

New York State Energy Research and Development Authority

NYSERDA's Energy Efficiency Portfolio Standard Program

Quarterly Report to the Public Service Commission
Quarter Ending September 30, 2012

Final Report
November 14, 2012



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1 *Introduction*

This quarterly report reflects progress on Energy Efficiency Portfolio Standard (EEPS) Program evaluation activities administered by the New York State Energy Research and Development Authority (NYSERDA). This report contains summaries of recently-completed evaluations and updates on evaluation recommendations and status through September 30, 2012. Information contained within this report comports with the guidance received from the New York State Department of Public Service (DPS) and discussed by the EEPS Evaluation Advisory Group (EAG) in July 2012.

2 Evaluation Reports Completed

NYSERDA finalized the following evaluation contractor reports in the third quarter of 2012:

1. Industrial and Process Efficiency Impact Evaluation, Megdal and Associates, September 2012.
2. New Construction Program Impact Evaluation, Megdal and Associates, September 2012.
3. Existing Facilities Market Characterization and Assessment Evaluation, Navigant Consulting, June 2012.¹
4. Agriculture Emergency Disaster Program Process Evaluation, Research Into Action, September 2012.
5. Commercial/Industrial Natural Gas Market Characterization, Navigant Consulting, September 2012.
6. New York ENERGY STAR[®] Homes Impact Evaluation, Megdal and Associates, September 2012.
7. Workforce Development Program Market Characterization and Assessment Evaluation, GDS Associates, September 2012.
8. Green Jobs – Green New York (GJGNY) Residential Program Process Evaluation and Market Characterization and Assessment, NMR Group, September 2012.²

¹ Finalized late in the second quarter and held for this reporting.

² Utilizing the existing infrastructure of the EEPS Home Performance with ENERGY STAR (HPwES) Program, GJGNY funding provides free or reduced-cost energy audits, and low-interest financing to homeowners for the installation of HPwES-eligible, energy-efficiency measures and eligible solar hot water systems. Though this work was supported by the GJGNY evaluation budget, the results are summarized in this report given their connection with the EEPS HPwES Program.

See Appendix A of this report for a high-level summary of each study listed above. The full evaluation reports can be found on NYSERDA's website.

3 *Evaluation Status Update*

Table 3-1 and Table 3-2 provide the anticipated schedule and status of current and upcoming impact, process and market evaluation activities by program. As applicable, table notes provide further clarification and information about study timing. Planned evaluation projects and timing may change based on input from internal and external stakeholders, and program progress. Likewise, evaluation project schedules are subject to change based on progress in administering the evaluation studies themselves. Future quarterly reports will highlight any timeline revisions.

Table 3-1. Impact Evaluation Schedule and Status

EEPS Program	Impact Evaluation Schedule					
	Detailed Evaluation Plan Submittal	Project Kick Off	Data Collection Complete	Draft Report	Final Report	Notes
Industrial & Process Efficiency (Phase 2)	Q4 - 2012	Q4 -2012	Q2 - 2013	Q3 - 2013	Q1 2014	Phase 1 evaluation of 2009 and 2010 participants was completed in August 2012. Pre-retrofit evaluation advisement is ongoing. Final report date changed from Q3 2013 to Q1 2014 due to allowing for a lengthier metering period as well as changing the detailed evaluation plan submittal date from Q3 to Q4 2012.
Existing Facilities	Late 2013	TBD	TBD	TBD	Late 2014	Current evaluation of 2007 - 2009 participants expected to be complete in Q4 2012.
Agriculture	Late 2013	TBD	TBD	TBD	Late 2014	Dependent on timing of completed installations.
New Construction	2014	TBD	TBD	TBD	2015	Current evaluation of 2007 and 2008 participants was completed in September 2012. Given programmatic changes underway, the next evaluation should not occur for a year or more since the project time line is long and program changes require time to assess.
Agriculture Disaster	Q1 - 2013	Q1 - 2013	Q3/4 - 2013	Q3/4 - 2013	Q3/4 - 2013	Dependent on timing of completed installations.
Flex Tech	2014	TBD	TBD	TBD	2015	Last evaluation completed in March 2012. Evaluation contractors recommend studying the Program every three years. Near term results are not expected to vary from the study recently completed.
Benchmarking	Q4 - 2012	TBD	TBD	TBD	TBD	Future evaluations to be included with Flex Tech. Current evaluation of the SBC Focus/Vertical Outreach Program

EEPS Program	Impact Evaluation Schedule					
	Detailed Evaluation Plan Submittal	Project Kick Off	Data Collection Complete	Draft Report	Final Report	Notes
						benchmarking activities in schools and commercial real estate was completed in September 2012 and can be found on the NYSERDA website. EEPS Benchmarking Program launched in December 2011.
Non-Participant Spillover Study	completed	completed	completed	August 2012	TBD	Covers commercial existing buildings. Final report timing TBD pending discussion with DPS regarding new Spillover Guidelines and possible change in final report content.
Multifamily Performance Program	Q4 - 2012	Q4 -2012	Q2/3 - 2013	Q3/4 - 2013	Q3/4 - 2013	Detailed evaluation plan submittal and project kick-off dates moved from Q3 to Q4 because MPP has not been evaluated before and more time than anticipated has been required for planning.
Point of Sale Lighting	Q3 - 2012	Q3 - 2012	Q3 - 2013	Q3/4 - 2013	Q4 - 2013	
EmPower New York	Q4 - 2012	Q4 - 2012	Q1 - 2013	Q2 -2013	Q2 -2013	Last evaluation completed in April 2012.
Home Performance with ENERGY STAR	2012	TBD	TBD	TBD	2013	Current evaluation of 2007-2009 program years will be completed in Q4.
New York ENERGY STAR Homes	2013	TBD	TBD	TBD	2014	Current evaluation of 2007 and 2008 participants was completed in September 2012.

Table 3-2. Process and Market Evaluation Schedule and Status

EEPS Program	Process and Market Evaluation Schedule					
	Detailed Evaluation Plan Submittal	Project Kick Off	Data Collection Complete	Draft Report	Final Report	Notes
Industrial & Process Efficiency	TBD	TBD	TBD	TBD	TBD	Last process evaluation completed in November 2011. Last market evaluation completed in May 2012.
Existing Facilities	completed	completed	completed	Q2 - 2012	Q3 - 2012	Current market evaluation completed in September 2012. Last process evaluation completed in February 2012.
Agriculture	TBD	TBD	TBD	TBD	TBD	
New Construction	Q4 - 2012	Q1 - 2013	Q3 - 2013	Q4 - 2013	Q4 - 2013	Intensive two-phase process evaluation completed in December 2011. Near term results not expected to vary. Study planned in 2012-2013 is a market evaluation only.
Agriculture Disaster	Q4 - 2011	Q4 - 2011	Q3 - 2012	Q3 - 2012	Q3 - 2012	Current evaluation completed in October 2012.
Flex Tech	Q4 - 2012	Q4 - 2012	Q4 - 2013	Q1 - 2014	Q2 - 2014	Last market evaluation completed in August 2011. Study planned in 2012-2014 is a process evaluation only. Detailed evaluation plan submittal was extended by one quarter.
Benchmarking	Q4 - 2012	Q4 - 2012	Q4 - 2013	Q1 - 2014	Q2 - 2014	Included in the Flex Tech evaluation. Detailed evaluation plan submittal was extended by one quarter.
Multifamily Performance Program	Q4 - 2012	Q1 - 2013	Q4 - 2013	Q1 - 2014	Q2 - 2014	Schedule increased by one quarter because MPP has not been evaluated before and more time than anticipated has been required for planning.
Point of Sale Lighting	Q3 - 2012	Q3 - 2012	Q3 - 2013	Q3/4 - 2013	Q4 - 2013	

EEPS Program	Process and Market Evaluation Schedule					
	Detailed Evaluation Plan Submittal	Project Kick Off	Data Collection Complete	Draft Report	Final Report	Notes
EmPower New York	TBD	TBD	TBD	TBD	TBD	Last process evaluation completed in July 2010.
Home Performance with ENERGY STAR	TBD	TBD	TBD	TBD	TBD	Evaluation plans under development based on newly available results from the Green Jobs – Green New York Small Homes Evaluation. In addition, evaluation plans will also coordinate with Statewide Residential Baseline.
ENERGY STAR Homes	TBD	TBD	TBD	TBD	TBD	Evaluation plans are pending based on forthcoming plans for the Statewide Residential Baseline.
Workforce Development MCA	completed	completed	completed	Q3 – 2012	Q3 - 2012	
C&I Natural Gas Market Characterization	completed	completed	completed	Q2 – 2012	Q3 – 2012	

New Recommendations

Recommendations generated from the recently-completed (Quarter 3, 2012) evaluation studies described in the Evaluation Reports Completed section are listed in Table 3-3 along with their status. The status of each recommendation is characterized as rejected, implemented, or pending based on input from NYSERDA program implementation staff. Rejected recommendations are those that will not be implemented by NYSERDA; implemented recommendations are those that have been incorporated into the NYSERDA program; and pending recommendations are those still awaiting a decision on implementation or rejection. In addition to characterizing new recommendations as rejected, implemented or pending, NYSERDA program staff's response and rationale for those characterizations is also provided.

Table 3-3. New Recommendations as of September 30, 2012

Program	Source of Recommendation (Contractor, Report Title, Date)	Recommendation	Status (Implemented, Pending or Rejected)	Program Implementer Response to Recommendation and Adoption Decision Rationale
New Construction	Megdal & Associates – Lead by Cx Associates New Construction Program Impact Evaluation Report for Program Years 2007 – 2008, September 2012	For projects and measures with large savings, consider including more rigorous commissioning and validation protocols as well as independent third-party M&V as part of Program delivery.	Pending	Commissioning is currently required for all projects with incentives of \$100,000 or greater. Customers may choose the commissioning provider of their choice. Within the context of current budgets and TRC, NCP will investigate options for expanded M&V and/or retro-commissioning incentives as part of program delivery. For larger projects NCP is reviewing the possibility of engaging the impact evaluation contractor in technical assistance discussions regarding energy modeling baselines.
		For projects with whole building or custom analysis include all measures in the analysis. The savings for those measures receiving standardized incentives should be analyzed as part of the whole building or custom analysis to ensure accurate quantification of interactive effects.	Implemented	For applications received after March 1, 2011, NCP no longer offers pre-qualified or pre-set incentives for ground source heat pumps (GSHP). Similar to other whole building or custom measures GSHP must be analyzed individually for each project. Furthermore to ensure that there are electricity savings, GSHP measures will only be considered where there is no gas available on site.
		Limit the use of prescriptive measures to smaller projects and use custom analysis for large measures.	Implemented	Under the current Program, the incentive cap for pre-qualified (PQ) measures is capped at \$30,000 per project, to limit the use of prescriptive measures to smaller projects. NCP expects to retain this cap in the next solicitation.

Program	Source of Recommendation (Contractor, Report Title, Date)	Recommendation	Status (Implemented, Pending or Rejected)	Program Implementer Response to Recommendation and Adoption Decision Rationale
		<p>Institute a mechanism for using the code space-by-space lighting power density (LPD) as the baseline for lighting incentives in new construction. Require documentation of space-by-space installed lighting power density and provide incentives for lighting systems that are more efficient than code rather than providing equipment-based incentives.</p> <ul style="list-style-type: none"> - Consider enabling program staff to use custom hours of operation for new construction lighting projects, or provide deemed hours of operation for various business types. 	Pending	<p>Existing NCP protocol is to require LPD space-by-space calculations for custom and whole building projects. Existing PQ lighting analysis includes Tech Market Manual protocols for determining energy savings.</p> <ul style="list-style-type: none"> - TAs currently work with customers to customize hours of operation for each project, based upon predicted building usage. For PQ projects, Tech Manual hours of operation are used.
		<p>Develop a clear VFD analysis protocol that includes a conservative estimate of the losses associated with VFDs. Losses of approximately 3% for VFDs are typically used in energy efficiency analysis.</p>	Pending	<p>The current custom measure tool requires the TA to input data from the VFD specification sheet, including losses. The upcoming revisions to the prequalified (PQ) equipment program and the current PQ calculators are based on the Tech Manual, which includes standard unit kWh and kW savings taken from NEEP data forwarded by National Grid (Chan, T. <i>Formulation of a Prescriptive Incentive for the VFD and Motors and VFD Impact Tables at NSTAR</i>. June 2010). NCP will confirm that losses are addressed in the Tech Manual information, and are being recorded by the TAs from the VFD spec sheets.</p>
		<p>Ensure that heat recovery ventilation analyses include the electric energy penalties associated with these systems and that they quantify the fossil fuel savings.</p>	Implemented	<p>Current heat recovery ventilation analyses include the penalties in accordance with current requirements. A program advisory addressed the issue and analysis tools were modified to include the penalties.</p>

Program	Source of Recommendation (Contractor, Report Title, Date)	Recommendation	Status (Implemented, Pending or Rejected)	Program Implementer Response to Recommendation and Adoption Decision Rationale
		Account for all energy impacts of measures in customer analysis and in the NYSERDA database including fossil fuels.	Implemented	TAs have been instructed to include fossil fuel impacts in energy analyses. OPCs have been directed to ensure that fossil fuel impacts are included in the TA reports and are entered in the NCP database.
		Ensure that prescriptive VFD measures are not allowed for new construction projects due to advances in building code.	Pending	NCP will modify Program guidelines to delete VFDs from the PQ incentive list.
		As lighting technologies advance, ensure Program incentives are leading customers to the most efficient options. Eliminate prescriptive rebates for high and low bay HID fixtures in the NCP.	Implemented	In the current PQ program, and the upcoming PQ program update, prescriptive rebates for HID fixtures have been eliminated.
		Adopt a standardized quality assurance protocol and review process for TA models and custom analyses. Consider adopting ASHRAE 90.1 chapter 11 tables for baseline determination.	Implemented	<ul style="list-style-type: none"> - OPCs have developed a high level checklist which is being used as part of the OPC report review process. NCP contracted with an expert modeling consultant, to develop modeling simulation guidelines for use by TA firms. The guidelines are expected to improve modeling accuracy and bring consistency to the modeling process. The guidelines have been distributed to staff and consultants, and training is proceeding throughout the State. Initial feedback has been very favorable. - NCP has solicited proposals for a new round of Outreach Project Consultant (OPC) contracts. The OPC firms provide outreach, field liaison with customers, review of TA reports including modeling results, and inspection of completed energy

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				<p>efficiency measures. The RFP for the new OPCs includes a requirement for the OPC firm(s) to have an experienced energy modeler on staff to support the OPC reviews of TA modeling information.</p> <p>- ASHRAE 90.1 is currently used as the NCP baseline for modeling, including chapter 11 tables.</p>
		<p>Modify the project analysis requirements so that both the customer peak and the New York Independent System Operator (NYISO) peak demand impacts are quantified.</p>	<p>Pending</p>	<p>NCP will work with OPCs, TAs and Coordinators to include the NYISO peak in the TA calculations and NCP will establish a field in the Buildings Portal database to capture the NYISO peak for reporting purposes. Customer kW reduction incentives will continue to be based upon customer peak demand.</p>
		<p>Ensure that working model files are retained by the program and are accessible for evaluations.</p>	<p>Implemented</p>	<p>NCP currently requires the TA to submit the modeling files with the final TA report.</p>
		<p>Obtain utility release forms that have a duration extending at least two calendar years beyond the year in which the incentive is provided. Determine whether there is a mechanism to transfer the release at the time of ownership transfer.</p>	<p>Implemented</p>	<p>A utility data release form is included in the documentation to be signed by the Customer prior to release of the incentive payment. The duration of the release authorization is three years. The release is specific to the NYSERDA customer and is not transferable. NCP does not propose to require transferability to an unknown future entity</p>
		<p>It appears that some redesign of the data entry form to include required inputs and error checking could reduce VFD data errors without increasing the burden of the program staff.</p>	<p>Implemented</p>	<p>Staff have been instructed to enter key data for all measures in the Buildings Portal database. NCP established the role of Coordinator manager. The Coordinator manager works with the Coordinator team to streamline processes and coordinate workflow. The Coordinator manager</p>

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				provides guidance to the Coordinator team to confirm that the data has been entered correctly.
		Verify that the database is updated to reflect post-installation inspections using a well-defined and detailed quality control protocol.	Implemented	<p>There is an established procedure for documenting savings changes between the offer letter stage and construction completion:</p> <ul style="list-style-type: none"> - Upon approval of the Technical Assistant's report, just prior to the offer letter, the Outreach Project Consultants (OPCs) enter measure level savings in the Buildings Portal measures tab under the headings for Offered Savings. - Upon completion of construction the OPCs enter the installed savings in the Installed Savings columns. - NCP will direct OPCs to provide additional oversight to ensure the offered and installed savings are consistently entered in the database.
		<p>Revise the TA study savings report format to include fossil fuel type and report fossil fuel savings in MMBtu to align with NYSERDA database requirements. Verify that the fields currently used for gas and fossil fuel savings in the database are all needed, add identification of fuel type other than natural gas in the database, and improve the data entry fields for fossil fuel to minimize reporting errors.</p> <ul style="list-style-type: none"> - Increase quality assurance of data entry of fossil fuel claims, particularly where large savings are being claimed. 	Implemented	<p>Staff have been instructed to enter key data for all measures in the Buildings Portal database. NCP established the role of Coordinator manager. The Coordinator manager works with the Coordinator team to streamline processes and coordinate workflow. The Coordinator manager provides guidance to the Coordinator team to confirm that the data has been entered correctly.</p> <p>As for the quality assurance of fossil fuel claims data entry, there is an established procedure for documenting savings changes between the offer letter stage and</p>

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				<p>construction completion:</p> <ul style="list-style-type: none"> - Upon approval of the Technical Assistant's report, just prior to the offer letter, the Outreach Project Consultants (OPCs) enter measure level savings in the Buildings Portal measures tab under the headings for Offered Savings. - Upon completion of construction the OPCs enter the installed savings in the Installed Savings columns. - NCP will direct OPCs to provide additional oversight to ensure the offered and installed savings are consistently entered in the database.
		<p>Work with TA and OPCs to continue to identify improvements to program delivery strategies and structures that will encourage early engagement in projects and support identification and adoption of comprehensive energy efficiency upgrades.</p> <p>Continue education and outreach to market actors.</p>	<p>Implemented</p>	<p>Prior to the evaluation NCP was aware of the need to engage customers earlier in the design process. The recent NCP process evaluation results also described customer concerns with process timing. Some factors are within NCP's control (internal processing) while others are controlled by the customer (application timing, return of the signed Promise to Pay letter). Based upon NCP's direct experience, and the recommendations in the process evaluation, NCP has taken several steps to accelerate and improve engagement with customers:</p> <ul style="list-style-type: none"> - Since mid-2010 outreach has been proactive rather than reactive. NCP marketers aggressively promote the Program, through large and small presentations and one to one meetings. Audiences include industry groups, architectural and engineering firms, real estate developers and lawyers, industrial development authorities,

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				<p>green building associations, local and state professional associations, lending institutions and other building industry stakeholders. The goal is to gain program recognition, to learn about upcoming projects and to engage customers earlier in project design. As a result of this effort NCP activity is up strongly in 2011 as compared to 2010, as shown below:</p> <ul style="list-style-type: none"> ○ Presentations – up 254% ○ Leads – up 167% ○ Applications – up 28% ○ Gross Square Footage – up 33% <p>- Working with NYSERDA Contracts and Legal Departments, and the NYSERDA team which processes the new statewide Consolidated Funding Application (CFA), NCP has instituted several process improvements to allow OPCs and TAs to engage customers earlier and to complete the TA reports in a more timely manner:</p> <ul style="list-style-type: none"> ○ OPCs provide customer assistance in completing the CFA. Since the OPCs are very familiar with the CFA questions the application time has been reduced from approximately an hour and a half to about 20 minutes. CFAs are forwarded to the OPCs as soon as the CFA team receives them.

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				<ul style="list-style-type: none"> ○ For TA services, NYSERDA informs the TA consultants as each project is assigned that they are allowed to engage in services at their own risk while paperwork is being finalized among NYSERDA, the customer, and the TA. NCP also has created a mechanism called the Ongoing Task Work Order that allows immediate engagement by TA consultants for certain projects, such as fast-tracked design, when deemed appropriate by an NCP project manager. TA services are defined using a simplified template which is much easier for a TA to complete and for the OPC and Project Manager (PM) to review and approve. TA report development is largely automated and the report template has been greatly simplified, allowing faster report preparation, review and approval. ○ The TA firms have received formal training in the NCP process and use of the templates. TAs obtain additional guidance and program updates through monthly conference calls arranged by NCP. ○ OPC Director conference calls with NCP senior project managers are conducted weekly, to discuss program

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				level issues and other matters of interest to the OPC firms.
		Accelerate the NCP evaluation cycle so that the evaluations are occurring within two years of project completion.	Pending	Evaluation staff will consider this recommendation when updating plans for the next evaluation cycle.
		The Impact Evaluation Team requests NYSERDA's support in enabling the evaluators to work with building management to obtain access to residential units and resident utility releases. This support will increase the effectiveness of the outreach effort, control evaluation costs, and reduce the elapsed time for obtaining this information.	Pending	Evaluation staff will consider this recommendation when updating plans for the next evaluation cycle.
		Complete a short study of program changes in the NCP over the past five years and the potential of those changes to affect the project RRs over time. This study should integrate the findings of this evaluation with the findings regarding program delivery and design in the subsequent years.	Pending	Evaluation staff will consider this recommendation when updating plans for the next evaluation cycle.
		Investigate and develop more reliable methods for the estimation of participant OSO. Surveys used to gather data for SO estimation need to include SO-respondent quotas wherever possible. Additional validity checks and follow-up verification studies are needed, particularly for factors that act as multipliers within the calculation formulas. - Significantly more resources will be needed to conduct this level of research into SO.	Pending	Evaluation staff will consider this recommendation when updating plans for the next evaluation cycle.

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		<p>Consider conducting a market effects study for the NCP and NYSERDA’s overall impact on the commercial, industrial and institutional new constructions markets in New York. The market effects methods need to attempt to include NCP impacts on market structure and operation that may not be directly identifiable by most market participants but influences the operation of the market since NCP interventions. If SO estimation still occurs or is used, future evaluations must ensure that there is not a double-counting or overestimation between market effects and SO.</p> <ul style="list-style-type: none"> - Significantly more resources will be needed to conduct an evaluation that provides reliable and rigorous estimates of market effects. 	Pending	Evaluation staff will consider this recommendation when updating plans for the next evaluation cycle.
		The recent New York Energy Code Compliance Study suggests that the state establish a new construction database in which all permit applications would be logged. Such a database would be an excellent resource for future new construction evaluations. Obtaining clean non-participant population data for this evaluation was extremely onerous.		
Industrial and Process Efficiency Program	Megdal & Associates – Lead by ERS Industrial and Process Efficiency Program: Impact Evaluation Report for Program Years 2009 – 2010, August- September 2012	Institute a longer Program M&V period on the Program’s larger energy savers.	Pending	NYSERDA agrees. However, marketplace feedback is that competing utility programs require far less proof of performance. Customers are opting for utility programs which pay higher incentives, use more ratepayer dollars per unit energy savings delivered, and require less proof of performance.

