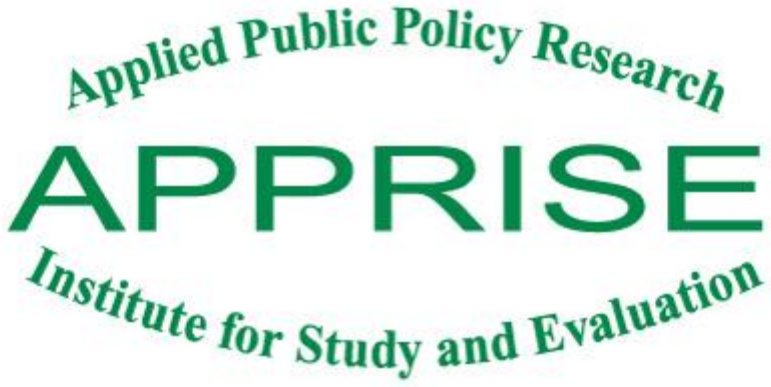

New Jersey Natural Gas
2015 SAVEGREEN Evaluation
Final Report

December 2015

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Executive Summary

This report presents the findings from the 2015 New Jersey Natural Gas (NJNG) SAVEGREEN Evaluation. NJNG'S SAVEGREEN Program provides incentives that are complimentary to the New Jersey Clean Energy Programs (NJCEP). The residential program provides grants or on-bill repayment plans to assist with the purchase and installation of furnaces/boilers and water heaters and other whole house home performance work. The commercial program provides NJCEP Direct Install participants with a no-interest on-bill repayment plan for the value of the project not covered by the NJCEP incentive.

Evaluation

The goals of the program evaluation were to assess the programs and answer the following questions.

- Are the SAVEGREEN programs and its associated outreach contributing to incremental energy efficiency activity in NJNG's service territory?
- Is SAVEGREEN influencing customers to make whole-house improvements?
- Are the SAVEGREEN programs providing value to participating and non-participating NJNG customers?
- Is the SAVEGREEN program effectively managed?

The following research activities were undertaken.

- *Background Research:* We reviewed SAVEGREEN documents, outreach data, and OPower report; and interviewed NJNG managers and staff, the NJCEP Market Managers and Program Coordinator, and DOE's Home Energy Score Program Manager.
- *SAVEGREEN Program Data Analysis*: We analyzed data provided by NJNG staff and data available on their EnergySavvy platform.
- *Participant Interviews:* We conducted a total of 50 in-depth telephone interviews with participants in the SAVEGREEN program components.
- *Contractor Interviews:* We conducted a total of ten in-depth telephone interviews with contractors who provide services in the SAVEGREEN program components.
- *Billing Data Analysis:* We analyzed NJNG billing data to understand the impact of the programs on natural gas usage. We collected and analyzed data from a sample of JCP&L customers to understand the impact of the programs on electric usage.

- *Non-Energy Benefits*: We analyzed the impact of the SAVEGREEN program on the environment, the economy, and participants' health and safety.

SAVEGREEN

NJNG'S SAVEGREEN provides incentives to enhance those provided through the New Jersey Clean Energy Program (NJCEP). The following SAVEGREEN benefits were offered in 2013 and the SAVEGREEN offerings were updated as the NJCEP changed.

- Residential Enhanced Rebate (Rebate): This program provides a $500 rebate for the installation of a high efficiency gas furnace or boiler in addition to the $250 or $300 rebate provided through the NJCEP. Customers must participate in an audit provided by NJNG to receive the program rebate.

- Residential Non-Home Performance On-Bill Repayment ($6500 OBRP): This program provides On-Bill Financing of up to $6,500, net the $900 rebate provided by the NJCEP, over a five-year period for customers who install a high efficiency gas furnace as well as a high efficiency gas water heater.

- Residential Home Performance with Energy Star On-Bill Financing and Rebate (HPwES OBRP): This program provides On-Bill Financing of up to $10,000 over a ten-year period as well as an incentive of $2,000, $4,000, or $5,000 based on Total Energy Savings (TES) for customers who participate in the NJCEP's HPwES program. Approved installation measures and incentives are in accordance with NJCEP's HPwES guidelines

- Commercial and Industrial Direct Install Program: This program provides On-Bill Financing of up to $53,571 for customers who participate in the NJ Clean Energy Direct Install Program. This is in addition to the 70 percent rebate provided by the NJ Clean Energy Program.

