (6/[6+(.400*13)] =.5357)			53.57%

⁷⁹ Contact rate = (Completes+refusals+break-offs)/(Completes+refusals+break-offs+not contacted).

⁸⁰ Cooperation rate = Completes/(Completes+refusals+breakoffs).

⁸¹ Response rate = Completes/[Completes+refusals+breakoffs+not contacted+ (e*(unknown eligibility))]. For this sector, e =.400.

Table 27 shows the disposition of all sampled Entry Level Union Training Centers and provides the contact, cooperation, and overall response rates. The contact rate for the Entry Level Union Training Centers was 100.0%, the cooperation rate was 85.71%, and the overall response rate was 46.45%.

Table 27. Survey Sample Disposition (Entry Level Union Training Centers)

		Number	Percent
TOTAL SAMPLE USED		24	100%
Excluded Sample	Not working/Unusable number	0	0.00%
Not Contacted	Respondent never available	0	0.00%
	Answer Machine	0	0.00%
	Call back/Left 800#		
Unknown Eligibility	No Answer/Busy Records not yet called/Scr. Not complete	11	45.83%
Not Eligible	Not Eligible/Not Qualified	6	25.00%
Refused/ Break-off	Refused/ Break-off	1	4.17%
COMPLETED INTERVIEW		6	25.00%
Contact rate⁸² = (7/7 =1.000)			100.0%
Cooperation rate⁸³ = (6/7 =.8571)			85.71%
Response rate⁸⁴ = (6/[7+(.538*11)] =.4645)			46.45%

⁸² Contact rate = (Completes+refusals+break-offs)/(Completes+refusals+break-offs+not contacted).

⁸³ Cooperation rate = Completes/(Completes+refusals+breakoffs).

⁸⁴ Response rate = Completes/[Completes+refusals+breakoffs+not contacted+ (e*(unknown eligibility))]. For this sector, e = 0.538.

Table 28 shows the disposition of all sampled Certification Training/2-4 Year Colleges and provides the contact, cooperation, and overall response rates. The contact rate for the Certification Training/2-4 Year Colleges was 100.0%, the cooperation rate was 100.0%, and the overall response rate was 56.01%.

Table 28. Survey Sample Disposition (Certification Training/2-4 Year Colleges)

		Number	Percent
TOTAL SAMPLE USED		25	100%
Excluded Sample	Not working/Unusable number	0	0.00%
Not Contacted	Respondent never available	0	0.00%
	Answer Machine	0	0.00%
	Call back/Left 800#		
Unknown Eligibility	No Answer/Busy	11	44.00%
	Records not yet called/Scr. Not complete		
Not Eligible	Not Eligible/Not Qualified	4	16.00%
Refused/ Break-off	Refused/ Break-off	0	0.00%
COMPLETED INTERVIEW		10	40.00%
Contact rate⁸⁵ = (10/10 =1.000)			100.0%
Cooperation rate⁸⁶ = (10/10 =1.000)			100.0%
Response rate⁸⁷ = (10/[10+(.714*11)] =.5601)			56.01%

⁸⁵ Contact rate = (Completes+refusals+break-offs)/(Completes+refusals+break-offs+not contacted).

⁸⁶ Cooperation rate = Completes/(Completes+refusals+breakoffs).

⁸⁷ Response rate = Completes/[Completes+refusals+breakoffs+not contacted+ (e*(unknown eligibility))]. For this sector, e = 0.714.

Table 29 shows the disposition of all sampled Mid-High Level Union Training Centers and provides the contact, cooperation, and overall response rates. The contact rate for the Mid-High Level Union Training Centers was 100.0%, the cooperation rate was 66.67%, and the overall response rate was 64.90%.

Table 29. Survey Sample Disposition (Mid-High Level Union Training Centers)

		Number	Percent
TOTAL SAMPLE USED		21	100%
Excluded Sample	Not working/Unusable number	0	0.00%
Not Contacted	Respondent never available	0	0.00%
	Answer Machine	0	0.00%
	Call back/Left 800#	0	0.00%
Unknown Eligibility	No Answer/Busy Records not yet called/Scr. Not complete	10	47.62%
Not Eligible	Not Eligible/Not Qualified	8	38.10%
Refused/ Break-off	Refused/ Break-off	1	4.76%
COMPLETED INTERVIEW		2	9.52%
Contact rate⁸⁸ = (3/3 =1.000)			100.0%
Cooperation rate⁸⁹ = (2/3 =.6667)			66.67%
Response rate⁹⁰ = (2/[3+(.273*10)] =.3490)			34.90%

⁸⁸ Contact rate = (Completes+refusals+break-offs)/(Completes+refusals+break-offs+not contacted).

⁸⁹ Cooperation rate = Completes/(Completes+refusals+breakoffs).

⁹⁰ Response rate = Completes/[Completes+refusals+breakoffs+not contacted+ (e*(unknown eligibility))]. For this sector, e = 0.273.

Table 30 shows the disposition of all sampled Industry Associations and provides the contact, cooperation, and overall response rates. The contact rate for the Industry Associations was 100.0%, the cooperation rate was 100.0%, and the overall response rate was 33.33%.

Table 30. Survey Sample Disposition (Industry Associations)

		Number	Percent
TOTAL SAMPLE USED		6	100%
Excluded Sample	Not working/Unusable number	0	0.00%
Not Contacted	Respondent never available	0	0.00%
	Answer Machine	0	0.00%
	Call back/Left 800#	0	0.00%
Unknown Eligibility	No Answer/Busy Records not yet called/Scr. Not complete	4	66.67%
Not Eligible	Not Eligible/Not Qualified	1	16.67%
Refused/ Break-off	Refused/ Break-off	0	0.00%
COMPLETED INTERVIEW		1	16.67%
Contact rate⁹¹ = (1/1 =1.000)			100.0%
Cooperation rate⁹² = (1/1 =1.000)			100.0%
Response rate⁹³ = (1/[1+(.500*4)] =.3333)			33.33%

⁹¹ Contact rate = (Completes+refusals+break-offs)/(Completes+refusals+break-offs+not contacted).

⁹² Cooperation rate = Completes/(Completes+refusals+breakoffs).

⁹³ Response rate = Completes/[Completes+refusals+breakoffs+not contacted+ (e*(unknown eligibility))]. For this sector, e = 0.500.

Table 31 shows the eligibility status and the estimated eligibility rate (e) for the sample. Of the total 179 pieces of sample used for the study, 104 pieces of sample had a definitive eligibility status. Of the 104 pieces that had definitive eligibility 47 pieces were eligible so the eligibility rate for this study is $47/104=.452$.

Table 31. Sample Eligibility and Estimated Eligibility Rate

	Number	Percent
Total Sample	179	100%
Known eligibility	104	58.10%
<i>Not eligible</i>	57	31.84%
<i>Not working</i>	1	0.56%
<i>Not eligible respondent</i>	56	31.28%
<i>Eligible</i>	47	26.26%
Unknown Eligibility	75	41.90%
Estimated Eligibility rate (e) = eligible/known eligibility	$47/104=.4519$	45.19%

Table 32 shows the eligibility status and the estimated eligibility rate (e) for the Community Training Agencies. Of the total 75 pieces of sample in this sector, 49 pieces of sample had a definitive eligibility status. Of the 49 pieces that had definitive eligibility 20 pieces were eligible so the eligibility rate for this study is $20/49=.408$.

Table 32. Sample Eligibility and Estimated Eligibility Rate (Community Training Agencies)

	Number	Percent
Total Sample	75	100%
Known eligibility	49	65.33%
<i>Not eligible</i>	29	38.67%
<i>Not working</i>	0	0.00%
<i>Not eligible respondent</i>	29	38.67%
<i>Eligible</i>	20	26.67%
Unknown Eligibility	26	34.67%
Estimated Eligibility rate (e) = eligible/known eligibility	$20/49=.4082$	40.82%

Table 33 shows the eligibility status and the estimated eligibility rate (e) for the Vocational & Coop Training Centers. Of the total 28 pieces of sample in this sector, 15 pieces of sample had a definitive eligibility status. Of the 15 pieces that had definitive eligibility 6 pieces were eligible so the eligibility rate for this study is $6/15=.400$.

Table 33. Sample Eligibility and Estimated Eligibility Rate (Vocational & Coop Training Centers)

	Number	Percent
Total Sample	28	100%
Known eligibility	15	53.57%
<i>Not eligible</i>	9	32.14%
<i>Not working</i>	1	3.57%
<i>Not eligible respondent</i>	8	28.57%
<i>Eligible</i>	6	21.43%
Unknown Eligibility	13	46.43%
Estimated Eligibility rate (e) = eligible/known eligibility	6/15=.4000	40.00%

Table 34 shows the eligibility status and the estimated eligibility rate (e) for the Entry Level Union Training Centers. Of the total 24 pieces of sample in this sector, 13 pieces of sample had a definitive eligibility status. Of the 13 pieces that had definitive eligibility 7 pieces were eligible so the eligibility rate for this study is $7/13=.538$.

Table 34. Sample Eligibility and Estimated Eligibility Rate (Entry Level Union Training Centers)

	Number	Percent
Total Sample	24	100%
Known eligibility	13	54.17%
<i>Not eligible</i>	6	25.00%
<i>Not working</i>	0	0.00%
<i>Not eligible respondent</i>	6	25.00%
<i>Eligible</i>	7	29.17%
Unknown Eligibility	11	45.83%
Estimated Eligibility rate (e) = eligible/known eligibility	7/13=.5385	53.85%

Table 35 shows the eligibility status and the estimated eligibility rate (e) for the Certification Training/2-4 Year Colleges. Of the total 25 pieces of sample in this sector, 14 pieces of sample had a definitive eligibility status. Of the 14 pieces that had definitive eligibility 10 pieces were eligible so the eligibility rate for this study is $10/14=.714$.

Table 35. Sample Eligibility and Estimated Eligibility Rate (Certification Training/2-4 Year Colleges)

	Number	Percent
Total Sample	25	100%
Known eligibility	14	56.00%
<i>Not eligible</i>	4	16.00%
<i>Not working</i>	0	0.00%
<i>Not eligible respondent</i>	4	16.00%
<i>Eligible</i>	10	40.00%
Unknown Eligibility	11	44.00%
Estimated Eligibility rate (e) = eligible/known eligibility	10/14=.7143	71.43%

Table 36 shows the eligibility status and the estimated eligibility rate (e) for the Mid-High Level Union Training Centers. Of the total 21 pieces of sample in this sector, 11 pieces of sample had a definitive eligibility status. Of the 11 pieces that had definitive eligibility 3 pieces were eligible so the eligibility rate for this study is $3/11=.273$.

Table 36. Sample Eligibility and Estimated Eligibility Rate (Mid-High Level Union Training Centers)

	Number	Percent
Total Sample	21	100%
Known eligibility	11	52.38%
<i>Not eligible</i>	8	38.10%
<i>Not working</i>	0	0.00%
<i>Not eligible respondent</i>	8	38.10%
<i>Eligible</i>	3	14.29%
Unknown Eligibility	10	47.62%
Estimated Eligibility rate (e) = eligible/known eligibility	3/11=.2727	27.27%

Table 37 shows the eligibility status and the estimated eligibility rate (e) for the Industry Associations. Of the total 6 pieces of sample in this sector, 2 pieces of sample had a definitive eligibility status. Of the 2 pieces that had definitive eligibility 1 piece was eligible so the eligibility rate for this study is $1/2=.500$.

Table 37. Sample Eligibility and Estimated Eligibility Rate (Industry Associations)

	Number	Percent
Total Sample	6	100%
Known eligibility	2	33.33%
<i>Not eligible</i>	1	16.67%
<i>Not working</i>	0	0.00%
<i>Not eligible respondent</i>	1	16.67%
<i>Eligible</i>	1	16.67%
Unknown Eligibility	4	66.67%
Estimated Eligibility rate (e) = eligible/known eligibility	$1/2=.5000$	50.00%

3.2.3 Data Processing

3.2.3.1 Non-Participating Employers

Coding

APPRISE Policy Analysts reviewed the open-end and “other-specify” responses. Codes were created for the open-end responses where appropriate. “Other-specify” responses were back coded into existing categories and new codes were created as necessary. The Employers survey included six “open-end” questions and eight “other-specify” questions. New codes were created for all of the six “open-end” questions and three of the eight “other-specify” questions.

Data Processing

The survey data were checked for consistency with the survey instrument. Data files were created in the following formats: SAS, SPSS, Stata, and Excel. All files were labeled with variable labels and value labels. Survey data codebooks were also created for this study and were distributed along with the data files.

Weighting

Responses were tabulated and graphed separately for each of the following business sectors: Builders, HVAC Contractors, Engineers/Consultants, and Real Estate Developers/Property Manager⁹⁴. Consistent with a December 8th, 2011 Sample Design Memo for this project’s Employer Surveys, no projections to the entire population have been made⁹⁵.

Within each business sector classification, the initial target number of survey completes was designed to produce a self-weighting survey that sampled “establishments in each sector in proportion to the share of employees that they represent” (see Workforce Development Program Market Assessment-Employer Sample Design Memo V7, 2011-12-08, Table 4 and the paragraphs that follow). The following tables show the actual number of completed surveys (shown in [brackets]) by business sector and size stratum, and for the total eligible population, for builders, HVAC Contractors, and Engineers/Consultants:

Table 38. Actual Completed Surveys: Avg. Number of employees [# of firms]⁹⁶

Employee Size Group	Builders	HVAC Contractors	Engineers/Consultants
	Avg # Employees [# of Firms]	Avg # Employees [# of Firms]	Avg # Employees [# of Firms]
Unknown	N/A [3]	N/A [2]	N/A [2]
1 through 9	1.97 [34]	2.58 [36]	2.58 [36]
10 through 19	10.67 [3]	14.50 [2]	13.14 [7]
20+	25.67 [3]	54.25 [4]	46.50 [2]
Total Complete Surveys	4.09 [43]	7.70 [44]	5.91 [47]

⁹⁴ At the 90% confidence level, available data for the Real Estate sector (9 complete surveys out of a total population of the 20 largest real estate firms) provides precision only to within +/- 21%, even taking into account the finite population correction factor. (If this population is taken to be the entire real estate sector and not just the 20 largest firms, then the precision is within +/- 27%). Results will be reported nevertheless, but may not be as useful as for the other three business sectors for which precision to within +/- 11 or 12% can be provided.

⁹⁵ Per Pages 3 and 4 of that memo: “A total sample frame has been developed ... to achieve 140 completed surveys. Although 90/10 precision will not be achieved at either an individual SIC code or at the higher overall population, regional or builder/contractor and engineering services/electrical contractor (NAICS) levels, a soft targeted number of completes has been set.....” “The primary purpose of this survey effort will be to report results from within specific targeted business sector categories. Therefore, no projections to the entire population will be made.”

⁹⁶ Figures for number of employees per firm were taken from Dunn & Bradstreet (D&B) records. There were a total of 7 firms in the surveyed sample for which no data was available from D&B. While those firms will not be used for computing the weights, self-reported data on firm size is available from the telephone surveys for those firms that will be used during analysis to determine which weight to assign to each firm. (Note: the identical figures for HVAC Contractors and Engineers/Consultants in the 1-9 size stratum are both correct; it is merely a coincidence that the numbers are identical.)

Table 39. Total Eligible Sample: Avg. Number of employees [# of firms]

Employee Size	Builders	HVAC Contractors	Engineers/Consultants
Group	Avg # Employees [# of Firms]	Avg # Employees [# of Firms]	Avg # Employees [# of Firms]
Unknown	N/A [9]	N/A [5]	N/A [35]
1 through 9	1.79 [800]	2.13 [586]	2.59 [393]
10 through 19	12.13 [24]	13.38 [32]	12.83 [48]
20+	44.31 [16]	51.14 [37]	48.12 [34]
Total Sample	2.86 [849]	5.41 [660]	6.41 [510]

During the fielding of the survey, adjustments to the eligible population tally were made, and the number of completed surveys in each stratum was not strictly met, so a weighting factor was applied for each size stratum, that renormalized the sample relative to the number of employees they represent in the actual eligible population.

An issue was raised in the Sample Design Memo about a different possible weighting strategy (see bottom of Memo’s Page 9):

“In some analyses, NYSERDA may be more interested in representing the number of firms than in representing the share of employees. For those analyses, it will be appropriate to develop relative weights within market sectors based on establishment counts. For example, in the construction sector, the small employee size stratum is 52% of the sample, but represents 87% of the firms. So, the establishment relative weight for completed interviews would be 1.67. By comparison, the establishments in the largest size group are 36% of the sample, but 6% of the establishments, so the establishment relative weight would be 0.167. The variation in relative weights across sample strata reduces the effective sample size and increases the variance of survey estimates.”

Therefore, a second weighting factor was developed for each sector and size category, based on the ratio of actual percentage of completes in each sector, relative to the eligible population of employers in that sector. Which weighting factor to apply will be determined for each survey question, depending on whether the question refers primarily to firms or to the employees of those firms.

By computing weights based on the number of employees in each size stratum, the following weighting factors were derived. Each weight is computed by dividing the total number of employees in the eligible population by the total number of employees in the sample, and then renormalizing to bring the totals back to the actual sample size. For example, for Builders, the total number of employees in the eligible population in size stratum 1-9 employees is $1.79 \times 800 = 1,432$, while the total in the survey sample is $1.97 \times 34 = 67$; thus the preliminary (pre-normalization) weighting factor is $1,432/67 = 21.373$. Calculated similarly, the pre-normalized weight for the 10-19 size stratum is $291/32 = 9.094$ and for the 20+ size stratum is 9.208. These weights are important only as to the ratios between them; thus, they can be renormalized by multiplying by any factor. Using the pre-normalized weights, the original 40 building firms for which employee data exists would become $34 \times 21.373 + 3 \times 9.094 + 3 \times 9.208 = 781.588$. To renormalize, all the weights are multiplied by $(40/781.588)$. The results for all three of the business sectors for which there will be weighting, are shown in Table 40.

Table 40. Weighting Factors for Each Sector and Size Category, Weighted by Share of Employees

Business Sector	Builders	HVAC Contractors	Engineers/Consultants
1-9 Employees	1.094	1.029	1.035
10-19 Employees	0.465	1.132	0.633
20 or more Employees	0.471	0.669	1.663

When applying weights based on the number of eligible firms, the weighting factors will be as shown in Table 41 computed similarly as to Table 40, but using the number of firms in the sample and in the eligible population, rather than the number of employees:⁹⁷

Table 41. Weighting Factors for Each Sector and Size Category, Weighted by Establishment Counts

Business Sector	Builders	HVAC Contractors	Engineers/Consultants
1-9 Employees	1.120	1.044	1.034
10-19 Employees	0.381	1.026	0.650
20 or more Employees	0.254	0.593	1.611

The study was originally intended to provide 90/10 confidence/precision within each business sector. That level of precision turned out not to be attainable. Taking into account the number of completed surveys, the total eligible population, and the sample design factor due to weightings, the precision levels we have achieved are shown in the following table.

Table 42. Confidence/Precision Within Each Business Sector

Business Sector	Builders	HVAC Contractors	Engineers/Consultants	Real Estate
Number of Completes	43	44	47	9
Total Eligible Population	849	660	510	20
Actual Confidence/Precision	90/12	90/12	90/12	90/21

⁹⁷ Note, however, that the weighting strategies from Tables 3 and 4 actually produce strikingly similar results, with variation that are likely to prove insignificant, except for one cell (Builders, 20 or more employees).

3.2.3.2 Non-Participating Employers – Real Estate Developers and Property Managers

Coding

GDS staff reviewed the open-end and “other-specify” responses. A notes section was added where appropriate. The Workforce Development Program Employers survey included six “open-end” questions and eight “other-specify” questions.

Data Processing

The survey data were checked for consistency with the survey instrument. An Excel spreadsheet was created to summarize all the data collected from the completed surveys. A survey data key was included to the right of the spreadsheet.

Weighting

Given the census approach used for this small and targeted sample, the data were not weighted.

3.2.3.3 Non-Participating Training Organizations

Coding

APPRISE Policy Analysts reviewed the open-end and “other-specify” responses. Codes were created for the open-end responses where appropriate. “Other-specify” responses were back coded into existing categories and new codes were created as necessary. The Workforce Development Program Training Organizations survey included eleven “open-end” questions and five “other-specify” questions. New codes were created for six of the eleven “open-end” questions and one of the five “other-specify” questions.

Data Processing

The survey data were checked for consistency with the survey instrument. Data files were created in the following formats: Excel (both labeled and unlabeled), SAS, SPSS, and Stata. Variables and values were labeled consistent with the survey instrument. Stata and Excel codebooks that provided the data layout were developed.

Weighting

As specified on Page 2 of the Sample Design Memo for the Non-Participating Training Organization Survey (dated November 23, 2011):

The survey was designed to provide statistical precision of 90% confidence with a +/- 10% sampling error (90/10) for New York State. The sample of non-participating training organizations selected to participate in this survey was stratified proportionally among the number of training organizations, based on their percent of the total number of non-participating training organizations in the State. The training organization types have been grouped into organizations that provide entry-level and mid- to high-level skills trainings within the State and that may or may not currently include energy efficiency components within their training efforts, but are all viewed as having the potential to include these components in the future.

Although the targeted number of completes was designed to achieve (or exceed) a 90/10 level of confidence and precision at the State level, it was understood that the number of completes would not be sufficient to achieve 90/10 at the training organization/sector level, or for the rolled up entry-level, of

mid- to high-level skills categories even when taking the finite population correction factor into account. Therefore, as specified in the sample design memo developed for this survey, analysis will be conducted and results reported with statistical validity only at the State level (across the entire population of eligible non-participating training organizations).⁹⁸ Results at the individual organization or skills-types levels may also be presented, if appropriate, but only for qualitative insight purposes. Attempts have been made, through a census approach, to achieve as many completes as possible within each targeted training organization type and skills-level category.

The actual number of surveys completed was not proportional across the board to the number of eligible organizations in each sector. Therefore, as shown in Table 43, post-survey weightings will be applied to ensure that results are presented in a manner that is most representative of the entire population.⁹⁹

Table 43. Completes by Sector

Sector (population)	Number of Eligible Records	Actual # of Completes	Actual Confidence/Precision
Community (73)	31	17	90/14
Vocational & Coop (28)	11	6	90/24
Entry Level Union (24)	13	6	90/26
Certification/2-4 Year Colleges (26)	18	10	90/18
Mid-High Level Union (22)	6	2	90/52
Industry Association (6)	3	1	90/82
Total (179)	82	42	90/9

As shown above in Table 43 as expected, the actual number of completed surveys do not provide desired (+/- 10%) precision at the 90% confidence at the training organization sector level (i.e., precision values ranged from +/- 14% to 82% depending on sector, even after taking into account the finite population correction factor). However, across the entire population (total all sectors), precision at the 90% confidence level reaches +/- 9%.

⁹⁸ *Sample Design Memo – Non-Participating Training Organization Survey*, prepared by GDS Associates, dated November 23, 2011.

⁹⁹ One area where post-survey weightings may be necessary includes a situation where it is found that some strata have relatively few training organizations but account for a disproportionately large number of trainees. In such a situation, the low frequency stratum may need to be weighted up based on some size metric but only if there were enough completes in the stratum to reasonably represent those in the stratum population.

Table 44. Targeted Population for Training Organizations Survey

Training Organization Type (NAICS Codes)	Total Number of Eligible Non- Participant Training Organizations (% of total)	Actual Number of Completed Surveys (% of total eligible)	Proposed Weighting Factor¹⁰⁰
Entry-Level Skills			
Community Training Agencies - WAP and Other Community Agencies - (NAICS: 624190, 813319)	31 (37.8%)	17 (40.5%)	0.934
Vocational and Cooperative Training, Rehabilitation and Job Training - Market Actor Specific - (NAICS: 624310, 923140)	11 (13.4%)	6 (14.3%)	0.939
Union Training Centers (NAICS: 813930)	13 (15.9%)	6 (14.3%)	1.109
Total Entry Level Skills Training Organizations	55 (67.1%)	29 (69.0%)	
Mid- to High-Level Skills			
Certification Training/2 and 4 Year Colleges (NAICS: 611210)	18 (22.0%)	10 (23.8%)	0.922
Union Training Centers (NAICS: 813930)	6 (7.3%)	2 (4.8%)	1.537
Industry Association/Other Technical Training (NAICS: 611430)	3 (3.7%)*	1 (2.4%)	1.537
Total Mid to High Level Skills Training Organizations	27 (32.9%)	13 (31.0%)	
Total All Training Organizations	82 (100%)	42 (100%)	

Although, given the available precision, it is not statistically valid to report results for each sector independently, the sectors can be grouped logically into two categories: low-level skills training

¹⁰⁰ Due to rounding, values shown in this column may differ slightly from the results obtained by dividing the percentages shown in the Eligible and Actual columns.

organizations, and mid-to-high-level skills training organizations, and the survey responses can be combined and reported out in each of those combined sectors. Reporting results separately could provide program staff with unique insights regarding energy efficiency training practices, trends and opportunities for these two very different skill-level training categories. Within these combined groupings, at the 90% confidence level, our reported results will be precise to within +/- 11% for the low-level skills training organizations, and within +/- 17% for the mid-to-high-level skills training organizations. While these precisions are not ideal, they may provide some useful insights and we would like to report them.

Therefore, the methodology to be used for weighting results from training organization surveys is summarized as follows:

- To combine the results across organizations, there are (at least) two ways in which one might consider weighting the results of each survey in the sample: the first would be to provide results weighted by the number of training organizations in the population, and the second would weight the results by the number of individuals served by these various training organizations.
- Since the MCA Team does not have any figures on the actual number of individuals, results will be weighted according to the number of training organizations they represent. The following table shows the number of each type of training organization and the percentage of the total they represent, the actual number of completed surveys, and the proposed weighting factors to be used to adjust the figures so that they represent each sector in proportion to its percentage in the overall population.
- The total number of training organizations column is taken from the Workforce Development Program Training Organization Sample Design Memo V3 2012-11-23 document, the actual number of completed surveys is taken from the raw data file, and the proposed weighting factor is computed by dividing the percentage of all eligible training organizations in a given sector by the percentage of actual completes in that sector.

SECTION 4. MARKET CHARACTERIZATION

This section presents market characterization results for NYSERDA's Workforce Development Program. Specifically, an analysis of New York State's present and future workforce needs, including technical and other skills with focus on energy efficiency industry and related jobs; the State's workforce training organizations, instructors and related affiliations and firm characteristics; and Workforce Development targeted trainee audiences, including quantification of unemployed, underemployed, hard-to-serve, and underserved populations.

This section is organized into five sub-sections as follows:

- Section 4.1 – summarizes the MCA Team's market characterization approach
- Section 4.2 – contains an upstate/downstate analysis of the total number of energy efficiency service and consulting and weatherization jobs in New York State in 2008. This section also includes a characterization of entry, mid- and high-level skill jobs from 2008 to 2018, based on specific NAICS codes identified as energy efficiency industries-related, as well as a list of the types of companies doing business within these industries. Workforce staffing requirements and types of skills required for energy efficiency jobs across various industries are also assessed. However, this research focuses mainly on large employers and sub-contractors that plan, manage, install and evaluate energy efficiency programs for the energy industry

Employer market actors (*i.e.*, the job creators) include:

- a. Utility Companies – Program staff for newly funded EEPS initiatives including utility providers and transmission/distribution companies in the State
 - b. NYSERDA - Program staff for new residential and commercial/industrial programs, research and development projects close to deployment
 - c. Energy Service Companies (ESCOs) – serving the State's energy efficiency market
 - d. Architects and Engineering Firms – serving the new construction and design/build market
 - e. Builders/Contractors and Program Participants – including home performance contractors, commercial/industrial building owners/lessors, commercial real estate owners/managers, multifamily building owners, etc.
 - f. Labor/Trade Unions – that support the energy efficient industry Home Performance Contractors serving the Home Performance with Energy Star (HPwES) program
- Section 4.3 – characterizes the Workforce Development Program's targeted employee populations (*i.e.*, the job seekers) including: educational attainment, the aging workforce, the State's unemployed and underemployed, and hard-to-reach/hard-to-serve populations.
 - Section 4.4 – provides an assessment of training organizations (both headquarter and satellite locations) identified as offering entry level job readiness skills and mid- to high-level energy efficiency-related education and job training in the State.
 - Section 4.5 – presents a high level summary of findings from all of this project's market characterization efforts.

Combined, these market characterization efforts provide baseline information on a broad range of applicable market actor variables and Program indicators, which will facilitate the identification and examination of changes within the Workforce Development Program's markets over time.

4.1 MARKET CHARACTERIZATION APPROACH

Market characterization results are generated primarily from secondary data sources, supplemented by information gathered during primary data collection efforts and discussions with stakeholders in the Program. To characterize the market within which NYSERDA's Workforce Development Program is being implemented, pertinent market and baseline information has been collected by geographic region throughout the state (*i.e.*, upstate vs. downstate comparisons and by county where applicable).

In performing this characterization, the MCA Team worked with NYSERDA Energy Analysis and program staff and other NYSERDA program evaluation contractors to identify specific market characterization parameters. For reporting purposes, these parameters have been separated into the energy efficiency services, consulting and weatherization industry's employers, employees and training organizations, as discussed in more detail in Sections 4.2, 4.3 and 4.4, respectively.

As part of this effort, the MCA Team:

- Participated in meetings with program staff and other NYSERDA evaluation contractors to discuss potential characterization parameters and other market indicators;
- Held discussions with key external stakeholders that interface with the target market segments;
- Reviewed the latest logic model, related reports and survey efforts to identify potentially relevant characterization parameters that have previously been identified and tracked by NYSERDA;
- Reviewed additional reports and survey efforts conducted by other entities to identify other potentially valuable characterization parameters currently being used within the industry; and
- Investigated other data sets to determine types of characterization data available for analysis. Table 2 provided a listing of some of the key documents and data sources used in this effort.

4.2. ENERGY EFFICIENCY SERVICES, CONSULTING AND WEATHERIZATION JOBS¹⁰¹

Energy efficiency jobs are in virtually every industry, and the skills needed to fill these positions range from entry-level to medium- and high-level skills. Utilities, state government, energy efficiency program delivery contractors, consultants, architectural and engineering firms and companies from all industries are hiring employees for energy efficiency positions. Following is a description of employer types that have a higher concentration of energy efficiency jobs within their industries/organizations.

Utilities – Regulated investor-owned electric and gas utilities (and sometimes even less regulated municipal and cooperative utilities) can provide important input regarding policies that support the development, implementation and evaluation of utility-sector energy efficiency programs. The origin of utility-sector energy efficiency programs traces back to the energy crises in the 1970s, when the concept of "energy conservation" emerged to help customers cope with soaring energy prices.¹⁰² Over time, this

¹⁰¹ NAICS Association, Definition and list of company categories, May 2012. www.naics.com.

¹⁰² American Council For An Energy Efficiency Economy, Article "Energy Efficiency Programs For Utility Customers", May 23,2012, www.aceee.org.

led to the development of an expanded set of customer energy efficiency programs provided by electric and natural gas utilities. In the 1980's, in some states, utility regulatory agencies set policies and energy savings goals that led to the development and practice of utility demand-side management programs, which included customer energy efficiency programs.¹⁰³

Certain aspects of state regulation and policy are critical for enabling and supporting utility energy efficiency programs. Experience has shown that without direct and supportive regulations and policies, utilities may not develop and offer significant customer energy efficiency programs. The greatest barrier for utilities is confidence they will at least recover the cost of developing and implementing energy efficiency programs. Beyond program cost recovery, utilities face key financial disincentives and barriers of future lost revenues to investment in energy efficiency. To address these financial barriers, some states have regulations and policies in place to create new business models for their investor-owned utilities that provide incentives for developing successful and effective energy efficiency programs.¹⁰⁴

Since the 1980's, energy efficiency has evolved to become recognized as an integral and highly valuable element of utility investments and operations. Utility energy efficiency programs have yielded significant energy and economic benefits to the utility system and to ratepayers. Energy efficiency programs have also led to job growth in many fields, including the building trades.¹⁰⁵

Today energy efficiency is regarded as an important utility grid management system resource that can reduce greenhouse gases, save money for customers, and generate jobs. The types of utility energy efficiency jobs range from building maintenance, transmission and distribution system design and operations, energy efficiency policy planning, program design, management and implementation, program evaluation and marketing, and includes multiple skill levels (from entry level to advanced expertise).

In response to both economic concerns and climate change, legislators and regulators in New York State and across the country have supported energy efficiency at unprecedented levels. According to the American Council for and Energy Efficiency Economy (ACEEE), the total budgets for electricity efficiency programs alone in the U.S. have increased to \$4.5 billion in 2010, up from \$3.4 billion in 2009. Given the increasing regulatory commitments to energy efficiency, this growth will likely continue over the next decade.¹⁰⁶ According to the 2011 ACEEE *Scorecard*,¹⁰⁷ New York State ranks #3 in the U.S.,

¹⁰³ American Council For An Energy Efficiency Economy, Article "Energy Efficiency Programs For Utility Customers", May 23, 2012, www.aceee.org.

¹⁰⁴ American Council For An Energy Efficiency Economy, Article "Energy Efficiency Programs For Utility Customers", May 23, 2012, www.aceee.org.

¹⁰⁵ American Council For An Energy Efficiency Economy, Article "Energy Efficiency Programs For Utility Customers", May 23, 2012, www.aceee.org.

¹⁰⁶ American Council For An Energy Efficiency Economy, Article "Utility Regulation and Policy", May 23, 2012 www.aceee.org.

¹⁰⁷ American Council For An Energy Efficiency Economy, Definition: *Scorecard* provides a comprehensive assessment of policy and programs that improve energy efficiency in our homes, businesses, industry, and transportation sectors. The *Scorecard* examines six state energy efficiency policy areas and presents these results in six chapters: (1) utility and public benefits programs and policies; (2) transportation policies; (3) building energy codes; (4) combined heat and power; (5) state government initiatives; and (6) appliance efficiency standards. States can earn up to 50 possible points in these six policy areas combined, with the maximum possible points in each area weighted by the magnitude of its potential energy savings impact. www.aceee.org.

behind Massachusetts (taking the #1 position for the first time) and California (slipping from the top spot it held for the first four editions of the ACEEE Scorecard) for its comprehensive policies and programs that improve energy efficiency in residential, businesses, industry, and transportation sectors. Therefore, the number of NYS utility energy efficiency-related jobs is expected to increase in the future based on elevated Program goals, Program investment and associated local, regional and state-wide targets, making this business category an important market actor group for the Workforce Development Program to target.

As utility investment in energy efficiency programs continues to increase, the need to hire new staff to support the development, implementation and evaluation will increase as well. It is estimated, for every \$1 million of investment in energy efficiency programs, two energy efficiency related jobs are created.¹⁰⁸

NYSERDA – NYSERDA is classified as a government agency and has about 500 employees who, through collaboration, seek to develop a diversified energy supply portfolio, improve market mechanisms, and facilitate the introduction and adoption of advanced technologies to help New Yorkers plan for and respond to uncertainties in the energy markets. NYSERDA strives to facilitate change through the widespread development and use of innovative technologies to improve the State’s energy, economic, and environmental wellbeing.^{109 110}

A key goal of NYSERDA is to help New York State meet its energy efficiency and savings goals by reducing energy consumption, promoting the use of renewable energy sources, and protecting the environment. In fulfilling its mission, NYSERDA’s workforce reflects its public service orientation, placing a premium on objective analysis and collaboration, as well as reaching out to solicit multiple perspectives and share information. NYSERDA is committed to public service, striving to be a model of efficiency and effectiveness, while remaining flexible and responsive to its customers’ needs. NYSERDA’s programs and services provide a vehicle for the State to work collaboratively with businesses, academia, industry, the federal government, environmental community, public interest groups, and energy market participants.

NYSERDA is primarily funded by the State’s regulated utility ratepayers through the System Benefits Charge (SBC), which was established on May 20, 1996, and these funds are allocated towards energy-efficiency programs, research and development initiatives, low-income energy programs, and environmental disclosure activities in the State. NYSERDA’s **New York Energy \$martSM**, and subsequent EEPS-funded programs have been created to help the State develop competitive markets for energy efficiency; demand management; outreach and education services; research, development, and demonstration; low-income services; to provide direct economic and environmental benefits to New Yorkers; and to help the State achieve its 15 x 15 goal.

There are numerous types of energy efficiency jobs at NYSERDA, ranging from entry-level staff to managerial positions in the areas of policy and strategy design, program development and delivery administration/implementation, and energy analysis/evaluation design, delivery and management support. NYSERDA program staff solicits bids and awards contracts for program implementation and evaluation.

¹⁰⁸ According to the Manpower Group Employment Outlook Survey, Quarter 2 2012 survey results for the Northeast (including New York), identified employers in four industry sectors expect the hiring pace to considerably increase in Quarter 2 2012: Construction, Transportation & Utilities, Leisure & Hospitality and Other Services.

¹⁰⁹ New York State Energy Research Development Authority, “About NYSERDA”, May 23, 2012. www.nyserda.ny.gov/.

¹¹⁰ LinkedIn Corporation, Search for NYSERDA. May 29, 2012. www.linkedin.com.

Energy efficiency-related positions at NYSERDA include office administration, senior and executive management, sales, marketing, community relations, finance and accounting. The number of jobs is directly related to the State's level of investment in energy efficiency programs and NYSERDA's authorized roles and responsibilities in these areas. Such levels are expected to remain stable and potentially increase in the future making NYSERDA staff another important market actor group for the Workforce Development Program to target.

Energy Service Companies (ESCOs) – The national ESCO market for energy efficiency project installations and services exceeded \$5.1 billion in 2011. Driven by public policies that encourage a greater emphasis on energy efficiency to reduce costs and improve operations, this market is expected to continue to grow faster than the domestic economy and reach \$16 billion in sales by 2020.¹¹¹

ESCOs are contractors hired by end use companies to provide energy solutions including energy efficiency. Services provided by ESCOs include: design and implementation of energy savings projects, energy efficiency and conservation measures, power generation and energy supply, and risk management. Employees that work for ESCOs typically perform in-depth analyses of their clients' properties, design energy efficient solution proposals, and if accepted, install or arrange for the installation (and often the financing) of recommended measures and equipment. ESCO employees also track energy and associated cost savings over time, as these savings are often used to pay back their capital investment in the project measures and systems over a period of five to twenty years.¹¹²

The hiring of staff to support energy efficiency programs and related projects increases proportionately with the investment in federal, state and utility energy efficiency programs. Further, energy efficiency firms comprise a variety of job types and it is important to recognize that not all jobs at these firms require energy efficiency-specific skills. However, the ESCO business category remains an important market actor group for the Workforce Development Program to target.

Engineering, Consulting and Architectural Firms – The energy efficiency industry, and companies expanding their energy efficiency engineering and consulting practices, are hiring an increased number of engineers and technical consultants from a variety of different specialties, including electrical, energy, industrial process, software, and more. According to the New England Clean Energy Council, engineers and consultants with experience and training are hard to find, even at a time when unemployment is high.¹¹³ Overall, engineering and technical consulting employment is expected to grow by 11% over the 2008 to 2018 decade.¹¹⁴

The design/build function of architectural engineering firms working in the existing building remodeling, as well as new construction markets is likely to grow as the demand for energy efficiency in construction grows in response to consumer demand and State and local legislative actions (NYS's 2009 EEPS

¹¹¹ Pike Research Report, "The US Energy Services Company Market", 2012. www.scribd.com/doc/.../The-U-S-Energy-Services-Company-Market.

¹¹² Energy Service Companies (ESCO), Mora Associates, Clean Energy/Clean Technology, Research Note, February 2010. eetd.lbl.gov/ea/EMS/ems_pubs.html.

¹¹³ Help Wanted: 24 Clean Energy Firms Hiring 300 New Employees Right Now, April 7, 2011. <http://www.cleanenergycouncil.org/blog/category/adoption/>.

¹¹⁴ Engineering Guide USA, "Engineering Job Outlook", May 23, 2012. http://education-portal.com/audio_engineering.html.

Order¹¹⁵, NYC's May 2012 Greener, Greater Buildings Plan¹¹⁶, NYS's 2009 GJGNY Act, etc.). The role of architects and engineers incorporating energy efficiency into the construction process is multifold.¹¹⁷ They advise on energy efficiency measures, evaluate how well the building design adapts to the needs of occupants, and make necessary improvements. Architects work with engineers, urban planners, interior designers, landscape architects, and other professionals. In fact, architects spend a great deal of their time coordinating information from, and the work of, other professionals engaged in the same project. They also assist clients to obtain construction bids, select contractors, and negotiate construction contracts. As construction proceeds, they visit building sites to ensure contractors follow the specified design, adhere to schedule, use specified materials and meet work quality standards. Sometimes, architects provide post-construction services, such as property or facilities management.

Employment of architects is strongly tied to the activity of the construction industry and is expected to grow faster than the average for all occupations through 2016 (18% between 2006 and 2016). Keen competition is expected for positions at the most prestigious firms, and opportunities will be best for those architects who are able to distinguish themselves with their creativity. Strong growth is expected to come from nonresidential construction as demand for commercial space increases. Residential construction, buoyed by low interest rates, is also expected to grow as more people become homeowners. However, if interest rates rise significantly, new home construction may decline again, but residential construction makes up only a small part of architects' work.¹¹⁸

Builders and Contractors – Builders and contractors are the service providers responsible for implementing energy efficiency in new construction and remodeling projects. Builders and contractors take direction for building specifications of construction projects from architects and clients, and build accordingly. These firms are responsible for projects being constructed to meet or exceed energy code and building standards. In addition, they ensure quality craftsmanship and often hire sub-contractors to perform different components of construction.

Growth in the building and contractor industries is directly tied to the economy. It is expected that from 2008 to 2018 there will be a 2% growth in the number of builder/contractor jobs in the State. Types of builder firms include those that construct residential single family and multi-family homes (less than 4 units), commercial and industrial builders of apartment buildings and business or industrial complexes. The number of employees in builder firms range from two to three people who hire sub-contractors to perform the work, to larger firms with up to 100 or more employees. The types of contractors hired by builders who act as a general contractor for building projects can include framing contractors, insulation and roof contractors, masonry contractors, electrical contractors, HVAC and equipment installation contractors.

The education requirement for a builder job is typically a high school degree or equivalent, with no experience required. On the job training is short term, and advancement is generally attained through certification and training workshops. The education requirement for contractor jobs is typically a high school degree with completion of a trade specific training course.

¹¹⁵ The New York Public Service Commission's June 23, 2008 EEPs Order called for an increase in SBC collections and a ramp up of program efforts by NYSERDA and the State's six investor-owned electricity transmission and distribution utilities to meet the State's "15-by-15" electricity reduction goal.

¹¹⁶ PlaNYC Green Buildings & Energy Efficiency. <http://www.nyc.gov/html/gbee/html/home/home.shtml>.

¹¹⁷ Wikianswers, What_ are_ responsibilities of an_ architect, May 2012., www.wikianswers.com.

¹¹⁸ All Things Political, "Architect Job Outlook", May 23, 2012. arts.mitrasites.com/architecture-jobs-outlook.html.

According to New York State Real Estate News, non-union construction constituted about 10% of the work in New York State in the 1970's. Little official data exists, but industry insiders agree the figure now hovers around 40%. Union workers are seen as more skilled, but very expensive. Non-union workers are also perceived as skilled and significantly less expensive, but don't offer the coordinated man-power. Presently, more developers are opting to use a combination of union and non-union workers.¹¹⁹ On December 31, 2011 the "New York Plan," that required construction in New York City to be "closed shop"- only employing union workers-was allowed to expire. The expiration of the New York Plan affects future developments, not projects already under construction.

There are currently 35 Laborers' Unions in New York State, representing over 40,000 members.¹²⁰ Union workers are predominantly hired for larger construction jobs requiring greater skill and expertise. The State's Laborers' Unions provide training, education and on-the-job experience in new and traditional construction skills through nationally recognized training courses. These courses are designed to equip apprentices with core skills that emphasize worksite safety and productivity and help expand the competitive position of union employers. These Unions believe each member should be provided core skills, new skills, and career path training. Over time, laborers can enhance their skills through advanced classes that help them keep pace with changing technologies and become eligible for more job opportunities.¹²¹

Labor Unions – In 2009, there were 1,183 labor union offices located in New York State, with 16,596 members. Compared to the rest of the country, New York State has one of the highest percent of union jobs, most notably in the education and construction industries. There are two tiers of labor union jobs, journeymen and apprenticeships. To join a union, a candidate signs on with a union and agrees to its terms and rules. Private and public firms hire union labor through an agreement with each union, and labor is assigned to work on specific jobs for a period of time. Training is available at some of New York State's union office locations and required for advancement in skill, wage and rank within each union. Wages are paid through the union.¹²²

Home Performance Contractors – These firms rate the efficiency of existing and new buildings and make recommendations for the installation of energy efficiency and conservation measures. The staffing needs of these firms include energy auditors, Home Energy Rating System (HERS) raters, energy consultants, efficiency technicians, building contractors (including potential union contractors), internal office support staff, marketing, sales and company management.

Identifying the types of companies engaged in the energy efficiency industry serves as a proxy to assess the current and future demand for Workforce Development jobs, and to identify the types of skills and education needed for these jobs. Two industry areas have been assessed as part of this workforce development, energy efficiency jobs characterization effort: 1) the Energy Efficiency Services and Consulting industry, and 2) the Energy Efficiency/Weatherization Industry.

Companies in the Energy Efficiency Services and Consulting industry have NAICS codes that begin with 541, and are defined as professional, scientific and technical service jobs, where employees' knowledge is

¹¹⁹ The Real Deal, New York City Real Estate News, "State of the Unions", by Katherine Clarke, December 29, 2011. http://therealdeal.com/issues_articles/state-of-the-unions/.

¹²⁰ New York State Laborers' Union,, May 2012 , <http://www.unions.org/unions/new-york/32>.

¹²¹ New York State Laborers' Union,, May 2012, <http://www.unions.org/unions/new-york/32>.

¹²² New York State Laborers' Union, May 2012, <http://www.unions.org/unions/new-york/32>.

the company's greatest asset. Most of the jobs in this industry require a degree, and moderate to extensive training in energy efficiency. The Energy Efficiency Services and Consulting industry firms offer their employees' knowledge and skills as a product or service delivered to clients, rather than installing equipment or materials. Energy Efficiency Service and Consulting jobs include: Energy Efficiency Program Managers, Energy Engineers and Managers, Cost Estimators, Electrical Engineers and Energy Consultants.

Companies in Energy Efficiency/Weatherization industries have NAICS classification codes that begin with 23, and are considered Specialty Trade Contractors. These companies primarily engage in specialized construction activities; such as plumbing, electrical work, and work for builders and general contractors under subcontract or directly for project owners. Jobs in these industries primarily relate to targeted residential and commercial construction activities including additions, alterations, retrofits, reconstruction, and installation, maintenance and repairs of systems. Energy Efficiency/Weatherization job titles include: Energy Auditor, HVAC Contractor, Plumber, Insulation Installer, and Electrician Assistant.

The remainder of this sub-section provides an overview of energy efficiency-related employment trends (by job skill), followed by more detailed information on the geographic location and numbers of job types. Maps at the end of Section 4.3 and 4.4 compare the current and future demand of Energy Efficiency Services and Consulting, and Energy Efficiency/Weatherization industry jobs to existing training resources and targeted trainee populations that exist in New York State. This comparison provides important insights regarding what kind of trainings are available, and where they may be needed across the State. Identifying the future labor needs of the energy efficiency industry, and the location of those needs, may help identify potential areas for additional Program focus.

4.2.1. Employment Trends by Job Skills 2008 – 2018; entry-, mid- and high-level¹²³

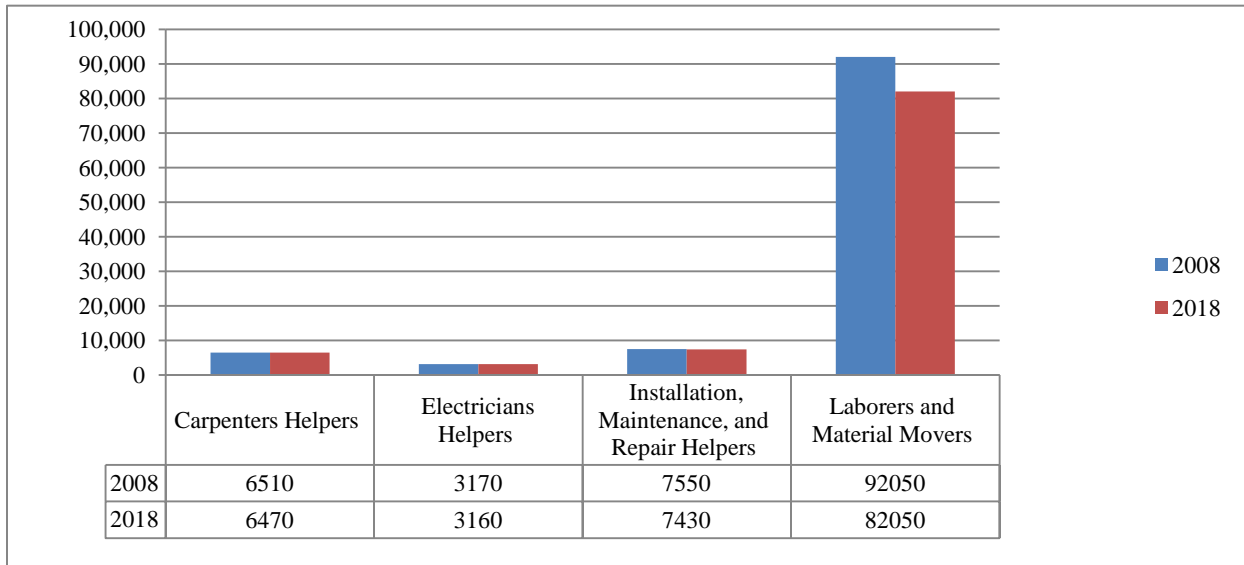
As shown in Figure 2, based on Bureau of Labor Statistics, ONet¹²⁴ data projections, the future demand for entry level skilled jobs in the energy efficiency industry in New York State shows a decline, ranging from -1% to -11%, from 2008 to 2018.¹²⁵ The largest decline is seen in the number of laborers and material mover jobs.

¹²³ Employment Trends by Job Skills 2008 – 2018; entry-, mid- and high-level baseline information and format for presentation of information, NYS Department of Labor “New York State Clean Energy Industry: Labor Market and Workforce Intelligence”, prepared in response to the first Report of the Renewable Energy Task Force, May 2009.

¹²⁴ O*NET, U.S. Department of Labor, [Employment & Training Administration, Occupation Search](http://www.onetonline.org/), <http://www.onetonline.org/>.

¹²⁵ O*NET, U.S. Department of Labor, [Employment & Training Administration](http://www.onetonline.org/), Occupation Search <http://www.onetonline.org/>.

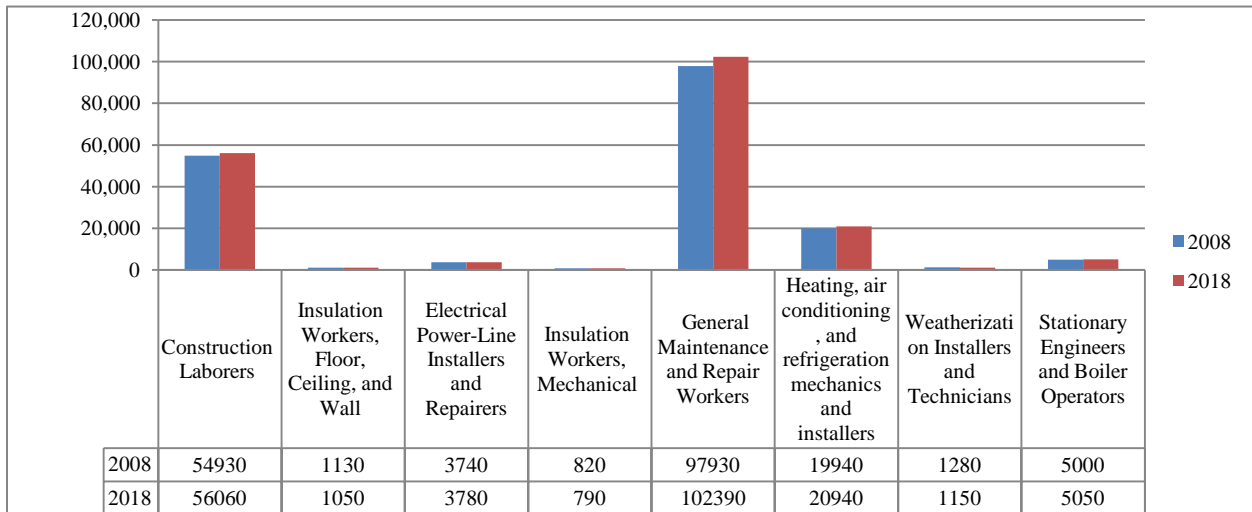
Figure 2. Employment Trend for Energy Efficiency Entry Level Skill Jobs, 2008 to 2018



Source: NYS Department of Labor, New York State Clean Energy Industry: Labor Market and Workforce Intelligence, May 2009, Table F-1 format, updated with job titles from selected NAICS codes and job trend information from Bureau of Labor Statistics, O*Net.

As shown in Figure 3, the demand for mid-level skill jobs in energy efficiency in the State, from 2008 to 2018, ranges from an increase of 5% in areas including HVAC and Maintenance and Repair, to a decrease of up to 10% in areas of Weatherization Installers and Insulation Workers.

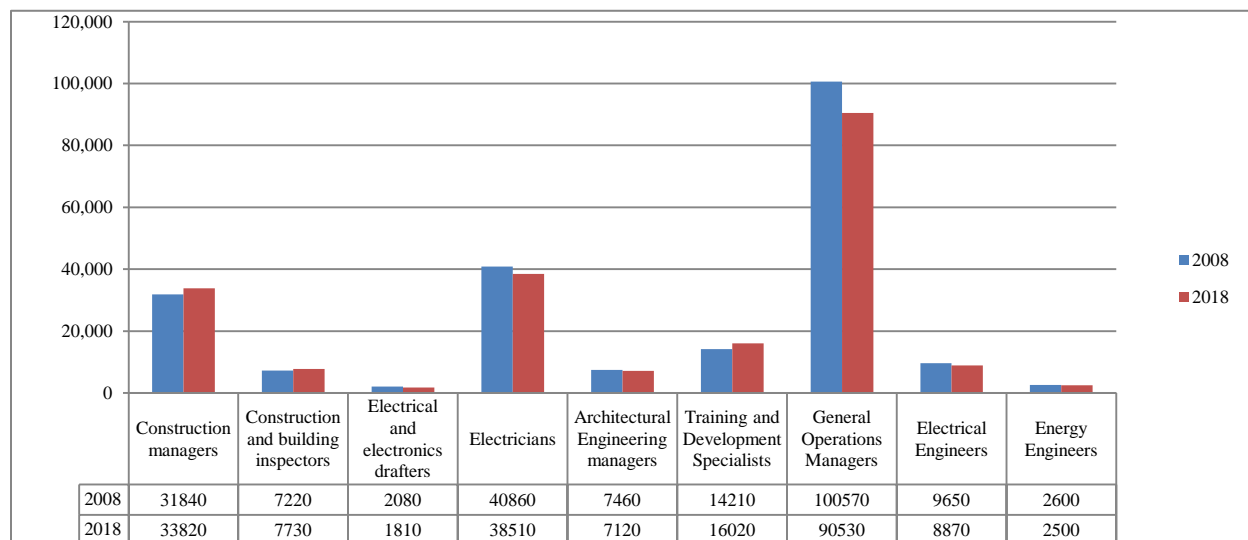
Figure 3. Employment Trend for Middle-Level Skill Jobs, 2008 to 2018



Source: NYS Department of Labor, New York State Clean Energy Industry: Labor Market and Workforce Intelligence, May 2009, Table F-1 format, updated with job titles from selected NAICS codes and job trend information from Bureau of Labor Statistics, O*Net.

Figure 4 shows that the future demand for high level skills jobs in energy efficiency in New York State, from 2008 to 2018 is mixed, and ranges from an increase of 13%, in Training and Development Specialists, to a 10% decrease in General Managers and Operations. Other jobs that show future increase in demand, and are Construction and Building Inspectors (7%) and Construction Managers (6%). The Brookings Institute and NYSDOL Green Jobs Reports support this finding that the construction industry is an area of growth for future energy efficiency jobs. Jobs that show a decrease in demand are Architects (-5%), Electricians (-6%) and Energy Engineers (-4%).

Figure 4. Employment Trend for High-Level Skill Jobs, 2008 to 2018



Source: NYS Department of Labor, New York State Clean Energy Industry: Labor Market and Workforce Intelligence, May 2009, Table F-1 format, updated with job titles from selected NAICS codes and job trend information from Bureau of Labor Statistics, O*Net.

Although not reflected in the above analysis, local legislation has potential to impact the high-level skills job opportunities (e.g., Greener Greater Building legislation of New York City) – specifically Local Law 87 and Local Law 88 which require energy auditing, retro-commissioning and lighting retrofits, of public and private buildings in New York City.¹²⁶ This legislation is an example of how policy can drive the demand for energy efficiency workers in the near future.

Local Law 87 is far-reaching and requires every building over 50,000 sq ft to undergo an American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Level 2 energy audit, and have its systems retuned every 10 years through the existing building commissioning or retro-commissioning process. Local Law 88 requires the upgrading of building lighting to current energy-efficiency standards, the installation of electrical sub-meters, and the submittal of monthly electrical statements to metered tenants.

Both the audit and existing building commissioning-retrofitting must be performed by energy professionals outside of a building’s O&M staff. The deadline for compliance is based on a building’s

¹²⁶ HPAC Engineering, New York City’s Greener, Greater Buildings Plan, by Ron Wilkinson, AKF Group LLC, New York, New York January 1, 2012.

tax-block number. For example, a building with a tax-block number ending with “6” needs to file in 2016. Anticipating the need for more building-performance professionals, the Urban Green Council, the New York chapter of the USGBC, created a Green Professional Skills Training Program (GPRO), a comprehensive national training and certificate program. The GPRO curriculum provides focused information on mechanical, electrical, plumbing, and general green practices for new and existing buildings, packed into easy-to-understand 4- to 12-hr courses.

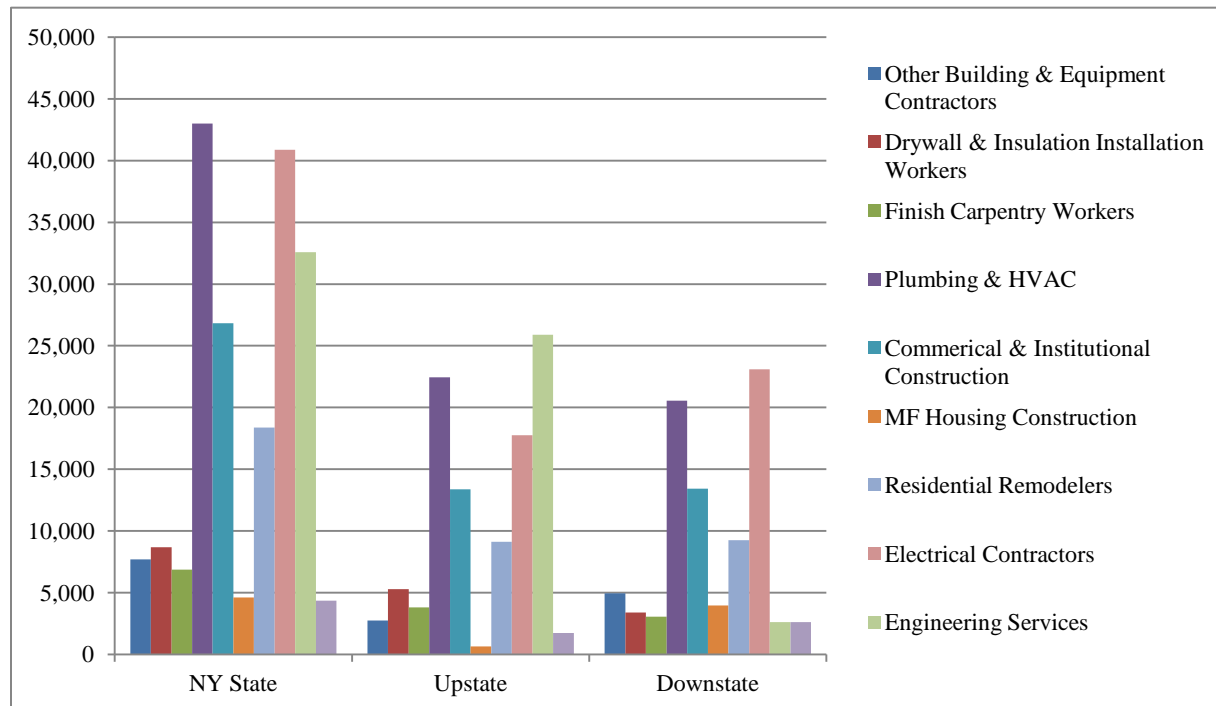
4.2.2. Energy Efficiency Workforce Development Jobs: Where and How Many?

In 2009, as shown in Figure 5, there were 189,827 energy efficiency services and weatherization-related jobs in New York State, 54% upstate and 46% downstate, excluding Long Island. The number and location of jobs in the State were determined through review of NAICS codes to identify industries primarily involved in the design, building, installation, maintenance of energy efficient equipment, and training of energy efficiency-related jobs and practices. These energy efficiency-related industries include: residential, commercial and institutional construction, electrical, HVAC and weatherization installation contractors, and energy efficiency services, consulting and training. Union jobs are represented within the various industry job categories and are thus, not quantified separately. Also, weatherization jobs do not appear as a single NAICS code. As such, the number of weatherization jobs in the State was determined using the same method outlined in New York State’s Clean Energy Report and combined data from the following NAICS codes: NAICS 238220 – Plumbing/HVAC, 238310 - Drywall and Insulation, 238350 - Finish Carpentry, and 238290 - Other Building and Equipment Contractors¹²⁷.

As shown in Figure 5, four industries dominate the New York State energy efficiency related job market; Plumbing & HVAC (23%), Commercial and Institutional Building (14%), Electrical Contracting (22%) and Engineering Services (15%). These four industries represent 74% of the number of jobs identified by the ten energy efficiency industries. Residential Remodelers also represent a noteworthy size of the energy efficiency job market (at 10%). These findings are consistent with the NYSDOL Green Jobs Report that identifies the construction industry as having the highest concentration of “green,” including energy efficiency related jobs.

¹²⁷ New York State Department of Labor, New York State’s Clean Energy Industry: Labor Market and Workforce Intelligence, May 2009. <http://www.labor.ny.gov/home/>.

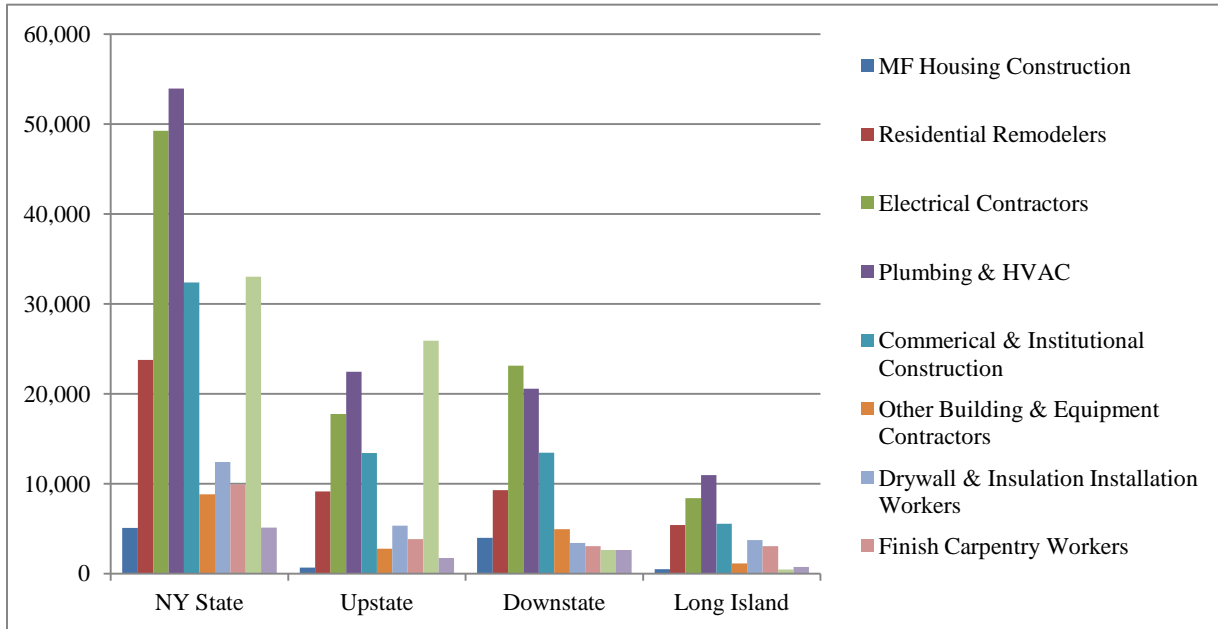
Figure 5. Total Energy Efficiency-Related Jobs in New York State - Excluding Long Island, 2009



Source: US Census County and Business Pattern, Number of Jobs identified by number of paid employees, 2009.

It is important to note that approximately 17% of the total number of energy efficiency-related jobs in the State are located in Long Island, as are 20% of the entry-level, and 3% of the mid- to high-level skill training organizations. Since existing employees and new workers often migrate to areas where job opportunities exist, valuable information could be missed if this Workforce Development Program Market Characterization effort did not examine the entire New York State area (including Long Island). As shown in Figure 6 below, when including Long Island, in 2009, there were a total of 229,576 energy efficiency-related jobs statewide: 45% upstate, 38% downstate, and 17% in Long Island. In all three of these regions, the greatest number of jobs was in the Plumbing and HVAC industry (NAICS 238220) representing 23% of all energy efficiency jobs in the State. When including Long Island, the same four industries that dominated the market still comprise 71% of all energy efficient jobs including Plumbing HVAC (23%), Electrical Contractors (21%), Engineering Services (13%), and Commercial and Institutional Construction (14%).

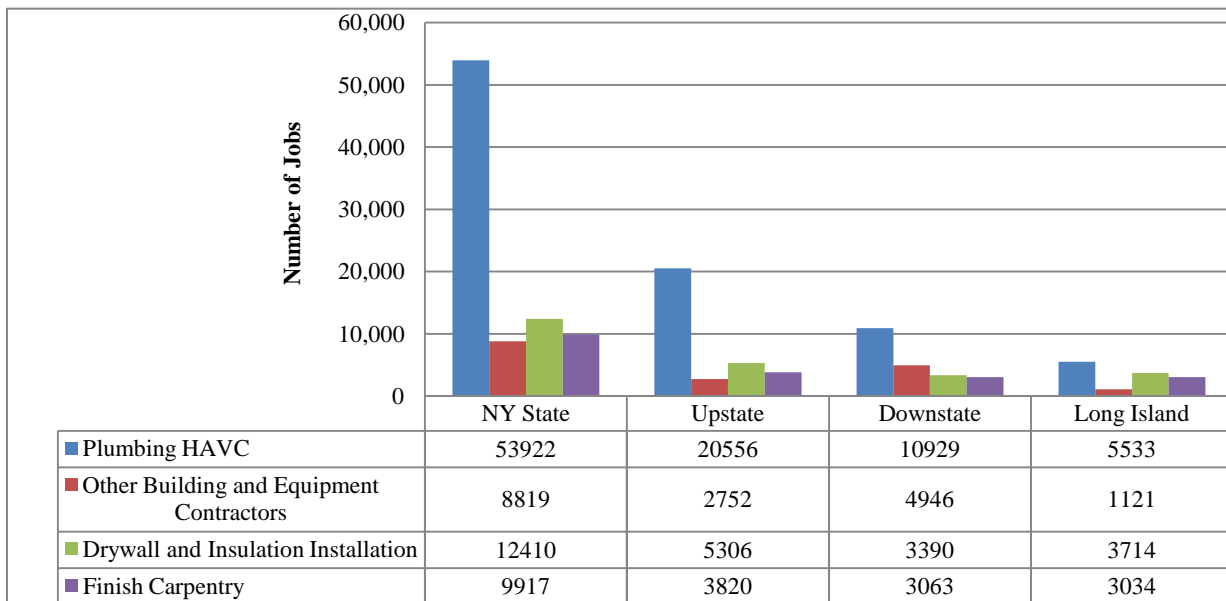
Figure 6. Total Energy Efficiency Jobs in New York State, including Long Island (2009)



Source: US Census County and Business Pattern, Number of Jobs identified by number of paid employees, 2009.

As shown in Figure 7, in 2009, including Long Island, the total number of energy efficiency jobs was 85,068. The greatest number of energy efficiency weatherization jobs was in the Plumbing and HVAC industry, totaling 53,900 jobs (22,437 upstate, 20,556 downstate, and 10,929 in Long Island). These jobs typically have been entry-level and mid-level skill jobs and represented 23% of the total number of energy efficiency-related jobs in the State.

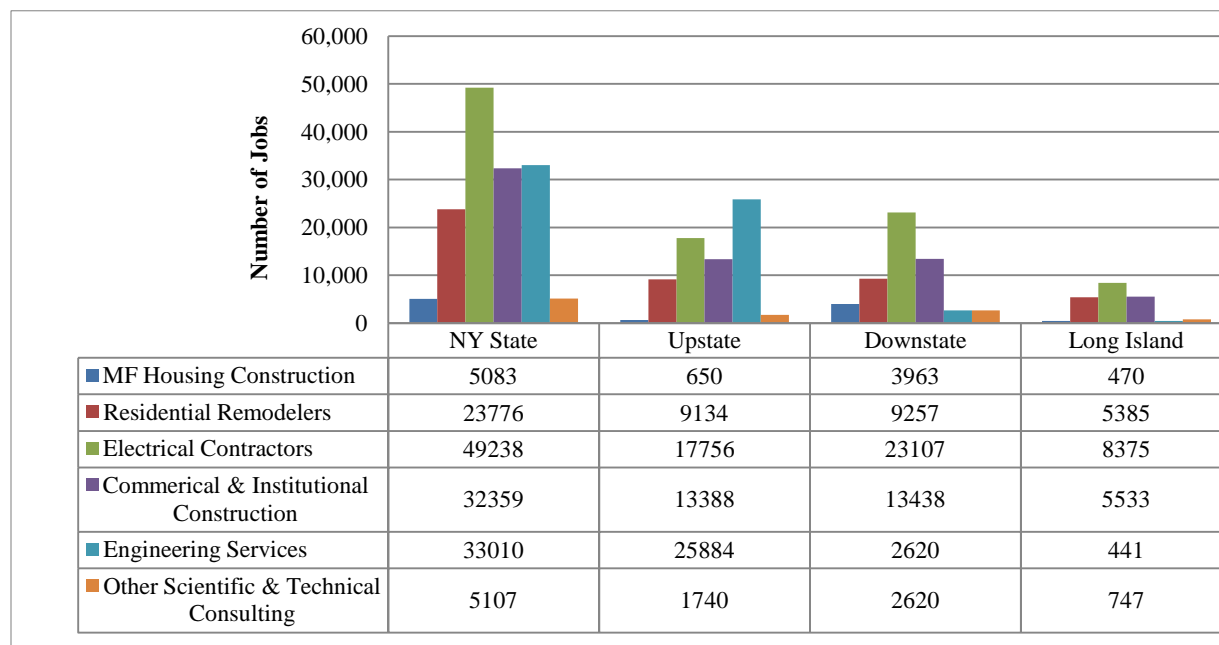
Figure 7. Total Number of Energy Efficiency/Weatherization Jobs in New York State (2009)



Source: US Census County and Business Pattern, Number of Jobs identified by number of paid employees, 2009.