Program	Source of Recommendation (Contractor, Report Title, Date)	Recommendation	Status (Implemented, Pending or Rejected)	Program Implementer Response to Recommendation and Adoption Decision Rationale
		Systematically collect supporting spreadsheets, models and data from technical assistance providers.	Pending	Response to program comments on this recommendation was finalized by the evaluators in the later stages of producing the final report on IPE. To that end, NYSERDA program staff have not had the opportunity to fully consider the recommendation and determine a course of action. Thus, the response to this recommendation is pending further review.
		Apply a common algorithm for tracking demand savings.	Pending	The Program will work with the marketplace to better report demand savings by the currently prescribed DPS methodology.
		Incorporate heating, ventilation, and air conditioning interactive effects into lighting analysis and report these and other secondary fuel impacts.	Pending	NYSERDA agrees.
		Create and Track Premise IDs.	Pending	Response to program comments on this recommendation was finalized by the evaluators in the later stages of producing the final report on IPE. To that end, NYSERDA program staff have not had the opportunity to fully consider the recommendation and determine a course of action. Thus, the response to this recommendation is pending further review.
		Increase Impact Evaluation Team involvement in pre-installation project review.	Pending	NYSERDA agrees. However, marketplace feedback is that competing utility programs require far less proof of performance. Customers are opting for utility programs which pay higher incentives, use more ratepayer dollars per unit energy savings delivered, and require less proof of performance.

Program	Source of Recommendation (Contractor, Report Title, Date)	Recommendation	Status (Implemented, Pending or Rejected)	Program Implementer Response to Recommendation and Adoption Decision Rationale
		Include a mechanism to monitor changes in program reported savings – Once a project’s savings are reported, they are eligible for evaluation. Some participants complete large projects in multiple stages that span many years. The evaluation team recommends that each phase of the project that has a unique completion date have a unique tracking record.	Pending	Response to program comments on this recommendation was finalized by the evaluators in the later stages of producing the final report on IPE. To that end, NYSERDA program staff have not had the opportunity to fully consider the recommendation and determine a course of action. Thus, the response to this recommendation is pending further review.
		Use 0.95 as the prospective realization rate for electric energy savings and 1.08 for demand savings.	Pending	This recommendation was added by the evaluators in the later stages of producing the final report on IPE. To that end, NYSERDA program staff have not had the opportunity to fully consider the recommendation and determine a course of action. Thus, the response to this recommendation is pending further review.
		Use 0.90 as the prospective NTGR – Evaluators expect SO to decline as more of the Program’s savings as associated with large unique projects that do not lend themselves to technology transfer.	Pending	This recommendation was added by the evaluators in the later stages of producing the final report on IPE. To that end, NYSERDA program staff have not had the opportunity to fully consider the recommendation and determine a course of action. Thus, the response to this recommendation is pending further review.
		Evaluation - Conduct in-depth primary research on participant SO.	Pending	Primary research on spillover is planned for Phase 2 of this evaluation. In the event that responses indicate significant spillover, the evaluation will use enhanced techniques to validate responses.
		Evaluation - Reassess NEIs in the next evaluation.	Pending	NYSERDA plans to continue with the assessment of NEIs, similar to the assessment in the Phase 1 study.

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Existing Facilities Program	Navigant Consulting Existing Facilities Program: Market Characterization and Assessment Summary, June 2012	Seek to increase the number of quality firms engaging end users in performance-based EFP projects. In so doing, the program can drive additional competition among firms working on performance-based projects, potentially leading to higher project volumes, lower costs to end users, or new competitive offerings from service providers (e.g., new approaches to project financing).	Pending	<p>NYSERDA's 2013 marketing plans will include a targeted effort directed to participating and non-participating service providers to increase participation among end use customers.</p> <p>Program staff has developed a prioritized list of ESCOs and an ESCO relations role has been developed. Staff has begun the process of meeting regularly with priority ESCO participants to discuss how to increase performance-based work between EFP and the ESCO, and how EFP's design and procedures can be optimized.</p>
		Convince new firms to learn about and undertake projects supported by performance-based incentives by marketing the program's perceived benefits to service providers. Specifically, program participation is an indicator of a firm's advanced capabilities, commitment to maximizing energy savings, and overall higher-quality services. An anticipated increase in demand for high-quality energy efficiency services will create particular opportunities for firms with past performance-based project experience while attracting new firms to attempt performance-based projects.	Pending	<p>NYSERDA's 2013 marketing effort will reflect a research-based approach to identifying and highlighting relevant value messages that increase levels of engagement and interest in NYSERDA performance-based programs among service providers.</p> <p>Among the prioritized list of ESCOs developed by program staff, some have participated in the program in the past, but are currently not active within EFP and some have never participated. An effort has begun to engage these ESCOs and grow the service provider market.</p>
		Adopt a targeted, two-fold approach to increasing performance-based energy savings. 1) Seek organic growth opportunities by marketing additional performance-based projects to facility owners who have previously completed such projects (most of which involved only a single energy-use system). 2) Capture a	Pending	The C&I integrated marketing program is designed to increase participation in NYSERDA's core Commercial & Industrial programs (including EFP) through a multi media, targeted approach among participating and prospect C&I audiences. For EFP specific efforts, promoting the performance-based opportunities are the

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		<p>portion of small-scale projects being planned by non-participants and convert them to larger, performance-based projects. This will enable EFP staff to capitalize on that portion of the market with at least some awareness of and willingness to pay for efficiency upgrades</p>		<p>priority. Project data has been mined to identify past participants who could benefit from a performance-based approach to energy savings. Marketing efforts are also underway to target specific verticals to increase program participation in subsectors that demonstrate great potential in terms of energy savings through performance-based projects.</p> <p>In addition, Program staff has begun implementing a key accounts approach to the market, in order to develop long-term relationships with large customers, which will help identify potential project opportunities. EFP's goal is to integrate with customers' long-term planning for energy efficiency and bundle multi-year capital improvements.</p> <p>As part of the key accounts approach, Program staff works with existing customers to identify additional potential project opportunities, focusing on system improvements. Program staff will continue to work with participants to ensure pre-qualified projects are converted into performance-based projects where possible.</p>
		<p>Raise awareness of EFP's potential role in implementing opportunities identified through PlanNYC benchmarking efforts. Encourage end users to implement larger, performance-based projects that they would not otherwise pursue without NYSERDA's independent review or validation of project designs. In addition, continue to market the performance-based component's contributions to addressing the persistent</p>	<p>Pending</p>	<p>As a core Program element and a key value message identified through customer and prospect end user research, M&V is reinforced throughout the marketing program and incorporated into the overarching integrated campaign platform . The existing platform positions NYSERDA as the knowledgeable partner who helps customers achieve "measurable results" for their energy efficiency measures.</p>

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		<p>cost and financial barriers facing end users. Specifically, increase the focus on the value of measurement and verification (M&V) in enhancing the quality and lowering the performance risk of large, whole-system or whole-building efficiency improvement projects</p>		<p>A component of the key accounts approach is the identification of additional project opportunities and expansion of project scope through enhanced interactions with large customers. Program staff and contractors often emphasize the benefits of M&V to customers. EFP has done a significant amount of M&V over the past 10 to 15 years. EFP's experience helps implement M&V cost-effectively, improves program and project results and helps ensure that customer returns on investment are achieved.</p>
		<p>Market the success of past performance-based projects, as well as the improvements downstate facilities are undertaking to comply with PlaNYC requirements, to upstate end-users as evidence of performance-based projects' contribution to deeper energy and cost savings.</p>	<p>Pending</p>	<p>The integrated marketing plan delivers past and potential customers a variety of messages that not only educate them about NYSERDA's services but reinforce NYSERDA's credibility and expertise through the dissemination of customer-specific project case studies. Case studies are customized and promoted by region and by vertical industry sector to optimize relevance by audience. Executed in video and downloadable written formats, case studies are distributed statewide through events and via the online advertising and targeted email efforts to help accelerate the participation decision making process.</p>
<p>Workforce Development Program</p>	<p>GDS Associates, Inc. Workforce Development Program: Market Characterization and Assessment Evaluation. September 2012</p>	<p>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</p>	<p>Rejected</p>	<p>NYSERDA program staff agree with this recommendation in general. However, we do not currently have the funds for employer outreach and awareness activities. We rely on training partners, as part of their contracts, to conduct outreach and to partner with employers where practical for job placement and recruitment activities and New York State Department</p>

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		as part of their work products and services. Since evidence indicates greater need for growth in these positions in construction trades, focus on enhancing training opportunities that lead to jobs in construction to support the demand for workers in this industry; specifically, unions, vocational and technical schools.		of Labor (NYSDOL) for employer outreach etc.
		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.	Rejected	NYSERDA agrees with this idea but is not in a position to implement it. See explanation in response to the recommendation above.
		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>i.e.</i> , 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).	Implemented	NYSERDA does this now with the exception of office support.
		Consider fostering relationships between employers and training organizations, and encourage training organizations to focus more on offering internships and	Pending	NYSERDA is doing this now under GJGNY and soon under its Technology & Market Development Program. If the workforce development petition for funds

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		<p>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.</p>		<p>under EEPS2 is approved, internships and on-the-job training will be a focus area under the new Operating Plan. The workforce team seeks to serve new or transitioning workers in gaining hands-on, experiential learning, designed to improve job placement rates of trained individuals.</p>
		<p>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.</p> <p>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</p>	<p>Rejected</p>	<p>Training programs have been most successful where the energy efficiency work is being done which does not always match with the goal of targeting counties with a large population of hard-to-reach and underserved citizens and where there are few to no existing training sites. Some of NYSERDA's training in the north country, for example, has not been sustainable due to the limited amount of energy efficiency work such as home performance jobs and the small population. We are focusing several efforts on 16-24 year olds in support of the Governor's NY Youth Works initiative.</p>
			<p>Pending</p>	<p>Program staff agree that the Program should target new training partners but need to see where the demand is related to energy efficiency work with the goal of</p>

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		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.		training towards internships with businesses, etc.
		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, 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.	Implemented	NYSERDA is working very closely with One Stop Career centers now under GJGNY. We also require that our training partners register with the One Stop Centers and our on-the-job (OJT) hires register with the One Stop Centers. NYSERDA has no knowledge of One Stops having technical training curriculum – they work with training partners, many of which are also NYSERDA partners.
Agriculture Disaster Program	Research Into Action Process Evaluation Team, Lead Investigators, October 2012	Continue offering the ADP assistance as a part of ongoing Agricultural Energy Efficiency Program until all of the funding is expended.	Rejected	NYSERDA received applications representing over 100% of available funding. NYSERDA coordinated with New York State Electric and Gas (NYSEG) and National Grid utility programs to optimize the use of disaster recovery funding and those applications that were eligible for utility programs were handed off accordingly. In addition, for some projects,

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				exact costs were not known until after the Program closed. In the end, 94% of the available ADP funds have been contracted. Funding for the ADP was specific for recovery efforts and, given the amount of remaining funds, it would not be prudent to re-open the Program.
		Involvement in ongoing state and local emergency management operations will be important to ensure NYSERDA is connected to these networks. Consider supporting opportunities to coordinate data needs and assessment tools to facilitate system integration and information sharing.	Implemented	NYSERDA is responsible for developing and maintaining the <i>New York State Energy Emergency Plan</i> . NYSERDA's President is a statutory member of the State Disaster Preparedness Commission and NYSERDA staffs the Energy Desk at the State Emergency Operations Center during emergency events. Additionally for the ADP effort, NYSERDA utilized its network of agriculture stakeholders to coordinate information sharing: NYS Department of Ag & Markets and United States Department of Agriculture (USDA) – Farm Service Agency, NYSPSC, National Grid and NYSEG offered associated agriculture disaster recovery programs and coordination with those entities occurred. NYSERDA will work with emergency management operations as appropriate in future emergency assistance program offers.
		Leverage equipment dealers' market network to more effectively and quickly promote the Program. Maintain a comprehensive list of equipment dealers that serve New York agricultural customers by equipment type and by county.	Implemented	NYSERDA maintains a list of vendors/dealers that service the agriculture sector and provided them with Program information as it became available. This list is not broken down by equipment type or county. With limited resources, NYSERDA needs to prioritize efforts to promote the Program. The activities discussed in recommendations 2 and 4 in this document have proven even more effective. Engaging mid-market actors to assist in promotion of a

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				future emergency assistance program offer will occur as appropriate.
		Direct outreach was important in the ADP and will be important in future emergency programs. Providing direct, face-to-face outreach is important to clarify any confusion affected farmers may have and to engage potential participants, especially under disaster circumstances.	Pending	Direct outreach is part of any NYSERDA program. This recommendation will be filed for reference for any future emergency assistance programs.
		Work with state and local emergency management operations to ensure NYSERDA programs are included in any comprehensive list of disaster assistance information that includes program contact, program eligibility, and assistance areas for future emergency programs.	Implemented	NYSERDA is responsible for developing and maintaining the <i>New York State Energy Emergency Plan</i> . NYSERDA's President is a statutory member of the State Disaster Preparedness Commission and NYSERDA staffs the Energy Desk at the State Emergency Operations Center during emergency events. Additionally for the ADP effort, NYSERDA utilized its network of agriculture stakeholders to coordinate information sharing: NYS Department of Ag & Markets and USDA – Farm Service Agency, NYSPSC, National Grid and NYSEG offered associated agriculture disaster recovery programs and coordination with those entities occurred. NYSERDA will work with emergency management operations as appropriate in future emergency assistance program offers.
		Investigate ways to integrate a NYSERDA disaster recovery program into other emergency services to facilitate a one-stop-shop experience for farmers.	Implemented	Integration and coordination of emergency assistance can occur as soon as entities are authorized to offer services. NYSERDA coordinated planning with similar programs offered by NYSEG and National Grid and complementary programs from NYS Department of Ag & Markets and USDA – Farm Service Agency occurred. As soon as NYSERDA was authorized to deliver the

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				<p>one-time ADP, NYSERDA coordinated execution with those organizations. Applications to the NYSERDA, National Grid, and NYSEG programs were triaged to assist farms in finding the best fit program and optimize administration and use of available ratepayer funds. Similar coordination efforts will be executed for future emergency assistance programs as appropriate.</p>
	<p>Megdal and Associates, New York ENERGY STAR Homes Impact Evaluation, September 2012.</p>	<p>Establish Program threshold requirements to account for changing energy codes; the Impact Evaluation Team understands that NYSERDA has already moved to ENERGY STAR v2.5 and 3.0 and added prescriptive requirements.</p>	<p>Implemented</p>	<p>Program has modified minimum Program thresholds in response to changes that have occurred in the NYEECC.</p> <p>Program staff expect to see, at least in the short-term, a decrease in the incremental savings per dwelling unit as a result of a higher minimum bar. As minimum energy code requirements have been raised, there are less low-cost-high savings measures available. Therefore, the Program must incorporate requirements into its design energy efficiency requirements that yield less savings per dollar invested (when compared to requirements previous Program requirements). Couple this with the EEPS cost-effectiveness requirement, which essentially limits how aggressively Program can pursue the next increment of energy savings, and maintaining a fixed percent savings over a set baseline, becomes much more difficult.</p>
		<p>Review the method used for estimating savings from heating, water heating, and cooling measures. It appears that the current method does not correctly account for baselines that vary by climate zone and also understates heating savings while</p>	<p>Implemented</p>	<p>Effective January 2012, the Program calculates savings based on the delta between a 2010 ECCCNY-compliant, climate zone-specific UDRH and a rated home, consistent with the recommendation. The Program implementation contractor</p>

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		dramatically overstating water heating savings. An alternative approach used in other states is to develop a user-defined reference home (UDRH) reflecting baseline practices and estimate savings from the REM/Rate results.		has developed a new savings estimation methodology and savings are “trued up” upon receipt of the REM/Rate file for the subject home or unit. The algorithms which led to the overstating are no longer the basis for Program reported savings.
		Consider the establishment of a separate development track for projects that are required to meet higher baseline standards. Some developers may be working under mandates to build toward certain level of efficiency (e.g. EPA ENERGY STAR) to comply with federal directives or satisfy funding requirements set by certain lenders and/or government agencies (e.g. HUD, NY state-housing agencies). This separate track may utilize a baseline (UDRH) that is different than the UDRH used for more traditional projects. This track may also have different program incentive structure that encourages certain end uses or certain savings goals over the baseline for this track.	Pending	The Program will consider this recommendation and will conduct a review of NYESH projects submitted to the Program that may meet a higher than code minimum threshold requirement.
		Consider whether changes need to be made to the process for installing screw-in CFLs as a Program measure. The responses to the homeowner telephone survey indicated that hardwired ENERGY STAR light fixtures installed during construction remained in place. ¹ However, over a third of the homeowners with reported Program savings for screw-in CFLs stated that there	Pending	Program will continue to monitor compliance of the installation of CFLs through the Program QA processes. Program staff emphasizes that the telephone survey of homeowners was fielded approximately 4 years after the move-in date and the ability of the homeowners to self report and recall move-in conditions may impact the results of this

¹ Most hardwired ENERGY STAR labeled light fixtures (not plug in lamps) require the use of a pin-based compact fluorescent light bulbs (CFL) so that the fixture cannot be outfitted with an incandescent light bulb which has a screw-base.

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		<p>were no screw-in CFL bulbs in the home when they moved in.² All of these respondents were the original owners of the new home. This may imply that the screw-in CFLs were removed prior to the homeowners' residency in the new homes.</p>		<p>study.</p>
		<p>Establish one method of tracking and recording those deemed savings that overlap with energy-modeled savings (e.g. ECM motors, central air conditioning, refrigerators and lighting). This can be addressed from within the developed UDRH.</p>	<p>Implemented</p>	<p>For central air conditioning, the Program captures deemed savings in the CRIS database; any additional savings are derived from the REM/Rate file are clearly indicated. Lighting and other appliance-related savings are captured through measure counts and deemed savings, and tracked in CRIS database.</p>
		<p>Review all Program databases to ensure the Program data is obtained and maintained in a way that allows for accurate evaluations, including reliable contact information to the extent possible, ways to link builders with projects, former builders and contact information for all projects. The Program should maintain a database of the REM/Rate results or develop a systematic procedure for obtaining these datasets easily or develop a procedure to obtain requested REM/Rate results and all related Program data.</p>	<p>Implemented</p>	<p>Program staff and implementation contractor continuously review, update or improve database capabilities and functionalities. An underlying capability the CRIS database is the ability to include accurate Program participant contact information and linking of participating builders to projects. The Program stores REM/Rate files for projects transmitted for payment after January 1, 2012, but it does not maintain a database of REM/Rate results. The Program maintains some contact information for formerly participating builders but does not actively update this information.</p>

² Screw-in CFLs can be installed in any light fixture or lamp that accepts standard incandescent bulbs as long as it is compatible with the lighting control (i.e. dimmer switches).

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		Conduct a baseline study to establish a defensible standard for establishing program savings. The lack of an independent, comprehensive baseline study added substantial complexity to this evaluation.	Implemented	NYSERDA, in collaboration with the New York Department of Public Service (DPS) and the Evaluation Advisory Group, is conducting a statewide residential baseline study across a broad range of customer segments and energy measures. It is anticipated that the results of this study will be available December 2013 and utilized to establish defensible standards for establishing program savings in future impact evaluations.
		Consider alternative strategies for estimating net and market effects. The self-report approach used in this evaluation suggests that market transformation may already be well underway.	Pending	NYSERDA will consider alternative evaluation strategies for estimating net program and market effects by exploring techniques for measuring the impacts of programs that seek to transform markets for energy efficiency products and practices.
		Improve methods for transferring required Program data to evaluators. For this evaluation, the Impact Evaluation Team ran into hurdles with acquiring Program data, including obtaining contact information for formerly-participating contractors and having to download REM/Rate files for the telephone survey respondents individually from the implementer's website.	Pending	NYSERDA Evaluation and Program staffs are exploring alternative data collection and transfer capabilities that improve the quality of data available for Program evaluation.
		Consider excluding the estimation of homeowner inside spillover in future impact evaluations, unless the homeowner surveys are conducted for other evaluation purposes.	Pending	In future evaluations, NYSEERDA will consider the need for telephone surveys to assess homeowner inside spillover. The survey used in this evaluation will be reviewed prior to the next evaluation to determine whether any changes in responses or questions are anticipated and, thus, whether additional survey efforts are warranted.

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Green Jobs – Green New York (GJGNY) Residential Program, New York Home Performance with ENERGY STAR (HPwES)	NMR Group, Inc., Process Evaluation and Market Characterization and Assessment, September 2012	Ensure that the marketing message to homeowners emphasizes the program benefits of saving on energy bills or saving energy. In order to support this effort, NYSERDA could provide sample data on potential net savings, in terms of financing costs and monthly savings on energy costs for different types of homes. Design interactive and educational tools to assist and engage the homeowner in understanding the potential efficiencies is another approach that could be taken.	Pending	Program staff are considering the benefits and costs of developing an interactive online energy audit tool for homeowners to learn about energy efficiency and the Home Performance with ENERGY STAR Program.
		Utilize the CBOs to promote the benefits of participating in the program by highlighting the GJGNY free or reduced-cost energy audits and financing of HPwES-eligible energy-efficiency measures. In addition, program staff, implementation contractors, HPwES contractors, and CBOs should promote the GJGNY free or reduced-cost energy audits as a way of helping customers determine how energy efficient their homes actually are. Program marketing and promotions should also emphasize that the audit provides an opportunity to educate customers about energy efficiency, that having the audit does not require further commitment, and that participants can learn about energy efficiency and health and safety measures for their homes.	Implemented	18 CBOs were selected to conduct outreach throughout NYS, including Long Island. The free audit has been very popular with over 23,500 completed. Contractors are successfully converting these audits to HPwES work at a rate of over 35%. The program continues to explore additional innovative financing approaches to improve the 66% loan approval rate.
		Improve the tracking and presentation of HPwES contractor information to customers. Explore incorporating	Pending	CBOs developed “vetted” contractor lists that identified contractors willing to work in their region, along with other pertinent

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		additional software functionality which would allow the NYSERDA website to list or sort contractors by distance from home and languages spoken. Examples of other search criteria that NYSERDA could consider include the number of HPwES projects completed, types of measures implemented, any quality assurance and quality control information that is not confidential, and customer satisfaction rating. For customers lacking web access, NYSERDA could provide such information over the phone or by mail. ³		information regarding languages proficiencies, BPI certifications held by staff, additional certifications, and specialties of the company. Program staff is developing a customer satisfaction survey that would be combined with contractor profile information to offer customers better guidance on selection of a contractor.
		Continue to leverage existing training resources and expand curriculum to incorporate more specific field, sector, and advanced technical training. Ensure the HPwES contractors are made aware of the trainings, training incentives, and have convenient access to training locations.	Implemented	Program staff continue to leverage the existing training resources continuously review the curriculum to include more field, sector, and advanced technical trainings.
		Continue to support contractor training for BPI certification. Worker or job readiness training should prepare participants for BPI certification by utilizing worker and job readiness trainings including hands-on training such as internships or other real-world experience. These trainings and subsequent certifications will help meet the HPwES contractor needs for experienced	Implemented	Program staff continues to support contractor training for BPI certifications, worker and job readiness programs.