- OPower Pilot: NJNG contracted with OPower to provide mailings to customers with information on their energy usage compared to their similar neighbors. OPower randomly assigned customers to a group that received the reports and a group that did not. They sent periodic reports on usage and conducted surveys to measure whether the information impacted customers' perceptions of NJNG and knowledge about energy efficiency offerings.

The 2013 incentives offered by the NJNG SAVEGREEN and the NJCEP are summarized in the table below.

Table ES-1
NJCEP and SAVEGREEN Program Benefits

Program	NJCEP Benefit			SAVEGREEN Benefit
Furnace/Boiler Enhanced Rebate	Furnace	$250		$500 NJNG Audit Required
	Boiler	$300		
Furnace and Water Heater $6500 On-Bill Financing	$900			Up to $6,500 OBRP 0% interest over 5 years NJNG Audit Required
HPwES	Tier	Savings	Rebate	Up to $10,000 OBRP 0% interest over 10 years SAVEGREEN pays NJCEP rebate when OBRP is used
	II	10%-19.99%	$2,000	
	III	20%-24.99%	$4,000	
		>25%	$5,000	
C&I Direct Install	70% of retrofit costs up to $125,000			Up to $53,571 OBRP 0% interest over 10 years

The goals of the SAVEGREEN program are as follows.

- Increase energy efficiency opportunities for customers.
- Promote and enhance the use of the NJCEP offerings.
- Raise awareness of the whole house approach to energy efficiency.
- Increase customer awareness of energy efficient appliances and weatherization measures.
- Increase NJ employment in energy efficiency and conservation

Participant Feedback

Interviews were conducted with participants in the $6500 On-Bill Repayment Program, the Home Performance Program, the Enhanced Rebate Program, and the C&I Direct Install Program. This section provides an overview of the findings from the SAVEGREEN participant interviews.

Residential Programs

Key findings from the interviews with residential program participants are summarized below.

- *Information Source*: The most common source of SAVEGREEN information was the contractor. Other sources that were frequently mentioned were the NJNG website, a friend or family member, or a neighbor. However, there were several additional information sources that were also noted. *The importance of the contractor in program outreach as well as the many diverse information sources shows that NJNG should continue focusing on the contractors and continue their wide range of outreach methods.*

- *Participation Reason:* The respondents were most likely to state that they participated in SAVEGREEN because they wanted to save money or energy, the SAVEGREEN financing benefits, and the need to replace their aging home equipment. *These benefits should continue to be emphasized in the program marketing.*

- *SAVEGREEN Application:* 36 of the 45 participants said that the SAVEGREEN application process was very easy, four said it was somewhat easy, and five (all Enhanced Rebate) stated that the contractor applied. 42 of the 45 participants were very satisfied with the program process overall. *The program process appears to be working well and does not need to be refined.*

- *SAVEGREEN Website:* 18 of the 45 participants visited the SAVEGREEN program website to learn about the program and the incentives and 17 of those 18 customers were able to find the information they were looking for. *The website is an important source of information and has provided participants with desired information. NJNG should continue to update the site if changes are made to the program.*

- *HPwES OBRP Program Audit:* The participants reported that the auditors provided detailed information, including recommendations for efficiency work, SAVEGREEN participation information, potential cost savings from the work, and information on the home's efficiency. (Note that this is the HPwES audit, not an audit provided by NJNG.) *NJNG should continue to provide training and information to HPwES participating contractors.*

- *HPwES OBRP Measures*: 14 of the 20 participants reported they installed all of the measures on the audit report and six reported that they installed most of the measures. Six of the respondents specifically mentioned that it didn't seem that they had the option to choose which measures were installed. *Contractors should be trained to clearly educate participants on their options for installation and how those decisions will or will not affect program benefits.*