Figure 8 shows that, in 2009, there were 144,508 mid- to high-level energy efficiency-related jobs in New York State, including construction, electrical contracting, engineering services and consulting. Statewide, the greatest number (49,238) of these job types was in Electrical Contracting, representing 33% of all mid- to high-level skill jobs (17,756 upstate, 23,107 downstate, 8,375 in Long Island), and 21% of all energy efficiency-related jobs in the State. Engineering Services were also prevalent, representing 25% of all energy efficiency services and consulting jobs including 25,884 Upstate. In total, mid- to high-level skill jobs represented 67% of the total number of 2009 energy efficiency-related jobs in the State.

Figure 8. Mid- to High-Level Jobs in New York State (2009)



Source: US Census County and Business Pattern, Number of Jobs identified by number of paid employees, 2009.

4.2.3. Targeted Employer Population for Workforce Development Program

The population of employers targeted for the primary, market assessment research conducted for this report is made up of companies located within the State that have employees, or hire contractors who perform jobs that are directly or indirectly involved with energy efficient building construction or the design, specification, delivery, installation, or servicing of electric energy using products or equipment within New York State homes or businesses. Such companies could either *support or directly provide*: (1) building/contractor services (i.e., single/multifamily builders, commercial/office builders, HVAC contractors, other building equipment contractors, real estate developers and property managers), or (2) engineering and consultant services (i.e., industrial and mechanical engineers, architects and other building design/construction consultants, HVAC engineers, energy conservation engineers and consultants, and lighting consultants and electrical contractors). Table 45 identifies an initial population of employers that hire for jobs which may require energy efficiency-related job skills.¹²⁸

¹²⁸ U.S. Census Bureau, County Business Pattern Data 2009 by North American Industry Classification System (NAICS) codes, www.census.gov/.

Table 45. Initial Population of Employers That Hire For Energy Efficiency Jobs In New York State

Business Classification	Number of Firms/Jobs*	Upstate Firms/Jobs*	Downstate Firms/Jobs*
Builders/Contractors			
Single Family Builders (NAICS: 236118)	6,321 Firms (41%) 18,478 Jobs (14%)	3,867 Firms (25%) 9,221 Jobs (69%)	2,454 Firms (16%) 9,257 Jobs (7%)
Multifamily Builders (NAICS: 236116)	310 Firms (2%) 4,988 Jobs (4%)	88 Firms (1%) 1,085 Jobs (1%)	222 Firms (1%) 3,903 Jobs (3%)
Commercial and Office Builders (NAICS: 236220)	1855 Firms (12%) 26,911 Jobs (20%)	1041 Firms (7%) 13,473 Jobs (10%)	814 Firms (5%) 13,438 Jobs (10%)
Electrical Contractors (NAICS: 238210)	222 Firms (1%) 3,301 Jobs (2%)	110 Firms (1%) 1,872 Jobs (1%)	112 Firms (1%) 1,429 Jobs (1%)
HVAC Contractors (NAICS: 238220)	4,755 Firms (31%) 43,158 Jobs (32%)	2,788 Firms (18%) 22,602 Jobs (17%)	1,967 Firms (13%) 20,556 Jobs (15%)
Other Building Equipment Contractors (NAICS: 238290)	373 Firms (2%) 7,905 Jobs (6%)	180 Firms (1%) 2,959 Jobs (2%)	193 Firms (1%) 4,946 Jobs (4%)
Real Estate Developers/Property Managers (top 10 of each, based on NYSERDA Study on downstate market actors ¹²⁹)	20 Firms (0%) N/A Jobs	N/A Firms N/A Jobs	20 Firms (0%) N/A Jobs
Total Contractors	13,856 Firms (89%) 104,741 Jobs (79%)	8,074 Firms (52%) 51,212 Jobs (38%)	5,782 Firms (37%) 53,529 Jobs (40%)
Engineers/Consultants			
Engineering Services (NAICS 541330)	1,727 Firms (11%) 28,649 Jobs (21%)	1,157 Firms (7%) 16,715 Jobs (13%)	570 Firms (4%) 11,934 Jobs (9%)
Total Engineers/Consultants	1,727 Firms (11%) 28,649 Jobs (21%)	1,157 Firms (7%) 16,715 Jobs (13%)	570 Firms (4%) 11,934 Jobs (9%)
Total Population	15,583 Firms (100%) 133,390 Jobs (100%)	9,231 Firms (59%) 67,927 Jobs (51%)	6,352 Firms (41%) 65,463 Jobs (49%)

* Excludes companies located in Long Island, and the percentages noted represent the percent of the total population of firms and jobs.

¹²⁹ Summit Blue Consulting LLC. “The Five W’s of Downstate New York, Characterizing the Market for Energy Efficiency”, prepared for NYSERDA, July 2009.

As can be seen from this table, a significant number of firms (over 15,000) and jobs (over 130,000) fall within these business categories. What is not quite as clear however, is that a majority of these firms and jobs have little to no direct relationship with electric energy efficiency improvement efforts – which is the focus of the Workforce Development Program. Therefore, all North American Industry Classification System (NAICS)-derived company categories were reviewed more closely, by Standard Industrial Classification (SIC) code, through an iterative filtering process with NYSERDA program staff and others to compile a more refined (and somewhat judgmental) list of companies from which a narrower, more targeted population was drawn – see Table 46.

It is important to note that other business categories were also considered for inclusion within the refined targeted population for employers, including energy efficient equipment distributors, manufacturers, weatherization agencies and auditors. Based on input and discussion with NYSERDA and others during the filtering process, distributors and manufacturers were removed from the sample since employees in these categories are not the target of NYSERDA’s training efforts. Weatherization agencies were also considered for inclusion in the final employer population sample, but eliminated primarily because these organizations may be the target of an ongoing Pace University skills gap analysis. Concerning auditors, this business category is actually included in the sample under Engineering Services/Electrical Contractors and represents building construction consultants, energy conservation consultants (including energy auditors), energy conservation engineers, lighting consultants, lighting contractors and energy management controls contractors.

According to the U. S. Bureau of Labor Statistics, and also highlighted in the NYSDOL Labor Market Information Green Jobs Report (NYSDOL Green Jobs Report) the construction industry is one of the largest employers among all energy efficiency related industries, and also offers the largest number of job openings and hiring opportunities. Studies, including the NYSDOL Green Jobs Report describe the characteristics of jobs in the energy efficient industry and noted they were more labor intensive than comparable fossil fuel jobs, such as coal mining which are more heavily mechanized. Additionally, the same report described jobs in the energy efficiency industry as similar in employment profile to the building construction industry, requiring many of the same types of job (i.e., architects, carpenters and electricians). The NYSDOL Green Jobs Report included an analysis of all firms in the State having one or more employees that perform a “green job”. This analysis revealed that the construction industry has the greatest percent of green employees, (27%), and the greatest number of firms with one or more employees in a “green job”.¹³⁰ Construction trade jobs offer moderate to long-term on-the-job training and provide entry-level skills employment opportunities. Additionally, within the construction industry, three jobs, carpenters, construction laborers, and electricians are listed in the top fifty jobs with the most openings in New York State, at 31st, 38th and 50th place respectively.¹³¹ As shown in Table 46, 38% of the energy efficiency jobs targeted by the Workforce Development Program are concentrated in Single Family (14%), Multifamily (4%) and Commercial/Office Building (20%) construction – totaling nearly 18,000 firms across the State. Given the magnitude of this number, NYSERDA is wise to include this market actor group of employers as one of its Program’s targeted areas. Other business categories targeted by NYSERDA’S Workforce Development Program include: architects and engineers, energy service companies, utilities and NYSERDA itself (all part of the contractors, engineers and consultants business categories included below in Table 46).

¹³⁰ New York State Department of Labor- Division of Research & Statistics. 2011. “*New York State Green Jobs Study, a Report for New York State*” <http://www.labor.ny.gov/stats/green/index.shtm>

¹³¹ America’s Career Infonet, Occupation Profile for New York State 2008. <https://www.acinet.org>

Table 46. More Detailed and Refined Sample Population – Statewide and by Region

Business Classification	% of Jobs	Total Firms	Upstate	Downstate
		(# and %)	(# and %)	(# and %)
Builders/Contractors	76%	24,458 (98%)	13,452 (54%)	11,006 (44%)
Single Family (SF) Builders (NAICS: 236118)	14%	17,129 (69%)	9,927 (40%)	7,202 (29%)
SIC 15210000 – SF Housing Construction		12,625 (51%)	6,919 (51%)	5,706 (28%)
SIC 15210100 – SF Home Remodeling, Additions & Repairs		877 (4%)	562 (4%)	315 (2%)
SIC 15210101 – General Remodeling, SF Homes		3,627 (15%)	2,446 (15%)	1,181 (10%)
Multifamily (MF) Builders (NAICS: 236116)	4%	165 (1%)	50 (0%)	115 (0%)
SIC 15220101 – Apartment Building Construction		121 (0%)	35 (0%)	86 (0%)
SIC 15220107 – MF Dwellings, New Construction		44 (0%)	15 (0%)	29 (0%)
Commercial and Office Builders (NAICS: 236220)	20%	1,165 (5%)	587 (2%)	578 (2%)
SIC 15420100 – Commercial & Office Building Contractors		633 (3%)	262 (3%)	371 (1%)
SIC 15420101 – Commercial & Office Building New Construction		532 (2%)	325 (2%)	207 (1%)
HVAC Contractors (NAICS: 238220)	32%	5,999 (24%)	2,888 (12%)	3,111 (12%)
SIC 17110000 – Plumbing, Heating, etc.		1,582 (6%)	704 (6%)	878 (3%)
SIC 17110103 – Heating Systems Repair/Maintenance		656 (3%)	110 (3%)	546 (0%)
SIC 17110400 – Heating and A/C Contractors		1,558 (6%)	881 (6%)	677 (4%)
SIC 17110401 – Mechanical Contractors		893 (4%)	404 (4%)	489 (2%)
SIC 17110405 – Warm Air Heating and A/C Contractors		1,109 (4%)	686 (4%)	423 (3%)
SIC 17119901 – Refrigeration Contractors		201 (1%)	103 (1%)	98 (0%)
Other Building Equipment Contractors (NAICS: 238290)	6%	9 (0%)	9 (0%)	0 (0%)
SIC 17969907 - Power Generation Equipment Installation		9 (0%)	9 (0%)	0 (0%)
Real Estate Developers & Property Managers (focus on top 10)	N/A			
Real Estate Developers (NAICS: 237210)	N/A	To be targeted from Downstate Study Top 10 Firms		
Property Management Companies	N/A	To be targeted from Downstate Study Top 10 Firms		
Engineers/Consultants (including Electrical Contractors)	23%	530 (2%)	248 (1%)	282 (1%)
Engineering Services (NAICS: 541330)	21%	455 (2%)	220 (1%)	235 (1%)
SIC 87110200 – Industrial Engineers		15 (0%)	13 (0%)	2 (0%)
SIC 87110202 – Mechanical Engineers		62 (0%)	39 (0%)	23 (0%)
SIC 87110401 – Building Construction Consultant		123 (0%)	52 (0%)	71 (0%)
SIC 87110403 – Heating & Ventilation Engineering		20 (0%)	8 (0%)	12 (0%)
SIC 87119906 – Energy Conservation Engineering		31 (0%)	20 (0%)	11 (0%)
SIC 87489904 – Energy Conservation Consultants		147 (1%)	77 (1%)	70 (0%)
SIC 87489907 – Lighting Consultants		57 (0%)	11 (0%)	46 (0%)
Electrical Contractors (NAICS: 238210)	2%	75 (0%)	28 (0%)	47 (0%)
SIC 17310202 – Energy Management Controls		37 (0%)	14 (0%)	23 (0%)
SIC 17319904 – Lighting Contractors		38 (0%)	14 (0%)	24 (0%)
Grand Total	100%	24,997	13,700	11,288

4.3. TARGETED EMPLOYEE POPULATIONS

Goals of the EEPS-funded Workforce Development Program are to overcome barriers to workforce training, to expand the existing energy efficiency training infrastructure across the State in both the residential and commercial- industrial sectors, and to increase employment opportunities in entry-level skill and mid- to high-level skill energy-efficiency occupations in New York State. Characterizing the types of employees that might be targeted for skills training to work in the energy efficiency industry is an important component of this MCA evaluation effort.

One study reviewed as part of this project looked at education and income levels of potential energy efficiency jobs holders, and concluded that low-income (and, indirectly, minority) workers would likely have more job opportunities if there were more entry-level energy efficient jobs available in their communities.¹³² Another analysis of green jobs, including those in energy efficiency, from 2000 through 2018, found mixed but overall positive employment opportunities for minorities and women, employee populations with historically greater unemployment rates.¹³³

In this sub-section, information regarding the employee population's level of educational attainment in New York State is provided, followed by a brief overview of the State's aging workforce. A quantification of the State's unemployed and underemployed populations is then provided, followed by a summary of the Workforce Development Program's other targeted hard-to-reach and hard-to-service populations.

4.3.1. Educational Attainment of New York State Population

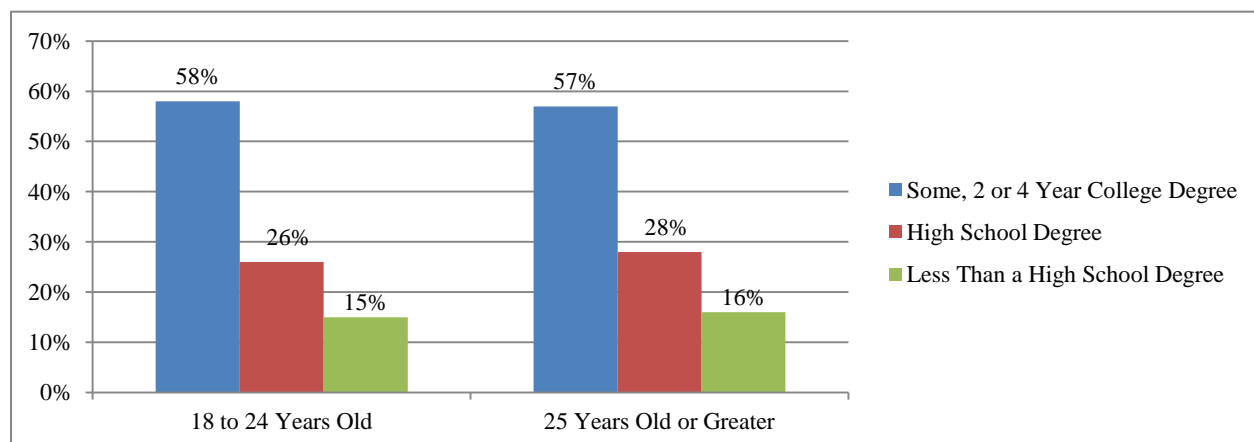
New York State has a highly educated population which offers a moderate size pool of employees for firms to target when hiring for entry-level and mid- to high-level skill energy efficient positions. Figure 9 shows the educational attainment of men and women across the State, broken out by 18 to 24 year olds, and 25 years and older. When compared to other states across the country, New York State ranks 5th for the number of men and women with advanced degrees, 8th for those with Bachelors' degrees, but only 34th for the number of high school graduates. In 2010, there were over 191,000 high school graduates in New York State.¹³⁴

¹³² America's Career Infonet, Occupation Profile for New York State 2008. <https://www.acinet.org>.

¹³³ University of Chicago, "Green Jobs: Who Benefits? Demographic Forecasting of Job Creation in U.S",. Green Jobs Studies. Masters Thesis by Gracey, Kyle. 2010, http://footprintnetwork.academia.edu/KyleGracey/Papers/169999/Green_Jobs_Who_Benefits_Demographic_Forecasting_of_Job_Creation_in_U.S._Green_Jobs_Studies.

¹³⁴ The University of The State of New York, The New York State Education Department, Albany, Projections of High School Graduates,,2007-08 to 2018-19. www.highered.nysed.gov/oris/demographics/hsgprojections.pdf.

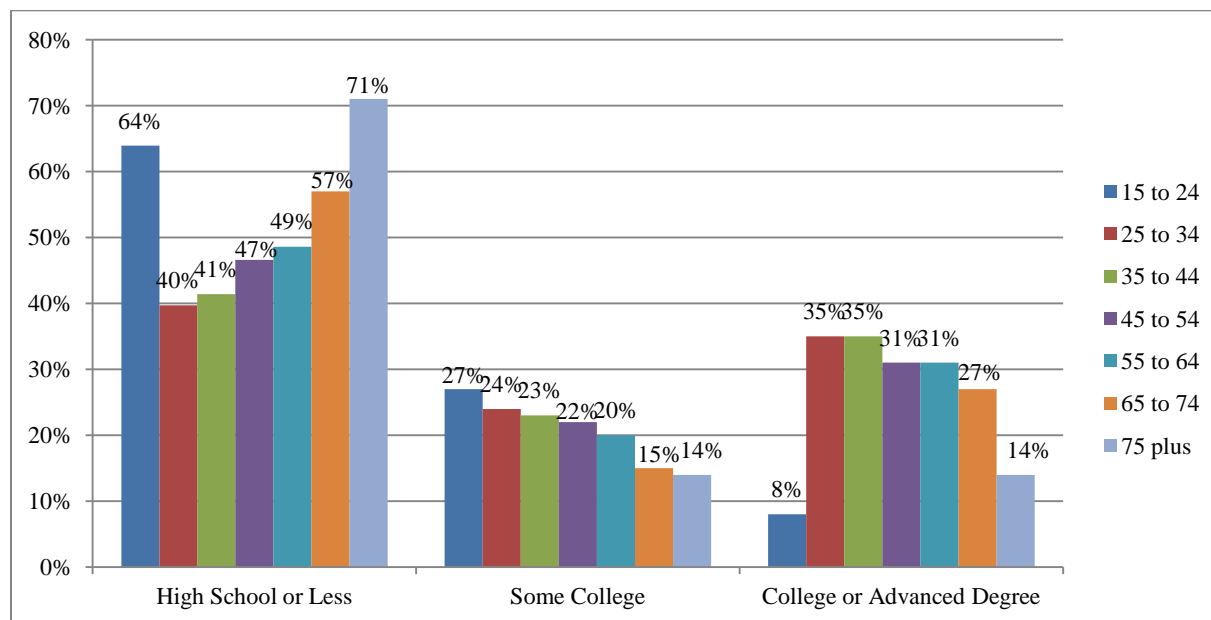
Figure 9. Educational Attainment, 18 to 24 and 25 plus, in New York State (2008)



Source: Population Bulletin, US Labor Force Trends, June 2008.

Employers typically want to hire workers with some relevant and current level of education and training. As compared to other states across the country, New York State residents 55 years old and older appear to represent a higher percentage of the population with at least a high school degree. As shown in Figure 10, the highest level of education attained by the majority of the State’s residents of all age groups is high school. Also, this figure shows, with the exception of 15 to 24 year olds who are currently of high school and college age, the younger the population, the more likely the group is to have some college, college or advanced degrees. The means that the younger workers are more likely to be college trained than their older counterparts.

Figure 10. Educational Attainment of New York State Population by Age 2008



Source: The Center of Aging and Work, The State Perspective Center at Boston College, New York State Indicators: Aging and Work, 2008.

4.3.2. The Aging Workforce – An Employment Trend

About 76 million baby boomers, or those born between 1946 and 1964, are approaching retirement age. According to Forbes, since “Boomers” make up about one-third of the U.S. workforce, statistics show there are not enough younger workers to replace them. The U.S. workforce grew at a rate of 30% in the 1970’s, and at 12% in the 1990’s, slowed to 3% from 2000 to 2010, and has grown 1.5% from 2011 to 2012.¹³⁵ Labor shortages will create a lack of skilled labor to fill jobs in key industries and may force a radical rethinking of recruitment, retention, flexible work schedules and possibly a need to increase the retirement age.¹³⁶

According to The National Association of Manufacturers, the technical and scientific fields are two key industry areas that will soon feel the talent crunch. This includes job positions in the energy industry. By 2010, the number of workers in the United States aged 35 to 44, or those typically moving into upper management, will decline by 19%. While the number of workers aged 45 to 54 will increase 21%, and the number of workers aged 55 to 64 will increase by 52%.¹³⁷

The median age of New York State’s population is 37.4 years, and the median age of the State’s workforce is 41.6 years (slightly older than that of the average US workforce). Nearly 24% of the State’s population is 55 years old or older, and 59.3% of the 55 to 64 year olds are employed.¹³⁸ In 2000, New York State had approximately equal numbers of residents under age 18 and over age 64. Looking at the impact of this trend in the future, in 2030, it is projected that the State will have twice as many residents over age 64 as it does under age 18.

Currently, occupations in architecture and engineering have the highest percent (nearly 28%) of workers 50 to 59 years old in New York State.¹³⁹ Slightly more than 24% of construction workers and repair and maintenance workers are 30 to 39 years old. Additionally, approximately 30% of installation, maintenance and repair workers are 40 to 49 years old.¹⁴⁰ Based on these statistics, energy workers are will soon be eligible to retire in large numbers, and the energy industry anticipates a serious labor shortage. According to the Center for Energy Workforce Development, this year in 2012, more than half of all power plant workers and over 40% of power line workers and engineers could retire and these jobs need to be filled.

The effects of aging workforce is predicted to create career opportunities in the electric utility and power fields for job-seekers in the very near future, and specifically for jobs such as: energy auditors, electric

¹³⁵ United States Department of Labor, Bureau of Labor statistics, Economic New Release: Employment Status of the Civilian Population by Sex and Age, 2011 to 2012. www.labor.us.gov/.

¹³⁶ Forbes Business Basics, An Aging Workforce’s Effect on US Employers, Scott Reeves, September 29, 2005. http://www.forbes.com/2005/09/28/career-babyboomer-work-cx_sr_0929bizbasics.html.

¹³⁷ Forbes Business Basics, An Aging Workforce’s Effect on US Employers, Scott Reeves, September 29, 2005. http://www.forbes.com/2005/09/28/career-babyboomer-work-cx_sr_0929bizbasics.html.

¹³⁸ Population Bulletin, U.S. Labor Force Trends, June 2008. www.prb.org/pdf08/63.2uslabor.pdf.

¹³⁹ The Center of Aging and Work, The State Perspective Center at Boston College, New York Indicators: Aging and Work, 2008. www.bc.edu/content/dam/files/.../agingandwork/.../states/NewYork.

¹⁴⁰ The Center of Aging and Work, The State Perspective Center at Boston College, New York Indicators: Aging and Work, 2008 www.bc.edu/content/dam/files/.../agingandwork/.../states/NewYork.

utility jobs, pipe-fitters and pipe layers, electrical line installers and line-workers, generation technicians, power engineers, electrical, mechanical, civil and chemical engineers.¹⁴¹

4.3.3. Population 18 to 24, and 25 Plus

In light of the impending shortage of labor to fill positions vacated by the aging workforce, it is interesting to explore how prepared the younger population is to fill these positions. This younger population is the pool from which companies will draw from to fill vacated positions.

A national study conducted by Pew Research revealed insight into the views of 18 to 24 year olds and 25 plus, on education, training, and the impact of the slow economic recovery on their careers and how prepared they believe they are for the future.¹⁴² Key findings of this study include:

- **Young adults (ages 18 to 34) say that the sluggish economy has had an impact on a wide array of coming-of-age decisions including career and schooling.** Nearly half (49%) say that in the past few years they have taken a job they didn't really want just to pay the bills. A smaller but still sizable share says that because of the tough economy they have gone back to school (35%), moved back in with their parents after living on their own (24%), postponed having children (22%) or postponed getting married (20%). This means that 18 to 34 year olds could seek training opportunities or alternative employment options, and pursuing training in energy efficiency could provide them with more viable employment options. A plurality of the public (41%) reports that young adults, rather than middle-aged or older adults, are having the toughest time in today's economy, even though the recent indicators on the nation's labor market show a decline in the unemployment rate.
- **Few young workers see their current job as a "career."** Among all 18 to 34 year-olds, only 30% consider their current job a career, compared with 52% among workers ages 35 and older. However, the survey suggests that young adults quickly transition from job to career.
- **Most young workers say they don't have the education and training to get ahead.** Among 18 to 34 year-olds who are employed, less than half (46%) say they have the education and training necessary to get ahead in their job or career. Among those who are not working, only 27% say they are adequately prepared for the kind of job they want.

4.3.4. Unemployed and Under-Employed¹⁴³

As of 2011, there were nearly 1.3 million people unemployed in New York State. While the population of over 18 year olds in the State, not including Long Island, is slightly higher upstate (50.4%) than

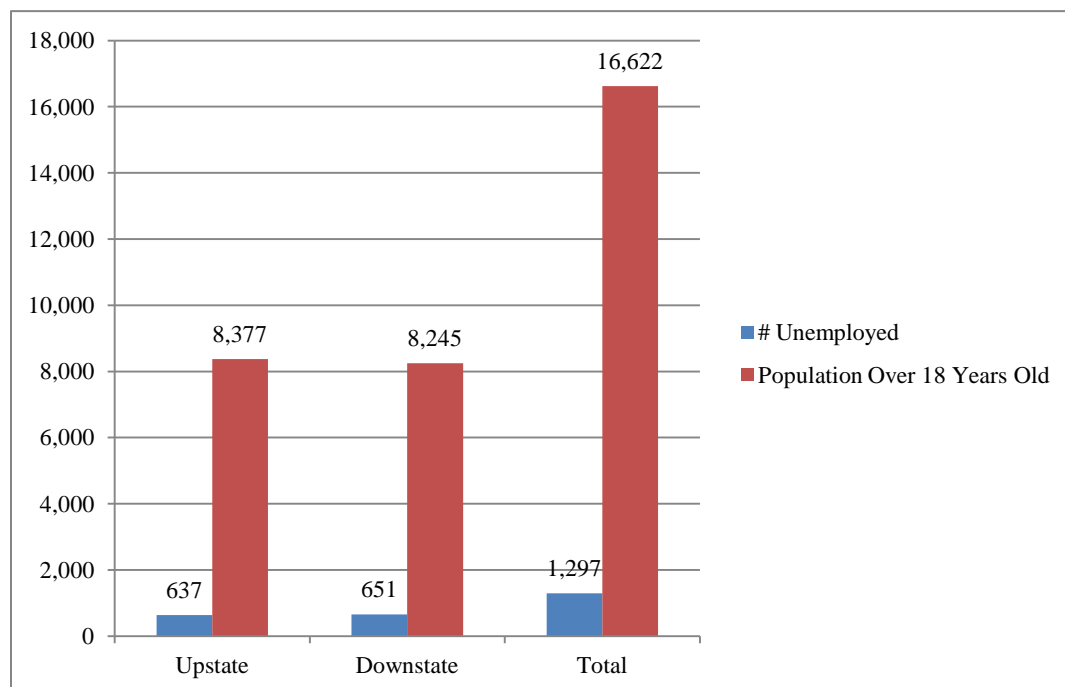
¹⁴¹ The Center of Aging and Work, The State Perspective Center at Boston College, New York Indicators: Aging and Work, 2008. www.bc.edu/content/dam/files/.../agingandwork/.../states/NewYork.

¹⁴² Pew Research Center, Social and Demographic Trends Report, "Young, Underemployed and Optimistic, coming of Age, Slowly, in a Tough Economy". February 9, 2012. www.pewsocialtrends.org/.../2012/.../PewSocialTrends-2012.

¹⁴³ For the purposes of this report poverty statistics used for analysis are from the US Census Bureau, American Fact Finder 2010 Poverty in New York State. NYSERDA's definition of poverty, according to HEAP program guidelines, is total household income of 60% or below of median household income. <http://www.nyserda.ny.gov/en/Page-Sections/Residential/Programs/Low-Income-Assistance/EmPower-for-Residents/Eligibility-Guidelines.aspx>.

downstate (49.6%), as shown in Figure 11, there is a higher percent and greater number of unemployed in the downstate region, than upstate (50.9% vs. 49.1% respectively).

Figure 11. Number of Unemployed in New York State, 2011 (in 1,000s)



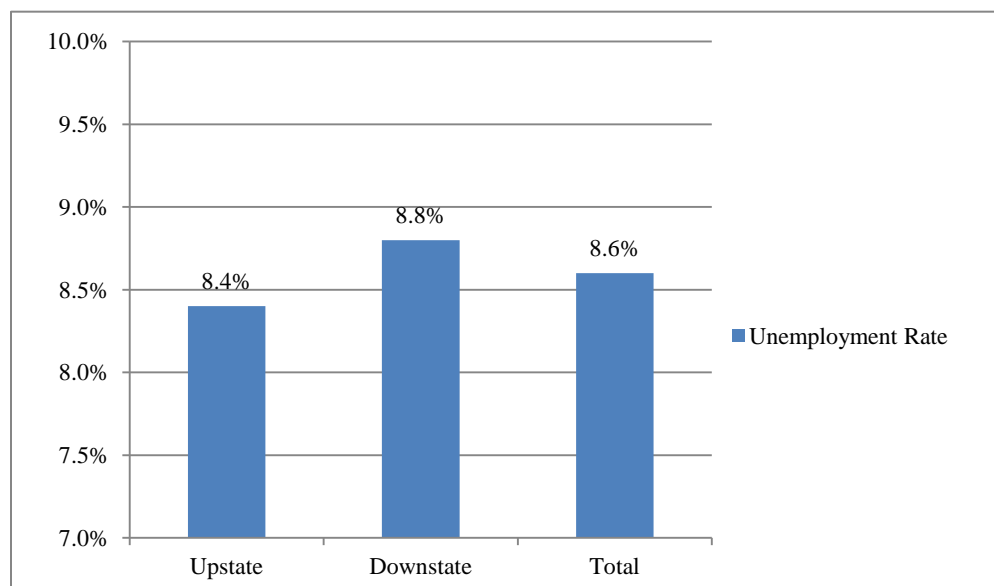
Source: US Census Bureau, American Fact Finder 2011 New York State Population, and GDS calculations.

In 2011, the overall unemployment rate in New York State was over 8.6%.¹⁴⁴ As shown in Figure 12, this rate was lower upstate (8.4%) vs. downstate (8.8%). Although these rates in both regions have increased a bit since the beginning of the economic recovery in 2009, unemployment remains higher Downstate than in the Upstate Region.¹⁴⁵

¹⁴⁴ US Census Bureau, American Fact Finder, New York State Unemployment 2011. www.census.org.

¹⁴⁵ New York State Department of Labor, Press Release, “New York State Economic Recovery Continues To Add Jobs”, June 2012. labor.ny.gov/stats/pressreleases/pruistat.shtm.

Figure 12. Unemployment Rate in New York State, 2011



Source: US Census Bureau, American Fact Finder 2011 New York State Population, and GDS calculations

Though workers of all ages have struggled through the recent recession, in 2010 young adults, ages 16 to 24, had an especially difficult time. Effects of the recession have spread unevenly across demographic groups within the young adult population, creating some of the lowest employment rates ever recorded among minorities and men in particular. Since a job is often the first step to economic independence and security, this generation of young people faces serious challenges as a result of their employment struggles. Over one-fifth of young minority men in their early twenties are currently unemployed. In 2010, only one-third of African American men aged 16-24 have a job at all - far below the record low of 45% unemployment rate across all young adults.¹⁴⁶ For comparison, whites in their early 20s have seen a doubling in their unemployment rate to 14%, but this number remains well below their Latino and African American peers.¹⁴⁷

Young adult men and women have also had strikingly different unemployment experiences during this recession. Both men and women began with similar unemployment rates, but over time, men lost far more jobs than women. By August of 2010, nearly 21% of young adult men (16-24) were unemployed compared to just over 15% of young women of similar age¹⁴⁸. The trend is less pronounced, though consistent, for adults over 25 years old.¹⁴⁹ The end result of this trend is that more young adult men have

¹⁴⁶ Bureau of Labor Statistics, Current Population Survey, 2010. www.bls.org/.

¹⁴⁷ Young Invincibles Issue Brief 2010, "ECONOMY HAMMERS ALREADY VULNERABLE YOUNG ADULTS, New Analysis Shows Long-Term Impact of Current Recession", By Rory O'Sullivan and Barbara Ray. May 2011 www.mybarbararay.com/tag/young-invincibles/.

¹⁴⁸ Bureau of Labor Statistics, Current Population Survey, 2010. www.bls.gov/.

¹⁴⁹ Young Invincibles Issue Brief 2010, "ECONOMY HAMMERS ALREADY VULNERABLE YOUNG ADULTS, New Analysis Shows Long-Term Impact of Current Recession", By Rory O'Sullivan and Barbara Ray. May 2011. www.mybarbararay.com/tag/young-invincibles/.

left the labor market than women. The rising unemployment and falling participation rate of young minority men in the workforce is predicted to exacerbate long-term challenges facing those populations.

Many argue that unemployment rates paint an incomplete picture of the labor situation, because people not applying for, or no longer receiving, unemployment benefits are not counted. Further, the unemployment rate does not represent parts of the population that are either so discouraged they are no longer looking for work, and therefore are not counted as part the labor workforce, or others that are working in jobs well below their skill levels or number of desired hours, and are underemployed.¹⁵⁰ The Bureau of labor Statistics calculates an underemployment rate that quantifies this population.

As shown below in Table 47, in 2010, the underemployment rate was consistently over 56% higher than the unemployment rate, indicating the presence of a substantial population not represented in the traditional unemployment statistic. This underemployment rate includes the total number of unemployed, plus all marginally attached workers, plus those that are employed only part time due to economic reasons, as a percent of the civilian labor force plus all marginally attached workers.¹⁵¹

Table 47. Averaged Unemployment Rate vs. Underemployment Rate, Q2 2010 to Q1 2011

Area	Unemployment Rate	Underemployment Rate	Percent Difference
United States	9.4%	16.5%	57.0%
New York State	8.4%	14.9%	56.4%
New York City	9.1%	15.5%	58.7%

Source: Bureau of Labor Statistics, Alternative Measures of Labor Underutilization for States, Second Quarter of 2010 through First Quarter of 2011 Averages, and GDS Calculations.

4.3.5. Hard-to-Reach and Hard-to-Serve Population¹⁵²

The hard-to-reach and hard-to-serve population is made up of working age men and women, 17 years of age and older, typically living at or below the poverty level, unemployed or underemployed individual, or those not currently included in the labor force statistics.¹⁵³ Within these categories a wide variety of population groups exist, including populations with barriers to employment such as limited English proficiency, persons with disabilities, and ex-offenders. The hard-to-reach and hard-to-serve, economically disadvantaged population in New York State is characterized in more detail below and

¹⁵⁰ Partnership oror Public Good, Policy Brief, April 2010. www.ppgbuffalo.org/ppg-policy-brief-the-federal-budget-and-wny/.

¹⁵¹ Bureau of Labor Statistics, Definition of Underemployment. May 2012. www.bls.gov/.

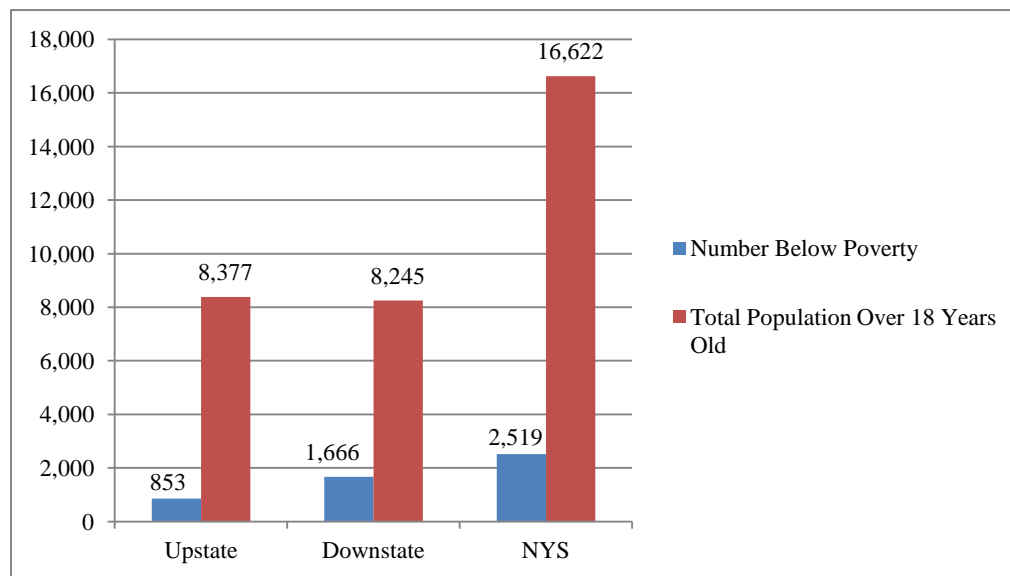
¹⁵²Hard to Reach and Serve populations, for the purpose of this study are defined as disadvantaged populations and those living at or below the poverty level in New York State, The definition of disadvantaged workers are individuals at least 17 years of age that fall within one of the following two categories: unemployed workers and incumbent workers. Within these two categories a wide variety of population groups exist, including individuals with barriers to employment, such as limited English proficiency; youth 17 years of age and older who have dropped out of school and are seeking employment; persons with disabilities; and ex-offenders. In-school high school students and other students enrolled in secondary education programs are not included in this definition.. Included in the definition of unemployed is those groups who are underemployed, or not included in the labor force.

¹⁵³ Population definition based on U.S. DOL, NY DOL, and Bureau of Labor Statistics data sources, and studies specific to identifying these group.

represents a segment of the overall population that is an important potential Workforce Development Program target market for energy efficiency skills training.

There is a high coincidence between hard-to-reach and hard-to-serve, disadvantaged populations, and populations living in poverty.¹⁵⁴ As shown in Figure 13, according to US Census 5-Year estimates, from 2006 to 2010, there were over 2.5 million people living at or below the poverty level in New York State (more than 1.6 million downstate and nearly 900 thousand upstate).

Figure 13. Number Living at or Below Poverty in New York State, 2006 to 2010 (in 1,000s)



Source: US Census, American Community Survey 5-Year estimates, 2006 to 2010. Poverty data not available in all counties, which impact the total population count and calculations. Based on New York State-specific minimum income/poverty rate.

In 2010, a record numbers of poor women and children nationally, and widespread poverty and insecurity in the states, 40.7%. In New York State, 37.7% of women who head families lived at or below the federal definition of poverty.

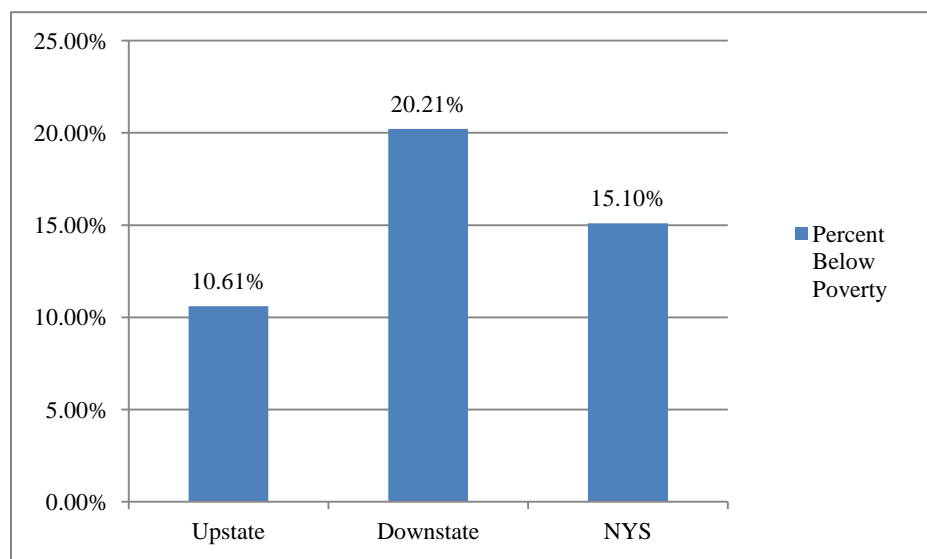
Figure 14 looks at the poverty rate¹⁵⁵ as a percentage of total population and shows that over 10% of the State’s population lives in poverty in upstate New York, and a greater percentage, over 20%, lives in poverty downstate. Overall, New York State has a poverty rate of nearly 15%. Although the total number of people living upstate and downstate are roughly equal; a significantly greater number of people living in poverty are located downstate. In 2010, a record numbers of poor women and children

¹⁵⁴ Living Life: Overlooked Aspects of Urban Employment, www.ifpri.org/sites/default/files/publications/fcnbr171.pdf.

¹⁵⁵ Poverty data was gathered using US Census Bureau statistics, which measures income and number of people per family against 48 thresholds to determine poverty rates. NYSERDA, using HEAP guidelines, defines poverty as 60% or below median income, thus, the finding on poverty presented in this report are conservative.

nationally, and widespread poverty and insecurity in the states, 40.7%. In New York State, 37.7% of women who head families lived at or below the federal definition of poverty¹⁵⁶.

Figure 14. Percent in Poverty in New York State, 2006 to 2010

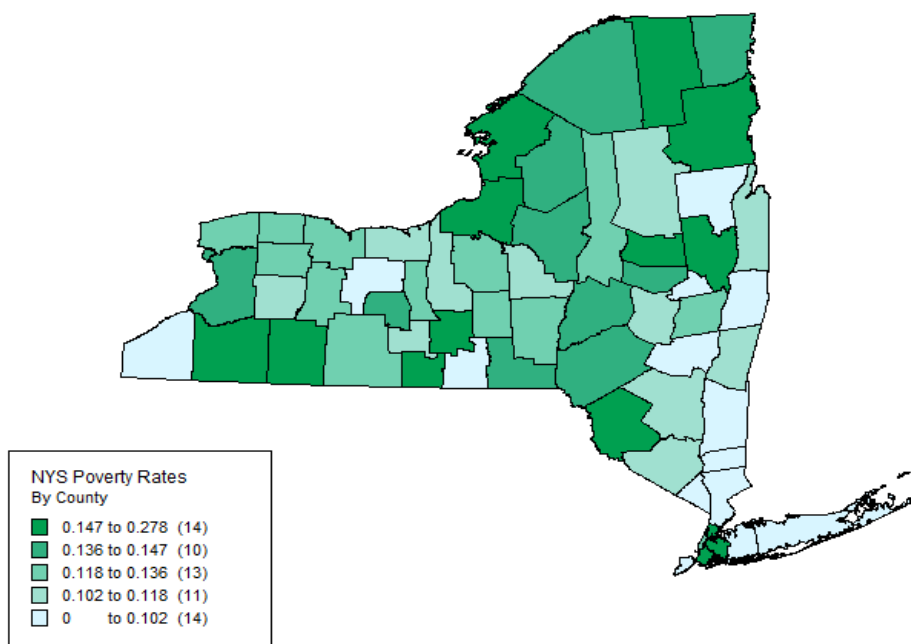


Source: US Census, American Community Survey 5-Year Estimates, 2006 to 2010, and GDS calculations. Poverty data not available in all counties, which impacts the total population count and calculations.

As shown more broadly in Map 1, clusters of counties in the northern, western and southern parts of upstate New York have high poverty rates, including Franklin, Essex, Jefferson, Oswego, Fulton, Allegany, Cattaraugus, Chemung, Tompkins and Sullivan Counties. In downstate New York, Bronx, Kings, New York and Queens Counties have the higher poverty rates.

¹⁵⁶ National Women’s Law Center, “Analysis of New 2010 Census Poverty Data”, September 2010. <http://www.nwlc.org/analysis-new-2010-census-poverty-data-%E2%80%93-september-2011>.

Map 1. New York State Poverty Rates, by County



Source: US Census, American Community Survey 3-Year estimates, 2006 to 2008. Poverty data not available in all counties, which impact the total population count and calculations.

Table 48 identifies the top ten counties in New York State with the highest percentage of its citizens living at or below the poverty rate (including general and age specific unemployment rates). As shown in this table, both Bronx and Kings Counties have the highest poverty and unemployment rates in the State, and four out of five of the counties that make up the downstate region appear on two or more lists. Likewise, Fulton and Oswego Counties have the highest poverty and unemployment rates in upstate New York.

Table 48. Top Ten Poverty Rate Counties, General and Age Specific Unemployment, 2006 to 2010

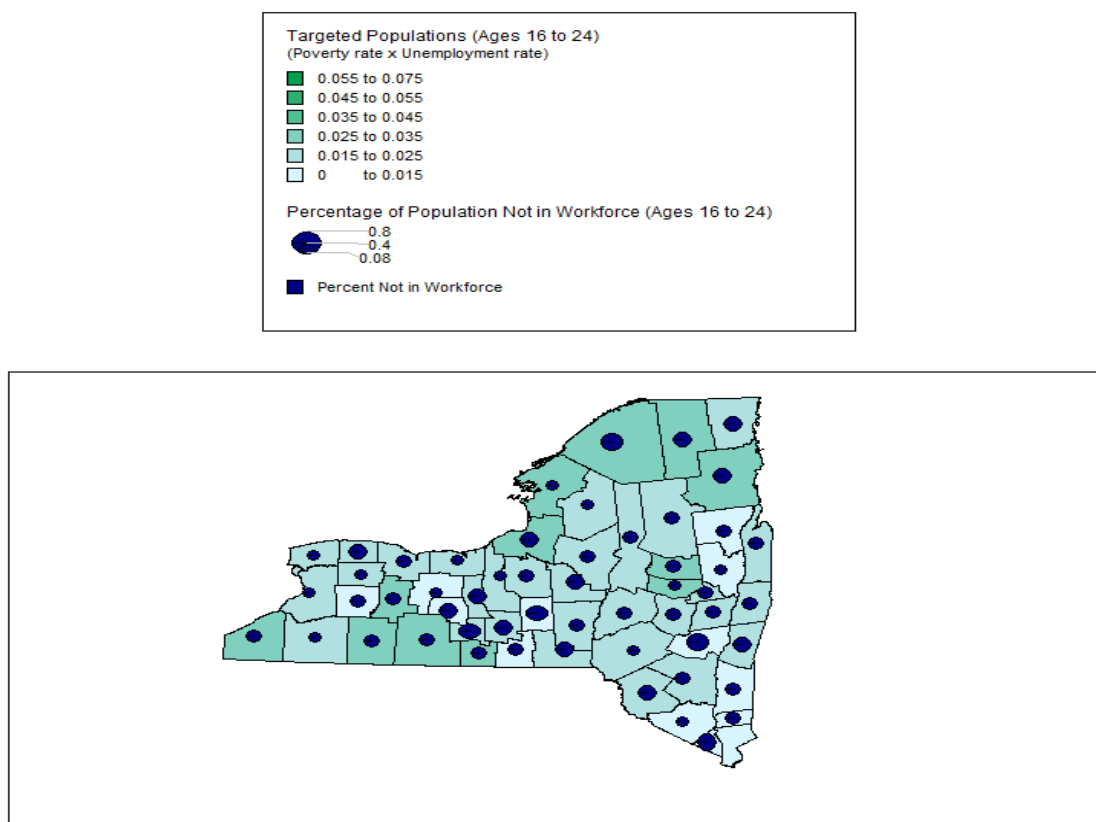
Poverty Rate		General Unemployment		20 to 24 Unemployment		25 to 64 Unemployment	
Bronx	0.28	Bronx	0.12	Bronx	0.23	Bronx	0.09
Kings	0.22	Kings	0.11	Essex	0.22	Fulton	0.07
Tompkins	0.19	Steuben	0.10	Montgomery	0.21	Oswego	0.07
Sullivan	0.19	Oswego	0.09	Chemung	0.20	Orleans	0.07
St. Lawrence	0.17	New York	0.09	Schoharie	0.20	Kings	0.07
Chautauqua	0.17	Fulton	0.09	Allegany	0.20	New York	0.07
Allegany	0.17	Queens	0.09	Oswego	0.20	Queens	0.06
Greene	0.16	Clinton	0.09	Steuben	0.20	Chemung	0.06
Fulton	0.16	Saratoga	0.09	Kings	0.18	Chautauqua	0.06
Yates	0.16	Chemung	0.09	Fulton	0.19	Washington	0.06

Source: U.S. Census Data, Select Economic Characteristics 2006-2010 American Community Survey 5-Year Estimates and GDS calculations.

Historically, unemployment has been a major factor contributing to poverty in the United States. To help identify the hard-to-reach and hard-to-serve, economically disadvantaged populations in New York State, a metric has been created using both poverty and age-specific unemployment information. This metric is used below to quantify and assess the magnitude of this target population by county across the State. Information on this population is separated into two age groups: 16 to 24 year olds, and 25 to 64.

Map 2 below, shows the geographic distribution, in upstate New York, of the hard-to-reach and hard-to-serve populations, by county. The darkest shaded counties indicate areas with greater unemployment rates and higher poverty rates, and the individual circles show the magnitude of 16 to 24 year olds not in the workforce (unemployed). As shown in this map, upstate counties with the higher hard-to-reach, hard-to-serve populations include: Allegany, Essex, St. Lawrence, Oswego, Chemung, Franklin, Fulton. Upstate counties with greatest percent of unemployed 16 to 24 year olds include: Schuylers, St. Lawrence, Greene, Rockland and Cortland.

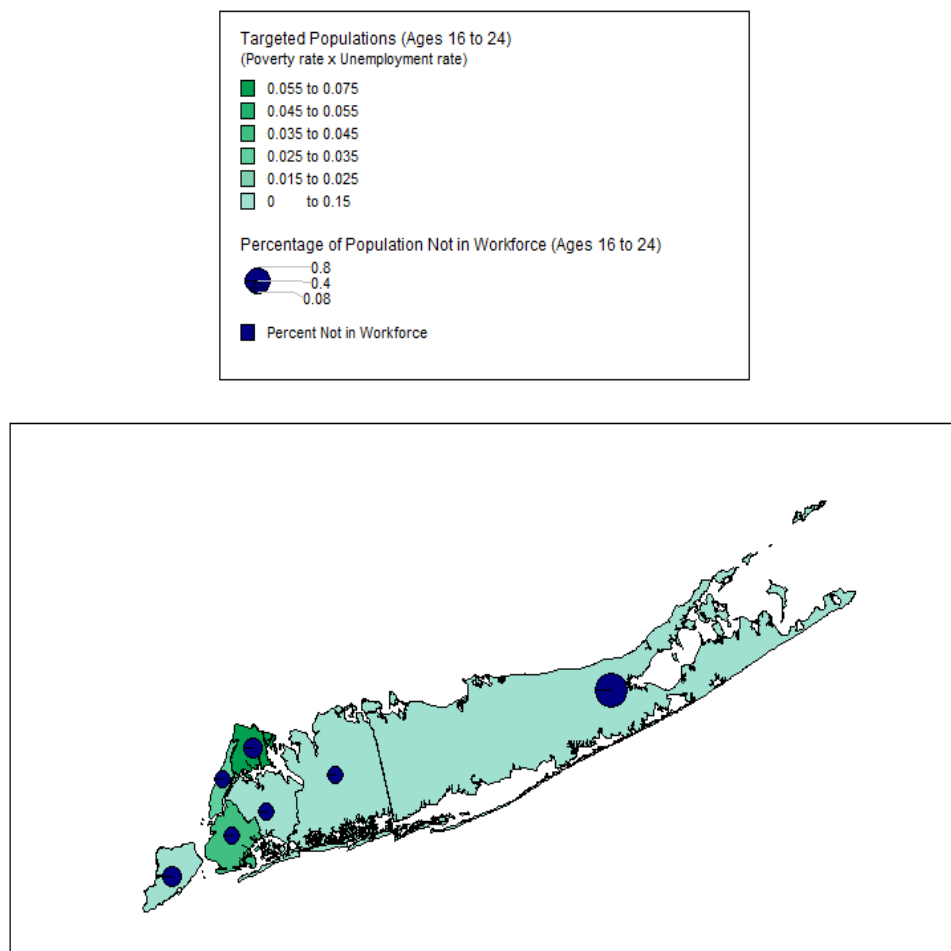
Map 2. Upstate Hard to Reach/Serve and Economically Disadvantaged, Ages 16 to 24, by County



Source: US Census, American Community Survey 3-Year estimates, 2006 to 2008. Poverty data not available in all counties, which impact the total population count and calculations.

Map 3 shows the geographic distribution of the hard-to-reach/serve population, ages 16 to 24, downstate and in Long Island. Bronx and Kings Counties have the highest percent of hard-to-reach, hard-to-serve populations, followed by Queens, New York and Richmond Counties. New York County represents the greatest downstate population of unemployed 16 to 24 year olds. In fact, all of the downstate counties appear in the top twenty counties State-wide with the highest population of hard-to-reach, hard-to-serve 16 to 24 year olds.

Map 3. Downstate and Long Island ¹⁵⁷Hard to Reach/Serve Population, Ages 16 to 24, by County

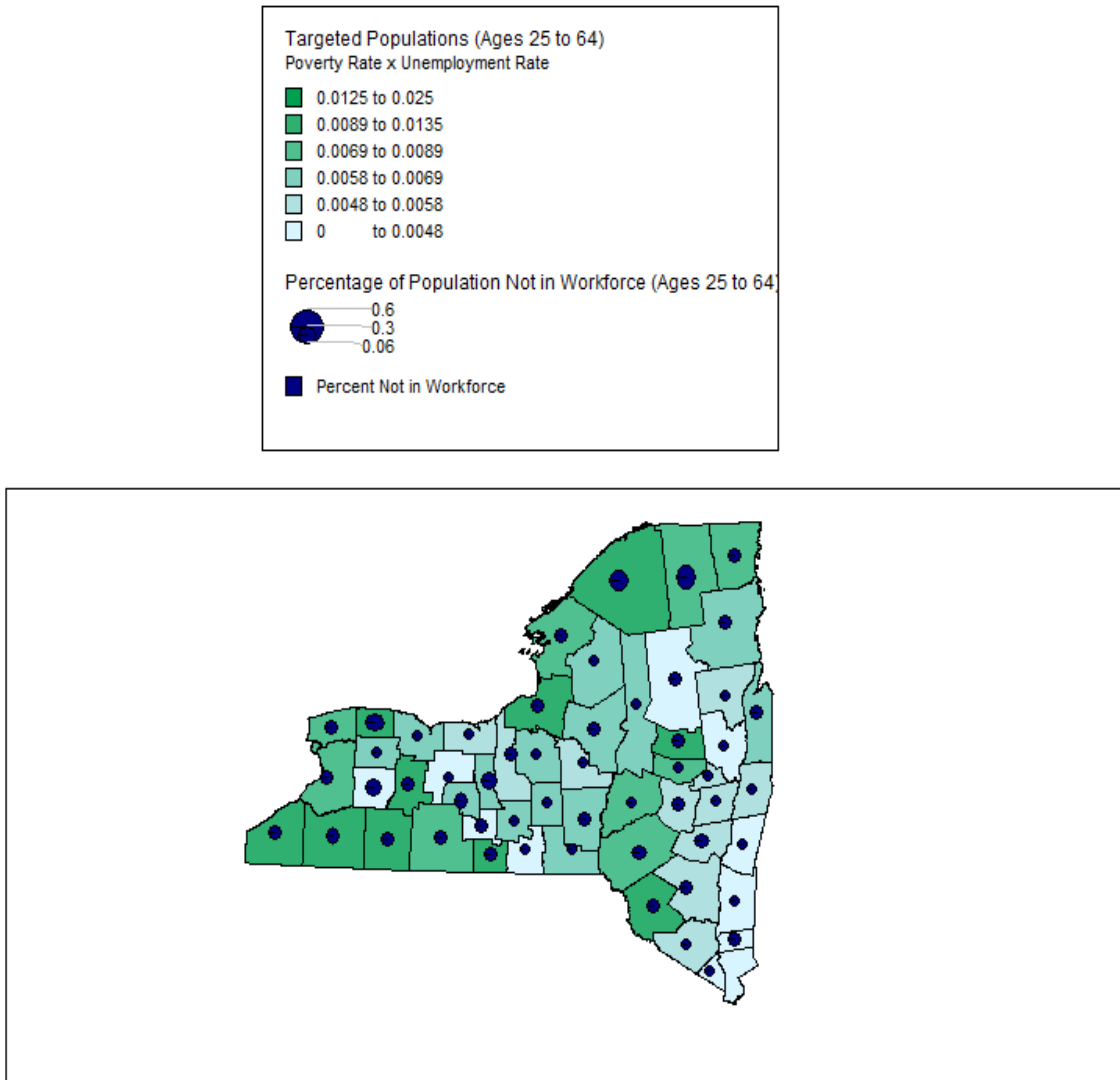


Source: US Census, American Community Survey 3-Year estimates, 2006 to 2008. Poverty data not available in all counties, which impact the total population count and calculations.

Map 4 shows a similar geographic distribution of hard-to-reach and hard-to-serve populations for 25 to 64 year olds in upstate New York State, with the highest poverty rates being found in Livingston, Fulton, Oswego, Chautauqua, Allegany, Franklin, Wyoming, St. Lawrence, Orleans and Seneca counties. St. Lawrence and Orleans counties have the greatest percent of 25 to 64 year olds not in the workforce (unemployed).

¹⁵⁷ Although not included in EEPS, given the transient nature of the workforce for training and obtaining a job, it was deemed prudent to include some information about training and energy efficiency job opportunities on Long Island. The Brooking’s Report identifies LI as having tremendous clean jobs growth and opportunity.

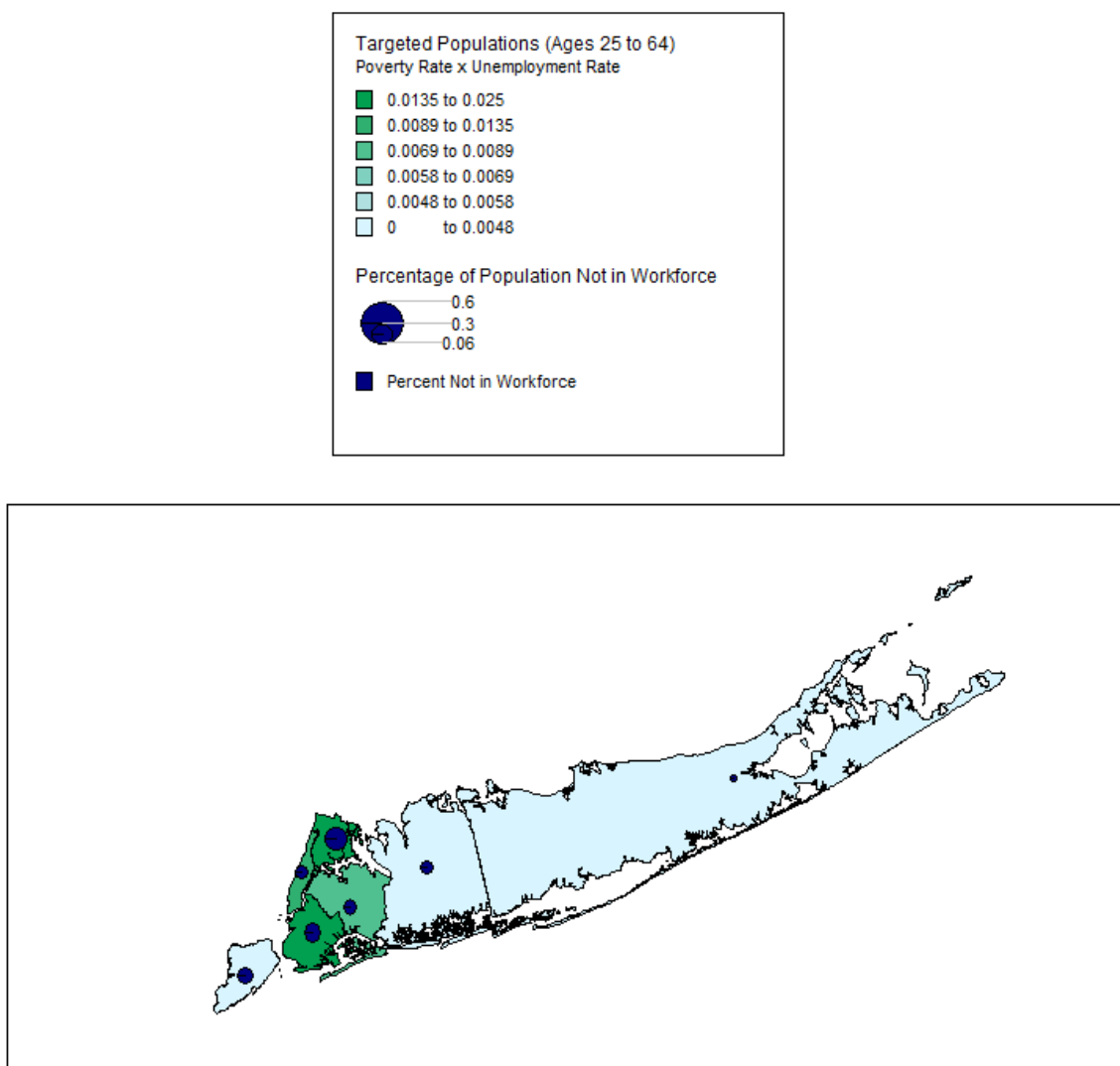
Map 4. Upstate Hard to Reach/Serve and Economically Disadvantaged, Ages 25 to 64, by County



Source: US Census, American Community Survey 3-Year estimates, 2006 to 2008. Poverty data not available in all counties, which impact the total population count and calculations.

Map 5 shows the downstate distribution this 25 to 64 year old population by county including Long Island. While all of the downstate counties appear in the top twenty counties with the highest percent of hard-to-reach and hard-to-serve populations, Bronx, Kings and New York have a greater percent of this target population than Queens and Richmond. Among all the downstate counties, New York County has the greatest percent of unemployed 25 to 64 year olds.

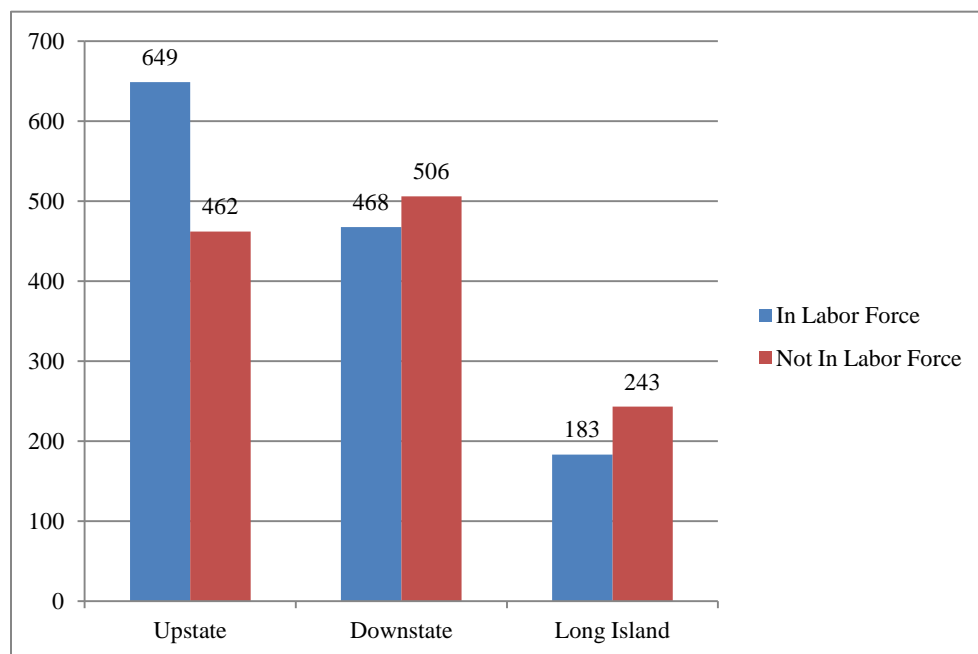
Map 5. Downstate and Long Island Hard to Reach/Serve Population, Ages 25 to 64, by County



Source: US Census, American Community Survey 3-Year estimates, 2006 to 2008. Poverty data not available in all counties, which impact the total population count and calculations.

As is clear from the figures and maps above, there is a large and broadly distributed population of hard-to-reach and hard-to-serve, unemployed workers in New York State. Another useful way to look at this information is to compare the population of 16 to 24 year olds, and 25 to 64 year olds, that are currently unemployed (including persons who are not working, not receiving unemployment benefits and are not actively looking for work) with the same age group's population that is currently in the labor force (has jobs). As shown in Figure 15, 462,000 (42%) of the employed plus employable 16 to 24 year olds in upstate New York are not in the labor force, over 500,000 (52%) downstate, and nearly 250,000 (57%) on Long Island.

Figure 15. Labor Force Status of 16- 24 Year Olds in NY State, 2006- 2010 (in 1,000s)



Source: U.S. Census Data, **Select Economic Characteristics 2006-2010 American Community Survey 5-Year Estimates** and GDS calculations.

The top three counties with the greatest percent of 16 to 24 year olds not in the labor force are Kings, Bronx and Richmond counties (Table 49), three downstate and seven upstate.

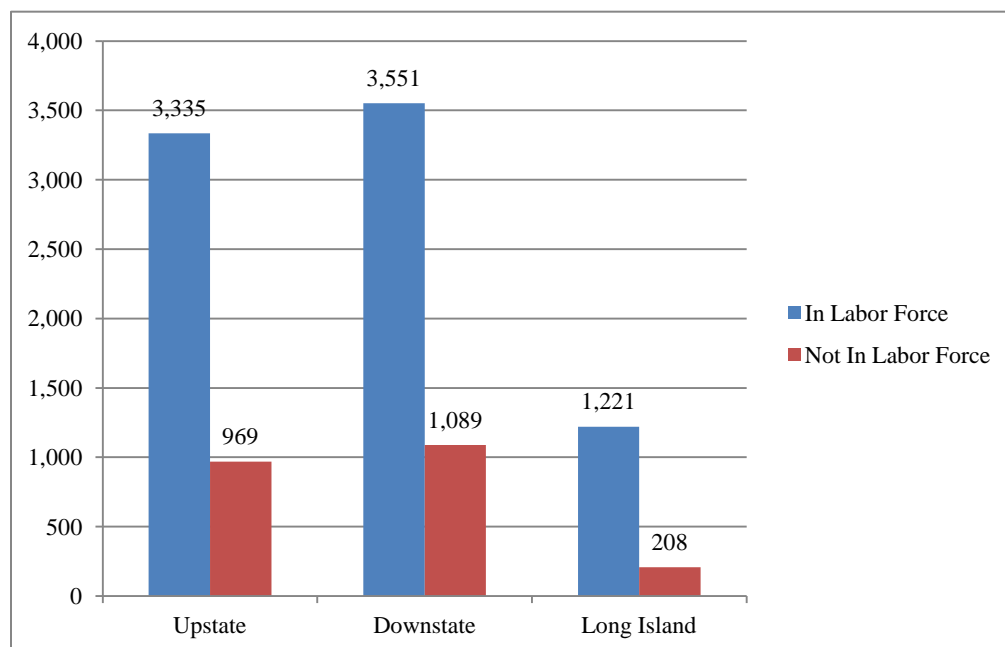
Table 49. Top Ten Counties with Greatest Percent 16-24 Year Olds Not in Labor Force, 2005-2009

County	Percent 16 to 24 Year Olds Not in Labor Force
Kings	56%
Bronx	54%
Richmond	53%
Schuyler	52%
St. Lawrence	52%
Greene	52%
Rockland	51%
Cortland	50%
Seneca	50%
Franklin	50%

Source: US Census, American Community Survey 5-Year Estimates, 2005 to 2009, and GDS calculations.

Figure 16 shows similar information for the population of 25 to 64 year olds that are not in the labor force: 969,000 (26%) upstate, over 1,089,000 (23%) downstate, and nearly 208,000 (16%) in Long Island.

Figure 16. Labor Force Status of 25-64 Year Olds in New York State, 2006-2010 (1000's)



Source: U.S. Census Data, Select Economic Characteristics 2006-2010 American Community Survey 5-Year Estimates and GDS calculations

As shown in Table 50, of the top ten counties with 25 to 64 year olds not in the labor force state-wide, nine are located upstate, and one (Bronx County) is downstate.

Table 50. Top Ten Counties with Greatest Percent 25-64 Year Olds Not in Labor Force, 2005-2009

County	Percent 25 to 64 Year Olds Not in Labor Force
Franklin	37%
Wyoming	33%
St. Lawrence	30%
Orleans	29%
Seneca	29%
Bronx	29%
Greene	27%
Clinton	27%
Chemung	27%
Hamilton	0.27

Source: US Census, American Community Survey 5-Year Estimates, 2005 to 2009, and GDS calculations.

4.4. TRAINING ORGANIZATIONS

Training is a vital component of the Workforce Development Program, and is designed to help build energy efficiency knowledge and skills among new job entrants, trades people and professionals who work, or have a desire to work in energy-related jobs and industries. Training supports enhanced energy efficiency practices across all industries, encourages working populations to work in energy efficiency jobs, and ensures the most current and up to date knowledge of energy efficient products and services available are used in the market. As the demand for workers in energy efficiency related jobs increases, the demand for training for those positions will likely increase as well.

Training organizations have been characterized for this report as either entry-level or mid- to high-level, to reflect difference in the skill being developed within each type of training program. Targeted energy efficiency entry- and mid- to high-level skills training to employees and potential employees will enhance the skills of the existing workforce and better prepare the new workforce for jobs in the energy efficiency industry. Building worker readiness and energy efficiency skills creates a better prepared workforce to fill the growing number of energy efficiency-related jobs. Enhancing the technical knowledge through mid- to high-level skills training creates an innovative environment by increasing the working knowledge of energy efficiency, which expands present and future opportunities to implement and share knowledge in various industries.