³ CBOs are undertaking “aggregation,” bringing a collection of eligible homes into the program using the same contractor or contractor team, which should also help to address the issue of finding and selecting contractors:

http://www.nyserda.ny.gov/Page-Sections/Green-Jobs-Green-New-York-Planning/Advisory-Council/~media/Files/EDPPP/Planning/GJGNY/Advisory%20Council%20Meetings/2010-05-26_GJGNY-draft-aggregation-model.ashx

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		workers.		
		Continue to enhance program data collection, tracking, and cross-contractor integration.	Pending	A software tool is being developed to more efficiently and effectively track projects from customer intake through completion. This tool will also provide enhanced reporting capabilities.
		Establish procedures to identify and more actively promote the program to customers who are more likely to need energy-efficiency work and are willing and able to finance retrofits. These procedures may be based on the prescreening tools already developed for the CBOs, input from the HPwES contractors, and measures such as HHI. This approach would result in a reduction in the number of participants who participate simply because the audit is offered at no or reduced cost but are less likely to install energy-efficiency measures.	Implemented	CBOs use a variety of prescreening tools to identify customers most likely to take advantage of the program. CBOs have also received training on the use of tools to identify customers.
		Consider offering additional seminars and webinars to educate HPwES contractors about the GJGNY low-interest loans. NYSERDA could also provide HPwES contractors with more guidance and better tools to sell the loan and help their customers through the application process. Align these approaches with the CBO effort to educate customers about the loans as well. Although EFS offers customer service and pre-screening, consider using an independent firm, such as EFS, to discuss GJGNY financing information with participants directly.	Pending	<p>Program staff plan to host a webinar dedicated to financing. In addition, training for call center staff is planned.</p> <p>EFS is also available to discuss GJGNY financing information with participants directly.</p> <p>The Building Performance Contractors Association is delivering a series of contractor training sessions across the state to answer contractor questions when it can and to offer feedback to NYSERDA.</p> <p>The CBOs are now represented at the monthly meetings sponsored by Efficiency First to bring NYSERDA and contractors together to seek solutions to barriers to increased adoption of energy efficiency.</p>

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		Identify ways for the HPwES contractors to ease the time burden for customers associated with scheduling or conducting the audit or installation of eligible measures. The program may achieve greater efficiencies by implementing processes to streamline program requirements, ensuring the effective scheduling of audits, simplifying paperwork, etc.	Implemented	<p>In July 2012, the credit application and assisted subsidy application process was streamlined.</p> <p>In September 2012, an online audit application was launched to streamline that audit.</p> <p>Access to utility bill and usage information would greatly streamline some program requirements.</p>
		Improve the conversion from GJGNY energy audits to work completed or measures installed by providing HPwES contractors and CBOs clear and timely information about program changes. This information should, at a minimum, include the change, its impacts, and complete and uncomplicated rationale for the change. Review contractor awareness of, participation in, and perceived effectiveness of the monthly webinars, which cover program changes, details, opportunities, and offer a venue for feedback. Consider surveying contractors on the efficacy of the webinars and other informational tools.	Implemented	<p>The conversion rate from audit to NYSERDA HPwES work completed is currently 35%, and significantly higher if work completed by HPwES contractors through utility rebate programs is considered.</p> <p>The Program delivers periodic webinars to discuss program changes and to collect feedback from contractors. In addition, there have been increased efforts to collect contractor feedback through Efficiency First and BPCA.</p>
		Identify ways to address concerns of consumers regarding financing the installation of HPwES-eligible energy-efficiency measures. In addition to increased marketing of the loan products, the program, CBOs, and individual HPwES contractors could provide customers with more information about the financial benefits of energy efficient measures. Increased use of testimonials and detailed explanations of benefits and costs might	Implemented, ongoing	<p>A financing fact sheet along with a Residential Financing Product Information Sheet (comparing the On-bill and Unsecured loan products) have been developed. Additional case studies for each regional market will be developed.</p> <p>Program staff continue to explore the benefits of offering incentives based on energy savings.</p>

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		help to encourage participants to install measures. Although constraints from existing funding and cost-effectiveness tests may limit the amount of incentives that can be provided, increasing the incentives for some measures would be a way to help reduce this barrier.		
		Develop marketing and educational materials that promote the benefits of early replacement of energy consuming equipment. Educate HPwES contractors on how best to offer the consumer guidance about the benefits of early replacement.	Pending	This recommendation requires information to support the benefits of early replacement of equipment.
		The HPwES program should review quality control policies and procedures to make sure mechanisms are in place to verify quality services and installations, according to program standards. The program should also review its contractor training and support to ensure the consistency and quality of installations.	Implemented, Ongoing	The program is exploring the benefits of adopting a QA approach that assesses the quality of the work. The existing QA scoring is based on the discovery of program deficiencies. The proposed approach utilizes detailed requirements for acceptable materials and installation procedures.
		Reinforce the importance of the QA process with customers by indicating the homeowner can receive a free, independent third-party review of the work completed by the HPwES contractor through the program. HPwES program marketing and promotions to customers should also emphasize the value and benefits of QA inspections. HPwES contractors should also be encouraged to highlight the QA process when explaining the benefits of participation as it shows that HPwES contractors are held to a high standard.	Implemented	Information on the QA process is available to customers through a brochure that each contractor is required to deliver to customers. Information on the QA process has also been written into new marketing publications and website language.

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		Develop targeted messages to educate Upstate-A ⁴ homeowners on the benefits of energy efficient improvements and promote the benefits of early replacement and opportunities to install and finance eligible measures through HPwES.	Implemented	A marketing campaign has been developed that uses messages that are targeted at specific market segments, as identified through market research conducted in 2011. CBOs also provide targeted messaging for their specific communities.
		Messaging to Upstate-B ⁵ participants should emphasize that the free or reduced-cost energy audits could help to identify the specific measures that could make their homes more energy efficient which, in turn, would help reduce their winter heating costs.	Implemented	A marketing campaign has been developed that uses messages that are targeted at specific market segments, as identified through market research conducted in 2011. CBOs also provide targeted messaging for their specific communities.
		Promote the GJGNY program in the Downstate ⁶ region with a focus on the easily achievable criteria for qualifying for the free or reduced-cost energy audit. In parallel, messaging to the Downstate consumer by the CBO, HPwES contractor and the program should concentrate on the benefits and opportunities to reduce energy bills by completing an audit and implementing measures.	Implemented	CBOs using median income charts to guide customers. Advertising mentions that most customers qualify for a no cost audit

⁴ Upstate-A (Central, Western and Finger Lakes) counties include: Allegany, Cattaraugus, Chautauqua, Erie, Genesee, Niagara, Orleans, Wyoming, Livingston, Monroe, Ontario, Seneca, Wayne, Yates, Cayuga, Cortland, Madison, Oneida, Onondaga, and Oswego.

⁵ Upstate-B counties include: Chemung, Schuyler, Steuben, Tioga, Tompkins; Broome, Chenango, Jefferson, Lewis, St. Lawrence, Albany, Clinton, Essex, Franklin, Fulton, Hamilton, Herkimer, Montgomery, Otsego, Rensselaer, Saratoga, Schenectady, Schoharie, Washington, Warren, Columbia, Delaware, Dutchess, Greene, Putnam, Sullivan, and Ulster.

⁶ Downstate counties include: Orange, Rockland, Westchester, Bronx, Kings, New York, Richmond, Queens, Nassau and Suffolk.

4 Pending Recommendations

Recommendations from previous evaluations that have not yet been characterized as implemented or rejected in prior reporting are listed, by program, in Table 4-1 through Table 4-7. These tables also provide NYSERDA program staff's response and rationale for the characterization. Note this section does not cover all EEPS programs NYSERDA administers; only programs with recommendations not previously reported as implemented or rejected are included in these tables.

Table 4-1. Pending Recommendations: Existing Facilities Program

Source of Recommendation (Contractor, Report Title, Date)	Recommendation	Status (Implemented, Pending or Rejected)	Program Implementer Response to Recommendation and Adoption Decision Rationale
Research Into Action, Process Evaluation, February 2012	Focus on providing incentive application status updates to service providers most affected by processing delays. Consider providing automated project status updates to free up program staff resources for other purposes. Support service providers by publicizing the typical length of time for each stage of NYSERDA review.	Pending	<p>NYSERDA is currently integrating its database systems and revising its business process. The new system is planned to include enhanced workflow and applicant communications that will allow service providers access to project status and automate communications at key business process toll gates. To better manage the expectations of its customers and service providers, NYSERDA is also developing the following:</p> <ul style="list-style-type: none"> - A description of the EFP verification process at each toll gate: Energy Analysis Review, which includes the pre-installation inspection, Project Installation Review and Measurement and Verification - A one page pictorial summary of the verification process that includes a description of deliverables and an estimated timeframe for each toll gate review <p>These one page descriptions will be reviewed by Marketing, attached to each contract, handed out at kick-off meetings and posted on the Existing Facilities website.</p>
	Improve program branding through marketing collateral, descriptive information, and application forms that clearly convey NYSERDA's leadership in energy efficiency and standards for assuring that project savings meet expectations. Continue to offer assistance with project development to end users and service providers.	Pending	<p>NYSERDA's leadership in energy efficiency, technical expertise and assurances for quality standards as indicated through statewide quantitative research are core foundational messages and are incorporated into all marketing communications materials/activities. The EFP is expanding its project development assistance by adding outreach contractor resources through a new RFP and developing a team of Key Account Managers assigned to specific end users and service providers.</p>

Table 4-2. Pending Recommendations: New Construction Program

Source of Recommendation (Contractor, Report Title, Date)	Recommendation	Status (Implemented, Pending or Rejected)	Program Implementer Response to Recommendation and Adoption Decision Rationale
RIA, New Construction Program (NCP) Process Evaluation, December 2011	The NCP should continue its efforts to ensure that projects are enrolled at the optimal time and that early participation steps are streamlined and as timely as possible.	Implemented	NCP program streamlining is an ongoing activity with a constant push toward incremental improvements in all project processing areas. Recent activities included a coordinated effort among NCP, the Consolidated Funding Application (CFA) staff and the Outreach Project Consultant (OPC) team, with a goal of engaging OPCs with applicants as quickly as possible. Several steps in the CFA process have been shifted from NCP staff to the OPC firm.
	Outreach Project Consultant (OPC) marketing should be continued and the program should continue to track its results, including the conversion rate of leads to applications.	Implemented	<p>OPC marketing is continuing OPC presentations and leads are logged in the Buildings Portal (BP) database and tracked monthly. The current OPC firm has been directed to be more diligent in using the applications tab in the leads section of the BP, since this will better document the conversion of leads to applications. A challenge is that the formal project name shown on the application is often not the same as the name assigned to the lead, when the formal name had not been established. NYSERDA has issued a RFP for OPC services for the NCP that will cover services from 2013 through 2016. As indicated in the solicitation, contractor success will be monitored through required reporting on metrics, including, but are not limited to, outreach activities and conversion of inquiries and leads to projects.</p> <p>NCP will work with the Marketing Department and OPCs to develop a link between the Solutions campaign leads and NCP applications. The work has started now that some leads are converting to applications.</p>
	To avoid unexpected results for participants seeking to employ integrated whole building designs, NCP staff members, OPCs, and TA providers need to continue to develop effective ways to explain the consequences of the new requirements surrounding the Total Resource Cost (TRC) test.	Implemented	NCP staff and contractors currently advise customers that energy efficiency measures are subject to a cost/benefit test, and some measures may not receive incentives. As contractors become more familiar with the impact of TRC they will have a better understanding of the measures that typically pass or fail, which will help in framing realistic expectations for customers. NCP will continue to investigate alternative ways to encourage higher performance within the TRC framework. An empirical study may be difficult to achieve as there are many variable factors with projects over time, making it difficult to isolate impacts from

Source of Recommendation (Contractor, Report Title, Date)	Recommendation	Status (Implemented, Pending or Rejected)	Program Implementer Response to Recommendation and Adoption Decision Rationale
			<p>TRC. As TA reports subject to TRC are completed NCP has been tracking the effects of TRC on project measures and incentives. NCP also has been seeking feedback from the OPCs and TAs about impacts of TRC on projects and providing program assistance. Initial anecdotal feedback indicates that TRC adds staff and contractor time and incentive opportunities are reduced, which may lead to higher program costs per project, less customer interest and lower program participation.</p> <p>The TRC test has resulted in reduced incentives and elimination of measures a number of projects. Anecdotal reports indicate that Technical Assistants face challenges in guessing what measures may drop out due to TRC, when the TAs are in initial discussions with applicants. This has resulted in applicant and TA frustration during energy analysis and development of proposed incentive reports.</p>
	<p>While NCP has made substantial progress developing an advanced analysis tool to foster deeper, cost-effective savings for smaller buildings. Further steps are needed to finalize and implement the package. Completing this analysis tool should be a high priority, given the surge in smaller building applicants.</p>	<p>Pending</p>	<p>The program continues to work with NCP contractors to incorporate the New Buildings Institute Core Performance Guide (CPG) into the program. The current activity regarding CPG is finalizing an incremental cost process by an NCP contractor, and testing of TRC protocol with CPG outputs. This has proven to be challenging work and has continued since the previous report.</p>

Table 4-3. Pending Recommendations: FlexTech Program

Source of Recommendation (Contractor, Report Title, Date)	Recommendation	Status (Implemented, Pending or Rejected)	Program Implementer Response to Recommendation and Adoption Decision Rationale
Megdal & Associates, Impact Evaluation, March 2012	<p>Update NYSERDA’s FlexTech study database system (buildings portal) to:</p> <ul style="list-style-type: none"> a. Allow energy savings recommendation entries for more than one fuel type b. Include findings from impact evaluation studies, such as tracking peak demand savings that are consistent with New York Department of Public Service (NY DPS) reporting requirements and capturing interactive savings associated with central cooling and heating plants c. Incorporate premise identifiers d. Retain electronically the data, analysis and supporting documentation from the FlexTech studies including PDFs of the final studies, Excel analysis files, building model input files, baseline/pre-retrofit billing data and HVAC trend data from the end use customers. 	<ul style="list-style-type: none"> a. Pending b. Implemented c. Pending d. Implemented 	<ul style="list-style-type: none"> a. Database changes will be made. b. Program is based on a market-based 50% cost share by customers to obtain information customers find valuable for making decisions to move forward with energy efficiency projects. Differing and sometimes no methods of assessing demand impact or interactive heating and cooling savings are valuable to customers providing the 50% cost share. Also, prescribed demand reporting methods evolve over time. Program will work with study providers and customers to better report demand savings by currently prescribed DPS methodology and better assess significant heating/cooling interactions. c. This recommendation is pertinent at the portfolio level. NYSERDA is developing methods to provide this tracking. d. Electronic copies of FlexTech projects including final reports and associated files are being retained.

Table 4-4. Pending Recommendations: Industrial and Process Efficiency Program

Source of Recommendation (Contractor, Report Title, Date)	Recommendation	Status (Implemented, Pending or Rejected)	Program Implementer Response to Recommendation and Adoption Decision Rationale
RIA, Industry & Process Efficiency (IPE) Process Evaluation, November 2011	The program would benefit from database and application processing upgrades needed for staff to improve project management, including implementing electronic signatures and better integration of NEIS and Buildings Portal.	Pending	NYSERDA has created a new Performance Management and Evaluation Systems department. Also, the Energy Efficiency Services (EES) Operations Unit continues to address changes needed to the multiple database process currently in place. Performance Management Systems and EES Operations are integrating staffing and responsibilities to optimize reporting, database, and processing upgrades
	The program team should continue to refine the dashboard in coordination with NYSERDA’s Operations Group.	Pending	NYSERDA has created a new Performance Management and Evaluation Systems department. Also, the Energy Efficiency Services (EES) Operations Unit continues to address changes needed to the multiple database process currently in place. Performance Management Systems and EES Operations are integrating staffing and responsibilities to optimize reporting, database, and processing upgrades. Dashboard upgrades will be submitted as requested refinements.
	The program would benefit from additional Technical Reviewer support for western New York and data centers throughout the state.	Pending	NYSERDA issued a new RFP for Outreach providers to support EEPS2 NYSERDA programs. Contractors will be selected later this year. Feedback from this evaluation will be considered in the TEP process and contract execution.
	The program would benefit from additional Outreach Contractor outreach to data centers, to consulting engineers that serve targeted industrial submarkets, including data centers and compressed air users, and to industrial customers in western New York (the greater Buffalo area, in particular). Across the state, outreach contractors should increase leveraging of economic development organizations to assist with targeted outreach	Pending	NYSERDA issued a new RFP for Outreach providers to support EEPS2 NYSERDA programs. Contractors will be selected later this year. Feedback from this evaluation will be considered in the TEP process and contract execution.

Source of Recommendation (Contractor, Report Title, Date)	Recommendation	Status (Implemented, Pending or Rejected)	Program Implementer Response to Recommendation and Adoption Decision Rationale
	Program staff could take steps to more strongly brand Industrial and Process Efficiency as a one-stop shop that leverages a cohesive team of people to assist customers from opportunity identification and justification, to verification and investment, in the next cost-saving project.	Pending	NYSERDA branding is a key part of the ongoing Integrated Marketing campaign. This multi-tiered marketing program delivers general C&I and program specific content through a combination of media including print , online and direct response tactics (email and direct mail) to key participating and prospect C&I audiences. Industrial and Process Efficiency will investigate with NYSERDA Marketing the appropriateness of individual program branding within overall NYSERDA branding.
	To facilitate coordinated outreach between program staff and outreach contractors and reduce duplicative or non-coordinated outreach to individual customers, the process evaluation team recommends that program staff use salesforce.com more consistently.	Pending	A NYSERDA-wide Customer Relation Management (CRM) tool is currently being implemented by the EES Operations Unit. Program use of SalesForce.com is being reassessed in coordination with the new CRM.
	The Industrial and Process Efficiency staff could host a workshop with Technical Reviewers and outreach contractors to further develop guidance case examples for per-unit-of-production calculation methodologies and messages likely to provide the best energy savings for the customer and the program.	Implemented	Technical Reviewer training was held at NYSERDA on February 28, 2012 that included case studies on how to calculate per unit of production savings. Future periodic training sessions will continue to improve the program.

Table 4-5. Pending Recommendations: New York ENERGY STAR Homes Program

Source of Recommendation (Contractor, Report Title, Date)	Recommendation	Status (Implemented, Pending or Rejected)	Program Implementer Response to Recommendation and Adoption Decision Rationale
Nexant, NYESH M&V, June 2007	Data from REM/Rate files should be included in CSG's database for all homes, including detailed equipment and appliance information and square footage of each home. CSG indicated that this recommendation will be incorporated into a future version of the program database. In addition, NYSERDA should periodically conduct quality control checks to verify that the information in the database is correct.	Implemented	The Program stores REM/Rate files for projects transmitted for payment after January 1, 2012.

Table 4-6. Pending Recommendations: EmPower New York Program

Source of Recommendation (Contractor, Report Title, Date)	Recommendation	Status (Implemented, Pending or Rejected)	Program Implementer Response to Recommendation and Adoption Decision Rationale
Nexant, EmPower M&V, April 2007	Devise a methodology to automate the electronic transfer of results from the EmPower New York Calculator to the EmPower New York database.	Pending	The Program will explore adoption of integrated management software.
	Devise a methodology to incorporate the AHAM baseline energy usage data, adjusted for degradation for refrigerators and freezers in to the EmPower New York Calculator to avoid the manual data entry errors while transferring results from REFRIGERATION [®] software to the EmPower New York Calculator.	Rejected	This recommendation is not viable at this time as the AHAM data has not been updated since 2000.

Source of Recommendation (Contractor, Report Title, Date)	Recommendation	Status (Implemented, Pending or Rejected)	Program Implementer Response to Recommendation and Adoption Decision Rationale
Megdal and Associates, EmPower Impact Evaluation, April 2012	Methods for estimating savings for envelope measures (both natural gas and electric) and replacement refrigerators should be evaluated.	Pending	<p>July 2007 changes to improve the accuracy of EmPower savings estimates will have a greater impact in the post-evaluation period in the areas of: 1) Attic insulation: increased the estimated R-value of pre-existing fiberglass insulation in poor condition; 2) Wall insulation: lowered savings estimates to account for wall studs, window framing, and estimated 4% voids; 3) EmPower initiated a system for flagging and correcting high estimated savings as appropriate.</p> <p>In 2010, the program discontinued the use of fiberglass to insulate rim joists in favor of spray foam for both air leakage reduction and insulation.</p> <p>In 2011, the program initiated a practice of core-sampling wall insulation to ensure appropriate density.</p> <p>Moving forward, EmPower plans to initiate:</p> <ul style="list-style-type: none"> - Introduction of an advanced air sealing protocol and system for calculating savings based on air leakage reduction. Contractor training is in progress. - Adjustments to energy use thresholds for refrigerator and freezer replacements.
	Review policies for CFL installation to assess how to assist participants and achieve cost-effective savings, and monitor change in CFL market to determine whether it is necessary to modify the approach to the installation of CFLs further as CFLs gain greater market acceptance.	Implemented	<p>In 2008, EmPower began adjusting the estimated hours of daily usage ;the approach is more conservative than the NY State Tech Manual or the system recently proposed by DPS staff. Also in 2008 EmPower tightened enforcement of the installation of CFLs and scoring of contractors' Quality Assurance with positive results</p> <p>The program is monitoring CFL market penetration; however, at this time finds that many opportunities remain for assisting low income households through the installation of CFLs.</p>
	Review the fields in the database and data collection processes to assess whether additional information, such as the presence of working air conditioning, could be added to the tracking system. Review the coding of measure	Pending	<p>EmPower will consider adding data fields to assist future evaluations, including:</p> <ul style="list-style-type: none"> - Secondary heating systems - Separate fields for attic and wall insulation savings

Source of Recommendation (Contractor, Report Title, Date)	Recommendation	Status (Implemented, Pending or Rejected)	Program Implementer Response to Recommendation and Adoption Decision Rationale
	descriptions to make it easier to identify fuel switching measures and differentiate attic and wall insulation. Improve error checking methods and frequency to correct tracking system errors in a timely manner.		<ul style="list-style-type: none"> - Air conditioning <p>The program has enhanced the process of data checking by the Program Implementer</p>
	<p>Consider including indicators of Non-Energy Benefits into future evaluation efforts, a lower cost option than full monetization studies, to aid policy makers' ability to have a more complete viewpoint when decisions are being made regarding low income programs.</p> <p>Monitor ongoing efforts that seek to quantify NEBs so these may be referenced within impact evaluations. This type of referral and indicators of the importance of NEBs to NYSERDA's participants may offer a low cost approach to ensure a socially responsible perspective is not lost in the reporting of savings estimates from sophisticated quantitative impact evaluations.</p>	Pending	<p>NYSERDA will attempt to include more non-energy impacts in future evaluations to the extent possible.</p>
	<p>Work with utilities to ensure that billing data is complete, useful and properly interpreted.</p>	Pending	<p>Great progress has been made in working with utilities on billing data questions since the time data were requested to conduct this study. NYSERDA is currently working with DPS and the utilities to determine whether an existing system for exchanging data between utilities and energy service companies can be used to more readily provide access to utility data needed by NYSERDA in the future.</p>
	<p>Although the Net-To-Gross component of the evaluation may not need to be conducted with every evaluation cycle, continuing to measure net effects for EmPower in the future is warranted.</p>	Pending	<p>NYSERDA will discuss the merits of continuing to assess NTG in future EmPower evaluations with DPS. Since most low income evaluations do not address NTG, and this study found the NTG to be nearly a 1.0, NYSERDA will weigh the benefits and costs of collecting such information in future studies.</p>

Source of Recommendation (Contractor, Report Title, Date)	Recommendation	Status (Implemented, Pending or Rejected)	Program Implementer Response to Recommendation and Adoption Decision Rationale
	Continue to use survey instruments to inform the billing analysis, assess non-energy benefits and NTG factors	Pending	This recommendation will be considered when designing the next evaluation

Table 4-7. Pending Recommendations: Workforce Development

Source of Recommendation (Contractor, Report Title, Date)	Recommendation	Status (Implemented, Pending or Rejected)	Program Implementer Response to Recommendation and Adoption Decision Rationale
Research Into Action, Process Evaluation, June 2012	NYSERDA should work with Career Pathways (CP) training partners to clearly identify and define the “career path” that each course fits into, to ensure that trainers and trainees understand how the course fits into that career path, and to incorporate consistent and comprehensive job-search skill training and post-training support into their curricula.	Pending	In future solicitations and CP contracts, NYSERDA will ask proposers/partners to better demonstrate to students how the course fits into a career pathway and to provide available information on training and certifications. NYSERDA will work with NYSDOL to provide information to CP students on assistance related to job search skills, employment opportunities and post-training support available through NYS DOL and the One-Stop Centers.
	NYSERDA should work with its training partners to identify Technical Training (TT) courses (e.g., <i>eQUEST</i> modeling) that should be taught at beginning and intermediate-advanced levels.	Pending	In future training solicitations, NYSERDA will require its training partners to perform more detailed trainee screening to better assess skills prior to technical training and better identify prerequisites to technical training, (e.g., The eQUEST modeling training exists for beginning, intermediate, advanced-level, and online training, yet the provider can better assess and screen participants prior to enrollment to direct the student to the appropriate level training).
	NYSERDA should work with its training partners to ensure that all trainers be given training in evidence-based adult education techniques	Pending	NYSERDA will look for ways to educate training providers in evidence-based learning techniques as necessary. Instructor experience is evaluated when workforce training proposals are reviewed.