- *Impact on Home*: Customers were most likely to report that their home was warmer or that that their gas bills were lower after participating in the program. When asked specifically about comfort and bills, 36 of the 45 respondents said they noticed changes in the comfort of their homes, and 29 said they noticed changes in their bills. *These program benefits should be included in SAVEGREEN marketing materials.*

- N*JNG Audit for Enhanced Rebate and $6500 OBRP*: Customers were most likely to say that they learned that there is potential to increase the efficiency of their home by installing insulation, or performing air sealing work. However, they were not very likely to undertake additional measures in the time period evaluated. *Auditors should provide additional information about SAVEGREEN benefits and the expected impacts of undertaking the additional measures.*

- *Home Energy Score*: Only two of the 12 Enhanced Rebate participants who were recorded in the database as having received the Home Energy Score remembered that they received it.[1] There were some problems with the score at that time, so it is possible that some auditors did not emphasize the score in the problematic cases. The two customers who remembered the report stated that it was helpful to understanding the efficiency of their home and it had a big impact on their decision to move forward with the additional work. *Given that most did not recall the report, it has not had that large of an impact. However, for those that did undertake the measures, the report appeared to be important, and that is validation to continue to provide the report, given that the investment in its development has been completed.*

- *SAVEGREEN Importance*: When asked how important the SAVEGREEN program was in the decision to make the improvements, 29 of the 45 said it was very important, nine said it was somewhat important, and seven said it was not at all important. However, 18 of the 20 HPwES OBRP participants said that the SAVEGREEN program was very important. *The On-Bill Repayment was important to the HPwES OBRP participants and should be continued to encourage the adoption of whole house improvements as long as the budget for this program is available.*

- *Barriers*: Only 7 of the 45 participants stated that they experienced any barriers completing the upgrades and only four experienced any barriers participating in the program. The barriers to the upgrades related to the ventilation required for the high efficiency systems, a separate inspection required by the customer's development, the time the contractor took for the installation, and having the new gas meter installed. The program barriers related to the need to find specific information for the application or the wait for the rebate. *Given the small number of participants who experienced barriers and the fact that most of these issues are not in the control of NJNG, there are no recommendations for addressing these.*

- *Satisfaction*: Participants expressed very high levels of satisfaction. 41 of the 45 were very or somewhat satisfied with the audit, 43 were very or somewhat satisfied with the installation contractor, 44 were very satisfied and one was somewhat satisfied with the installation work, and 43 were very satisfied and three were somewhat satisfied overall with SAVEGREEN. *The high levels of satisfaction show that the program is working well and there is little room for improvement.*

- *Participant Recommendations:* Only about half had one or more recommendations for the program. The most common recommendation was to increase the amount of marketing that is conducted. *While the participants had learned about the program through various sources, they were under the impression that many NJNG customers are not aware of SAVEGREEN.*

[1] An ongoing DOE study has found a significantly higher recall rate.

Commercial and Industrial Programs

Key findings from the interviews with C&I Direct Install program participants are summarized below.

- *Information Source*: The C&I Direct Install participants heard about the program through contractors and through personal acquaintances. Two of the five noted that the contractor approached them and informed them of the program. *NJNG should work with the C&I Direct Install contractors to provide additional outreach about the program.*

- *Program Process*: All five respondents reported that the SAVEGREEN application process was very easy, that they were very satisfied with the length of time to receive their program incentive, and that they were very satisfied with the program process overall. *There are no recommendations for the program process.*

- *Assessment*: All five participants reported that the contractor reviewed the assessment results, explained the measures that qualified and their portion of the project costs, and explained the On-Bill Repayment program. All five of the participants also felt that the assessment was very helpful in informing their decisions about which measures to install and they were all very satisfied with the assessment. *The contractors appear to be doing a good job with the assessment and with customer communication.*

- *Measures*: While four of the five participants installed all of the measures recommended by the program, one participant installed most of the measures. The participants reported that they chose to install these measures due to the expected cost savings, the cost and hassle of maintaining their older current equipment, and the impact on the environment.