Following is a characterization of the entry- and mid- to high-level training organizations in New York State. As noted previously in the Brookings Report, Long Island has been included in limited analysis because there is a notable concentration of energy efficient and green jobs training activities and organizations located on Long Island. Given Long Island's proximity to Downstate New York, these activities and organizations are also noted in this report. When characterizing the State's training organization infrastructure, this report identifies separately all organizations that might be capable of offering training for energy efficiency related jobs, and those NYSERDA training partners that are already contracted to provide Workforce Development-targeted training services. Information on where these training organizations are located was gathered from various sources including internet searches, union and association lists, and NYSERDA reports.

4.4.1. Entry-Level Training

As of March 1, 2012, 235 locations were identified as offering entry-level skill and workforce readiness training in New York. These locations include: community agencies, vocational schools, cooperative and local support organizations, and training centers (both headquarters and satellite locations). Of these locations, 72% were upstate, 16% downstate and 12% on Long Island. In New York's upstate region, the greatest percent of entry-level skills training and worker readiness organizations were providing vocational and cooperative education services (86%), including organizations such as the Boards of Cooperative Education Services (BOCES) and One Stop Career Centers.

As of March 1, 2012, under 19% of worker readiness and entry-level skills training locations in New York State were providing training support under contract through NYSERDA Workforce Development training organizations.¹⁵⁸ This means there remains a large percentage of entry-level training locations available to deliver Workforce Development energy efficiency training should needs arise.

¹⁵⁸ It is important to note that 79 of the State's total 235 worker readiness and entry-level training organizations are New York One Stop Career Centers, which it was discovered through this project's telephone surveys do not directly offer training programs at their locations, but only refer their clients to trainings offered elsewhere.

4.4.2. Mid- to High-level Training

As of March 1, 2012, 91 locations in the State offered mid- to high-level skills development, secondary education and degree programs in energy efficiency. Of these, 69% are located upstate, 22% downstate, and 7% in Long Island (an additional 3% of these training locations are actually out of state¹⁵⁹). These training organization locations consist of industry associations, the Building Performance Institute (BPI) and the Association for Energy Affordability (AEA), and account for 36% of the mid- to high-level training organizations, followed by two- and four-year colleges, which account for 29%. Forty-four training partners, or 48%, are contracted with NYSERDA to deliver Workforce Development training.

Table 51 shows the types and total number of entry- and mid- to high-level training organizations identified as operating in the State (both those currently participating in NYSERDA's Workforce Development Program and non-participating organizations). It is important to note that union training centers appear in both the entry-level and mid- to high-level skills training groups. Although often providing both types of training from the same centers, the Union Training Centers have been separated to focus on the type of training they do the most (for example the 24 Union Training Centers identified under the Entry-Level Skills section of Table 51 represent centers that offer mainly basic skills training and apprenticeships, while the 25 Union Training Centers identified under the mid- to high-level skills section of Table 51 represent centers that mainly offer journeymen and master skills training. Also note that some of NYSERDA's Industry Association training partners and one Union training partner are headquartered out of state.

¹⁵⁹ Two Workforce Development Program mid-to-high level training organizations are located out of state, and work within New York to provide mid to high level training; these firms are located in Connecticut and Washington State

Table 51. Initial Targeted Population for Training Organizations Survey¹⁶⁰

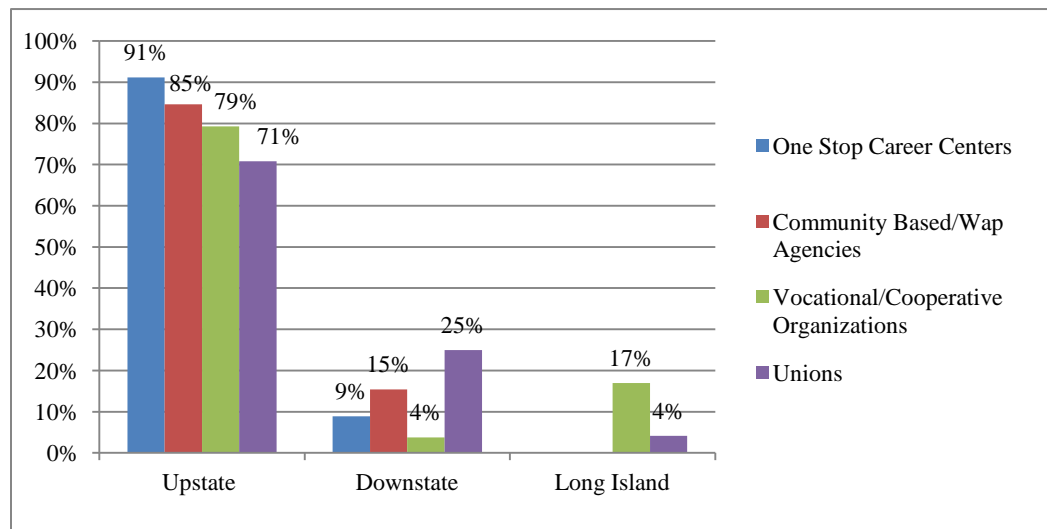
Training Organization Type (NAICS Codes)	Total Number of Training Organizations (% of total)	Participating Training Organizations	Non- Participating In-State Training Organizations (Sample Size)
New York One Stop Career Centers (NAICS: 921120)	79 (24%)	0	79 (33%)
Community Training Agencies - WAP and Other Community Agencies - (NAICS: 624190, 813319)	78 (24%)	5	73 (31%)
Vocational and Cooperative Training, Rehabilitation and Job Training - Market Actor Specific - (NAICS: 624310, 923140)	53 (16%)	38	15 (6%)
Union Training Centers (NAICS: 813930)	24 (7%)	0	24 (10%)
Consultants (NAICS: 541690)	1 (0%)	1	0 (0%)
Total Entry Level Skills Training Organizations	235 (72%)	44	191 (80%)
Certification Training/2 and 4 Year Colleges (NAICS: 611210)	62 (19%)	39	23 (10%)
Union Training Centers (NAICS: 813930)	25 (8%)	1*	24 (10%)
Industry Association/Other Technical Training (NAICS: 611430)	4 (1%)*	4*	0 (0%)
Total Mid to High Level Skills Training Organizations	91 (28%)	44	47 (20%)
Total All Training Organizations	326 (100%)	88	238 (100%)

*Includes one or more organizations' headquarters located outside of New York State.

¹⁶⁰ Excludes organizations located in Long Island.

As shown in Figure 17, in New York State, the greatest percent of all entry-level skills training and worker readiness organization locations are One Stop Career Centers (34%), followed by Community Based Agencies (33%) and include weatherization agencies community agencies and Pathways Out of Poverty grant recipients. Eighty-four percent of all entry level training organizations are located Upstate; this includes 91% of One Stop Career Centers, 85% of Community Based Agencies, 79% Vocational, Cooperative and Rehabilitation Service organizations.

Figure 17. Entry-Level Skills Training Locations by Type and Region, 2011



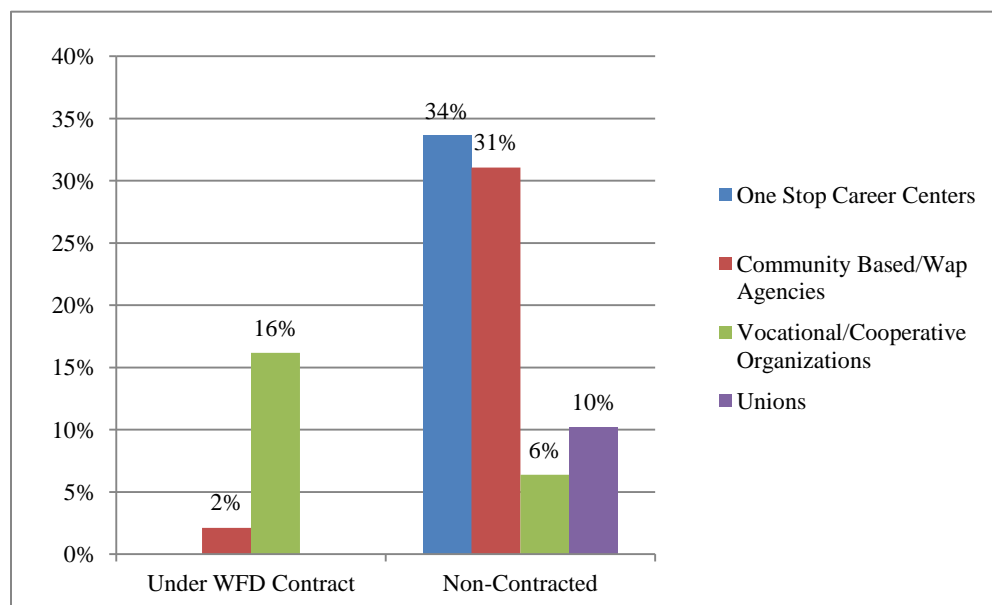
Upstate N=198, Downstate N=27, and Long Island N=10.

Source: Pathways Out of Poverty Grant Recipient Press Release, US Department of Labor announces \$150 million for “Pathways Out of Poverty” training grant for green jobs, 1/13/2010, internet search and NYSERDA reports.

As shown in Figure 18, nearly 19% (44) of the 235 worker readiness and entry level skills training locations in New York State are with contracted NYSERDA Workforce Development training organizations. However, with 81% of the total locations in New York State not yet participating, there could be an opportunity to increase the number of contracted Workforce Development training locations if needs arise. Of those organizations under contract by NYSERDA, the upstate region has the greatest percentage (75%) of Workforce Development worker readiness entry-level skill training organizations, followed by Downstate (16%), and Long Island (2%).

Shortly after the non-participating training organization surveys began, APPRISE recommended that One Stop Centers be eliminated from the sample because they did not appear to directly offer in-house training, and only refer people seeking training for career advancement or to gain employment to other training organizations. Subsequently, 79 One Stop Center locations were removed from the sample list, reducing the total number of entry-level skills training organizations to 156. At the same time, 28 training organizations (19 entry-level and 9 mid- to high-level) were identified and added from a list developed by Pace University. The end result, and as shown in Table 52, the revised sample of training organizations totaled 275.

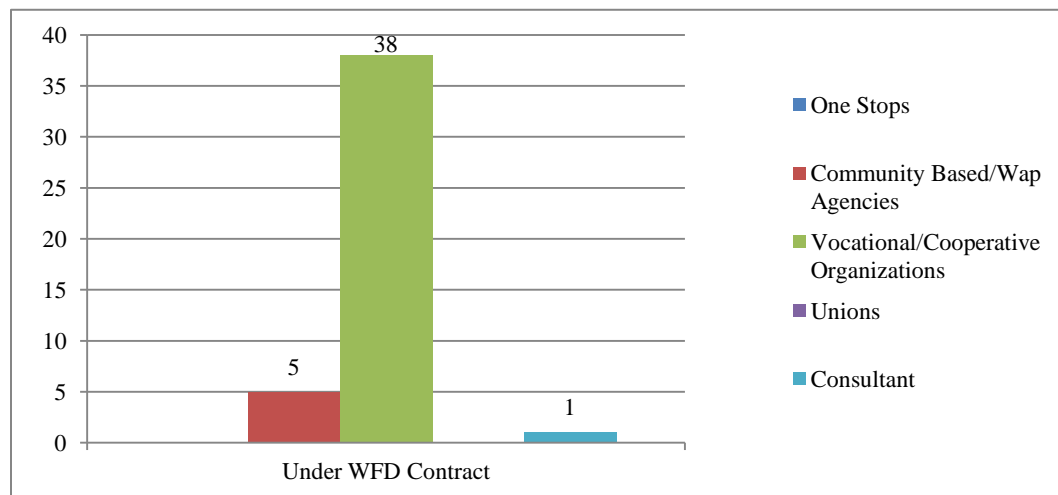
Figure 18. Percent of Entry-Level Skills Training Locations Contracted by Region, 2011



Source: Pathways Out of Poverty Grant Recipient Press Release, US Department of Labor announces \$150 million for “Pathways Out of Poverty” training grant for green jobs, 1/13/2010, internet search and NYSERDA reports.

As shown in Figure 19, a total of 44 organization locations have been identified as already under contract with NYSERDA to offer entry-level skill and workforce readiness training in New York State, including: 5 community agencies, 38 vocational, cooperative and local support and training organizations (both headquarters and satellite locations). Additionally, there is one contracted Workforce Development Training Partner located out of State (a consultant) that travels to various locations in New York to conduct training.

Figure 19. Workforce Development Entry-Level Skills Training Organizations in New York



Source: Pathways Out of Poverty Grant Recipient Press Release, US Department of Labor announces \$150 million for “Pathways Out of Poverty” training grant for green jobs, 1/13/2010, internet search and NYSERDA reports.

Table 52. Revised Targeted Population for Training Organizations Survey

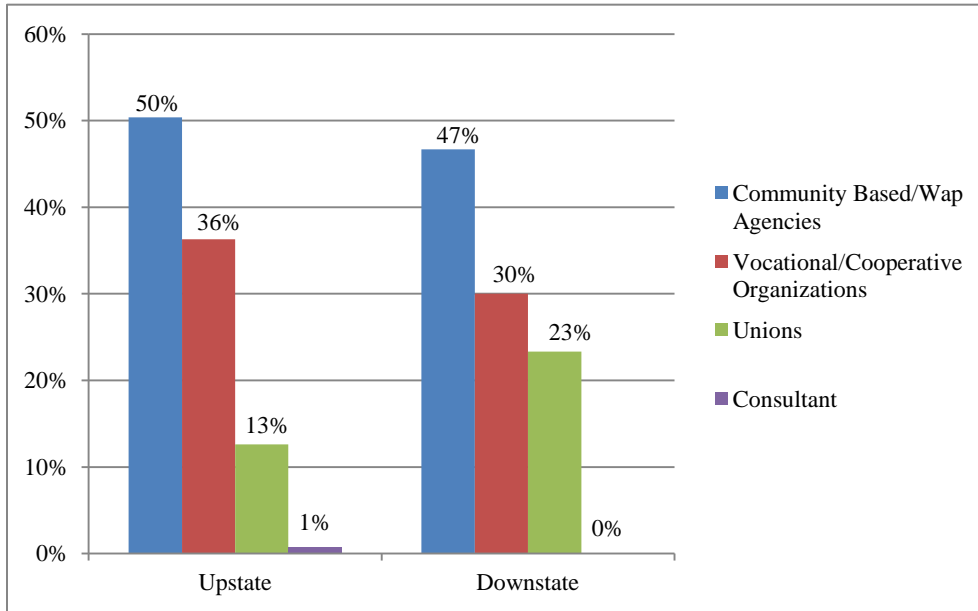
Training Organization Type (NAICS Codes)	Total Number of Training Organization Locations (% of total)	Participating Training Organizations	Non- Participating In- State Training Organization Locations (Sample Size)
Community Training Agencies - WAP and Other Community Agencies - (NAICS: 624190, 813319)	82 (30%)	5	77 (41%)
Vocational and Cooperative Training, Rehabilitation and Job Training - Market Actor Specific - (NAICS: 624310, 923140)	67 (24%)	38	29 (16%)
Union Training Centers (NAICS: 813930)	25 (9%)	0	25 (13%)
Consultants (NAICS: 541690)	1 (0%)	1	0 (0%)
Total Entry Level Skills Training Organizations	175 (64%)	44	131 (70%)
Certification Training/2 and 4 Year Colleges (NAICS: 611210)	65 (24%)	39	26 (14%)
Union Training Centers (NAICS: 813930)	25 (9%)	1*	24 (13%)
Industry Association/Other Technical Training (NAICS: 611430)	10 (4%)	4*	6 (3%)
Total Mid to High Level Skills Training Organizations	100 (36%)	44	56 (30%)
Total All Training Organizations	275 (100%)	88	187 (100%)

* Indicates one or more of the training organizations is located out of State.

The remainder of this section provides details of the revised list of non-participating entry- and mid- to high-skill level training organizations characterized in this report.

As shown in Figure 20, excluding Long Island, the greatest percent of entry-level skills training and worker readiness organizations in the State are Community Based Agencies, representing 50% of the total number of entry-level training organizations upstate and 47% downstate. Vocational and Cooperative Organizations represent 36% and 30% of all entry-level training organizations upstate and downstate, respectively.

Figure 20. Entry-Level Skills Training Locations by Type and Region (2011)

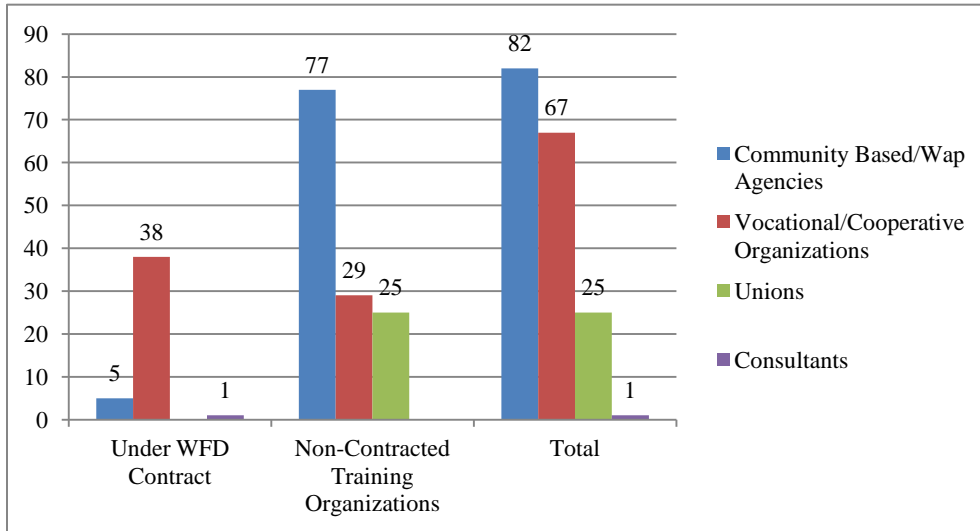


Upstate N=135 and Downstate N=30.

Source: Pathways Out of Poverty Grant Recipient Press Release, US Department of Labor announces \$150 million for “Pathways Out of Poverty” training grant for green jobs, 1/13/2010, internet search and NYSERDA reports.

As shown in Figure 21, 44 (25%) of the 175 total entry-level training locations in New York State are contracted with NYSERDA as Workforce Development training organizations. Thirty-eight (over 86%) of the contracted entry-level Training Partners are Vocational/Cooperative training organizations, but represent 38% (67 of 175) of the total entry-level training organizations identified in New York State. Eleven percent (5) of the contracted training partners are Community Based and Weatherization agencies, accounting for 47% of the State’s total identified entry-level training organizations. Unions offering entry level skills training represent 14% of the organizations identified, with none contracted with NYSERDA for entry-level skills training.

Figure 21. Contracted vs. Non-Contracted Entry-Level Skills Training Locations (2011)

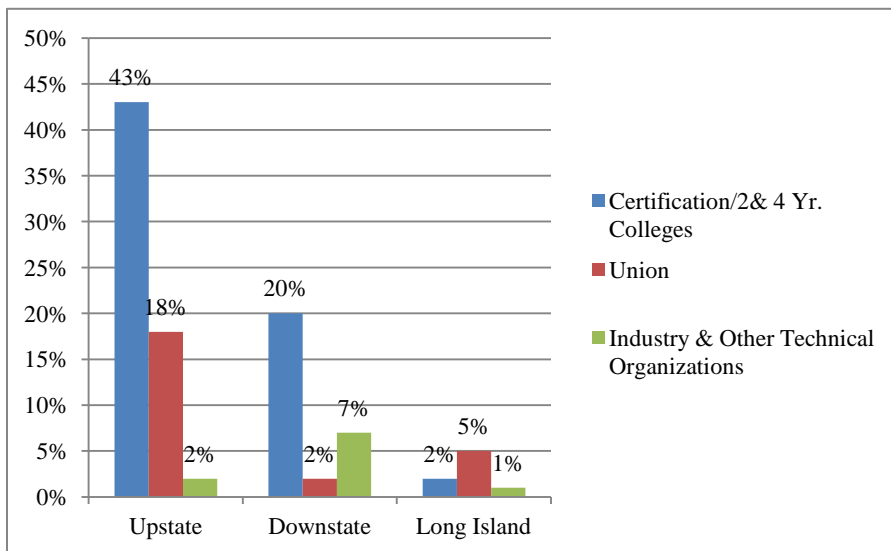


Under WFD Contract N=44, Non-Contracted Training Organizations N=131.

Source: Pathways Out of Poverty Grant Recipient Press Release, US Department of Labor announces \$150 million for “Pathways Out of Poverty” training grant for green jobs, 1/13/2010, internet search and NYSERDA reports.

As shown in Figure 22, the greatest percent of mid- to high-level skills training locations in upstate New York are Certification and 2 and 4 year Colleges (43%) and Union training organizations (18%) The greatest percent of mid-to high-level skills training organizations located downstate are Certification and 2 and 4 year Colleges (20%) and Industry Associations (7%), including BPI and AEA certification. The greatest percent of training organizations on Long Island are Unions (5%).

Figure 22. Mid to High-Level Skills Training Organizations by Type and Region, 2011*

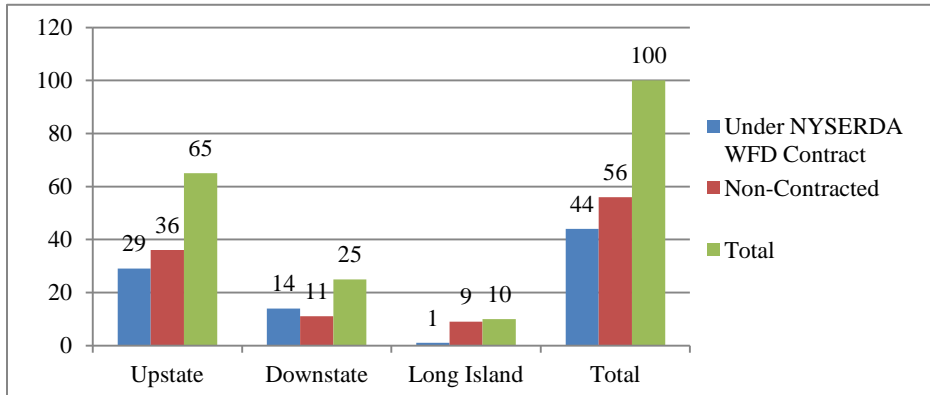


Upstate N=63, Downstate N=29, and Long Island N=8

Source: NYSERDA reports and Internet search, including BPI website and NY Local Union website. This does not include the two training organizations located out of State.

Figure 23 shows that 44% (44) of the 100 mid- to high-level skills training locations identified in the State are contracted NYSERDA Workforce Development training partners. With 56% of the total locations in New York State not yet working with NYSERDA, there is opportunity to increase the number of mid- to high-level Training Partners across the State if needs arise. Of those organizations under contract by NYSERDA as mid- to high-level Workforce Development partners, 66% are located upstate, 32% downstate, and approximately 2% in Long Island. Additionally, there are two NYSERDA contracted Workforce Development Training Partners located out of State.

Figure 23. Contracted vs. Non Contracted Mid- to High-Level Training Locations, by Region (2011)

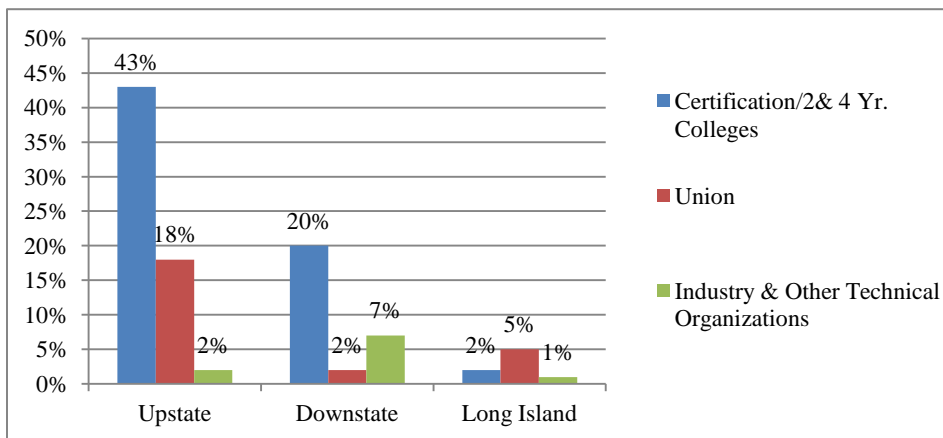


Upstate N= 65, Downstate N=25, and Total N=100.

Source: NYSERDA reports and Internet search, including BPI website and NY Local Union website.

As shown in Figure 24, a total of 100 mid- to high-level training locations have been identified in the State, including those already under contract with NYSERDA. These organizations represent a mix of colleges/certification programs, union training, industry associations, industry training and consultants. Of these, 29 (29%) are located downstate, 63 (63%) are upstate and 8 (8%) are located in Long Island. Two mid- to high-level training organizations are located out of state and are not included in this analysis.

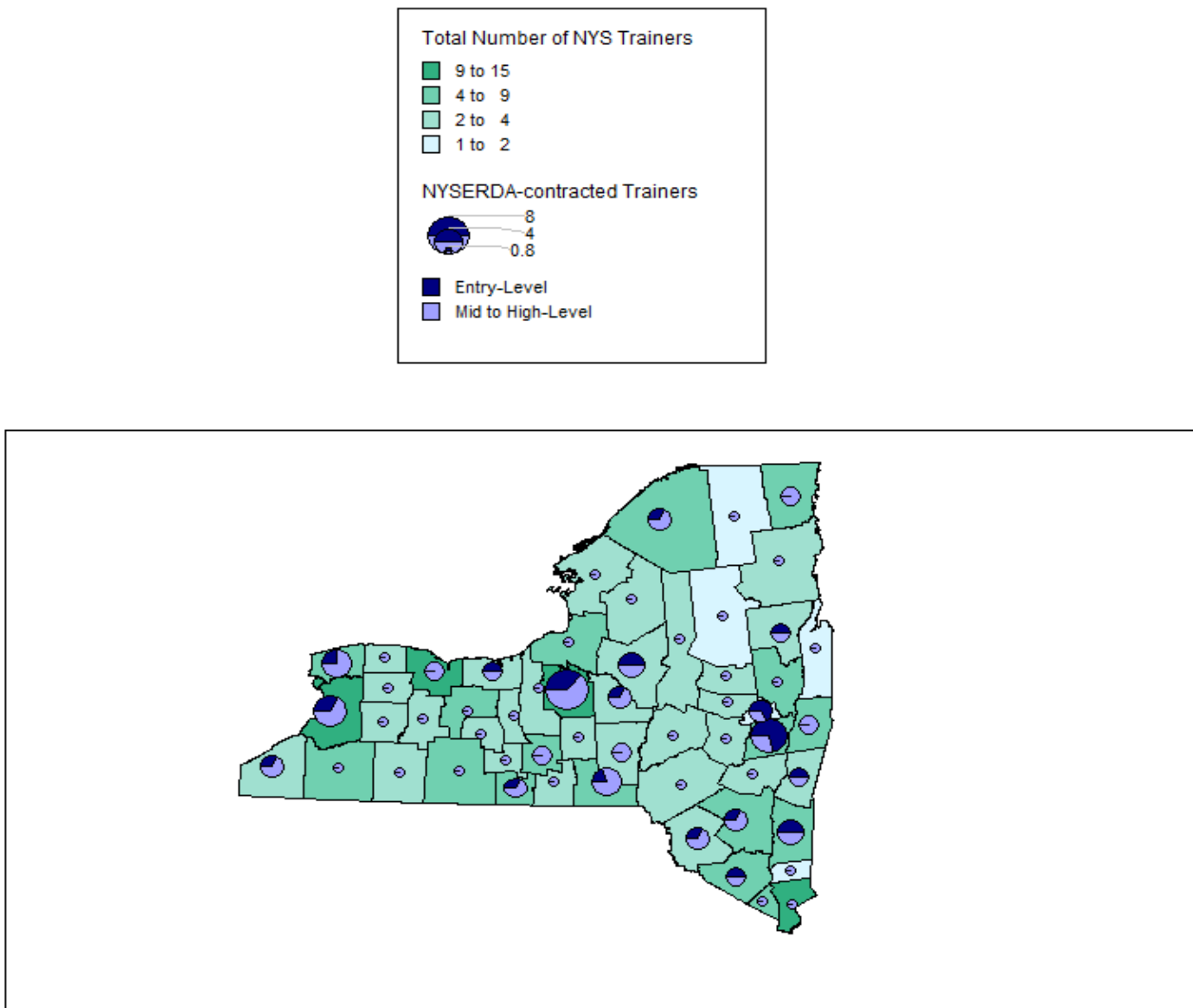
Figure 24. Total Number of Workforce Development Mid- to High-Level Skills Training Locations



Source: NYSERDA reports and Internet search, including BPI website and NY Local Union website.

Map 6 shows the total number of upstate training organization locations (entry-level and mid- to high-level), by county, and the number of those that are currently under contract, as partners in NYSERDA’s Workforce Development Program. Darker shades represent a higher number of training centers. The individual pie charts within each county indicate the number of entry- and mid- to high-level NYSERDA Workforce Development contracted Training Partners.

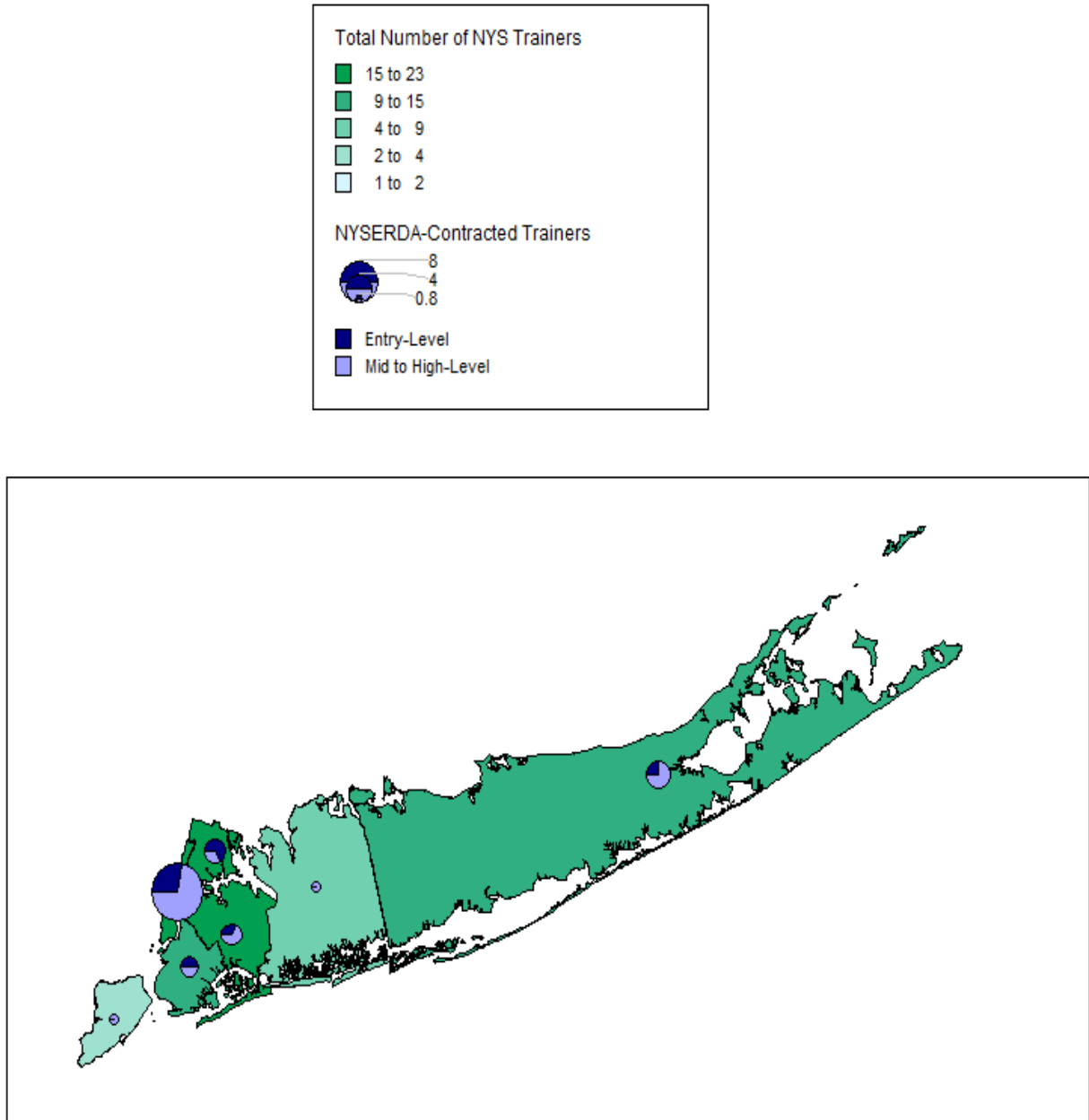
Map 6. Distribution of Training Centers in Upstate New York



Source: Pathways Out of Poverty Grant Recipient Press Release, US Department of Labor announces \$150 million for “Pathways Out of Poverty” training grant for green jobs, 1/13/2010, internet search and NYSERDA reports, BPI and NY Local Union website. For the purpose of this analysis, out of State Training Partners are not listed.

Map 7 shows this same information for training organizations located downstate. Given NYSERDA's Program reach does not extend into Long Island, it is not surprising to see such small numbers of contracted organizations located in this region of the state.

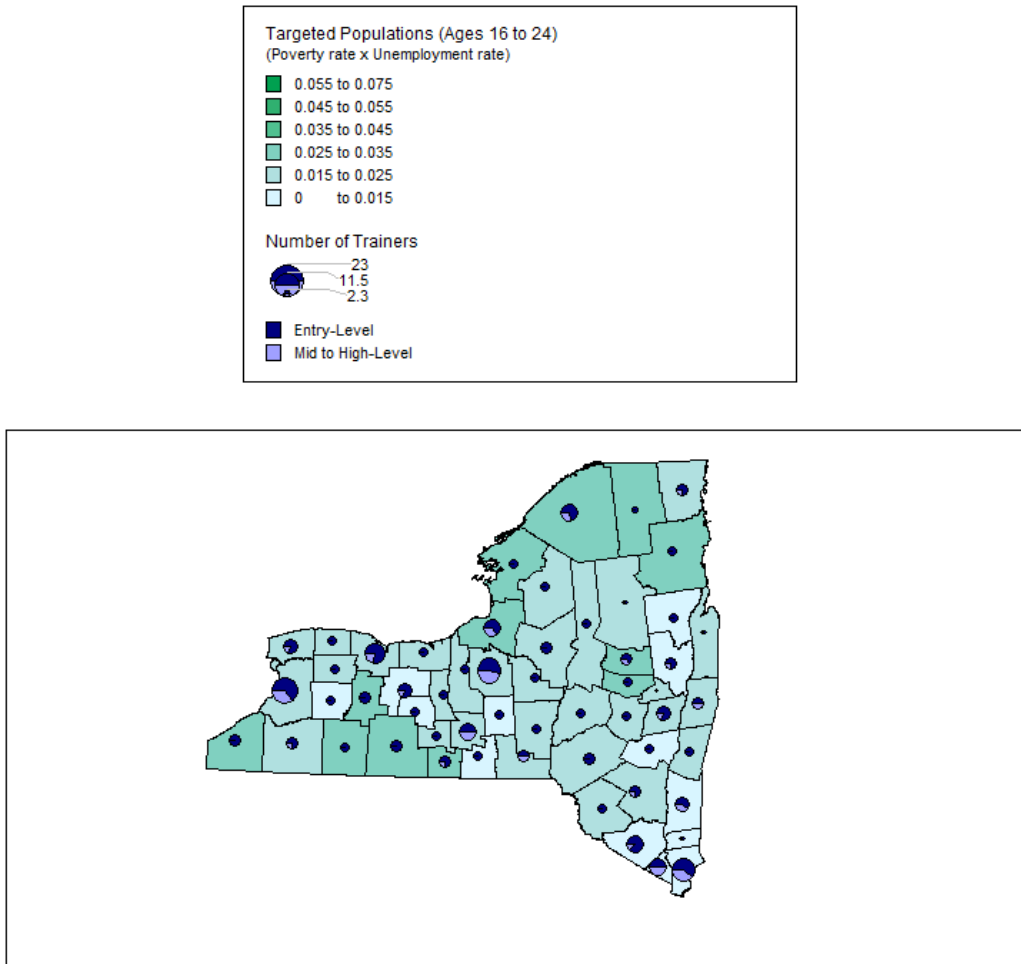
Map 7. Distribution of Training Centers in Downstate New York



Source: Pathways Out of Poverty Grant Recipient Press Release, US Department of Labor announces \$150 million for "Pathways Out of Poverty" training grant for green jobs, 1/13/2010, internet search and NYSERDA reports, BPI and NY Local Union website. For the purpose of this analysis, out of State Training Partners are not listed.

To provide some insight into alignment of training organizations with targeted employee groups, the following series of maps overlay the county-specific location of training organizations (pie charts) across the targeted hard-to-reach, hard-to-serve populations (shade gradients). Maps are provided separately for upstate and downstate regions, for targeted populations aged 16 to 24 years old and 25 to 64 years old. As shown on Map 8, upstate counties with greater percentage of hard to reach/serve and economically disadvantaged populations, aged 16 to 24 years old, but with a lower number of training organization locations include St. Lawrence, Allegany, Essex, Jefferson, Chautauqua, Franklin, Fulton, Montgomery and Steuben. Developing additional Program partner training resources, if such a need exists in these counties could yield increased employment opportunity benefits.

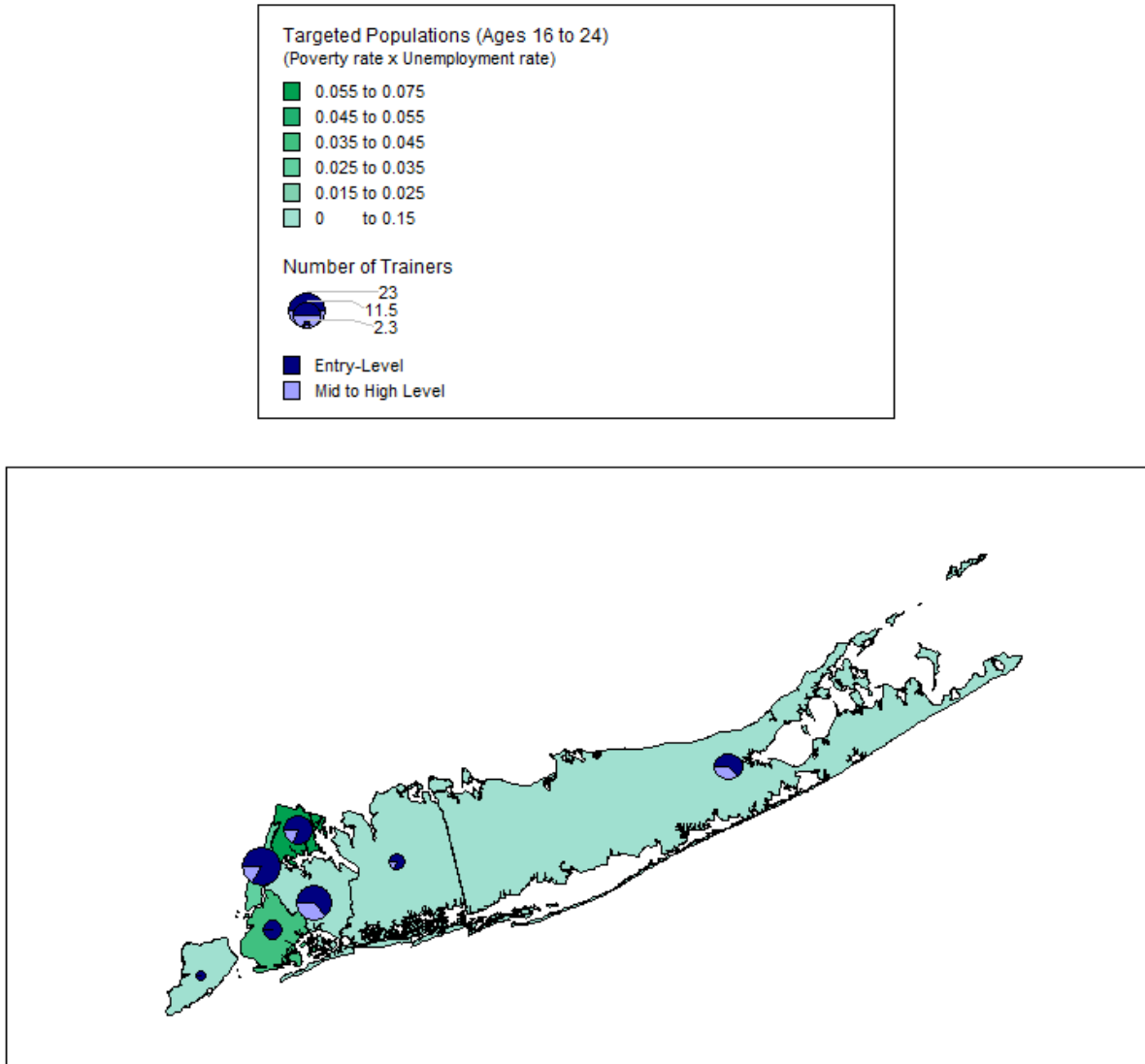
Map 8. Upstate Training Organizations vs. Targeted Population Aged 16 to 24, by County



Source: Pathways Out of Poverty Grant Recipient Press Release, US Department of Labor announces \$150 million for “Pathways Out of Poverty” training grant for green jobs, 1/13/2010, internet search and NYSERDA reports, internet search, BPI website and NY Local Union website.

Map 9 compares downstate county hard-to-reach/serve populations, aged 16 to 24 years old, against training organization locations. As shown in the map, there may be a shortage of training organizations in Kings, Bronx and New York Counties.

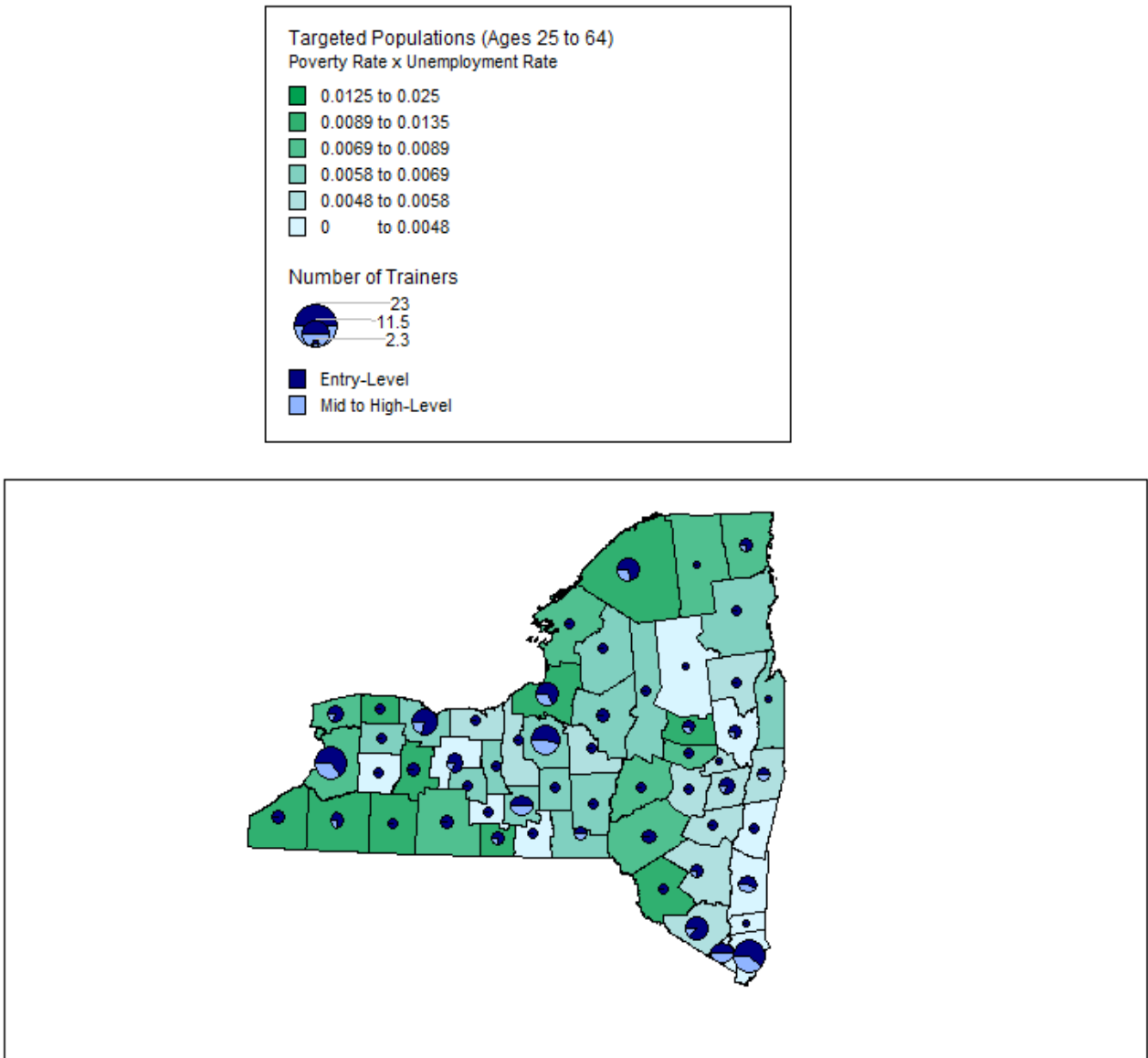
Map 9. Downstate Training Organizations vs. Targeted Population Aged 16 to 24, by County



Source: Pathways Out of Poverty Grant Recipient Press Release, US Department of Labor announces \$150 million for “Pathways Out of Poverty” training grant for green jobs, 1/13/2010, internet search and NYSERDA reports, internet search, BPI website and NY Local Union website.

Map 10 compares the number of training organizations, by upstate counties, with the percentage of hard to reach/serve and economically disadvantaged populations aged 25 to 64 years. Developing additional Program partner training resources in counties that appear under-represented could yield increased employment opportunity benefits, if needs exist.

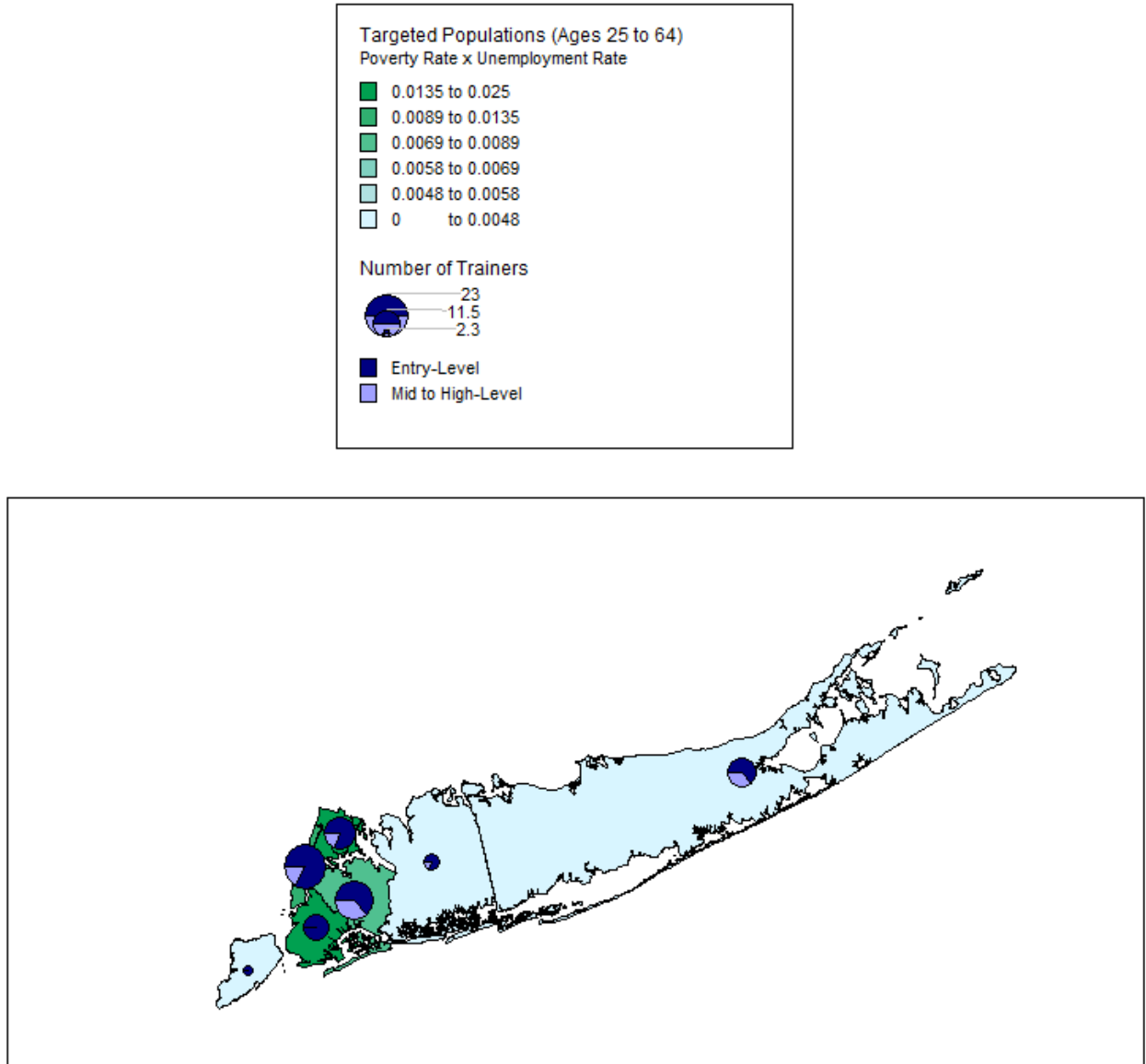
Map 10. Upstate Training Organizations vs. Targeted Population Aged 25 to 64, by County



Source: Pathways Out of Poverty Grant Recipient Press Release, US Department of Labor announces \$150 million for “Pathways Out of Poverty” training grant for green jobs, 1/13/2010, internet search and NYSERDA reports, internet search, BPI website and NY Local Union website.

Map 11 compares downstate county hard-to-reach/serve populations, aged 25 to 64 years old, against training organization locations.

Map 11. Downstate Training Organizations vs. Targeted Population Aged 25 to 64, by County



Source: Pathways Out of Poverty Grant Recipient Press Release, US Department of Labor announces \$150 million for “Pathways Out of Poverty” training grant for green jobs, 1/13/2010, internet search and NYSERDA reports, internet search, BPI website and NY Local Union website.

SECTION 5. MARKET ASSESSMENT

This section identifies and examines key Program and market assessment indicators for NYSERDA's Workforce Development Program as it relates to two key market actor groups: 1) Employers, and 2) Training Organizations, as described in more detail below.¹⁶¹ All data used to assess the market for these two groups was collected through strategically designed and implemented telephone survey instruments, derived from the Workforce Development Program's Logic Model and through discussion with NYSERDA program staff, review of other relevant materials, input from other members of NYSERDA's evaluation contractor teams, the New York Department of Labor and Pace University researchers.

Employers: The population of employers targeted for this market assessment is made up of companies located within New York State that have employees or hire contractors who perform jobs that are directly or indirectly involved with energy efficient building construction or the design, specification, delivery, installation, or servicing of electric energy using products or equipment within homes or businesses in the State. Such companies could either *support or directly provide*: (1) building/contractor services (i.e., single/multifamily builders, commercial/office builders, HVAC contractors, other building equipment contractors, real estate developers and property managers), or (2) engineering and consultant services (i.e., industrial and mechanical engineers, building construction consultants, HVAC engineers, energy conservation engineers and consultants, and lighting consultants and electrical contractors).

The types of information gathered through telephone surveys with this market actor group included:¹⁶²

- Energy efficiency workforce skills
- General awareness of job skills-related training
- Training infrastructure awareness and satisfaction
- Energy efficiency employment plans and practices
- Awareness of NYSERDA and/or broader workforce development efforts
- Participation in other SBC-funded initiatives

See Section 5.1 for detailed findings and market assessment results from the employer telephone surveys.

Training Organizations: The population targeted for this market assessment is made up of training organizations not currently under contract with NYSERDA as Workforce Development Program training partners. These organizations may, or may not currently include energy efficiency components within their training efforts, but are all viewed as having the potential to include these components in the future.

¹⁶¹ A third market actor group, non-participating potential future trainees, was also considered for market assessment, but ultimately dropped from this evaluation project's primary research activities work plan. Appendix A provides more details regarding the evaluation team's recommendation to halt non-participating trainee survey plans (dated December 14, 2011).

¹⁶² It is important to note that there was a limited budget for implementing the employer telephone survey component of this Workforce Development Program market characterization and assessment (MCA) effort – \$15,000 of a total \$150,000 MCA project budget. A major objective of this employer telephone survey, therefore, was to collect baseline information from targeted groups of businesses that might make use of the program's training support activities.

The types of information gathered through telephone surveys with this market actor group included:

- Training practices – types offered, energy efficiency inclusion, tuition aid offered/used, hard-to-serve/underserved populations trained, pre-training interest in energy efficiency, barriers to expansion of existing and development of new training efforts, need for more energy efficiency materials and training venues
- Training trends and plans – assess change in demand for energy efficiency training, drivers of change, planned response to change
- Trainee interest in energy efficiency – post training (from training organization perspective)
- Energy efficiency employment placement and opportunities for trainees – jobs found, job types, specific training organization outreach and trainee placement activities, job opportunity trends
- Awareness of NYSERDA and/or broader energy efficiency training infrastructure and associated workforce development efforts – general awareness, source of awareness and level of awareness

Section 5.2 presents detailed results from the training organization telephone surveys.

Section 5.3 provides a higher level summary of the combined employer and training organization survey results along with associated recommendations.

5.1 EMPLOYERS

Energy efficiency-related jobs exist within a variety of company types, and require varying skill sets (i.e., entry-level, and mid- to high-level). The company types selected for assessment in this study included: Builders, HVAC Contractors, Engineers/Consultants, and Real Estate Developers/Property Management firms. These company categories were chosen because they tend to have a higher concentration of energy efficiency related jobs, as documented by the NYSDOL Green Jobs Report, Brookings and GJGNY Reports. For each of these potential energy efficiency employer (company) categories, market assessment results are presented in the subsections below by the following groupings: energy efficiency workforce skills, training awareness, training infrastructure usage and satisfaction, employment plans and practices, awareness of NYSERDA and broader workforce development efforts, and participation in other NYSERDA or New York State utility-funded initiatives.

5.1.1 Energy Efficiency Workforce Skills Baseline

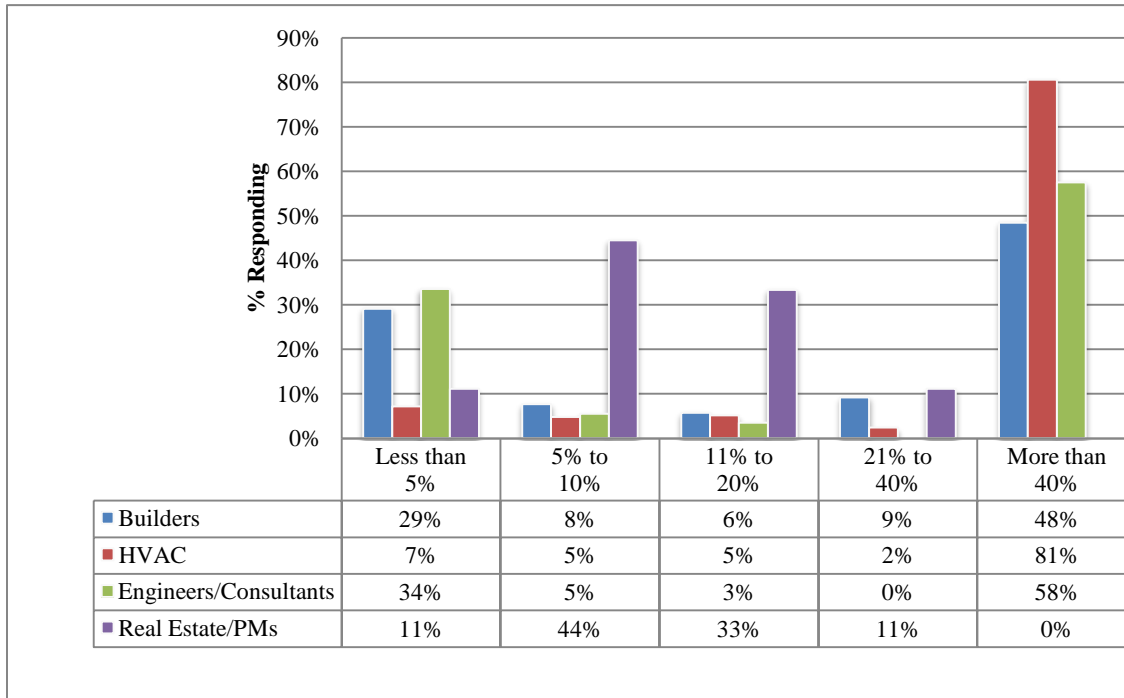
This section assesses some general firmographic information and energy efficiency workforce skills in the baseline data. This includes respondents' perceptions regarding the number of employees involved with energy efficiency activities, the percent of their company's work that was related to energy efficiency and associated employee experience/training attended, and job types (entry-level vs. skilled). In addition, this section summarizes respondents' past energy efficiency hiring experience, including underserved and hard-to-reach individuals.

5.1.1.1 Involvement with Energy Efficiency Activities

Employer respondents were asked to identify how many (what percentage) of their employees are involved with energy efficient building construction, or designing, recommending, installing or servicing energy using equipment in New York Homes or businesses. As shown in Figure 25, the greatest percent of energy efficiency-related jobs are in companies identified as HVAC contracting firms where 81% of respondents reported that more than 40% of their employees are involved with energy efficiency activities. Engineers/Consulting firms and Builder respondents also noted high percentages of their employees involved with energy efficiency activities, with 58% and 48% respectively noting that more than 40% of their employees are engaged in such work. A majority of Real Estate Development and

Property Management firms (77%) reported between 5% and 20% of their employees are involved in energy efficiency-related jobs.

Figure 25. Percentage of Employees Involved in Energy Efficiency Activities

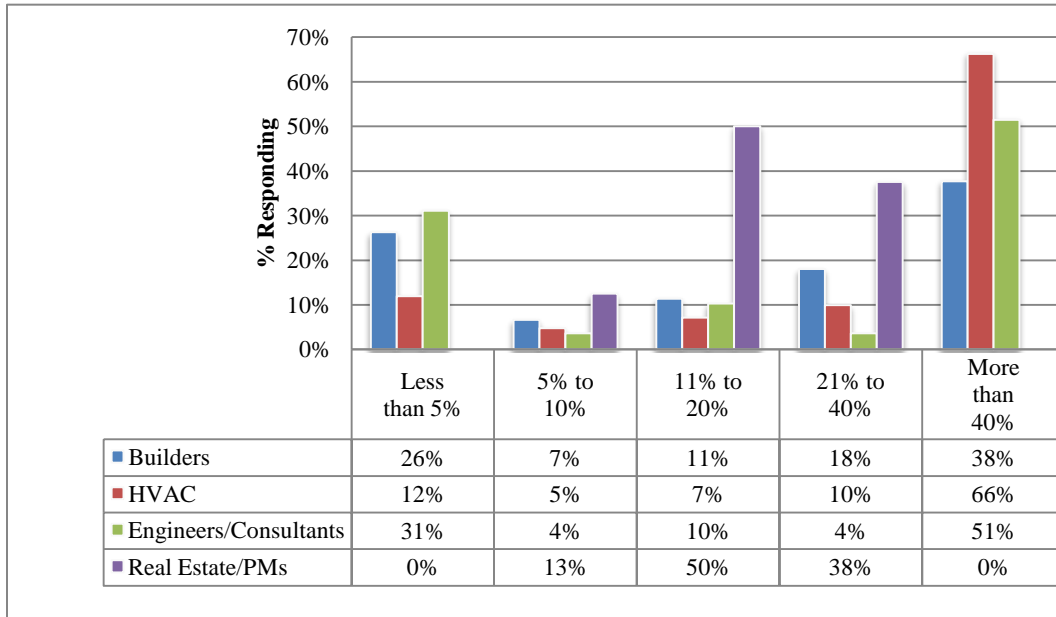


Builders N=42, HVAC N=44, Engineers/Consultants N=48, and Real Estate Developers/Property Managers N=9.

When asked what percentage of their company’s work during the past year was energy efficiency related, as shown in

Figure 26, again the HVAC respondents (66%) noted that more than 40% of their firm's work could be categorized that way. A majority of Engineering and Consulting firms (51%) and Builder respondents (38%), also reported more than 40% of their company's work last year was energy efficiency-related. Nearly 88% of the Real Estate Developer and Property Management respondents identified energy efficiency as representing between 11% and 40% of their company's work over this past year. It is interesting to note that 31% of responding Engineers/Consultants and 26% of the Builders interviewed identified energy efficiency activities as representing less than 5% of their company's previous year activities. This may be a potential area of focus for NYSERDA's efforts, where these two employer groups could be targeted with information regarding the value of including energy efficiency as part of their work products and services.

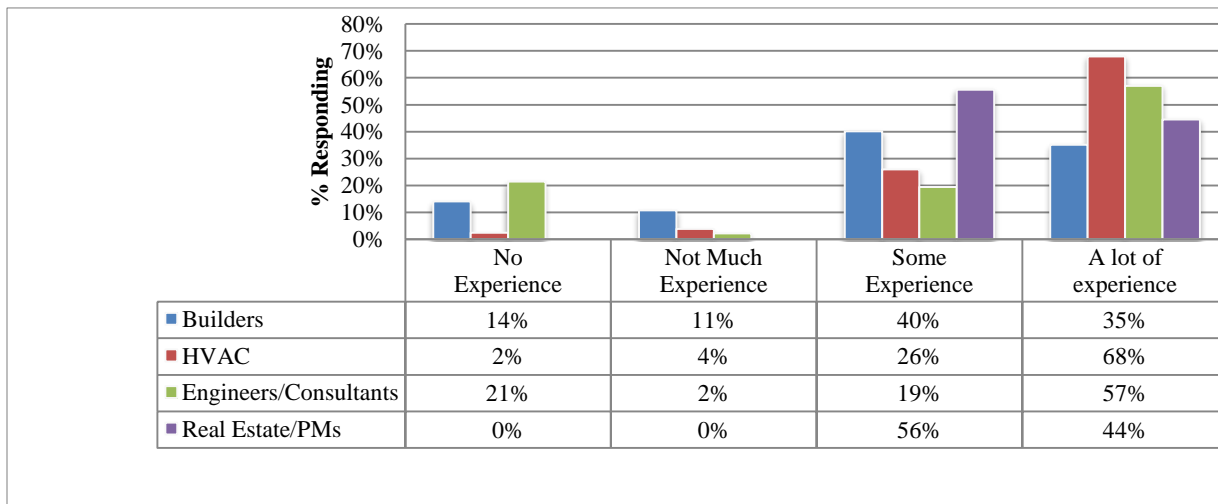
Figure 26. Percent of Company’s Work That Was Energy Efficiency-Related in Past Year



Builders N=40, HVAC N=44, Engineers/Consultants N=46, and Real Estate Developers/Property Managers N=9.

When asked how much experience the respondent companies’ employees had in performing the energy efficiency components of their work, over 75% of the companies in each business type reported that their employees had “some” to “a lot” of experience. HVAC and Engineers/Consultants respondents reported having the greatest percentages, with 68% and 57% respectively noting “a lot” of experience. By looking at the still large percentage of respondents claiming “no,” “not much” or only “some” experience, it appears that there remains a large market (65% of Builders, 56% of Real Estate Developers/Property Managers, 42% of Engineers/Consultants, and 32% of HVAC Contractors) for additional skills development and training opportunities.

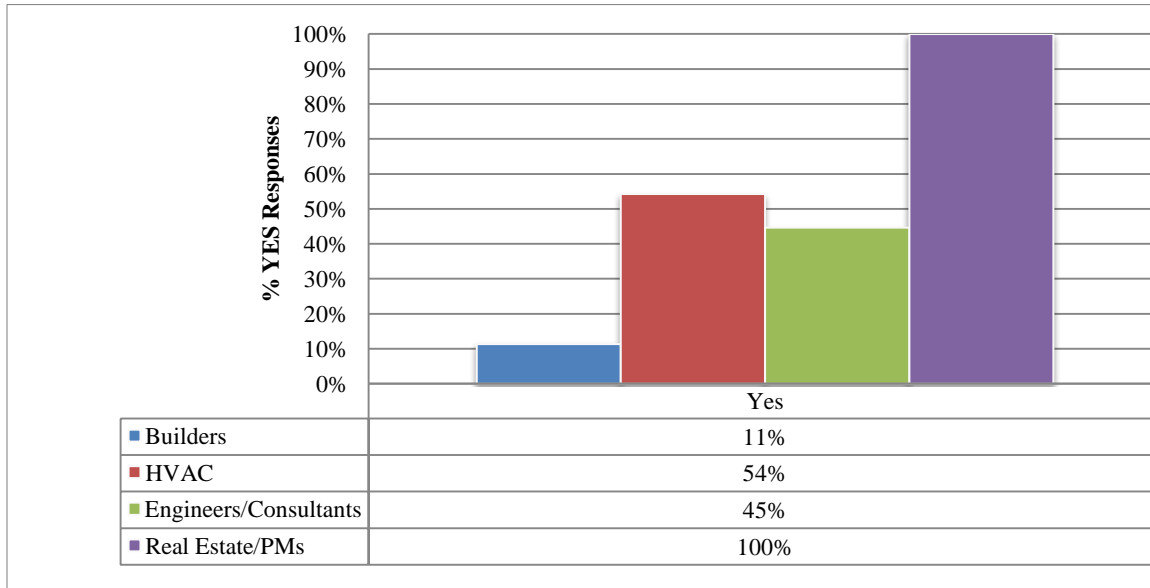
Figure 27. Employee Experience with EE Related Work



Builders N=38, HVAC N=43, Engineers/Consultants N=48, and Real Estate Developers/Property Managers N=9.

Respondents were asked if their company has attended (or sent employees to) any job training courses related to energy efficiency in the last 12 months. As shown in Figure 28, there remains a substantial number of companies in the State that have yet to take advantage of such trainings (46% of HVAC contractors, 55% of Engineers/Consultants and nearly 90% of Builders).

Figure 28. Percent “Yes” - Employees Sent To Energy Efficiency Training in Past Year



Builders N=38, HVAC N=43, Engineers/Consultants N=48, and Real Estate Developers/Property Managers N=9.

5.1.1.2 Types of Skilled and Unskilled Positions Being Hired

When asked if their company hires for unskilled positions, as shown in Table 53, among respondents who said at least 5% of their employees’ jobs involved energy efficiency, entry-level office support was the unskilled position mentioned most often. Unskilled laborers and residential/commercial construction employees are also commonly hired by Builders, HVAC Contractors and Engineers/Consultant companies.

As shown in Table 54, architectural/engineering, energy consultant, residential construction, and HVAC installers are the most commonly identified skilled positions hired (67%, 67%, 64% and 61% respectively). Other skilled positions for which respondents said they hire include commercial construction, building shell improvement, electrical contracting, and equipment installation.

Table 53. Percent of Firms Hiring Unskilled Positions By Industry

Unskilled Positions	Builders	HVAC	Engineers/ Consultants	Real Estate/ PMs
Entry-Level Office Support	36%	27%	59%	100%
Residential Construction	34%	35%	16%	
Commercial Construction	23%	32%	48%	
Laborers (unspecified)	100%			
other: Doorman and Porter	4%			
other: Maintenance / Cleaning	3%	3%		22%
other: Warehouse Driver / Loader		3%	3%	
other: Electronic Pipefitters			3%	
other: Mechanical/Electrical Engineering			5%	
other: Administrative / Clerical				78%

Builders N=30, HVAC N=41, Engineers/Consultants N=31, and Real Estate Developers/Property Managers N=8.

Table 54. Percent of Firms Hiring Skilled Positions By Industry

Skilled Positions	Builders	HVAC	Engineers/ Consultants	Real Estate/ Property Mgmt
Residential Construction	64%	34%	42%	
Commercial Construction	43%	39%	41%	22%
Building Shell Improvement	47%	11%	46%	
HVAC Installation	31%	61%	33%	11%
Electrical Contractor	47%	15%	28%	
Equipment Installation	37%	54%	42%	
Sales and Related Support	24%	20%	32%	
Architectural/Engineering Services	44%	13%	47%	67%
Energy Consultant	19%	14%	67%	22%
Property Manager/Real Estate Developer	22%	4%	8%	
Other Skilled Positions	7%	8%	23%	44%

Builders N=30, HVAC N=41, Engineers/Consultants N=31, and Real Estate Developers/Property Managers N=8.

When asked if their companies hire for other types of skilled positions, respondents identified a number of specific jobs types as shown in Table 55. This table breaks out other skilled job types respondents offered, by company category.

Table 55. Other Skilled Positions Offered, by Company Category*

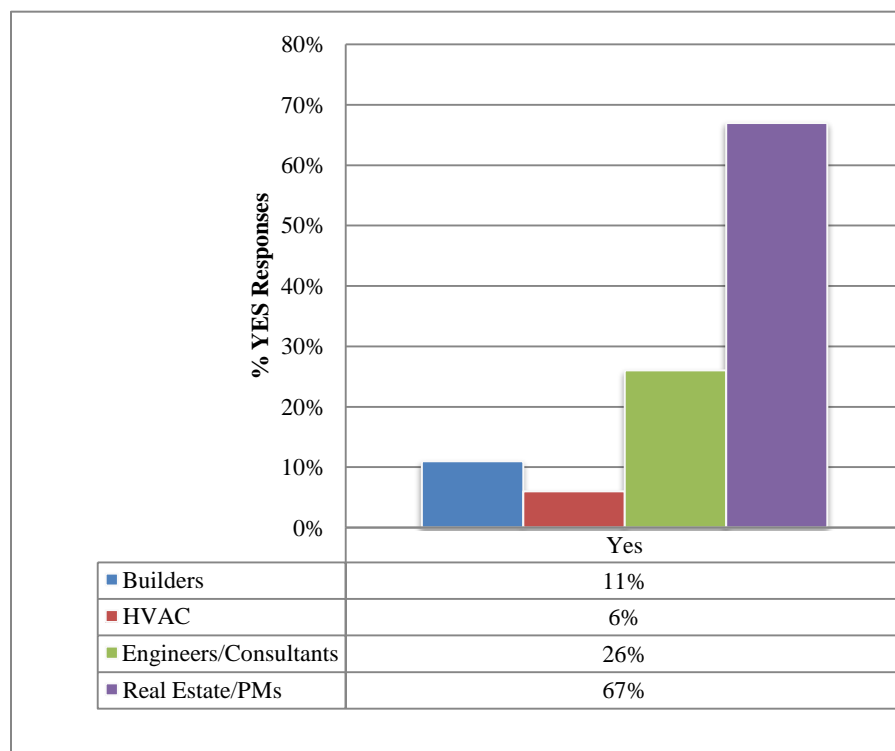
Builders
Administration
Masons and waterproofers
Real estate skilled positions
Plumber
HVAC
Controllers
HVAC
Once in a while I'll hire a mason for concrete, brick and stone; also septic tank people
Engineers/Consultants
Designers, project managers, drafters, and cad operators
Drivers, debris removing and recycling
Energy molders computer
Environment remediation
Financial Modeling
Lighting design
Specialty Design Engineers And Implantation Engineers
Real Estate
Construction Project Management, engineers and consultants
Engineers
Engineers, Urban Development Specialists
Financial Analysts, engineers, construction project managers
HVAC, LEED Auditors/inspectors
LEED Inspectors
Project managers, legal staff

*Verbatim responses of survey respondents

5.1.1.3 Energy Efficiency-Specific Hiring Practices

Respondents were asked if, in the last 12 months, their company has hired any new employees for one or more energy efficiency positions. As shown in Figure 29, 26% of engineering/consulting firms, 11% of building firms, and 6% of HVAC firms responded “yes” that they have hired new employees for one or more energy efficiency positions. In addition, from the limited and targeted sample of Real Estate Development and Property Management respondents, 67% said “yes”.