5 *Other*

Per the DPS reporting guidance, this section provides an opportunity to report significant activities or events not already reflected in the report. This section is not for reporting routine activities.

There are no other significant activities requiring explanation for the third quarter of 2012.

Appendix A: Completed Evaluation Summaries

This appendix contains a high-level summary of each recently-completed evaluation study. The full report on each evaluation study can be found on the NYSERDA website. Summaries appear within this appendix in the following order:

1. Industrial and Process Efficiency Impact Evaluation, Megdal and Associates, September 2012.
2. New Construction Program Impact Evaluation, Megdal and Associates, September 2012.
3. Existing Facilities Market Characterization and Assessment Evaluation, Navigant Consulting, June 2012.
4. Agriculture Emergency Disaster Program Process Evaluation, Research Into Action, September 2012.
5. Commercial/Industrial Natural Gas Market Characterization, Navigant Consulting, September 2012.
6. New York ENERGY STAR Homes Impact Evaluation, Megdal and Associates, September 2012.
7. Workforce Development Program Market Characterization and Assessment Evaluation, GDS Associates, September 2012.
8. Green Jobs – Green New York Residential Program Process Evaluation and Market Characterization and Assessment, NMR Group, September 2012.¹

¹ Finalized late in the second quarter and held for this reporting.

Industrial and Process Efficiency Program: Impact Evaluation Summary

Evaluation Report Prepared by: Megdal & Associates Impact Evaluation Team

Energy & Resource Solutions, Lead Investigators, August 2012

Program Summary

NYSERDA's Industrial and Process Efficiency Program (the "Program") provides installation incentives to manufacturing, agricultural, mining, wastewater, and data center customers. Performance-based incentives are available for both electric and natural gas projects. The Program is relatively new, with the first 26 projects completed in 2009, and an additional 44 completed in the first six months of 2010. The majority of projects in the first two program years were lighting and compressed air upgrades. As the program matures, the complexity of the projects is expected to increase to include more process-specific energy efficiency measures. The Program requires that the participant conduct pre-installation measurement (where possible) of equipment performance on larger projects to demonstrate savings potential and then measure post-installation equipment performance to ensure the program is garnering expected savings. It is funded through the Energy Efficiency Portfolio Standard.

Evaluation Objectives and Key Findings

The primary objective of this impact evaluation was to determine the electric and natural gas savings attributable to the Program for projects completed from Program inception in early 2009 through June 30, 2010. The evaluation was designed to estimate the realization rate, i.e., the ratio of the evaluated savings to the program-reported savings; and to develop estimates of free ridership, i.e., the proportion of program savings that would have occurred without the program, and SO, i.e., the additional savings caused by the program but not funded by it or other efficiency programs.¹ Evaluators also analyzed the effects of projects on participants' non-energy costs and on their use of oil and coal. Additionally provided is a brief overview of the evaluators' involvement in pre-installation review of selected large projects. Table 1 summarizes the Program's overall savings.

¹ This summary presents the results for the first phase of a two-phase evaluation plan. A second phase of this impact evaluation will evaluate projects completed after June 2010 and will include development of program-specific spillover estimates from primary research.

Table 1. Summary of Evaluated Savings for Program Years 2007 – June 30, 2009

Parameter	Electric Energy (MWh/yr)	Electric Demand (MW)	Natural Gas (MMBtu/yr)
Program Reported Savings	34,794	4.0	928,023
Realization Rate	0.89	1.01	1.14
Evaluation Gross Savings	30,967	4.0	4,186
Net-to-Gross Ratio (NTG) ²	1.04	1.04	1.04
Evaluated Net Savings	32,206	4.2	4,353

Detailed Findings: Realization Rate and Net-to-Gross

Realization Rate: The realization rate (RR) for electric energy savings is 0.89, with 4.9% relative precision at 90% confidence; the summer coincident peak demand reduction RR overall is 1.01 with 35.1% relative precision at 90% confidence.² The natural gas RR is 1.14 and has no sampling error, as only two projects claimed natural gas savings and both were evaluated.

Net-to-Gross: About one third of participants' savings, 34%, were found to be free ridership that would have occurred without Program intervention. Since the Program is new and it takes time for participants and market actors to absorb and act upon the new information disseminated through the program, it is likely that estimating spillover from primary data collection would underestimate the actual impacts of the Program. Consequently, the Evaluators estimated total spillover from prior NYSERDA evaluations of 38% offsets the free ridership effect, as shown in Table 2. The SO components were estimated to be 4% on-site by incentive recipients, 19% by participating vendors at other facilities, and 15% by nonparticipants.

² The estimate of relative precision for the demand savings is only marginally informative given that the Program did not require applicants to calculate peak demand savings until the latter part of the evaluation period and NYSERDA does not have a peak demand savings target for the Program.

Table 2. Free Ridership Estimate and Spillover Estimates from Secondary Sources

Attribution Variable	Factor
Free ridership (FR)	0.34
Inside Spillover ¹ (ISO)	0.04
Outside Spillover ² (OSO)	0.19
Nonparticipant Spillover ³ (NPSO)	0.15
Calculation MTGR = (1 - FR) + ISO + OSO + NPSO	(1 - 0.34) + 0.15 + 0.19 + 0.04
Net-to-gross ratio (NTGR)	1.04

¹ Summit Blue Consulting LLC and Quantec *Commercial and Industrial Performance Program Market Characterization, Market Assessment and Causality Evaluation*, May 2007

² Summit Blue Consulting LLC and Quantec *Commercial/Industrial Performance Program Market Characterization, Market Assessment and Causality Evaluation*, Final Report. March 2005.

³ Summit Blue Consulting LLC and Quantec, LLC. *NYSERDA Commercial and Industrial Market Effects Evaluation, Final Report*, submitted by, October 2007.

Non-Energy Impacts: Non-energy impacts (NEIs) were material and quantifiable for 14 of the 36 projects in the M&V sample. Most of the NEIs are associated with measures that reduce operations and maintenance costs. Evaluators quantified the NEIs for projects whenever possible. In the aggregate analysis, the dollar value of the NEIs was normalized per MWh/yr or per MMBtu/yr or first-year reported savings on the project. The analysis did not attempt to quantify non-participant NEIs. Table 3 shows the normalized savings which amount to more than \$188,000 annually and represent about 6% of the retail value of the annual energy savings resulting from implemented measures.

Table 3. Non-Energy Impacts – Summary of Results

NEIs - Projects with Reported Electric Savings	Normalized Value of NEIs	Total Annual Program NEI Value
Projects with Reported Electric Savings	\$5.09 /MWh of reported savings	\$176,011
Projects with Reported Natural Gas Savings	\$3.37 /MMBtu of reported savings	\$12,370

Evaluation Methods and Sampling

The components of the evaluation are described below:

1. On-site M&V was conducted at 36 facilities. The RR was calculated based on the information gathered and analyses performed during this M&V. The Impact Team developed each site-

specific scope of work to leverage any program M&V activities. The on-site evaluation M&V also determined non-energy impacts such as operations and maintenance savings, production savings, and water use savings.

2. On-site and telephone surveys were administered to facility decision-makers for the projects included in the M&V sample to develop inputs into the estimate of free ridership. Surveys were implemented for 33 of the 36 projects where on-site M&V was performed. Decision-maker interviews could not be secured for three of the projects. Spillover was not in the scope of primary research, rather, it was estimated based on previous NYSERDA evaluations similar to the one performed.
3. A telephone survey with vendors associated with the projects in the on-site M&V sample was conducted to provide additional input into the estimate of FR for the sampled projects. Evaluators completed interviews with vendors for 35 projects.

Evaluators also assessed the indirect impact of electric program measures on fossil fuel energy use and of natural gas program measures on electricity and non-natural gas fossil fuel energy use. Secondary natural gas impacts, largely due to heating penalties associated with lighting efficiency projects, are expressed as a function of reported MWh of electric savings and for the program overall. This is shown in Table 4. One electric program project is significantly reducing on-site coal use. The two projects funded through the natural gas program had no reported or evaluated secondary energy effects.

Table 4. Electric Program Secondary Energy Impacts – Summary of Results

Non-Reported Fuel Impacts	MMBtu/MWh of Reported Savings	Evaluated Gross Secondary Impact (MMBtu/yr)
Natural gas	(0.33)	(11,572)
Coal	N/A	19,599

The sample was designed to determine the electric RRs for the upstate and downstate regions separately at the 90/10 confidence/precision level. Sample sizes were chosen using stratified ratio estimation (SRE), assuming an error ratio of 0.60. Since natural gas savings were claimed for only two projects, both were evaluated to estimate the RR for natural gas. For electric projects, the primary sampling unit was the project, and the sample frame was stratified by size, defined according to the annual electrical energy savings.

Pre-installation Review -- Evaluation Involvement

In addition to the traditional post-installation M&V of projects completed through June 30, 2010, the Impact Evaluation Team continues to work with program staff on selected large projects that will be completed in 2012 or later to ensure that program-funded project M&V activities are designed for both program and evaluation purposes, as appropriate. Through this ongoing process evaluators and program staff have the opportunity to review projects prior to implementation to encourage consistency in baseline definition, methodology, and data collection for the Program's largest projects.

Recommendations and Program Administrator Response

The following nine program recommendations and two evaluation recommendations were made by the evaluators conducting this study. NYSERDA's initial response to these recommendations is also summarized below and will be tracked over time.

Program Recommendation 1: *Institute a longer Program M&V period on the Program's larger energy savers.* In several instances, reported savings deviated from evaluated savings due only to differences in the duration of pre- and post-installation measurement performed at the site. Increasing the M&V duration enables better assessment of measure long-term savings, especially for process-driven measures for which the savings are highly dependent on fluctuations in production.

Response to Program Recommendation 1: Pending. NYSERDA agrees. However, marketplace feedback is that competing utility programs require far less proof of performance. Customers are opting for utility programs which pay higher incentives, use more ratepayer dollars per unit energy savings delivered, and require less proof of performance.

Program Recommendation 2: *Systematically collect supporting spreadsheets, models and data from technical assistance providers.* Both program and evaluation staff agreed that having program staff routinely gather and retain of technical assistance provider spreadsheets and metered data in its original format would facilitate program staff review of projects as well as future evaluations. If this comprehensive compilation of records for all projects is unwieldy, at least do it for the largest projects, such as those with incentives in excess of \$250,000.

Response to Program Recommendation 2: Pending. Response to program comments on this recommendation was finalized by the evaluators in the later stages of producing the final report on IPE. To that end, NYSERDA program staff have not had the opportunity to fully consider the recommendation and determine a course of action. Thus, the response to this recommendation is pending further review.

Program Recommendation 3: *Apply a common algorithm for tracking demand savings.* The high variance in the peak demand savings realized by the Program stem from inconsistencies in algorithms and requirements regarding peak demand calculations. Evaluators recommend that program staff consider requiring that peak demand be calculated consistently across projects.³

Response to Program Recommendation 3: Pending. The program will work with the marketplace to better report demand savings by currently prescribed DPS methodology.

Program Recommendation 4: *Incorporate heating, ventilation, and air conditioning interactive effects into lighting analysis where significant impacts are likely.* The evaluation results showed that the heating and cooling effects of reduced lighting load and run-time hours can be significant, especially in facilities such as data centers with high cooling loads. Evaluators recommend that the Program reports these and other secondary fuel impacts.

Response to Program Recommendation 4: Pending. NYSERDA agrees.

Program Recommendation 5: *Create and Track Premise IDs.* Establish unique premise IDs that are constant across programs and that remain constant for a facility in the event of name changes or other turnover. The use of premise IDs is not uncommon in the utility environment, whereby a portion of each customer's account number can be the unique premise ID number, and the suffix of the number is the only thing that changes with alterations in account ownership.

Response to Program Recommendation 5: Pending. Response to program comments on this recommendation was finalized by the evaluators in the later stages of producing the final report on IPE. To that end, NYSERDA program staff have not had the opportunity to fully consider the recommendation and determine a course of action. Thus, the response to this recommendation is pending further review.

Program Recommendation 6: *Increase Impact Evaluation Team involvement in pre-installation project review.* The evaluation team's involvement in pre-installation program review has resulted in adjusted savings estimates and consistency between evaluation and program M&V metering and agreement in baseline definitions. Program and evaluation staff should actively work together to ensure more systematic involvement of the Impact Evaluation Team in pre-installation program review and increase the number of projects.

Response to Program Recommendation 6: Pending. NYSERDA agrees. However, marketplace feedback is that competing utility programs require far less proof of performance. Customers are opting for utility programs which pay higher incentives, use more ratepayer dollars per unit energy savings delivered, and require less proof of performance.

³ This evaluation calculated demand impact based on the average load during all summer weekday non-holiday afternoons. In the next evaluation cycle the definition is expected to be that specified in the *New York Standard Approach for Estimating Energy Savings from Energy Efficiency Programs, Residential, Multi-Family, and Commercial/Industrial Measures*, prepared for the New York Department of Public Service by TecMarket Works, October 15, 2010, p. 8: "The Program Administrators (PAs) should calculate coincident peak demand savings based on the hottest summer non-holiday weekday during the hour ending at 5 p.m."

Program Recommendation 7: *Include a mechanism to monitor changes in program reported savings.* Once a project's savings are reported, they are eligible for evaluation. Some participants complete large projects in multiple stages that span many years. As currently operated, program administrators can either create a new project record for each stage or can modify existing project records to increase the associated savings and incentive values and change project completion dates, among other fields, as new measures are finished. The latter approach causes unusual and significant challenges to evaluation. Projects in this evaluation could reappear in the next evaluation with different values. Any analysis of program performance over a period of time based on tracking data would be flawed. The evaluation team recommends that each phase of the project with a unique completion date should have a unique tracking record.

Response to Program Recommendation 7: Pending. Response to program comments on this recommendation was finalized by the evaluators in the later stages of producing the final report on IPE. To that end, NYSERDA program staff have not had the opportunity to fully consider the recommendation and determine a course of action. Thus, the response to this recommendation is pending further review.

Program Recommendation 8: *Use 0.95 as the prospective realization rate for electric energy savings and 1.08 for demand savings.* The overall electric energy (kWh) RR is 0.89, the electric demand (kW) RR is 1.01, and the natural gas (MMBtu) RR is 1.14. These are the findings applicable to this retrospective evaluation of projects completed from program launch through June 2010. NYSERDA also applies an RR when reporting savings for current projects. The retrospective natural gas realization rate is appropriate for use for this purpose as well. However, an evaluated outlier project is not likely to be representative of any future project and its performance materially affected the electric RRs. Evaluators recommend that NYSERDA apply this evaluation's electric energy RR absent the outlier of 0.94 and the demand RR absent the outlier of 1.08 for prospective use.

Response to Program Recommendation 8: Pending. This recommendation was added by the evaluators in the later stages of producing the final report on IPE. To that end, NYSERDA program staff have not had the opportunity to fully consider the recommendation and determine a course of action. Thus, the response to this recommendation is pending further review.

Program Recommendation 9: *Use 0.90 as the prospective NTGR.* Evaluators expect SO to decline as more of the Program's savings as associated with large unique projects that do not lend themselves to technology transfer, which is a major factor in SO. For this reason evaluators recommend using a lower prospective NTGR than the value used for the Phase 1 projects in this evaluation.

Response to Program Recommendation 9: Pending. This recommendation was added by the evaluators in the later stages of producing the final report on IPE. To that end, NYSERDA program staff have not had the opportunity to fully consider the recommendation and determine a course of action. Thus, the response to this recommendation is pending further review.

Evaluation Recommendations

Evaluation Recommendation 1: Conduct in-depth primary research on participant SO – Direct assessment of participant SO through survey research is the preferred method of calculating this factor. Evaluators believe that enough time will have passed by the time that the next phase of evaluation occurs to merit direct surveying of participants to calculate SO.

Response to Evaluation Recommendation 1: Pending. Primary research on SO is planned for Phase 2 of this evaluation. In the event that responses indicate significant SO, the evaluation will use enhanced techniques to validate responses.

Evaluation Recommendation 2: Reassess NEIs in the next evaluation –Discussion with customers and service providers during our pre-installation evaluation work suggests that some of the major process measures in the Program pipeline will substantively affect customers’ product quality, speed of production, and business retention and thus have significant NEIs. Based on these conversations and on the expected increase in the proportion of such projects in the Program portfolio overall, evaluators recommend continued assessment of NEIs.

Response to Evaluation Recommendation 2: Pending. NYSERDA plans to continue with the assessment of NEIs, similar to the assessment in the Phase 1 study.

NYSERDA New Construction Program: Impact Evaluation Summary

Evaluation Report Prepared by: Megdal & Associates Impact Evaluation Team

Cx Associates, Lead Investigators, September 2012

Program Summary

The New Construction Program (NCP or Program), historically funded through the System Benefits Charge (SBC) and now through the Energy Efficiency Portfolio Standard (EEPS), targets non-residential customers and their design teams. NCP addresses a multifaceted and technically sophisticated market including building developers, owners, design firms, and contractors. It provides participants with cost-shared technical assistance (TA) services and/or financial incentives for implementing energy efficiency measures in new construction and substantial renovation projects.

Evaluation Objectives and Key Findings

The purpose of this impact evaluation is to establish rigorous and defensible estimates for the net energy and demand savings attributable to NCP projects completed in calendar years 2007 – 2008. The primary vehicle for evaluating savings was on-site measurement and verification (M&V). The evaluated Program savings are shown in Table 1. Overall, NCP produced 68,310,066 kWh and 15,037 kW of electricity and demand savings.

Table 1. Summary of NCP Savings for Projects Completed in Years 2007-2008¹

	Annual Electric Savings (kWh/Yr)	Peak Electric Demand Savings (kW)
Program-reported savings	82,940,828	22,769
Realization rate	71%	52%
Evaluated gross savings	58,887,988	11,840
Net-to-gross ratio	1.16 ^a	1.27 ^a
Total evaluated net savings	68,310,066	15,037

¹ The Program did not provide incentives for fossil fuels for the program years 2007-2008. However during the period addressed in this evaluation, in some cases fossil fuels impacts were included in the TA studies and quantified in the NYSERDA database.

^a The values for kWh and kW net-to-gross ratios varied due to modeling of partial net impacts.

Detailed Findings: Realization Rates and Net-to-Gross

Realization Rate (RR)

The RR is the ratio of evaluated gross energy savings to the Program's reported savings. The RR represents the percentage of program-estimated savings that is actually achieved based on the results of the evaluation M&V analysis. An RR of 1.0 would indicate that the realized savings are exactly as estimated by the NYSERDA studies. An RR less than 1.0 indicates lower achieved savings than originally estimated in the study. The realization rates were 71% and 52% for electric energy and electric demand savings, respectively. These results are based on the 39 projects included in the sample.

Through a measure-specific, in-depth analysis of the evaluated gross and program reported savings for each project, the Impact Evaluation Team found a number of issues that affect the accuracy of the claimed savings. Table 2 summarizes the most common reasons for discrepancies between the program-reported and evaluated gross savings and the approximate impact at the project level. In the table, whole building projects are counted as a single measure and the issues are attributed to the category with the largest impact. This analysis focuses on the measures within projects that have the largest impact and is not inclusive of all measures or variations.

Table 2. Differences in Realization Rates

Reason for RR Other Than One	Number of Projects in Which Issue Had a Significant Impact¹	Difference between Evaluated and Program Reported Savings kWh	% Contribution to Reduction in Savings
Operations differed from preconstruction estimates	25	-10,363,181	56%
Issues with program analysis	7	-3,880,471	21%
Claimed measures not installed	3	-2,991,819	16%
Database entry issues	1	-686,558	4%
Installed equipment less efficient than claim	3	-544,051	3%
Program baselines different from code	4	-298,191	2%
Lighting analysis issues	14	120,204	-1%
Total difference	57	-18,644,067	100%

¹ This analysis assessed the reasons for significant variations in savings at the measure level and did not include all of the evaluated measures. Therefore the difference in savings shown in the table is smaller than that for the entire program. The number of projects is greater than for the evaluation because some projects had multiple measures with different reasons for discrepancies between the program and evaluated savings for each measure. No sampling weights were applied in this analysis which is another reason the values are not the same as for the entire program.

Net-to-Gross (NTG)

A NTG greater than 1.0 indicates that the program SO outweighs free ridership, and the program achieved more savings than were claimed based on direct activity. The overall NCP net-to-gross ratio (NTGR) was 1.16 for kWh savings and 1.27 for kW savings (see Table 3); the variation in the electricity and demand savings NTG values is due to modeling of participant net impacts. Free ridership (FR) measures the likelihood the participant would have implemented the measure without the Program, and SO is the degree to which the customers' participation in the New Construction Program influenced them to take additional actions to save energy. "Inside" SO (ISO) occurs when energy saving actions are taken at the same project site, but are not done as part of the Program. "Outside" SO (OSO) occurs when energy saving actions are taken at other sites that are not part of their program participation. Non-participant spillover (NPSO) captures some of the larger market effects beyond those customers or actors directly participating in the program.