  When asked specifically about comfort, three felt that their new heating units provided a more balanced, reliable temperature, and one noted that the new heating unit was quieter. When asked specifically about changes in energy bills, three reported that they noticed decreased energy bills, one had not noticed any changes, and one was unsure. *The benefits of reduced bills and improved comfort should be included in the program marketing materials.*

- *SAVEGREEN Importance*: Four of the five respondents had not been planning on making energy efficiency improvements but upon learning about the program, decided to undertake the upgrades. When asked if they would have moved forward with the project if the On-Bill Repayment program had not been available, four stated that they would not have moved forward, and one reported that he may have moved forward with the project at another time.

  All five of the participants felt that the On-Bill Repayment aspect of the program was very important in their decision to pursue the energy efficiency upgrades. The participants stressed that it allowed them to complete the upgrades when they would not have been able to otherwise, even with the available grant money.

All five participants felt that the NJ Clean Energy rebates were very important in their decision to pursue the energy efficiency upgrades. The participants reported that the rebate allowed them to afford the project and that it convinced them to participate.

The program appears to have a large impact on the uptake of energy efficiency and should be continued in its form if budget is available.

- *Satisfaction*: All of the participants were very or somewhat satisfied with the contractor and the installation. All were very satisfied for the program. *The high levels of satisfaction show that the program is working well and there is little room for improvement.*

Contractor Feedback

APPRISE conducted in-depth telephone interviews with ten contractors who served customers in the various NJNG SAVEGREEN Programs and combinations of programs. This section provides a summary of the findings from the contractor interviews and recommendations based upon those findings.

Program Information and Participation

- *SAVEGREEN Contractor Information Source:* Residential program contractors reported that they learned about the SAVEGREEN programs through a letter or email received from NJNG, a NJNG contractors meeting, Conservation Services Group (CSG)[2], and the NJ Clean Energy program.

- *SAVEGREEN Customer Information Source:* Contractors were most likely to report that customers learned about SAVEGREEN through the contractor, followed by learning about it through NJNG. Contractors noted that NJNG conducts a lot of marketing for the program in the gas bill, online, in a mailed flyer, or through a NJNG auditor.

- *Customer Participation:* Most residential program contractors reported that a high percentage of their customers participated in one of the SAVEGREEN programs.

- *C&I Direct Install Marketing*: One C&I contractor stated that telemarketing was most effective marketing technique and one stated that in-person visits where they offer free energy audits and education was the most successful strategy.

- *C&I Direct Install Participation:* When asked why they thought there had not been more participation in the C&I Direct Install Program, one contractor thought it was a lack of awareness and the other stated that it is difficult for customers to understand the offering.

[2] CSG is a subcontractor to the market manager for New Jersey's Clean Energy Program. The company has subsequently been acquired and is now known as CLEAResult.

Recommendation: NJNG should continue to market SAVEGREEN to contractors with emails and training sessions and they should continue to market SAVEGREEN to customers through print and web-based advertisements.

SAVEGREEN Process

- *Barriers to Participation*: Four of the eight residential contractors noted one or more barriers to customer participation and one of the two C&I direct install contractors noted a barrier to participation. One residential contractor referred to the hot water heater replacement requirement, three to the credit requirement for the OBRP, one to the equipment efficiency requirements which can be expensive, one to clutter in the attic, and one to the difficulty with scheduling.

Finding: It does not appear that there are significant barriers that SAVEGREEN can or should address with program changes.

- *C&I Coordination*: The C&I Direct Install Contractors were asked whether they coordinate with the refrigeration contractors to help the customers obtain all eligible measures. One noted that he reaches out to the refrigeration contractor when there are opportunities and one noted that they only do so if the customer specifically asks about those measures.

Recommendation: NJNG should discuss the potential for additional coordination with refrigeration contractors with the C&I contractors and with the NJCEP managers who have direct control over this process.[3]

NJNG Information and Communication

- *NJNG SAVEGREEN Contractor Trainings*: When the residential contractors were asked whether they attended the NJNG SAVEGREEN contractor trainings, all stated that either they or their manager/partner and their staff had done so. The contractors noted that the trainings provided a better understanding of SAVEGREEN, provided technical information, and helped them to do their work more efficiently. All reported that the trainings were very helpful.

- *Training Needs*: When asked what types of training they feel NJNG should offer to help the business and participation in SAVEGREEN, four responded that the current offerings are what is needed. Others requested trainings on selling the high-efficiency option, explaining the rebate, understanding the programs, and more frequent Manual J trainings.