Figure 29. New Employees Hired for Energy Efficiency Positions



Builders N=42, HVAC N=44, Engineers/Consultants N=48, and Real Estate Developers/Property Managers N=9.

When asked what their primary sources were for finding these new employees, as shown in Table 56, word of mouth was the most popular source for Builders and HVAC Contractors (62% and 61% respectively), followed by ads/postings as the most common sources for Engineers/Consultants and Real Estate Developers/Property Managers (at 44% each).

Table 56. Sources for Finding New Employees

Sources	Builders	HVAC	Engineers/Consultants	Real Estate/PMs
Word of Mouth	62%	61%	34%	0%
Ads/postings	27%	39%	44%	44%
Referrals	24%	0%	5%	0%
Recruiters/Staffing Agencies	5%	0%	34%	0%
Other	5%	39%	18%	44%

Builders N=5, HVAC N=3, Engineers/Consultants N=13, and Real Estate Developers/Property Managers N=6.

Respondents noted a number of other sources their companies use to find new employees. These sources as shown in Table 57 by company type and include: web postings, internships and unions.

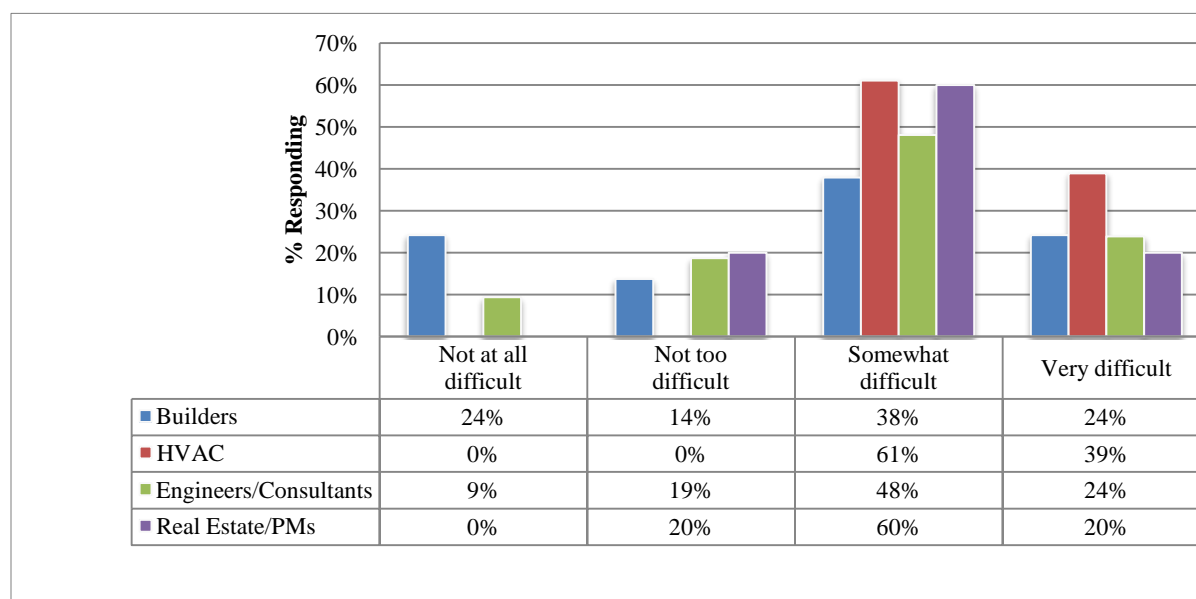
Table 57. Verbatim Responses for Other Sources for Finding New Employees*

Builders
We post on the web, we recruit through professional organizations, recruit agencies, state job bank, and female minority sub contractors
HVAC
Craig's List, Trade Schools, and call-ins
Engineers/Consultants
Internal
The union-we are a union shop
Word of mouth, previous interns
Real Estate
Ads on company website and Monster.com
Company sponsored Internship program, hired 7 from this past year
Company website, and in-house internships for college and graduate students
Job postings on company website
Union fills the positions
Websites; company site, Indeed.com & Facebook

*Verbatim responses of survey respondents.

Respondents whose companies hired employees for new energy efficiency positions within the last 12 months were asked how difficult it was to find those new employees. As shown in Figure 30, either all or a large percent of respondents in each industry cluster said it was either “somewhat difficult” or “very difficult” (100% of HVAC respondents, 80% of Real Estate Developers/Property Managers, 72% of Engineers/Consultants, and 62% of Builders). Facilitating networking between training organizations and hiring companies could ease this difficulty of finding skilled workers.

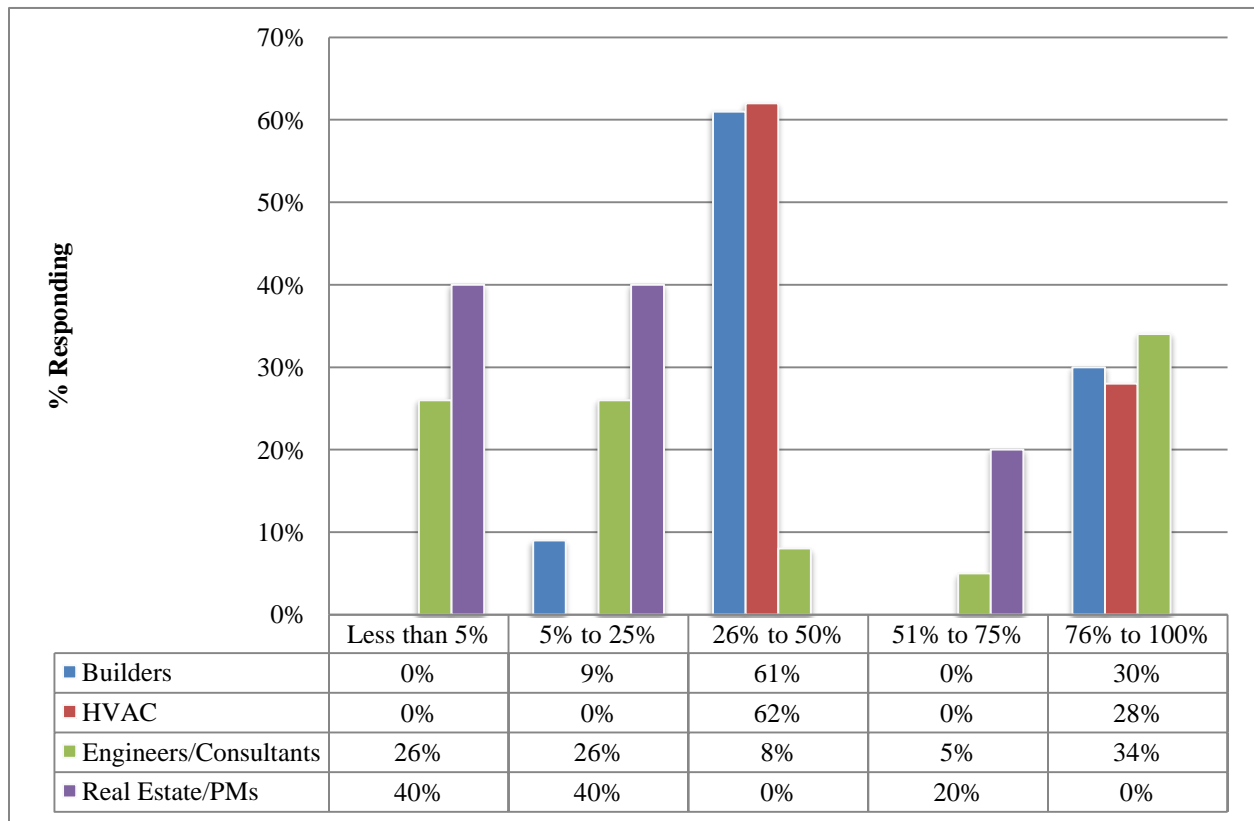
Figure 30. Difficulty Finding New Energy Efficiency-Skilled Employees



Builders N=5, HVAC N=3, Engineers/Consultants N=13, and Real Estate Developers/Property Managers N=5.

Respondents whose companies hired employees for energy efficiency positions within the last 12 months were asked to estimate the percentage of these entry-level (unskilled) and skilled employees that need additional training or skills development in order to perform their duties to acceptable, professional or industry standards. Figure 31 shows a majority of respondents believe that less than half their entry level (unskilled) employees in energy efficiency-related positions need additional training (80% of Real Estate Developers/Property Managers, 70% of Builders, 62% HVAC and 60% of Engineers/Consultants). However, 30% of Builder and 28% of HVAC respondents estimated that between 76% to 100% of these employees need such training, along with 34% of entry level Engineers and Consultants. This could indicate that a demand exists for additional training for entry-level energy efficiency job skills development.

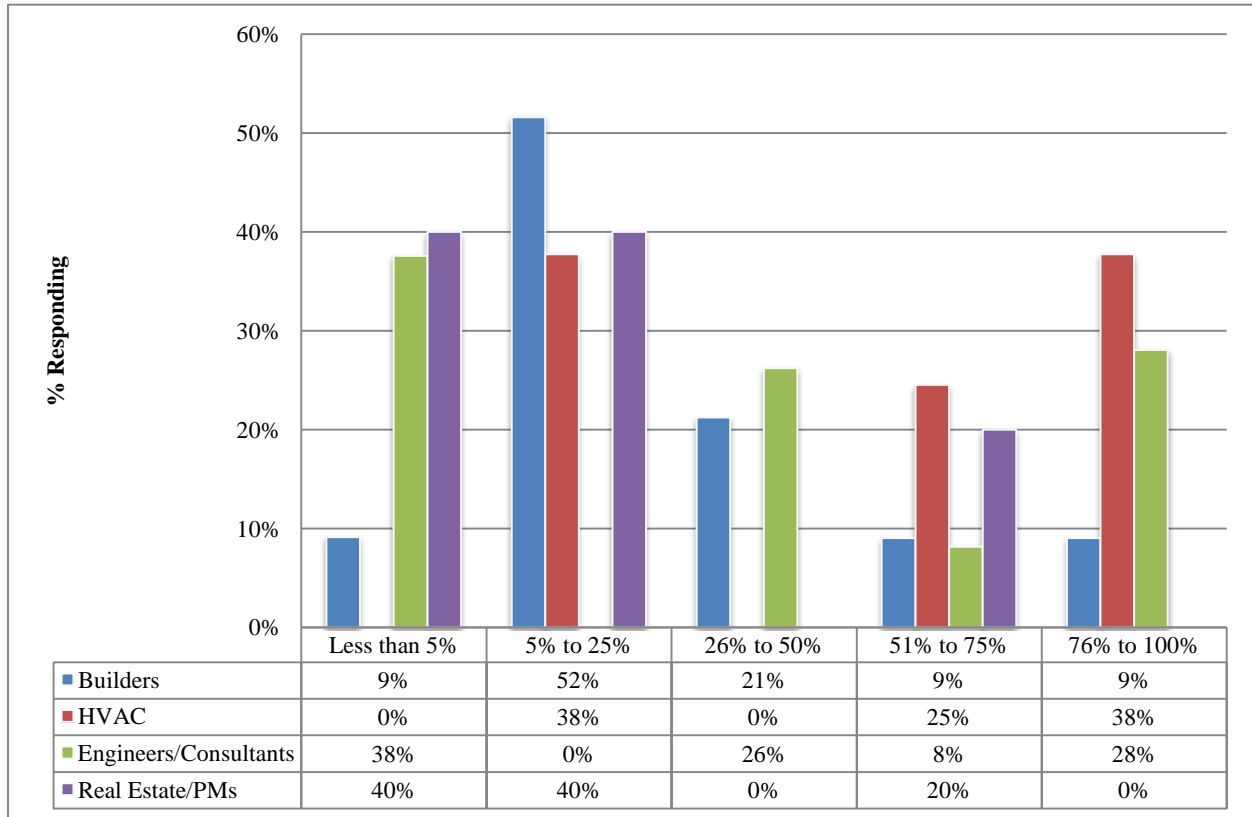
Figure 31. Percent of Unskilled Employees In Need Of Additional Training



Builders N=5, HVAC N=3, Engineers/Consultants N=13, and Real Estate Developers/Property Managers N=5.

For skilled workers, Figure 32 also shows a large number of respondents believe that less than half their skilled employees in energy efficiency-related positions need additional training (82% of Builders, 80% of Real Estate Developers/Property Managers, 64% of Engineers/Consultants, and 38% of HVAC respondents). Interestingly, however, 63% of HVAC respondents estimate that more than half of their employees need such training, followed by 36% of Engineers/Consultants, 20% of Real Estate Developers/Property Managers, and 18% of Builders. This could indicate a demand exists for additional higher-level energy efficiency job skills training, especially among HVAC employees.

Figure 32. Percent of Skilled Employees In Need Of Additional Training

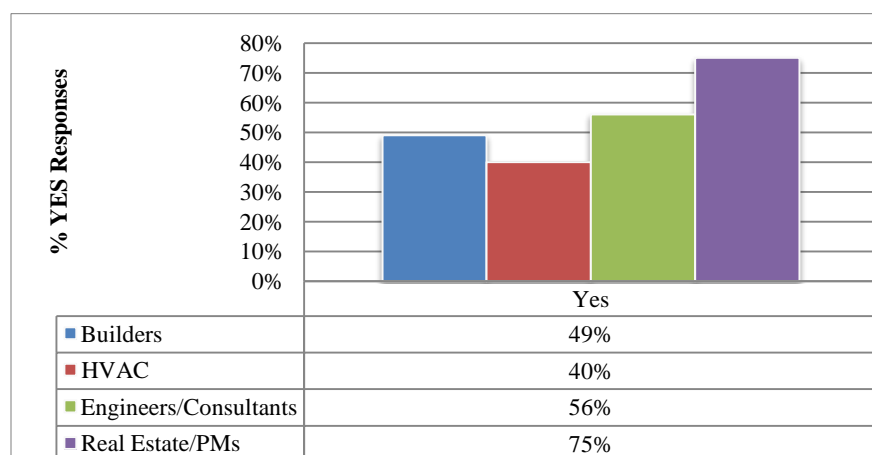


Builders N=5, HVAC N=3, Engineers/Consultants N=13, and Real Estate Developers/Property Managers N=5

5.1.1.4 Hiring Practices – Hard-to-Reach and Underserved Populations

Respondents were asked a number of questions regarding hiring and employment practices associated with hard-to-reach and underserved populations (previously defined). As shown in Figure 33, 75% of Real Estate Development and Property Management firms have hired from the hard-to-reach and underserved groups within the past two years. Similarly 56% of Engineering/Consulting firms, 49% of Builder and 40% of HVAC respondents noted hiring from these populations.

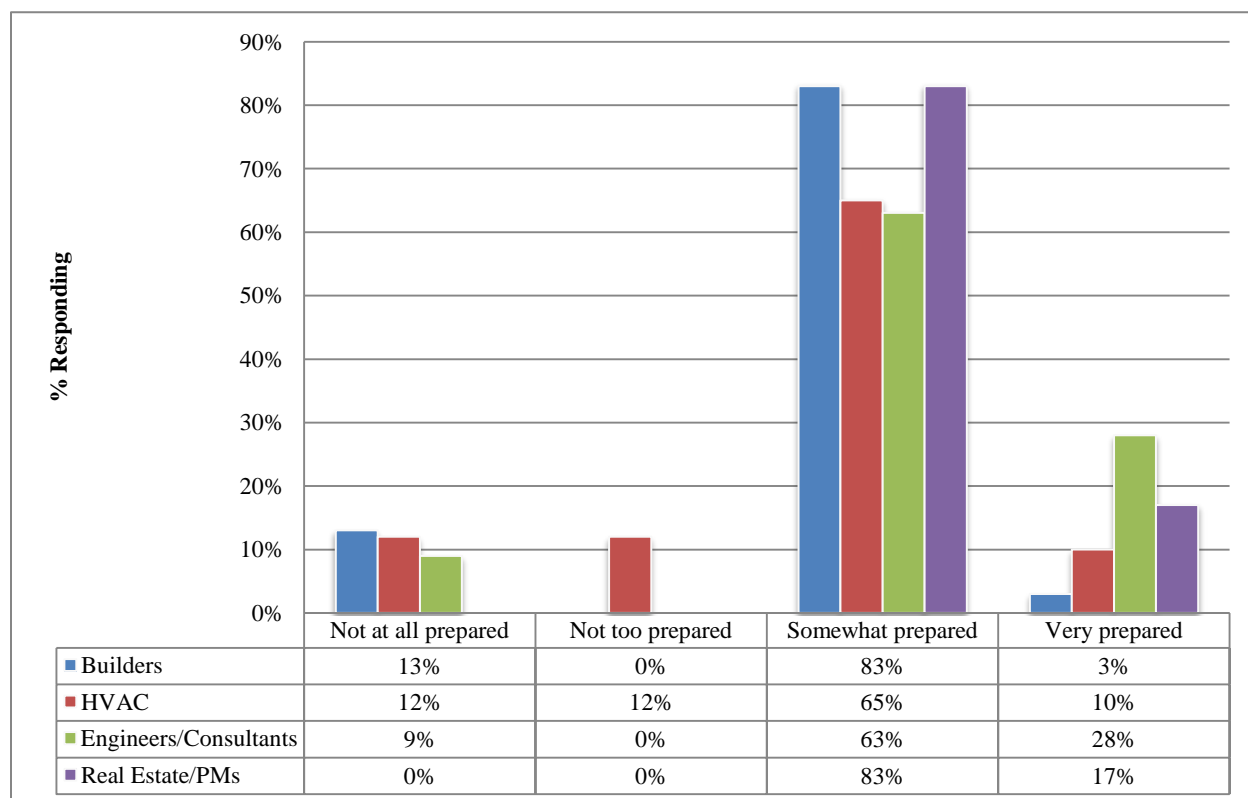
Figure 33. Hiring New Employees From Hard-to-Reach and Underserved Populations



Builders N=41, HVAC N=43, Engineers/Consultants N=47, and Real Estate Developers/Property Managers N=8

Of the respondents that noted hiring employees from these populations, an overwhelming percentage found these new hires either “somewhat prepared” or “very prepared” to enter and work in their hired positions. As shown in Figure 34, 100% of Real Estate Development and Property Management respondents answered in this manner, followed by Engineers/Consultants (91%), Builders (86%), and HVAC (75%).

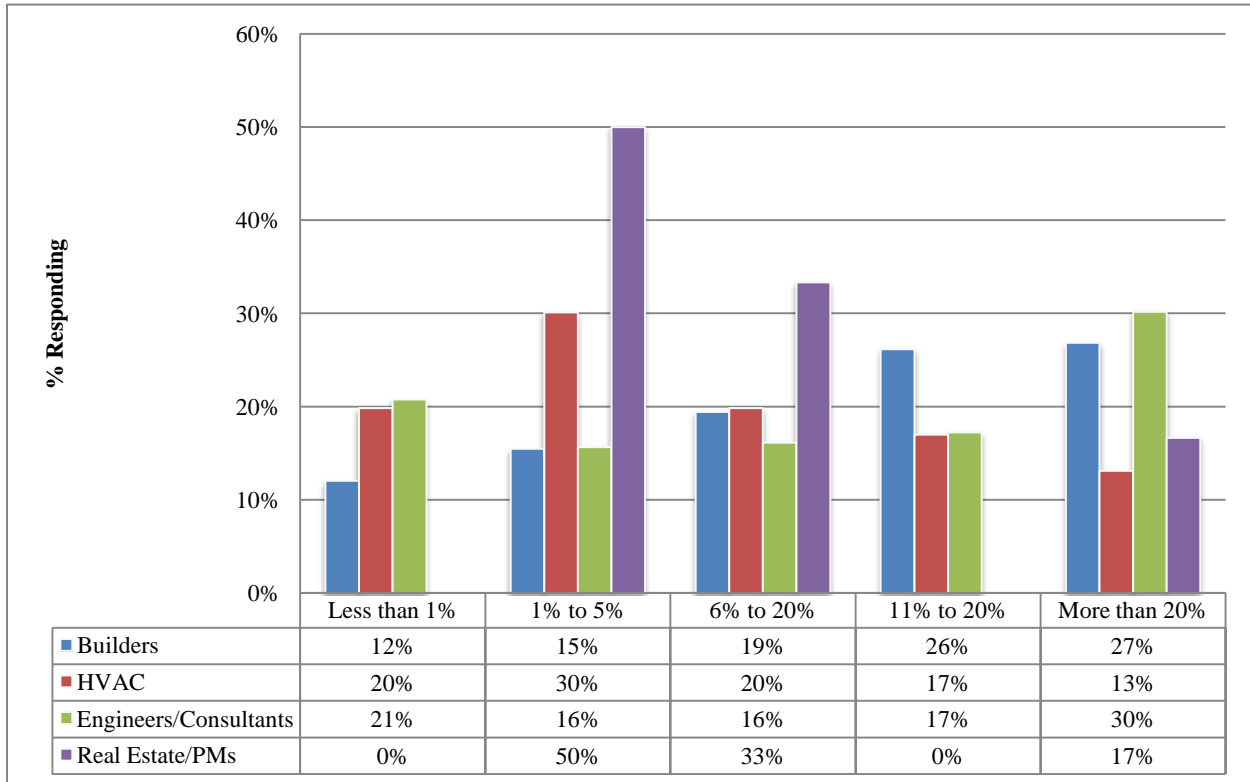
Figure 34. Preparedness of New Hires From Hard-to-Reach and Underserved Populations



Builders N=20, HVAC N=17, Engineers/Consultants N=25, and Real Estate Developers/Property Managers N=6.

When asked what percentage of their companies’ employees fell into one or more of these population groups, as shown in Figure 35, Engineers/Consultants had the higher percentage (with 30% of respondents saying that more than 20% of their employees were from these populations). This was followed by Builders (27%), Real Estate Developers/Property Managers (17%), and HVAC (13%).

Figure 35. Percent of Company Employees From Hard-to-Reach and Underserved Populations



Builders N=19, HVAC N=16, Engineers/Consultants N=23, and Real Estate Developers/Property Managers N=6.

5.1.2 General Awareness of Job-Skills Related Training

The level of awareness of various types of jobs skills training varied by employer type and could present an opportunity for more targeted outreach and support. Respondents were read a list of job skills training programs offered in New York State to assess and quantify individual awareness levels. As shown in Table 58 awareness of these types of programs is high, especially among Engineers/Consultants and Real Estate Developers/property Manager respondents, (where between 50% to 100% responded “Yes”). The lowest skills training area of awareness was for sector-based training (only 18% of HVAC and 20% of Builders noted awareness of this type of training).

Table 58. Awareness of New York Job Skills Training Programs

	Builders	HVAC	Engineers/ Consultants	Real Estate/ PMs
Worker Readiness Training	28%	41%	51%	89%
Vocational Training	49%	65%	77%	89%
Sector-Based Training	20%	18%	50%	100%
Advanced Technical Training	34%	69%	72%	100%
Training for Certification/Accreditation	36%	61%	69%	100%
Other Skills-Based Training Programs	22%	31%	39%	33%

Builders N=42, HVAC N=44, Engineers/Consultants N=48, and Real Estate Developers/Property Managers N=9.

A similar question was asked of respondents regarding internships, apprenticeships and other on-the-job training opportunities in the State. Table 59 shows fairly high levels of awareness for these general types of programs as well – ranging from 39% to 59% for HVAC Contractors, Builders and Engineers/Consultants, and 100% for Real Estate Developers and Property Managers.

Table 59. Awareness of Internship/Apprenticeship Programs

	Builders	HVAC	Engineers/ Consultants	Real Estate/PMs
Aware of: Field Training	40%	39%	44%	100%
Aware of: Internships and Apprenticeships	40%	54%	59%	100%
Aware of: Other Training Programs	17%	16%	10%	11%

Builders N=42, HVAC N=44, Engineers/Consultants N=48, and Real Estate Developers/Property Managers N=9.

Other types of training programs that respondents noted they were aware of included: unions, BOCES, vocational/tech, OSHA and low income youth programs.

5.1.3 Training Infrastructure Usage and Satisfaction

For each of the skills-based and on-the-job-based training programs respondents were asked to identify which ones their companies actually used. Additional questions were asked regarding their satisfaction levels and perceptions regarding the value of these programs, along with suggestions on how they might be improved.

Usage of New York’s Energy Efficiency Training Infrastructure

As shown in Table 60, except for the limited/targeted number of large Real Estate Developer/Property Management respondents (where responses ranged from 33 to 100% usage), usage levels of all types of training were quite low amongst Builders, HVAC and Engineer/Consulting respondents (ranging from 3% to 33%). Builders tended to be the group least likely to use such training programs, which could provide a targeted market actor audience for additional outreach and awareness efforts.

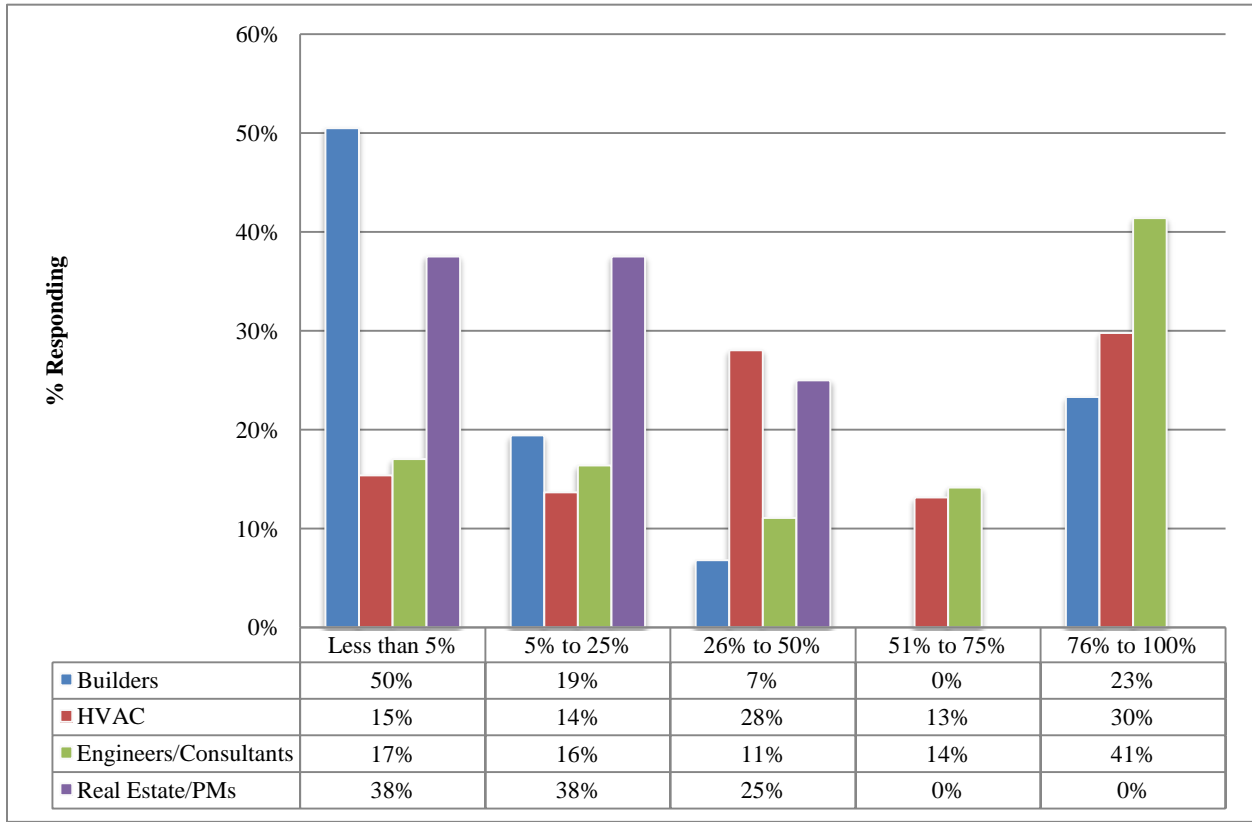
Table 60. Programs Used By Firms

	Builders	HVAC	Engineers/ Consultants	Real Estate/ PMs
Worker Readiness Training	8%	9%	4%	63%
Vocational Training	14%	26%	25%	33%
Sector-Based Training	20%	6%	21%	56%
Advanced Technical Training	3%	12%	27%	78%
Training for Certification/Accreditation	18%	17%	33%	89%
Field Training	9%	17%	14%	56%
Internships/Apprenticeships	4%	27%	28%	44%
Other Skills-Based Training Programs	17%	19%	26%	100%

Builders N=42, HVAC N=44, Engineers/Consultants N=48, and Real Estate Developers/Property Managers N=9.

In addition to asking if their companies used specific types of training (results summarized in the table above), respondents were also asked what percentage of their companies’ employees participated in one or more skills-based or on-the-job type training programs. For skills-based trainings, as shown in Figure 36, only the Engineers/Consultant respondents answered more than 50% (i.e., 14% said between 51% to 75%, and 41% said between 76% and 100% = 55% saying at least more than 50%). A majority of the other respondents said that less than half their employees had participated in these types of skills-based trainings (100% of Real Estate Developers/Property managers, 76% of Builders, and 57% of HVAC Contractors).

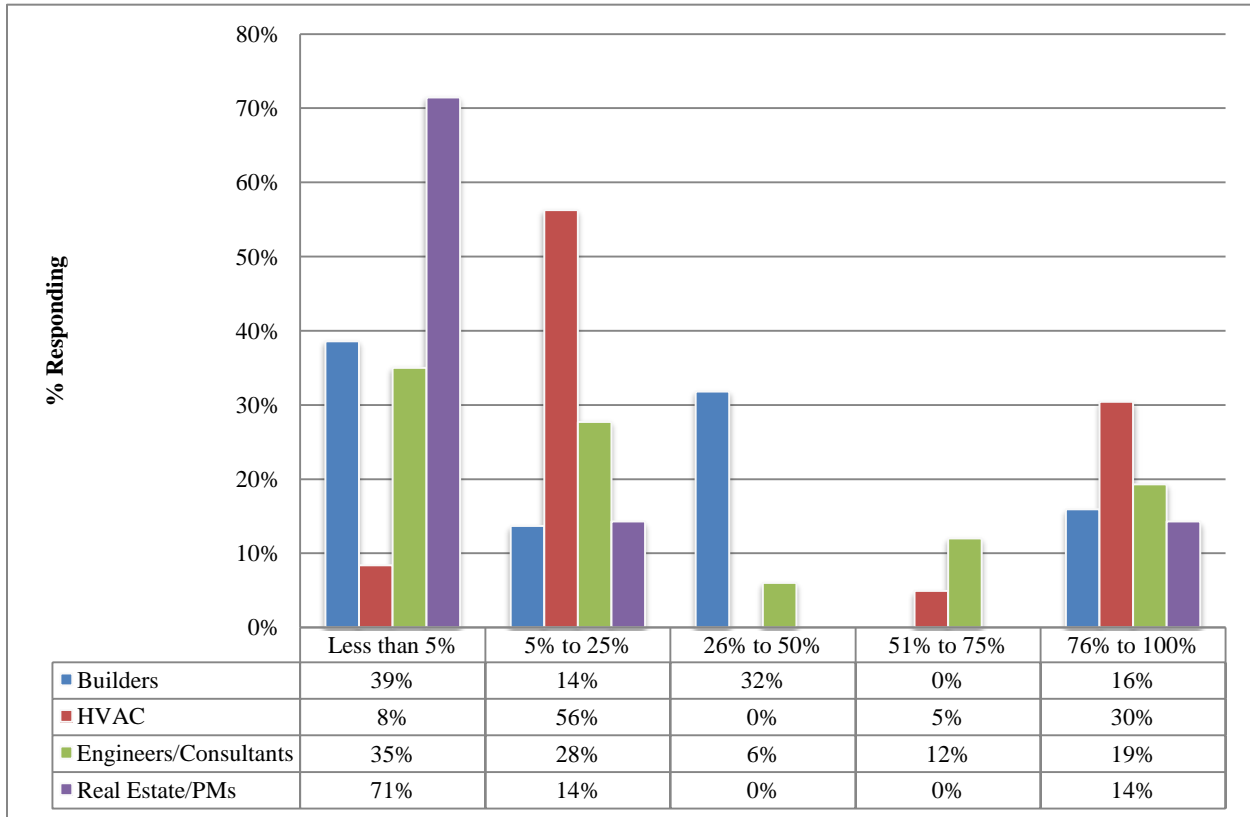
Figure 36. Percentage of Employees Participating in Skills-Based Training



Builders N=16, HVAC N=21, Engineers/Consultants N=28, and Real Estate Developers/Property Managers N=8.

As shown in Figure 37, similar low employee participation levels exist across all respondent companies for on-the-job training programs, where 85% of Builders and Real Estate Developers said that less than half their companies’ employees have participated in such trainings. Similarly, 69% of Engineers/Consultants and 64% of HVAC Contractor respondents report less than 50% employee participation. As shown earlier, a lack of awareness influences participation in skills and on-the-job based training programs. However, other reasons may also exist, and possibilities were probed in a subsequent question.

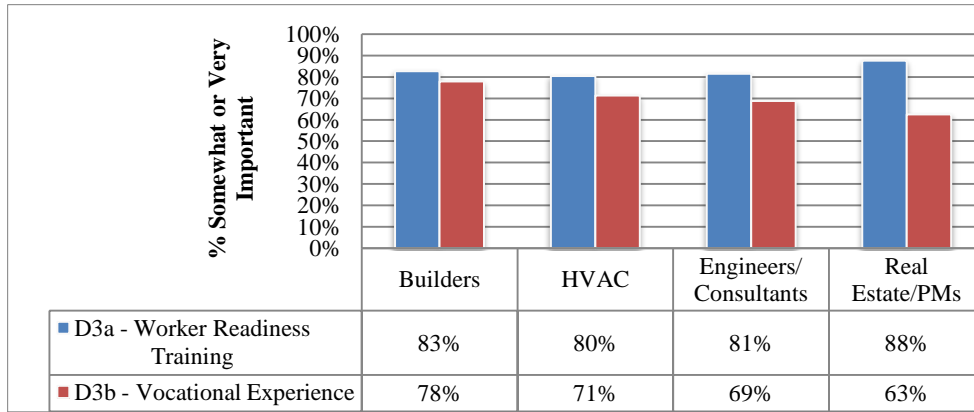
Figure 37. Percentage of Workforce in On-The-Job Training



Builders N=7, HVAC N=15, Engineers/Consultants N=18, and Real Estate Developers/Property Managers N=7.

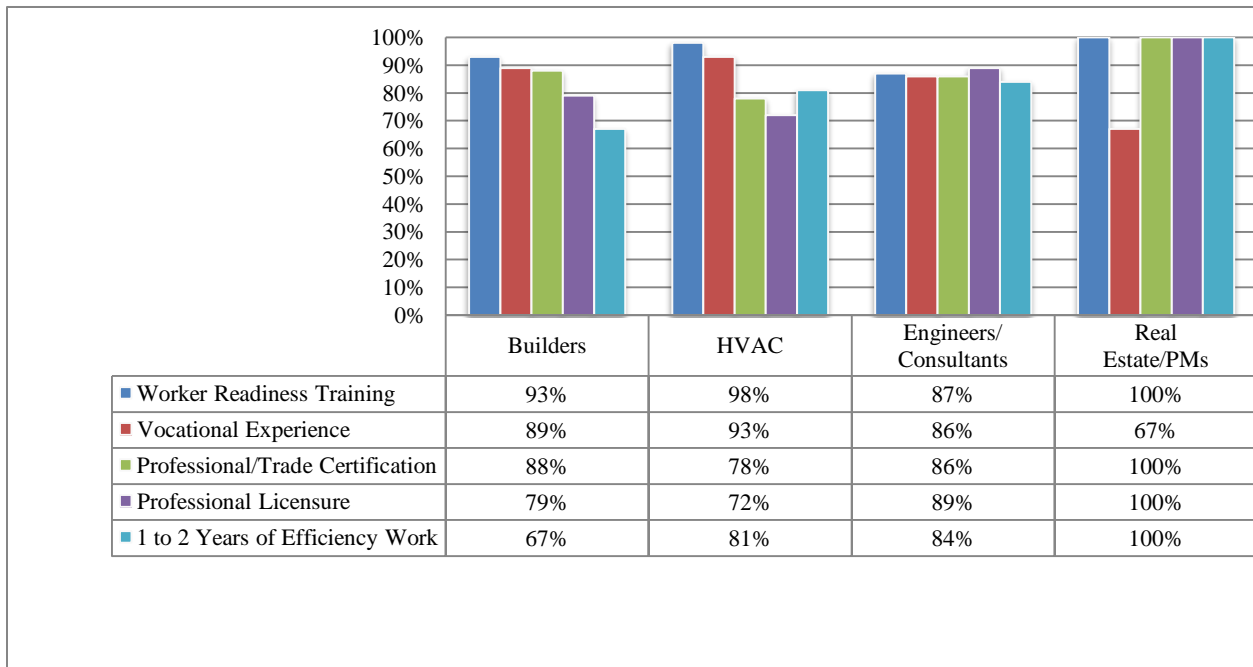
One reason for low training program participation could be lack of importance placed on such training by the employer. As shown in Figure 38 and Figure 39, for both unskilled (entry-level) and skilled (mid- to high-level) positions, sufficient training is an important factor that respondent companies consider when making their hiring decisions. Figure 38 shows that for unskilled jobs, between 63% and 83% of respondents believe that worker readiness training and some type of vocational (construction/trade) experience is important. Similarly, for skilled positions, Figure 39 shows that between 67% and 100% of respondents believe that worker readiness training, vocational experience, professional/trade certification, licensure, and at least 1 to 2 years of energy efficiency work experience is important. This indicates that there must be some other factor(s), beyond lack of importance that is resulting in low levels of participation in the State’s training programs among employers. Possible reasons for low levels of participation were explored and could include the lack of information about training opportunities, lack of financial aid and the perceived high cost of the training programs (the most frequent responses).

Figure 38. Important Factors When Hiring for Unskilled Positions



Builders N=7, HVAC N=15, Engineers/Consultants N=18, and Real Estate Developers/Property Managers N=7.

Figure 39. Percent Responses of Somewhat or Very Important Factors for Hiring Skilled Positions



Builders N=42, HVAC N=44, Engineers/Consultants N=48, and Real Estate Developers/Property Managers N=9.

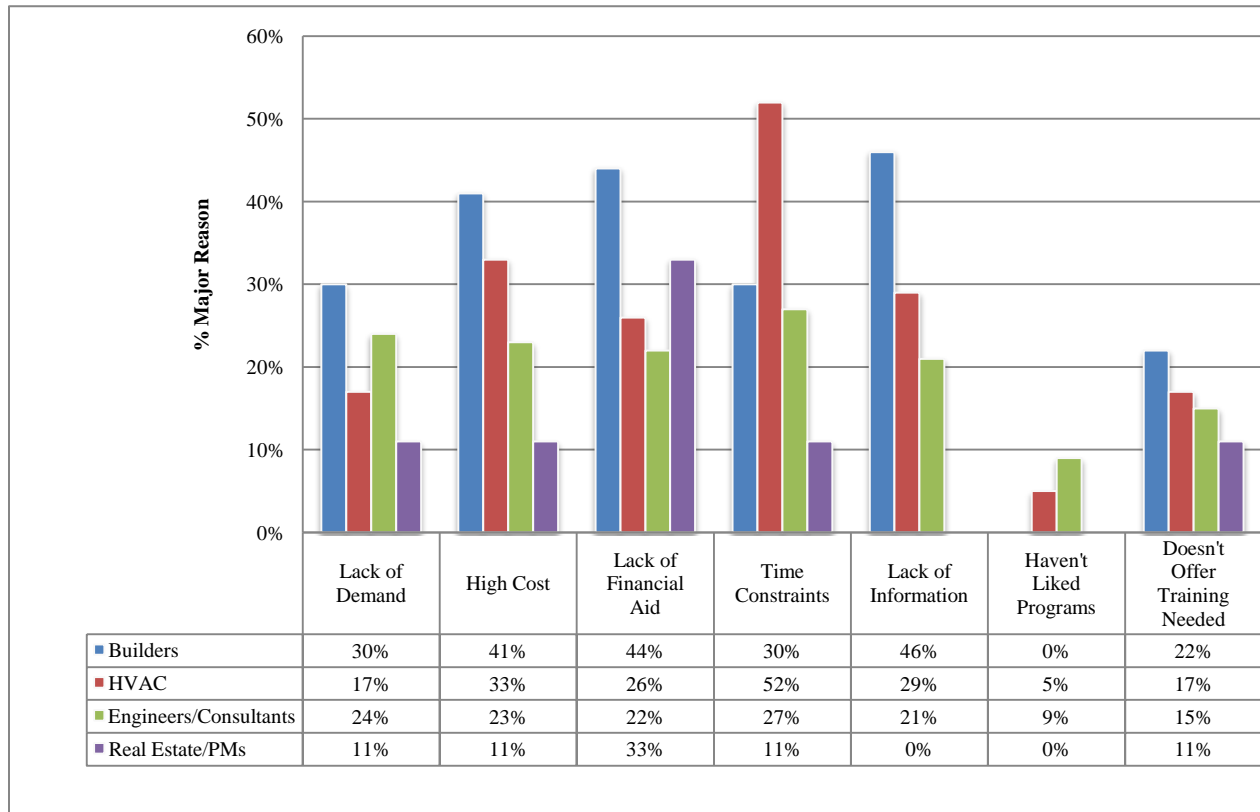
For Builders, as shown in Figure 40, the reason most often identified by respondents (46%) why more of their company’s employees do not participate in energy efficiency skills-related training programs is lack of information about the training opportunities. This reason is followed by lack of financial aid and the perceived high cost of the training programs (44% and 41% respectively). For HVAC Contractors, the top three reasons for limited employee participation are time constraints (52%), high cost (33%) and lack of information (29%). Among Engineers/Consultant respondents time constraints, lack of demand, and high costs are the highest rated reasons for non participation. (27%, 24% and 23% respectively). Finally, for Real Estate Developers and Property Managers, lack of financial aid was the highest rated reason (at 33%). Lack of demand, high cost, time constraints, and type of the training being sought was not

offered, are also identified as potential reasons by the Real Estate Developer/Property Management respondents at 11% each.

Others reasons employers don't send more employees to participate in energy efficiency skills-related training, offered by firms include; "lack of knowledge of programs available," "location of where training is held," "We hire people that come trained," "Time and money," and "Energy efficiency skills aren't required for some positions."

Targeting outreach efforts to each of the company types that these respondent groups represent, with messages that address their individual highest priority reasons for limited participation could help improve the uptake and effectiveness of these important training programs.

Figure 40. Major Reason More Employees Are Not Sent For Energy Efficiency Skills Training



Builders N=41, HVAC N=42, Engineers/Consultants N=40, and Real Estate Developers/Property Managers N=9.

5.1.3.1 Satisfaction with New York's Energy Efficiency Training Infrastructure

A number of satisfaction questions were asked of respondents that indicated their companies used either the skills-based, or on-the-job type energy efficiency training programs offered in New York State. In general, respondents overwhelmingly reported the trainings provided were very or somewhat valuable. Table 61 provides a breakdown of the respondents' satisfaction ratings by training program type. Since the number of respondents that participated in the various training programs was small, results are presented as weighted Ns (number of respondents) and not as percentage of respondents.

Table 61. Satisfaction Ratings by Training Program Type

Satisfaction with: Worker Readiness Training	Builders	HVAC	Engineers/Consultants	Real Estate/PMs
Not at all satisfied/Not too satisfied				
Somewhat satisfied	2	2	1	4
Very satisfied	1	2	1	1
TOTAL N=	3	4	2	5
Satisfaction with: Vocational Experience	Builders	HVAC	Engineers/Consultants	Real Estate/PMs
Not at all satisfied			1	
Not too satisfied	1		2	
Somewhat satisfied	3	4	7	3
Very satisfied		8	1	
TOTAL N=	4	12	11	3
Satisfaction with: Sector-Based Training	Builders	HVAC	Engineers/Consultants	Real Estate/PMs
Not at all satisfied/Not too satisfied				
Somewhat satisfied		1	5	4
Very satisfied		2	5	1
TOTAL N=	0	3	10	5
Satisfaction with: Advanced Technical Training	Builders	HVAC	Engineers/Consultants	Real Estate/PMs
Not too satisfied		1	1	
Somewhat satisfied			4	2
Very satisfied	1	4	6	5
TOTAL N=	1	5	11	7
Satisfaction with: Training for Certification/Accreditation	Builders	HVAC	Engineers/Consultants	Real Estate/PMs
Not too satisfied			3	
Somewhat satisfied	4	3	4	1
Very satisfied	3	4	7	8
TOTAL N=	7	7	14	9
Satisfaction with: Field Training	Builders	HVAC	Engineers/Consultants	Real Estate/PMs
Not too satisfied		1	1	
Somewhat satisfied	2	2	3	4
Very satisfied	1	5	2	1
TOTAL N=	3	8	6	5
Satisfaction with: Internships and Apprenticeship Programs	Builders	HVAC	Engineers/Consultants	Real Estate/PMs
Not too satisfied		1		
Somewhat satisfied	1	5	7	1
Very satisfied	1	5	4	3
TOTAL N=	2	11	11	4

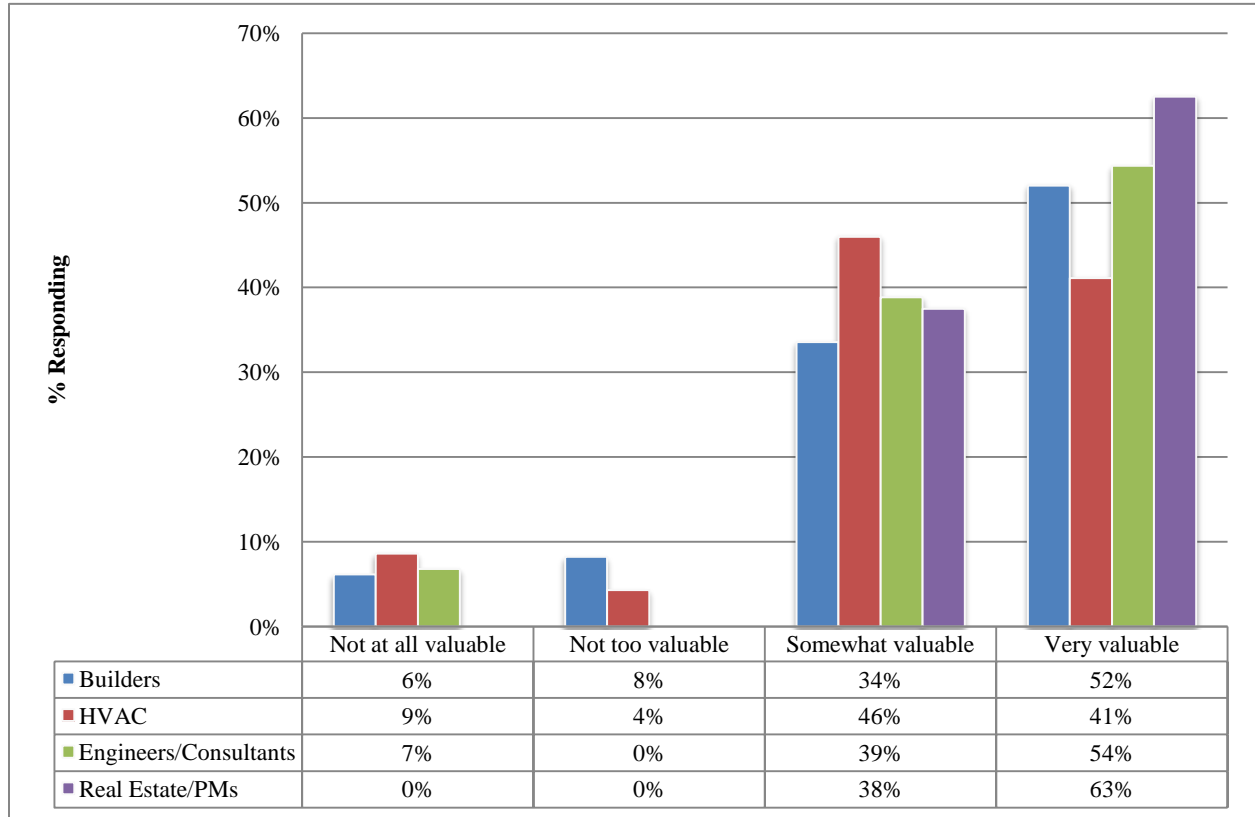
Respondents were asked what could be done to increase their satisfaction with these programs. Verbatim responses are listed in Table 62 below. Respondents interested in training request more frequency, online and funding options.

Table 62. Verbatim Responses on Ways to Increase Satisfaction

Builders
Availability time frame
Cost is high and too have more available
Just follow up the programs. EPA is very tough with the new but they are lax with supporting contractors to make sure that things are done right
Maybe they need to get more on-the-job training experience
More on-line courses
More training
Offer them more during the year for OSHA, I am very satisfied with NESPA we are seasonal they do it during the off season
People who want to work no one does - no desire
We haven't done any of these programs just aware of them
We really don't get involved with them too much. There are so many hoops to jump through and we have enough work. So we just stay out of it
HVAC
Absolutely nothing because of my age
Closed down and reopen with new programs because they are not teaching kids probably
I'd say if anything we don't care enough about them. We've been contacted in the past but it's infrequent
Just not enough people out there doing internships
More contractor input
More people in trade school, no one wants to get their hands dirty, cant find anyone who wants to work
Engineers/Consultants
Biggest disconnect: what state wants and what the city wants in terms of requirements where managers can seed dollars for building projects
More professional presentation capabilities and presentation training of the instructors
Needs to be more simple, the online program was too difficult to navigate and got frustrating
Not much really, because it's hit or miss with interns, one we had was great, the other not so much. Depends mainly on the individual temperament
Outreach afterwards. A place to borrow equipment
Real Estate/PMs
If there were more of them
Material be more current
Offer better computer and office skills training
Overall satisfied

When asked how valuable respondents thought their companies considered the training provided through these types of training programs, as shown in Figure 41, an overwhelming majority said either “somewhat” or “very valuable.”

Figure 41. Value of Training Programs



Builders N=18, HVAC N=24, Engineers/Consultants N=30, and Real Estate Developers/Property Managers N=8.

Suggestions offered by respondents to increase the value of the State’s energy efficiency- related training programs include; “make training hands on, specific and targeted”; “advertise training opportunities to increase awareness”; “subsidize the cost and incent companies to send employees for training”; “make more funds available”; “introduce this to unions in New York, because New York is a big union state”. Table 62 provides actual verbatim responses regarding ways to increase the value of New York’s energy efficiency training programs. Suggestions include increasing the end user demand, so customers will request energy efficiency products, and incorporating energy efficiency training at vocational and technical schools.

Table 63. Verbatims for Increasing Value of Training Programs

Builders
Get the banks to loosen up to work with small business to find out what we need to grow
I don't deal in the energy efficiency field so it doesn't apply
I think they need to have a demand for energy efficiency
Improve the practicality of using energy efficient would improve the demand
Make it more fun and enticing and more involved
Make more funds available. Also there's no licensing in this state so we're competing with people out of a garage. We just stopped bidding on them
NY is a big union state maybe introducing this to the union not just the companies
Raise the energy codes and it would stimulate more growth in our industry
Try and get more people to apply through unemployment
We would like to keep in contact by phone not internet
HVAC
Bring us more customers that want to pay for it
Efficiency upgrade rebates return, that did the best for my business
If I did hire I would send them to the manufacturer (seminar) on new equipment
If they would come out with a program where you had some unemployed person looking for a job and willing to train like in the old days and you work for a person and get a little bit of money-these are for big business/ not given to small businesses
More public awareness on the benefits of putting in more energy efficiency products
More time in the class room then the 6 months program
NYSERDA rebates
That's a hard question to answer. Training is very difficult for people in my business. If you don't learn it on your own you have to take time out of your day or week to increase your education. So, in other words, small businesses are out of luck
Too make the training more expectable to unskilled workers who do not speak English well or speak it as a second language
Training is horrible at the voc-tech level
Engineers/Consultants
Better enforcement of them and follow the code
Do a better job matching the companies that need the training with the schools that offer it
Have NYISO (New York Independent Systems Operator) sponsor more events
Having the jobs
Hire more firms like ours to do the training. We do some training for NYSERDA
Make the program funding contingent on participation in the program
More education in variable positions
Not everyone is college material they need to concentrate on increase knowledge support for voc-tech schools and training
Some state certification, with consistency. One unregulated class system now. Two classes could have different requirements, but both lead to the same certification
Amount of material taught in the time frame. If class takes 2 hrs, can't afford time wise to get ½ hrs worth of usable material
You're not going to like my answer -- let private industry handle it. I don't think the state should be involved in this
Real Estate
Classes should be ongoing
Training could be customized to the specific training need of the client

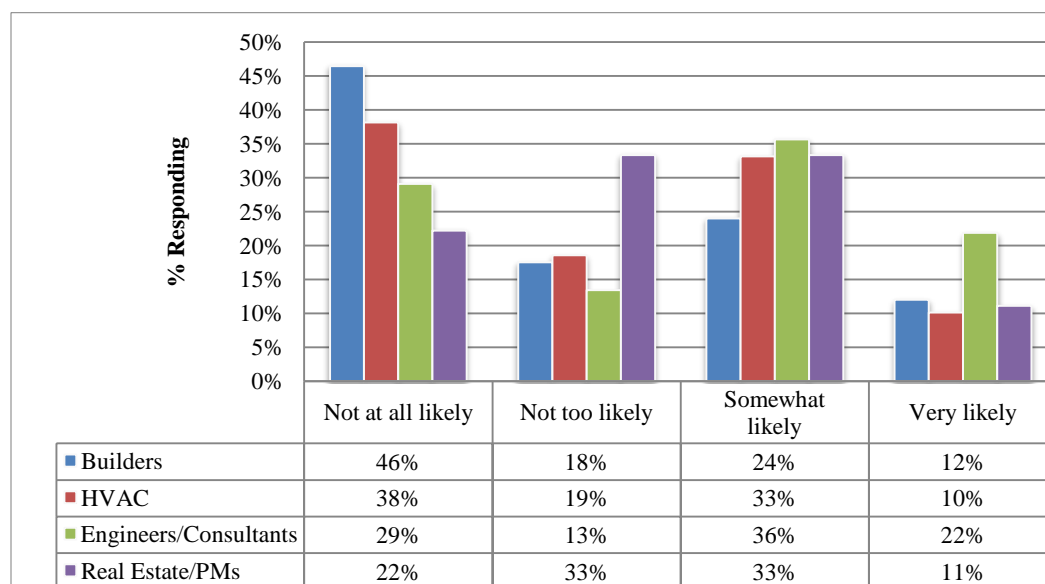
5.1.4 Energy Efficiency Employment Plans and Practices

In this section, responses to questions regarding energy efficiency job hiring plans and job areas are summarized.

5.1.4.1 Likelihood of Hiring New Energy Efficiency-Related Positions

Respondents were asked how likely their companies would hire more employees to fill energy efficiency-related positions in the next 12 months. According to responses, the short-term outlook for hiring more employees for energy efficiency related positions is limited. As shown in Figure 42, only Engineering/Consulting industry respondents indicated more than half (58%) of their companies are either somewhat or very likely to hire employees for energy efficiency related positions. Less than half of all other respondent groups answered this way (44% Real Estate Developer/Property Managers, 43% HVAC, and 36% of the Builders).

Figure 42. Likelihood of Hiring Employees for Energy Efficiency Positions in Next 12 Months



Builders N=41, HVAC N=43, Engineers/Consultants N=48, and Real Estate Developers/Property Managers N=9.

When asked in what job areas respondents thought their companies might be planning to increase their energy efficiency hiring, the top four job areas were HVAC Installation/Technicians (19 responses), Energy Conservation Consultant (9 responses), Installation, Maintenance and Repair (8 responses), and Skilled Commercial Construction (7 responses). Other job areas mentioned include energy conservation consulting, installation, maintenance and repair workers, skilled residential, plumbers, project managers, consultants, professional workers, skilled data analysts, skilled energy efficiency trainers, skilled lighting designers and energy auditors.

5.1.4.2 Barriers Preventing Companies from Hiring More Energy Efficiency Positions

As shown in Table 64, the most common barrier to hiring more energy efficiency-related employees (other than those that said that such positions were not applicable to their work), is money/costs (ranging from 13% to 25% across all respondent groups). Work flow (i.e., the current and near future demand for their services - uncertainty regarding the types and magnitude of projects that might be coming down the road) was also a commonly identified barrier (8% to 26%) across most respondent company types. For

Real Estate Developers and Property Managers, no demand or need was the most commonly identified barriers (44%). Other responses included: “We don’t hire individuals, we hire companies that have individuals” and “We don’t want to grow the company for tax reasons”.

Table 64. Barriers to Additional Hiring

Barriers to hiring more employees	Builders	HVAC	Engineers/Consultants	Real Estate/PMs
Work flow	26%	17%	8%	
Not applicable to their work	21%	0%	43%	22%
No demand or need	13%	11%	0%	44%
Money/costs	22%	25%	13%	22%
Small company	6%	17%	5%	0%
	N=27	N=25	N=20	N=9

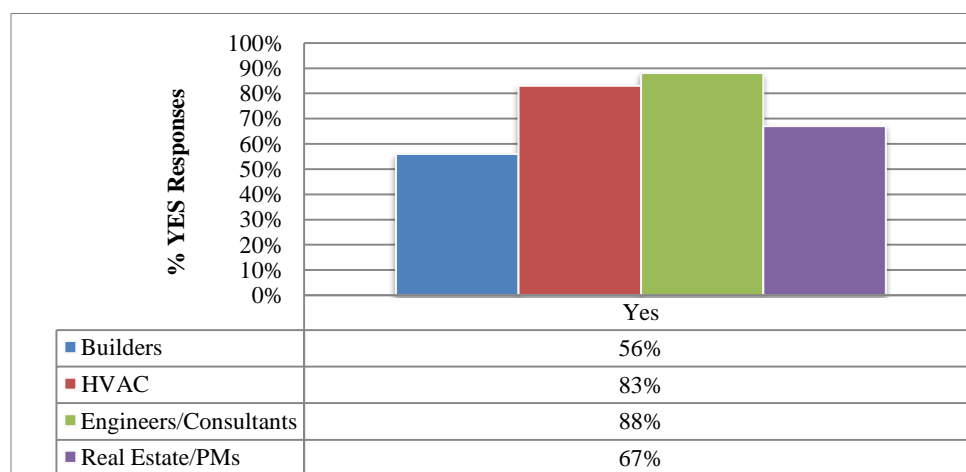
5.1.5 Awareness of NYSERDA and/or Broader Workforce Development Efforts

In this section, responses to questions regarding awareness of NYSERDA and their support for energy efficiency training and certifications, and other energy efficiency-focused training programs in New York State are summarized, along with associated satisfaction items.

5.1.5.1 Awareness of NYSERDA and its Energy Efficiency Training Efforts

Respondents were asked, before they participated in this evaluation project’s telephone survey, if they were aware of NYSERDA. As shown in Figure 43, awareness of NYSERDA is high, ranging from 56% for Builders to 88% for Engineers/Consultants. But there still remains room for additional outreach, especially among Builders and Real Estate Developers, where 44% and 33% respectively, are still largely unaware.

Figure 43. Awareness of NYSERDA Among Respondents

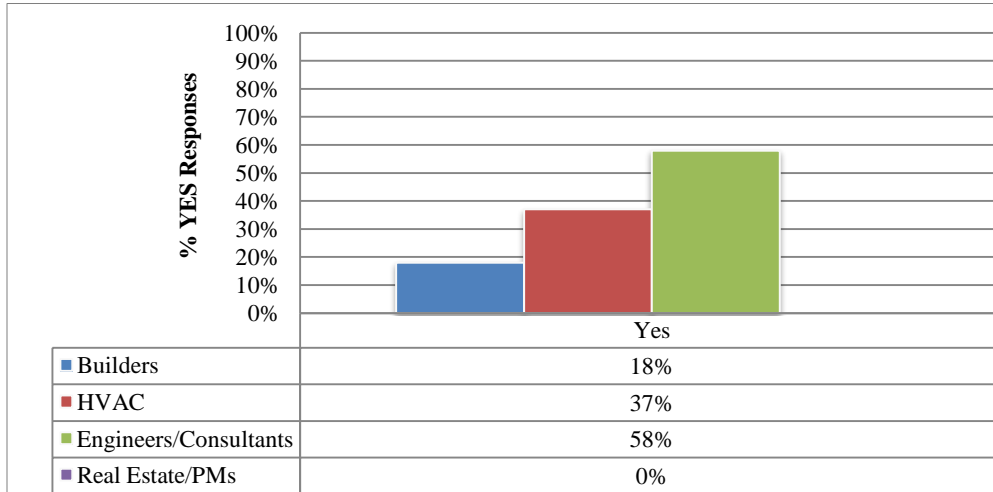


Builders N=42, HVAC N=44, Engineers/Consultants N=48, and Real Estate Developers/Property Managers N=9.

Respondents were also asked if they were aware (before the phone interview) that NYSERDA provides support for basic skills development through advanced-level energy efficiency training and certifications. As shown in Figure 44, awareness of these NYSERDA support efforts was substantially lower than their awareness of NYSERDA alone. This lower level of awareness should come as no surprise, since

NYSERDA’s support for training is mainly provided behind the scenes and would not necessarily be apparent to trainees or sponsoring companies. For Engineers/Consultants, only 58% of respondents reported awareness of the training efforts vs. 88% that were aware of NYSERDA in general. The drop off in awareness was even more dramatic for HVAC, Builders and Real Estate Developers/Property Managers (37%, 18% and 0% respectively vs. 83%, 56% and 67% general NYSERDA awareness). Although the lack of awareness among trainees and sponsoring companies is somewhat expected, if NYSERDA wishes to increase awareness among trainees and sponsors of their training support, additional outreach with information about NYSERDA’s efforts could be helpful.

Figure 44. Awareness of NYSERDA's Energy Efficiency Skills Training and Certification Programs



Builders N=42, HVAC N=44, Engineers/Consultants N=48, and Real Estate Developers/Property Managers N=9.

When asked how they heard about NYSERDA’s energy efficiency training support, as shown in Table 65, past participation in NYSERDA programs was the most frequent response (10), followed by networking (9) and NYSERDA’s web site (8). Other sources included: direct/live marketing, indirect marketing, internet ads, print ads, through one of the company’s employees who was a past Workforce Development Program participant, and from vendors and utilities. Although the number of aware respondents was small, this table can help identify potential outreach sources NYSERDA might use to ramp up awareness efforts.

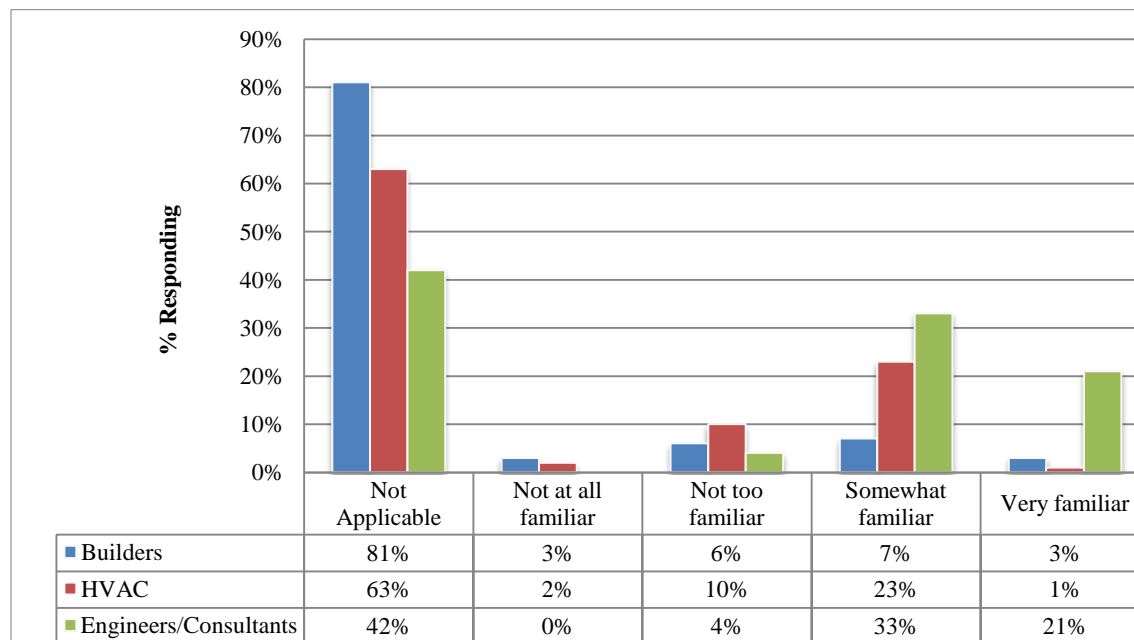
Table 65. Sources of Awareness Regarding NYSERDA’s Training Support Efforts*

How did you hear about NYSERDA's supported EE training programs?	Builders	HVAC	Engineers/Consultants	Total
Direct Live Marketing		2	4	6
Indirect Marketing		2		2
Internet Ads	1	2		3
Company Website	1	1	6	8
Print Ads		3		3
Networking	3	1	5	9
Past NYSERDA Participant	1	4	5	10
Employed Past WFD Participant	1			1
NYSERDA Energy Efficiency Training Program	1		5	6

* Since the number of aware respondents was small, results are presented as weighted N’s (number of respondents) and not as percentage of respondents.

To assess the degree of familiarity with NYSERDA’s energy efficiency training support, rather than just asking a yes/no-type question, respondents were also asked to rate their level of familiarity - from “not at all familiar,” to “very familiar”. As shown in Figure 45, the level of familiarity among those that were aware of NYSERDA’s training support is quite low with only 21% of Engineers/Consultant respondents saying they were “very familiar”. Familiarity is lower still for Builders and HVAC Contractors, at 3% and 1% respectively.

Figure 45. Familiarity with NYSERDA's Supported Energy Efficiency Training Efforts*



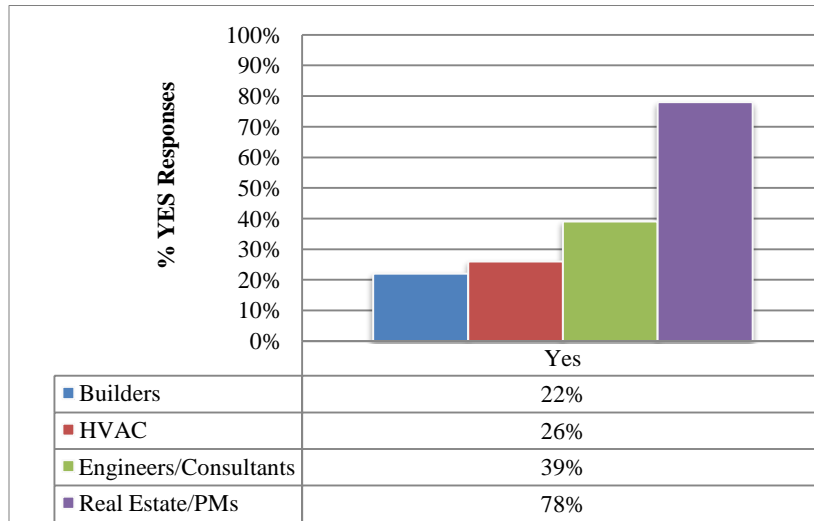
Builders N=42, HVAC N=44, and Engineers/Consultants N=48.

* To provide an accurate picture of how many people are aware of NYSERDA's training efforts, all respondents were represented in this figure (not just those that, in an earlier question said they were aware of NYSERDA). N/A means they did not have prior knowledge about NYSERDA.

5.1.5.2 Awareness of and Satisfaction with Non-NYSERDA Energy Efficiency Training Efforts

Except for the limited/targeted group of Real Estate Developer/Property Management respondents (78%), as shown in Figure 46, awareness of non-NYSERDA energy efficiency focused training programs in New York State is low. Consistent with awareness levels of NYSERDA-supported training efforts, 39% of Engineers/Consultants, 26% HVAC, and 22% for Builders where aware of other (non-NYSERDA) training programs where students can go to develop basic job skills or receive advanced skills training in the field of energy efficiency. Given that awareness of all energy efficiency skill training is low, NYSERDA could possibly achieve additional Program uptake through increased outreach.