Table 3. Net to Gross Ratio Estimates for NCP Program Years 2007- 2008

Net-to-Gross Variable	Factor for kWh	Factor for kW
Free ridership (FR) ¹	0.66	0.55
Inside spillover (ISO) ¹	0.01	0.01
Outside spillover (OSO)	0.20	0.20
Non participant spillover (NPSO)	0.61	0.61
Net-to-gross ratio (NTGR) NTGR ² = (1-FR) ^{1, 2, 3} + ISO ^{1, 2, 3} + OSO + NPSO	1.16	1.27

¹Using an innovative approach for this NCP evaluation, FR and ISO were determined through modeling.

²Technically, the formula using the modeling approach is: NTGR = MPNR + OSO + NPSO where Modeled Partial Net Rate (MPNR) = (1 – FR) + ISO

³ MPNR_{kWh} = ((1-0.66) + 0.01) = 0.35 and MPNR_{kW} = ((1-0.55) + 0.01) = 0.46

The pilot market effects study found that the current NTG analysis methods used by NYSERDA are likely to be leaving out some level of program-induced market changes and market effects. This study found that the upper bound for the un-captured NCP market effect may be as high as 14 GWh or one-third as large as the NPSO measured and reported for this evaluation. Further evaluation research needs to be undertaken to provide a reliable estimate of market effects.

Evaluation Methods and Sampling

The NCP impact evaluation has several major components:

1. Determination of project evaluated gross savings
 - a. Site-specific M&V of installed measures
 - b. Modeled as-built annual energy use of the installed systems, calibrated to utility data where feasible and normalized to typical meteorological conditions
 - c. Modeling of code baseline⁴ energy use for the systems affected by the Program
2. Determination of modeled partial net savings
 - a. Participating owner and design firm surveys
 - b. Modeling of project-specific baselines
 - c. Non-participant baseline surveys
3. Determination of participant OSO through survey data and review and use of participant OSO data from the prior evaluation
4. Determination of NPSO through non-participant surveys

⁴ A comprehensive statewide C&I baseline study is slated to begin in 2013.

Also part of the evaluation was a pilot study of potential market effects not captured by SO.

Sample projects were chosen using stratified ratio estimation (SRE) to meet a 90/10 confidence/precision level statewide. The final evaluation sample included 39 projects.

Recommendations and Program Administrator Response

The following program and evaluation recommendations were made by the evaluators conducting this study. NYSERDA's initial response to these recommendations is also summarized below and will be tracked over time. However, the Program is dynamic and has made significant changes since the evaluation period, which includes having already addressed some of the recommendations made by the Impact Evaluation Team.

Program Recommendations

Program Recommendation 1: *For projects and measures with large savings, consider including more rigorous commissioning and validation protocols as well as independent third-party M&V as part of Program delivery.* Operating conditions often differ from the assumptions made during the design phase of new construction projects. The impacts of these changes can be particularly significant for large projects with long lead times.

Response to Program Recommendation 1: Pending. Commissioning is currently required for all projects with incentives of \$100,000 or greater. Customers may choose the commissioning provider of their choice. Within the context of current budgets and TRC, NCP will investigate options for expanded M&V and/or retro-commissioning incentives as part of program delivery. For larger projects NCP is reviewing the possibility of engaging the impact evaluation contractor in technical assistance discussions regarding energy modeling baselines.

Program Recommendation 2: *For projects with whole building or custom analysis include all measures in the analysis. The savings for those measures receiving standardized incentives should be analyzed as part of the whole building or custom analysis to ensure accurate quantification of interactive effects.* The inclusion of measures with deemed savings in complex whole building or custom analyses fails to address interactive effects and can result in the overestimation of savings.

Response to Program Recommendation 2: Implemented. For applications received after March 1, 2011, NCP no longer offers pre-qualified or pre-set incentives for ground source heat pumps (GSHP). Similar to other whole building or custom measures GSHP must be analyzed individually for each project. Furthermore to ensure that there are electricity savings, GSHP measures will only be considered where there is no gas available on site.

Program Recommendation 3: *Limit the use of prescriptive measures to smaller projects and use custom analysis for large measures.* Large prescriptive measures had a significant negative impact on realized savings.

Response to Program Recommendation 3: Implemented. Under the current program the incentive cap for PQ measures is capped at \$30,000 per project, to limit the use of prescriptive measures to smaller projects. NCP expects to retain this cap in the next solicitation.

Program Recommendation 4: *Institute a mechanism for using the code space-by-space lighting power density (LPD) as the baseline for lighting incentives in new construction. Require documentation of space-by-space installed lighting power density and provide incentives for lighting systems that are more efficient than code rather than providing equipment-based incentives.* Several projects used lighting equipment deemed savings and incentives, which sometimes resulted in a baseline that exceeded the code and in other cases resulted in installed participant lighting projects that did not meet code. Operating hours for lighting efficiency measures often varied significantly from the default deemed hours.

- *Consider enabling program staff to use custom hours of operation for new construction lighting projects, or provide deemed hours of operation for various business types.*

Response to Program Recommendation 4: Pending. Existing NCP protocol is to require LPD space-by-space calculations for custom and whole building projects. Existing PQ lighting analysis includes Tech Market Manual protocols for determining energy savings.

--TAs currently work with customers to customize hours of operation for each project, based upon predicted building usage. For PQ projects, Tech Manual hours of operation are used.

Program Recommendation 5: *Develop a clear VFD analysis protocol that includes a conservative estimate of the losses associated with VFDs. Losses of approximately 3% for VFDs are typically used in energy efficiency analysis.* Variable frequency drive (VFD) losses were underestimated in some analyses.

Response to Program Recommendation 5: Pending. The current custom measure tool requires the TA to input data from the VFD specification sheet, including losses. The upcoming revisions to the prequalified (PQ) equipment program and the current PQ calculators are based on the Tech Manual, which includes standard unit kWh and kW savings taken from NEEP data forwarded by National Grid (Chan, T. *Formulation of a Prescriptive Incentive for the VFD and Motors and VFD Impact Tables at NSTAR*. June 2010). NCP will confirm that losses are addressed in the Tech Manual information, and are being recorded by the TAs from the VFD spec sheets.

Program Recommendation 6: *Ensure that heat recovery ventilation analyses include the electric energy penalties associated with these systems and that they quantify the fossil fuel savings.* Heat recovery ventilation analyses did not always include the fan static pressure penalties associated with these systems and did not consistently report the significant fossil fuel savings that result from heat recovery ventilation systems.

Response to Program Recommendation 6: Implemented. Current heat recovery ventilation analyses include the penalties in accordance with current requirements. A program advisory addressed the issue and analysis tools were modified to include the penalties.

Program Recommendation 7: *Account for all energy impacts of measures in customer analysis and in the NYSERDA database including fossil fuels.* In many projects with significant fossil fuel impacts, including fuel switching, fossil fuel impacts were not accounted for in the program database and in some cases they were not accounted for in the TA analysis.

Response to Program Recommendation 7: Implemented. TAs have been instructed to include fossil fuel impacts in energy analyses. Outreach Project Consultants (OPCs) have been directed to ensure that fossil fuel impacts are included in the TA reports and are entered in the NCP database.

Program Recommendation 8: *Ensure that prescriptive VFD measures are not allowed for new construction projects due to advances in building code.* Current energy codes require the use of variable frequency drives (VFDs) on most mechanical systems and the application of VFDs is very common in new construction. While retrofits of drives on existing buildings is still a viable measure, variable speed drive measures should not be expected to result in significant savings for new construction applications going forward.

Response to Program Recommendation 8: Pending. NCP will modify program guidelines to delete VFDs from the PQ incentive list.

Program Recommendation 9: *As lighting technologies advance, ensure program incentives are leading customers to the most efficient options. Eliminate prescriptive rebates for high and low bay HID fixtures in the NCP.* A few projects in the sample included high bay high intensity discharge (HID) lighting. Since fluorescent high bay fixtures are readily available on the market and are more efficient, provide better lighting quality and more control options than HID products, guiding customers to these fixtures is likely to yield longer term savings and increased customer satisfaction.

Response to Program Recommendation 9: Implemented. In the current PQ program, and the upcoming PQ program update, prescriptive rebates for HID fixtures have been eliminated.

Program Recommendation 10: *Adopt a standardized quality assurance protocol and review process for TA models and custom analyses. Consider adopting ASHRAE 90.1 chapter 11 tables for baseline determination.* Various issues were found with TA models and analyses. Developing a quality assurance protocol for these models and regular review process would likely increase the accuracy of the analyses.

Response to Program Recommendation 10: Implemented. OPCs have developed a high level checklist which is being used as part of the OPC report review process. NCP contracted with an expert modeling consultant, to develop modeling simulation guidelines for use by TA firms. The guidelines are expected to improve modeling accuracy and bring consistency to the modeling process. The guidelines have been distributed to staff and consultants, and training is proceeding throughout the State. Initial feedback has been very favorable.

NCP has solicited proposals for a new round of OPC contracts. The OPC firms provide outreach, field liaison with customers, review of TA reports including modeling results, and inspection of completed energy efficiency measures. The RFP for the new OPCs includes a requirement for the OPC firm(s) to have an experienced energy modeler on staff to support the OPC reviews of TA modeling information.

ASHRAE 90.1 is currently used as the NCP baseline for modeling, including chapter 11 tables.

Program Recommendation 11: *Modify the project analysis requirements so that both the customer peak and the NYISO peak demand impacts are quantified.* Summer peak kW savings recorded in the program database most often reflected customer peak savings whereas evaluators calculated the average

kW reduction over the summer performance hours of 12 p.m. to 6 p.m. weekdays, non-holiday, June - August. Consequently, the variation in the RR for the summer peak kW savings was high.

Response to Program Recommendation 11: Pending. NCP will work with OPCs, TAs and Coordinators to include the NYISO peak in the TA calculations and NCP will establish a field in the Buildings Portal database to capture the NYISO peak for reporting purposes. Customer kW reduction incentives will continue to be based upon customer peak demand.

Program Recommendation 12: *Ensure that working model files are retained by the program and are accessible for evaluations.* Obtaining the modeling files for the original TA analyses was difficult and time-consuming. NYSERDA program staff was instrumental in collecting these files for the evaluators. It is the evaluators' understanding that the NCP now obtains copies of the TA model files at the time the TA report is finalized.

Response to Program Recommendation 12: Implemented. NCP currently requires the TA to submit the modeling files with the final TA report.

Program Recommendation 13: *Obtain utility release forms that have a duration extending at least two calendar years beyond the year in which the incentive is provided. Determine whether there is a mechanism to transfer the release at the time of ownership transfer.* Utility releases were required to request billing data from the utilities, and the process of obtaining the waivers and the billing data was onerous. It is the understanding of the Impact Evaluation Team that the NCP now obtains utility release forms for NCP projects. However, the duration and transferability of the releases may require review.

Response to Program Recommendation 13: Implemented. A utility data release form is included in the documentation to be signed by the Customer prior to release of the incentive payment. The duration of the release authorization is three years. The release is specific to the NYSERDA customer and is not transferable. NCP does not propose to require transferability to an unknown future entity.

Program Recommendation 14: *It appears that some redesign of the data entry form to include required inputs and error checking could reduce VFD data errors without increasing the burden of the program staff.* Several issues were found with data reporting in the program database, such as the incorrect entry of inputs on VFD measures. When data entry errors are repeated over time, it is likely to reflect an issue with the entry tool rather than with the individuals entering the data.

Response to Program Recommendation 14: Implemented. Staff have been instructed to enter key data for all measures in the Buildings Portal database. NCP established the role of Coordinator manager. The Coordinator manager works with the Coordinator team to streamline processes and coordinate workflow. The Coordinator manager provides guidance to the Coordinator team to confirm that the data has been entered correctly.

Program Recommendation 15: *Verify that the database is updated to reflect post-installation inspections using a well-defined and detailed quality control protocol.* In several cases the project files reflected changes in the installed measures that were not reflected in the program database.

Response to Program Recommendation 15: Implemented. There is an established procedure for documenting savings changes between the offer letter stage and construction completion:

- Upon approval of the Technical Assistant's report, just prior to the offer letter, the Outreach Project Consultants (OPCs) enter measure level savings in the Buildings Portal measures tab under the headings for Offered Savings.
- Upon completion of construction the OPCs enter the installed savings in the Installed Savings columns.
- NCP will direct OPCs to provide additional oversight to ensure the offered and installed savings are consistently entered in the database.

Program Recommendation 16: *Revise the TA study savings report format to include fossil fuel type and report fossil fuel savings in MMBtu to align with NYSEDA database requirements. Verify that the fields currently used for gas and fossil fuel savings in the database are all needed, add identification of fuel type other than natural gas in the database, and improve the data entry fields for fossil fuel to minimize reporting errors.* Fossil fuel impacts were not consistently entered in the database nor checked for accuracy. Persistent database entry errors likely require modifications to the database and/or project report formats rather than training of program staff responsible for data entry. Addressing the issue at this level to increase accuracy will be more effective over the long term.

- *Increase quality assurance of data entry of fossil fuel claims, particularly where large savings are being claimed.*

Response to Program Recommendation 16: Implemented. Staff have been instructed to enter key data for all measures in the Buildings Portal database. NCP established the role of Coordinator manager. The Coordinator manager works with the Coordinator team to streamline processes and coordinate workflow. The Coordinator manager provides guidance to the Coordinator team to confirm that the data has been entered correctly.

As for the quality assurance of fossil fuel claims data entry, there is an established procedure for documenting savings changes between the offer letter stage and construction completion:

- Upon approval of the Technical Assistant's report, just prior to the offer letter, the Outreach Project Consultants (OPCs) enter measure level savings in the Buildings Portal measures tab under the headings for Offered Savings.
- Upon completion of construction the OPCs enter the installed savings in the Installed Savings columns.
- NCP will direct OPCs to provide additional oversight to ensure the offered and installed savings are consistently entered in the database.

Program Recommendation 17: *Work with TA and OPCs to continue to identify improvements to program delivery strategies and structures that will encourage early engagement in projects and support identification and adoption of comprehensive energy efficiency upgrades.* Over the course of performing the impact evaluation, the review engineers identified energy efficiency opportunities that were not included in the TA analysis or other program documents. Areas such as comprehensive lighting efficiency were not typically addressed in the projects reviewed in this evaluation. The NCP can provide design teams with options to go beyond "typical" efficiency measures. Lost opportunities in new construction result in increased energy use over the life of the building for some measures.

- *Continue education and outreach to market actors.*

Response to Program Recommendation 17: Implemented. Prior to the evaluation NCP was aware of the need to engage customers earlier in the design process. The recent NCP process evaluation results also described customer concerns with process timing. Some factors are within NCP's control (internal processing) while others are controlled by the customer (application timing, return of the signed Promise to Pay letter). Based upon NCP's direct experience, and the recommendations in the process evaluation, NCP has taken several steps to accelerate and improve engagement with customers:

- Since mid-2010 outreach has been proactive rather than reactive. NCP marketers aggressively promote the Program, through large and small presentations and one to one meetings. Audiences include industry groups, architectural and engineering firms, real estate developers and lawyers, industrial development authorities, green building associations, local and state professional associations, lending institutions and other building industry stakeholders. The goal is to gain Program recognition, to learn about upcoming projects and to engage customers earlier in project design. As a result of this effort NCP activity is up strongly in 2011 as compared to 2010, as shown below:
 - Presentations – up 254%
 - Leads – up 167%
 - Applications – up 28%
 - Gross Square Footage – up 33%

- Working with NYSERDA Contracts and Legal Departments, and the NYSERDA team which processes the new statewide Consolidated Funding Application (CFA), NCP has instituted several process improvements to allow OPCs and TAs to engage customers earlier and to complete the TA reports in a more timely manner:
 - o OPCs provide customer assistance in completing the CFA. Since the OPCs are very familiar with the CFA questions the application time has been reduced from approximately an hour and a half to about 20 minutes. CFAs are forwarded to the OPCs as soon as the CFA team receives them.
 - o For TA services, NYSERDA informs the TA consultants as each project is assigned that they are allowed to engage in services at their own risk while paperwork is being finalized among NYSERDA, the customer, and the TA. NCP also has created a mechanism called the Ongoing Task Work Order that allows immediate engagement by TA consultants for certain projects, such as fast-tracked design, when deemed appropriate by an NCP project manager. TA services are defined using a simplified template which is much easier for a TA to complete and for the OPC and Project Manager (PM) to review and approve. TA report development is largely automated and the report template has been greatly simplified, allowing faster report preparation, review and approval.

- The TA firms have received formal training in the NCP process and use of the templates. TAs obtain additional guidance and Program updates through monthly conference calls arranged by NCP.

- OPC Director conference calls with NCP senior project managers are conducted weekly, to discuss Program level issues and other matters of interest to the OPC firms.

Evaluation Recommendations

Evaluation Recommendation 1: *Accelerate the NCP evaluation cycle so that the evaluations are occurring within two years of project completion.*

Response to Evaluation Recommendation 1: Pending. Evaluation staff will consider this recommendation when updating plans for the next evaluation cycle.

Evaluation Recommendation 2: *The Impact Evaluation Team needs NYSERDA's support in enabling the evaluators to work with building management to obtain access to residential units and resident utility releases. This support will increase the effectiveness of the outreach effort, control evaluation costs, and reduce the elapsed time for obtaining this information.* The commercial new construction market includes an increasing share of multifamily buildings. A whole building approach involves treating both the residential and common areas of these buildings. Impact evaluation methods often rely on gaining access to equipment for metering and obtaining utility data, which is complicated in multifamily buildings.

Response to Evaluation Recommendation 2: Pending. Evaluation staff will consider this recommendation when updating plans for the next evaluation cycle.

Program Recommendation 3: *Complete a short study of Program changes in the NCP over the past five years and the potential of those changes to affect the project RRs over time. This study should integrate the findings of this evaluation with the findings regarding Program delivery and design in the subsequent years.* The Impact Evaluation Team understands that the NCP has evolved substantially as reflected in many of the evaluated projects. In order to determine the next steps for the Program, it is important to document the changes that have been instituted since 2008 and those currently in progress.

Response to Evaluation Recommendation 3: Pending. Evaluation staff will consider this recommendation when updating plans for the next evaluation cycle.

Evaluation Recommendation 4: *Investigate and develop more reliable methods for the estimation of participant OSO. Surveys used to gather data for SO estimation need to include SO-respondent quotas wherever possible. Additional validity checks and follow-up verification studies are needed, particularly for factors that act as multipliers within the calculation formulas.*

- *Significantly more resources will be needed to conduct this level of research into SO.*

Response to Evaluation Recommendation 4: Pending. Evaluation staff will consider this recommendation when updating plans for the next evaluation cycle.

Evaluation Recommendation 5: *Consider conducting a market effects study for the NCP and NYSERDA's overall impact on the commercial, industrial and institutional new constructions markets in New York. The market effects methods need to attempt to include NCP impacts on market structure and operation that may not be directly identifiable by most market participants but influences the operation of the market since NCP interventions. If spillover estimation still occurs or is used, future evaluations must ensure that there is not a double-counting or overestimation between market effects and SO.*

- *Significantly more resources will be needed to conduct an evaluation that provides reliable and rigorous estimates of market effects.*

Response to Evaluation Recommendation 5: Pending. Evaluation staff will consider this recommendation when updating plans for the next evaluation cycle.

Other Recommendations

- **Other Recommendation:** The recent New York Energy Code Compliance Study⁵ suggests that the state establish a new construction database in which all permit applications would be logged. Such a database would be an excellent resource for future new construction evaluations. Obtaining clean non-participant population data for this evaluation was extremely onerous.
- **Response to Other Recommendation:** Pending. NYSERDA will monitor this.

⁵ *New York Energy Code Compliance Study* (Vermont Energy Investment Corporation, January 2012)

NYSERDA Existing Facilities Program: Market Characterization and Assessment Summary

Evaluation conducted by: Navigant Consulting, Inc. Market Characterization and Assessment
Evaluation Team, Navigant Consulting, Lead Investigators, June 2012

Program Summary

NYSERDA's Existing Facilities Program (EFP) is designed to help build market infrastructure for and increase investment in electrical and gas energy efficiency, peak demand reduction, and demand response projects. The Program provides technical and financial support (through prequalified and performance-based incentives) that reduces risk to end users and offsets a portion of the upfront costs associated with installation of new technologies and equipment. EFP targets various sectors of energy end-use customers, including commercial and industrial (C&I) businesses, health care facilities, colleges and universities, state and local governments, schools, hospitality/hotels, data centers, communications facilities and commercial real estate and retail businesses.

Evaluation Objective and High Level Findings

In 2011, Navigant Consulting conducted a market characterization and assessment (MCA) evaluation on the Existing Facilities Program.⁶ The EFP MCA evaluation sought to review Program activity to-date, validate Program assumptions regarding market characteristics, provide additional details regarding market structure and opportunities, and ensure consistency with NYSERDA's prior Program evaluation activities. NYSERDA program staff and managers can use the evaluation results to adjust Program implementation as needed to ensure maximum market interest and uptake of Program offerings.

⁶ The final EFP MCA Evaluation Report is available at: [Existing Facilities Program MCA Report](#)

Based on discussions with program staff, this study focused only on electrical efficiency projects that would be eligible for or previously received performance-based incentives.⁷ These projects provide higher overall and per-project energy savings than those from prequalified measures. The study also focused on three end-user priority market sectors that have delivered large shares of performance-based electricity savings to date: 1) institutions such as health care facilities and colleges and universities; 2) offices (sub-segmented into owner-occupied offices and office property managers); and 3) large retail chain stores.

The MCA study results indicate that most performance-based projects implemented by priority-sector end users involved a single energy-use system and that the majority of performance-based savings have come from lighting and lighting controls projects. Looking forward, non-participants cited both lighting and HVAC improvements as holding considerable energy savings potential for their facilities. A majority of participating end users in two sectors (institutional and owner-occupied offices) report that too few quality firms exist in the service provider market.

Evaluation Recommendations and Program Administrator Response⁸

The following recommendations were made by the evaluators conducting this study. NYSERDA's initial response to these recommendations is also summarized below and will be tracked over time:

Program Recommendation 1: *Seek to increase the number of quality firms engaging end users in performance-based EFP projects.* In so doing, the Program can drive additional competition among firms working on performance-based projects, potentially leading to higher project volumes, lower costs to end users, or new competitive offerings from service providers (e.g., new approaches to project financing).

Response to Program Recommendation 1: NYSERDA's 2013 marketing plans will include a targeted effort directed to participating and non-participating service providers to increase participation among end user customers. Program staff has developed a prioritized list of ESCOs and an ESCO relations role has been developed. Staff has begun the process of meeting regularly with priority ESCO participants to discuss how to increase Performance-based work between EFP and the ESCO and how EFP's Program design and procedures can be optimized.

⁷ The study specifically excluded: 1) gas efficiency projects; 2) peak load reduction (e.g., demand response load curtailment and energy storage); and 3) industrial and manufacturing facility projects. These exclusions were agreed upon in consultation with NYSERDA evaluation and program staff in August 2010.