Recommendation: NJNG should continue to provide trainings as they increase SAVEGREEN awareness and provide important information to contractors.

[3] Recent proposed changes for the structure of the DI program may address this issue.

- *SAVEGREEN Project Website*: All eight of the residential program contractors stated that they had visited the SAVEGREEN Project website to learn about the program and the benefits that are offered, and they all stated that they were able to find the information that they were looking for.

- *SAVEGREEN Contractor Portal*: Seven of the eight residential contractors stated that they used the SAVEGREEN contractor portal or microsite to learn about program updates and four of the eight stated that they used it as a source of marketing information.

  Four HPwES and Seal-up contractors were asked if they bid on jobs on the NJNG Contractor Portal and three of the four contractors stated that they did so. Only one of the four stated that it had been an important source of business.

  Contractors recommended that NJNG email contractors to let them know when the portal is updated, that the portal is limited to BPI-certified contractors, that customers must provide email addresses for easier contact, and that NJNG let customers know they may receive fewer than three bids.

Recommendation: NJNG should continue to update and maintain the SAVEGREEN Project Website and the Contractor Portal as these are important sources of information for contractors. NJNG should send emails to alert contractors when program updates are posted on the portal.

- *Contacting Contractors*: The eight residential contractors were asked what the best way was for NJNG to reach contractors with information about SAVEGREEN. While six stated that email was the best method, and some noted that the email should alert them to an update on the Portal, others stated the best way was through the website, training sessions, a mailing, or a phone call.

Recommendation: NJNG should continue to use email as the primary source of contractor communication.

Contractor Assessments and Audits

- *High Efficiency Information Provided to Customers*: Contractors who participate in the Enhanced Rebate program were asked what information they provide to customers about the high efficiency equipment compared to the other options. Two stated that they provide information on gas savings, one stated that they refer the customer to the NJNG website to use the gas savings calculator, one stated that they explain the efficiency levels and usage, and one stated that they provide information about the rebate.

- *Seal-up Audit:* Seal-up contractors were asked whether they use the information from the NJNG audit or perform a separate audit prior to performing the air sealing and insulation work. Both stated that they perform their own audit. One stated that it was required by the NJCEP and one stated that they rely on their own audit to determine pricing and air sealing opportunities.

- *C&I Assessment*: Both C&I contractors stated that they review the assessment with the company representative. When asked what questions or concerns customer have about the upgrades and related costs, they stated that the customers usually ask about the savings or return on investment, pricing, and the financing.

Efficiency Measures

- *Program Requirements*: The four Enhanced Rebate contractors had no issues with the program requirements. The $6500 OBRP contractors commented that they would like an OBRP option without a requirement to replace the water heater and that the program is too strict about oversizing boilers. The one HPwES contractor who had an issue with the program requirements stated that the OBRP approval requirements were too strict.

- *Barriers to Participation or High Efficiency Equipment*: Contractors were asked whether there were any barriers to participation or installation of high efficiency equipment. Two of the four rebate contractors noted that the venting requirements could be a barrier. One of the two $6500 OBRP contractors noted that the cost of the high-efficiency equipment could be a barrier to implementing the furnace/boiler and hot water heater upgrades. Three of the four HPwES and seal-up contractors noted one or more barriers, including the expense of duct improvements, denial of loans, and township permitting requirements. One of the C&I Direct Install contractors also remarked on the permitting requirements as a barrier.

SAVEGREEN Impact

- *Enhanced Rebate Impact*: All four rebate contractors and the two $6500 OBRP contractors stated that the rebates were enough to convince customers to install the high-efficiency equipment option. When asked how much of an impact the rebate had on the installation of high-efficiency equipment, three rebate contractors stated that it was very important and one said it was somewhat important.

- *$6500 OBRP Impact:* Both $6500 OBRP contractors felt that the OBRP for the furnace/boiler and water heater was very important in the customers' decision to install the high-efficiency equipment. When asked if customers would install the high-efficiency option without the SAVEGREEN $6500 OBRP, all three contractors said that customers would not.