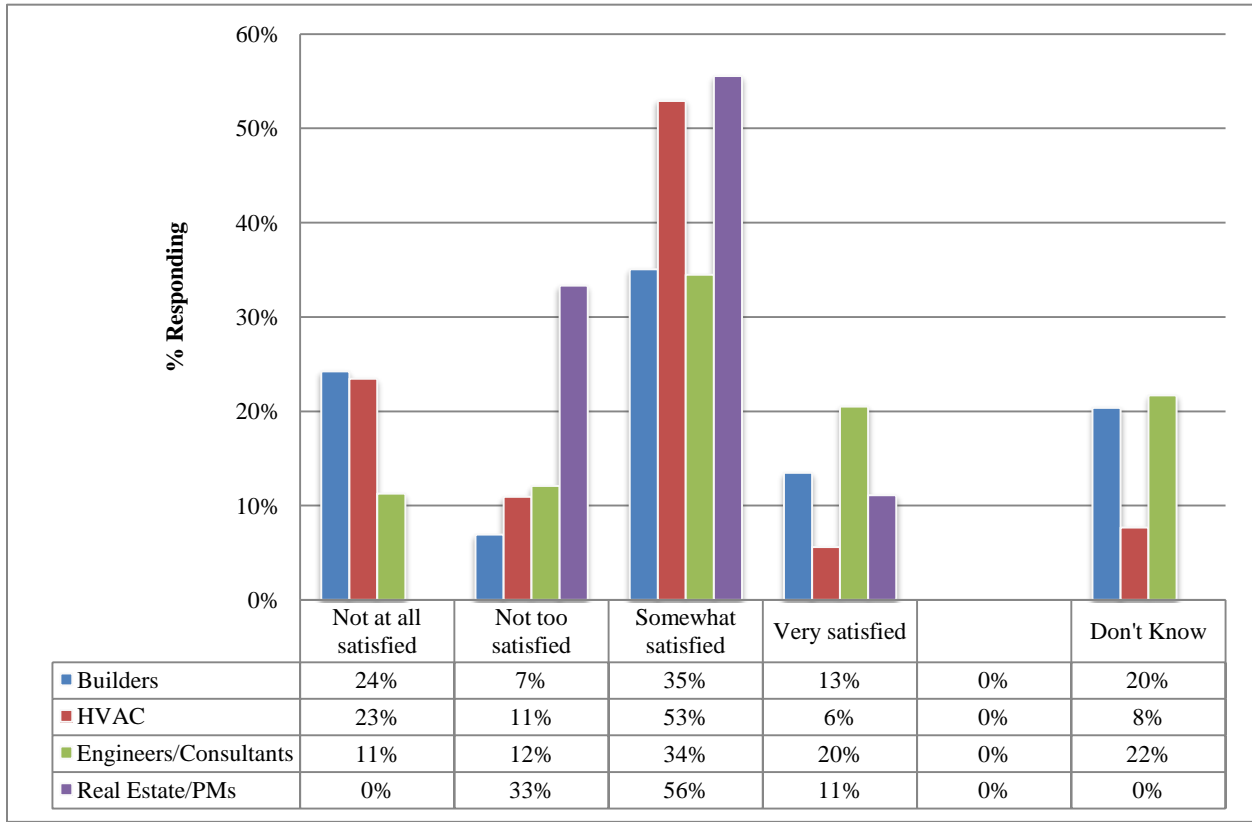
Figure 46. Knowledge of Non-NYSERDA Energy Efficiency Related Job Training Programs



Builders N=42, HVAC N=44 and Engineers/Consultants N=48 and Real Estate Developers/Property Managers N=9.

Respondents were asked to rate their level of satisfaction with the availability of conveniently accessible energy efficiency-related training programs in their company’s general geographic area. As shown in Figure 47, a majority of respondents noted that they were either “somewhat satisfied” or “very satisfied” (67% of Real Estate Developers/Property Managers, 59% of HVAC Contractors, 54% of Engineers/Consultants, and 48% of Builders). These responses suggest, however, that there remains substantial opportunity for improvement. Suggestions offered to improve satisfaction included: providing more information/awareness, offering more time slots and increasing availability, providing more local/accessible sites, and making training more affordable or increasing available funding. Additional verbatim response suggestions are provided in Table 66. Some of these suggestions only make sense if demand for training beyond existing schedules and locations truly exists.

Figure 47. Satisfaction with Availability of Training Programs in Geographical Area



Builders N=42, HVAC N=44, Engineers/Consultants N=48 and Real Estate Developers/Property Managers N=9.

Table 66. Ways to Increase Satisfaction with Training Locations*

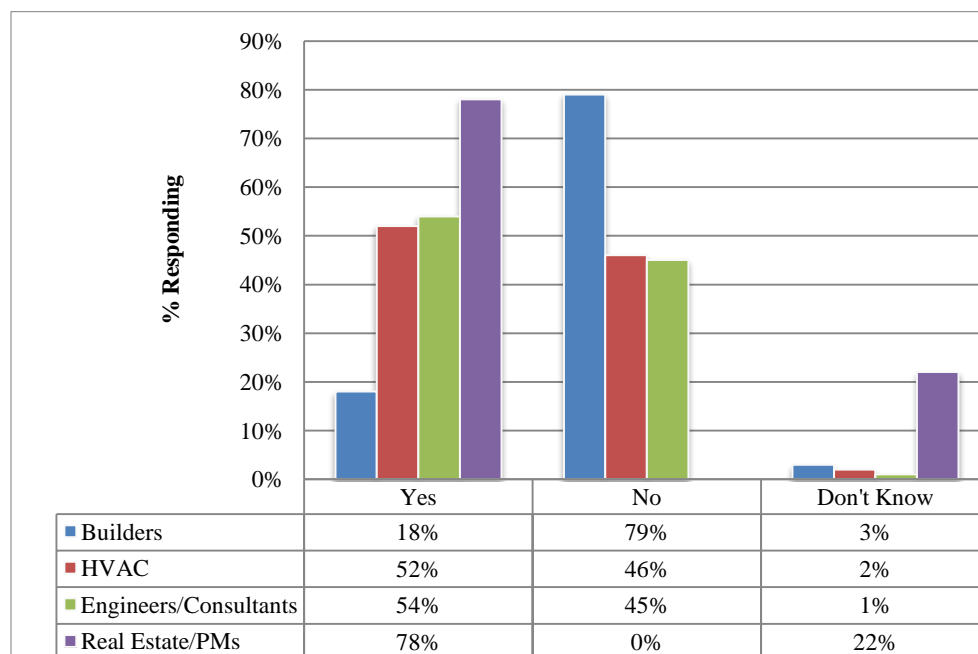
Builders
BOCES do training in our field but I have a lot of problems getting their students to come and work for us
Emails or notifications
Making info more available either trade magazines or e-mail
More need and exposure
Syracuse builders exchange provides training - contact them to offer programs and more people would know about - a bulletin every week
The only thing that would help would be if there was government funding and then be on a list where we get a chance to bid on these contracts
HVAC
Training should be done during the slow season depending
Engineers/Consultants
Explaining the locations. There's not an interest
Not applicable to our line of work
Not enough people that are persuading a career
NYSERDA makes it very difficult to follow the program
NYSERDA should be enlisting the expertise to teach those from companies like ours especially during a period of slow economic growth to fund the companies that are in that market to get them to do the training
We hire with knowledge base already
Real Estate
Have more training locations
Having more locations available would help
If classes were offered more often
If classes were readily available, ongoing, and a joint venture with utilities and the State

*Verbatim responses from survey respondents.

5.1.6 Participation in Other SBC-Funded Initiatives

In this final section of the employer telephone surveys, respondents were asked to identify any NYSERDA or New York State utility programs that their companies' work with relating to energy efficiency products or services. As shown in Figure 48, slightly more than half the HVAC Contractors (52%) and Engineers/Consultants (54%), and 78% of the Real Estate Developers/Property Managers reported having worked with NYSERDA or the other utilities on energy efficiency projects. Only 18% of the Builders interviewed said they had done so. This means there remains a substantial population of Builders (79%) and nearly half of the HVAC Contractors and Engineers/Consultants that have not availed themselves of NYSERDA or utility energy efficiency program support.

Figure 48. Participation in NYSEDA or Other Programs By Sector



Builders N=42, HVAC N=44, Engineers/Consultants N=48 and Real Estate Developers/Property Managers N=9.

When asked to identify the specific programs they participated in, Table 67 shows that most recalled Con Edison (11) or NYSEDA (9 FlexTech, 8 General and 4 Existing Facilities) initiatives.

Table 67. Program Participation Reported By Respondents

	Builders	HVAC	Engineers/ Consultants	Real Estate/ PMs	Total
Participation in: Con Edison (general)		4	7		11
Participation in: NYSEDA (general)	3		5		8
Participation in: National Grid (general)	2	3			5
Participation in: FlexTech		1	5	3	9
Participation in: Existing Facilities		1	3		4
Participation in: Central Hudson		2	1		3

Other verbatim responses are presented in Table 68.

Table 68. Program Participation Verbatims

Builders
Commercial project in Woodstock for NYSERDA; gave credits for certain HVAC units- Energy Credit Program
Energy Star, Geo thermal, Multi family program
NYSERDA solar panels
We work with Messina Electric but I'm not aware of what services they have
HVAC
Commercial and residential high efficiency sale of equipment, rebates for high efficiency motors and GEO-thermal and solar
Energy efficiency heating rebates, my husband does paperwork for that
Home Performance With Energy Star And Green Jobs, Green NY
National Fuel and NY State Electric and Gas and the affiliate of NY State Electric and Gas, Rochester Gas
New York Residential Upgrade programs, NYSACK, NYSID rebate programs
Rebates and tax credits thru the local fuel providers
RGE and NESEG, along with Federal Rebate Programs
Small businesses
The Energy Star, The ACCA And that's a whole other thing that I hadn't been involved with yet- we just became accredited
The National Grid Program, setting back thermostats incentives, and installing high efficiency heat equipment
The rebate for the high efficiency boilers and furnaces through Nation Grid. My customer's get the rebate and believe it or not that little rebate actually makes people switch to the higher efficiency units
Engineers/Consultants
Business Partners Program, Flextech, and Commercial Lighting Program
Central Hudson, O&rR, and ConEd
ConEd C&I program and NYSERDA Evaluation Services Program, ConEd C&I program. Converge Program
ConEd, almost every one applicable to our clients, TRC (Consulting firm)
Demand response in selling meters
Different PONs through the contractors
Empower, Flextech, new construction
Greens Program through NYSERDA
I don't know them by name ... Energy Star, Home Performance
Rebate programs for the utility companies Multi Family Performance and FlexTch
On 75 family or more. And less ConEd 75 family or more, and ConEd 75 family or less
PON 1746
Specific projects - Individual studies rather than programs
The Existing Facilities Program, helping people enroll in ICAP CR Program
Training through NYSERDA NYC Acre
Real Estate
Demand Response, Efficient Lighting, Flextech and others, can't remember the names
Energy Star Programs, MF Performance Program, Flextech, New Construction, Existing Facilities Program and Others
LEED, Energy Management, Efficient Lighting, Green Buildings

5.2 TRAINING ORGANIZATIONS

This section provides detailed results from the telephone surveys conducted with a sample of non-participating training organizations in New York¹⁶³. Results are reported on separately for training practices, trends and plans, trainee interest in energy efficiency, energy efficiency employment placement and opportunities for trainees, and awareness of NYSERDA and broader training infrastructure and associated workforce development efforts.

5.2.1 Firmographics and Training Practices

Following a series of firmographic questions, respondents were asked to identify skills and areas in which their organizations might offer training, along with an assessment of how often energy efficiency elements were included within their training materials. In addition, the survey asked questions regarding motivating factors driving new trainees to come and learn energy efficiency-related job skills. Results from these questions are summarized below, along with respondent-identified potential factors limiting respondent organization’s ability to maintain or expand energy efficiency-related training components, assessment of their organizations’ perceived importance of making energy efficiency-related training materials available for use, approaches used to promote their training programs, and the extent to which hard-to-reach and underserved populations are targeted and aware of their training programs. Finally, this section summarizes respondents’ opinions regarding sources and uses of financial aid for trainees.

5.2.1.1 Training Organization Firmographics

Forty-one training organizations participated in the telephone survey consisting of 28 entry-level and 13 mid- to high-level organizations. A majority of these organizations reported having only one single location (68% of entry-level and 60% of mid- to high-level training organizations). Of the organizations having more than one location, 30% of the entry-level respondents reported having 2 to 4 locations with none reporting having five or more, while 14% of the mid- to high-level organizations reported having 3 locations and the remainder (36%) reported having between 5 and 13 locations.

When asked approximately how many training classes¹⁶⁴ organizations offered across all their New York State locations during the past twelve months, as shown in Table 69, 40% of all entry-level respondents said less than 5, compared to 14% of mid- to high-level training organizations. The mid- to high-level respondents fell on the other side of the spectrum, with 26% reporting offering over 100 classes last year.

Table 69. Number of Training Classes Held In The Past Twelve Months

	Entry-Level	Mid/High
Less than 5	40%	14%
Between 5 and 20	28%	21%
21 to 50	13%	24%
51 to 100	5%	14%
Over 100	14%	26%

¹⁶³ This report defines non-participating as training organizations that were not partners in NYSERDA’s Workforce Development Program at the time the surveys were fielded.

¹⁶⁴ Training classes refers to the number of individual classes offered. Information regarding the number of modules that may be included in each class was not part of this question.

When asked to estimate the number of job placements made by their organizations statewide over the past 12 months, as shown in Table 70, 40% of all entry-level and 43% of mid- to high-level respondents said less than five trainees were placed in jobs. On the high end, over 100 job placements in the past 12 months were reported by 18% of both entry- and mid- to high-level respondents. Additionally, respondents were asked to estimate how many of these job placements were in energy efficiency-related positions. As shown in Table 71, more of the mid- to high-level training organizations reported placing trainees in energy efficiency-related jobs than did entry-level organizations. One interpretation of this data is that there are more energy efficiency job opportunities for mid- to high-level skilled employees. Another could point to a need for additional outreach among the entry-level organizations to increase awareness of the value and need for energy efficiency-related training components to be incorporated into their current skills development activities.

Table 70. Number of Job Placements In The Past Twelve Months

Placements	Entry-Level	Mid/High
Less than 5	40%	43%
Between 5 and 20	24%	11%
21 to 50	13%	0%
51 to 100	5%	29%
Over 100	18%	18%

Table 71. Number of Job Placements in Energy Efficiency Positions

Placements	Entry-Level	Mid/High
Less than 5	41%	16%
Between 5 and 20	43%	42%
21 to 50	16%	16%
Over 50	0%	26%

5.2.1.2 Skills and Areas of Training Offered

Respondents were asked to identify the types of skills and topic areas that their organizations offer training in. Although somewhat counterintuitive, as shown in Table 72, respondents from both entry-level and mid- to high-level training organizations noted offering training in areas ranging from worker readiness to advanced technical training. The top four offerings among entry-level training respondents were worker readiness (90%), certification/accreditation (83%), sector training (78%) and vocational/technical skills (76%). For mid- to high-level training organizations, 100% offered certification/accreditation training, 93% offered sector training, and 82% offered advanced technical and vocational/technical skills training.

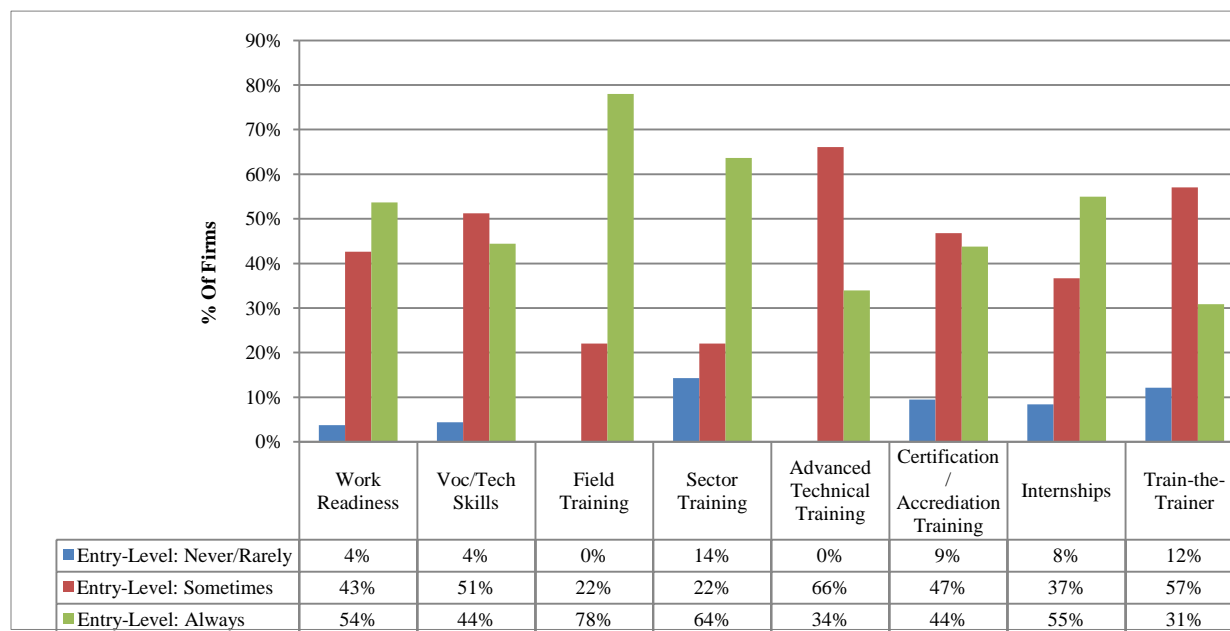
Table 72. Skills and Areas of Training Offered

Skills	Entry-Level	Mid/High
Work Readiness	90%	73%
Voc/Tech Skills	76%	82%
Field Training	69%	69%
Sector Training	78%	93%
Advanced Technical Training	49%	82%
Certification/ Accreditation Training	83%	100%
Internships	40%	47%
Train-the-Trainer	32%	80%

Entry Level N=28, Mid/High N=14, Total N=42.

For each type of training offered, respondents were asked how often they included energy efficiency elements within their training materials. As shown in Figure 49, a majority of entry-level training organizations stated that their materials either “sometimes” or “always” include energy efficiency elements. This is most prevalent with field training and sector training (where 78% and 64% believe these elements are “always” included). However, there remains a large percentage, across all entry-level training types, in which energy efficiency elements are lacking.

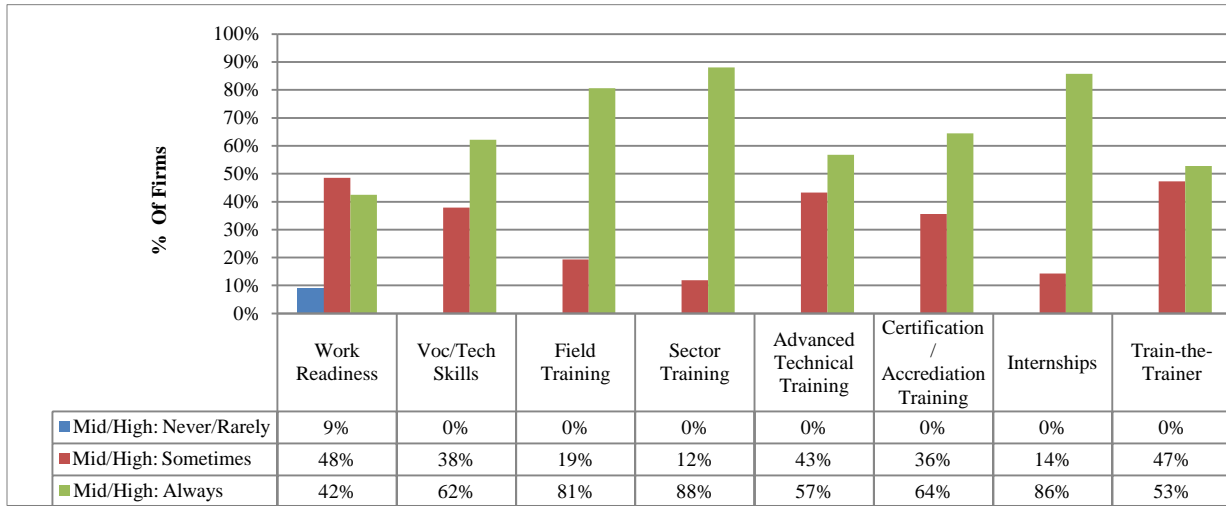
Figure 49. Entry-Level Training Incorporating Energy Efficiency Elements



N varies by question from 9 to 25.

For mid- to high-level training organizations, as shown in Figure 50, nearly 100% of respondents report that energy efficiency elements are either “always” or “sometimes” incorporated within training activities. One exception is with worker readiness training, where respondents stated only 42% “always” and 48% “sometimes” include energy efficiency elements (and just under 10% “never” include such elements).

Figure 50. Mid- to High-Level Training Including Energy Efficiency Elements



N varies by question from 18 to 35.

Based on these results (Figure 49 and Figure 50), it appears that a greater opportunity exists to work with entry-level training organizations, than with mid- to high-level organizations to explain the value and need for incorporating energy efficiency elements into their training materials. However, a closer look at the actual materials being incorporated into the higher level training activities might reveal a need of outreach to this mid- to high-level group as well.

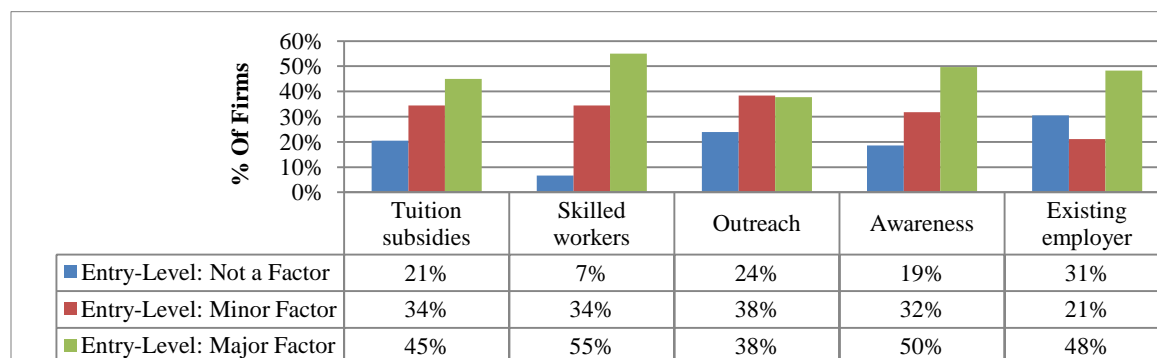
5.2.1.3 Potential Factors Motivating New Trainees to Learn Energy Efficiency Job Skills

Entry-level training organization respondents were asked to identify potential factors that may be motivating or driving new trainees to come to learn energy efficiency-related job skills. As shown in Figure 51, the top three motivators noted were: 1) a perceived need for more skilled workers for energy efficiency jobs (labeled as “Skilled workers” in the following tables) in New York State (55%), 2) a general increased awareness and demand for energy efficient products and services (50%), and 3) employers request that an existing employee take training (48%).

As shown in Figure 52, the top three motivators noted by mid- to high-level training organization respondents were: 1) employers request that an existing employee take training (89%), 2) a general increased awareness and demand for energy efficient products and services (82%), and 3) a perceived need for more skilled workers for energy efficiency jobs in New York State (73%). Availability of training/tuition subsidies is mentioned as a major motivator by 51% of respondents.

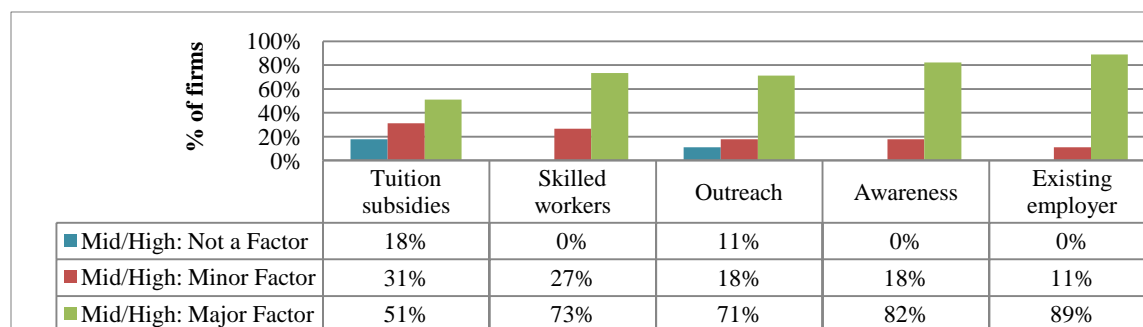
Other reasons, noted as verbatim by both entry-level and mid- to high-level training organization respondents included: “finding employment” or “increasing employment opportunities,” and “changing careers” or “increasing job skills”.

Figure 51. Factors Driving Trainees to Enroll in Training – Entry-Level



Entry Level, N=28.

Figure 52. Factors Driving Trainees to Training – Mid- to High-Level



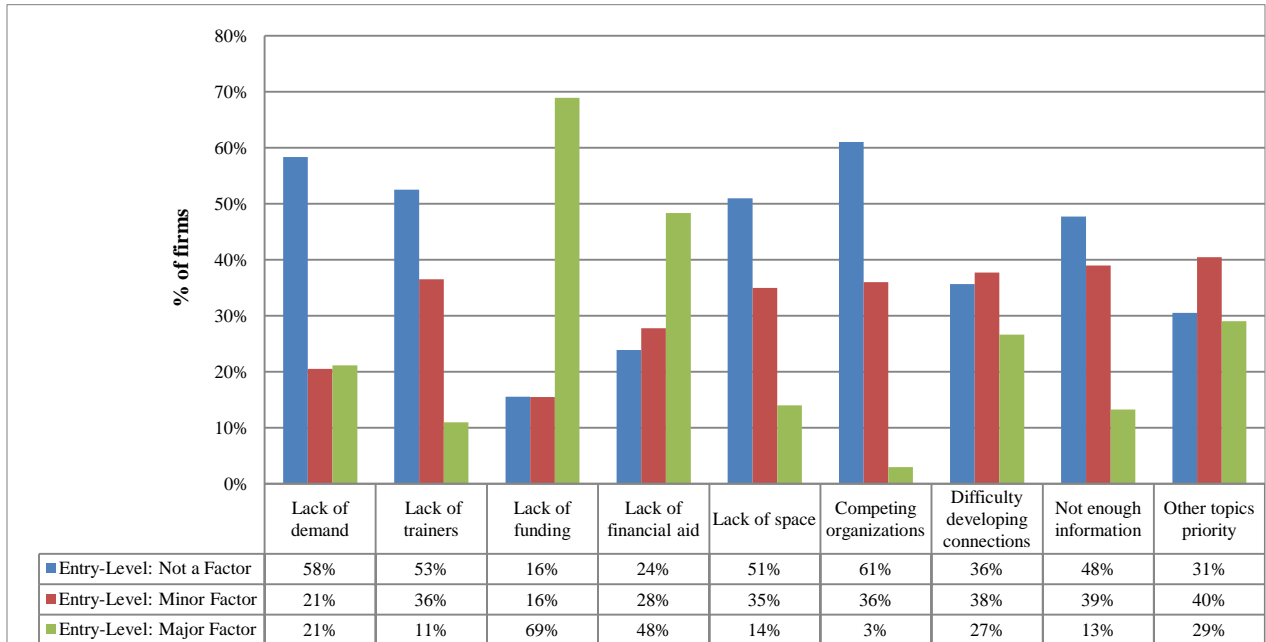
Mid- to High-Level, N=14.

When asked which of the major factors mentioned above is the single most important reason new trainees may be interested in learning energy efficiency related skills, entry-level skill training organization respondents stated “existing employers asked them to take the training”. Mid- to high-level respondents noted “the availability of training or tuition subsidies,” which appears consistent with one of NYSERDA’s Workforce Development Program goals for continuing subsidies.

5.2.1.4 Factors Limiting Organizations’ Ability to Expand Energy Efficiency Training

Entry-level respondents were read a list of potential factors that might be limiting their training organizations’ ability to maintain or expand training programs that include energy efficiency-related components. As shown in Figure 53, the top three factors included: a lack of funding to hire and train trainers (59%), lack of student financial aid (48%), and other work related, non-energy efficiency topics have higher priority (29%). The top three items identified as not being factors at all included: “too many competing organizations offering similar training programs” (61% said this was not at all a factor), “lack of demand for energy efficiency-related training services” (58% said this was not at all a factor), and “lack of qualified trainers available” (53% said this was not a factor).

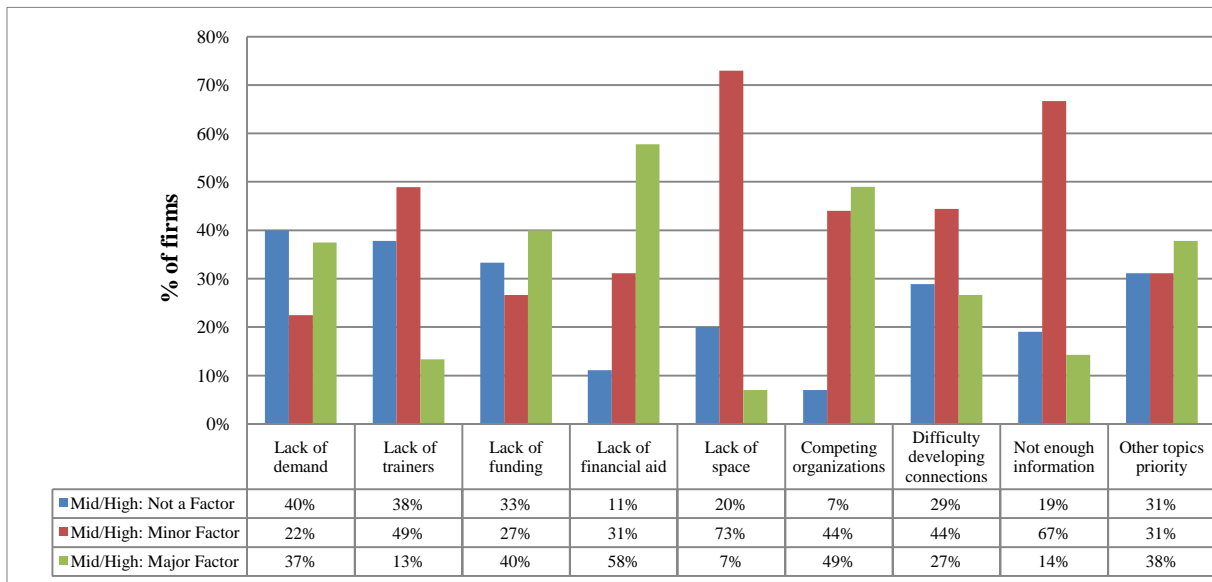
Figure 53. Factors Limiting Ability To Provide Energy Efficiency Training – Entry-Level



Entry N=21.

As shown in Figure 54, the top three major factors limiting the ability to provide energy efficiency training identified by the mid- to high-level skill training organizations respondents were: 1) lack of financial aid (58%), 2) too many competing organizations offering similar training programs (49%) and 3) lack of funding to hire and train trainers (40%). Similar to the entry-level respondents, neither “lack of demand” nor “lack of qualified trainers,” were identified as factors at all (40% and 30% respectively said these were “not a factor”).

Figure 54. Factors Limiting Ability To Provide Energy Efficiency Training – Mid/High-Level



Mid/High, N=14.

Of the major factors previously mentioned, the lack of funding to hire and train trainers is the single most important major factor limiting training organizations’ ability to maintain or expand training programs that include energy efficiency components among 50% of all training organizations surveyed. When asked which of the major factors mentioned above is the single most important factor limiting their organizations’ ability to maintain or expand training programs that include energy efficiency-related components, both entry-level and mid- to high-level skill training organization respondents stated “lack of available funding to hire and train trainers” (57% and 40% respectively). These responses can help to focus the Program’s attention on the barriers and issues that would be most effective to address; for example, supplement a training organization’s proper training of trainers to include energy efficiency and related curriculum.

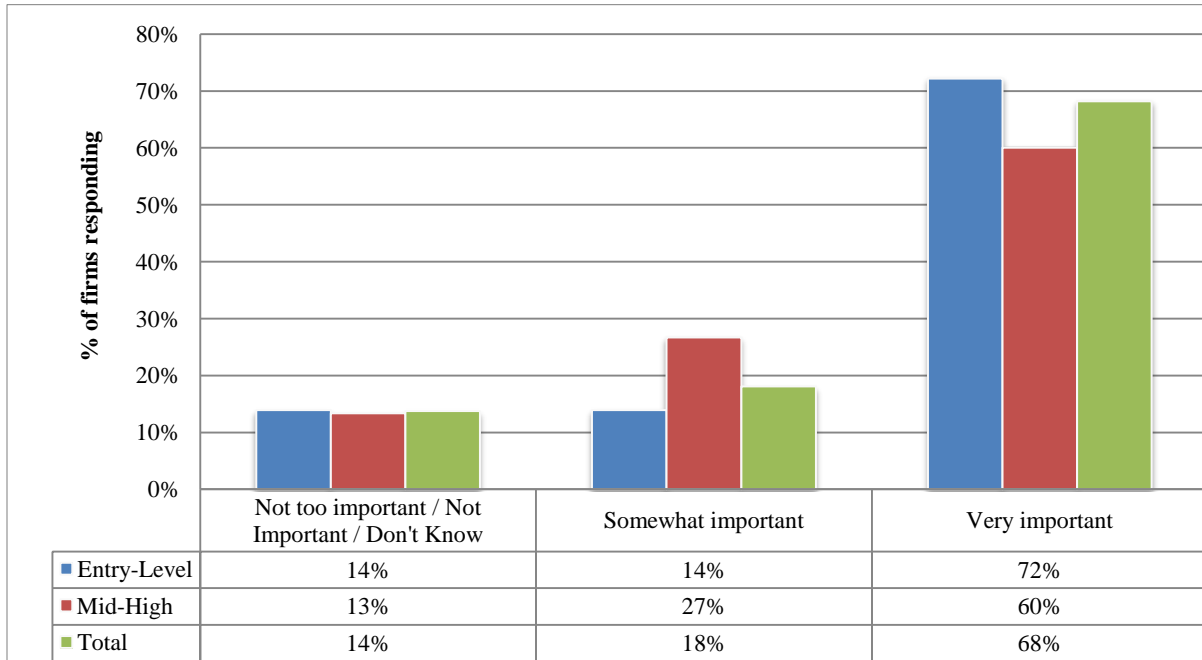
5.2.1.5 Importance of Energy Efficiency-Related Training Materials

Respondents were asked to rate the importance of having energy efficiency-related training materials (including curricula) available for their organizations’ use. As shown in Figure 55, importance was rated high by both entry- level and mid- to high-level training organization respondents (86% and 87% respectively when looking at those that said both “somewhat” or “very important”). When looking just at those that said “very important,” entry-level respondents rated the availability of these materials 12% higher than the mid- to high-level respondents (72% vs. 60%). As shown in Table 73, of those respondents that said the availability of energy efficiency-related training materials was either “not too important” or “not at all important,” reasons for feeling this way included the following:

Table 73. Verbatim Responses

Entry Level Skill Training Organizations
Don't need materials
If we had funding and employment opportunities we could work on curricula
Most of the training materials come form international sources or a common place
Mid to High Level Skills Training Organizations
We have developed our own training materials
Our curricula is better than NYSERDA's

Figure 55. Importance of Training Materials As Rated By Training Organizations



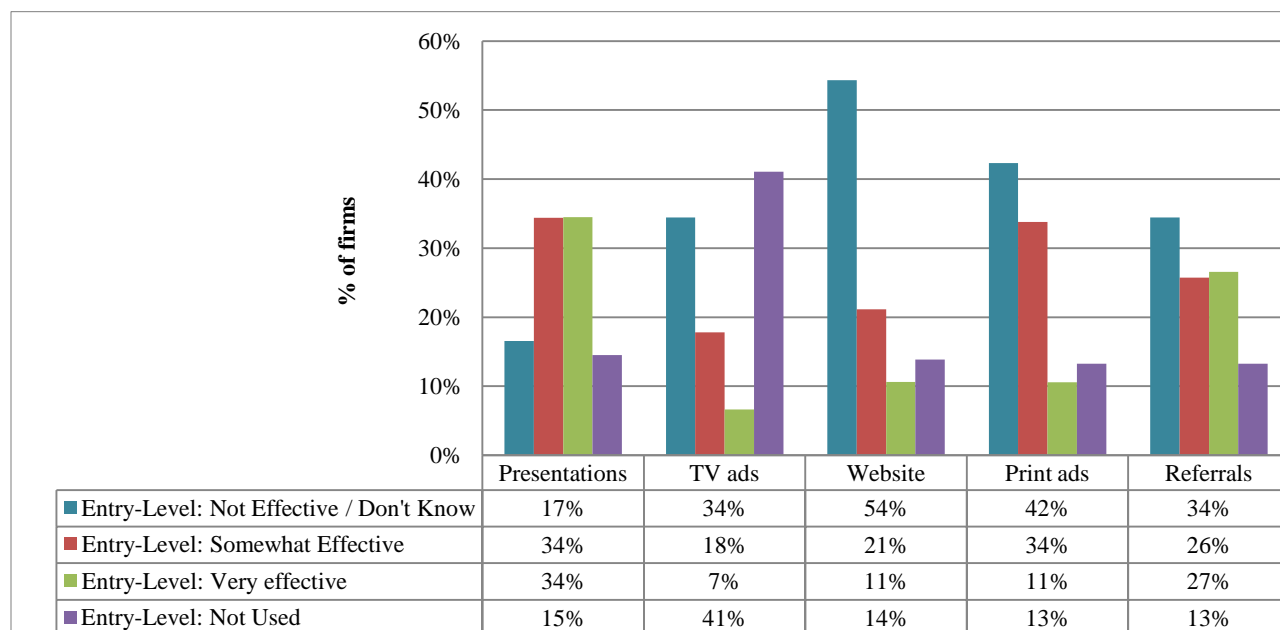
Entry Level N=28, Mid to High Level N=14 and Total N=42.

5.2.1.6 Training Promotion Approaches

Respondents were asked a series of questions regarding the effectiveness of approaches their organizations might be using to promote their training programs. As shown in Figure 56, for entry-level training organizations, presentations to potential trainees or organizations representing such trainees, and referrals or relationships with One-Stops were identified as being the most effective approaches (34% and 27% respectively). Training organization web sites and print ads were seen as the least effective (54% and 42% respectively).

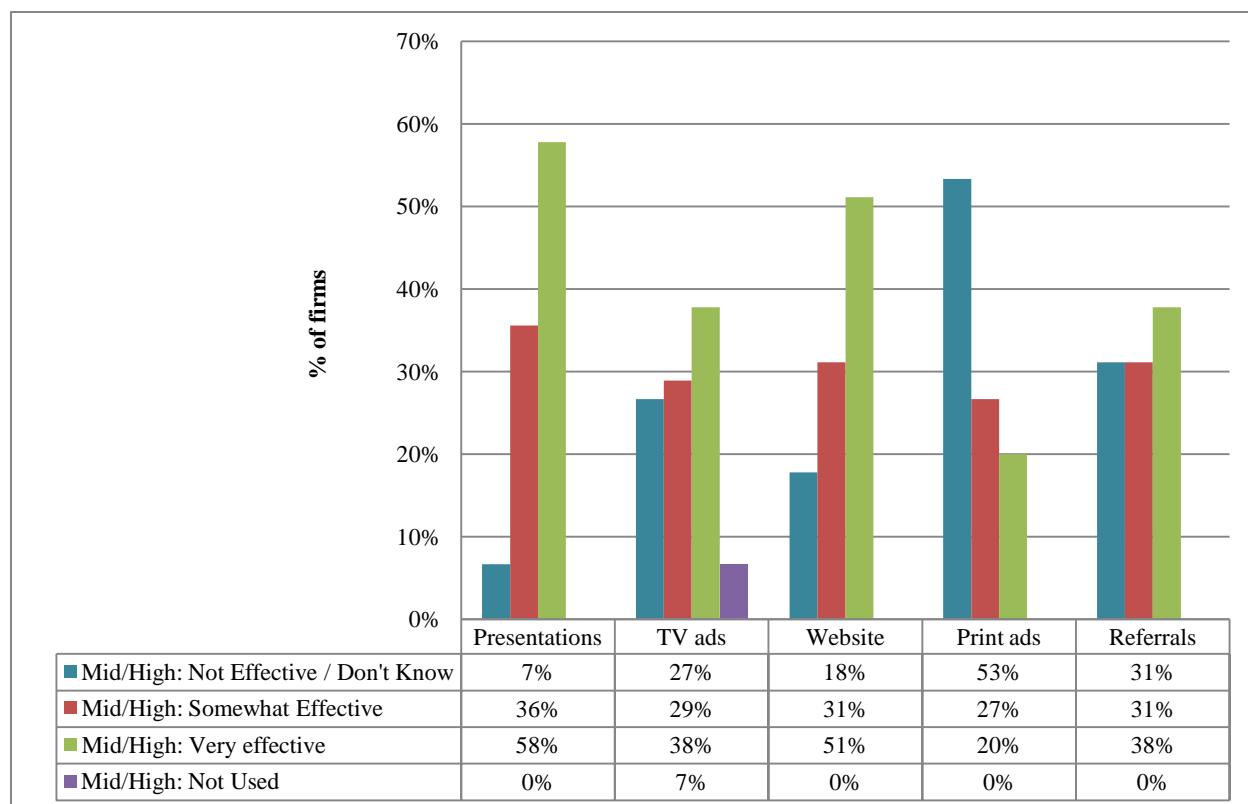
Similar to the entry-level respondents the mid- to high-level training organization respondents identified presentations as the most effective approach for promoting their training programs (58%). However, as shown in Figure 57, although identified as the least effective promotion approach for entry-level organizations, web sites were identified as an extremely effective approach for the mid- to high-level respondents (51%). Print ads were identified by this group, similar to entry-level respondents, as being the least effective (53%). When asked if there were other approaches used by training organizations to promote their training programs, 28% of respondent entry level, and 18% of mid- to high-level organizations identified networking and associated outreach at job fairs or through partnerships and 7% of each group identified word of mouth as an effective approach. In addition, 11% of mid- to high-level training organizations identified college credits as an effective promotion approach (i.e., where organizations would advertise the fact that their program was qualified to earn college, or continuing education credits).

Figure 56. Effectiveness of Approaches Used To Promote Training Programs – Entry-Level



N = 28.

Figure 57. Effectiveness of Approaches Used To Promote Training Programs – Mid- to High-Level



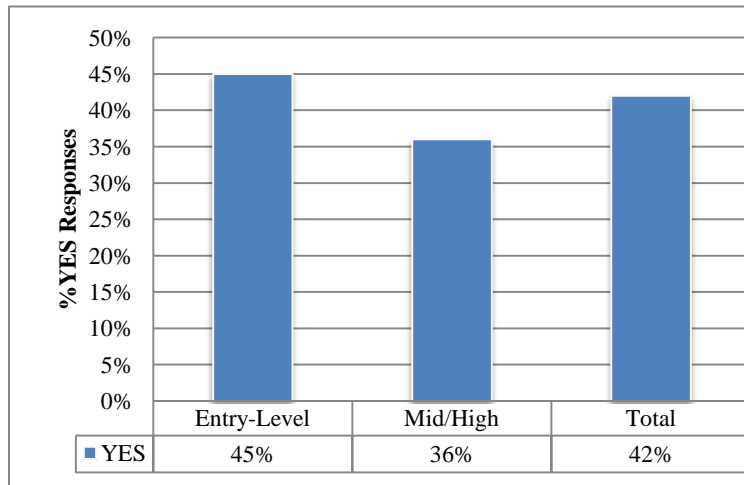
N = 14.

5.2.1.7 Targeted Training Audiences – Hard-to-Reach and Underserved Populations

Respondents were asked a series of questions relating to their organization’s training activities for the hard to reach and underserved groups, previously described. :

When asked if their organization specifically targeted any of these hard-to-reach and underserved populations for training that includes energy efficiency components, as shown in Figure 58, less than half (45% entry-level and 36% mid- to high-level) of the training organization respondents answered “yes”. This means that more of the hard-to-reach and underserved populations could be served if organizations, not currently targeting them, were encouraged to do so.

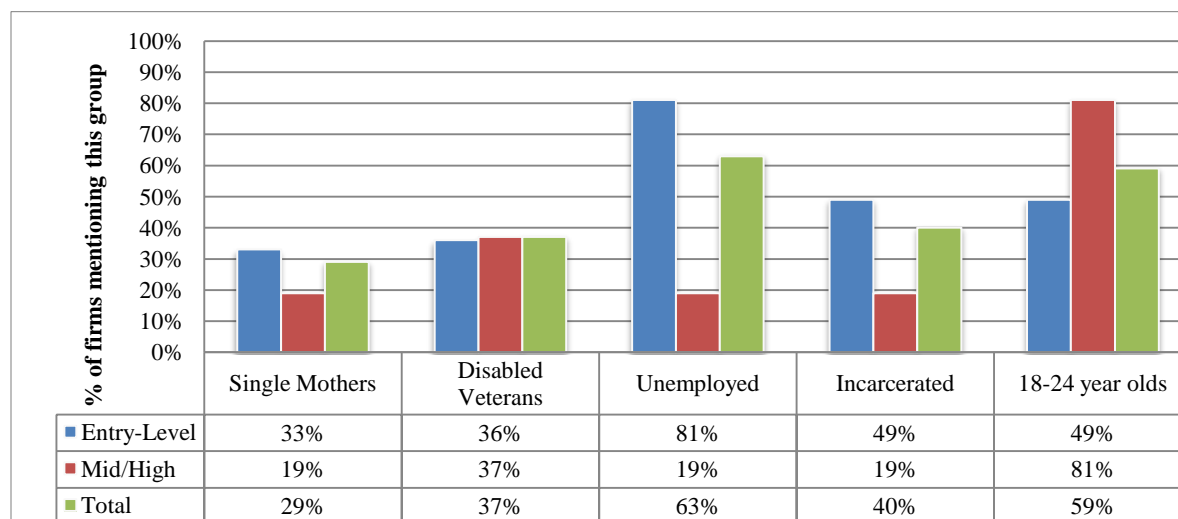
Figure 58. Percentage of Training Firms Targeting Hard-to-Reach and Underserved Populations



Entry Level N=28, Mid/High Level N=14 and Total N=42.

Of those respondents that stated they target these populations, a more specific question was asked to identify which of these groups they actually targeted and designed courses. As shown in Figure 59, the top three groups identified by entry-level training organization respondents were “the unemployed” (81%), “previously incarcerated” and “18 to 24 year olds” (49% each). For mid- to high-level respondents, the top two responses were “18 to 24 year olds” (81%) and “disabled veterans” (37%). Greater coordination among referral agencies and training organizations may increase the participation of these groups in skills training programs.

Figure 59. Hard-To-Reach and Underserved Groups Targeted For Training



Entry Level N=13, Mid/High Level N=5 and Total N=18.

Respondents were also asked to provide a brief description of the types of courses their training organizations offered these targeted groups. The top two course types identified by entry-level respondents were “worker readiness” (32%) and “weatherization” (24%). For mid- to high-level respondents, “apprenticeships” was the most reported method of training (63%), along with the other following course types: “weatherization and energy auditing,” “building analysis” and “multi-family auditing” at 19% each.

In a related question, respondents were asked, in the past two years, among trainees who have received training from your organization that included energy efficiency-related components, approximately what percentage fell into of the identified hard-to-reach/underserved categories. As shown in Table 74, entry-level respondents said the 81% of “unemployed,” 59% of “18-24 year olds,” and 32% of “previously incarcerated” populations fell into the “20% or more category.” This is consistent with the populations targeted for these classes identified in Figure 59.

Table 74. Percent of Targeted Groups That Received Training in the Past Two Years – Entry-Level

	0% to 1%	1% to 5%	5% to 10%	10% to 20%	20% or more	Don't Know
Single Mothers	40%	25%	9%	8%	8%	9%
Disabled Veterans	57%	16%	0%	9%	8%	9%
Unemployed	0%	9%	0%	0%	81%	9%
Incarcerated	25%	0%	16%	8%	32%	19%
18-24 year olds	8%	8%	8%	8%	59%	9%

N=13.

A similar question was asked of the mid- to high-level respondents. As shown in Table 75, respondents said 81% of “18 to 24 year old” and 31% of the “unemployed” populations fell into the “20% or more category.” When compared to the targeted populations identified in Figure 59, it is noteworthy to see that “disabled veterans” are not mentioned as one of the populations that fell into the “20% or more” category – meaning additional outreach to this hard-to-reach population group might be necessary. While the information presented in this report on veterans focuses of disabled vets, the Department of Labor has recently made targeting all returning veterans for skills training a priority.

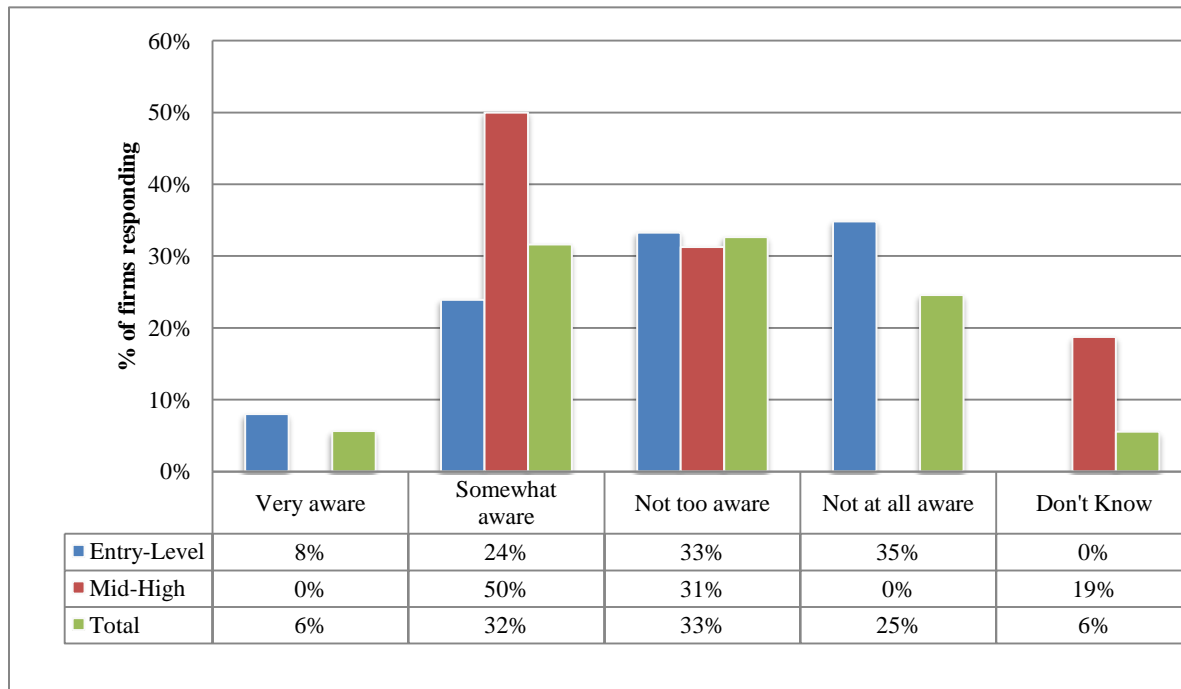
Table 75. Percent of Targeted Groups That Received Training in the Past Two Years – Mid/High

	0% to 1%	1% to 5%	5% to 10%	10% to 20%	20% or more	Don't Know
Single Mothers	19%	50%	0%	0%	0%	31%
Disabled Veterans	50%	50%	0%	0%	0%	0%
Unemployed	19%	0%	19%	31%	31%	0%
Incarcerated	50%	31%	0%	0%	0%	19%
18-24 year olds	19%	0%	0%	0%	81%	0%

N=5.

Finally, training organization respondents were asked, prior to participation in their organizations’ training programs, how aware people from the hard-to-reach and underserved population groups were about employment opportunities in energy efficiency-related fields. Awareness of employment opportunities in energy efficiency varied greatly among the hard-to-reach and underserved trainee populations, prior to training. As shown in Figure 60, perceived awareness was very low across both the entry-level and mid- to high-level training organization respondents, with only 8% of entry-level respondents and 0% of the mid- to high-level respondents saying “very aware.” Given that these populations are labeled as “hard-to-reach,” this result is not surprising. However, it does suggest that additional outreach efforts may help increase awareness among these groups and could improve the Program’s success in serving these populations.

Figure 60. Population’s Awareness of Energy Efficiency Employment Opportunities Prior to Training

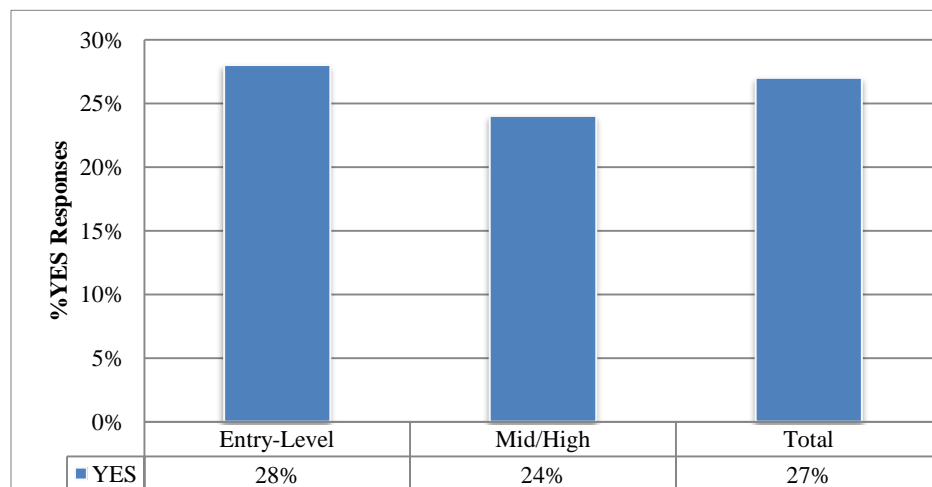


Entry Level N=13, Mid/High Level N=5 and Total N=18.

5.2.1.8 Financial Aid Offerings, Sources and Utilization

Respondents were asked a series of questions regarding financial aid offers, sources and percent usage by trainees. Overall, 27% of training organizations offer financial aid to individuals who may not otherwise be able to afford training. As shown in Figure 61, 28% of entry level skill training organizations and 24% of mid-to-high-level training organizations state they offer financial aid.

Figure 61. Training Organizations Offering Financial Aid



Entry Level N=28, Mid/High Level N=14 and Total N=42.

When asked to identify the sources where this financial aid came from, 48% of the entry –level and 27% of the mid- to high-level respondents who said that their organizations offered financial aid reported that it came from either federal or state funding sources. Forty percent of the entry-level and 27% of the mid- to high-level respondents said that the aid came directly from the training organization itself. Another source, identified by 45% of the mid- to high-level respondents was a “joint labor management fund.”

When asked what percent of trainees receive financial aid, 76% of entry-level skill training organizations, and 73% of mid- to high-level skill training organization respondents estimated that between 76% to 100% of their students receive financial aid.

5.2.2 Training Trends and Plans

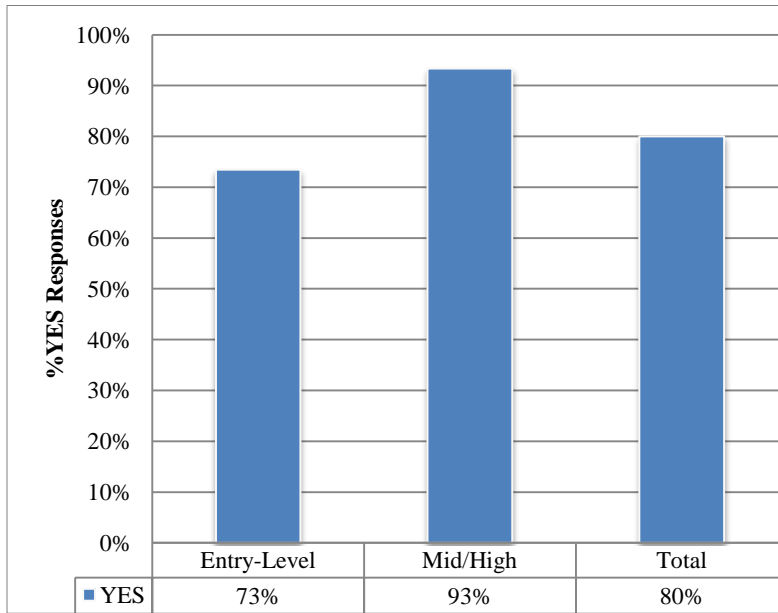
In this section, respondents were asked a series of questions regarding the need for additional energy efficiency training, abilities to meet those needs, factors driving any increased demand, and plans for expansion or development of new training programs.

5.2.2.1 Need for Additional Energy Efficiency Trainings

Respondents were asked if there was a need for additional energy efficiency training opportunities in the area(s) their organizations serve. As shown in Figure 62, a large majority of respondents believe that there is a need for more of such training opportunities (93% of mid- to high-level and 73% of entry-level respondents). When asked why they felt this way, a common response was that there was “not enough training to meet demand” (51% of entry-level and 18% of mid- to high-level respondents felt this way).

Table 76 lists all other verbatim answers provided by respondents during the telephone survey on this topic. It is important to note that demand for training, and availability of jobs in which to place training program graduates, are two different things. Although the overall energy efficiency job market remains uncertain, perhaps recent local legislation in New York City, to audit and increase the efficiency of all private and public buildings, will increase demand for energy efficiency workers (actual new jobs) not currently reflected in the market data. This local demand could be the reason training organizations believe more training is needed. Some of these respondent opinions would need to be tested to determine if actual demand exceeds existing training opportunities and venue capabilities.

Figure 62. Need For Additional EE Training Opportunities



Entry Level N=28, Mid/High Level N=14 and Total N=42.

Table 76. Verbatim Reasons Why There Is or Is Not a Need for More Training

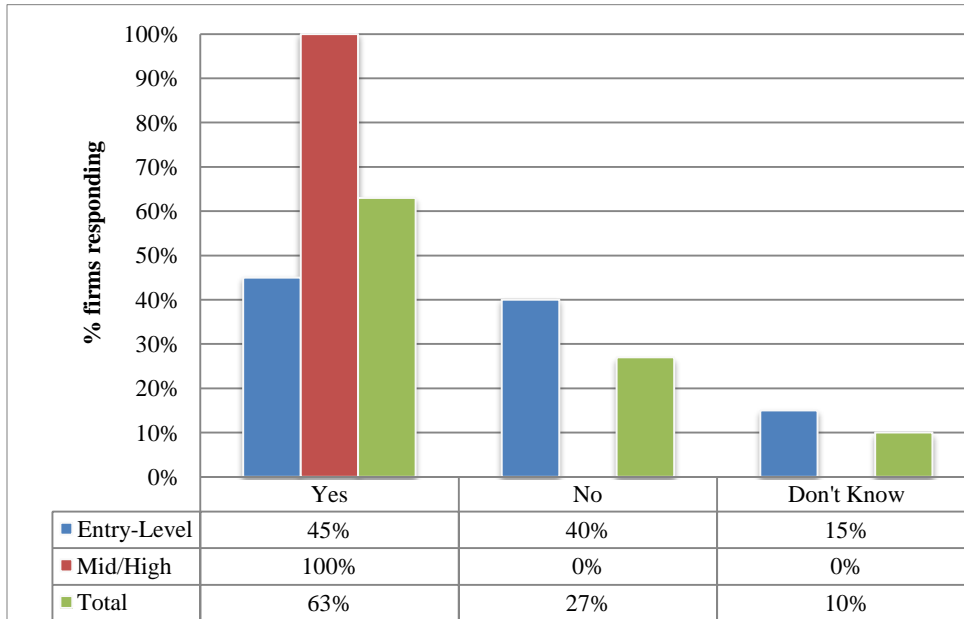
	% Mentioning (Entry-Level)	% Mentioning (Mid/High)
Not enough training to meet demand	51%	18%
Not enough funding/low income area/poor economy	7%	20%
Need for awareness/push for energy efficiency	11%	18%
Because whatever training I need its automatically available	3%	
I think that if we had the time to expand and do the training we would have a better response	3%	
The number of training sites at the time are saturating the market	3%	
There are different types out there not cover through NYSERDA	4%	
These people only go to training for 3 months. They need a much longer training period	3%	
We are a really small county and not enough jobs if they trained lack of employment	3%	
We use NYSERDA and it's been accurate	3%	
Because there is a lot of sustained housing in the Syracuse area that need to be upgraded		7%
Every house I go into needs major retrofit work. Contractors are doing a shabby job of building. I had someone come to me after she had a new house built and her first propane bill was five thousand dollars. More retrofit work is needed. Therefore more quality-focused training is needed		7%
Its not in demand		7%
There's a great need here and also its a poor community		7%
There have been union members that take the training because they think that they will get a promotion. They will save energy in their building		7%
We need to increase solar thermal training		11%

(N=28)

(N=14)

Respondents were asked if more students were brought to their organization, would they be able to handle the increased demand. As shown in Figure 63, 100% of the mid- to high-level training organizations said “yes” to this question. However, less than half (45%) of the entry-level respondents said “yes” and 40% of them said “no.” One possible reason entry level organizations may not be able to accommodate increased demand is the cut in DOL funding that supports their programs. Additional NYSERDA training infrastructure development support could fill the funding gap within the entry-level organizations and help them meet the anticipated increased demand for energy efficiency training among basic skills/new job entrants.

Figure 63. Ability to Handle Increased Demand for Training

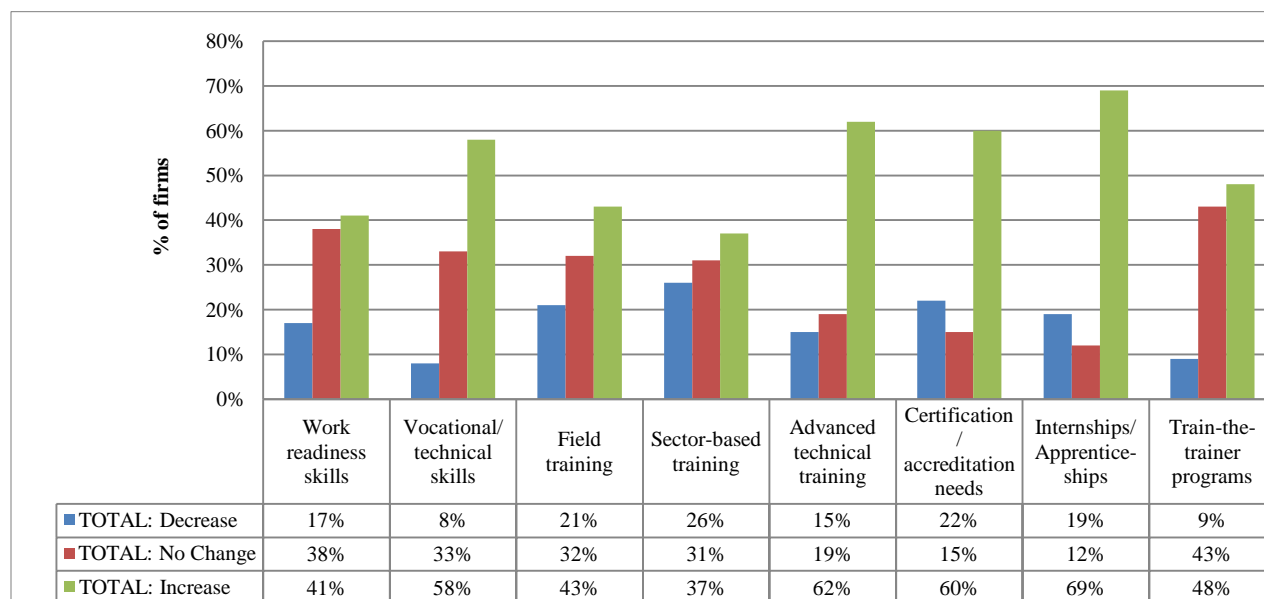


Entry Level N=28, Mid/High Level N=14 and Total N=42.

5.2.2.2 Changes in the Number of Training Requests of Last 12 Months

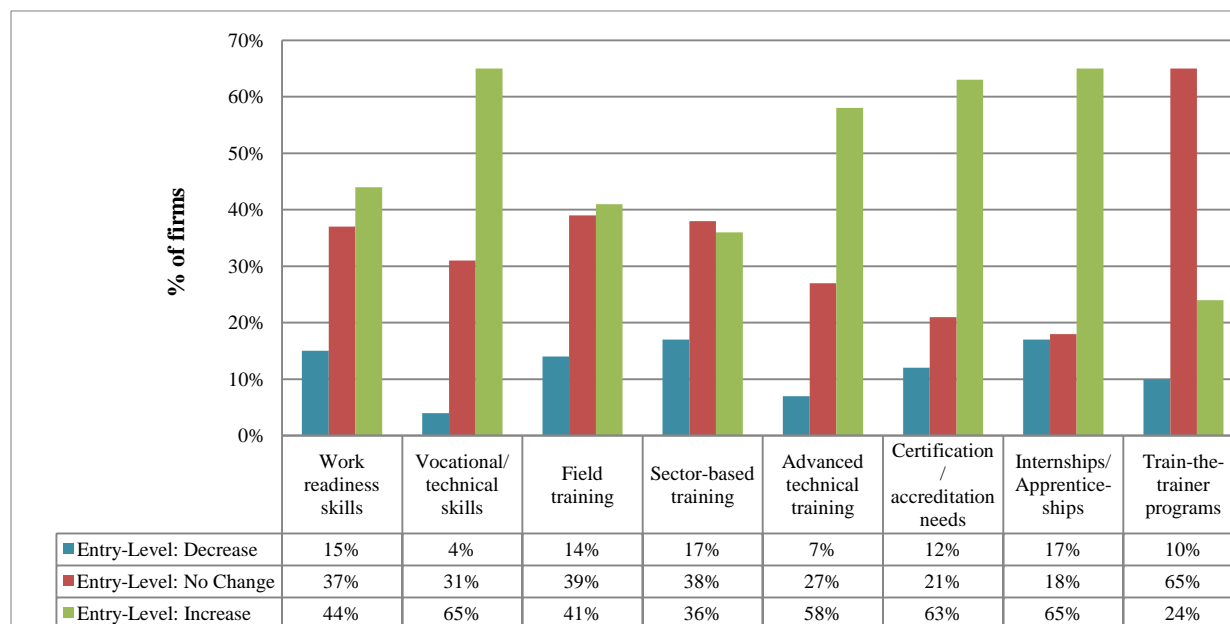
For each of the training types respondents’ organizations offer, they were asked to identify if they have seen an increase, decrease or no change in the request for training over the past 12 months. As shown in Figure 64, looking across both entry-level and mid- to high-level respondents, increased demand has been seen within every training type. Greatest increases were in requests for internships and apprenticeships (69%), followed by advanced technical training (62%), training to meet certification/accreditation needs (60%) and for vocational/technical skills (58%). Interestingly, a number of respondents also reported “no change” or even a decrease in requests for their training services – especially in the “train-the-trainer” area for entry-level organizations (65% reported “no change”), and the “sector-based training” area for mid- to high-level organizations (40% reported seeing a “decrease” in training requests). Figure 65 and Figure 66 provide more details regarding specific entry-level and mid- to high-level responses.

Figure 64. Change in Requests for Training over Last 12 Months - Total



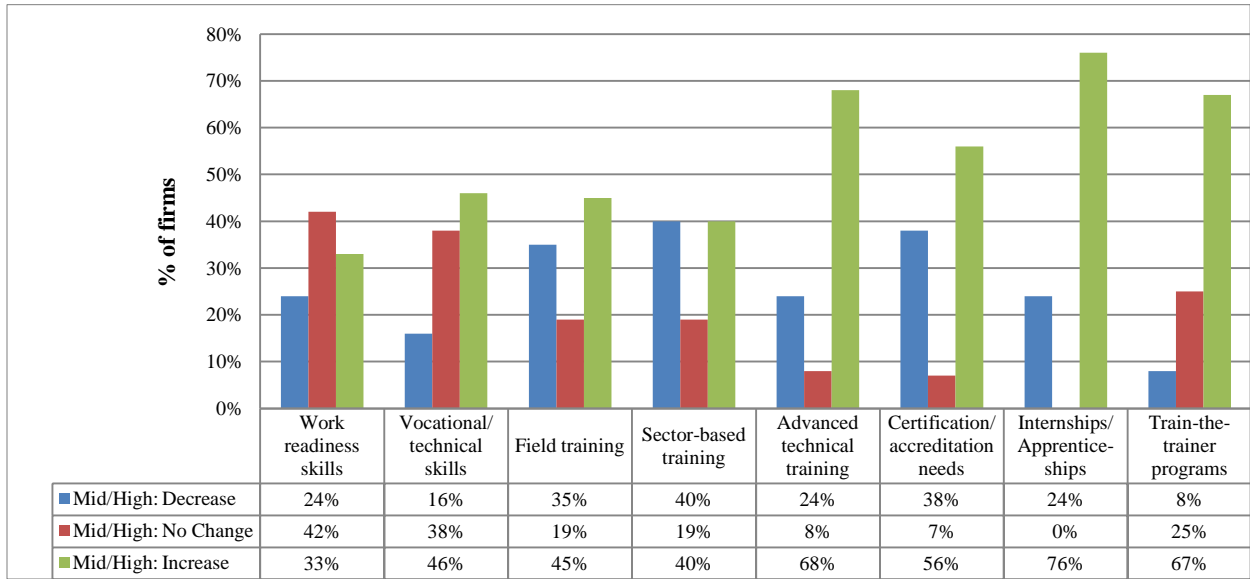
N ranges from 18 to 37 depending on training type.

Figure 65. Change in Requests for Training over Last 12 Months – Entry-Level



N ranges from 11 to 25 depending on training type.

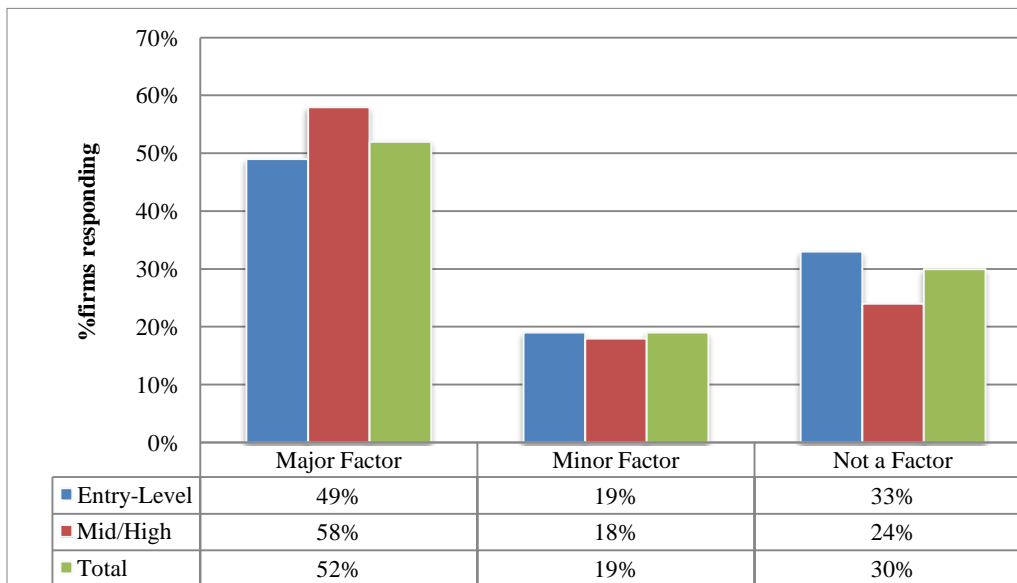
Figure 66. Change in Requests for Training over Last 12 Months – Mid- to High-Level



N ranges from 7 to 14 depending on training type.