⁸ The MCA team included additional sector-specific end-user recommendations that can be found in the full MCA report.

Program Recommendation 2: *Convince new firms to learn about and undertake projects supported by performance-based incentives by marketing the Program's perceived benefits to service providers.* Specifically, Program participation is an indicator of a firm's advanced capabilities, commitment to maximizing energy savings, and overall higher-quality services. An anticipated increase in demand for high-quality energy efficiency services will create particular opportunities for firms with past performance-based project experience while attracting new firms to attempt performance-based projects.

Response to Program Recommendation 2: NYSERDA's 2013 marketing effort will reflect a research-based approach to identifying and highlighting relevant value messages that increase levels of engagement and interest in NYSERDA performance-based programs among service providers.

Among the prioritized list of ESCOs developed by program staff, some have participated in the Program in the past, but are currently not active within EFP and some have never participated. An effort has begun to engage these ESCOs and grow the service provider market.

Program Recommendation 3: *Adopt a targeted, two-fold approach to increasing performance-based energy savings.* 1) Seek organic growth opportunities by marketing additional performance-based projects to facility owners who have previously completed such projects (most of which involved only a single energy-use system). 2) Capture a portion of small-scale projects being planned by non-participants and convert them to larger, performance-based projects. This will enable EFP staff to capitalize on that portion of the market with at least some awareness of efficiency and has a willingness to pay for efficiency upgrades.

Response to Program Recommendation 3: The C&I integrated marketing program is designed to increase participation in NYSERDA's core Commercial & Industrial programs (including EFP) through a multi media, targeted approach among participating and prospect C&I audiences. For EFP specific efforts, promoting the performance-based opportunities are the priority. Project data has been mined to identify past participants who could benefit from a performance-based approach to energy savings. Marketing efforts are also underway to target specific verticals to increase Program participation in subsectors that demonstrate great potential in terms of energy savings through performance-based projects. In addition, Program staff has begun implementing a key accounts approach to the market, in order to develop long-term relationships with large customers, which will help identify potential project opportunities. EFP's goal is to integrate with customers' long-term planning for energy efficiency and bundle multi-year capital improvements.

As part of the key accounts approach, Program staff works with existing customers to identify additional potential project opportunities, focusing on system improvements. Program staff will continue to work with participants to ensure pre-qualified projects are converted into performance-based projects where possible.

Program Recommendation 4: *Raise awareness of EFP's potential role in implementing opportunities identified through PlanNYC benchmarking efforts.* Encourage end users to implement larger, performance-based projects that they would not otherwise pursue without NYSERDA's independent review or validation of project designs. In addition, continue to market the performance-based component's contributions to addressing the persistent cost and financial barriers facing end users.

Specifically, increase the focus on the value of measurement and verification (M&V) in enhancing the quality and lowering the performance risk of large, whole-system or whole-building efficiency improvement projects.

Response to Program Recommendation 4: As a core program element and a key value message identified through customer and prospect end user research, M&V is reinforced throughout the marketing program and incorporated into the overarching integrated campaign platform. The existing platform positions NYSERDA as the knowledgeable partner who helps customers achieve “measurable results” for their energy efficiency measures.

A component of the key accounts approach is the identification of additional project opportunities and expansion of project scope through enhanced interactions with large customers. Program staff and contractors often emphasize the benefits of M&V to customers. EFP has done a significant amount of M&V over the past 10 to 15 years. EFP’s experience helps implement M&V cost-effectively, improves Program and project results and helps ensure that customer returns on investment are achieved.

Program Recommendation 5: *Market the success of past performance-based projects, as well as the improvements downstate facilities are undertaking to comply with PlaNYC requirements, to upstate end-users as evidence of performance-based projects’ contribution to deeper energy and cost savings.*

Response to Program Recommendation 5: The integrated marketing plan delivers a variety of messages to past and potential customers that not only educate them about NYSERDA’s services but reinforce NYSERDA’s credibility and expertise through the dissemination of customer-specific project case studies. Customized case studies are promoted by region and vertical industry sector to optimize audience relevance. Executed in video and downloadable written formats, case studies are distributed statewide through events and via the online advertising and targeted email efforts to help accelerate the participation decision making process.

Detailed Market Characterization and Assessment Findings

Selected Market Characterization Findings

Selected findings from the market characterization effort include the following:⁹

- The total area of C&I buildings in NYSERDA’s target market is approximately 2.8 billion square feet, according to the McGraw-Hill Construction Building Stock data. More than half of that area (53%) lies in the upstate region, while the remaining 47 % is located downstate.¹⁰ In terms of priority sectors, the office sector represents about 24% of the total area of eligible C&I buildings,

⁹ Unless otherwise noted, Nassau and Suffolk counties, which are located on Long Island, are not included in these analyses due to the fact that customer accounts located on Long Island receive power from the Long Island Power Authority (LIPA) which is not part of the SBC program.

¹⁰ The downstate region includes Bronx, Kings, New York, Queens, Richmond, and Westchester counties.

while schools and hospitals represent 15% and 7%, respectively. The majority of most sectors' building space lies in upstate New York; however, about 64% of the Office and Bank building area (430 million square feet) is located in the downstate region.¹¹

- Recent policy initiatives in New York City will likely increase awareness of and demand for energy efficiency. The Greener, Greater Buildings Plan (GGBP)¹² passed in 2009 by the New York City Council includes four laws that will require increased energy efficiency in large existing buildings. The plan requires benchmarking of city buildings greater than 10,000 square feet and other buildings greater than 50,000 square feet beginning in 2011.¹³ Implementation of the plan is a key focus of the City's PlaNYC 2030 initiative, which includes several other actions likely to contribute to increased demand for efficiency-related services in the downstate region.¹⁴
- Lighting and lighting controls have produced the majority of performance-based program savings (57%), with controls and VFDs (21%) and cooling measures (16%) also representing large shares. Motors accounted for 5%. However, lighting and lighting controls measures represent a lower amount of per-project savings compared to each of the other equipment categories.¹⁵
- While lighting measures have contributed the greatest share of performance-based savings to date, improving federal lighting standards will likely decrease the amount of energy savings the Program can claim from lighting measures as baseline and measure lifetime assumptions change.
- In the majority of cases, individual projects involve only a single facility site and energy system (e.g., lighting). In a handful of cases, applicants undertook simultaneous performance-based upgrades of multiple sites or systems (e.g., lighting and cooling). Notably, large retail chain stores show high potential for a facility portfolio approach to performance-based savings projects; 18 individual companies implemented performance-based EFP projects at 190 store locations.

Selected Market Assessment Findings

Selected findings from the market assessment effort include the following:

- Institutional projects reveal a more diverse distribution of performance-based energy savings across measure categories than other priority market sectors. About half of non-participants have upgraded lighting systems in the past three years, and fewer organizations plan to implement lighting projects in the next two to three years than projects involving HVAC, motors or building management systems (BMS). This finding suggests that institutions may generally be moving past lighting retrofits to energy efficiency upgrades with more energy-intensive systems.
- In the office sector, lighting and lighting controls upgrades comprise 70% of performance-based savings; the remainder is split between controls and VFDs (21%) and cooling (8%). Among

¹¹ McGraw-Hill Construction Building Stock Square Feet, 2008.

¹² PlaNYC 2030. http://nytelecom.vo.llnwd.net/o15/agencies/planyc2030/pdf/planyc_2011_energy.pdf

¹³ Specific benchmarking requirements can be found in Local Law No. 84 Article 309, accessed October 4, 2011, http://www.nyc.gov/html/planyc2030/downloads/pdf/1184of2009_benchmarking.pdf.

¹⁴ PlaNYC 2030. http://nytelecom.vo.llnwd.net/o15/agencies/planyc2030/pdf/planyc_2011_energy.pdf

¹⁵ S. Mufson. "New Lighting Standards Announced," *Washington Post*, June 30, 2009. Accessed March 9, 2010 at: <http://www.washingtonpost.com/wp-dyn/content/article/2009/06/29/AR2009062904273.html>.

owner occupants, however, only 30% have upgraded lighting systems in the past three years, with fewer having upgraded HVAC systems. While most property managers have made some recent lighting and HVAC upgrades, survey responses suggest that additional opportunities exist, particularly among owner occupants.

- In the large retail chain store sector, approximately 96% of the performance-based savings arise from lighting and lighting controls projects. In addition, large chain retailers appear to rely less heavily on service providers to assist with the EFP application process. Both the literature and EFP database suggest that these organizations replicate a limited scope of rapid payback measures (e.g., lighting) across their building portfolios.
- Among service providers, new firms have entered the energy efficiency market in New York at a moderate rate over the past five years. Of those, the majority focus on electrical efficiency. In fact, most participant firms focus their activities solely on electrical efficiency, with only 30% serving both gas and electrical systems. Sixty-four percent of participant firms focus to some degree on lighting systems, with only 18% focusing on HVAC.
- While service providers generally feel that the economic recession has had limited effect on demand for energy efficiency improvements, end-users' budget limitations and payback requirements continue to present a significant barrier to efficiency projects. Notably, most service provider firms that participate in performance-based projects offer some type of project financing; however, only half reported using performance contracts.

Evaluation Methods and Sampling

The research approach used by the MCA Team to evaluate the EFP market included the following:

- Reviewing programmatic documentation and secondary data sources
- Conducting primary data collection via telephone surveys with the following market actor groups:
 - Participant and eligible non-participant end-use customers^{16,17} (69 and 97 total completes, respectively)
 - Participant and eligible non-participant energy efficiency service providers (39 and 116 total completes, respectively)¹⁸

The research approach was informed by the EFP Program logic model, completed in 2010.¹⁹ Key research findings generated by the evaluation are related to the outputs and outcomes anticipated by the program logic model.

¹⁶ Participant end users are those with completed projects that received performance-based incentives and that fall into one of the target sectors. Non-participants are those that are eligible for but have not yet applied for an EFP incentive (either performance based or prequalified).

¹⁷ Separate sector-level data was collected for institutions (23 part./50 non-part. completes), owner-occupied offices (24 part./36 non-part.), office property managers (17 part./11 non-part.), and large retail chain stores (5 part.). Response rates from the large retail chain store sector were too low for statistical analysis.

¹⁸ Participant service providers were those listed as applicants for projects that received performance-based incentives. Non-participants are those with SIC codes identical to those for Participating Service Providers, but that are not associated with an EFP incentive application (either performance-based or prequalified).

NYSERDA Agricultural Energy Efficiency Program (ADP): Process Evaluation Summary

Prepared by: Research Into Action Process Evaluation Team

Research Into Action, Lead Investigators, October 2012

Program Summary

NYSERDA began operating the ADP in October 2011 after Hurricane Irene and Tropical Storm Lee did tremendous damage to New York's farms in August and September 2011. The goal of ADP is to provide emergency assistance for storm-damaged farms to incorporate energy-efficient electric and natural gas equipment, measures, systems and improvements into replacements and repairs.

Evaluation Objective and High Level Findings

Evaluation objectives included: 1) Assessing effectiveness of program process including outreach and marketing, technical assistance, project review, and program implementation; 2) Assessing the ability of the program to meet the identified need of affected farms including whether there are additional unmet needs, and the role of the program in these customers' future productivity in New York State; and 3) Identifying lessons learned that can facilitate deployment of similar services in future disasters.

The followings are key conclusions from the process evaluation research:

- The ADP's program process was working well, and program staff members were respected for their technical competence and their helpfulness to farmers. The ADP provided highly critical assistance to storm-damaged farms, and it is evident that this assistance seized energy-saving opportunities that many affected farmers otherwise might not have realized. Despite well-intended outreach efforts, more than a quarter of nonparticipant farms were unaware of the ADP. In addition, many participant farms are not fully recovered and some damage remains unrepaired, though what they reported as damaged does not appear to be within the purview of the ADP.
- The most significant challenge the Program experienced was marketing and outreach. The primary problem was a lack of a comprehensive list of damaged farms in the affected counties. In

¹⁹ The EFP Program Logic Model can be found here: [NYSERDA Evaluation Contractor Reports](#)

addition, the timing of program approval delayed rollout which limited the ability to leverage existing agricultural support mechanisms to conduct damage assessment and broadcast program information effectively. The Program also could not mobilize equipment dealers effectively to promote the program.

- Times of disaster by nature are confusing and challenging. Disaster recovery assistance offered by numerous organizations to affected farms had different qualifications and application requirements. In addition, two utilities offered programs that were very similar to the ADP in overlapping geographical areas. These clearly contributed to market confusion among affected farmers.

Recommendations and Program Administrator Response

The following recommendations were made by the evaluators conducting this study; Program staff initial response to these recommendations is also summarized below and will be tracked over time.

Recommendation 1: *Continue offering the ADP assistance as a part of ongoing Agricultural Energy Efficiency Program until all of the funding is expended.*

Response to Recommendation 1: Rejected. NYSERDA received applications representing over 100% of available funding. NYSERDA coordinated with the New York State Electric and Gas (NYSEG) and National Grid utility programs (see Recommendation 6) to optimize the use of disaster recovery funding and those applications that were eligible for utility programs were handed off accordingly. In addition, for some projects, exact costs were not known until after the Program closed. In the end, 94% of the available ADP funds have been contracted. Funding for the ADP was specific for recovery efforts and, given the amount of remaining funds, it would not be prudent to re-open the Program.

Recommendation 2: *Involvement in ongoing state and local emergency management operations will be important to ensure NYSERDA is connected to these networks. Consider supporting opportunities to coordinate data needs and assessment tools to facilitate system integration and information sharing.*

Response to Recommendation 2: Implemented. NYSERDA is responsible for developing and maintaining the *New York State Energy Emergency Plan*. NYSERDA's President is a statutory member of the State Disaster Preparedness Commission and NYSERDA staffs the Energy Desk at the State Emergency Operations Center during emergency events. Additionally for the ADP effort, NYSERDA utilized its network of agriculture stakeholders to coordinate information sharing: NYS Department of Ag & Markets and United States Department of Agriculture (USDA) – Farm Service Agency, NYSPSC, National Grid and NYSEG offered associated agriculture disaster recovery programs and coordination with those entities occurred. NYSERDA will work with emergency management operations as appropriate in future emergency assistance program offers.

Recommendation 3: *Leverage equipment dealers' market network to more effectively and quickly promote the Program. Maintain a comprehensive list of equipment dealers that serve New York agricultural customers by both equipment type and county.*

Response to Recommendation 3: Implemented. NYSERDA maintains a list of vendors/dealers that service the agriculture sector and provided them with program information as it became available. This list is not broken down by equipment type or county. With limited resources, NYSERDA needs to prioritize efforts to promote the Program. The activities discussed in recommendations 2 and 4 in this document have proven even more effective. Engaging mid-market actors to assist in promotion of a future emergency assistance program offer will occur as appropriate.

Recommendation 4: *Direct outreach was important in the ADP as it will be in future emergency programs.* Providing direct, face-to-face outreach is important to clarify any confusion affected farmers may have and to engage potential participants, especially under disaster circumstances.

Response to Recommendation 4: Pending. Direct outreach is part of any NYSERDA program. This recommendation will be filed for reference for any future emergency assistance programs.

Recommendation 5: *Work with state and local emergency management operations to ensure NYSERDA programs are included in any comprehensive list of disaster assistance information that includes program contact, program eligibility, and assistance areas for future emergency programs.*

Response to Recommendation 5: Implemented. NYSERDA is responsible for developing and maintaining the *New York State Energy Emergency Plan*. NYSERDA's President is a statutory member of the State Disaster Preparedness Commission and NYSERDA staffs the Energy Desk at the State Emergency Operations Center during emergency events. Additionally for the ADP effort, NYSERDA utilized its network of agriculture stakeholders to coordinate information sharing: NYS Department of Ag & Markets and USDA – Farm Service Agency, NYSPSC, National Grid and NYSEG offered associated agriculture disaster recovery programs and coordination with those entities occurred. NYSERDA will work with emergency management operations as appropriate in future emergency assistance program offers.

Recommendation 6: *Investigate ways to integrate a NYSERDA disaster recovery program into other emergency services to facilitate a one-stop-shop experience for farmers.*

Response to Recommendation 6: Implemented. Integration and coordination of emergency assistance can occur as soon as entities are authorized to offer services. NYSERDA coordinated planning with similar programs offered by NYSEG and National Grid and complementary programs from NYS Department of Ag & Markets and USDA – Farm Service Agency occurred. As soon as NYSERDA was authorized to deliver the one-time ADP, NYSERDA coordinated execution with those organizations. Applications to the NYSERDA, National Grid, and NYSEG programs were triaged to assist farms in finding the best fit program and optimize administration and use of available ratepayer funds. Similar coordination efforts will be executed for future emergency assistance programs as appropriate.

Detailed Process Evaluation Findings

Outreach and Market Responses

NYSERDA and its implementation contractor (EnSave) for the ADP led program outreach activities working with agricultural agencies, along with direct outreach to farmers and equipment dealers, and other marketing channels. Interview contacts unanimously reported that reaching out to damaged farms was a challenge. All of these organizations shared the common problem of the lack of a comprehensive list of damaged farms in the affected counties, as there is no central warehouse of storm-damage data. The NYSERDA ADP implementation contractor did report that the list compiled by the New York Soil and Water Conservation District for its Agricultural and Community Recovery Fund Program helped them identify potential participant farms for the NYSERDA ADP.

Most interview respondents said that they expected a greater level of qualifying damage than what actually applied to the ADP. Only 13% of the nonparticipant farmers surveyed for this evaluation reported damage that qualified for participation. Interview contacts speculated that the reasons for the lower than expected participation rate were a misunderstanding of the program and qualification requirements, the agricultural sector's cyclical nature, and the later than ideal program launch.

Program Awareness

Among nonparticipant farms in the qualified counties, 68% were aware of the ADP. Fewer than half of the equipment dealers that service electric or natural gas equipment for New York agricultural customers were aware of ADP. Among those dealers that were aware of ADP, 19% reported they reached out to prospective customers to sell equipment by taking advantage of ADP.

Farm Profiles

NYSERDA's project tracking system recorded 67 unique participant farms. Among them, most were customers of National Grid and Orange & Rockland. Among the nonparticipant farms, the largest percentage said that New York State Electric and Gas Company was their electric utility.

The most common farm type for participants was a "business started after 1950" with "medium field size" (100-500 acres). Among participant farms, more than half reported that they grow row crops (the most common mention), followed by dairy. Dairy was the most common product type among nonparticipant

farms. Most likely, due to different type of farming (row crops), the participant farms reported theirs as irrigated farms more often than nonparticipant farms.

Program Process

Satisfaction with all program areas among the participant farms was very high. Applicants said that, once they enrolled in the Program, the Program process worked smoothly. Although many applicants sought assistance from the implementer with various aspects of the Program, most participant farms reported that application materials were easy to understand, and a majority of them reported they received sufficient help to complete their applications. A majority of participants also thought the parties involved in the program and disaster assistance coordinated and worked well together.

Program Influences

An overwhelming number of participating farmers reported that the ADP provided crucial support to help them recover from the impacts of the storm(s). Notably, half of these respondents said they would have had to reduce the size of their operation or would have gone out of business without the ADP assistance. A majority of these participants also said that, without the ADP, they only would have repaired the damaged equipment (53%), not replaced nor repaired (19%) it, or replaced it with a standard efficiency model (6%). Half of the participants also reported non-energy benefits from the new equipment, such as improved equipment and product quality, which increased productivity.

More than half of the participating equipment dealers reported that the ADP had positive economic impacts on their businesses.

Recovery Status

Despite the ADP support they received, at the time of this report, a majority of participant farms (73%) had not fully recovered from the storm damages. Nearly one-fifth of the surveyed participant farms (18%) reported their farms still were “mainly unrecovered” or “not at all recovered” from the storms. Almost half of these farmers reported they still have land and soil damage on their farms caused by the storms. About one-quarter reported structural and/or equipment damages. Seventeen percent reported they still had not recovered from crop-related damages. Likely none of these remaining damages are within the purview of the ADP.

Suggestions for Future Emergency Programs

An important suggestion, provided by many interview respondents was to improve damage assessment and outreach activities by using the existing agricultural community support mechanisms. In particular, they suggested that NYSERDA work with agricultural emergency response partners and local emergency committees on an ongoing basis to ensure that NYSERDA is better able to coordinate with other agencies' data requirements and data collection tool(s) to develop a comprehensive list of farms. As very few equipment dealers were involved in outreach efforts to their prospective customers, many of these dealers suggested that NYSERDA involve them in emergency program's outreach efforts earlier in the process to best meet their customer's needs in an emergency.

It is evident that farmers were confused about the numerous disaster recovery/relief funding sources that were available to them, and these programs' varying qualification and application requirements. Participating farmer contacts commented that it would be very helpful to have a comprehensive list of assistance programs that delineates contacts, eligibility requirements, and assistance areas. Many interview contacts also suggested having a unified program delivery mechanism, which would decrease market confusion and streamline the assessment process and administration.

During a disaster, recovering farmers need and expect assistance programs to operate quickly and efficiently, and process payments rapidly. To expedite the process, some farmers suggested that it would be better if the program would: 1) pay qualifying farmers before they buy replacement equipment, rather than reimbursing them for purchased equipment, and 2) conduct all inspection and verification activities after the equipment has been installed. Many dealers also requested faster payment to maintain their cash flow.

Evaluation Methods and Sampling

The evaluation team conducted interviews with all of the key personnel and entities, including: NYSERDA program staff and implementation contractor, as well as utility program administrators and various agricultural agencies active in the counties targeted by the Program. In addition, the evaluation team surveyed a sample of equipment dealers and installers that provide contractor services to agricultural customers, program participants, and farm owners who did not participate in the Program but reside in the affected counties. The sampling strategy is outlined in Table 1 below.

Table 1. Sampling Strategy

Audience Type	Population	Sample	Interview Mode	Interview Format	Confidence / Precision	Timing	Response rate
Program Staff	3	3	Phone	In-depth Interview	NA	March 2012	NA
Implementation Contractor Staff	1	1	Phone	In-depth Interview	NA	March 2012	NA
Agriculture Agency Contacts	7 agencies	5 agencies	Phone	In-depth Interview	NA	June-July 2012	NA
Other Utility Program Administrators	2 utilities	2 utilities	Phone	In-depth Interview	NA	June-July 2012	NA
Participants	67 farms	34 farms	Phone	Survey	90% / 10%	July 2012	64%
Nonparticipants	~177 farms	63 farms	Phone	Survey	90% / 10%	April 2012	41%
Dealers / Installers	~118 firms	45 firms	Phone	Survey	90% / 10%	July 2012	58%

NYSERDA Commercial/Industrial Natural Gas Market Characterization Project Summary

Evaluation conducted by: Navigant Consulting, Inc. Market Characterization and Assessment
Evaluation Team, October 2012

Project Context

In June 2008, the New York State Public Service Commission (PSC) established the State's Energy Efficiency Portfolio Standard (EEPS) and approved a subset of efficiency programs to commence immediately. A subsequent series of PSC Orders issued during the latter half of 2009 authorized NYSERDA to further expand and add to its efficiency program offerings. In addition to the electric System Benefits Charge (SBC), the PSC commenced collection of a natural gas SBC in order to allow NYSERDA and other program administrators to broaden or begin offering programs for gas efficiency measures.