- *HPwES Impact:* Both HPwES and both seal-up contractors felt that the SAVEGREEN benefits were very important in the customers' decision to pursue the energy efficiency upgrades.

- *C&I Impact:* Both C&I contractors also felt that the SAVEGREEN OBRP and the NJ Clean Energy rebate were very important in their customers' decisions to pursue the energy efficiency upgrades.

- *Other Factors Influencing Projects*: Contractors were asked what other factors in addition to the program incentives influenced customers' decision to purchase high efficiency equipment or to move forward with the home performance project. Seven of the ten contractors noted the importance of saving energy, reducing bills, or the return on the investment. Three contractors noted that if the equipment was older or not working well and three noted that if there were comfort issues the customer would be more likely to undertake the project. Others mentioned the financing options offered by their company, health and safety issues, and lighting quality.

- *Whole House Upgrades*: Three of the four rebate contractors, both home performance contractors, and both seal-up contractors reported that the SAVEGREEN program influences customers to perform whole house improvements.

  When asked what more the program could do to encourage customers to move forward with whole house upgrades, three contractors recommended more marketing, and others recommended higher rebates for the furnace and boiler, increased financing options, free audits, increased emphasis on the importance of the audit, and better communication about the contractor release that the customer signs.

- *SAVEGREEN Impact on Energy Efficiency Awareness*: Many of the contractors felt that SAVEGREEN has positively impacted customers' awareness of energy efficiency options and programs. While seven contractors said that the impact had been significant, one said that customers are made aware if they call NJNG and two did not know what the impact had been.

Recommendation: The SAVEGREEN Programs appear to have a big impact on customer implementation of energy efficiency upgrades, and on whole house upgrades and customer awareness. NJNG should continue to offer the programs if funding is available.

Contractor Satisfaction and Recommendations

- *SAVEGREEN Satisfaction*: When asked about satisfaction, all four rebate contractors were very satisfied with the rebate process and both $6500 OBRP contractors were satisfied with the OBRP process. All of the ten contractors were very satisfied with SAVEGREEN overall, except for one seal-up contractor who was somewhat satisfied.

- *Rebate Recommendations*: Contractors' recommendations related to increasing the rebate amount, keeping the rebates available, having the rebates go directly to the contractor, and not requiring the water heater replacement for OBRP.

- *HPwES Recommendations*: One contractor recommended that the check be sent directly to the contractor.

- *Seal-up Contractors Recommendations*: These contractors recommended that contractors should be required to be BPI-certified[4], that NJNG increase program marketing, that NJNG provide additional incentives in the summer when work is slow, and that NJNG notify the contractors when new gas lines are brought into the area.

- *C&I Recommendations*: Both C&I contractors recommended that payments go directly to the contractor (This change was implemented in October 2015.) They also recommended more marketing and that there is better integration among the programs.

Recommendation: NJNG should ensure that contractors know there is an option for contractors to receive the incentive directly for programs where this is available and NJNG should consider providing this option for programs where it is not available. (Note: NJNG made this change in October 2015.)

Usage Impacts

This usage impact analysis provided estimates of the impacts of the Enhanced Rebate and HPwES programs on energy usage by analyzing pre and post usage data for participants compared to a matched nonparticipant sample. Key findings from the analysis were as follows.

- *Enhanced Rebate Natural Gas Savings*: The Enhanced Rebate savings were estimated to be 76 Therms, a savings of 6.9 percent of the pre-treatment usage.

    - Furnace and Boiler Savings: Natural gas savings were higher for customers who replaced boilers. Savings were estimated to be 68 Therms or 6.2 percent of pre-treatment usage for furnaces and 103 Therms or 9.3 percent of pre-treatment usage for the boilers.

    - Savings by Pre-Treatment Gas Usage: Participants with higher pre-treatment usage had greater savings from the heating system replacement. While customers with pre-treatment usage of less than 800 Therms saved an average of 37 Therms, those with pre-treatment usage between 800 and 1,200 Therms saved an average of 79 Therms, and those with pre-treatment usage over 1,200 Therms saved an average of 105 Therms.