For those respondents that indicated requests increased for at least one of their organization’s training programs, a question was asked regarding how much of a factor they would say their “employer requests” have been in driving this increase. As shown in Figure 67, 58% of mid- to high-level respondents, and 49% of entry-level respondents identified “employer requests” as being a major factor. This means employers are a large driving factor of the increased demand for training.

Figure 67. Employer Request for Training As A Factor Of Increased Demand

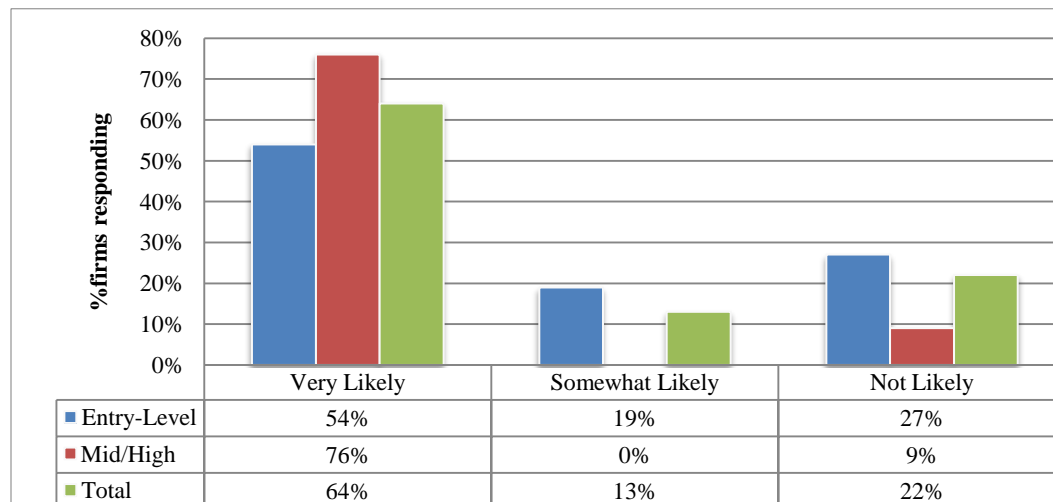


Entry Level N=21, Mid/High Level=10 and Total N=31.

5.2.2.3 Likelihood of Expansion or Development of New Training Programs

When asked how likely it was that respondent organizations would expand or develop new training programs to meet increased demand they have reported in the last 12 months, as shown Figure 68, 76% of the mid- to high-level and 54% of the entry-level respondents said they were “very likely” to expand. Interestingly, 27% of the entry-level respondents said they were “not likely” to expand. For the smaller percent of training organizations that said they were not likely to expand, reasons for this response included: budget constraints, insufficient increase in demand, and lack of jobs for trainees to move into.

Figure 68. Percent of Organizations Likely to Expand in the Next Twelve Months¹⁶⁵



Entry Level N=21, Mid/High Level N=11 and Total N=32.

5.2.2.4 Trainee Interest in Energy Efficiency – Post Training

For trainees who completed their organizations’ skills development offerings within the past 12 months, respondents were asked to say how interested they believed these trainees were in seeking, or continuing employment in an energy efficiency-related field. Across all training organization respondents there appear to be a high level of interest among their graduated trainees in energy efficiency-related jobs.

As shown in Figure 69, the percent of entry-level skill trainees interested in seeking or continuing energy efficiency-related employment ranged from a low of 47% (worker readiness trainees) to a high of 69% (field training trainees). Respondents whose organizations offered worker readiness training reported the greatest percent of trainees “not interested” (27%) in energy efficiency-related employment.¹⁶⁶

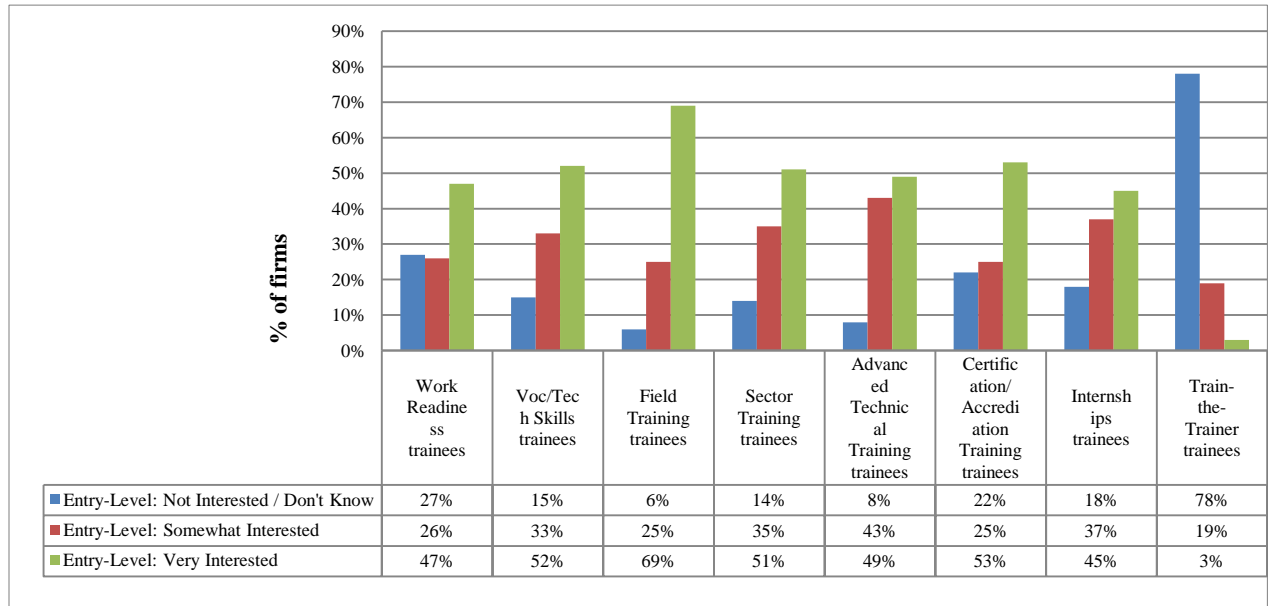
NYSERDA’s Workforce Development Program could potentially help increase entry-level trainee’s interest in energy efficiency-related employment by providing additional information regarding the

¹⁶⁵ A small number of “Don’t Know” responses were omitted, so the mid- to high-level percent numbers do not add up to 100%.

¹⁶⁶ Note – the “not interested” category includes “not too interested” and “don’t know” responses.

benefits and opportunities available to them in the energy efficiency jobs field and by working with training organizations to develop more in field training options.

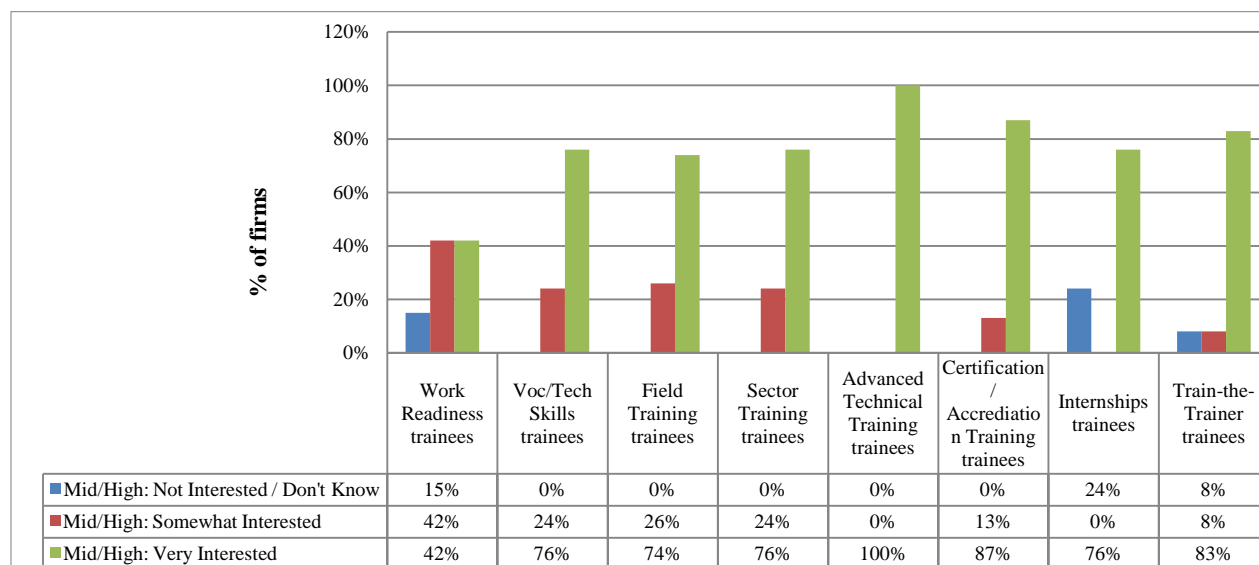
Figure 69. Trainees’ Interest in Seeking or Continuing Energy Efficiency Employment – Entry-Level



N ranges from 9 to 26 depending on training type.

As shown in Figure 70, a high percentage of mid- to high-level respondents said their organizations’ graduating trainees were interested in seeking or continuing employment in an energy efficiency-related field, ranging from 76% (internship or apprenticeship trainees) to 100% (advanced technical trainees). Respondents whose organizations offered internship training reported the greatest percent of trainees “not interested” (24%) in energy efficiency-related employment. This suggests that a closer look at the internship and apprenticeship positions might be needed.

Figure 70. Trainees’ Interest in Seeking or Continuing Energy Efficiency Employment – Mid/High



N ranges from 7 to 14 depending on training type.

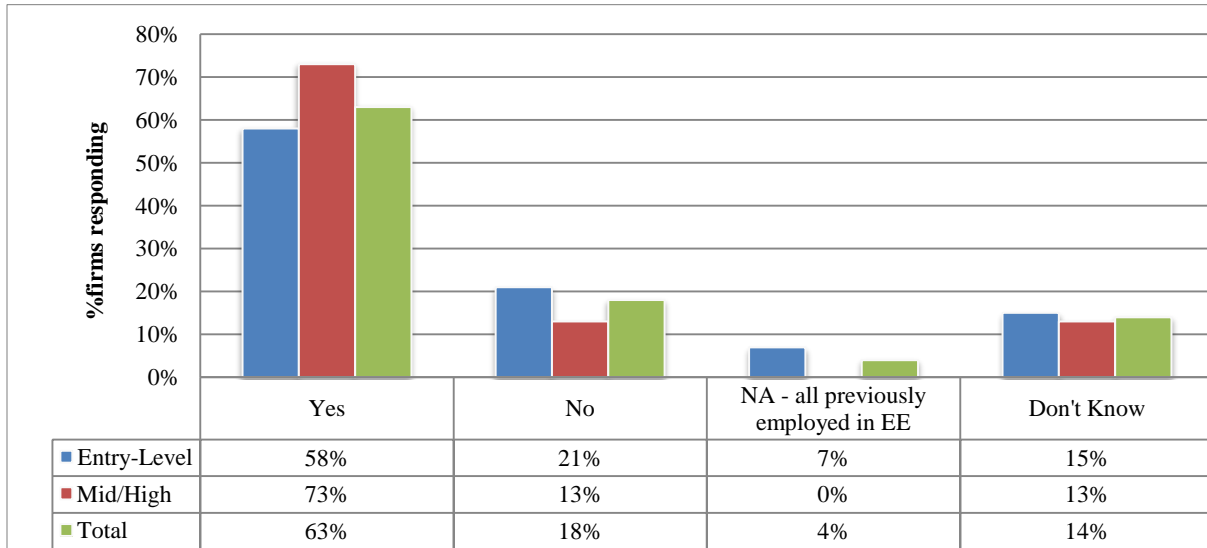
5.2.3 Energy Efficiency Employment Placement and Opportunities

In this section, results are presented from a series of questions that respondents were asked regarding energy efficiency job placements for trainees that have attended their organizations classes. In addition, responses to questions regarding internships and on-the-job skills development opportunities are summarized along with respondent assessments of potential areas for energy efficiency jobs growth.

5.2.3.1 Trainees Finding Employment in Energy Efficiency-Related Fields

Respondents were asked if any of their organizations’ trainees, who were not previously employed in an energy efficiency-related field, found jobs in this field in the last 12 months. As shown in Figure 71, a majority of training organization respondents said “yes” to this question (73% mid- to high-level and 58% of entry-level respondents). These are self-reported results and have not been verified through other sources.

Figure 71. Trainees Who Have Found Work In Energy Efficiency-Related Field Post Training



Entry Level N=28, Mid/High Level N=14 and Total N=42.

Respondents that answered “yes” to the question regarding their organizations’ trainees finding energy efficiency-related jobs, were asked to provide more specifics regarding the type of jobs. Responses included jobs in the areas of office support, various skill levels of construction, equipment installation and repair. These job types are identified as growing occupations by the US Census and NYSDOL Green Jobs Report. As shown in Table 77, “building shell improvement” was mentioned most by both entry-level and mid- to high-level respondents as a job type where trainees have found employment (85% mid/high and 74% entry), followed by “equipment installation, maintenance and repair” (82% mid/high and 58% entry). For mid- to high-level respondents, other common job types included “HVAC installation/technician” (76%) and “general residential construction/skilled” and general commercial construction/skilled” (73% each).

Table 77. Job Types Where Trainees Have Found Employment

Job Types	% Mentioning (Entry-Level)	% Mentioning (Mid/High)
General office and project administrative support	41%	
General residential construction, entry-level	52%	58%
General commercial construction, entry-level	32%	53%
General residential construction, skilled	44%	73%
General commercial construction, skilled	32%	73%
Building shell improvement	74%	85%
HVAC installation/technician	42%	76%
Electrical contractor	30%	43%
Equipment installation, maintenance, repair	58%	82%
Sales and related support	24%	10%
Architectural, engineering, and related services	18%	33%
Energy conservation consultant	41%	45%

Job Types	% Mentioning (Entry-Level)	% Mentioning (Mid/High)
Property management or real estate development	23%	
Weatherization	7%	
Window fabrication	7%	
Energy auditor / weatherization for multifamily buildings		9%
Green plumbing		15%
Industrial entry level		15%
Multi-family lead training		9%
Urban planning and energy auditing		9%

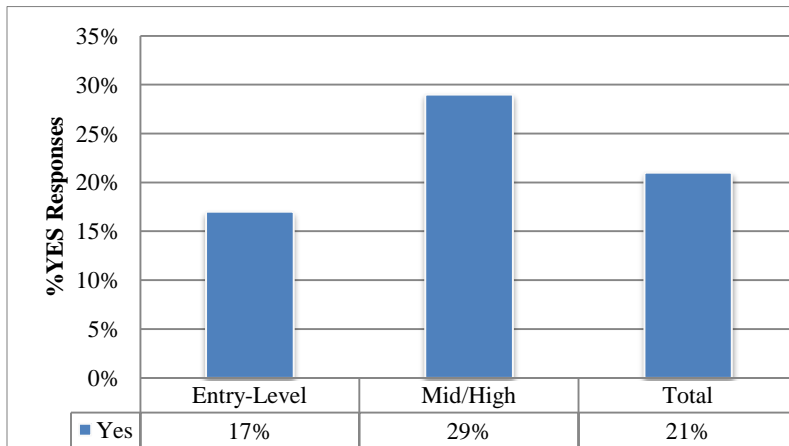
(N=16)

(N=10)

5.2.3.2 Internships and Job Placement Arrangements

When asked if their organizations have any specific internships or job placement arrangements with businesses or organizations involved in the energy efficiency field, as shown in Figure 72, only 29% of mid- to high-level and 17% of entry-level respondents said “yes.” Since employers often look for experience and frequently hire interns for permanent employment, the fact that most training organizations do not have active internship or job placement arrangements with business in the State provides a potential focus point for the Program.

Figure 72. Internship Placement by Training Organization

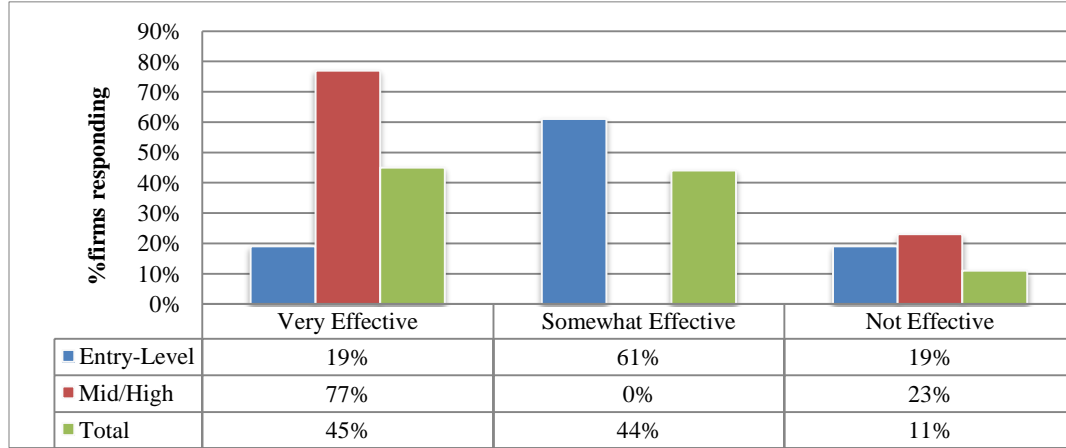


Entry Level N=5, Mid/High Level N=4 and Total N=9.

Respondents that said their organizations had specific internship or job placement arrangements were asked to describe them. For energy-level training organizations, internship arrangements include: on-the-job training work for window replacement and construction companies, property management firms, weatherization and building management companies and with utilities. Internship arrangements described for mid- to high-level skill trainees include: those available through union labor agreements, electrical contractors, and equipment installation firms.

When asked how effective these arrangements were, as shown in Figure 73, 77% of the mid- to high-level training organization respondents that had internship arrangements said they were “very effective.” Only 19% of the entry-level respondents felt this way, with 61% saying they were “somewhat effective.”

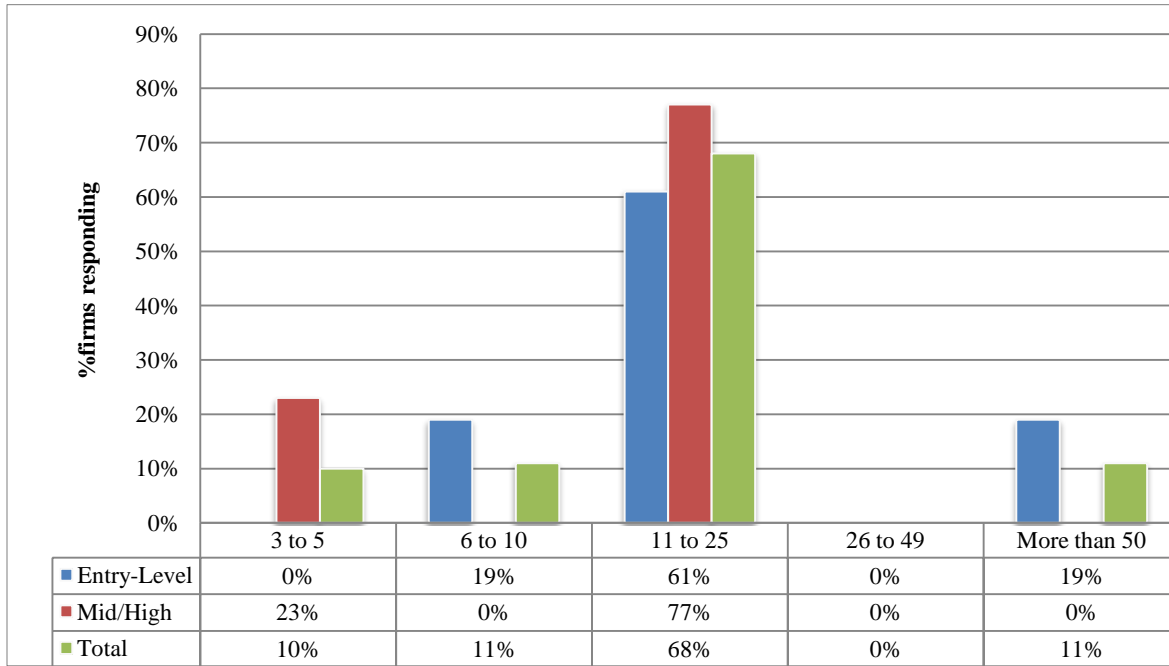
Figure 73. Effectiveness of Internships in Supplementing Training to Promote Job Placement



Entry Level N=5, Mid/High Level N=4 and Total N=9.

All respondents whose organizations had internship or job placement arrangements were asked if they would be able to expand these arrangements if resources and funding were made available to their organization for on-the-job skills training. And all said “yes” (5 entry-level and 4 mid- to high-level respondents). These respondents were also asked to estimate how many more workers they might be able to place each year in energy efficiency-related jobs. As shown in Figure 74, 77% of mid- to high-level and 61% of entry-level respondents said their organizations could place between 11 to 25 additional trainees. On either end of this range, 19% of the entry-level respondents said they could place more than 50 trainees and 19% said between 6 and 10. While 23% of the mid- to high-level training organization respondents said they could only place between 3 to 5.

Figure 74. How Many Additional Trainees Could Be Placed Each Year



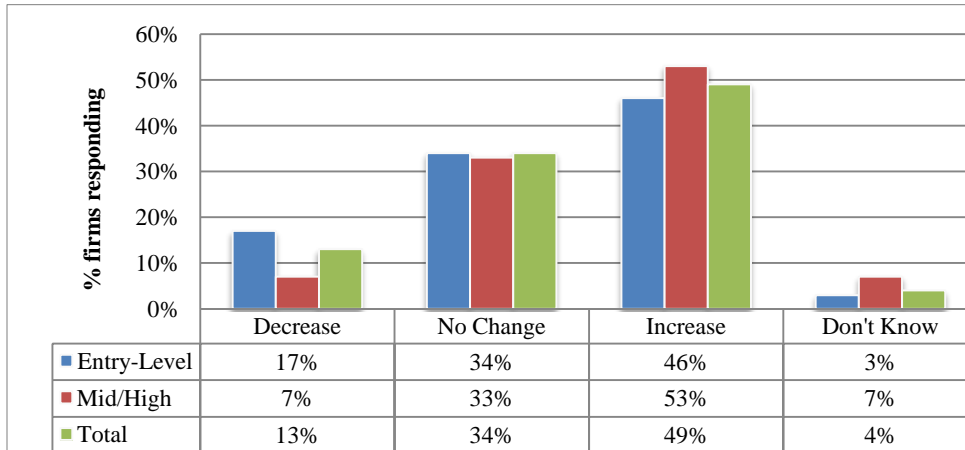
Entry Level N=5, Mid/High Level N=4 and Total N=9.

Respondents that said additional resources and funding would allow their organizations to place more workers into energy efficiency-related internship or job placement arrangements were asked to identify the job areas where these workers would be placed. The most common areas identified by entry-level respondents included: general commercial construction, general office and project administrative support, building shell improvement, HVAC installation/technician, electrical contractor, and property management/real estate development positions. For mid-to high-level respondents, the most common areas included residential and commercial construction. According to the US Census and NYSDOL Green Jobs Report, these job areas are all expected to grow in the next few years.

5.2.3.3 Energy Efficiency Employment Opportunities Growth Projections

Respondents were asked what direction they thought employment opportunities in energy efficiency-related fields would head over the next twelve months (increase, decrease or stay about the same). As shown in Figure 75, 53% of all mid- to high-level respondents, 46% of entry-level respondents, believe there will be an increase. Only 7% of mid- to high- level and 17% of entry-level respondents felt there will be a decrease and approximately a third (33/34%) said there would be no change. One could view this as a positive outlook and an opportunity for the Program to continue its skills development efforts to meet this perceived increased need.

Figure 75. Expected Change In EE Employment Opportunities Over Next Twelve Months



Entry Level N=28, Mid/High Level N=14 and Total N=42.

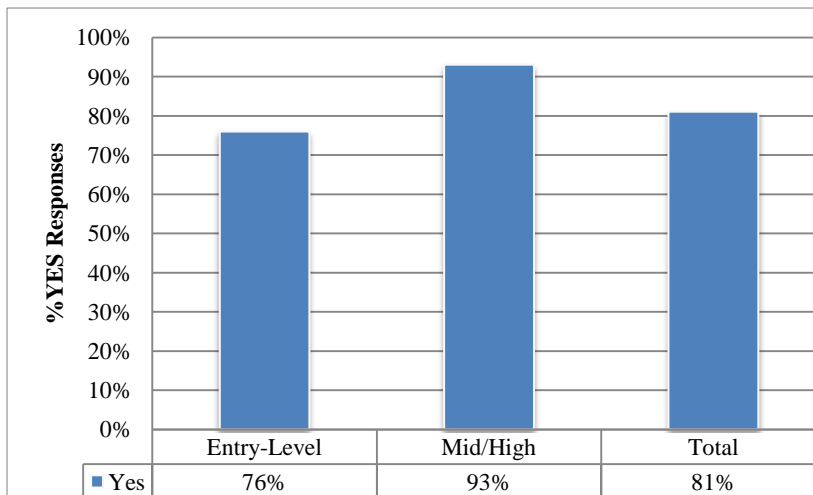
5.2.4 Awareness of NYSERDA and/or Broader Workforce Development Efforts

In this section, responses to questions regarding awareness of NYSERDA, their support for energy efficiency training and certifications, and other energy efficiency-focused training programs in New York State are summarized.

5.2.4.1 Awareness of NYSERDA and its Energy Efficiency Training Efforts

When asked, before they participated in this evaluation project’s telephone survey, if they were aware of NYSERDA, all respondents said “yes” (28 entry-level and 14 mid- to high-level respondents). Respondents were also asked if, before this survey, they were aware that NYSERDA provided support for basic skills development through advanced-level energy efficiency training and certifications. As shown in Figure 76, 93% of mid- to high-level and 76% of entry-level respondents said “yes.”

Figure 76. Awareness of NYSERDA support for skills development



Entry Level N=28, Mid/High Level N=14 and Total N=42.

When asked how they heard about NYSERDA’s energy efficiency training support, as shown in Table 78, past NYSERDA participation, networking, and NYSERDA’s website were the top three sources identified by entry-level verbatim respondents (26%, 26% and 23% respectively). For mid- to high-level respondents, the top three sources included: NYSERDA’s website (38%), past NYSERDA program participation (26%) and the Department of Labor (21%).

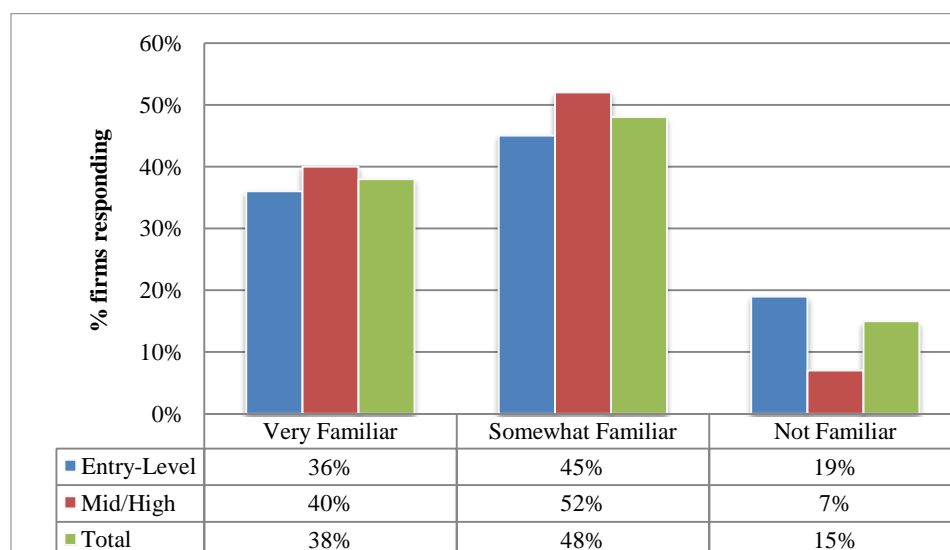
Table 78. How Training Organizations Heard about NYSERDA’s Training Program Support*

Information Sources	% Mentioning (Entry-Level)	% Mentioning (Mid/High)
Networking	26%	19%
Past NYSERDA Program Participant	26%	26%
NYSERDA Website	23%	38%
Internet Ads	18%	7%
Weatherization	9%	
Employ Past WFD Participants	5%	
Conferences	5%	
Member of Western Union Apollo Group	5%	
Direct Marketing	4%	7%
Indirect Marketing	4%	
Television Ads	4%	7%
Print Ads	4%	
Always been aware	4%	
Erie county community college	4%	
NY Contractors	4%	
OJT Program	4%	
Apply for Grant		7%
Department of Labor		21%
Industry Awareness		10%

*Verbatim responses from survey respondents.

Although a large majority of training organization respondents were aware that NYSERDA provides support for energy efficiency skills development, a much smaller percentage said they were “very familiar” with those efforts (40% of mid- to high-level and 36% of entry-level respondents). Slightly more (52% mid- to high-level and 45% entry-level) said that they were “somewhat familiar.” This means, if a need is identified, perhaps in areas with high concentrations of target trainee populations, there could be additional opportunity to inform and recruit an increased number of training organizations as partners with NYSERDA’s Workforce Development Program efforts.

Figure 77. Familiarity with NYSERDA’s Supported Energy Efficiency Training Efforts

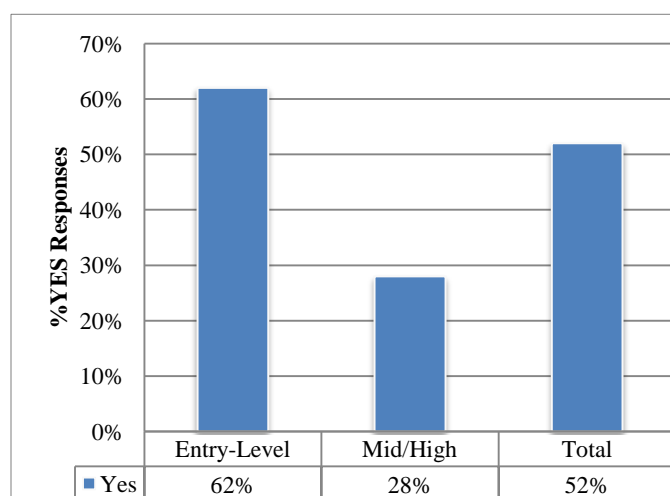


Entry Level N=21, Mid/High Level N=13 and Total N=34.

5.2.4.2 Training Organizations’ Awareness of Non-NYSERDA Energy Efficiency Training Efforts

As shown in Figure 78, entry-level respondents are substantially more aware of non-NYSERDA programs in New York State that provide training in basic or advanced job skills in the energy efficiency field than are mid- to high-level training organization respondents (62% entry-level vs. 28% mid-to high-level). Some of the programs mentioned by respondents included: The New York State Weatherization Directors Association (NYSWDA), the Building Professionals Institute (BPI), the Association for Energy Affordability, Labor Mason Tenders Training Fund’s Local 10, Green Jobs Training Center, Community Colleges and National Grid. Where possible, NYSERDA’s Program should continue to coordinate and leverage resources within and across these other programs.

Figure 78. Awareness of Other New York State Energy Efficiency Related Training Programs



Entry Level N=21, Mid/High Level N=13 and Total N=34.

SECTION 6. SUMMARY OF FINDINGS AND ACTIONS FOR CONSIDERATION

The MCA Team’s goal for this report has been to provide data and intelligence to inform program-related decision-making. To this end, the MCA Team has collected and analyzed a substantial amount of primary and secondary data to:

- Characterize the market eligible to utilize the Workforce Development program’s training skills development, training support and services and discuss program accomplishments and market penetration.
- Assess the progress of the Workforce Development Program in meeting key program and market assessment indicators.

This section presents the MCA Team’s conclusions and recommendations as derived from the evaluation of the Workforce Development Program.

6.1 MARKET CHARACTERIZATION FINDINGS

This section summarizes key findings from the above characterization efforts.

6.1.1 Employers

Energy efficiency jobs exist in virtually every industry. Utilities, state government, builders and contractors (including mechanical, electrical and general contractors, and home performance, weatherization and other efficiency delivery contractors), energy service companies (ESCOs), consultants, architectural and engineering firms and companies from all industries are poised to hire employees for energy efficiency positions. The State’s labor unions also train and provide jobs for union members seeking employment in energy efficiency-related jobs. Job positions that exist within all of these organizations are categorized by skill level and education requirement, and are typically identified as entry-level jobs and mid- to high-level jobs.

6.1.1.1 Employment Trends

The following paragraphs highlight key findings regarding employment trends. However, it is important to note that existing employment trend data is only a snapshot of quantitative information available, and does not take into consideration the influence or impact of public policy and local legislation, market forces or investment for to development of an industry in the short or long term.

In response to both economic concerns and climate change, legislators and regulators in New York and across the country have supported energy efficiency at unprecedented levels. According to the American Council for an Energy Efficient Economy (ACEEE), the total budgets for electricity efficiency programs alone in the U.S. have increased to \$4.5 billion in 2010, up from \$3.4 billion in 2009. Given the increasing regulatory commitments to energy efficiency, this growth will likely continue over the next decade.¹⁶⁷ According to the 2011 ACEEE *Scorecard*,¹⁶⁸ New York State ranks #3 in the U.S., behind

¹⁶⁷ ACEEE website, Article “Utility Regulation and Policy”, May 23, 2012 www.aceee.org.

¹⁶⁸ ACEEE *Scorecard* provides a comprehensive assessment of policy and programs that improve energy efficiency in our homes, businesses, industry, and transportation sectors. The *Scorecard* examines six state energy efficiency policy areas and presents these results in six chapters: (1) utility and public benefits programs and policies; (2) transportation policies; (3) building energy codes; (4) combined heat and power; (5) state government initiatives; and (6) appliance efficiency standards. States can earn up to 50 possible points in these six policy areas combined,

Massachusetts and California for its comprehensive policies and programs that improve energy efficiency in residential, businesses, industry, and transportation sectors. Therefore, the number of energy efficiency-related jobs in New York is expected to increase in the future based on elevated investment and associated local, regional and state-wide targets.

In the near term, growth in New York's energy efficiency jobs is expected to be limited due to the slow overall economic recovery. However, three industry clusters show a high concentration of green jobs today (including energy efficiency-related jobs) that are expected to continue to be in demand in the future: construction, building services and professional services. Jobs in the construction cluster include residential and commercial construction and electric power construction. Jobs in the building services cluster include parts of the real estate development and property management industries and services to buildings. Jobs in the professional services cluster include architects, engineers (electrical, mechanical and drafting) – these professions provide consulting services that facilitate the installation of energy efficiency products, processes and foster participation in programs by clients.¹⁶⁹

Over the longer term (for the period 2008 – 2018) future demand for high-level energy efficiency-related jobs in New York is projected to range from an increase of 13% in Training and Development Specialists, to a 10% decrease in General Managers and Operations. Future demand for mid-level energy efficiency jobs during this same period (2008-2018) ranges from an increase of 5% in job areas including HVAC, maintenance and repair, to a decrease of up to 10% in areas of weatherization installers and insulation workers. For entry-level energy efficiency-related jobs, future demand in New York State shows a slight decline, ranging from -1% to -11%, with the largest decline projected in the number of laborers and material movers. The construction industry, however, appears to have solid growth potential in the state for energy efficiency-related jobs. Construction trade jobs offer moderate to long-term on-the-job training and provide entry-level skills employment opportunities. Additionally, in 2012 three jobs in the construction industry – carpenters, construction laborers, and electricians – are listed in the top fifty jobs with the most openings in New York State, at 31st, 38th and 50th place respectively.¹⁷⁰

Among the challenges the energy efficiency industry will face in the coming years is employee retention, along with trends showing that workers often migrate to areas of job opportunities. Approximately 20% of the total number of the energy efficiency/weatherization and energy efficiency services and consulting jobs in all of New York State are located on Long Island, as are 12% of the entry-level, and 7% of the mid- to high-level skill training organizations. Given this number of energy efficiency jobs and training organization locations on Long Island, this report includes some quantification of relevant Long Island statistics.

with the maximum possible points in each area weighted by the magnitude of its potential energy savings impact. www.aceee.org > Publications.

¹⁶⁹ The New York City Labor Market Information Service, <http://www.urbanresearch.org/about/cur-components/new-york-city-labor-market-information-service-nyclmis>, along with the New York State Department of Labor, New York State Green Jobs Study, September 2011. New York State Department of Labor- Division of Research & Statistics. 2011. “*New York State Green Jobs Study, a Report for New York State*”.

<http://www.labor.ny.gov/stats/green/index.shtml>.

¹⁷⁰ America's Career Infonet, Occupation Profile for New York State 2008. <https://www.acinet.org>.

6.1.1.2 Job Types, Numbers and Locations¹⁷¹

In 2009, four industries accounted for nearly 72% of the energy efficiency-related jobs in New York State (including Long Island): HVAC (23%), Electrical Contracting (21%), Engineering Services (14%) and Commercial and Industrial Construction (14%).

Mid-to-high-level jobs accounted for 63% of all energy efficiency related jobs in New York in 2009. In that year, there were over 148,500 mid- to high-level energy efficiency services and consulting jobs in the State (47% upstate, 38% downstate and 15% in Long Island).

In total, there were more than 85,000 basic skills/entry-level weatherization and energy efficiency services jobs in the State in 2009 (40% upstate, 38% downstate and 22% in Long Island). Across these three regions, the greatest percent of entry-level jobs was found in the HVAC industry (over 53,000 jobs total – nearly 22,500 upstate, 20,500 downstate, and approximately 11,000 in Long Island).

6.1.1.3 Program-Targeted Jobs Quantification

The population of employers targeted for this market assessment was made up of companies that either support or directly provide building/contractor services (i.e., single/multifamily builders, commercial/office builders, HVAC contractors, other building equipment contractors, real estate developers and property managers), or engineering and consultant services (i.e., industrial and mechanical engineers, architects and other building design/construction consultants, HVAC engineers, energy conservation engineers and consultants, and lighting consultants and electrical contractors). A significant number of these firms (over 15,000) and jobs (over 130,000) fall within these business categories. However, a majority of these firms and jobs have little to no direct relationship with electric energy efficiency improvement efforts – the focus of NYSERDA’s Workforce Development Program.

The energy efficiency jobs targeted by the Workforce Development Program are concentrated in Single Family (14%), Multifamily (4%) and Commercial/Office Building (20%) construction – totaling nearly 8,500 firms across the State. Given the magnitude of this number, NYSERDA is wise to include this market actor group of employers as one of its program’s targeted areas. Other business categories targeted by NYSERDA’s Workforce Development Program include: architects and engineers, energy service companies, utilities and NYSERDA itself¹⁷² (all part of the contractors, engineers and consultants business categories).¹⁷³

¹⁷¹ Based on data gathered from 2009 US Census County Business Pattern data.

¹⁷² NYSERDA is provided here as an example of an organization, through whose actions, energy efficiency programs are designed, requests for proposals and program opportunity notices are issued and contractors are hired. In turn, these contractors hire additional employees to meet and implement program objectives. Similar to electric and gas utilities, NYSERDA also hires employees for energy efficiency program design, evaluation and management-related positions within its own organization.

¹⁷³ It is important to note that other business categories were also considered for inclusion within the refined targeted population for employers, including energy efficient equipment distributors, manufacturers, weatherization agencies and auditors. Based on input and discussion with NYSERDA program staff and others during the filtering process, distributors and manufacturers were removed from the sample since employees in these categories are not the target of NYSERDA’s Workforce Development training efforts. Weatherization agencies were also considered for inclusion in the final employer population sample, but eliminated primarily because these organizations will be the target of an upcoming PACE evaluation.

6.1.2 Employees (the Potential Program “Trainees”)

A key Workforce Development Program goal is to increase employment opportunities in entry-level skill and mid- to high-level skill energy-efficiency occupations in New York State. Focus is on the employer and industry types noted earlier, including contractors, energy services providers, architects and engineers, building operators, and facility managers for jobs in all areas of design, sales, installation, operation and maintenance of energy efficient technologies and services. In addition, the Public Service Commission approved \$2 million to provide energy efficiency training to low-income populations, in conjunction with the NYSDOL “pathways out of poverty” program to engage disadvantaged communities. As such, characterizing the types of employees that might be targeted for skills training to work in these energy efficiency-related jobs has been an important component of this MCA evaluation effort.

6.1.2.1 Educational Attainment

New York ranks 5th in the nation for the number of men and women with advanced degrees, 8th for those with Bachelors’ degrees, but only 34th for the number of high school graduates (just over 191,000 graduates from New York high schools in 2010).¹⁷⁴ Since, in most cases, employers are seeking workers with some relevant and current level of education and training, this means there are a significant number of high school graduates, and also those who have not earned a high school diploma, who could benefit from the entry-level/worker readiness skills training that NYSERDA’s Workforce Development Program has to offer.

As compared to other states across the country, New York residents 55 years and older represent a higher percentage of the State’s population with at least a high school diploma. With the exception of 15 to 24 year olds who are currently of high school and college age, the younger the population, the more likely they are to have some college, college or advanced degrees than their older counterparts. This means there are more potential employees in the pipeline with higher education and skill levels for mid- to high-level jobs than there are for entry-level jobs.

6.1.2.2 Aging Workforce

About 76 million baby boomers, born between 1946 and 1964, are approaching retirement age nationwide. Boomers make up nearly one-third of the U.S. workforce, and there is projected to be an insufficient number of younger workers to replace them. In 2010, the number of workers in the United States aged 35 to 44, or those typically moving into upper management, declined by 19%. Additionally, the number of workers aged 45 to 54 increased 21%, and the number of workers aged 55 to 64 increased by 52%.¹⁷⁵ Energy workers are becoming eligible to retire in large numbers, and the energy industry anticipates a labor shortage. For example, according to the Center for Energy Workforce Development, by the year 2012, more than half of all power plant workers and over 40% of power line workers and engineers could need to be replaced.

In 2000, the State had approximately equal numbers of residents under age 18 and over age 64. However, it is projected that by 2030, New York State will have nearly twice as many residents over age 64 as

¹⁷⁴ Projections of High School Graduates, The University of The State of New York, The New York State Education Department, Albany 2007-08 to 2018-19, www.highered.nysed.gov/oris/demographics/hsgprojections.pdf.

¹⁷⁵ Projections of High School Graduates, The University of The State of New York, The New York State Education Department, Albany 2007-08 to 2018-19, www.highered.nysed.gov/oris/demographics/hsgprojections.pdf.

under age 18. This means the population has been declining, and in the near future there will be fewer workers to fill jobs. The median age of New York's population is 37.4 years, while the median age of the State's workforce is 41.6 years (slightly older than that of the average U.S. workforce). Nearly 24% of the State's population is 55 years old or older, and over half (nearly 60%) of those aged 55 to 64 are employed.¹⁷⁶

Reports on the aging workforce show the energy and health care industries are already suffering from a skills shortage¹⁷⁷. Engineers and utility line workers are examples of job areas at risk of experiencing the consequences of a labor shortage. In addition, the National Association of Manufacturers predicts there will soon be a labor shortage in technical and scientific fields. This means that career opportunities will be coming available in the electric utility and other energy efficiency and related fields for job-seekers in the very near future:¹⁷⁸ These opportunities will include positions as energy auditors, pipe-fitters and pipe layers, electrical line installers and line-workers, generation technicians, power engineers, electrical, mechanical, civil and chemical engineers.

It is important to temper these opportunities by noting findings from a recent Pew Research national study regarding the views of those 18 to 24 years old and over 25 on education and training, the impact of the economy on their careers and how prepared they are for the future.¹⁷⁹ As identified in the study, young adults (ages 18 to 34) say that the sluggish economy has had an impact on a wide array of coming-of-age decisions including career and schooling. In addition, young adults have been hit hard by the recession and few view their current job as a "career." Most report that they don't have the education and training to attain career goals. Combined, these findings confirm a need for the Workforce Development to remain focused on providing outreach and training support to this younger group of potential employees.

6.1.2.3 Unemployed and Under-Employed

As of 2011, nearly 1.3 million people were unemployed in New York State (49.1% upstate, 50.9% downstate). This translates into an overall unemployment rate in the State of 8.6% (8.4% upstate and 8.8% downstate). During this most recent recession, men have lost more jobs than women (21% of men ages 16 to 24 were unemployed vs. 15% of women in August 2011). Over one-fifth of the State's unemployed population is made up of young minority men in their 20s.

It is important to note that the unemployment rate does not represent parts of the population that are discouraged and are no longer looking for work, as well as those that have not applied for or receive unemployment benefits. It also does not include part of the labor workforce that are working in jobs well below their skill levels or less than the number of desired hours or underemployed.¹⁸⁰ In 2010, the underemployment rate in New York was 14.9%. This is nearly seven percentage points higher than the

¹⁷⁶ Population Bulletin, U.S. Labor Force Trends, June 2008. www.prb.org/pdf08/63.2uslabor.pdf.

¹⁷⁷ An Aging Workforce's Effect on US Employers, Scott Reeves, Forbes Business Basics, September 29, 2005. www.forbes.com > Leadership > Careers.

¹⁷⁸ About.com: Energy, "Aging Workforce Creates Job Opportunities in Energy: Retiring Employees Will Need To Be Replaces Labor Shortage Expected", Wendy Lyons-SunShine, May 24, 2012. www.about.com.

¹⁷⁹ Pew Research Center, Social and Demographic Trends Report, "Young, Underemployed and Optimistic, coming of Age, Slowly, in a Tough Economy". February 9, 2012. <http://www.pewsocialtrends.org/2012/02/09/young-underemployed-and-optimistic/>.

¹⁸⁰ Partnership for Public Good, Policy Brief, April 2010. www.ppgbuffalo.org/new-policy-brief-on-buffalos-sprawl/.

State's unemployment rate and indicates the presence of a substantial population not represented in the traditional unemployment statistic.

6.1.2.4 Hard-to-Reach and Hard-to-Serve Populations

In 2010, over 2.5 million people (15% of the State's total population) were living at, or below the poverty level in New York (66% downstate and 34% upstate). The number of these individuals not included in labor force statistics (i.e., persons who are not working, not receiving unemployment benefits and are not actively looking for work) is substantial.¹⁸¹ Combined, those living at or below the poverty level, unemployed or underemployed, or not included in the labor force, make up what is defined as the hard-to-reach and hard-to-serve population.¹⁸² In New York State, this population represents an important target market for potential Workforce Development Programs and energy efficiency skills training. For the purpose of this analysis, poverty rate information was gathered that represents populations living at or below the 100% poverty threshold, defined by the US Census Bureau. Since NYSERDA defines poverty according to the HEAP guidelines, 60% of median income or below, our analysis presents a conservative estimate of poverty in New York State.

For this report, information on the hard-to-reach/hard-to-serve populations in New York State was separated into two age groups (16 to 24 year olds, and 25 to 64), and maps were developed to help quantify and assess the magnitude of this target population by county across the State. Comparing the population of individuals within these two age groupings that are currently unemployed (including persons who are not working, not receiving unemployment benefits and are not actively looking for work) with the same age group's population that is currently in the labor force (has jobs) it becomes clear that there is a large and broadly distributed population of hard-to-reach/hard-to-serve and unemployed workers in the state. More than 462,000 (42%) of the employed plus unemployed 16 to 24 year olds in upstate New York are not in the labor force, over 500,000 (52%) downstate, and nearly 250,000 (57%) on Long Island. For the population of 25 to 64 year olds that are not in the labor force: 969,000 (26%) upstate, over 1,089,000 (23%) downstate, and nearly 208,000 (16%) in Long Island.

Allegany, Essex, St. Lawrence, Oswego, Chemung, Franklin, and Fulton counties have the highest poverty rates among 16 to 24 year olds. Upstate counties with the greatest percent of unemployed 16 to 24 year olds include: Schuyler, St. Lawrence, Greene, Rockland and Cortland. Bronx and Kings Counties have the highest percent of hard-to-reach/hard-to-serve populations in the downstate region, followed by Queens, New York and Richmond Counties. New York County represents the greatest downstate population of unemployed 16 to 24 year olds. In fact, all of the downstate counties appear in the top twenty counties State-wide with the highest population of hard-to-reach/hard-to-serve 16 to 24 year olds.

Livingston, Fulton, Oswego, Chautauqua, Allegany, Franklin, Wyoming, St. Lawrence, Orleans and Seneca counties have the highest poverty rates among 25 to 64 year olds. St. Lawrence and Orleans counties have the greatest percent of 25 to 64 year olds not in the workforce (unemployed). While all of the downstate counties appear in the top twenty counties with the highest percent of populations at, or below the poverty level, Bronx, Kings and New York have a greater percent of this target population than

¹⁸¹ Data available for economically disadvantaged population includes information on ages 16 to 24 years and ages 25 to 64 years.

¹⁸² Food Policy Research Institute, *Living Life: Overlooked Aspects of Urban Employment*. www.ifpri.org/sites/default/files/publications/fcnbr171.pdf.

Queens and Richmond. Among all the downstate counties, New York County has the greatest percent of unemployed 25 to 64 year olds.

6.1.3 Training Organizations

Training is a significant component of the Workforce Development Program and is designed to help build energy efficiency knowledge and skills among new and potential job entrants, trades people and professionals who work, or have a desire to work in energy-related jobs and industries. For this report, training organizations have been separated into groups that provide mainly entry-level skills training, or those that provide mid- to high-level training and related support services.

6.1.3.1 Entry-Level Training

As of March 1, 2012, of the 175 total entry-level training locations in New York State, 25% (44) are current partners in NYSERDA's Workforce Development Program. Thirty-eight of the entry-level Training Partners (over 86%) are Vocational/Cooperative training organizations. These vocational/cooperative training organizations however, represent only 38% (67 of 175) of the total entry-level training locations identified in New York State. Eleven percent (5) of the contracted training partners are Community Based and Weatherization agencies, accounting for 47% of the State's total identified entry-level training locations.

Unions have also been identified as offering entry level skills training and represent 14% of the State's entry-level skills-based training locations. None of these union training organizations, however, have been contracted with NYSERDA to provide entry-level skills training.

With 75% of the State's total entry-level training locations not yet participating, there may be opportunity to increase the number of training partners contracted as part of NYSERDA's Workforce Development Program, if demand exists and program staff deems program expansion appropriate.

6.1.3.2 Mid- to High-Level Training

As of March 1, 2012, a total of 100 mid- to high-level training organizations have been identified in the State, including those already under contract with NYSERDA. These organizations represent a mix of colleges, union training, industry associations, industry training and certification programs and consultants. Of these, 29 (29%) are located downstate, 63 (63%) are upstate and 8 (8%) are located in Long Island. Forty-four percent (44) of these 100 mid- to high-level skills training organizations are contracted with NYSERDA as Workforce Development training partners. Of these contracted organizations, 66% are located upstate, 32% downstate, and approximately 2% in Long Island. Additionally, two NYSERDA contracted Workforce Development Training Partners are located out of State. With 56% of the total organizations in New York State not yet contracted by NYSERDA, there is an opportunity to increase the number of mid- to high-level contracted Training Partners across the State.

6.1.3.3 Linkage between Training Organizations and Targeted Employee (Trainee) Groups

To provide some insight into alignment of training locations with targeted employee groups, included in Section 4 of this report, a series of maps were presented that overlaid county-specific locations of training organizations against targeted hard-to-reach/hard-to-serve populations. These maps were presented separately for upstate and downstate regions, and for targeted populations aged 16 to 24 years old and 25 to 64 years old. Results showed a number of upstate counties where there was a greater percentage of hard-to-reach/serve populations than there were training locations to serve them. These counties included: St. Lawrence, Allegany, Essex, Jefferson, Chautauqua, Franklin, Fulton, Montgomery and Steuben. Similarly downstate, there appears to be a shortage of training locations in Kings, Bronx and New York Counties. Developing additional Program partner training resources in these counties, if

demand for their services truly exists, could provide important supplemental career pathways out of poverty or this hard-to-reach/underserved population group.

6.2 MARKET ASSESSMENT FINDINGS

This section summarizes key findings from the above market assessment efforts where key program and market assessment indicators were examined for NYSERDA's Workforce Development Program as it related to two key market actor groups: 1) Employers, and 2) Training Organizations.

6.2.1 Employers

The population of employers targeted for this market assessment was made up of companies located within New York that have employees or hire contractors who perform jobs that are directly or indirectly involved with energy efficient building construction or the design, specification, delivery, installation, or servicing of electric energy using products or equipment within homes or businesses in the State. Such companies could either *support or directly provide*: (1) building/contractor services (i.e., single/multifamily builders, commercial/office builders, HVAC contractors, other building equipment contractors, real estate developers and property managers), or (2) engineering and consultant services (i.e., industrial and mechanical engineers, building construction consultants, HVAC engineers, energy conservation engineers and consultants, and lighting consultants and electrical contractors). These company categories were chosen because they tend to have a higher concentration of energy efficiency related jobs, as documented by the NYSDOL Green Jobs and Brookings Reports.

The types of information gathered through telephone surveys with this market actor group included:¹⁸³

- Energy efficiency workforce skills
- General awareness of job skills-related training
- Training infrastructure awareness and satisfaction
- Energy efficiency employment plans and practices
- Awareness of NYSERDA and/or broader workforce development efforts
- Participation in other SBC-funded initiatives

6.2.1.1 Energy Efficiency Workforce Skills baseline

Involvement with Energy Efficiency Activities

Heating, Ventilation and Air Conditioning (HVAC) contractors, along with Engineers and Consultants, and Builders appear to have the greatest percentage of employees involved in energy efficiency. Eighty-one percent of HVAC firms reported that more than 40% of their employees are involved with energy efficiency activities. Engineers and Consulting firms and Builder also noted high percentages of their employees involved with energy efficiency activities, with 58% and 48% respectively noting that more than 40% of their employees are engaged in such work. These same employer types reported high

¹⁸³ It is important to note that there was a limited budget for implementing the employer telephone survey component of this Workforce Development Program market characterization and assessment (MCA) effort – \$15,000 of a total \$150,000 MCA project budget. A major objective of this employer telephone survey, therefore, was to collect baseline information from targeted groups of businesses that might make use of the program's training support activities.

percentages of their company's work as being energy efficiency related. Sixty-six percent of HVAC respondents noted that more than 40% of their firm's work could be categorized as energy efficiency-related. A majority of Engineering and Consulting firms (51%) and Builder respondents (38%) also responded this way.

Although firms report having solid levels of involvement with energy efficiency activities, there remains a substantial percentage where energy efficiency activities represent 10% or less of their company's previous year activities (39% of responding Engineers/Consultants, 37% of the Builders and 55% of the Real Estate Developers/Property Managers). This may be a potential area of focus for NYSERDA's efforts, where these three employer groups could be targeted with information regarding the value of including energy efficiency as part of their work products and services.

Similarly, although a majority of HVAC (68%) and Engineers/Consultants (57%) reported having a lot of experience with energy efficiency-related work, there remains a still substantial percentage of respondents claiming "no," "not much" or only "some" experience. Therefore, it appears that there remains a large market (65% of Builders, 56% of Real Estate Developers/Property Managers, 42% of Engineers/Consultants, and 32% of HVAC Contractors) for additional skills development and training opportunities.

When asked if their companies attended (or sent employees to) any job training courses related to energy efficiency in the last 12 months, responses given indicate there remains a substantial number of companies in the State that have yet to take advantage of such trainings (46% of HVAC contractors, 55% of Engineers/Consultants and nearly 90% of Builders).

Types of Skilled and Unskilled Positions Being Hired

Entry-level jobs (positions being hired) vary depending on the type of service industry sector assessed (i.e., Builders, HVAC Contractors, Engineers and Consultants, or Real Estate Developers and Property Managers). For the Builders sector, laborer jobs are the most common positions being hired, followed by entry-level office support (100% and 36% respectively). HVAC contractors, residential and commercial construction jobs are the most common entry-level positions being hired (35% and 32% respectively). Engineers and Consultants identify entry-level office support and commercial construction positions most often, 59% and 48% respectively. One hundred percent of Real Estate Developer and Property Managers respondents identified entry-level office support as the most common unskilled position they hire (78% administrative/clerical).

Regarding skilled positions, respondents representing building firms identified residential construction, building shell improvement and electrical contractor positions as the most common they have filled (64%, 47% and 47% respectively). For HVAC contractors, mechanical and other equipment installation positions (61% and 54% respectively). Engineer and Consultant respondents identified energy consultant and building shell improvement positions as the most common skilled job types they have hired (67% and 46% respectively). Sixty-seven percent of Real Estate Developers and Property Managers identify architectural and engineering service jobs as the most common energy efficiency-related skilled positions filled.

Energy Efficiency-Specific Hiring Practices

In the last 12 months, 26% of engineering/consulting firms, 11% of building firms, 6% of HVAC firms, and 67% of the limited and targeted sample of Real Estate Development and Property Management respondents reported hiring new employees for one or more energy efficiency-related positions. The primary source for finding these new employees varied by company type. Word-of-mouth was the most common source for Builders and HVAC contractors (62% and 61% respectively). Whereas, Engineers/Consultants and Real Estate Developers/Property Managers relied more on ads and internal job postings (44% each). Other sources offered by respondents were general web postings, internships and unions.

Of companies that hired employees for new energy efficiency positions in the last 12 months, a majority of respondents said it was either “somewhat difficult” or “very difficult” to find these new energy efficiency-skilled employees (100% of HVAC respondents, 80% of Real Estate Developers/Property Managers, 72% of Engineers/Consultants, and 62% of Builders). This group was also asked what percent of their skilled and unskilled employees needed additional training.

With respect to unskilled employees, most respondents felt that less than half their entry level (unskilled) employees in energy efficiency-related positions need more training (80% of Real Estate Developers/Property Managers, 70% of Builders, 62% HVAC and 60% of Engineers/Consultants). Similarly for skilled positions, most respondents said that less than half their skilled employees in energy efficiency-related positions needed additional training (82% of Builders, 80% of Real Estate Developers/Property Managers, 64% of Engineers/Consultants, and 38% of HVAC). Interestingly however, 63% of HVAC respondents estimated that more than half of these employees needed such training, followed by 36% of Engineers/Consultants, 20% of Real Estate Developers/Property Managers, and 18% of Builders. This could confirm that a demand exists for additional higher-level energy efficiency job skills training, especially among HVAC employees. A similar conclusion for entry-level training can be reached given the fact that 34% of Engineers/Consultants, 30% of Builders, and 28% of HVAC contractor respondents identified a need for such training for a large majority of their employees.

Hiring Practices – Hard-to-Reach and Underserved Populations

Respondents were asked a number of questions regarding hiring and employment practices associated with hard-to-reach and underserved populations (defined earlier in this report). Results showed that 75% of Real Estate Development and Property Management firms, 56% of Engineering/Consulting firms, 49% of Builders and 40% of HVAC respondents noted hiring from these populations.

Of those respondents that noted hiring employees from these populations, an overwhelming percentage found these new hires either “somewhat prepared” or “very prepared” (100% of Real Estate Development and Property Management respondents, 91% of Engineers/Consultants, 86% of Builders, and 75% of HVAC contractors).

When asked what percentage of their companies’ employees fell into one or more of these population groups, Engineers/Consultants had the highest percentage (with 30% of respondents saying that more than 20% of their employees were from these populations). This was followed by Builders (27%), Real Estate Developers/Property Managers (17%), and HVAC (13%).

6.2.1.2 General Awareness of Job-Skills Related Training

Respondents were read a list of job skills training programs in the State including: worker readiness, vocational and technical, sector-based (such as building science and whole-house approach), advanced technical training (including lighting design and retrofits, heat pumps, energy management systems, indoor air quality and ventilation, advanced insulation and air sealing, and commercial cooling systems), and training to address certification and accreditation needs. Awareness of these types of programs is high, especially amongst Engineers/Consultants and Real Estate Developers/Property Manager respondents. The lowest area of awareness among respondents was sector-based training. This could be due to a lack of understanding of what sector-based training is and could identify an opportunity area for more targeted outreach and support.

A similar question was asked of respondents regarding internships, apprenticeships and other on-the-job training opportunities in the State. Again, respondents reported fairly high levels of awareness for these types of programs – ranging from 39% to 59% for HVAC Contractors, Builders and Engineers/Consultants to 100% for Real Estate Developers and Property Managers.

6.2.1.3 Training Infrastructure Usage and Satisfaction

Usage of New York's Energy Efficiency Training Infrastructure

Except for the limited/targeted number of large Real Estate Developer/Property Management respondents (where responses ranged from 33% to 100% usage), usage levels were quite low among Builders, HVAC and Engineer/Consulting respondents (ranging from 3% to 33%). Builders tended to be the respondent group that reported using training programs the least, making them an excellent target for more of the Program's outreach and awareness efforts.

Participation in one or more skills-based or on-the-job type training program across respondent company types was fairly low. For skills-based trainings, only the Engineers/Consultant respondents answered that more than 50% of their employees participated in these types of skills-based trainings. Similar low employee participation levels existed across all respondent companies for on-the-job training programs. One reason for low training program participation could be lack of importance for such training on behalf of the hiring employer. However, for both unskilled (entry-level) and skilled (mid- to high-level) positions, sufficient training was identified as an important factor respondent companies consider when making their hiring decisions. This means that there must be some other factor(s), beyond lack of importance that is resulting in low levels of participation in the State's training programs among employers. Based on survey responses, the following additional factors were identified, and vary by service industry type.

Factors resulting in low levels of training program participation among Builders include lack of information about the training opportunities (46% identified this as the most significant reason). The second and third most common reasons among Builder respondents were lack of financial aid and high cost of the training programs (44% and 41% respectively). For HVAC Contractors, the top three reasons for limited employee participation were time constraints (52%), high cost (33%) and lack of information (29%). Time constraints, lack of demand and high costs were the highest rated reasons for Engineers/Consultant respondents (27%, 24% and 23% respectively). Finally, for Real Estate Developers and Property Managers, lack of financial aid was the highest rated reason (at 33%). Targeting outreach efforts to each of the company types that these respondent groups represent, with messages that address their individual highest priority reasons for limited participation could help improve the uptake and effectiveness of these important training programs. For example, focused outreach to Builders regarding the availability of incentives, and the value of incorporating energy efficiency practices and measures into their business strategies could help to increase their awareness and interest in sending employees to training programs, or hiring employees that have energy efficiency-related skills.

Satisfaction with New York's Energy Efficiency Training Infrastructure

Although only a small number of respondents reported participating in training programs, in general, these respondents overwhelmingly felt the trainings provided were very or somewhat valuable. When asked to suggest ways to increase the value of energy efficiency training programs in New York State, these same respondents made a number of recommendations including: "make training hands on, specific and targeted," "advertise training opportunities to increase awareness," "subsidize the cost and incent companies to send employees for training," "make more funds available," and "introduce this to unions in New York, because New York is a big union state."

6.2.1.4 Energy Efficiency Employment Plans and Practices

Likelihood of Hiring New Energy Efficiency-Related Positions

According to responses from this project's interviews with the Program's targeted employer groups (Builders, HVAC Contractors, Engineers/Consultants and Real Estate Developers /Property Managers), the short-term outlook for hiring more employees for energy efficiency related positions appears limited. Only the Engineering/Consulting firms had more than half of its respondents (58%) indicate that their

companies are either somewhat or very likely to hire employees for energy efficiency related positions. Less than half of all other respondent groups felt this way (44% Real Estate Developer/Property Managers, 43% HVAC, and 36% of the Builders). These survey responses do not reflect recent New York City legislation and other public policy initiatives that might accelerate energy efficiency activities and increase the need for skilled energy efficiency employees.

The top four job areas where respondents thought their companies might be planning to increase their energy efficiency hiring were HVAC Installation/Technicians (19 responses), Energy Conservation Consultant (9 responses), Installation, Maintenance and Repair (8 responses), and Skilled Commercial Construction (7 responses). Other job areas mentioned include energy conservation consulting, installation, maintenance and repair workers, skilled residential, plumbers, project managers, consultants, professional workers, skilled data analysts, skilled energy efficiency trainers, skilled lighting designers and energy auditors. This information might be useful in guiding the focus of energy efficiency-related job training programs over the next few years.

Barriers Preventing Companies from Hiring More Energy Efficiency-Related Employees

The most common barrier to hiring more energy efficiency-related employees varied, somewhat, by respondent company type. For Builders, work flow (the current and near future demand for their services) was identified as the most common barrier (26%), followed by money/cost (22%). For HVAC respondents, money/cost was identified as the most common barrier (25%), followed by work flow (17%). Engineers and Consultants also identified money/cost and work flow as the two most common barriers (13% and 8% respectively). For Real Estate Developers and Property Managers, no demand or need was identified as the most common barriers (44%), followed by money/cost (22%).

6.2.1.5 Awareness of NYSERDA and/or Broader Workforce Development Efforts

Awareness of NYSERDA and its Energy Efficiency Training Efforts

Awareness of NYSERDA is high among those surveyed, ranging from 56% for Builders to 88% for Engineers/Consultants. But there still remains room for additional outreach, especially with Builders and Real Estate Developers, among whom 44% and 33% respectively, are still unaware. Awareness of NYSERDA's support efforts in the areas of basic skills development through advanced-level energy efficiency training and certifications was substantially lower than awareness of NYSERDA alone. For Engineers and Consultants, only 58% of respondents reported awareness of the training efforts vs. 88% that were aware of NYSERDA in general. The drop off in awareness was even more dramatic for HVAC, Builders and Real Estate Developers/Property Managers (37%, 18% and 0% respectively vs. 83%, 56% and 67% general NYSERDA awareness).

To assess the degree of familiarity with NYSERDA's energy efficiency training support, rather than just asking a yes/no-type question regarding awareness, respondents were also asked to rate their level of familiarity – from “not at all familiar,” to “very familiar.” The level of familiarity among those that were aware of NYSERDA's training support is quite low with only 21% of Engineers/Consultant respondents saying they were “very familiar.” Familiarity was lower still for Builders and HVAC Contractors, at 3% and 1% respectively. Although this finding is not unexpected since NYSERDA's support for training has been behind the scenes, and participants were not aware of NYSERDA's role. However, if NYSERDA wants to improve awareness of their training support efforts, additional outreach highlighting NYSERDA and its training support services will be necessary.

When asked how they heard about NYSERDA's energy efficiency training support, previous participation in NYSERDA sponsored training was the most frequent response (10), followed by networking (9) and NYSERDA's web site (8). Other sources included: direct/live marketing, indirect marketing, internet ads, print ads, through one of the company's employees who was a past Workforce

Development Program participant, and vendors and utilities. Although the number of aware respondents was small, if desired, this information can be used to help identify potentially effective outreach strategies for increasing awareness and familiarity of NYSERDA's services and support for training.

Awareness of and Satisfaction with Other Energy Efficiency Training Efforts

Awareness of other energy efficiency focused training programs in New York State, where students can go to develop basic job skills or receive advanced skills training in the field of energy efficiency, is low (39% among Engineers/Consultants, 26% HVAC, and 22% for Builders). This is consistent with awareness levels identified regarding NYSERDA-supported training efforts and could point to an opportunity to achieve additional Program uptake through increased outreach. The one exception to this low awareness level was with the limited/targeted group of Real Estate Developers and Property Managers where 78% of respondents noted awareness of these programs.

Concerning satisfaction with the availability of conveniently accessible energy efficiency-related training programs in their company's general geographic area, a majority of respondents noted that they were either "somewhat satisfied" or "very satisfied" (67% of Real Estate Developers/Property Managers, 59% of HVAC Contractors, 54% of Engineers/Consultants, and 48% of Builders). These responses suggest, however, that there remains substantial opportunity for improvement. To summarize, suggestions offered to improve satisfaction included: providing more information/awareness, offering more time slots and increasing availability, providing more local/accessible sites, and making training for affordable or increasing available funding.

6.2.1.6 Participation in Other NYSERDA and New York State Utility-Funded Initiatives

Slightly more than half the HVAC Contractors (52%) and Engineers/Consultants (54%), and 78% of the Real Estate Developers/Property Managers reported having worked with NYSERDA or other New York utilities on energy efficiency projects. Only 18% of the Builders interviewed said they had done so. This means there remains a substantial population of Builders (79%) and nearly half of the HVAC Contractors and Engineers/Consultants that have not taken advantage of any of the available NYSERDA or utility energy efficiency program support. When asked to identify the specific programs they participated in, most recalled Con Edison or NYSERDA in general, or their specific FlexTech and Existing Facilities initiatives.

6.2.2 Training Organizations

The population targeted for this market assessment was made up of training organizations not currently under contract with NYSERDA as Workforce Development Program training partners. These organizations may, or may not currently include energy efficiency components within their training efforts, but are all viewed as having the potential to include these components in the future.

The types of information gathered through telephone surveys with this market actor group included:

- Training practices – types offered, energy efficiency inclusion, tuition aid offered/used, hard-to-serve/underserved populations trained, pre-training interest in energy efficiency, barriers to expansion of existing and development of new training efforts, need for more energy efficiency materials and training venues
- Training trends and plans – assess change in demand for energy efficiency training, drivers of change, planned response to change
- Trainee interest in energy efficiency – post training (from training organization perspective)
- Energy efficiency employment placement and opportunities for trainees – jobs found, job types, specific training organization outreach and trainee placement activities, job opportunity trends

- Awareness of NYSERDA and/or broader energy efficiency training infrastructure and associated workforce development efforts – general awareness, source of awareness and level of awareness

6.2.2.1 Firmographics and Training Practices

Training Organization Firmographics

Forty-one training organizations participated in these market assessment telephone surveys including 28 entry-level, and 13 mid- to high-level organizations. A majority of these organizations report having only one single location (68% of entry-level and 60% of mid- to high-level training organizations). Of those organizations having more than one location, 30% of the entry-level respondents report having two to four locations with none reporting having five or more, and 14% of the mid- to high-level organizations report having three locations and the remainder (36%) report having between 5 and 13 locations.

When asked approximately how many training classes respondent organizations offered across all their New York locations during the past twelve months, a majority of entry-level respondents offered 20 or less (28% offered between 5 and 20 classes and 40% report offering less than 5). The mid- to high-level training organization respondents typically offered 21 or more classes (26% offered over 100, 14% offered between 51 and 100, and 24% offered between 21 and 50 classes last year).