To date, NYSERDA has had good success engaging the C&I market with its natural gas efficiency program offerings. Participation levels vary across program type, market sector, and geography and some NYSERDA staff perceive that customers may currently be more attracted to utility natural gas efficiency program offerings than NYSERDA offerings. In addition, NYSERDA staff indicates that they have limited knowledge regarding the key players in the C&I natural gas market including the large customers who may be eligible to participate in the NYSERDA programs. Thus, NYSERDA requested that the Market Characterization and Assessment (MCA) evaluation team conduct a C&I natural gas market characterization to generate information regarding these topics as well as broader market conditions to help inform the development of its natural gas efficiency program offerings for non-residential customers.

Evaluation Objectives and High Level Findings

This market characterization was designed to provide NYSERDA with information regarding 1) the macro drivers influencing the New York market for natural gas efficiency technologies, 2) the prevailing natural gas services supply chain within the State, and 3) a comparison of NYSERDA's custom and prescriptive natural gas efficiency offerings with those of the major utilities in New York. The final report presents a comprehensive view on the overall natural gas efficiency market in New York through market, supply chain, and utility perspectives; however, Navigant recognizes the following study limitations:

- The results of the study are based on internal expertise, secondary research, and interviews with equipment installers and utilities. The perspectives offered by equipment installers and utilities during the interviews were objectively summarized. Claims made by respondents should be taken as informative and not literal until further verification.
- By design, the study focused on the upstream component of the natural gas energy efficiency supply chain. End-users were not interviewed. Interviewing end-users could enrich the findings of the study; doing so however, was beyond the scope of this study.
- While the study captured the current state of utility programs at the time of the project, programs may have changed since then. In addition, some programs were already in transition at the time of the study (e.g., Con Edison's increase in incentives in June 2011).

Suggestions for Consideration and Program Administrator Response

NYSERDA's success in the large C&I segment is well recognized by its customers. Results from installer interviews reveal that large C&I customers are very satisfied with NYSEERDA's performance-based offerings. The findings of this study suggest that NYSEERDA should continue and expand its current efforts in the large C&I customer segment.

Customers drawn to pre-qualified incentives tend to have less capacity to devote time and effort towards the incentive application and any measurement and verification (M&V) processes associated with program participation. These customers gravitate towards utility prescriptive offerings due to a perceived lower time commitment. If NYSEERDA chooses to further engage customers favoring pre-qualified incentives, it may wish to consider the incentive selection factors identified in this study to help develop strategies which increase the visibility and attractiveness of NYSEERDA's offerings to this customer segment.

Navigant has summarized suggestions for consideration categorized for marketing programs, processes, and future research topics:

Marketing suggestions

1. **Continue and increase contractor outreach:** NYSEERDA hosts brown bag sessions to educate contractors on the incentive application process. These sessions as well as on-site visits are considered very beneficial and engaging by equipment installation firms of all sizes.
2. **Provide tangible marketing materials:** NYSEERDA should provide tangible marketing materials (e.g. program brochures) that help explain the programs to customers. This approach is effective for reaching small to mid-size customers.

3. **Direct marketing to energy intensive industries:** Chemical and metals industries are energy-intensive and are the largest industrial users of natural gas in New York. These industries might be an attractive market for NYSERDA who should use the Industrial and Process Efficiency (IPE) Program and other direct outreach channels to increase engagement from customers in this sector. This is an effective marketing approach to reach large industrial customers which are the target market for the IPE Program.

Program Process Suggestions:

1. **Increase understanding of factors driving customers' choice of programs:** Installers indicate that time commitment and incentive amounts are the main drivers for choosing an energy efficiency program. Most utilities have shorter pre-qualified incentive processes because they have centralized billing systems in place that directly reference customer account information during the application process. While the SBC determination causes longer processing time for NYSERDA incentives, customers are generally more drawn to programs requiring less paperwork and time commitment. However, time commitment from customers and program administrators is necessary for M&V activities which NYSERDA views as essential to developing long-term savings estimates and program quality control.
2. **Continue with performance-based incentives and explore options to modify pre-qualified incentives to further engage small to mid-size customers:** NYSERDA currently offers both performance-based and pre-qualified incentives. NYSERDA's performance-based incentives have been successful among large C&I customers. Small to mid-size customers choosing pre-qualified incentives tend to have less capacity to devote time and effort towards the incentive application and M&V processes. As such, some small to mid-size customers may gravitate towards choosing utility offerings due to a perceived lower time commitment. To further engage small to mid-size customers, NYSERDA could explore alternative pre-qualified incentive structures such as offering bonus incentives to pre-qualified customers after performance verification resulting from the M&V process. The eligibility of a bonus may motivate customers to participate in the M&V process and make customers more receptive to a longer participation process.

Future Research Topics:

This study was conceived as a high-level effort to provide NYSERDA with additional information regarding the market for natural gas incentive offerings in the C&I sector. Should NYSERDA perceive a need for more targeted information in this market, Navigant has identified the following items that may be of interest to NYSERDA evaluation planners and program staff.

- **End-user interviews:** The interviews conducted for this study focused on equipment installers and utility program staff. Future research focusing on end-users' experiences with NYSERDA programs could be conducted to enrich the study with more perspectives.
- **Program eligibility research:** NYSERDA may wish to research the existing large customer base to determine the percentage of customers who have interruptible gas service and are therefore

ineligible to participate in NYSERDA programs. Having information on customer program eligibility would help NYSERDA efficiently target potential customers.

- **Ratepayer cost research:** It is critical for program administrators to keep ratepayer cost as low as possible while delivering valuable program offerings. Much value can be derived by monitoring and comparing the cost of energy saved by each program administrator to pinpoint and improve the efficiency of program administration.
- **Impact of codes and standards on natural gas efficiency savings potential:** As described in this study, the Energy Conservation Construction Code of New York State 2010 (ECCCNYS) was only recently adopted. As such, the impact of codes and standards on savings potential has not been well studied. Understanding the impact of codes and standards is critical as it could have implications on program administrators' opportunities to achieve goals and targets.
- **Additional utility interviews:** Only a few utility contacts were available for comment in this study. Further study focusing on the perspective of utilities regarding their collaboration with NYSERDA would be valuable.
- **Online program comparison tool:** Survey respondents of all sizes indicated that a large source of confusion regarding programs stems from the lack of a centralized database or webpage for efficiency program research. This requires contractors and, to a lesser extent, customers to spend time and effort comparing existing program offerings and associated requirements across multiple sources. The DPS should consider conducting additional research to determine market interest in and the likely viability of an online program features and services comparison tool to help contractors and customers reduce time spent on program research. The suggested web tool is similar to the New Jersey Clean Energy Program website where information from various programs can be easily accessed on the same platform.²⁰ An additional example is the online energy efficiency program identification tool developed by unwaste.org.

Evaluation Methods and Sampling

The research approach used by the MCA Team to conduct the C&I natural gas market characterization included the following:

- Reviewing NYSERDA and utility programmatic documentation as well as other secondary data sources (e.g., U.S. Energy Information Administration, U.S. Census, U.S. Department of Energy)
- Conducting primary data collection via telephone interviews with NYSERDA program staff (n=3), utility program staff (n=3), and representatives from energy services companies and natural gas equipment installers (n=18)

²⁰ www.njcleanenergy.com/main/rebates-and-promotions.

NYSERDA New York Home ENERGY STAR[®] Homes Program: Impact Evaluation Summary

Evaluation Conducted by: Megdal & Associates, Impact Evaluation Team

Lead Investigator: Lori Megdal, Megdal & Associates, September 2012

Program Summary

The New York ENERGY STAR Homes Program was designed to transform the new home construction industry in the State of New York through the encouragement of building homes that use at least 20% less energy than homes built to simply meet the energy code. The Program is targeted toward the residential new construction market using enhanced EPA ENERGY STAR guidelines with builders as the primary participants. Each home receives an energy rating (HERS rating) performed by a Residential Energy Services Network (RESNET)-certified home energy rater (HERS rater). In addition to meeting the federal EPA guidelines, NYESH includes mechanical ventilation and must yield a minimum of 500 kilowatt-hours (kWh) electric saving annually via light fixtures, compact fluorescent lamps (CFLs), appliances and mechanical measures. The Program uses REM/Rate[™] software to ascertain if the overall efficiency of the home meets the program standard.

Evaluation Objective and Key Findings

The goal of this impact evaluation was to establish rigorous and defensible estimates of the energy and demand savings that can be attributed to the NYESH Program for program years 2007 and 2008.

A primary focus of this impact evaluation was to verify the inputs needed for modeling savings and comparing the as-built homes to an appropriate baseline. An equally important element of assessing impacts is to construct solid and defensible estimates of all impacts that are program-induced (rather than naturally-occurring). This assessment of net effects includes numerous potential sources of SO, including both participant and non-participant SO.

The evaluated net program savings were estimated using a pre- and post-energy consumption (billing) analysis; the final results including the net-to-gross factors are shown in Table 1 below. The NYESH Program saved 4,164,447 annual kWh of electricity and 160,183 annual MMBtu of non-electric (fossil)

fuels from projects completed during 2007 and 2008 program years. The net-to-gross factor calculations for this evaluation are presented in two ways: first, with all builders included and second, with the government housing participants removed. This approach was taken as the survey responses from the builder of the government housing had a large influence on the free rider rate (moving it from 56% to 64% at the program level). The final net evaluated savings are estimated with the higher free rider rate, as it reflects all program activity during program years 2007 and 2008.

Table 1. Net Program Savings

	Annual Electric Savings (kWh/Year)	Annual Non-Electric Savings (MMBtu/Year)
NYSERDA Program Reported Gross Savings	7,964,862	283,260
Realization Rate ¹	80%	87%
Evaluated Gross Savings ²	6,406,841	246,436
Net-to-Gross Factor (All Homes)	0.65	0.65
Evaluated Net Savings for PY 2007-2008	4,164,447	160,183
Net- to-Gross Factor (excluding government housing)	0.72	0.72

¹ The 90% confidence interval on realization rates for kWh and MMBtu savings are $\pm 1.3\%$ and $\pm 2.2\%$, respectively.

² The lower and upper 90% confidence limits for kWh Savings are 6,268,346 and 6,371,890, respectively, and the lower and upper 90% confidence limits for MMBtu savings are 243,037 and 249,269, respectively.

Detailed Findings: Realization Rate and Net-to-Gross

Realization Rate (RR): A RR of 1.0 indicates that the realized savings are exactly as estimated by the program. An RR less than 1.0 indicates lower achieved savings than originally estimated. The realization rates are 80% and 87% for the electric and natural gas and other fossil fuel savings, respectively.²¹ These results are based on all homes with sufficient and reliable utility billing records. Consequently, the 90% confidence intervals of plus/minus 1.3% and plus/minus 2.2% for the electricity and natural gas savings, respectively, reflect the variability within the models, not the sampling precision.

²¹ Ibid

Net-to-Gross (NTG): A NTG ratio greater than 1.0 indicates that the program spillover outweighs free ridership, and the program achieved more savings than were claimed based on direct activity.

The free ridership (FR) rate and SO rate are combined to produce a NTG ratio that is applied to evaluation-estimated gross savings to produce net savings.

$$\text{Net-to-Gross Ratio (NTGR)} = 1 - \text{Free ridership Factor} + \text{Participant Spillover Factor}$$

Table 2. Program Free Ridership and Spillover Estimates

Attribution Variable	Factor
Total Free ridership	0.64
Total spillover	0.27
Net-to-gross factor (equals 1-FR+SO)	0.65

Evaluation Methods and Sampling

The evaluation design was complex and required many steps, as described below:

- A telephone survey of participating homeowners was conducted to determine the as-built characteristics of the homes (140 homeowners), supplemented with an on-site survey of a small number of these homes (30) to verify the telephone responses.
- Baseline home characteristics were developed for comparison purposes.
- Utility billing records were obtained and cleaned to assess heating loads and overall consumption.
- Energy modeling and analysis using REM/Rate™ was conducted on a sample of participating homes (154).
- Net effects were estimated through enhanced self-reports relying primarily on telephone surveys of participating (70), formerly participating (18) and non-participating (58) builders.

The participation of one builder who exclusively constructs government housing and completed a large number of homes in the Program presented challenges for this evaluation. This participating builder was found to be working under substantially different conditions than the other participating builders.

Though the NTG approach was the same for all builders, this builder was assigned to a separate stratum to ensure that the NTG results from the government homes were applied only to these homes.

There were concerns expressed regarding this builder of government housing and how the NTG was developed. The proposed further research into this issue would have required a change to the evaluation design for this stratum only, and may have introduced bias to study. While evaluation plans can change in certain circumstances, the Impact Evaluation Team concluded that applying consistent methods across all builders as specified in the work plan was critical to developing robust and defensible results, and that changing the method in reaction to a specific respondent's answers is counter to standard evaluation practices.

NYESH has been working with builders since its inception in 2001, and one of the complicating factors in estimating NTG factors for longer running energy efficiency programs is that participating builders or contractors may have internalized the energy efficiency practices over time and no longer attribute the change in practices to the program although the program may have contributed to the initial decision to adopt efficient practices. The large builders also have the highest likelihood of having an internal validity issue from a testing effect, which occurs when respondents know what to expect, may know the consequences of their answers and answer according to these understandings rather than providing a true response. These factors could introduce a bias to the NTG factors, either upward or downward. To the extent possible, these issues should be considered in the design of future evaluations.

In addition, if the large scale participation of government housing builders continues in future program years, the Impact Evaluation Team recommends that implementation policies be tailored to target additional savings above what are achieved through compliance with the EPA ENERGY STAR Home guidelines. A separate implementation track could be developed for government housing which would utilize a different baseline for homes completed through this track.

Recommendations and Program Administrator Response

The results of this evaluation suggest that substantial changes have occurred in the residential new construction market and the Program may need to make some adjustments to respond to these changes. Recommendations are divided into program and evaluation issues.

Program Recommendation 1: *Establish program threshold requirements to account for changing energy codes; the Impact Evaluation Team understands that NYSERDA has already moved to ENERGY STAR v2.5 and 3.0 and added prescriptive requirements.*

Response to Program Recommendation 1: Implemented. Program has modified minimum Program thresholds in response to changes that have occurred in the NYEECC. Program staff expect to see, at least in the short-term, a decrease in the incremental savings per dwelling unit as a result of a higher minimum bar. As minimum energy code requirements have been raised, there are less low-cost-high savings measures available. Therefore, the Program must incorporate requirements into its design energy efficiency requirements that yield less savings per dollar invested (when compared to requirements previous Program requirements). Couple this with the EEPS cost-effectiveness requirement, which essentially limits how aggressively Program can pursue the next increment of energy savings, and maintaining a fixed percent savings over a set baseline, becomes much more difficult.

Program Recommendation 2: *Review the method used for estimating savings from heating, water heating, and cooling measures.* It appears that the current method does not correctly account for baselines that vary by climate zone and also understates heating savings while dramatically overstating water heating savings. An alternative approach used in other states is to develop a user-defined reference home (UDRH) reflecting baseline practices and estimate savings from the REM/Rate results.

Response to Program Recommendation 2: Implemented. Effective January 2012, the Program calculates savings based on the delta between a 2010 ECCCNY-compliant, climate zone-specific UDRH and a rated home, consistent with the recommendation. The Program implementation contractor has developed a new savings estimation methodology and savings are “trued up” upon receipt of the REM/Rate file for the subject home or unit. The algorithms which led to the overstating are no longer the basis for program reported savings.

Program Recommendation 3: *Consider the establishment of a separate development track for projects that are required to meet higher baseline standards.* Some developers may be working under mandates to build toward certain level of efficiency (e.g. EPA ENERGY STAR) to comply with federal directives or satisfy funding requirements set by certain lenders and/or government agencies (e.g. HUD, NY state-housing agencies). This separate track may utilize a baseline (UDRH) that is different than the UDRH used for more traditional projects. This track may also have different program incentive structure that encourages certain end uses or certain savings goals over the baseline for this track.

Response to Program Recommendation 3: Pending. The Program will consider this recommendation and will conduct a review of NYESH projects submitted to the Program that may meet a higher than code minimum threshold requirement.

Program Recommendation 4: *Consider whether changes need to be made to the process for installing screw-in CFLs as a program measure.* The responses to the homeowner telephone survey indicated that hardwired ENERGY STAR light fixtures installed during construction remained in place.²² However, over a third of the homeowners with reported program savings for screw-in CFLs stated that there were no screw-in CFL bulbs in the home when they moved in.²³ All of these respondents were the original

²² Most hardwired ENERGY STAR labeled light fixtures (not plug in lamps) require the use of a pin-based compact fluorescent light bulbs (CFL) so that the fixture cannot be outfitted with an incandescent light bulb which has a screw-base.

²³ Screw-in CFLs can be installed in any light fixture or lamp that accepts standard incandescent bulbs as long as it is compatible with the lighting control (i.e. dimmer switches).

owners of the new home. This may imply that the screw-in CFLs were removed prior to the homeowners' residency in the new homes.

Response to Program Recommendation 4: Pending. Program will continue to monitor compliance of the installation of CFLs through the program QA processes. Program staff emphasizes that the telephone survey of homeowners was fielded approximately 4 years after the move-in date and the ability of the homeowners to self report and recall move-in conditions may impact the results of this study.

Program Recommendation 5: *Establish one method of tracking and recording those deemed savings that overlap with energy-modeled savings (e.g. ECM motors, central air conditioning, refrigerators and lighting).* This can be addressed from within the developed UDRH.

Response to Program Recommendation 5: Implemented. For central air conditioning, the Program captures deemed savings in the CRIS database; any additional savings are derived from the REM/Rate file are clearly indicated. Lighting and other appliance-related savings are captured through measure counts and deemed savings, and tracked in CRIS database.

Program Recommendation 6: *Review all program databases to ensure the program data is obtained and maintained in a way that allows for accurate evaluations, including reliable contact information to the extent possible, ways to link builders with projects, former builders and contact information for all projects.* The Program should maintain a database of the REM/Rate results or develop a systematic procedure for obtaining these datasets easily or develop a procedure to obtain requested REM/Rate results and all related program data.

Response to Program Recommendation 6: Implemented. Program staff and implementation contractor continuously review, update or improve database capabilities and functionalities. An underlying capability the CRIS database is the ability to include accurate Program participant contact information and linking of participating builders to projects. The Program stores REM/Rate files for projects transmitted for payment after January 1, 2012, but it does not maintain a database of REM/Rate results. The Program maintains some contact information for formerly participating builders but does not actively update this information.

Evaluation Recommendation 1: *Conduct a baseline study to establish a defensible standard for establishing program savings.* The lack of an independent, comprehensive baseline study added substantial complexity to this evaluation.

Response to Evaluation Recommendation 1: NYSERDA, in collaboration with the New York Department of Public Service (DPS) and the Evaluation Advisory Group, is conducting a statewide residential baseline study across a broad range of customer segments and energy measures. It is anticipated that the results of this study will be available December 2013 and utilized to create defensible standards for establishing program savings in future impact evaluations.

Evaluation Recommendation 2: *Consider alternative strategies for estimating net and market effects.* The self-report approach used in this evaluation suggests that market transformation may already be well underway.

Response to Evaluation Recommendation 2: NYSERDA will consider alternative evaluation strategies for estimating net program and market effects by exploring techniques for measuring the impacts of programs that seek to transform markets for energy efficiency products and practices.

Evaluation Recommendation 3: *Improve methods for transferring required program data to evaluators.* For this evaluation, the Impact Evaluation Team experience difficulty with acquiring Program data, including obtaining contact information for formerly-participating contractors and having to download REM/Rate files for the telephone survey respondents individually from the implementer's website.

Response to Evaluation Recommendation 3: NYSERDA Evaluation and Program staffs are exploring alternative data collection and transfer capabilities that improve the quality of data available for program evaluation.

Evaluation Recommendation 4: *Consider excluding the estimation of homeowner SO in future impact evaluations, unless the homeowner surveys are conducted for other evaluation purposes.*

Response to Evaluation Recommendation 4: In future evaluations, NYSERDA will consider the need for telephone surveys to assess homeowner inside ISO. The survey used in this evaluation will be reviewed prior to the next evaluation to determine whether any changes in responses or questions are anticipated, and thus, warrants additional survey efforts.

Workforce Development Program: Market Characterization and Assessment Evaluation

Evaluation Conducted by: GDS Associates, Inc., Market Characterization and Assessment Team

GDS Associates, Inc., Lead Investigators, September 2012

Program Summary

The EEPS-funded Workforce Development (WFD) Program was developed to overcome barriers to workforce training, expand the State's existing energy efficiency training infrastructure, and to enhance training and career opportunities in energy efficiency (EE) related professions.²⁴ The Program targets workers with some EE work experience, as well as disadvantaged populations including the unemployed, underemployed, hard-to-serve, and under-served populations.²⁵ The objective is to provide the State's present and future workforce with technical skills to meet the employment needs of a growing energy efficiency industry, as well as the needs of programs funded through the broader EEPS efforts.

Evaluation Objective and High Level Findings

This report presents the results of the WFD Market Characterization and Assessment (MCA) evaluation.

The evaluation work was designed to achieve the following objectives:

- Describe and document the market structure as it relates to the program's targeted market actors, including employment groups from the energy efficiency (EE) industry and training organizations not participating in the WFD Program
- Provide baseline and background information required by NYSERDA to define and deliver the WFD Program to target markets

²⁴For the purposes of this report, the energy efficiency services industry was defined to include companies in the state that hire employees or contractors to perform jobs directly or indirectly related to energy efficient building construction, or the design, specification, delivery, installation, or servicing of electric energy using products or equipment within homes or businesses.

²⁵ 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; disadvantaged workers are individuals at least 17 years of age and fulfill one of the following two criterion: 1) 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. 2) The unemployed, underemployed (those working but in a job beneath their training/education level or for less than their desired number of hours), and those not receiving unemployment benefits and who are not counted in the labor statistics because they have decided to stop seeking employment.

- Provide data from market actors regarding hiring goals, training needs, and training/employment barriers
- Track changes in markets over time with a specific focus on market indicators that are likely to be affected by the WFD Program

The study concluded that while near-term growth in EE jobs is expected to be slow due to the recession, the number of such jobs is expected to increase in the long term based on a combination of increased demand, state and federal investment in related training programs, and an aging workforce whose imminent retirement will create more job openings at all skill levels. These trends should provide new opportunities to current skilled EE workers, as well as underserved and underemployed populations and increase demand for EE training. While EE-related jobs are expected to increase at all skill levels, the majority of available jobs will be in fields that require higher levels of technical expertise and certification.

While the evidence indicates that available work skills training (including those sponsored by NYSERDA) is meeting current EE workforce training needs, the evaluation identified a number of non-participating training centers that can step up to meet the need for additional training capacity, should such a need arise. While the existing training infrastructure appears to be sufficient to provide the levels of training and certification support necessary to meet current demands of the EE workforce it also shows the potential to expand to meet increasing training needs as greater numbers of people enter the EE workforce.