- *Home Performance Natural Gas Savings*: The HPwES savings were estimated to be 221 Therms, a savings of 21 percent of the pre-treatment usage.

    - Savings by Rebate and On-bill Financing Amount: Participants with higher job costs had greater savings. Those with the combined program benefit of over $14,000 had savings of 251 Therms or almost 24 percent of pre-treatment gas usage.

[4] BPI-certification is a program requirement.

  - Savings by Pre-Treatment Gas Usage: Participants with higher pre-treatment usage had greater savings from the program. Participants with pre-treatment usage of over 1,200 Therms had savings of 329 Therms or 22 percent of pre-treatment usage.

- *Electric Usage Impacts*: The electric usage impact analysis did not produce reliable or consistent estimates due to the small sample size and the high variability in savings. The Enhanced Rebate savings estimates were not statistically significant and differed between the degree day, pooled regression, and PRISM approaches. While the degree day and pooled regression approaches showed small increases in electric usage, the PRISM analysis showed virtually no change in usage. However, the differences between the estimates were not statistically significant.

  The HPwES electric savings estimates were not consistent across the various approaches. While the degree day method estimated an increase in usage, the pooled regression and PRISM approaches estimated savings that ranged from under one percent to 3.6 percent. Again, it appears that a larger sample size would be needed to develop a reliable estimate of the change in usage.

Non-Energy Benefits

The non-energy benefits analysis analyzed the impact of SAVEGREEN on greenhouse gas emissions, economic activity in the state, and health and safety for program participants.

The energy efficiency installations under the Enhanced Rebate and HPwES OBRP programs resulted in 2014 savings of $373,054 by avoiding emissions of air pollutants associated with natural gas and electricity generation. The lifetime benefits from these avoided emissions is $4,453,491.

The Rebate and HPwES OBRP program also increased both output and employment in the state of New Jersey. Output increased by $9,864,167 as a result of the 2013 program, and 495 jobs were created.

In total, 3,868 health and safety issues were discovered as a result of the Enhanced Rebate program and 246 were discovered as a result of the $6500 OBRP program. Health and safety issues were identified in 42 percent of Rebate participants' homes and in 40 percent of the buildings audited through the $6500 OBRP program. These issues were only identified to the homeowner as a result of the fact that audits are required to be performed by one of SAVEGREEN's BPI-certified auditors for both of these SAVEGREEN programs.

Key Findings and Recommendations

NJNG's SAVEGREEN Program has achieved many successes since its implementation in 2009.

- *Customer Participation*: SAVEGREEN has succeeded in obtaining high levels of participation in the Enhanced Rebate and Home Performance programs.

- *Contractor Recruitment*: NJNG has significantly increased contractors' participation in the programs.

- *Contractor Training*: Through its training sessions, NJNG has provided contractors with important technical and program information.

- *Satisfaction*: Participants and contractors expressed high levels of satisfaction with the SAVEGREEN program.

- *Gas Usage Impacts*: SAVEGREEN achieved significant gas savings through the Enhanced Rebate and Home Performance programs.

- *Non-Energy Benefits*: SAVEGREEN achieved significant environmental, economic, and health and safety benefits.

Key findings and recommendations relating to program design and administration, marketing and participation, contractors, and program impact are provided below.

Program Design and Administration

Recommendations with respect to program design and administration relate to BPU requirements, EnergySavvy data and capabilities, Real Home Analyzer (RHA), electric usage data, and the NJNG audit.

1. *NJNG should continue to make the BPU aware of the impact that short-term program approval and frequent program design changes have on their ability to effectively manage and implement the SAVEGREEN program.*

2. *NJNG should assess which program statistical reports would be most useful and work with EnergySavvy to develop these reports.*

3. *NJNG should request that the RHA software be updated so that audit data can be uploaded into EnergySavvy.*

4. *NJNG should work with EnergySavvy to make additional data fields available to assist with documenting program impacts.*

5. *NJNG should work with JCP&L to add a sign-off on the SAVEGREEN application to allow NJNG to obtain JCP&L customers' electric usage data. This would allow for a greater number of customers to have their electric usage impacts assessed in a future evaluation.*

6. *Auditors should provide additional information about SAVEGREEN benefits and the expected impacts of undertaking the additional measures. Recent program changes including the increased timeframe to 18 months and the reduced savings requirement for the NJCEP should increase uptake as well.*

7. *The SAVEGREEN program process appears to be working well and does not need to be refined.*

Marketing and Participation

NJNG has been very successful in marketing SAVEGREEN and increasing participation in the program. They should continue their current outreach methods, engage C&I contractors in marketing, include information on program benefits in marketing materials, and continue to update the SAVEGREEN website.