Respondents were asked to estimate the number of job placements made by their organizations statewide over the past 12 months. They were also asked, of those job placements, how many were for energy efficiency-related positions. A majority, 64% of both entry-level and mid- to high-level respondents said they had 20 or fewer job placements over the past 12 months. Of those job placements, most were not in energy efficiency-related positions. The mid- to high-level training organizations reported having made more energy efficiency-related job placements than the entry-level respondents (42% of mid- to high-level respondents report making 21 or more of such placements during the past 12 months vs. only 16% of the entry-level respondents).

Skills and Areas of Training Offered

Respondents were asked to identify the types of skills and areas that their organizations offer training in. The top four offerings among entry-level training respondents were worker readiness (90%), certification/ accreditation (83%), and sector training (78%) and vocational/ technical skills (76%). For mid- to high-level training organizations, 100% offered certification/ accreditation training, 93% offered sector training, and 82% offered advanced technical and vocational/ technical skills training. For each type of training offered, respondents were asked how often they included energy efficiency elements within their training materials.

For entry-level training organizations, a majority of respondents state their materials either “sometimes” or “always” include energy efficiency elements. This is most prevalent with field training and sector training (where 78% and 64% believe these elements are “always” included). However, there remains a large percentage, across all entry-level training types, where energy efficiency elements are lacking. For mid- to high-level training organizations, a majority of respondents believed that energy efficiency elements are “always” incorporated within training activities (from 53% for train-the-trainer activities, to 88% for sector trainings). Looking across both “sometimes” and “always” responses, nearly all training activities received responses that added to 100% of the time. One exception is with worker readiness training, for which respondents state only 42% “always” and 48% “sometimes” include energy efficiency elements (and just under 10% “never” include such elements).

Based on these results, there appears to be great opportunities to work with entry-level training organizations to explain the value and need for incorporating energy efficiency elements into their training materials, than exists for mid- to high-level organizations. One reason for this need for entry-level training organization support could be the substantial reduction in DOL funding in recent years for

additional entry-level training support. A closer look at the actual materials being incorporated into these higher level training activities might reveal a need of outreach to this mid- to high-level group as well.

Potential Factors Motivating New Trainees to Learn Energy Efficiency Job Skills

According to entry-level training organization respondents, the top three factors motivating or driving new trainees to come to learn energy efficiency-related job skills include: 1) a perceived need for more skilled workers for energy efficiency jobs in New York (55%), 2) a general increased awareness and demand for energy efficient products and services (50%), and 3) an existing employer (for trainees currently employed) request they take training (48%). When asked which of these factors was the single most important reason new trainees may be interested in learning energy efficiency related skills, respondents identified the existing employer request item as the major reason.

The top three motivators noted by mid- to high-level training organization respondents were: 1) an existing employers' (for trainees currently employed) request they take training (89%), 2) a general increased awareness and demand for energy efficient products and services (82%), and 3) a perceived need for more skilled workers for energy efficiency jobs in New York (73%). Availability of training/tuition subsidies was also mentioned as a major motivator by 51% of respondents. When asked which was the single most important reason, respondents training/tuition subsidies as the major factor.

Potential Factors Limiting Organizations' Ability to Expand Energy Efficiency Training

According to entry-level respondents, the top three factors that might be limiting their training organizations' ability to maintain or expand training programs that include energy efficiency-related components included: a lack of funding to hire and train trainers (59%), lack of financial aid (48%), and other topics have higher priority (29%). The top three items identified as not being factors at all included: "too many competing organizations offering similar training programs" (61% said this was not at all a factor), "lack of demand for energy efficiency-related training services" (58% said this was not at all a factor), and "lack of qualified trainers available" (53% said this was not a factor).

The top three major factors identified by the mid- to high-level skill training organizations respondents were: 1) lack of financial aid (58%), 2) too many competing organizations offering similar training programs (49%) and 3) lack of funding to hire and train trainers (40%). Similar to the entry-level respondents, neither "lack of demand" nor "lack of qualified trainers," were identified as factors at all (40% and 30% respectively said these were "not a factor").

The single most important factor limiting both entry-level and mid- to high-level training organizations' ability to maintain or expand training programs that include energy efficiency-related components was "lack of available funding to hire and train trainers" (57% and 40% respectively). These responses can help to focus the Program's attention on addressing the barriers and issues, and help determine the most effective course of action. .

Importance of Energy Efficiency-Related Training Materials

When asked to rate the importance of having energy efficiency-related training materials (including curricula) available for their organizations' use, both entry- level and mid- to high-level training organization respondents rated the importance of having these materials as at least moderately high (86% and 87% respectively).

Training Promotion Approaches

For entry-level training organizations, presentations to potential trainees or organizations representing such trainees, and referrals or relationships with NYSDOL One Stop Career Centers were identified as being the most effective approaches being used to promote their training programs (34% and 27% respectively).¹⁸⁴ Web sites and print ads were seen as the least effective (54% and 42% respectively).

For the mid- to high-level training respondents, similar to entry-level, presentations were identified as the most effective approach for promoting their training programs (58%). However, although identified as being the least effective promotion approach for entry-level organizations, web sites were identified as being an extremely effective approach for the mid- to high-level respondents (51%). Print ads were identified by this group, similar to entry-level respondents, as being the least effective (53%).

Targeted Training Audiences – Hard-to-Reach and Underserved Populations

Respondents were asked a series of questions relating to their organization's training activities for groups of hard-to-reach and underserved populations.¹⁸⁵

Less than half (45% entry-level and 36% mid- to high-level) of the training organization respondents said that their organizations specifically targeted any of these hard-to-reach and underserved populations for training that includes energy efficiency components. This means there remains a large portion of this hard-to-reach and underserved population that could be targeted for energy efficiency training.

Of those respondents that stated they did target these populations, the top three groups identified by entry-level training organization respondents were "the unemployed" (81%), "previously incarcerated" and "18 to 24 year olds" (49% each). For mid- to high-level respondents, the top two responses were "18 to 24 year olds" (81%) and "disabled veterans" (37%). The top two course types identified by entry-level respondents as being offered to these targeted populations were "worker readiness" (32%) and "weatherization" (24%). For mid- to high-level respondents, "apprenticeships" was the most reported course type (63%), followed by "weatherization" and "energy auditing, building analysis and multi-family auditing" at 19% each.

When asked what percentage of their courses' total number of trainees came from each of the targeted hard-to-reach and underserved populations, entry-level respondents said the 81% of "unemployed," 59% of "18-24 year olds," and 32% of "previously incarcerated" populations fell into the "20% or more category." This is consistent with the populations targeted for these classes. For mid- to high-level respondents, 81% of "18 to 24 year old" and 31% of the "unemployed" populations fell into the "20% or more category." When compared against the targeted populations, it is noteworthy to see that "disabled

¹⁸⁴ New York State, Department of Labor One Stop Career Centers protects workers, assist the unemployed, and connect job seekers to jobs. The Department of Labor has information and free services for job seekers and workers. One Stop's offer resume help, career guidance, job placement training and apprenticeships.

¹⁸⁵ Hard to Reach and Serve populations, for the purpose of this study are defined as disadvantaged populations and those living at or below the poverty level in New York State, The definition of disadvantaged workers are individuals at least 17 years of age that fall within one of the following two categories: unemployed workers and incumbent workers. Within these two categories a wide variety of population groups exist, including individuals with barriers to employment, such as limited English proficiency; youth 17 years of age and older who have dropped out of school and are seeking employment; persons with disabilities; and ex-offenders. In-school high school students and other students enrolled in secondary education programs are not included in this definition. Included in the definition of unemployed are those groups who are underemployed, or not included in the labor force.

veterans” are not mentioned as one of the populations that fell into the “20% or more” category – meaning that additional outreach to this hard-to-reach population group might be necessary.

Finally, regarding the hard-to-reach and underserved populations, respondents were asked, prior to participation in their organizations training programs, to assess how aware they thought that people from these groups were about employment opportunities in an energy efficiency-related field. Awareness of employment opportunities in energy efficiency varied greatly among these potential trainee populations. Perceived awareness was very low across both the energy-level and mid- to high-level training organization respondents, with only 8% of entry-level respondents and 0% of the mid- to high-level respondents saying “very aware.” Given that these populations are considered “hard-to-reach,” this result is not surprising. However, it does suggest that additional efforts should be made to increase awareness among these groups if the Program is to succeed in its efforts to serve these populations.

Financial Aid Offerings, Sources and Utilization

Overall, 27% of training organizations offer financial aid to individuals who may not otherwise be able to afford training (28% entry level, 24% of mid-to high-level).

The most common source of financial aid for entry-level training came from federal or state funding (48%) Federal and State funding was also the most common source of financing noted by mid-to high-level respondents,(27%) Forty percent of the entry-level and 27% of the mid- to high-level respondents also said that the aid came directly from the training organization itself. Another source, identified by 45% of the mid- to high-level respondents was a “joint labor management fund.”

A majority of students from both entry and mid-to high-level training organizations receive financial aid. When asked what percent of trainees receive financial aid, 76% of entry-level skill training organizations, and 73% of mid- to high-level skill training organization respondents estimated that between 76% to 100% of their students receive financial aid.

6.2.2.2 Training Trends and Plans

Need for Additional Energy Efficiency Trainings

A large majority of respondents believe that there is a need for additional energy efficiency training opportunities in the area(s) their organizations serve (93% of mid- to high-level and 73% of entry-level respondents). The most common reason why respondents felt this way was that there was “not enough training to meet demand” (51% entry-level, 18% mid- to high-level).

When asked if more students were brought to their organization, would they be able to handle the increased demand, 100% of the mid- to high-level training organizations said “yes.” However, less than half (45%) of the entry-level respondents said “yes” and 40% of them said “no.” This means that additional training infrastructure development support may be needed within the entry-level organizations for sufficient supply to be maintained to meet the Program’s anticipated increased demand for energy efficiency training opportunities among basic skills/new job entrants. As noted previously, one reason for this greater need for entry-level training organization support could be due to a substantial reduction in funding from the NYSDOL in recent years to support additional training.

Changes in the Number of Training Requests of Last 12 Months

Looking across both entry-level and mid- to high-level respondents, increased demand has been seen within every training type. Greatest increases were in requests for internships and apprenticeships (69%), followed by advanced technical training (62%), training to meet certification/accreditation needs (60%) and for vocational/technical skills (58%). Interestingly, a number of respondents also reported “no change” or even a decrease in requests for their training services – especially in the “train-the-trainer” area for entry-level organizations (65% reported “no change”), and the “sector-based training” area for mid- to high-level organizations (40% reported seeing a “decrease” in training requests).

Respondents who indicated requests increased for at least one of their organizations training programs where asked specifically how much of a factor “employer requests” have been in driving this increase, and 58% of mid- to high-level and 49% of entry-level said it was a “major factor.”

Likelihood of Expansion or Development of New Training Programs

Seventy-six percent of the mid- to high-level and 54% of the entry-level respondents said they were “very likely” to expand or develop new training programs to meet increased demand they have seen in the last 12 months. Interestingly, 27% of the entry-level respondents said they were “not likely” to expand. For those that said they were not likely to expand, reasons for this response included: budget constraints, insufficient increase in demand, and lack of jobs for trainees to move into.

Trainee Interest in Energy Efficiency – Post Training

Looking across all training organization respondents, there appears to be a high level of interest among their graduated trainees in energy efficiency-related jobs.

The percent of entry-level skill trainees interested in seeking or continuing energy efficiency-related employment ranged from a low of 47% (worker readiness trainees) to a high of 69% (field training trainees). Respondents whose organizations offered worker readiness training, reported the greatest percent of trainees “not interested” (27%) in energy efficiency-related employment.¹⁸⁶ This potentially identifies an area where NYSERDA’s Workforce Development Program could provide additional information regarding the benefits and opportunities available for trainees that exist within the energy efficiency jobs field.

The percent of mid- to high-level respondents that said their organizations’ graduating trainees were interested in seeking or continuing employment in an energy efficiency-related field was quite high, ranging from 76% (internship or apprenticeship trainees) to 100% (advanced technical trainees). Respondents whose organizations offered internship training reported the greatest percent of trainees “not interested” (24%) in energy efficiency-related employment. This suggests that a closer look at the internship and apprenticeship positions might be needed.

6.2.2.3 Energy Efficiency Employment Placement and Opportunities

Trainees Finding Employment in Energy Efficiency-Related Fields

A majority of respondents believe that of their organizations’ trainees not employed previously in an energy efficiency-related field; 73% mid- to high-level and 58% of entry-level respondents were able to find jobs in this field in the last 12 months. Positions that respondents believe these trainees were hired into included jobs in the areas of office support, various skill levels of construction, equipment installation and repair. These job types have been identified as growing occupations by the US Census and NYSDOL Green Jobs Report. Positions in “building shell improvement” were mentioned most by both entry-level and mid- to high-level respondents as a job type where trainees have found employment (85% mid/high and 74% entry), followed by “equipment installation, maintenance and repair” (82% mid/high and 58% entry). For mid- to high-level respondents, other common job types included “HVAC installation/technician” (76%) and “general residential construction/skilled” and general commercial construction/skilled” (73% each).

¹⁸⁶ Note – the “not interested” category includes “not too interested” and “don’t know” responses.

Internships and Job Placement Arrangements

Only 29% of mid- to high-level and 17% of entry-level respondents said that their organizations have specific internships or job placement arrangements with businesses or organizations involved in the energy efficiency field. Since employers often look for experience and frequently hire interns for permanent employment, the fact that most training organizations do not have active internship or job placement arrangements with business in the State provides a potential focus point for the Program.

For those entry-level respondents that said their organization had specific internship or job placement arrangements, such arrangements included: on-the-job training work for window replacement and construction companies, property management firms, weatherization and building management companies and with utilities. Arrangements described for mid- to high-level skill trainees included: those available through union labor and management agreements, electrical contractors, and equipment installation firms. In cases where NYSERDA is not already familiar with these arrangements, additional research could be conducted to identify and leverage off the strengths of each, so additional targeted internships and job placement arrangements can be developed.

When asked how effective these arrangements were, 77% of the mid- to high-level training organization respondents that had internship arrangements said they were “very effective.” Only 19% of the entry-level respondents felt this way, with 61% saying they were “somewhat effective”

All respondents whose organizations had internship or job placement arrangements were asked if they would be able to expand these arrangements if resources and funding were made available to their organization for on-the-job skills training. And all said “yes” (5 entry-level and 4 mid- to high-level respondents). When then asked to estimate how many more workers they might be able to place each year in energy efficiency-related jobs, 77% of mid- to high-level and 61% of entry-level respondents said their organizations could place between 11 to 25 additional trainees. On either end of this range, 19% of the entry-level respondents said they could place more than 50 trainees and 19% said between 6 and 10. While 23% of the mid- to high-level training organization respondents said they could only place between three to five. The most common areas identified by entry-level respondents where these additional job placements would occur included: general commercial construction, general office and project administrative support, building shell improvement, HVAC installation/technician, electrical contractor, and property management/real estate development positions. For mid-to high-level respondents, the most common areas were residential and commercial construction. According to the US Census and NYSDOL Green Jobs Report, these job areas are all expected to grow nearly 6% in the next few years.

Energy Efficiency Employment Opportunities Growth Projections

More than half (53%) of all mid- to high-level respondents and 46% of entry-level respondents believe that employment opportunities in energy efficiency-related fields will increase over the next twelve months. Only 7% of mid- to high- level and 17% of entry-level respondents felt there will be a decrease and approximately a third said there would be no change. One could view this as a positive outlook and an opportunity for the Program to continue its skills development efforts to meet this perceived increased need.

6.2.2.4 Awareness of NYSERDA and/or Broader Workforce Development Efforts

Awareness of NYSERDA and its Energy Efficiency Training Efforts

Awareness if NYSERDA was extremely high among all non-participating training organization respondents (100% of both entry-level and mid- to high-level respondents were aware of NYSERDA before their participation in this project’s telephone survey effort). Similarly, a large majority of respondents were also aware that NYSERDA provided support for basic skills development through advanced-level energy efficiency training and certifications (93% of mid- to high-level and 76% of entry-level).

When asked how they heard about NYSERDA's energy efficiency training support, being a past NYSERDA participant, networking, and NYSERDA's website were the top three sources identified by entry-level respondents (26%, 26% and 23% respectively). For mid- to high-level respondents, the top three sources included: NYSERDA's website (38%), past NYSERDA Program participant (26%) and the Department of Labor (21%).

Although a large majority of training organization respondents were aware that NYSERDA provides support for energy efficiency skills development, a much smaller percentage said they were "very familiar" with those efforts (40% of mid- to high-level and 36% of entry-level respondents). Slightly more (52% mid- to high-level and 45% entry-level) said that they were "somewhat familiar." This means there remains substantial opportunity to inform and recruit an increased number of training organizations as partners with NYSERDA's Workforce Development Program efforts.

Awareness of Other Energy Efficiency Training Efforts

Entry-level respondents are substantially more aware of other programs in New York State that provide training in basic or advanced job skills in the energy efficiency field than are mid- to high-level training organization respondents (62% entry-level vs. 28% mid-to high-level). Some of the programs mentioned by respondents included: The New York State Weatherization Directors Association (NYSWDA), the Building Professionals Institute (BPI), the Association for Energy Affordability, Labor Local 10, Green Jobs Training Center, Community Colleges and National Grid. Wherever possible, NYSERDA's Program should continue to coordinate and leverage resources within and across these other programs.

6.3 ACTIONS FOR CONSIDERATION BY PROGRAM STAFF

Developing specific recommendations regarding programmatic changes or modifications was not a goal of this MCA effort. However, the work performed by the MCA Team has identified some potential actions that could be considered by program staff, as suggested below:

- Consider targeting training and employer outreach to the four industry types that dominate the energy efficiency market in New York: HVAC, Electrical Contracting, Engineering Services and Commercial and Industrial Construction. Focus on increasing these potential employers' awareness regarding the value and benefits associated with including energy efficiency as part of their work products and services. As noted in earlier analysis and supported by the NYSDOL Green Jobs Report and Brookings Report, the construction industry has a considerable number of energy efficiency related jobs, as compared to other industries, and the demand is expected to grow through 2018. Focusing on enhancing training opportunities that lead to jobs in construction would support the demand for workers in this industry; specifically, unions, vocational and technical schools.
- When designing outreach efforts to each of the company/industry types, consider targeting them with messages that address their individual highest priority reasons for limited participation. This could help improve the uptake and effectiveness of these important training programs.
- Consider targeting training programs to meet the most common entry-level and mid-to-high-level job areas where major energy efficiency employer types show needs (*i.e.*, Builders – laborers, residential construction, building shell improvements, electric contractor positions; HVAC – residential and commercial construction, mechanical and other equipment installation positions; Engineers/Consultants – office support, commercial construction, energy consulting, building shell improvement positions; Real Estate Developers/Property Managers – office support, architectural and engineering service positions).
- Consider fostering relationships between employers and training organizations, and encourage training organizations to focus more on offering internships and apprenticeships as part of their training curriculum. According to employers, internships are a valuable source of experience and

are frequently used as a mechanism to hire through for filling permanent full time positions. Encouraging internship programs will enhance training opportunities, and increase hiring opportunities. Include developing mentoring opportunities where those employees in the workforce that are skilled and nearing retirement, share their knowledge with trainees and new/younger employees just entering the energy efficiency field.

- Consider targeting training programs in counties where the population of hard-to-reach and underserved citizens is the greatest and where there currently are few to no existing training opportunities. Focus those training programs appropriately for the age groups 16 to 24 and 25 to 65 year olds. Enhancing training in these geographical areas will enable disadvantaged populations to receive training and be better prepared for gainful employment opportunities.
- Consider expanding outreach to entry-level and mid-to high-level training organizations throughout the State that are not currently Training Partners within NYSERDA's Workforce Development Program. Use county-specific information on targeted hard-to-reach/underserved populations to help guide and prioritize which organizations and geographic regions of the State to focus outreach efforts on.
- Consider increasing existing collaborative efforts with One Stop Career Centers, to provide entry level skills training. Currently there are 79 One Stops located in New York State, one or more in each county. One Stop Career Centers are an established resource for people seeking training and/or to gain employment, and currently refer people to outside training upon request, and offer apprenticeships. Partnering more closely with One Stops is a natural fit to expanding the reach of NYSERDA's Workforce Development training throughout the State, and would enhance the value and service to people seeking training and employment. As part of this effort it will be important to explain the value and need for incorporating energy efficiency elements into their training curriculum.

APPENDIX A

Workforce Development Program Non-Participating Trainee Survey Memo



GDS Associates, Inc.

Engineers and Consultants

MEMORANDUM

To: Todd French, Project Manager, NYSERDA

From: Scott Albert, GDS Associates

Date: December 14, 2011

Subject: WFD Program – Recommendation to Halt Non-Participating Trainee Survey Plans

Per your request, this memo is written to formalize our earlier email recommendation (dated November 2, 2011) to halt plans to interview the non-participating potential trainee market actor group. As discussed previously, based on further review of potential approaches for identifying and reaching this targeted market actor group, a number of issues have been raised that make it necessary to rethink the need and appropriateness of conducting interviews with non-participating potential trainees as part of our ongoing WFD Program Market Characterization and Assessment Study.

The final WFD Workplan called for completing 70 surveys with a targeted group of non-participating potential trainees (with no statistically valid results available from separate upstate-downstate areas). Given the probable difficulty in reaching this already hard-to-reach audience (18-25 year olds, single mothers, disabled veterans, ex-offenders, disadvantaged/low income individuals, etc.), an in-the-field intercept approach was planned rather than a telephone survey approach.

To achieve the 70 targeted completes, a field survey implementation strategy was developed that called for selecting ten cities strategically chosen from across the state. Within each of the selected cities, a trained field surveyor would work to identify potential respondents from which to complete seven interviews. The surveyor would intercept potential respondents while standing outside of a previously identified location where targeted respondents might tend to visit. Two specific locations were to be identified per city from which to complete each city's designated seven surveys. These locations might include: a shopping mall, unemployment office, or job training center. Main research areas included:

- Awareness of energy efficiency-related workforce development programs, training facilities, opportunities and careers, and the sources of awareness.
- Barriers to pursuing energy efficiency-related job training, including lack of incentives for tuition and certification fee reimbursements, lack of information and tools needed to participate, lack of training facilities and programs, lack of demand for energy efficiency jobs, and lack of internships and apprenticeship programs.

- Perceptions regarding energy efficiency-related products and services and job opportunities.

Demographic information also was to be collected to better describe these hard-to-reach and underserved populations.

For the following reasons, we recommend halting plans to interview this targeted group of market actors:

- 1) Value – information collected from this limited group (70) of hard-to-reach and underserved potential trainees:
 - a. will not be sufficient to draw conclusions within specific groups (women, ex-offenders, disabled veterans, etc.) or geographically. Precision was set at 90/10 at the statewide level, offering a limited ability to draw statewide conclusions about the overall research population.
 - b. is not representative of the broader populations on which program staff want to focus the evaluation (i.e., hard-to-reach and underserved populations are a component audience targeted by the WFD Program’s Career Pathways training efforts and Career Pathways is just a small part of the overall WFD program).
- 2) Budget – Limited budget for the entire WFD MCA effort might be better utilized elsewhere in this project.
 - a. new information from NYDOL LMI research and other sources has been reviewed and used to supplement evaluation design and implementation efforts
 - b. additional time and effort could be better expended revisiting the preliminary market characterization and previously completed program logic model in light of this more recent LMI and other insights gained by program staff and process evaluation findings, and implementing the revised non-participating employer sample plan approved recently by the DPS, including conducting depth interviews with targeted downstate real estate developers and property managers.

I understand that NYSERDA will be checking with the Department to confirm that all are okay with this “halt” recommendation. In the meantime, please be assured that GDS is focusing time and efforts on getting the now approved Non-Participating Employer and Training Organization Surveys and Sample Plans successfully in the field over the next two weeks.

Thanks for your consideration and continued support.

APPENDIX B
Non-Participating Employers Survey Instrument

**EEPS Workforce Development Program
Market Assessment Telephone Survey – Employers
(11-15-2011 FINAL V12)**

INTRODUCTION

Hello, this is <INTERVIEWER> calling from [INSERT CALL CENTER]. I am calling on behalf of NYSERDA (the New York State Energy Research and Development Authority). May I please speak with the person at your company responsible for hiring decisions?

IF NEEDED: We are conducting research to evaluate NYSERDA's Workforce Development Program. This program funds training to prepare people to work in jobs that help promote energy efficiency. I would like to speak with someone about your company's hiring practices and employee training.

[IF TITLED RESPONDENT IS NOT AVAILABLE OR DOES NOT EXIST: I would like to speak with someone who is familiar with the types of workers your company has recently hired, or may be hiring in the near future. Who would that person be, and is he or she available?]

[ONCE NAMED OR NEW RESPONDENT IS ON THE PHONE, CONTINUE.]

This is <INTERVIEWER> calling from [INSERT CALL CENTER]. I am calling on behalf of NYSERDA (the New York State Energy Research and Development Authority) to evaluate its Workforce Development Program. This program funds training to prepare people to work in jobs that help promote energy efficiency. I would like to speak with you about your company's hiring practices and employee training. READ IF NECESSARY: The survey should take around 15 minutes. We will not use your responses in any way that would reveal your identity.

[IF THE RESPONDENT HAS QUESTIONS ABOUT THE SURVEY, YOU MAY TELL HIM OR HER TO CALL TODD FRENCH, NYSERDA, AT (518) 862-1090, x3212.]

A. FIRMOGRAPHICS

A1. What is your company's primary business or expertise? [PROMPT IF NECESSARY. MARK ONLY ONE]

01. SINGLE FAMILY BUILDER
02. MULTIFAMILY BUILDER
03. COMMERCIAL AND OFFICE BUILDER
04. ELECTRICAL CONTRACTOR
05. HEATING, VENTILATION AND AIR-CONDITIONING (HVAC) CONTRACTOR
06. POWER GENERATION EQUIPMENT CONTRACTOR
07. REAL ESTATE DEVELOPER OR PROPERTY MANAGER
08. ENGINEERING CONSULTING SERVICES (INDUSTRIAL, MECHANICAL, OR HVAC)
09. BUILDING CONSTRUCTION CONSULTANT
10. ENERGY CONSERVATION ENGINEER/CONSULTANT
11. LIGHTING CONSULTANT
95. OTHER [SPECIFY]

- 96. REFUSED
- 97. DON'T KNOW

A2. Approximately how many employees currently work for your company at all New York State locations?

- 01. [RECORD NUMBER]
- 96. REFUSED
- 97. DON'T KNOW

A3. About how many of these employees are involved with energy efficient building construction, or designing, recommending, installing or servicing energy using equipment in homes or businesses in New York? Would you say it is...? [READ LIST]

- 1. Less than 5%
- 2. 5% to 10%
- 3. 11% to 20%
- 4. 21% to 40%
- 5. More than 40%
- 96. REFUSED
- 97. DON'T KNOW

A4. Approximately what percentage of your company's work during the past year was related to energy efficient building construction, or designing, specifying, installing or servicing of energy using equipment in homes or businesses? Would you say it was... [READ LIST]?

- 1. Less than 5%
- 2. 5% to 10%
- 3. 11% to 20%
- 4. 21% to 40%
- 5. More than 40%
- 96. REFUSED
- 97. DON'T KNOW

READ: For the rest of this survey, I will refer to these types of positions, that is, those that are involved with energy efficient building construction, designing, recommending, installing or servicing energy using equipment as "energy efficiency positions."

A4a. How much experience would you say your employees have in performing the energy efficiency components of your work? Would you say... [READ LIST]?

- 01. No experience
- 02. Not much experience
- 03. Some experience

- 04. A lot of experience
- 96. REFUSED
- 97. DON'T KNOW

A4b. In the last 12 months, has your company attended or sent employees to any job training courses related to energy efficiency?

- 01. YES
- 02. NO
- 96. REFUSED
- 97. DON'T KNOW

[IF A3 = 01 "LESS THAN 5%" SKIP TO SECTION B, OTHERWISE ASK A5]

Now I'd like to ask about the different types of skilled and unskilled positions you hire for in your company.

A5. First, do you hire for any of the following *unskilled* positions... [INSERT ITEM]?

- a. General office and project administrative support
- b. General Residential Construction entry-level support
- c. General Commercial Construction entry level support

- 01. YES
- 02. NO
- 96. REFUSED
- 97. DON'T KNOW

A5d. Do you hire for any other types of *unskilled* positions?

- 01. YES [SPECIFY]
- 02. NO
- 96. REFUSED
- 97. DON'T KNOW

A6. Do you hire for any of the following *skilled* positions...[INSERT ITEM] ?

- a. General Residential Construction (skilled contractors and project managers)
- b. General Commercial Construction (skilled contractors and project managers)
- c. Building shell improvement
- d. Heating & Air Conditioning (HVAC) installation/technician
- e. Electrical contractor
- f. Equipment installation, maintenance and repair
- g. Sales and related support
- h. Architectural, engineering, or related services
- i. Energy conservation consultant
- j. Property management or real estate development

- 01. YES
- 02. NO
- 96. REFUSED
- 97. DON'T KNOW

A6k. Do you hire for any other types of *skilled* positions?

- 01. YES [SPECIFY]
- 02. NO
- 96. REFUSED
- 97. DON'T KNOW

SECTION B. ENERGY EFFICIENCY WORKFORCE SKILLS BASELINE

B1. In the last 12 months, has your company hired any new employees for one or more energy efficiency positions?

[IF NEEDED: Energy efficiency position include those involved with energy efficient building construction, or designing, specifying, installing or servicing of energy using equipment in homes or businesses.]

- 01. YES
- 02. NO [SKIP TO B4]
- 96. REFUSED
- 97. DON'T KNOW

B1a. What are your primary sources for finding these new employees?

[NOTE TO APPRISE: – CODE POST FIELDING – potential responses could include: referrals, advertisement, job placement agency, NYS Department of Labor 1 stop career centers, apprenticeship/internship program, union, training center, other]

- 01. [RECORD VERBATIM]
- 96. REFUSED
- 97. DON'T KNOW

B2. How difficult has it been to find workers with energy efficiency experience to meet your company's needs when hiring employees for energy efficiency-related positions – would you say it has been [READ LIST]...?

- 01. Not at all difficult
- 02. Not too difficult
- 03. Somewhat difficult
- 04. Very difficult
- 96. REFUSED
- 97. DON'T KNOW

B3a. Thinking about all of your company's employees who are in entry-level or unskilled energy efficiency positions, in your opinion, what percentage of all these employees, need additional training or skill development to perform their duties to acceptable professional or industry standards? [READ LIST]

- 01. Less than 5%
- 02. 5 to 25%

- 03. 26 to 50%
- 04. 51 to 75%
- 05. 76 to 100%
- 96. REFUSED
- 97. DON'T KNOW

B3b. Thinking about all of your company's employees who are in skilled energy efficiency positions, in your opinion, what percentage of all your company's employees in these positions, need additional training or skill development to perform their duties to acceptable professional or industry standards? Would you say...

- 01. Less than 5%
- 02. 5 to 25%
- 03. 26 to 50%
- 04. 51 to 75%
- 05. 76 to 100%
- 96. REFUSED
- 97. DON'T KNOW

For the next set of questions, I will be asking about your thoughts on hiring and employing from the following groups:

- **single mothers who are the primary wage-earner in their household,**
- **disabled veterans,**
- **individuals who were previously unemployed or underemployed and living below the poverty rate,**
- **individuals previously incarcerated (in jail), or**
- **individuals ranging from 18-24 years of age**

B4. To the best of your knowledge, in the *last two years*, has your company hired anyone that comes from one of these groups? **[IF NECESSARY: INCLUDE LIST OF GROUPS AGAIN AND READ]**

- 01. YES
- 02. NO **[SKIP TO NEXT SECTION]**
- 96. REFUSED **[SKIP TO NEXT SECTION]**
- 97. DON'T KNOW **[SKIP TO NEXT SECTION]**

B4a. How prepared would you say they were for their job responsibilities? Would you say...**[READ LIST]**?

- 01. Not at all prepared
- 02. Not too prepared
- 03. Somewhat prepared
- 04. Very prepared
- 96. REFUSED
- 97. DON'T KNOW

B4b. About what percentage of your company's employees fall into one or more of these groups? Would you say... **[READ LIST]**?

[READ IF NECESSARY: Your best estimate is fine.]

- 01. Less than 1%
- 02. 1% to 5%
- 03. 6% to 10%
- 04. 11% to 20%
- 05. More than 20%
- 96. REFUSED
- 97. DON'T KNOW

SECTION C. GENERAL AWARENESS OF JOB SKILLS-RELATED TRAINING

C1. I'm going to read a list of various types of job skills training programs in New York State. For each one, please indicate if your company is aware of this type of program. First, [INSERT ITEM], is your company aware of this type of program?

- a. Work Readiness Skills Training – including workplace preparation, teamwork, problem solving, time management, conflict resolution and basic job skills education
- b. Vocational and Technical Skills Training – with a specific vocational objective
- c. Sector-Based Training – such as building science and “whole-house approach” training
- d. Advanced Technical Training – including lighting design and retrofits, heat pumps, energy management systems, indoor air quality and ventilation, advanced insulation and air sealing techniques, commercial cooling systems,
- e. Training to Address Certification and Accreditation Needs – including BPI, HERS, CEM, or for professional development, continuing education purposes
- f. Are there other types of skills-based training programs or services that your company has used? **[SPECIFY]**

- 01. YES
- 02. NO
- 96. REFUSED
- 97. DON'T KNOW

C2. I'm going to read a list of various types of internship, apprenticeship and other on-the-job training opportunities in New York State. For each one, please indicate if your company is aware of this type of opportunity. First [INSERT ITEM], is your company aware of this type of opportunity?

- a. Field Training – including support for HVAC, plumbing, electricians, etc.
- b. Internships and Apprenticeship Programs – intended to link academic and work experience through on-the-job training

- 01. YES
- 02. NO **[ASK C2b]**
- 96. REFUSED **[ASK C2b]**
- 97. DON'T KNOW **[ASK C2b]**

C2c. Are there other types of on-the-job type training programs or services that your company has used?

- 01. YES **[SPECIFY]**

- 02 NO
- 96 REFUSED
- 97 DON'T KNOW

SECTION D. TRAINING INFRASTRUCTURE USAGE/SATISFACTION BASELINE

D1. For each of the various types of skills-based and on-the-job training programs you said you were aware of, please indicate if your company has used this type of program. By “Used” we mean that your company has either hired someone from, or sent someone through, this type of program. First, skills based programs...

Skills-Based:

- a. [SHOW IF C1a=1] Work Readiness Skills Training – including workplace preparation, teamwork, problem solving, time management, conflict resolution and basic job skills education
- b. [SHOW IF C1b=1] Vocational and Technical Skills Training – with a specific vocational objective
- c. [SHOW IF C1c=1] Sector-Based Training – such as building science and “whole-house approach” training
- d. [SHOW IF C1d=1] Advanced Technical Training – including lighting design and retrofits, heat pumps, energy management systems, indoor air quality and ventilation, advanced insulation and air sealing techniques, commercial cooling systems,
- e. [SHOW IF C1e=1] Training to Address Certification and Accreditation Needs – including BPI, HERS, CEM, or for professional development, continuing education purposes
- f. [SHOW THE VERBATIM ANSWER FOR C1f IF C1f=1]

Next, on-the-job based training programs. Has your company used any of these on-the-job based programs?

On-The-Job Based:

- g. [SHOW IF C2a=1] Field Training – including support for HVAC, plumbing, electricians, etc.
- h. [SHOW IF C2b=1] Internships and Apprenticeship Programs – intended to link academic and work experience through on-the-job training
- i. [SHOW THE VERBATIM ANSWER FOR C2c IF C2c=1]

- 01 YES
- 02 NO
- 96 REFUSED
- 97 DON'T KNOW

[ASK D2a IF ANY D1a-D1f=01]

D2a. What percentage of your employees have participated in one or more of these types of skills-based training programs? Would you say...

- 01. Less than 5%
- 02. 5 to 25%
- 03. 26 to 50%
- 04. 51 to 75%
- 05. 76 to 100%

- 96. REFUSED
- 97. DON'T KNOW

[ASK D2b IF ANY D1g-D1i=01]

D2b. What percentage of your employees have participated in one or more of these types of on-the-job type training programs? Would you say..

- 01. Less than 5%
- 02. 5 to 25%
- 03. 26 to 50%
- 04. 51 to 75%
- 05. 76 to 100%
- 96. REFUSED
- 97. DON'T KNOW

D3. I'm going to read you some factors you may consider when hiring employees for unskilled positions. For each one please say how important it is very important, somewhat important, not too important, or not at all important? First... [INSERT ITEM]

a. Worker Readiness/Job Readiness Training?

[IF NEEDED: This includes workplace preparation, teamwork, problem solving, time management, conflict resolution and basic education?]

b. Some type of vocational (Construction / Trade) experience?

- 01. Not at all important
- 02. Not too important
- 03. Somewhat important
- 04. Very important
- 96. REFUSED
- 97. DON'T KNOW

D4. Now I'm going to read you some factors you may consider when hiring employees for skilled positions. For each one, please tell me how important it is..[READ LIST]? First ...[INSERT ITEM]

a. Worker Readiness/Job Readiness Training **[IF NEEDED:** This includes workplace preparation, teamwork, problem solving, time management, conflict resolution and basic education]

b. Some type of vocational experience? **[IF NEEDED:** Construction or trade experience]

c. Some type of Professional / Trade certification? **[IF NEEDED:** BPI, HERS, CEM, certification, etc.]

d. Some type of professional licensure in the industry **[IF NEEDED:** licensed electrician, professional engineer, etc.)?

e. At least 1 to 2 years of energy efficiency work experience?

- 01. NOT AT ALL IMPORTANT
- 02. NOT TOO IMPORTANT

- 03. SOMEWHAT IMPORTANT
- 04. VERY IMPORTANT
- 96. REFUSED
- 97. DON'T KNOW

D5. I'm going to read you a list of possible reasons why you don't have more of your employees participate in energy efficiency skills-related training programs? For each reason, please tell me if it is a major reason, minor reason, or not a reason at all. First [INSERT ITEM], is this a major, minor, or not a reason, that you don't have more of your employees participate in these training programs?

- a. Lack of demand for energy efficiency products and services
- b. High cost of training programs
- c. Lack of financial aid to support training
- d. Not enough time
- e. Not enough information about the training opportunities
- f. Have not liked past training programs
- g. Training offered does not meet the very specific training needed at the time

- 01. MAJOR REASON
- 02. MINOR REASON
- 03. NOT A REASON
- 96. REFUSED
- 97. DON'T KNOW

D6. Are there other reasons why you don't have more of your employees participate in energy efficiency skills-related training programs?

- 01. YES [SPECIFY]
- 02. NO
- 96. REFUSED
- 97. DON'T KNOW

[ASK D7 IF ANY D1a-D1i = 01. OTHERWISE, SKIP TO D8]

D7. You indicated earlier that your company has used the following types of energy efficiency-related training programs. For each one, please tell me how satisfied your company was with the quality of that training ... [READ LIST]. First...

Skills-Based:

- a. [SHOW IF D1a=1] Work Readiness Skills Training – including workplace preparation, teamwork, problem solving, time management, conflict resolution and basic job skills education
- b. [SHOW IF D1b=1] Vocational and Technical Skills Training – with a specific vocational objective
- c. [SHOW IF D1c=1] Sector-Based Training – such as building science and “whole-house approach” training
- d. [SHOW IF D1d=1] Advanced Technical Training – including lighting design and retrofits, heat pumps, energy management systems, indoor air quality and ventilation, advanced insulation and air sealing techniques, commercial cooling systems,

- e. **[SHOW IF D1e=1]** Training to Address Certification and Accreditation Needs – including BPI, HERS, CEM, or for professional development, continuing education purposes
- f. **[SHOW THE VERBATIM ANSWER FOR C1f IF D1f=1]**

On-The-Job Based:

- g. **[SHOW IF D1g=1]** Field Training – including support for HVAC, plumbing, electricians, etc.
- h. **[SHOW IF D1h=1]** Internships and Apprenticeship Programs – intended to link academic and work experience through on-the-job training
- i. **[SHOW THE VERBATIM ANSWER FOR C2c IF D1i=1]**

- 01. Not at all satisfied
- 02. Not too satisfied
- 03. Somewhat satisfied
- 04. Very satisfied **[SKIP TO D7k]**
- 96. REFUSED **[SKIP TO D7j]**
- 97. DON'T KNOW **[SKIP TO D7j]**

[ASK D7j IF ANY RESPONSES FROM D7a – D7i ≠4.]

D7j. What could be done to increase your satisfaction with these programs?

- 01. **[RECORD VERBATIM]**
- 96. REFUSED
- 97. DON'T KNOW

D7k. In general, how valuable does your company consider the training provided through these types of training programs...**[READ LIST]**?

- 01. Not at all valuable
- 02. Not too valuable
- 03. Somewhat valuable
- 04. Very valuable **[SKIP TO E1]**
- 96. REFUSED
- 97. DON'T KNOW

D8. What would you suggest be done to increase the value of training provided through the energy efficiency-related training programs in New York?

- 01 **[RECORD VERBATIM]**
- 96 REFUSED
- 97 DON'T KNOW

SECTION E. ENERGY EFFICIENCY EMPLOYMENT PLANS AND PRACTICES

E1. In the next 12 months, how likely are you to hire more employees to fill energy efficiency-related positions within your company like those noted earlier– would you say you are...**[READ LIST]**?

- 01. Not at all likely **[SKIP TO E2]**
- 02. Not too likely **[SKIP TO E2]**
- 03. Somewhat likely

- 04. Very likely
- 96. REFUSED [**SKIP TO E2**]
- 97. DON'T KNOW [**SKIP TO E2**]

E1a. In what types of job areas does your company plan to increase its workforce? [DO NOT PROMPT; MARK ALL THAT APPLY]

- 01. GENERAL OFFICE AND PROJECT ADMINISTRATIVE SUPPORT
- 02. UNSKILLED, ENTRY LEVEL, GENERAL RESIDENTIAL CONSTRUCTION
- 03. UNSKILLED, ENTRY LEVEL, GENERAL COMMERCIAL CONSTRUCTION
- 04. GENERAL RESIDENTIAL CONSTRUCTION (SKILLED CONTRACTORS AND PROJECT MANAGERS)
- 05. GENERAL COMMERCIAL CONSTRUCTION (SKILLED CONTRACTORS AND PROJECT MANAGERS)
- 06. BUILDING SHELL IMPROVEMENT
- 07. HEATING & AIR CONDITIONING (HVAC) INSTALLATION/TECHNICIAN
- 08. ELECTRICAL CONTRACTOR
- 09. INSTALLATION, MAINTENANCE AND REPAIR
- 10. SALES AND RELATED SUPPORT
- 11. ARCHITECTURAL, ENGINEERING, OR RELATED SERVICES
- 12. ENERGY CONSERVATION CONSULTANT
- 13. PROPERTY MANAGEMENT OR REAL ESTATE DEVELOPMENT
- 95. OTHER [**SPECIFY**]
- 96. REFUSED
- 97. DON'T KNOW

[**ASK E2 IF E1≠3,4**]

E2. What would you say is the biggest reason preventing your company from hiring more employees for energy efficiency-related positions within your company?

- 01. [**RECORD VERBATIM**]
- 96. REFUSED
- 97. DON'T KNOW

SECTION F. AWARENESS OF NYSERDA AND/OR BROADER WFD EFFORTS

F1. Before this call, were you aware of NYSERDA [**IF NECESSARY**: NYSERDA is the New York State Research and Development Authority]?

- 01. YES
- 02. NO [**SKIP TO F3**]
- 96. REFUSED [**SKIP TO F3**]
- 97. DON'T KNOW [**SKIP TO F3**]

F2. Before this call, were you aware that NYSERDA provides support for basic skills development through advanced-level energy efficiency training and certifications?

- 01. YES
- 02. NO [SKIP TO F3]
- 96. REFUSED [SKIP TO F3]
- 97. DON'T KNOW [SKIP TO F3]

F2a. How did you hear about NYSERDA's supported energy efficiency training programs? [DO NOT PROMPT. MARK ALL THAT APPLY]

- 01. DIRECT MARKETING – LIVE PRESENTATION, CALL
- 02. INDIRECT MARKETING – PUBLIC SERVICE ANNOUNCEMENTS, PRESS RELEASES
- 03. RADIO ADS
- 04. TELEVISION ADS
- 05. INTERNET ADS
- 06. COMPANY WEBSITE
- 07. PRINT ADS
- 08. CAREER FAIR
- 09. HOME SHOWS
- 10. NETWORKING/TEAMING WITH OTHERS
- 11. PAST NYSERDA PROGRAM PARTICIPANT
- 12. EMPLOY PAST WFD PARTICIPANTS
- 95. OTHER [SPECIFY]
- 96. REFUSED
- 97. DON'T KNOW

F2b. How familiar are you with NYSERDA's supported energy efficiency training efforts? Would you say you are... [READ LIST]?

- 01. Very familiar
- 02. Somewhat familiar
- 03. Not too familiar
- 04. Not at all familiar
- 96. REFUSED
- 97. DON'T KNOW

F3. Are you aware of any other energy efficiency-focused training programs in New York State, where students can go to develop basic job skills or receive advanced skills training in the field of energy efficiency?

- 01. YES
- 02. NO
- 96. REFUSED
- 97. DON'T KNOW

F3a. How satisfied is your company with the availability of conveniently accessible energy efficiency-related training programs in your general area? Would you say you are... [READ LIST]

- 01. Not at all satisfied

- 02. Not too satisfied
- 03. Somewhat satisfied
- 04. Very satisfied **[SKIP TO NEXT SECTION]**
- 96. REFUSED **[SKIP TO NEXT SECTION]**
- 97. DON'T KNOW **[SKIP TO NEXT SECTION]**

F3b. What could be done to improve your level of satisfaction with the accessibility to existing energy efficiency-related training locations?

01. **[RECORD VERBATIM]**

96. REFUSED

97. DON'T KNOW

SECTION G. PARTICIPATION IN OTHER SBC-FUNDED INITIATIVES

G1. Does your company work with NYSERDA or any New York utility to provide energy efficiency products or services through programs they sponsor?

[READ IF NECESSARY – For example, NYSERDA’s Home Performance with ENERGY STAR® or FlexTech Programs, National Grid’s Small and Mid-Sized Business Energy Efficiency Program, Central Hudson Gas and Electric Corporation’s Home Energy Savings Central Program]

- 01. YES
- 02. NO **[SKIP TO THANK YOU AND END]**
- 96. REFUSED **[SKIP TO THANK YOU AND END]**
- 97. DON'T KNOW **[SKIP TO THANK YOU AND END]**

G1a. Which energy efficiency initiatives or programs does your company participate in? **[DO NOT PROMPT.]**

01. **[RECORD VERBATIM]**

96. REFUSED

97. DON'T KNOW

SECTION CC: CLOSING

CC1. Those are all the questions I have, thank you very much for your time today. May I record your name for verification purposes?

01. **[RECORD NAME]**

96. REFUSED **[SAY: YOUR FIRST NAME IS SUFFICIENT.]**

97. DON'T KNOW

APPENDIX C

Non-Participating Employers Survey Instrument – Real Estate/Property Managers

**EEPS Workforce Development Program
Market Assessment Telephone Survey – Real Estate Developers/Property Managers
(1-4-2012 DRAFT V12A-DEPTH)**

INTRODUCTION

Hello, this is Sharon Brown calling from GDS Associates. I am calling on behalf of NYSERDA (the New York State Energy Research and Development Authority). May I please speak with [CONTACT NAME or READ: the person at your company responsible for hiring decisions]?

IF NEEDED: We are conducting research to evaluate NYSERDA's Workforce Development Program. This program funds training to prepare people to work in jobs that help promote energy efficiency. I would like to speak with someone about your company's hiring practices and employee training.

[IF TITLED RESPONDENT IS NOT AVAILABLE OR DOES NOT EXIST: I would like to speak with someone who is familiar with the types of workers your company has recently hired, or may be hiring in the near future. Who would that person be, and is he or she available?]

[ONCE NAMED OR NEW RESPONDENT IS ON THE PHONE, CONTINUE.]

This is Sharon Brown calling from GDS Associates. I am calling on behalf of NYSERDA (the New York State Energy Research and Development Authority) to evaluate its Workforce Development Program. This program funds training to prepare people to work in jobs that help promote energy efficiency. I would like to speak with you about your company's hiring practices and employee training. READ IF NECESSARY: The survey should take around 15 minutes. We will not use your responses in any way that would reveal your identity.

[IF THE RESPONDENT HAS QUESTIONS ABOUT THE SURVEY, YOU MAY TELL HIM OR HER TO CALL TODD FRENCH, NYSERDA, AT (518) 862-1090, x3212.]

A. FIRMOGRAPHICS

A1. What is your company's primary business or expertise? [PROMPT IF NECESSARY. MARK ONLY ONE]

- 12. REAL ESATE DEVELOPER
- 13. PROPERTY MANAGER
- 98. OTHER [SPECIFY]
- 99. REFUSED
- 100. DON'T KNOW

A2. Approximately how many employees currently work for your company at all New York State locations?

- 02. [RECORD NUMBER]
- 96. REFUSED
- 97. DON'T KNOW

A3. About how many of these employees are involved with energy efficient building construction, or designing, recommending, installing or servicing energy using equipment in homes or businesses in New York? Would you say it is...? [READ LIST]

- 6. Less than 5%
- 7. 5% to 10%
- 8. 11% to 20%
- 9. 21% to 40%
- 10. More than 40%
- 96. REFUSED
- 97. DON'T KNOW

A4. Approximately what percentage of your company's work during the past year was related to energy efficient building construction, or designing, specifying, installing or servicing of energy using equipment in homes or businesses? Would you say it was... [READ LIST]?

- 6. Less than 5%
- 7. 5% to 10%
- 8. 11% to 20%
- 9. 21% to 40%
- 10. More than 40%
- 96. REFUSED
- 97. DON'T KNOW

READ: For the rest of this survey, I will refer to these types of positions, that is, those that are involved with energy efficient building construction, designing, recommending, installing or servicing energy using equipment as "energy efficiency positions."

A4a. How much experience would you say your employees have in performing the energy efficiency components of your work? Would you say... [READ LIST]?

- 05. No experience
- 06. Not much experience
- 07. Some experience
- 08. A lot of experience
- 98. REFUSED
- 99. DON'T KNOW

A4b. In the last 12 months, has your company attended or sent employees to any job training courses related to energy efficiency?

- 01. YES
- 02. NO
- 96. REFUSED
- 97. DON'T KNOW

[IF A3 = 01 “LESS THAN 5%” SKIP TO SECTION B, OTHERWISE ASK A5]

Now I’d like to ask about the different types of skilled and unskilled positions you hire for in your company.

A5. First, do you hire for any *unskilled* positions? [IF NEEDED READ: By unskilled we mean where no specific technical knowledge or experience is required]

- 01. YES [PLEASE SPECIFY: _____]
- 02. NO
- 96. REFUSED
- 97. DON’T KNOW

A6. Do you hire for any *skilled* positions? [IF NEEDED, READ: BY skilled we mean where specific technical skills are required, for example, construction, HVAC, plumbing, etc.)

- 01. YES [PLEASE SPECIFY: _____]
- 02. NO
- 96. REFUSED
- 97. DON’T KNOW

SECTION B. ENERGY EFFICIENCY WORKFORCE SKILLS BASELINE

B1. In the last 12 months, has your company hired any new employees for one or more energy efficiency positions?

[IF NEEDED: Energy efficiency position include those involved with energy efficient building construction, or designing, specifying, installing or servicing of energy using equipment in homes or businesses.]

- 03. YES
- 04. NO [**SKIP TO B4**]
- 98. REFUSED
- 99. DON’T KNOW

B1a. What are your primary sources for finding these new employees?

[NOTE: – CODE POST FIELDING – potential responses could include: referrals, advertisement, job placement agency, NYS Department of Labor 1 stop career centers, apprenticeship/internship program, union, training center, other]

- 02. [**RECORD VERBATIM**]
- 96. REFUSED
- 97. DON’T KNOW

B2. How difficult has it been to find workers with energy efficiency experience to meet your company’s needs when hiring employees for energy efficiency-related positions – would you say it has been [READ LIST]...?

- 05. Not at all difficult
- 06. Not too difficult

- 07. Somewhat difficult
- 08. Very difficult
- 98. REFUSED
- 99. DON'T KNOW

B3a. Thinking about all of your company's employees who are in entry-level or unskilled energy efficiency positions, in your opinion, what percentage of all these employees, need additional training or skill development to perform their duties to acceptable professional or industry standards? [READ LIST]

- 06. Less than 5%
- 07. 5 to 25%
- 08. 26 to 50%
- 09. 51 to 75%
- 10. 76 to 100%
- 98. REFUSED
- 99. DON'T KNOW

B3b. Thinking about all of your company's employees who are in skilled energy efficiency positions, in your opinion, what percentage of all your company's employees in these positions, need additional training or skill development to perform their duties to acceptable professional or industry standards? Would you say...

- 06. Less than 5%
- 07. 5 to 25%
- 08. 26 to 50%
- 09. 51 to 75%
- 10. 76 to 100%
- 98. REFUSED
- 99. DON'T KNOW

For the next set of questions, I will be asking about your thoughts on hiring and employing from the following groups:

- **single mothers who are the primary wage-earner in their household,**
- **disabled veterans,**
- **individuals who were previously unemployed or underemployed and living below the poverty rate,**
- **individuals previously incarcerated (in jail), or**
- **individuals ranging from 18-24 years of age**

B4. To the best of your knowledge, in the *last two years*, has your company hired anyone that comes from one of these groups? **[IF NECESSARY: INCLUDE LIST OF GROUPS AGAIN AND READ]**

- 03. YES
- 04. NO **[SKIP TO NEXT SECTION]**
- 97. REFUSED **[SKIP TO NEXT SECTION]**
- 98. DON'T KNOW **[SKIP TO NEXT SECTION]**

B4a. How prepared would you say they were for their job responsibilities? Would you say...[READ LIST]?

- 05. Not at all prepared
- 06. Not too prepared
- 07. Somewhat prepared
- 08. Very prepared
- 98. REFUSED
- 99. DON'T KNOW

B4b. About what percentage of your company's employees fall into one or more of these groups? Would you say... [READ LIST]?

[READ IF NECESSARY: Your best estimate is fine.]

- 06. Less than 1%
- 07. 1% to 5%
- 08. 6% to 10%
- 09. 11% to 20%
- 10. More than 20%
- 98. REFUSED
- 99. DON'T KNOW

SECTION C. GENERAL AWARENESS OF JOB SKILLS-RELATED TRAINING

C1. I'm going to read a list of various types of job skills training programs in New York State. For each one, please indicate if your company is aware of this type of program. First, [INSERT ITEM], is your company aware of this type of program?

- a. Work Readiness Skills Training – including workplace preparation, teamwork, problem solving, time management, conflict resolution and basic job skills education
- b. Vocational and Technical Skills Training – with a specific vocational objective
- c. Sector-Based Training – such as building science and “whole-house approach” training
- d. Advanced Technical Training – including lighting design and retrofits, heat pumps, energy management systems, indoor air quality and ventilation, advanced insulation and air sealing techniques, commercial cooling systems,
- e. Training to Address Certification and Accreditation Needs – including BPI, HERS, CEM, or for professional development, continuing education purposes
- f. Are there other types of skills-based training programs or services that your company has used?

[SPECIFY]

- 01. YES
- 02. NO
- 96. REFUSED
- 97. DON'T KNOW

C2. I'm going to read a list of various types of internship, apprenticeship and other on-the-job training opportunities in New York State. For each one, please indicate if your company is aware of this type of opportunity. First [INSERT ITEM], is your company aware of this type of opportunity?

- a. Field Training – including support for HVAC, plumbing, electricians, etc.
- b. Internships and Apprenticeship Programs – intended to link academic and work experience through on-the-job training

- 01. YES
- 02. NO [ASK C2b]
- 96. REFUSED [ASK C2b]
- 97. DON'T KNOW [ASK C2b]

C2c. Are there other types of on-the-job type training programs or services that your company is aware of?

- 01. YES [SPECIFY]
- 02. NO
- 96. REFUSED
- 97. DON'T KNOW

SECTION D. TRAINING INFRASTRUCTURE USAGE/SATISFACTION BASELINE

D1. For each of the various types of skills-based and on-the-job training programs you said you were aware of, please indicate if your company has used this type of program. By “Used” we mean that your company has either hired someone from, or sent someone through, this type of program. First, skills based programs...

Skills-Based:

- a. [SHOW IF C1a=1] Work Readiness Skills Training – including workplace preparation, teamwork, problem solving, time management, conflict resolution and basic job skills education
- b. [SHOW IF C1b=1] Vocational and Technical Skills Training – with a specific vocational objective
- c. [SHOW IF C1c=1] Sector-Based Training – such as building science and “whole-house approach” training
- d. [SHOW IF C1d=1] Advanced Technical Training – including lighting design and retrofits, heat pumps, energy management systems, indoor air quality and ventilation, advanced insulation and air sealing techniques, commercial cooling systems,
- e. [SHOW IF C1e=1] Training to Address Certification and Accreditation Needs – including BPI, HERS, CEM, or for professional development, continuing education purposes
- f. [SHOW THE VERBATIM ANSWER FOR C1f IF C1f=1]

Next, on-the-job based training programs. Has your company used any of these on-the-job based programs?

On-The-Job Based:

- g. [SHOW IF C2a=1] Field Training – including support for HVAC, plumbing, electricians, etc.
- h. [SHOW IF C2b=1] Internships and Apprenticeship Programs – intended to link academic and work experience through on-the-job training
- i. [SHOW THE VERBATIM ANSWER FOR C2c IF C2c=1]
 - 03. YES
 - 04. NO
 - 98. REFUSED
 - 99. DON'T KNOW

[ASK D2a IF ANY D1a-D1f=01]

D2a. What percentage of your employees have participated in one or more of these types of skills-based training programs? Would you say...

- 06. Less than 5%
- 07. 5 to 25%
- 08. 26 to 50%
- 09. 51 to 75%
- 10. 76 to 100%
- 98. REFUSED
- 99. DON'T KNOW

[ASK D2b IF ANY D1g-D1i=01]

D2b. What percentage of your employees have participated in one or more of these types of on-the-job type training programs? Would you say..

- 06. Less than 5%
- 07. 5 to 25%
- 08. 26 to 50%
- 09. 51 to 75%
- 10. 76 to 100%
- 98. REFUSED
- 99. DON'T KNOW

D3. I'm going to read you some factors you may consider when hiring employees for unskilled positions. For each one please say how important it is: very important, somewhat important, not too important, or not at all important? First... [INSERT ITEM]

a. Worker Readiness/Job Readiness Training?

[IF NEEDED: This includes workplace preparation, teamwork, problem solving, time management, conflict resolution and basic education?]

b. Some type of vocational (Construction / Trade) experience?

- 05. Not at all important
- 06. Not too important
- 07. Somewhat important
- 08. Very important
- 98. REFUSED
- 99. DON'T KNOW

D4. Now I'm going to read you some factors you may consider when hiring employees for skilled positions. For each one, please tell me how important it is..[READ LIST]? First ...[INSERT ITEM]

a. Worker Readiness/Job Readiness Training **[IF NEEDED:** This includes workplace preparation, teamwork, problem solving, time management, conflict resolution and basic education]

b. Some type of vocational experience? **[IF NEEDED:** Construction or trade experience]

- c. Some type of Professional / Trade certification? [**IF NEEDED:** BPI, HERS, CEM, certification, etc.]
- d. Some type of professional licensure in the industry [**IF NEEDED:** licensed electrician, professional engineer, etc.)?]
- e. At least 1 to 2 years of energy efficiency work experience?
 - 05. NOT AT ALL IMPORTANT
 - 06. NOT TOO IMPORTANT
 - 07. SOMEWHAT IMPORTANT
 - 08. VERY IMPORTANT
 - 98. REFUSED
 - 99. DON'T KNOW

D5. I'm going to read you a list of possible reasons why you don't have more of your employees participate in energy efficiency skills-related training programs? For each reason, please tell me if it is a major reason, minor reason, or not a reason at all. First [INSERT ITEM], is this a major, minor, or not a reason, that you don't have more of your employees participate in these training programs?

- a. Lack of demand for energy efficiency products and services
- b. High cost of training programs
- c. Lack of financial aid to support training
- d. Not enough time
- e. Not enough information about the training opportunities
- f. Have not liked past training programs
- g. Training offered does not meet the very specific training needed at the time

- 04. MAJOR REASON
- 05. MINOR REASON
- 06. NOT A REASON
- 96. REFUSED
- 97. DON'T KNOW
- 99. NOT APPLICABLE (ALL EMPLOYEES PARTICIPATE)

D6. Are there other reasons why you don't have more of your employees participate in energy efficiency skills-related training programs?

- 01. YES [**SPECIFY**]
- 02. NO
- 96. REFUSED
- 97. DON'T KNOW

[ASK D7 IF ANY D1a-D1i = 01. OTHERWISE, SKIP TO D8]

D7. You indicated earlier that your company has used the following types of energy efficiency-related training programs. For each one, please tell me how satisfied your company was with the quality of that training ... [READ LIST]. First...

Skills-Based:

- a. [SHOW IF D1a=1] Work Readiness Skills Training – including workplace preparation, teamwork, problem solving, time management, conflict resolution and basic job skills education
- b. [SHOW IF D1b=1] Vocational and Technical Skills Training – with a specific vocational objective
- c. [SHOW IF D1c=1] Sector-Based Training – such as building science and “whole-house approach” training
- d. [SHOW IF D1d=1] Advanced Technical Training – including lighting design and retrofits, heat pumps, energy management systems, indoor air quality and ventilation, advanced insulation and air sealing techniques, commercial cooling systems,
- e. [SHOW IF D1e=1] Training to Address Certification and Accreditation Needs – including BPI, HERS, CEM, or for professional development, continuing education purposes
- f. [SHOW THE VERBATIM ANSWER FOR C1f IF D1f=1]

On-The-Job Based:

- g. [SHOW IF D1g=1] Field Training – including support for HVAC, plumbing, electricians, etc.
- h. [SHOW IF D1h=1] Internships and Apprenticeship Programs – intended to link academic and work experience through on-the-job training
- i. [SHOW THE VERBATIM ANSWER FOR C2c IF D1i=1]

- 05. Not at all satisfied
- 06. Not too satisfied
- 07. Somewhat satisfied
- 08. Very satisfied [SKIP TO D7k]
- 98. REFUSED [SKIP TO D7j]
- 99. DON'T KNOW [SKIP TO D7j]

[ASK D7j IF ANY RESPONSES FROM D7a – D7i ≠4.]

D7j. What could be done to increase your satisfaction with these programs?

- 02. [RECORD VERBATIM]
- 96. REFUSED
- 97. DON'T KNOW

D7k. In general, how valuable does your company consider the training provided through these types of training programs...[READ LIST]?

- 05. Not at all valuable
- 06. Not too valuable
- 07. Somewhat valuable
- 08. Very valuable [SKIP TO E1]
- 98. REFUSED
- 99. DON'T KNOW

D8. What would you suggest be done to increase the value of training provided through the energy efficiency-related training programs in New York?

- 01 [RECORD VERBATIM]
- 96 REFUSED

97 DON'T KNOW

SECTION E. ENERGY EFFICIENCY EMPLOYMENT PLANS AND PRACTICES

E1. In the next 12 months, how likely are you to hire more employees to fill energy efficiency-related positions within your company like those noted earlier– would you say you are...[READ LIST]?

- 05. Not at all likely [**SKIP TO E2**]
- 06. Not too likely [**SKIP TO E2**]
- 07. Somewhat likely
- 08. Very likely
- 98. REFUSED [**SKIP TO E2**]
- 99. DON'T KNOW [**SKIP TO E2**]

E1a. In what types of job areas does your company plan to increase its workforce? [DO NOT PROMPT; MARK ALL THAT APPLY]

- 14. GENERAL OFFICE AND PROJECT ADMINISTRATIVE SUPPORT
- 15. UNSKILLED, ENTRY LEVEL, GENERAL RESIDENTIAL CONSTRUCTION
- 16. UNSKILLED, ENTRY LEVEL, GENERAL COMMERCIAL CONSTRUCTION
- 17. GENERAL RESIDENTIAL CONSTRUCTION (SKILLED CONTRACTORS AND PROJECT MANAGERS)
- 18. GENERAL COMMERCIAL CONSTRUCTION (SKILLED CONTRACTORS AND PROJECT MANAGERS)
- 19. BUILDING SHELL IMPROVEMENT
- 20. HEATING & AIR CONDITIONING (HVAC) INSTALLATION/TECHNICIAN
- 21. ELECTRICAL CONTRACTOR
- 22. INSTALLATION, MAINTENANCE AND REPAIR
- 23. SALES AND RELATED SUPPORT
- 24. ARCHITECTURAL, ENGINEERING, OR RELATED SERVICES
- 25. ENERGY CONSERVATION CONSULTANT
- 26. PROPERTY MANAGEMENT OR REAL ESTATE DEVELOPMENT
- 98. OTHER [**SPECIFY**]
- 99. REFUSED
- 100. DON'T KNOW

[ASK E2 IF E1≠3,4]

E2. What would you say is the biggest reason preventing your company from hiring more employees for energy efficiency-related positions within your company?

- 02. [**RECORD VERBATIM**]
- 98. REFUSED
- 99. DON'T KNOW

SECTION F. AWARENESS OF NYSERDA AND/OR BROADER WFD EFFORTS

F1. Before this call, were you aware of NYSERDA [**IF NECESSARY**: NYSERDA is the New York State Research and Development Authority]?

- 01. YES
- 02. NO [**SKIP TO F3**]
- 96. REFUSED [**SKIP TO F3**]
- 97. DON'T KNOW [**SKIP TO F3**]

F2. Before this call, were you aware that NYSERDA provides support for basic skills development through advanced-level energy efficiency training and certifications?

- 01. YES
- 02. NO [**SKIP TO F3**]
- 96. REFUSED [**SKIP TO F3**]
- 97. DON'T KNOW [**SKIP TO F3**]

F2a. How did you hear about NYSERDA's supported energy efficiency training programs? [**DO NOT PROMPT. MARK ALL THAT APPLY**]

- 13. DIRECT MARKETING – LIVE PRESENTATION, CALL
- 14. INDIRECT MARKETING – PUBLIC SERVICE ANNOUNCEMENTS, PRESS RELEASES
- 15. RADIO ADS
- 16. TELEVISION ADS
- 17. INTERNET ADS
- 18. COMPANY WEBSITE
- 19. PRINT ADS
- 20. CAREER FAIR
- 21. HOME SHOWS
- 22. NETWORKING/TEAMING WITH OTHERS
- 23. PAST NYSERDA PROGRAM PARTICIPANT
- 24. EMPLOY PAST WFD PARTICIPANTS
- 96. OTHER [**SPECIFY**]
- 96. REFUSED
- 97. DON'T KNOW

F2b. How familiar are you with NYSERDA's supported energy efficiency training efforts? Would you say you are... [**READ LIST**]?

- 05. Very familiar
- 06. Somewhat familiar
- 07. Not too familiar
- 08. Not at all familiar
- 96. REFUSED
- 97. DON'T KNOW

F3. Are you aware of any other energy efficiency-focused training programs in New York State, where students can go to develop basic job skills or receive advanced skills training in the field of energy efficiency?

- 03. YES
- 04. NO

- 98. REFUSED
- 99. DON'T KNOW

F3a. How satisfied is your company with the availability of conveniently accessible energy efficiency-related training programs in your general area? Would you say you are... [READ LIST]

- 05. Not at all satisfied
- 06. Not too satisfied
- 07. Somewhat satisfied
- 08. Very satisfied [**SKIP TO NEXT SECTION**]
- 98. REFUSED [**SKIP TO NEXT SECTION**]
- 99. DON'T KNOW [**SKIP TO NEXT SECTION**]

F3b. What could be done to improve your level of satisfaction with the accessibility to existing energy efficiency-related training locations?

- 02. [**RECORD VERBATIM**]
- 96. REFUSED
- 97. DON'T KNOW

SECTION G. PARTICIPATION IN OTHER SBC-FUNDED INITIATIVES

G1. Does your company work with NYSERDA or any New York utility to provide energy efficiency products or services through programs they sponsor?

[**READ IF NECESSARY** – For example, NYSERDA's Home Performance with ENERGY STAR® or FlexTech Programs, National Grid's Small and Mid-Sized Business Energy Efficiency Program, Central Hudson Gas and Electric Corporation's Home Energy Savings Central Program]

- 03. YES
- 04. NO [**SKIP TO THANK YOU AND END**]
- 98. REFUSED [**SKIP TO THANK YOU AND END**]
- 99. DON'T KNOW [**SKIP TO THANK YOU AND END**]

G1a. Which energy efficiency initiatives or programs does your company participate in? [DO NOT PROMPT.]

- 02. [**RECORD VERBATIM**]
- 98. REFUSED
- 99. DON'T KNOW

Those are all the questions I have, thank you very much for your time today.

APPENDIX D

Non-Participating Training Organizations Survey Instrument

**EEPS Workforce Development Program
Market Assessment Telephone Survey – Nonparticipating Training Organizations
FINAL V7 – January 10, 2012**

INTRODUCTION

Hello, this is <INTERVIEWER> calling from IC International. I am calling on behalf of NYSERDA [READ IF NECESSARY: the New York State Energy Research and Development Authority]. May I please speak with [IF NAME LISTED ON SAMPLE: <CONTACT NAME> or] the person [IF <College = 0>: responsible for your organization's training program?] [IF <College = 1>: responsible for determining the types of classes and programs to offer potential students?]

[READ IF NECESSARY: We are conducting research to evaluate NYSERDA's Workforce Development Program. This program funds training to prepare people to work in jobs that help promote energy efficiency. I would like to speak with you about your [IF College=0: organization's training programs] [IF College=1: your organization's job-preparatory skills development classes].

[IF TITLED RESPONDENT IS NOT AVAILABLE OR DOES NOT EXIST: I would like to speak with someone who is familiar with your organization's training programs. Who would that person be, and is he or she available?]

[ONCE NAMED OR NEW RESPONDENT IS ON THE PHONE, CONTINUE – IF ORIGINAL PERSON IS CORRECT RESPONDENT, SKIP TO S1]

This is <INTERVIEWER> calling from IC International. I am calling on behalf of NYSERDA [READ IF NECESSARY: the New York State Energy Research and Development Authority] to evaluate its Workforce Development Program. This program funds training to prepare people to work in jobs that help promote energy efficiency. I would like to speak with you about your organization's experiences with job skills-related training activities. [READ IF NECESSARY: The survey should take around 15 minutes. We will not use your responses in any way that would reveal your identity.]