Evaluation Recommendations and Program Administrator Response

Program Recommendation 1: *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. Since evidence indicates greater need for growth in these positions in construction trades, focus on enhancing training opportunities that lead to jobs in construction to support the demand for workers in this industry; specifically, unions, vocational and technical schools.

Response to Program Recommendation 1: Rejected. NYSERDA program staff agree with this recommendation in general. However, they do not currently have the funds for employer outreach and awareness activities. As part of their contracts, they rely on training partners to conduct outreach and to partner with employers where practical for job placement and recruitment activities and NYSDOL for employer outreach, etc.

Program Recommendation 2: *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.

Response to Program Recommendation 2: Rejected. NYSERDA agrees with this idea but is not in a position to implement it. See explanation in response to the recommendation above.

Program Recommendation 3: *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).*

Response to Program Recommendation 3: Implemented. NYSERDA does this now with the exception of office support.

Program Recommendation 4: *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.

Response to Program Recommendation 4: Pending. NYSERDA is doing this now under GJGNY and soon under its Technology & Market Development Program. If the workforce development petition for funds under EEPS2 is approved, internships and on-the-job training will be a focus area under the new Operating Plan. The workforce team seeks to serve new or transitioning workers in gaining hands-on, experiential learning, designed to improve job placement rates of trained individuals.

Program Recommendation 5: *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.

Response to Program Recommendation 5: Rejected. Training programs have been most successful where the energy efficiency work is being conducted, which does not always match with the goal of targeting counties with a large population of hard-to-reach and underserved citizens and where there are few to no existing training sites. Some of NYSERDA's training in the North Country region, for example, has not been sustainable due to the limited amount of energy efficiency work (e.g., Home Performance with ENERGY STAR jobs) and the small population in that area of the state. Program staff are focusing several efforts on 16 to 24 year olds in support of the Governor's NY Youth Works initiative.

Program Recommendation 6: *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.*

Response to Program Recommendation 6: Pending. Program staff agree that the Program should target new training partners but need to see where the demand is related to energy efficiency work with the goal of training towards internships with businesses, etc.

Program Recommendation 7: 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, 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.

Response to Program Recommendation 7: *Implemented. NYSERDA is working very closely with One Stop Career centers now under GJGNY. Program staff require that our training partners register with the One Stop Centers and our OJT hires register with the One Stop Centers. NYSERDA has no knowledge of One Stops having technical training curriculum; they work with training partners, many of which are also NYSERDA partners.*

Selected Market Characterization and Assessment Findings

Market Characterization

Selected findings from the market characterization effort include the following:

- In 2009, four industries accounted for nearly 72% of the EE-related jobs in the State: HVAC (23%), Electrical Contracting (21%), Engineering Services (14%) and Commercial and Industrial Construction (14%).
- Mid to high level skill jobs accounted for 63% of all EE jobs in 2009, totaling 148,500 statewide
- Future demand for energy efficiency-related jobs in the State (for the period ending 2018) varies by skill level, projecting increases in mid to high level skill positions of 13% in Training and Development Specialists Projections for mid-level EE positions range from an increase of 5% HVAC, Maintenance and Repair. Entry-level jobs, including laborers and material mover jobs show a decrease over this same time period.
- Close to 3.5 Million hard to reach/serve and unemployed workers are broadly distributed across the state: Upstate (41%); Downstate (46%) and Long Island (13%) While the percentages are similar geographically among the two age groups studied (16 to 24 and 25 to 64), it is important to note that 57% of the hard to reach 16 to 24 year old population resides on Long Island.
- A number of counties have a combination of high concentrations of hard to reach populations and high poverty rates. Upstate counties include (but are not limited to) Allegany, St Lawrence, and Oswego. Downstate these populations reside primarily in the counties comprised by the

metropolitan New York area. Results of GIS analysis show that these counties may not have a commensurate number of training organizations to serve these populations.

- At least 100 mid- to high-level training organizations were identified in the state, including some already under contract with NYSERDA. Among these diverse organizations are colleges, union training organizations, industry associations (e.g., Building Performance Institute (BPI), and other entities that provide academic and trade specific training and certification.

Market Assessment

Selected findings from the market assessment effort include the following:

Employers Hiring Practices/Worker Readiness

- HVAC contractors, along with Engineers and Consultants, and Builders reported the greatest percentage of employees involved in EE-related work. In contrast, 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.
- Companies reported varying numbers of EE employees hired over the last 12 months: Engineering/consulting (26%), Building firms (11%), HVAC firms (6%). Most of these hires were for higher skilled positions. A majority of these respondents reported that it was either "somewhat difficult" or "very difficult" to find these new energy efficiency-skilled employees.
- Sixty three percent of HVAC respondents estimated that more than half of their employees needed EE-related training, followed by Engineers/Consultants (36%), Real Estate Developers/Property Managers (20%), and Builders (18%). Across the four employer groups, between 40-75% reported hiring employees from the hard to reach/disadvantaged population.
- More than half of the Engineering and Consulting firm respondents reported they were somewhat or very likely to hire employees for EE-related positions (in the next 12 months). Less than half of the other employer groups reported that they would be hiring for these positions. Among those hiring, the top anticipated positions are HVAC installation/technicians; energy conservation consultants; equipment installation, maintenance and repair, and skilled commercial construction
- The most common barriers to hiring EE-related employees varied across respondents and included, most prominently, interruption of work flow and cost of training.

Awareness and Use of Training

- Participants reported a high level of general awareness of available job skills training programs, internships, apprenticeships and other on-the-job training opportunities in NY State.
- Despite high levels of awareness, participants did not report a commensurate use of EE training. Among the three largest sectors, less than half sent workers to EE-related training: HVAC (44%) Engineers/consultants (45%), and HVAC (44%). In contrast all eight of the Real Estate Management firms responded that they sent workers to EE-related training. Respondents gave varying reasons for low participation including lack of information, time constraints, or high cost of trainings.
- Respondents who attended training overwhelmingly reported that these trainings were very or somewhat valuable.

Awareness of NYSERDA

- 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 EE projects prior to the survey. Only 18% of the Builders interviewed said they had done so.
- Awareness of NYSERDA is high, ranging from 56% for Builders to 88% for Engineers/Consultants.
- Awareness of NYSERDA's workforce training efforts was substantially lower than the awareness of NYSERDA in general, and consistent with a low awareness of other energy efficiency focused training programs in New York.

Evaluation Methods and Sampling

The research approach used by the MCA Team to evaluate the EE market included the following:

- Reviewing programmatic documentation and secondary data sources
- Conducting primary data collection via telephone surveys with the following market actor groups:
 - Employers, including: builders (43 completes), HVAC contractors (44 completes), engineers/consultants (47 completes), real estate developers and property management firms (9 completes)
 - Nonparticipating training organizations (42 completes)

The research approach was informed by the WFD Program logic model, completed in December 2010.²⁶ Key research findings generated by the evaluation are related to the outputs and outcomes anticipated by the program logic model.

²⁶ The WFD Program Logic Model can be found here: [Workforce Development Program \(WFD\) Logic Model](#)

Green Jobs – Green New York (GJGNY) Residential Program: Market Characterization and Assessment and Process Evaluation

Evaluation Conducted by: NMR Group, Inc., Market Characterization and Assessment Team

Lead Investigator: Rohit Vaidya, NMR Group, Inc., September 2012

Program Summary

The GJGNY Act of 2009 was signed into law on October 9, 2009. GJGNY is a statewide program that provides access to energy audits, installation services for eligible energy efficient measures, low-cost financing, and training for various green-collar careers. The GJGNY Program also supports sustainable community development and creates opportunities for green jobs. Designed to leverage existing efforts, the GJGNY Program aligns closely with and is largely delivered through the existing residential, commercial, multifamily, and workforce development program initiatives administered by NYSERDA. Utilizing the existing infrastructure of the Energy Efficiency Portfolio Standard (EEPS) Home Performance with ENERGY STAR (HPwES) Program, GJGNY provides free or reduced-cost energy audits, and low-interest financing to homeowners for the installation of HPwES-eligible, energy efficiency measures and eligible solar hot water systems. In addition, GJGNY provides funding for constituency-based organizations (CBOs) to conduct outreach to targeted communities for energy efficiency and workforce development opportunities available through GJGNY.

This combined market and process evaluation addresses GJGNY activities for residential one- to four-family homes and the financing, outreach, and marketing efforts delivered through the New York HPwES Program. This is the first process evaluation and MCA of GJGNY for the New York HPwES one-to four family - and focuses on project activity which began in November 2010.

Evaluation Objective and Key Findings

The overall objectives of the process evaluation and MCA study were to document the experience of early changes to the program, provide input on the effectiveness of the program during summer/fall 2011, and assess the degree to which program activities were in alignment with program goals. The evaluation specifically assessed barriers to achievement of program goals, influences of program activities on program perceptions, and processes for each program component. The evaluation also assessed baseline conditions for energy audits, HPwES projects, financing of HPwES projects, and CBO outreach activities.

Key market characterization/assessment findings are summarized below by topic.

Market awareness. Market awareness of HPwES appears to be low. A small fraction (2%) of surveyed non-participants reported unaided awareness of HPwES. After being prompted with a description of HPwES, a little more than one-third of non-participants (36%) reported awareness of this program. Among the non-participants who were aware of HPwES, nearly seven-tenths (69%) reported being aware of the GJGNY free or reduced-cost energy audits, and close to six-tenths (57%) reported being aware of the GJGNY low-interest loans. From the perspectives of those involved in administering or delivering the HPwES program, lack of awareness of the program was a significant barrier to participation in the audits.

Customer interest in HPwES program offerings. Among non-participants, about one-fifth each indicated interest in the HPwES program (17%), GJGNY free or reduced-cost energy audit (19%), and the GJGNY low-interest financing (20%). About one-fourth of low-moderate income respondents indicated interest in the overall HPwES program (26%), with stronger interest in the free or reduced-cost GJGNY energy audit (32%) as opposed to the financing (21%). Overall, the lack of interest in the HPwES program was driven by a perceived lack of need for it.

GJGNY business and jobs impact. The HPwES contractors participating in HPwES and offering GJGNY free or reduced-cost energy audits reported that HPwES accounted for about 36% of their revenues in 2010 and 32% in 2011.

Competition for customers with utility rebate programs. The surveyed homeowners indicated substantially higher levels of awareness of utility energy efficiency programs than of NYSERDA programs.

Key process evaluation findings are summarized below by topic.

Overall program marketing and outreach. NYSERDA staff thought that HPwES marketing has been effective and slightly over one-fifth (22%) of HPwES contractors were satisfied or very satisfied with HPwES marketing conducted by NYSERDA. However, over two-fifths (44%) of the HPwES contractors surveyed were somewhat dissatisfied with program marketing.

Marketing of GJGNY free or reduced-cost energy audits. The implementation contractors reported that customers typically learned of the GJGNY free or reduced-cost energy audits through the HPwES contractor marketing and outreach efforts and, following the introduction of the GJGNY free or reduced-cost energy audits, over one-fourth of HPwES contractors (28%) indicated that they had adjusted their marketing efforts to include promoting these audits. A majority of the contractors (58%) thought that the introduction of GJGNY free or reduced-cost energy audits led to an increase in the installation of energy efficiency measures through HPwES.

Administrative processes. Two areas were identified as occasional sources of delays in the running of the program: gathering the energy usage data from applicants and delayed delivery of the energy audit report by HPwES contractors.

Program changes. Program staff report that the Total Resource Cost (TRC) test, required by the Public Service Commission under the EEPS program rules, had reduced the number of HPwES-eligible energy efficiency measures and thus the flexibility in terms of the work that could be done. They reported that while positive changes, such as the free or reduced-cost energy audits through GJGNY, had occurred, the other changes to measure screening had reduced uptake.

Program participation motivations. The primary driver of the surveyed homeowners' decisions to have their home evaluated by a Home Performance auditor was the desire to save on energy costs/bills. Another important factor driving the decision by some customers appeared to be an interest in finding out how efficient their home was.

Program participation barriers. A major barrier to program participation was the difficulty associated with timing or scheduling the energy audit.

Importance and use of financing and incentives. Around four-fifths of HPwES program participants accord high importance to the GJGNY free or reduced- cost energy audit (79%), incentives (80%), and financing (71%) in their decisions to install HPwES-eligible energy efficiency measures.

Program satisfaction. A large majority of customers who completed an audit (78%) and subsequent work in their homes (95%) were satisfied or very satisfied with the HPwES program. HPwES contractor satisfaction with the program was mixed, with around one-third each indicating satisfaction (36%) and dissatisfaction (31%). The reasons most often cited for dissatisfaction were: certain energy efficient measures were no longer eligible in the HPwES program, difficult or changing standards for measure qualification, and reduced program incentives.

Evaluation Methods and Sampling

This combined market characterization assessment and process evaluation addresses GJGNY activities for residential one- to four-family homes and the financing, outreach, and marketing efforts delivered through the HPwES program. This is the first process evaluation and MCA study of the program and focuses on project activity beginning in November 2010, when the GJGNY offerings became available.

For this evaluation, the evaluation team gathered and analyzed information from primary and secondary data sources including a review of HPwES and GJGNY program documents and databases; in-depth interviews with program staff, implementation contractors, and HPwES contractors; surveys of program participants, general population non-participants, and low-moderate income non-participants; surveys of HPwES contractors; and reviews of secondary information (Table 1).

Table 1. Report Data Sources

Information Sources	Sample size	Description
Program staff interviews	8	In-depth interviews with six NYSERDA and two utility staff members
Implementation contractor interviews	7	In-depth interviews with implementation contractors who work on behalf of NYSERDA on the HPwES/GJGNY program
HPwES contractor interviews	10	In-depth interviews with contractors who conduct home energy audits and install energy-efficiency measures
Participant surveys	536	Telephone survey
Non-participant surveys	212	Telephone survey
Low-moderate income respondent surveys	106	Telephone survey
HPwES contractor surveys	59	Telephone survey

Recommendation and Program Administrator Response

Program Recommendation 1: Ensure that the marketing message to homeowners emphasizes the program benefits of saving on energy bills or saving energy. In order to support this effort, NYSERDA could provide sample data on potential net savings, in terms of financing costs and monthly savings on energy costs for different types of homes. Design interactive and educational tools to assist and engage the homeowner in understanding the potential efficiencies is another approach that could be taken.

Response to Program Recommendation 1: Pending. Program staff are considering the benefits and costs of developing an interactive online energy audit tool for homeowners to learn about energy efficiency and the Home Performance with ENERGY STAR Program.

Program Recommendation 2: Utilize the CBOs to promote the benefits of participating in the program by highlighting the GJGNY free or reduced-cost energy audits and financing of HPwES-eligible energy-efficiency measures. In addition, program staff, implementation contractors, HPwES contractors, and CBOs should promote the GJGNY free or reduced-cost energy audits as a way of helping customers determine how energy efficient their homes actually are. Program marketing and promotions should also emphasize that the audit provides an opportunity to educate customers about energy efficiency, that having the audit does not require further commitment, and that participants can learn about energy efficiency and health and safety measures for their homes.

Response to Program Recommendation 2: Implemented. Eighteen CBOs were selected to conduct outreach throughout NYS, including Long Island. The free audit has been very popular with over 23,500 completed. Contractors are successfully converting these audits to HPwES work at a rate of over 35%. The program continues to explore additional innovative financing approaches to improve the 66% loan approval rate.

Program Recommendation 3: Improve the tracking and presentation of HPwES contractor information to customers. Explore incorporating additional software functionality which would allow the NYSERDA

website to list or sort contractors by distance from home and languages spoken. Examples of other search criteria that NYSERDA could consider include the number of HPwES projects completed, types of measures implemented, any Quality Assurance (QA) and Quality Control (QC) information that is not confidential, and customer satisfaction rating. For customers lacking web access, NYSERDA could provide such information over the phone or by mail.

Response to Program Recommendation 3: Pending. CBOs developed “vetted” contractor lists that identified contractors willing to work in their region, along with other pertinent information regarding languages proficiencies, BPI certifications held by staff, additional certifications, and specialties of the company. Program staff is developing a customer satisfaction survey that would be combined with contractor profile information to offer customers better guidance on selection of a contractor.

Program Recommendation 4: Continue to leverage existing training resources and expand curriculum to incorporate more specific field, sector, and advanced technical training. Ensure the HPwES contractors are made aware of the trainings, training incentives, and have convenient access to training locations.

Response to Program Recommendation 4: Implemented. Program staff continue to leverage the existing training resources continuously review the curriculum to include more field, sector, and advanced technical trainings.

Program Recommendation 5: Continue to support contractor training for BPI certification. Worker or job readiness training should prepare participants for BPI certification by utilizing worker and job readiness trainings including hands-on training such as internships or other real-world experience. These trainings and subsequent certifications will help meet the HPwES contractor needs for experienced workers.

Response to Program Recommendation 5: Implemented. Program staff continues to support contractor training for BPI certifications, worker and job readiness programs.

Program Recommendation 6: Continue to enhance program data collection, tracking, and cross-contractor integration.

Response to Program Recommendation 6: Pending. A software tool is being developed to more efficiently and effectively track projects from customer intake through completion. This tool will also provide enhanced reporting capabilities.

Program Recommendation 7: Establish procedures to identify and more actively promote the program to customers who are more likely to need energy-efficiency work and are willing and able to finance retrofits. These procedures may be based on the prescreening tools already developed for the CBOs, input from the HPwES contractors, and measures such as HHI. This approach would result in a reduction in the number of participants who participate simply because the audit is offered at no or reduced cost but are less likely to install energy-efficiency measures.

Response to Program Recommendation 7: Implemented. CBOs use a variety of prescreening tools to identify customers most likely to take advantage of the program. CBOs have also received training on the use of tools to identify customers.

Program Recommendation 8: Consider offering additional seminars and webinars to educate HPwES contractors about the GJGNY low-interest loans. NYSERDA could also provide HPwES contractors with more guidance and better tools to sell the loan and help their customers through the application process. Align these approaches with the CBO effort to educate customers about the loans as well. Although EFS offers customer service and pre-screening, consider using an independent firm, such as EFS, to discuss GJGNY financing information with participants directly.

Response to Program Recommendation 8: Pending. Program staff plan to host a webinar dedicated to financing. In addition, training for call center staff is planned. EFS is also available to discuss GJGNY financing information with participants directly. The Building Performance Contractors Association is delivering a series of contractor training sessions across the state to answer contractor questions when it can and to offer feedback to NYSERDA. The CBOs are now represented at the monthly meetings sponsored by Efficiency First to bring NYSERDA and contractors together to seek solutions to barriers to increased adoption of energy efficiency.

Program Recommendation 9: Identify ways for the HPwES contractors to ease the time burden for customers associated with scheduling or conducting the audit or installation of eligible measures. The program may achieve greater efficiencies by implementing processes to streamline program requirements, ensuring the effective scheduling of audits, simplifying paperwork, etc.

Response to Program Recommendation 9: Implemented. In July 2012, the credit application and assisted subsidy application process was streamlined. In September 2012, an online audit application was launched to streamline that audit. Access to utility bill and usage information would greatly streamline some program requirements

Program Recommendation 10: Improve the conversion from GJGNY energy audits to work completed or measures installed by providing HPwES contractors and CBOs clear and timely information about program changes. This information should, at a minimum, include the change, its impacts, and complete and uncomplicated rationale for the change. Review contractor awareness of, participation in, and perceived effectiveness of the monthly webinars, which cover program changes, details, opportunities, and offer a venue for feedback. Consider surveying contractors on the efficacy of the webinars and other informational tools.

Response to Program Recommendation 10: Implemented. The conversion rate from audit to NYSERDA HPwES work completed is currently 35%, and significantly higher if work completed by HPwES contractors through utility rebate programs is considered. The Program delivers periodic webinars to discuss program changes and to collect feedback from contractors. In addition, there have been increased efforts to collect contractor feedback through Efficiency First and BPCA.

Program Recommendation 11: Identify ways to address concerns of consumers regarding financing the installation of HPwES-eligible energy-efficiency measures. In addition to increased marketing of the loan products, the program, CBOs, and individual HPwES contractors could provide customers with more information about the financial benefits of energy efficient measures. Increased use of testimonials and detailed explanations of benefits and costs might help to encourage participants to install measures. Although constraints from existing funding and cost-effectiveness tests may limit the amount of incentives that can be provided, increasing the incentives for some measures would be a way to help reduce this barrier.

Response to Program Recommendation 11: Implemented, ongoing. A financing fact sheet along with a Residential Financing Product Information Sheet (comparing the On-bill and Unsecured loan products) has been developed. Additional case studies for each regional market will be developed. Program staff continue to explore the benefits of offering incentives based on energy savings.

Program Recommendation 12: Develop marketing and educational materials that promote the benefits of early replacement of energy consuming equipment. Educate HPwES contractors on how best to offer the consumer guidance about the benefits of early replacement.

Response to Program Recommendation 12: Pending. This recommendation requires information to support the benefits of early replacement of equipment.

Program Recommendation 13: The HPwES program should review quality control policies and procedures to make sure mechanisms are in place to verify quality services and installations, according to program standards. The program should also review its contractor training and support to ensure the consistency and quality of installations.

Response to Program Recommendation 13: Implemented, ongoing. The program is exploring the benefits of adopting a QA approach that assesses the quality of the work. The existing QA scoring is based on the discovery of program deficiencies. The proposed approach utilizes detailed requirements for acceptable materials and installation procedures.

Program Recommendation 14: Reinforce the importance of the QA process with customers by indicating the homeowner can receive a free, independent third-party review of the work completed by the HPwES contractor through the program. HPwES program marketing and promotions to customers should also emphasize the value and benefits of QA inspections. HPwES contractors should also be encouraged to highlight the QA process when explaining the benefits of participation as it shows that HPwES contractors are held to a high standard.

Response to Program Recommendation 14: Implemented. Information on the QA process is available to customers through a brochure that each contractor is required to deliver to customers. Information on the QA process has also been written into new marketing publications and website language.

Program Recommendation 15: Develop targeted messages to educate Upstate-A homeowners on the benefits of energy efficient improvements and promote the benefits of early replacement and opportunities to install and finance eligible measures through HPwES.

Response to Program Recommendation 15: Implemented. A marketing campaign has been developed that uses messages that are targeted at specific market segments, as identified through market research conducted in 2011. CBOs also provide targeted messaging for their specific communities.

Program Recommendation 16: Messaging to Upstate-B participants should emphasize that the free or reduced-cost energy audits could help to identify the specific measures that could make their homes more energy efficient which, in turn, would help reduce their winter heating costs.

Response to Program Recommendation 16: Implemented. A marketing campaign has been developed that uses messages that are targeted at specific market segments, as identified through market research conducted in 2011. CBOs also provide targeted messaging for their specific communities.

Program Recommendation 17: Promote the GJGNY program in the Downstate region with a focus on the easily achievable criteria for qualifying for the free or reduced-cost energy audit. In parallel, messaging to the Downstate consumer by the CBO, HPwES contractor and the program should concentrate on the benefits and opportunities to reduce energy bills by completing an audit and implementing measures.

Response to Program Recommendation 17: Implemented. CBOs using median income charts to guide customers. Advertising mentions that most customers qualify for a no cost audit

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Quarterly Report to the Public Service Commission
Quarter Ending September 30, 2012

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