[IF THE RESPONDENT HAS QUESTIONS ABOUT THE SURVEY, YOU MAY TELL HIM OR HER TO CALL TODD FRENCH, NYSERDA, AT (518) 862-1090, x3212]

S1. Does your organization offer training that prepares trainees to work in an energy efficiency-related field? Before you answer this question, please note that we are using the phrase “*energy-efficiency related*” in a broadly defined way. Our definition includes: indirect training [READ IF NECESSARY: for example, basic job skills, plumbing or electric repair], direct training [READ IF NECESSARY: for example, energy auditing, weatherization, or green building techniques], or higher level training [READ IF NECESSARY: for engineers, designers, building operators, program administrators, and training for career advancement, professional development or certification/accreditations and licensure].

- 01 YES
- 02 NO [THANK AND TERMINATE AND READ TERMINATE SCRIPT A]
- 96 REFUSED [THANK AND TERMINATE]
- 97 DON'T KNOW [THANK AND TERMINATE AND READ TERMINATE SCRIPT A]

[TERMINATE SCRIPT A: For this survey we are speaking only with organizations that offer training in the broadly defined energy efficiency-related field.]

S2. Does your organization offer training programs in partnership with, or supported by, NYSERDA's ongoing energy efficiency skills training efforts,

- 01 YES [ASK: “Do you receive funding from NYSERDA through the Workforce Development Program?”] [IF YES, THANK AND TERMINATE AND READ TERMINATE SCRIPT B; IF NO, CONTINUE SURVEY AND RECODE S2 TO 02]
- 02 NO
- 96 REFUSED [THANK AND TERMINATE AND READ TERMINATE SCRIPT B]
- 97 DON'T KNOW

[TERMINATE SCRIPT B: For this survey we are speaking only with organizations that have not participated in NYSERDA's Workforce Development program.]

SECTION A. TRAINING PRACTICES

A1. I'm going to read you a list of skills and areas in which your organization might offer training. Please tell me if you offer training in any of the follow areas. First... **[INSERT ITEM a]** **[READ IF NECESSARY: Does your organization offer training in this area?]** Next... **[INSERT ITEMS b-h]**

- a. Work readiness skills training, including workplace preparation, teamwork, problem solving, time management, conflict resolution, and basic job skills education?
- b. Vocational and Technical Skills Training? **[READ IF NECESSARY: with a specific vocational objective]**
- c. Field training, including support for HVAC, plumbing, electricians, and others?
- d. Sector based training, such as residential building science and “whole-house approach training”? **[READ IF NECESSARY: sector-based training targets specific business market areas including residential construction, business/industrial facilities management, education, biotech, health sectors, etc.]**
- e. Advanced technical training? **[READ IF NECESSARY: including lighting design and retrofits, heat pumps, energy management systems, indoor air quality and ventilation, advanced insulation and air sealing techniques, commercial cooling systems]**
- f. Training to Address Certification and Accreditations Needs? **[READ IF NECESSARY: including BPI, HERS, CEM, or for professional development or continuing education purposes]**
- g. Internships and Apprenticeship Programs intended to link academic and work experience through on-the-job training?
- h. “Train-the-trainer” training programs?
 - 01 YES
 - 02 NO
 - 03 DON'T OFFER WITHIN OUR ORGANIZATION, BUT DO REFER PEOPLE TO SUCH TRAININGS OFFERED BY OTHERS **[IF VOLUNTEERED]**
 - 96 REFUSED
 - 97 DON'T KNOW

[IF ALL A1a – A1h ≠ 01, SKIP TO A3]

A2. For each type of training you just mentioned, please tell me how often this type of training includes energy efficiency elements within the training materials. First, for...**[ROTATE a-h; INSERT FIRST ITEM]**. Would you say this type of training never, rarely, sometimes, or always includes energy efficiency elements? Next, for...**[INSERT REMAINING ITEMS]**

- a. **[SHOW IF A1a = 01: Work readiness skills training?]** **[READ IF NECESSARY: Including workplace preparation, teamwork, problem solving, time management, conflict resolution, and basic job skills education]**
- b. **[SHOW IF A1b = 01: Vocational and technical skills training?]** **[READ IF NECESSARY: with a specific vocational objective]**
- c. **[SHOW IF A1c = 01: Field training?]** **[READ IF NECESSARY: including support for HVAC, plumbing, electricians, and others]**
- d. **[SHOW IF A1d = 01: Sector-based training?]** **[READ IF NECESSARY: such as residential building science and “whole-house approach training”]**
- e. **[SHOW IF A1e = 01: Advanced technical training?]** **[READ IF NECESSARY: including lighting design and retrofits, heat pumps, energy management systems, indoor air quality and ventilation, advanced insulation and air sealing techniques, commercial cooling systems]**
- f. **[SHOW IF A1f = 01: Training to address certification and accreditations needs?]** **[READ IF NECESSARY: including BPI, HERS, CEM, or for professional development or continuing education purposes]**
- g. **[SHOW IF A1g = 01: Internships and apprenticeship programs?]** **[READ IF NECESSARY: intended to link academic and work experience through on-the-job training]**

- h. **[SHOW IF A1h = 01: “Train the trainer” programs?]**
- 01 NEVER
 - 02 RARELY
 - 03 SOMETIMES
 - 04 ALWAYS
 - 96 REFUSED
 - 97 DON’T KNOW

A3. Now I’m going to read you a number of potential factors that may be motivating or driving new trainees to come to you to learn energy efficiency-related job skills. For each reason, please tell me whether it is a major factor, minor factor, or not at all a factor in driving them to your trainings. First...**[ROTATE a-e; INSERT FIRST ITEM] [READ IF NECESSARY: Is this a major, minor, or not a factor that new trainees come to you for training?]** Next... **[INSERT REMAINING ITEMS]**

- a. Availability of training or tuition subsidies?
- b. A perceived need for more skilled workers for energy efficiency jobs in NY?
- c. Response to marketing and outreach efforts that encourage getting energy efficiency skills training?
- d. General increased awareness and demand for energy efficient products and services?
- e. Their existing employer (if currently employed) asked them to take the training?
 - 01 MAJOR FACTOR
 - 02 MINOR FACTOR
 - 03 NOT AT ALL A FACTOR
 - 96 REFUSED
 - 97 DON’T KNOW

A3f. Do you think there are any other factors that are motivating or driving new trainees to come to you to learn energy efficiency-related job skills?

- 01 YES **[SPECIFY] [NOTE TO PROGRAMMER – PLEASE SET THIS VERBATIM UP AS A 1ST/2ND/3RD/ MENTION RESPONSE; WE WANT TO CAPTURE THE MOST IMPORTANT VERBATIM RESPONSE FIRST]**
- 02 NO
- 96 REFUSED
- 97 DON’T KNOW

[ASK A3g IF MORE THAN ONE OF (A3a-e AND A3f) = 01; OTHERWISE, SKIP TO A4]

A3g. Of the items you just mentioned that were “major factors,” which of these is the **one** most important reason new trainees may be interested in learning energy efficiency related skills? **[PROMPT WITH LIST BELOW IF RESPONDENT CAN’T REMEMBER] [RESPONDENT MUST GIVE ANSWER FOUND IN LIST BELOW]**

- 01 **[SHOW IF A3a = 01] AVAILABILITY OF TRAINING OR TUITION SUBSIDIES**
- 02 **[SHOW IF A3b = 01] A PERCEIVED NEED FOR MORE SKILLED WORKERS FOR ENERGY EFFICIENCY JOBS IN NY**
- 03 **[SHOW IF A3c = 01] RESPONSE TO MARKETING AND OUTREACH EFFORTS THAT ENCOURAGE GETTING ENERGY EFFICIENCY SKILLS TRAINING**
- 04 **[SHOW IF A3d = 01] GENERAL INCREASED AWARENESS AND DEMAND FOR ENERGY EFFICIENT PRODUCTS AND SERVICES**
- 05 **[SHOW IF A3e = 01] THEIR EXISTING EMPLOYEE (IF CURRENTLY EMPLOYED) ASKED THEM TO TAKE THE TRAINING**
- 91 **[SHOW THE FIRST OTHER MENTION FROM A3f]**
- 92 **[SHOW THE SECOND OTHER MENTION FROM A3f]**
- 93 **[SHOW THE THIRD OTHER MENTION FROM A3f]**

- 96 REFUSED
- 97 DON'T KNOW

A4. I'm going to read a number of potential factors that may be limiting your organization's ability to maintain or expand training programs that include energy efficiency-related components. For each factor, please tell me whether it is a major factor, minor factor, or not at all a factor. First...**[INSERT ITEM a]** **[READ IF NECESSARY: Is this a major, minor, or not a factor limiting your organization's ability to maintain or expand training programs?]** Next... **[INSERT ITEMS b-i]**

- a. Lack of demand for energy-efficiency related training services?
- b. Lack of qualified trainers available?
- c. Lack of funding to hire and train trainers?
- d. Lack of financial aid for trainers?
- e. Lack of available space to run your training classes?
- f. Too many competing organizations offering similar training programs?
- g. Difficulty developing job, internship, or apprentice connections with employers for trainees?
- h. Not enough information about the training opportunity?
- i. Other topics have higher priority?
 - 01 MAJOR FACTOR
 - 02 MINOR FACTOR
 - 03 NOT AT ALL A FACTOR
 - 96 REFUSED
 - 97 DON'T KNOW

A4j. Are there other factors that may be limiting your organization's ability to maintain or expand training programs that include energy efficiency-related components?

- 01 YES **[SPECIFY]** **[NOTE TO PROGRAMMER – PLEASE SET THIS VERBATIM UP AS A 1ST/2ND/3RD/ MENTION RESPONSE; WE WANT TO CAPTURE THE MOST IMPORTANT VERBATIM RESPONSE FIRST]**
- 02 NO
- 96 REFUSED
- 97 DON'T KNOW

[ASK A4k IF MORE THAN ONE OF (A4a-i AND A4j) = 01; OTHERWISE, SKIP TO A5]

A4k. Of the items you just mentioned that were "major factors," which of these is the **one** most important factor limiting your organization's ability to maintain or expand training programs that include energy-efficiency related components? **[PROMPT WITH LIST BELOW IF RESPONDENT CAN'T REMEMBER]**

- 01 **[SHOW IF A4a = 01]** LACK OF DEMAND FOR ENERGY-EFFICIENCY RELATED TRAINING SERVICES?
- 02 **[SHOW IF A4b = 01]** LACK OF QUALIFIED TRAINERS AVAILABLE?
- 03 **[SHOW IF A4c = 01]** LACK OF FUNDING TO HIRE AND TRAIN TRAINERS?
- 04 **[SHOW IF A4d = 01]** LACK OF FINANCIAL AID FOR TRAINERS?
- 05 **[SHOW IF A4e = 01]** LACK OF AVAILABLE SPACE TO RUN YOUR TRAINING CLASSES?
- 06 **[SHOW IF A4f = 01]** TOO MANY COMPETING ORGANIZATIONS OFFERING SIMILAR TRAINING PROGRAMS?
- 07 **[SHOW IF A4g = 01]** DIFFICULTY DEVELOPING JOB, INTERNSHIP, OR APPRENTICE CONNECTIONS WITH EMPLOYERS FOR TRAINEES?
- 08 **[SHOW IF A4h = 01]** NOT ENOUGH INFORMATION ABOUT THE TRAINING OPPORTUNITY?
- 09 **[SHOW IF A4i = 01]** OTHER TOPICS HAVE HIGHER PRIORITY?

- 91 **[SHOW THE FIRST OTHER MENTION FROM A4j]**
- 92 **[SHOW THE SECOND OTHER MENTION FROM A4j]**
- 93 **[SHOW THE THIRD OTHER MENTION FROM A4j]**
- 96 REFUSED
- 97 DON'T KNOW

A5. How important is it to your organization that energy efficiency-related training materials (including curricula) are made available for your use? Would you say it is very, somewhat, not too, or not at all important?

- 01 VERY IMPORTANT **[SKIP TO A6]**
- 02 SOMEWHAT IMPORTANT **[SKIP TO A6]**
- 03 NOT TOO IMPORTANT
- 04 NOT AT ALL IMPORTANT
- 96 REFUSED **[SKIP TO A6]**
- 97 DON'T KNOW **[SKIP TO A6]**

A5a. Why do you feel this way?

- 01 **[RECORD VERBATIM]**
- 96 REFUSED
- 97 DON'T KNOW

A6. I am now going to read you a list of different approaches that your organization may be using to promote its training programs. For each one, please tell me whether the approach is very, somewhat, not too, or not at all effective. First... **[ROTATE a-e; INSERT FIRST ITEM]** Next... **[INSERT REMAINING ITEMS]**

- a. Presentations to potential trainees or organizations representing such trainees?
- b. TV advertisements, including news stories or program sponsorship?
- c. Your organization's website?
- d. Print advertisement?
- e. Referrals or relationships with 1-Stops?
 - 01 VERY EFFECTIVE
 - 02 SOMEWHAT EFFECTIVE
 - 03 NOT TOO EFFECTIVE
 - 04 NOT AT ALL EFFECTIVE
 - 05 DON'T USE THIS TYPE OF PROMOTION **[IF VOLUNTEERED]**
 - 96 REFUSED
 - 97 DON'T KNOW

A6f. Are there other approaches that your organization may be using to promote its training programs?

- 01 YES **[SPECIFY]**
- 02 NO
- 96 REFUSED
- 97 DON'T KNOW

For the next few questions, I will be asking about your organization's training activities for the following groups of people:

- single mothers who are the primary wage-earner in their household,
- disabled veterans,
- individuals who are unemployed or underemployed and living below the poverty level,
- individuals that have been previously incarcerated, or

- individuals ranging from 18 to 24 years of age.

A7. Does your organization specifically target any of the groups of people just mentioned for training with energy efficiency components?

- 05. YES
- 06. NO [**SKIP TO A9**]
- 96. REFUSED [**SKIP TO A9**]
- 97. DON'T KNOW [**SKIP TO A9**]

A8. Which groups of people just mentioned do you target and design courses for? [**ACCEPT MULTIPLE**] [**PROMPT IF NEEDED**]

- 01. SINGLE MOTHERS WHO ARE THE PRIMARY WAGE-EARNER IN THEIR HOUSEHOLD
- 02. DISABLED VETERANS
- 03. INDIVIDUALS WHO ARE UNEMPLOYED OR UNDEREMPLOYED AND LIVING BELOW THE POVERTY LEVEL
- 04. INDIVIDUALS THAT HAVE BEEN PREVIOUSLY INCARCERATED
- 05. INDIVIDUALS RANGING FROM 18 TO 24 YEARS OF AGE
- 95. OTHER [**SPECIFY**]
- 96. REFUSED [**SKIP TO A9**]
- 97. DON'T KNOW [**SKIP TO A9**]

A8a. Can you give a brief description of the courses you offer these individuals? [**READ IF NECESSARY: What types of training opportunities do you offer in these courses?**]

- 01. [**RECORD VERBATIM**]
- 96. REFUSED
- 97. DON'T KNOW

A8b. In the past two years, among the trainees who have received training from you that included energy efficiency-related components, approximately what percentage fell into each of the following groups? First...[**ROTATE a-c; INSERT FIRST ITEM**] Would you say... [**READ IF NECESSARY: Your best estimate is fine.**] Next... [**INSERT REMAINING ITEMS**]

- a. Single mothers who are the primary wage-earner in their household?
 - b. Disabled veterans?
 - c. Individuals who are unemployed or underemployed and living below the poverty level?
 - d. Individuals that have been previously incarcerated?
 - e. Individuals ranging from 18 to 24 years of age?
- 11. 0%
 - 12. More than 0% but less than 1%
 - 13. 1% to less than 5%
 - 14. 5% to less than 10%
 - 15. 10% to less than 20%, or
 - 16. 20% or more
 - 96. REFUSED
 - 97. DON'T KNOW

A8c. Prior to participation in your training, how aware would you say people from these groups were about employment opportunities in an energy efficiency-related field – very, somewhat, not too, or not at all aware?

- 01. VERY AWARE
- 02. SOMEWHAT AWARE

- 03 NOT TOO AWARE
- 04 NOT AT ALL AWARE
- 05 DIFFERS BY TYPE OF GROUP **[IF VOLUNTEERED]**
- 96 REFUSED
- 97 DON'T KNOW

A9. Does your organization offer financial aid to individuals who may not otherwise be able to afford training?

- 01 YES
- 02 NO **[SKIP TO SECTION B]**
- 96 REFUSED **[SKIP TO SECTION B]**
- 97 DON'T KNOW **[SKIP TO SECTION B]**

A9a. Where does this financial aid come from? **[MARK ALL THAT APPLY]**

- 01 DIRECTLY FROM TRAINING ORGANIZATION
- 02 FOUNDATION
- 03 CITY/COUNTY
- 04 STATE (i.e. DEPARTMENT OF LABOR)
- 05 FEDERAL FUNDING
- 06 COLLEGE/UNIVERSITY
- 07 TUITION
- 95 OTHER **[SPECIFY]**
- 96 REFUSED **[SKIP TO SECTION B]**
- 97 DON'T KNOW **[SKIP TO SECTION B]**

A9b. Approximately what percentages of your trainees receive financial aid? Would you say... **[READ LIST]**

- 01 Less than 5%
- 02 5-10%
- 03 11-25%
- 04 26-50%
- 05 51-75%
- 06 76-100%
- 96 REFUSED
- 97 DON'T KNOW

1.1 SECTION B. TRAINING TRENDS AND PLANS

B0. Do you feel there is a need for additional energy efficiency training opportunities in the area your organization serves?

- 01 YES
- 02 NO
- 96 REFUSED
- 97 DON'T KNOW

B0a. Why do you feel this way?

- 01 **[RECORD VERBATIM]**
- 96 REFUSED
- 97 DON'T KNOW

B0b. If more students were brought to your organization, would you be able to handle the increased demand?

- 01 YES
- 02 NO
- 96 REFUSED
- 97 DON'T KNOW

[IF ALL A1a-A1h ≠ 01, SKIP TO SECTION D]

B1. You previously mentioned different types of training your organization offers. I'd like to know in the last 12 months, has your organization seen an increase, decrease or no change in the number of training requests for each type of training. First...**[ROTATE a-h; INSERT FIRST ITEM]** **[READ IF NECESSARY: Have you noticed an increase, decrease, or no change in number of requests for this type of training?]** Next... **[INSERT REMAINING ITEMS]**

- a. **[SHOW IF A1a = 01: Work readiness skills training?]** **[READ IF NECESSARY: Including workplace preparation, teamwork, problem solving, time management, conflict resolution, and basic job skills education]**
- b. **[SHOW IF A1b = 01: Vocational and technical skills training?]** **[READ IF NECESSARY: with a specific vocational objective]**
- c. **[SHOW IF A1c = 01: Field training?]** **[READ IF NECESSARY: including support for HVAC, plumbing, electricians, and others]**
- d. **[SHOW IF A1d = 01: Sector-based training?]** **[READ IF NECESSARY: such as building science and "whole-house approach training"]**
- e. **[SHOW IF A1e = 01: Advanced technical training?]** **[READ IF NECESSARY: including lighting design and retrofits, heat pumps, energy management systems, indoor air quality and ventilation, advanced insulation and air sealing techniques, commercial cooling systems]**
- f. **[SHOW IF A1f = 01: Training to address certification and accreditations needs?]** **[READ IF NECESSARY: including BPI, HERS, CEM, or for professional development or continuing education purposes]**
- g. **[SHOW IF A1g = 01: Internships and apprenticeship programs?]** **[READ IF NECESSARY: intended to link academic and work experience through on-the-job training?]**
- h. **[SHOW IF A1h = 01: "Train-the-trainer" training programs?]**
 - 01 INCREASE
 - 02 DECREASE
 - 03 NO CHANGE
 - 96 REFUSED
 - 97 DON'T KNOW

[ASK B2a IF ONE OR MORE OF B1a-B1h =1; OTHERWISE, SKIP TO C1]

B2a. You have indicated that requests for at least one of your training programs have increased in the last 12 months. How much of a factor would you say employer requests have been in driving this increase? Would you say they have been a major factor, minor factor, or not at all a factor?

- 01 MAJOR FACTOR
- 02 MINOR FACTOR
- 03 NOT A FACTOR
- 96 REFUSED
- 97 DON'T KNOW

B2b. How likely is it that your organization will expand or develop new training programs to meet the increased demand you have seen in the last 12 months? Would you say it is very likely, somewhat likely, not too likely, or not at all likely? **[READ IF NECESSARY: If you have already expanded your programs to meet this increased demand, please say so.]**

- 01 VERY LIKELY [**SKIP TO C1**]
- 02 SOMEWHAT LIKELY [**SKIP TO C1**]
- 03 NOT TOO LIKELY
- 04 NOT AT ALL LIKELY
- 05 HAVE ALREADY EXPANDED TO MEET THIS INCREASED DEMAND [**IF VOLUNTEERED**] [**SKIP TO C1**]
- 96 REFUSED [**SKIP TO C1**]
- 97 DON'T KNOW [**SKIP TO C1**]

B3. What would you say are the primary reasons your organization is not planning to expand or develop new programs to meet the increased demand? [**DO NOT PROMPT**] [**MARK ALL THAT APPLY**]

- 01 DEMAND INCREASED, BUT NOT SUFFICIENTLY TO JUSTIFY EXPANSION
- 02 BUDGET CONSTRAINTS
- 03 INSUFFICIENT FACILITIES
- 04 NOT ENOUGH INFORMATION
- 05 NO QUALIFIED TRAINERS AVAILABLE
- 06 OTHER TOPICS HAVE HIGHER PRIORITY
- 95 OTHER [**SPECIFY**]
- 96 REFUSED
- 97 DON'T KNOW

1.2 SECTION C. TRAINEE INTEREST IN ENERGY EFFICIENCY – POST TRAINING

C1. For trainees who completed your organization's [**ROTATE a-h; INSERT FIRST ITEM**] in the last 12 months, how interested would you say they were in seeking, or continuing employment in an energy efficiency-related field? Would you say they were very, somewhat, not too, or not at all interested?

Next...[**INSERT REMAINING ITEMS**]?

- a. [**SHOW IF A1a = 01: Work readiness skills training**] [**READ IF NECESSARY: Including workplace preparation, teamwork, problem solving, time management, conflict resolution, and basic job skills education**]
- b. [**SHOW IF A1b = 01: Vocational and technical skills training**] [**READ IF NECESSARY: with a specific vocational objective**]
- c. [**SHOW IF A1c = 01: Field training**] [**READ IF NECESSARY: including support for HVAC, plumbing, electricians, and others**]
- d. [**SHOW IF A1d = 01: Sector-based training**] [**READ IF NECESSARY: such as building science and "whole-house approach training"**]
- e. [**SHOW IF A1e = 01: Advanced technical training**] [**READ IF NECESSARY: including lighting design and retrofits, heat pumps, energy management systems, indoor air quality and ventilation, advanced insulation and air sealing techniques, commercial cooling systems**]
- f. [**SHOW IF A1f = 01: Training to address certification and accreditations needs**] [**READ IF NECESSARY: including BPI, HERS, CEM, or for professional development or continuing education purposes**]
- g. [**SHOW IF A1g = 01: Internships and apprenticeship programs**] [**READ IF NECESSARY: intended to link academic and work experience through on-the-job training**]
- h. [**SHOW IF A1h = 01: "Train-the-trainer" training programs**]
 - 01 VERY INTERESTED
 - 02 SOMEWHAT INTERESTED
 - 03 NOT TOO INTERESTED
 - 04 NOT AT ALL INTERESTED
 - 96 REFUSED
 - 97 DON'T KNOW

1.3 SECTION D. ENERGY EFFICIENCY EMPLOYMENT PLACEMENT/OPPORTUNITIES

D1. To the best of your knowledge, in the last 12 months, have any of your trainees that were not previously employed in an energy efficiency-related field, found employment in this field? [**READ IF NECESSARY:** working for companies that design, deliver, install, or service products that use energy within homes or businesses in New York State?]

05. YES

06. NO [**SKIP TO D2**]

07. NOT APPLICABLE – ALL TRAINEES PREVIOUSLY EMPLOYED IN AN ENERGY EFFICIENCY-RELATED FIELD [**IF VOLUNTEERED**] [**SKIP TO D2**]

96 REFUSED [**SKIP TO D2**]

97 DON'T KNOW [**SKIP TO D2**]

D1a. I'm going to read you a list of potential energy efficiency-related job types. For each type, please tell me if it has or has not been an area where your trainees have found employment. First... [**ROTATE a-m; INSERT FIRST ITEM**] [**READ IF NECESSARY:** Has it been an area where your trainees have found employment?] Next... [**INSERT REMAINING ITEMS**]

a. General office and project administrative support?

b. General residential construction, entry level?

c. General commercial construction, entry level?

d. General residential construction [**READ IF NECESSARY:** skilled contractors and project management]?

e. General commercial construction [**READ IF NECESSARY:** skilled contractors and project management]?

f. Building shell improvement?

g. Heating, Ventilation & Air-Conditioning (HVAC) installation/technician?

h. Electrical contractor?

i. Equipment installation, maintenance and repair?

j. Sales and related support?

k. Architectural, engineering, or related services?

l. Energy conservation consultant?

m. Property management or real estate development?

14. HAS

15. HAS NOT

96 REFUSED

97 DON'T KNOW

D1n. Are there other job areas where your trainees have found energy-efficiency-related employment?

01 YES [**SPECIFY**]

02 NO

96 REFUSED

97 DON'T KNOW

D2. Does your organization have any specific internships or job placement arrangements with businesses or organizations involved in the energy efficiency field?

- 01 YES
- 02 NO **[SKIP TO D3]**
- 96 REFUSED **[SKIP TO D3]**
- 97 DON'T KNOW **[SKIP TO D3]**

D2a. Please describe these arrangements.

- 01 **[RECORD VERBATIM]**
- 96 REFUSED
- 97 DON'T KNOW

D2b. How effective are these arrangements in supplementing training needs to promote job placement? Would you say they are very, somewhat, not too, or not at all effective?

- 01 VERY EFFECTIVE **[SKIP TO D2d]**
- 02 SOMEWHAT EFFECTIVE **[SKIP TO D2d]**
- 03 NOT TOO EFFECTIVE
- 04 NOT AT ALL EFFECTIVE
- 96 REFUSED **[SKIP TO D2d]**
- 97 DON'T KNOW **[SKIP TO D2d]**

D2c. What could be done to make these arrangements more effective?

- 01 **[RECORD VERBATIM]**
- 96 REFUSED
- 97 DON'T KNOW

D2d. If resources and funding were made available to your organization for on-the-job skills training and experience, would you be able to expand these arrangements such that you could place additional workers into the energy efficiency field?

- 01 YES
- 02 NO **[SKIP TO D3]**
- 96 REFUSED **[SKIP TO D3]**
- 97 DON'T KNOW **[SKIP TO D3]**

D2e. About how many additional workers do you think you could place each year? Would you say....

[READ LIST]

- 01 1 or 2,
- 02 3 to 5,
- 03 6 to 10,
- 04 11 to 25,
- 05 26 to 50, or
- 06 More than 50?
- 96 REFUSED **[SKIP TO D3]**
- 97 DON'T KNOW **[SKIP TO D3]**

D2f. Referring to the list of potential energy efficiency-related job types I read earlier, for each type, please tell me if it would be an area where these additional workers would likely find employment.

- a. General office and project administrative support
- b. General residential construction, entry level
- c. General commercial construction, entry level

- d. General residential constructions [**READ IF NECESSARY:** skilled contractors and project management]
- e. General commercial construction [**READ IF NECESSARY:** skilled contractors and project management]
- f. Building shell improvement
- g. Heating, Ventilation & Air-Conditioning (HVAC) installation/technician
- h. Electrical contractor
- i. Equipment installation, maintenance and repair
- j. Sales and related support
- k. Architectural, engineering, or related services
- l. Energy conservation consultant
- m. Property management or real estate development
 - 01 YES
 - 02 NO
 - 96 REFUSED
 - 97 DON'T KNOW

D2n. Are there other job areas where these additional workers would likely find energy-efficiency-related employment?

- 01 YES [**SPECIFY**]
- 02 NO
- 96 REFUSED
- 97 DON'T KNOW

D3. In the next 12 months, do you think that employment opportunities in energy efficiency-related fields will increase, decrease, or stay about the same?

- 01 INCREASE
- 02 DECREASE
- 03 STAY ABOUT THE SAME
- 96 REFUSED
- 97 DON'T KNOW

1.4 SECTION E. AWARENESS OF NYSERDA AND/OR BROADER WFD EFFORTS

E1. Before this call, were you aware of NYSERDA [**READ IF NECESSARY:** the New York State Energy Research and Development Authority]?

- 01 YES
- 02 NO [**SKIP TO E3**]
- 96 REFUSED [**SKIP TO E3**]
- 97 DON'T KNOW [**SKIP TO E3**]

E2. Before this call, were you aware that NYSERDA provides support for basic skills development through advanced-level energy efficiency training and certifications?

- 01 YES
- 02 NO [**SKIP TO F1**]
- 96 REFUSED [**SKIP TO F1**]
- 97 DON'T KNOW [**SKIP TO F1**]

E2a. How did you hear about NYSERDA's supported energy efficiency training programs? [**DO NOT PROMPT**] [**MARK ALL THAT APPLY**]

- 25. DIRECT MARKETING – LIVE PRESENTATION, CALL

- 26. INDIRECT MARKETING – PUBLIC SERVICE ANNOUNCEMENTS, PRESS RELEASES
- 27. RADIO ADS
- 28. TELEVISION ADS
- 29. INTERNET ADS
- 30. NYSERDA WEBSITE
- 31. PRINT ADS
- 32. CAREER FAIR
- 33. HOME SHOWS
- 34. NETWORKING/TEAMING WITH OTHERS
- 35. PAST NYSERDA PROGRAM PARTICIPANT
- 36. EMPLOY PAST WFD PARTICIPANTS
- 95 OTHER [**SPECIFY**]
- 96 REFUSED
- 97 DON'T KNOW

E2b. How familiar are you with NYSERDA's supported energy efficiency training efforts? Would you say you are very, somewhat, not too, or not at all familiar?

- 09. VERY FAMILIAR
- 10. SOMEWHAT FAMILIAR
- 11. NOT TOO FAMILIAR
- 12. NOT AT ALL FAMILIAR
- 96 REFUSED
- 97 DON'T KNOW

E3. Are you aware of any other programs in New York State that provide training in basic or advanced job skills in the energy efficiency field?

- 01 YES
- 02 NO [**SKIP TO F1**]
- 96 REFUSED [**SKIP TO F1**]
- 97 DON'T KNOW [**SKIP TO F1**]

E3a. Which programs are you aware of? [**INTERVIEWER: FOR EACH PROGRAM MENTIONED, PLEASE INCLUDE WHO SPONSORS OR RUNS THE PROGRAM AND WHERE THE PROGRAM IS LOCATED IN THE RESPONSE**]

- 01 [**RECORD VERBATIM**]
- 96 REFUSED
- 97 DON'T KNOW

SECTION F. FIRMOGRAPHICS

I have just a few final questions regarding your training organization.

F1. How many training locations does your organization currently have across New York State?

- 01 [RECORD NUMBER]
- 96 REFUSED
- 97 DON'T KNOW

F2. During the past 12 months, approximately how many training classes did your organization offer across all your New York State locations? A training class can be anything from a one-time workshop, to a multi-day program, or ongoing classes, where an identical training event is conducted quarterly or more frequently.

- 01 [RECORD NUMBER]
- 96 REFUSED
- 97 DON'T KNOW

[IF RESPONDENT OFFERED ADDITIONAL INFORMATION WHEN ANSWERING F2, INPUT RESPONSE AS A VERBATIM IN F2a BELOW, OTHERWISE, SKIP TO F3]

F2a.

- 01 [RECORD VERBATIM]

F3. During the past 12 months, approximately how many job placements did your organization produce statewide?

- 01 [RECORD NUMBER]
- 96 REFUSED [THANK AND TERMINATE]
- 97 DON'T KNOW [THANK AND TERMINATE]

[ASK F3a IF F3 01 >=1]

F3a. How many of these job placements were in energy efficiency-related positions?

- 01 [RECORD NUMBER] [PROGRAMMER: ONLY ALLOW NUMBERS FROM 0-F3_01]
- 96 REFUSED [THANK AND TERMINATE]
- 97 DON'T KNOW [THANK AND TERMINATE]

Those are all the questions I had. Thank you very much for your time. **[NOTE TO CATI PROGRAMMER: PLEASE INSERT SPACE AND PROMPTS FOR INTERVIEWER TO CAPTURE RESPONDENT NAME/TITLE/PHONE NUMBER]**

APPENDIX E

Sample Design Memo – Non- Participating Employer Surveys



GDS Associates, Inc.
Engineers and Consultants

M E M O R A N D U M

To: Todd French

From: Scott Albert

Date: December 8, 2011

Cc: David Carroll and Kathi Barringer (APPRISE), Bob Wirtshafter and Rohit Vaidya (NMR), Jane Peters (RIA), Brent Barkett (Navigant), Sharon Brown and John Hutts (GDS)

Subject: Sample Design Memo – Employer Surveys

for NYSERDA Workforce Development Program, Market Assessment Efforts

PURPOSE & BACKGROUND:

The purpose of this memo is to provide an explanation of the sample design process used to develop the sample frame for this NYSERDA Workforce Development Program (WFD) Market Assessment, Employer telephone survey. Targeted number of completes and associated quotas for specific strata are also included in this memo. It is important to note, up front, that there is a limited budget for implementing the employer telephone survey component of this WFD program market characterization and assessment (MCA) effort – \$15,000 of a total \$150,000 MCA project budget. A major objective of this employer telephone survey, therefore, is to collect baseline information from targeted groups of businesses that might make use of the program's training support activities.

The telephone survey instrument is designed to gather relevant information from employers in New York that have staff engaged in energy efficiency occupations. Types of information to be gathered were derived from the WFD Program's Logic Model and through discussion with NYSERDA program staff, review of other relevant materials, input from other members of NYSERDA's evaluation contractor teams, the New York Department of Labor and PACE University researchers, and include:

- Energy efficiency workforce skills baseline
- General awareness of job skills-related training
- Training infrastructure awareness and satisfaction baseline
- Energy efficiency employment plans and practices
- Awareness of NYSERDA and/or broader workforce development efforts

- Participation in other SBC-funded initiatives

TARGETED POPULATION:

The population targeted for this sample is made up of companies located within New York that have employees or hire contractors who perform jobs that are directly or indirectly involved with energy efficient building construction or the design, specification, delivery, installation, or servicing of electric energy using products or equipment within homes or businesses in the State. Such companies could either support or directly provide: (1) building/contractor services (i.e., single/multifamily builders, commercial/office builders, HVAC contractors, other building equipment contractors, real estate developers and property managers), or (2) engineering and consultant services (i.e., industrial and mechanical engineers, building construction consultants, HVAC engineers, energy conservation engineers and consultants, and lighting consultants and electrical contractors). Table 1 provides more information on the types and number of these companies (i.e., initial population) to be targeted by this survey. The number of jobs within each company category is also presented in this table based on US Census data by North American Industry Classification System (NAICS) code.

As can be seen from this table, a significant number of firms and jobs fall within these company categories. What is not quite as obvious however, is the fact that a majority of these companies and jobs have little to no direct relationship with electric energy efficiency improvement efforts – which are the focus of the WFD Program. Therefore, as described in more detail later in this memo, all NAICS-derived company categories were reviewed more closely, by SIC code, through an iterative filtering process with NYSERDA program staff and others to compile a more refined (and somewhat judgmental) list of companies from which to draw a sample. More information regarding the ultimately targeted company types represented within each company category (by SIC code) is provided in Table 2. Appendix A presents a description of data sources and additional detail on methodologies used to refine the NAICS population and develop a sample frame for this survey.

It is important to note that other company categories were also considered for inclusion within the initial targeted population for employer surveys, including distributors, manufacturers, weatherization agencies and auditors. Based on input and discussion with NYSERDA program staff and others during the filtering process, distributors and manufacturers were removed from the sample since employees in these categories are not the target of NYSERDA's WFD training efforts. Weatherization agencies were also considered for inclusion in the employer sample, but eliminated primarily because these organizations will be the target of an upcoming PACE evaluation. Concerning auditors, this category is actually included in the sample under Engineering Services/Electrical Contractors and includes building construction consultants, energy conservation consultants, energy conservation engineers, lighting consultants, lighting contractors and energy management controls contractors.

Table 1. Initial Targeted Population for Employer Surveys

Business Classification	Number of Firms/Jobs*	Upstate Firms/Jobs	Downstate Firms/Jobs
Builders/Contractors			
Single Family Builders (NAICS: 236118)	6,321 Firms (41%) 18,478 Jobs (14%)	3,867 Firms (25%) 9,221 Jobs (69%)	2,454 Firms (16%) 9,257 Jobs (7%)
Multifamily Builders (NAICS: 236116)	310 Firms (2%) 4,988 Jobs (4%)	88 Firms (1%) 1,085 Jobs (1%)	222 Firms (1%) 3,903 Jobs (3%)
Commercial and Office Builders (NAICS: 236220)	1855 Firms (12%) 26,911 Jobs (20%)	1041 Firms (7%) 13,473 Jobs (10%)	814 Firms (5%) 13,438 Jobs (10%)
Electrical Contractors (NAICS: 238210)	222 Firms (1%) 3,301 Jobs (2%)	110 Firms (1%) 1,872 Jobs (1%)	112 Firms (1%) 1,429 Jobs (1%)
HVAC Contractors (NAICS: 238220)	4,755 Firms (31%) 43,158 Jobs (32%)	2,788 Firms (18%) 22,602 Jobs (17%)	1,967 Firms (13%) 20,556 Jobs (15%)
Other Building Equipment Contractors (NAICS: 238290)	373 Firms (2%) 7,905 Jobs (6%)	180 Firms (1%) 2,959 Jobs (2%)	193 Firms (1%) 4,946 Jobs (4%)
Real Estate Developers and Property Managers (focus on top 10 of each, based on NYSERDA Study on Downstate market Actors ¹⁸⁷)	20 Firms (0%) N/A Jobs	N/A Firms N/A Jobs	20 Firms (0%) N/A Jobs
Total Contractors	13,856 Firms (89%) 104,741 Jobs (79%)	8,074 Firms (52%) 51,212 Jobs (38%)	5,782 Firms (37%) 53,529 Jobs (40%)
Engineers/Consultants			
Engineering Services (NAICS 541330)	1,727 Firms (11%) 28,649 Jobs (21%)	1,157 Firms (7%) 16,715 Jobs (13%)	570 Firms (4%) 11,934 Jobs (9%)
Total Engineers/Consultants	1,727 Firms (11%) 28,649 Jobs (21%)	1,157 Firms (7%) 16,715 Jobs (13%)	570 Firms (4%) 11,934 Jobs (9%)
Total Population	15,583 Firms (100%) 133,390 Jobs (100%)	9,231 Firms (59%) 67,927 Jobs (51%)	6,352 Firms (41%) 65,463 Jobs (49%)

* Excludes companies located in Long Island

SAMPLE DESIGN:

The Employer survey, along with all surveys specified in the work plan for this MCA evaluation effort, has been specified to be a low-cost survey, with limited management intervention. As such, the sample of

¹⁸⁷ The Summit Blue Consulting LLC. “The Five W’s of Downstate New York, Characterizing the Market for Energy Efficiency”, prepared for NYSERDA, July 2009.

employers selected to participate in this survey has been grouped into two main categories: business classification and business size. Business classification, although initially defined in Table 1 based on NAICS codes, has been further disaggregated using relevant SIC codes. Table 2 provides results from this more refined listing of the employer survey targeted population. These results are grouped into two major business classification types: builder/contractors, and engineering services/electrical contractors. Regional counts (upstate and downstate) are also shown in Table 2 and the population frame from each business category will be developed to ensure appropriate representation is maintained statewide.

A total sample frame has been developed from this list to achieve 140 completed surveys. Although 90/10 precision will not be achieved at either the individual SIC code or at the higher overall population, region or builder/contractor and engineering services/electrical contractor (NAICS) levels, a soft targeted number of completes has been set (see Table 3) at four combined NAICS levels and according to approximate business size (small, medium and large). Before setting these targets, information was collected and compiled to identify the population percentage of targeted companies within each region, by business type. Table 2 presents results from this population assessment. In addition, Table 2 includes the proportion of total jobs and establishments corresponding to the selected NAICS categories.

After review of the targeted NAICS and SIC codes, the business sector categories shown in Table 2 were narrowed to four primary categories.¹⁸⁸ These four combined NAICS-level business categories include: 1) Builders (single family, multifamily, commercial and office), 2) HVAC Contractors, 3) Real Estate Developers and Property Managers, and 4) Engineers/Consultants (engineering services and electrical contractors). Other businesses shown in Table 2, corresponding to NAICS code 238290 (Other Building Equipment Contractors), and SIC code 17969907 (Power Generation Equipment Installation), were dropped from the initial population as it was concluded that this particular business type should not be targeted primarily because installation of power generation equipment is not deemed to be sufficiently related to electric energy efficiency projects which are the topic of this survey effort. More details regarding the filtering process used to develop the ultimate sample frame and targeted number of completes and quotas can be found in Appendix A.

The primary purpose of this survey effort will be to report results from within specific targeted business sector categories. Therefore, no projections to the entire population will be made. Post-survey, size-based, weightings will be developed and applied (as described in more detail below) to ensure that proper comparisons can be made within each of the targeted business sector classifications.

The population of businesses projected to have the most need for employees trained through the Workforce Development Program is divided into the four business sectors noted above: builders, HVAC contractors, engineers/consultants, and real estate developers/property managers. The population of businesses for the first three sectors can be documented in terms of the number of establishments and the number of employees from existing databases. Table 4 shows estimates for the share of establishments and the share of employees in each size stratum for each of these three sectors.

¹⁸⁸ As a result of this step, and given limited scope and budget for this employer survey, no reliable statements will be made about the overall population of energy efficiency-related employers in New York, or the total number of energy efficiency-related jobs in New York.

Table 2. More Detailed and Revised Sample Population – Statewide and by Region

Business Classification	% of	Total Firms**	Upstate	Downstate
	Jobs*	(# and %)	(# and %)	(# and %)
Builders/Contractors	76%	24,458 (98%)	13,452 (54%)	11,006 (44%)
Single Family (SF) Builders (NAICS: 236118)	14%	17,129 (69%)	9,927 (40%)	7,202 (29%)
SIC 15210000 – SF Housing Construction		12,625 (51%)	6,919 (51%)	5,706 (28%)
SIC 15210100 – SF Home Remodeling, Additions & Repairs		877 (4%)	562 (4%)	315 (2%)
SIC 15210101 – General Remodeling, SF Homes		3,627 (15%)	2,446 (15%)	1,181 (10%)
Multifamily (MF) Builders (NAICS: 236116)	4%	165 (1%)	50 (0%)	115 (0%)
SIC 15220101 – Apartment Building Construction		121 (0%)	35 (0%)	86 (0%)
SIC 15220107 – MF Dwellings, New Construction		44 (0%)	15 (0%)	29 (0%)
Commercial and Office Builders (NAICS: 236220)	20%	1,165 (5%)	587 (2%)	578 (2%)
SIC 15420100 – Commercial & Office Building Contractors		633 (3%)	262 (3%)	371 (1%)
SIC 15420101 – Commercial & Office Building New Construction		532 (2%)	325 (2%)	207 (1%)
HVAC Contractors (NAICS: 238220)	32%	5,999 (24%)	2,888 (12%)	3,111 (12%)
SIC 17110000 – Plumbing, Heating, etc.		1,582 (6%)	704 (6%)	878 (3%)
SIC 17110103 – Heating Systems Repair/Maintenance		656 (3%)	110 (3%)	546 (0%)
SIC 17110400 – Heating and A/C Contractors		1,558 (6%)	881 (6%)	677 (4%)
SIC 17110401 – Mechanical Contractors		893 (4%)	404 (4%)	489 (2%)
SIC 17110405 – Warm Air Heating and A/C Contractors		1,109 (4%)	686 (4%)	423 (3%)
SIC 17119901 – Refrigeration Contractors		201 (1%)	103 (1%)	98 (0%)
Other Building Equipment Contractors (NAICS: 238290)	6%	9 (0%)	9 (0%)	0 (0%)
SIC 17969907 - Power Generation Equipment Installation		9 (0%)	9 (0%)	0 (0%)
Real Estate Developers & Property Managers (focus on top 10)	N/A			
Real Estate Developers (NAICS: 237210)	N/A	To be targeted from Downstate Study Top 10 Firms		
Property Management Companies	N/A	To be targeted from Downstate Study Top 10 Firms		
Engineers/Consultants (including Electrical Contractors)	23%	530 (2%)	248 (1%)	282 (1%)
Engineering Services (NAICS: 541330)	21%	455 (2%)	220 (1%)	235 (1%)
SIC 87110200 – Industrial Engineers		15 (0%)	13 (0%)	2 (0%)
SIC 87110202 – Mechanical Engineers		62 (0%)	39 (0%)	23 (0%)
SIC 87110401 – Building Construction Consultant		123 (0%)	52 (0%)	71 (0%)
SIC 87110403 – Heating & Ventilation Engineering		20 (0%)	8 (0%)	12 (0%)
SIC 87119906 – Energy Conservation Engineering		31 (0%)	20 (0%)	11 (0%)
SIC 87489904 – Energy Conservation Consultants		147 (1%)	77 (1%)	70 (0%)
SIC 87489907 – Lighting Consultants		57 (0%)	11 (0%)	46 (0%)
Electrical Contractors (NAICS: 238210)	2%	75 (0%)	28 (0%)	47 (0%)
SIC 17310202 – Energy Management Controls		37 (0%)	14 (0%)	23 (0%)
SIC 17319904 – Lighting Contractors		38 (0%)	14 (0%)	24 (0%)

Grand Total	100%	24,997	13,700	11,288
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* Based on proportional allocation of job/firm computed from data at the NAICS code level provided in Table 1.

** Excludes companies located in Long Island and excludes Real Estate Developers and Property Management firms.

Table 3. Targeted Number of Completes – Total Sample

Business Classification	Total # of Completes*
Builders (SF, MF, Commercial and Office)	44
HVAC Contractors	44
Engineers/Consultants (including Electrical Contractors)	44
Real Estate Developers & Property Managers	8
TOTAL	140

* Although 90/10 will not be achieved across the entire population or even within each of these business classification categories, precision and confidence intervals will be calculated within each category based on actual number of completes. Initial estimates suggest results should achieve 90/15 or better, within the Builders, HVAC Contractors and Engineering Services/Electrical Contractors business classifications, with lower results for the Real Estate and Property Managers category.

Table 4. Percent of Firms and Employees by Size of Firm

Business Sector	1-9 Employees	10-19 Employees	20 or More Employees
Construction	87% of firms	7% of firms	6% of firms
	52% of employees	12% of employees	36% of employees
HVAC Contractors	79% of firms	12% of firms	9% of firms
	39% of employees	18% of employees	44% of employees
Engineers/Consultants	77% of firms	11% of firms	12% of firms
	33% of employees	14% of employees	52% of employees

In the absence of other information, it is projected that firms with the most employees would have the greatest need for trained staff. For that reason, we propose to sample establishments in each sector in proportion to the share of employees that they represent. For example, 36% of the Construction Interviews would be allocated to Construction Establishments with 20 or more employees. With respect to the number of employees, then, the sample is self weighting. However, because there might be differential survey eligibility rates by size strata, it may be appropriate to post-weight the data to reflect those differences.

Since NYSERDA Program staff are interested in the needs for trained staff in each of these three market sectors, the maximum amount of information can be generated by allocating one-third of the target sample cases to each sector. The final allocation of sample cases for each of these three business sectors by firm size is identified in Table 5.

Table 5. Targeted Number of Completes – by Size of Firm

Business Sector	1-9 Employees	10-19 Employees	20 or More Employees
Construction	23	5	16
HVAC Contractors	17	8	19
Engineering Consultants	15	6	23

In some analyses, NYSERDA may be more interested in representing the number of firms than in representing the share of employees. For those analyses, it will be appropriate to develop relative weights within market sectors based on establishment counts. For example, in the construction sector, the small employee size stratum is 52% of the sample, but represents 87% of the firms. So, the establishment relative weight for completed interviews would be 1.67. By comparison, the establishments in the largest size group are 36% of the sample, but 6% of the establishments, so the establishment relative weight would be 0.167. The variation in relative weights across sample strata reduces the effective sample size and increases the variance of survey estimates.

As an alternative, a compromise sampling solution could be applied. In such a sampling procedure, the sample allocation might be based on an averaging of the establishment count percentage and the employee count percentage. As a result, the establishment count weights would be less extreme. However, the effective sample size for both the employee based sample and the establishment based sample would be less than the nominal sample size. If we had prior information on the differences in variability by size group, that would have allowed us to improve the sample design. However, since those data are not available, we cannot optimize the sample using this information.

Results and Survey Implementation Plans

The research conducted to develop this sample design memo has confirmed that electric energy efficiency-related work can occur in nearly every industry and company type. The challenge for this sample selection effort has been to identify only those companies in New York that perform the highest concentrations of electric energy efficiency improvement activities, and thus are most likely to need skilled employees provided through NYSERDA’s WFD program. In conclusion, the list of four combined NAICS codes categories, and the resulting filtered list of companies identified in Table 2 by 8-digit SIC code, have been found to be an appropriate sample population from which to conduct this evaluation project’s non-participating employer surveys.

When implementing this sample plan to achieve the targeted number of completes specified in Table 3, a randomized sample of the 8-digit SIC codes within each of the combined NAICS code categories will be developed, and calls placed from top to bottom of that randomized order until the targeted number of completes is achieved and soft targets for each NAICS code and size category have been met.¹⁸⁹ This

¹⁸⁹ Within specific NAICS code categories, information regarding firm size (by number of employees) may already be available. In such cases, randomization will be conducted within this subset of firms to achieve the targeted number of soft target completes.

process will be utilized for each of the Builders, HVAC Contractors and Engineers/Consultant business categories. For the Real Estate Developers and Property Managers category, a different approach will be utilized with focus on the ten largest New York City-located firms from each of these two business types identified in a downstate market characterization study completed for NYSERDA in 2009.¹⁹⁰ Depth interviews will be conducted with this targeted, downstate group of Real Estate Developers and Property Managers, based on a slightly revised version of the current employer telephone survey instrument. This will allow for more open ended responses to key questions rather than the instrument's current coded response options. Budget limitations for this current MCA survey effort preclude a broader, statewide, assessment of this group.

¹⁹⁰ *The Five W's of Downstate New York, Characterizing the Market for Energy Efficiency*, prepared by Summit Blue Consulting LLC, for NYSERDA, July 2009.

APPENDIX A

DATA SOURCES AND SAMPLE POPULATION IDENTIFICATION METHODOLOGY

An extensive and iterative process was used to identify the population of employers in New York from which to develop a sample frame for NYSERDA's WFD Non-Participating Employer Survey. This process included:

- review of multiple secondary data sources (including numerous available reports and studies), and
- substantial discussion and procurement of input and feedback from numerous parties (including NYSERDA WFD and GJGNY Program and Energy Analysis staff, NY DOL and PACE researchers, and members of NYSERDA's program evaluation contractor team from NMR, APPRISE and GDS).

Following is a summary of the data sources, discussions and methodologies used in this sample population identification effort.

Targeted Population

There is considerable public information available on the broad topic of "Green Jobs". The focus of this evaluation and the population targeted for this specific Non-Participating Employer sample is made up of a subset of companies, located within New York, that have employees or hire contractors who perform jobs that are directly or indirectly involved with energy efficient building construction, or the design, specification, delivery, installation, or servicing of products/equipment that affect electric energy use within homes or businesses in the State. To determine which company types to include in this subset of green job firms, a number of data sources were reviewed and individuals consulted leading to development of a group of companies that either support or directly provide: (1) building/contractor services (i.e., single/multifamily builders, commercial/office builders, HVAC contractors, other building equipment contractors, real estate developers and property managers), or (2) engineering/consultant services (i.e., industrial and mechanical engineers, building construction consultants, HVAC engineers, energy conservation engineers and consultants, and lighting consultants/electrical contractors).

Data Sources and Filtering Methodology

Various secondary data sources, reports and studies were used to gather relevant information leading to identification and compilation of a list of the companies to be used for the WFD Market Characterization and non-participating employer survey sample. The major sources are summarized briefly below:

Clean Energy Report List of Common Occupations and Associated Skills in NY State¹⁹¹

This document was used as a starting point and ongoing reference because it provided insight and analysis of the Green jobs.

ONet¹⁹²

ONet is a workforce resource that provides information on jobs, as well as industry and market analysis. This resource was used to identify an initial list of relevant “Green Jobs”, growth trends, occupation profiles and skills required for appropriate electric energy efficiency-related jobs. The resulting ONet list was crosschecked against the Clean Energy Report list to identify similarities and overlaps regarding types of industries, keeping in mind the focus on electric energy efficiency vs. broader green and renewable energy-type jobs.

Bureau of Labor and Statistics Green Goods and Services Industries by NAICS code¹⁹³

This resource was used to develop an initial list of specific energy efficiency-related industries (by NAICS code). The list was then reviewed to ensure focus was kept on electric energy efficiency-related goods and service industries.

NY Department of Labor’s Labor Market Information (LMI) Report¹⁹⁴

More recently, the New York Department of Labor’s Labor Market Information Report was reviewed to crosscheck and verify previous industry and job-type selections. Results confirmed that existing selected construction and trade industries (and associated NAICS codes) were valid and consistent with DOL’s sample selection process and reported results.

Other Data Sources

In addition to the four sources noted above, information was collected and considered regarding contractor types that typically provide electric energy efficiency-related services throughout the region, including participating contractors from NYSERDA’s existing EEPS-funded programs (*i.e.*, Home Performance with ENERGY STAR®, ENERGY STAR Homes, Empower, Existing Facilities, New Construction and FlexTech). Much of this information was available through directly relevant experience

¹⁹¹ NYS Department of Labor “New York State’s Clean Energy Industry: Labor Market and Workforce Intelligence”, prepared in response to the first Report of the Renewable Energy Task Force, May 2009.

¹⁹² National Center for ONet Development, www.onetonline.org, developed for the U.S. Department of Labor Employment and Training Administration.

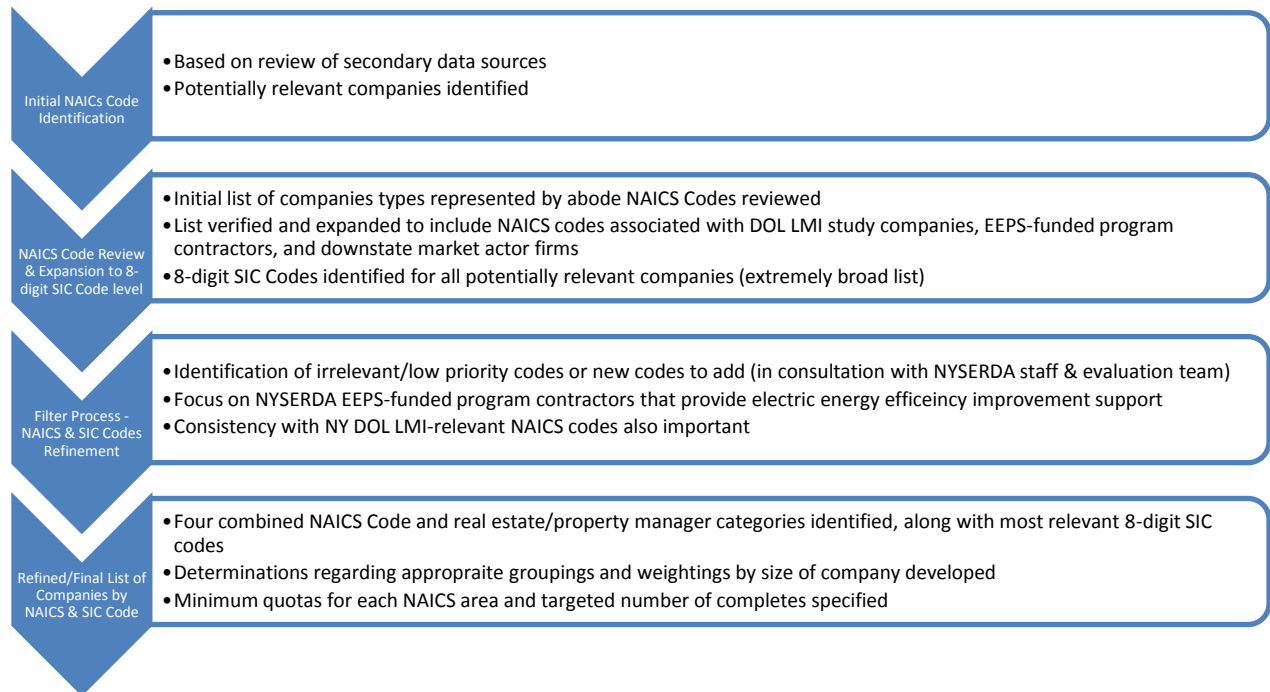
¹⁹³ U.S. Department of Labor “Bureau of Labor Statistics, Green Jobs and Service Industries by NAICS Code, www.bls.gov/green/final_green_def_8242010_pub.pdf, August 2010.

¹⁹⁴ New York State Department of Labor, partially funded by a grant awarded by the United States Department of Labor’s Employment and Training Administration, “Labor and Market Information Report: New York State”. August 2009

of GDS Associates, APPRISE, Navigant Consulting, and other NYSERDA evaluation contractor or program staff. Finally, Manta.com and NAICS.com were used to identify NAICS and SIC codes and associated industry definitions.

Through review of these multiple sources, a thorough list of potentially appropriate builders, contractors, engineering and consulting companies was compiled. An extensive review and filtering process was then conducted as shown in Figure 1.

Figure 1 – New York WFD Targeted Employer Survey Identification Filtering Process



Results

These research activities confirmed that electric energy efficiency-related work can occur in nearly every industry and company type. The challenge for this sample selection effort has been to identify only those companies in New York that perform the highest concentrations of electric energy efficiency improvement activities, and thus are most likely to need skilled employees provided through NYSERDA’s WFD program. In conclusion, the list of four combined NAICS codes categories, and the resulting filtered list of companies identified in Table 2 by 8-digit SIC code, have been found to be an appropriate sample population from which to conduct this evaluation project’s non-participating employer surveys. When implementing this sample plan to achieve the targeted number of completes, a randomized sample of the 8-digit SIC codes within each of the combined NAICS code categories will be developed and calls will be placed from top to bottom of that randomized order until the targeted number of completes is achieved and all soft targets have been met. For the real estate development and property manager grouping, a census approach will be used to achieve the targeted number of completes from among a list of the top 10 largest real estate development and property management companies identified through a recently completed Downstate Market Actors Study, and included in Appendix B of this memo.

APPENDIX B

List of Real Estate Developers/Property Managers

In Downstate New York, nearly two-thirds of existing building space in the C&I sector is managed by third-party property management firms, with the 15 largest firms accounting for approximately 90% of the total managed square footage.¹⁹⁵ In addition, rental units comprise more than two-thirds of New York City's housing stock¹⁹⁶, and many residential building owners use third-party property management firms to manage their rental assets.

The largest Real Estate Developers, based on the total value of projects, and largest Property Managers, based on the total square foot managed, employ over 20,000 workers in Downstate New York.¹⁹⁷ Thus, it was deemed prudent to include these market actors in the employer sample design. The following is a list of top ten Real Estate Developers and top ten Property Managers, with SIC codes and number of employees where available.¹⁹⁸

Real Estate Developers

Commercial/Industrial

NYC – School of Construction Authority – SIC 821103, 500 to 999 employees

NY State Dormitory Authority – SIC 5131, no employee information available (or unverifiable)

Alexander's of Rego Park II Inc., c/o Vorando Development, SIC 6531, 2 employees

New York City Transit Authority, SIC 411102, 50 to 99 employees

New York City Economic Development Corporation Apartments, SIC 655202, 9 employees

Apartments

Muss Development Corporation, SIC 653118, 1 to 4 employees

New York City Housing Preservation and Development Corporation, SIC 8399, 105 employees

Forest City Ratner Company, SIC 655202, 10 employees

NYU Downtown Hospital, no SIC or employee information available (or unverifiable)

PACE University, no SIC or employee information available (or unverifiable)

¹⁹⁵ The Summit Blue Consulting LLC. "The Five W's of Downstate New York, Characterizing the Market for Energy Efficiency", prepared for NYSERDA, July 2009.

¹⁹⁶ Ibid.

¹⁹⁷ Ibid.

¹⁹⁸ Ibid.

Property Management Companies

Cushman and Wakefield, Inc. – SIC 6531, 12,035 employees

CB Richard Ellis – SIC 6531, 6,000 employees

Jones Land LeSalle Americas Inc. – SIC 6531, no employee information available/unverifiable

Newmark Knight Frank – SIC 6531, 435 employees

SL Green Realty Corporation – SIC 6531, no employee information available (or unverifiable)

Trishman Speyer Properties – SIC 653118, 390 employees

Grubb and Ellis - SIC 8742, 175 employees

Brookfield Properties Corporation – SIC 6531

GVA Williams – SIC 6531, 40 employees

Vornado Realty Trust – SIC 653108, 1 to 4 employees

APPENDIX F

Sample Design Memo – Non-Participating Training Organizations Survey



GDS Associates, Inc.
Engineers and Consultants

MEMORANDUM

To: Todd French

From: Scott Albert

Date: November 23, 2011

Cc: Brent Barkett (Navigant), Sharon Brown, John Hutts and Jason Morse (GDS)

David Carroll, Kathi Barringer (APPRISE), Bob Wirtshafter (NMR), Jane Peters (RIA)

Subject: Sample Design Memo – Non Participating Training Organization Survey

NYSERDA Workforce Development Program, Market Assessment Efforts

PURPOSE & BACKGROUND:

The purpose of this memo is to provide an explanation of the sample design process used to develop the sample frame for this NYSERDA Workforce Development Program (WFD) Market Assessment, Non-Participating Training Organization telephone survey. These organizations may, or may not currently include energy efficiency components within their training efforts, but are all viewed as having the potential to include these components in the future. Types of information to be gathered were derived from the WFD Program's Logic Model and through discussion with NYSERDA program staff, review of other relevant materials, input from other members of NYSERDA's evaluation contractor teams, the New York Department of Labor and PACE University researchers, and include:

- Training practices – types offered, energy efficiency inclusion, tuition aid offered/used, hard-to-serve/underserved populations trained, pre-training interest in energy efficiency, barriers to expansion of existing and development of new training efforts, need for more energy efficiency materials and training venues
- Training trends and plans – assess change in demand for energy efficiency training, drivers of change, planned response to change
- Trainee interest in energy efficiency – post training (from training organization perspective)
- Energy efficiency employment placement and opportunities for trainees – jobs found, job types, specific training organization outreach and trainee placement activities, job opportunity trends
- Awareness of NYSERDA and/or broader energy efficiency training infrastructure and associated workforce development efforts – general awareness, source of awareness and level of awareness

- Other areas of interest?

TARGETED POPULATION:

Table 1 identifies by type of training organization and training skill level, the total number of training organizations, participating and non-participating organizations, and the targeted number of non-participating training organization completes planned for this survey effort. It is important to note that Union Training Centers appear in both the entry-level and mid- to high-level skills training groups. Although often providing both types of training from the same centers, the Union Training Centers have been separated to focus on the type of training they do the most (for example the 24 Union Training Centers identified under the Entry-Level Skills section of Table 1 represent centers that offer mainly basic skills training and apprenticeships – designated as entry-level skills categories for this sample design, while the 26 Union Training Centers identified under the Mid- to High-Level Skills section of Table 1 represent centers that mainly offer journeymen and master skills training – designated as mid- to high-level skills categories for this sample design). Also note that some of NYSERDA’s Industry Association training partners and one Union training partner are headquartered out of state.

Table 1. Targeted Population for Training Organizations Survey¹⁹⁹

Training Organization Type (NAICS Codes)	Total Number of Training Organizations (% of total)	Participating Training Organizations	Non-Participating In-State Training Organizations (Sample Size)	Targeted Number of Completes (% of total)
Entry-Level Skills				
New York One Stop Career Centers (NAICS: 921120)	79 (24%)	0	79 (33%)	23 (33%)
Community Training Agencies - WAP and Other Community Agencies - (NAICS: 624190, 813319)	78 (24%)	5	73 (31%)	22 (31%)
Vocational and Cooperative Training, Rehabilitation and Job Training - Market Actor Specific - (NAICS: 624310, 923140)	53 (16%)	38	15 (6%)	4 (6%)
Union Training Centers (NAICS: 813930)	24 (7%)	0	24 (10%)	7 (10%)
Consultants (NAICS: 541690)	1 (0%)	1	0 (0%)	0 (0%)
Total Entry Level Skills Training Organizations	235 (72%)	44	191 (80%)	56 (80%)

¹⁹⁹ Excludes organizations located in Long Island.

Training Organization Type (NAICS Codes)	Total Number of Training Organizations (% of total)	Participating Training Organizations	Non- Participating In-State Training Organizations (Sample Size)	Targeted Number of Completes (% of total)
Mid- to High-Level Skills				
Certification Training/2 and 4 Year Colleges (NAICS: 611210)	62 (19%)	39	23 (10%)	7 (10%)
Union Training Centers (NAICS: 813930)	25 (8%)	1*	24 (10%)	7 (10%)
Industry Association/Other Technical Training (NAICS: 611430)	4 (1%)*	4*	0 (0%)	0(0%)
Total Mid to High Level Skills Training Organizations	91 (28%)	44	47 (20%)	14 (20%)
Total All Training Organizations	326 (100%)	88	238 (100%)	70 (100%)

*Includes one or more organizations' headquarters located outside of New York State.

SAMPLE DESIGN:

The survey is designed to provide statistical precision of 90% confidence with a ±10% sampling error (90/10) for New York State. The sample of non-participating training organizations selected to participate in this survey will be stratified proportionately among the number of training organizations, based on their percent of the total number of non-participating training organizations in New York. The training organization types identified in Column 1 of the above table have been grouped into organizations that provide entry-, mid-, and high-level skills trainings within the state and that may or may not currently include energy efficiency components within their training efforts, but are all viewed as having the potential to include these components in the future. These organizations often serve specific trainee market actor groups, including hard-to-serve and underserved populations such as single mothers who are the primary wage-earner in their household, disabled veterans, individuals who are unemployed or underemployed and living below the poverty rate, individuals that have been previously incarcerated, and 18 to 24 year olds. Some of these training organizations also provide professional certification, accreditation and other advanced skills development programs to help trainees that are already employed, and seeking to fill advanced technical training needs.

The column in Table 1 labeled “participating training organizations” represents all training organizations currently listed as partners in NYSERDA’s WFD program. The “non-participating training organizations” column represents training organizations that are not currently participating in NYSERDA’s WFD Program. This group (the non-participating training organizations) represents the targeted population from which a sample will be drawn for telephone surveys. The targeted number of completes is defined as the number of surveys to be completed within each training organization

category.²⁰⁰ For cross referencing purposes back to the North American Industry Classification System (NAICS), NAICS codes have been included in Table 1 for each training organization category.

DATA SOURCES AND SAMPLE POPULATION IDENTIFICATION METHODOLOGY:

A list of 238 non-participating training organizations was developed using internet searches, industry and association websites and NYSERDA's WFD targeted market actor training resource organization websites (including individual organization and association web sites specific to training and outreach programs for local New York State union organizations, veterans, ex-convicts, women, unemployed, underemployed, and low income groups). When allocating the sample to each training organization type, the total population of non-participating training organizations in New York was divided proportionally, based on the number, distribution and mix of the total number of current skills training organizations identified as active in the state.

As shown in Table 1, a total sample of 70 surveys has been targeted for completion. This will exceed the 90/10 confidence and precision required at the state level. However, the number of completes listed in this table at the individual NAICS organization level are not sufficient to achieve 90/10 for those organizations, or for the rolled up entry-level, or mid- to high-level skills categories without consideration of a finite population adjustment (FPA) factor as discussed in more detail below. Therefore, analysis will be conducted and results reported with statistical validity only at the state level (across the entire population of non-participating training organizations). Results at the individual organization or skills-types levels may also be presented, if appropriate, but only for qualitative insight purposes. Attempts will be made, through a census approach, to achieve as many completes as possible within each targeted training organization type and skills-level category, and post survey weightings may need to be applied to ensure that results are presented in a manner that is most representative of the entire population.²⁰¹

Table 2 provides more details regarding SIC codes associated with the defined strata, to aid (if needed) in pulling the actual survey sample. It is important to note that the total population from which completes have been targeted is quite small. Therefore, the ability to achieve the number of targeted completes within each training organization type might be difficult. After consideration of a finite population adjustment (FPA) factor, a reduced number of 56 completes would be required to achieve 90/10 at the state level. Based on the FPA factor, 90/10 could also be achieved at the rolled up entry- and mid- to high-level skills categories, but only if at least 53 completes and 39 completes were achieved, respectively (92 total). Based on the methodological and budget realities (sufficient only for up to 70 completes), achievement of 92 completes cannot be accomplished within this current evaluation effort. However, if the effort is successful in completing 53 or more of the 56 surveys targeted to the entry-level training organizations, than 90/10 may also be achievable across that rolled-up group.

²⁰⁰ Note: Training organization counts are based on the number of locations of training organizations within the state (and not the number of unique organizations).

²⁰¹ One area where post-survey weightings may be necessary includes a situation where it is found that some strata have relatively few training organizations but account for a disproportionately larger number of trainees. In such a situation, the low frequency stratum may need to be weighted up based on some size metric but only if there were enough completes in the stratum to reasonably represent those in the stratum population.

Table 2. NAICS/SIC Codes for Targeted Sample & Sample Needed for 90/10 with FPA Factor

NAICS Code	SIC Code	Training Organization Type	Total Targeted Completes	Required Completes for 90/10 After Consideration of FTP	
Entry-Level Skills			50		
921120	912104	New York One Stop Career Centers	17		
624190 813319	832218 8399	Community Training Agencies (WAP & Other Community Agencies)	17		
624310 923140	8331 9451	Vocational and Cooperative Training, & Rehabilitation and Job Training Organizations	11		
813930	8631	Union Training Centers - Entry Level	5		
541690	8748	Consultants	0		
Mid- to High-Level Skills			20		
611210	8222	Certification Training/ 2 & 4 Year Colleges	15		
813930	8631	Union Training Centers - Mid to High	5		
611430	829931	Industry Association and Other Technical Training	0		
Total			70		56

Source: Internet Search, Certification and Trade Association and Other Targeted Organization Websites, and GDS.