1. *The importance of the contractor in program outreach as well as the many diverse information sources shows that NJNG should continue focusing outreach on the contractors and also continue their wide range of outreach methods.*

2. *NJNG should work more closely with the C&I Direct Install contractors to provide additional outreach about the program.*

3. *The benefits of reduced bills and improved comfort should be emphasized in the program marketing with testimonials from former program participants.*

4. *Given the small number of participants who experienced participation or installation barriers and the fact that most issues were not in the control of NJNG, there are no recommendations for addressing barriers.*

5. *NJNG should discuss the potential for improved coordination with refrigeration contractors with the C&I contractors*

6. *The SAVEGREEN website is an important resource for the program and has provided participants with desired information. NJNG should continue to update the site if changes are made to the program.*

Contractors

Contractors make use of the contractor portal and prefer email as a contact method. NJNG should continue to use these approaches and continue to provide contractor training sessions.

1. *NJNG should continue to update and maintain the SAVEGREEN Website and Portal, and these are important resources for the contractors.*

2. *NJNG should email contractors to inform them when the portal is updated.*

3. *NJNG should continue to use email as primary source of contractor communication.*

4. *NJNG should continue to provide contractor training sessions.*

5. *While NJNG may have limited control over this issue, home performance contractors should be trained to clearly educate participants on their options for installation and how those decisions will or will not affect program benefits.*

6. *The C&I contractors appear to be doing a good job with the assessment and with customer communication.*

7. *Contractors recommended that SAVEGREEN rebates and financing be sent directly to the contractor. This change was implemented in October 2015.*

Program Impact

SAVEGREEN has increased uptake of program measures, reduced gas usage, and provided important environmental, economic, and health and safety benefits. *SAVEGREEN should be continued if budget is available.*

I. Introduction

This report presents the findings from the 2015 New Jersey Natural Gas (NJNG) SAVEGREEN Evaluation. NJNG'S SAVEGREEN Program provides incentives that are complimentary to the New Jersey Clean Energy Programs (NJCEP). The residential programs provide grants and/or on-bill repayment plans to assist with the purchase and installation of furnaces/boilers and water heaters and other whole house home performance work. The commercial program provides NJCEP Direct Install participants with a no-interest on-bill repayment plan for the value of the project not covered by the NJCEP incentive.

A. Evaluation Objectives and Activities

The goals of the program evaluation are to assess the programs and answer the following questions.

- Are the SAVEGREEN programs and its associated outreach contributing to incremental energy efficiency activity in NJNG's service territory?
- Is SAVEGREEN influencing customers to make whole-house improvements?
- Are the SAVEGREEN programs providing value to participating and non-participating NJNG customers?
- Is the SAVEGREEN program effectively managed?

The following research activities were undertaken.

- *Background Research:* We reviewed SAVEGREEN documents, outreach data, and OPower report; and interviewed NJNG managers and staff, the NJCEP Market Managers and Program Coordinator, and DOE's Home Energy Score Program Manager.
- *SAVEGREEN Program Data Analysis*: We analyzed data provided by NJNG staff and data available on their EnergySavvy platform.
- *Participant Interviews:* We conducted a total of 50 in-depth telephone interviews with participants in the SAVEGREEN programs.
- *Contractor Interviews:* We conducted a total of ten in-depth telephone interviews with contractors who provide SAVEGREEN services.
- *Billing Data Analysis:* We analyzed NJNG billing data to understand the impact of the programs on natural gas usage. We collected and analyzed data from a sample of JCP&L customers to understand the impact of the programs on electric usage.

- *Non-Energy Benefits*: We analyzed the impact of the SAVEGREEN program on the environment, the economy, and participants' health and safety.

B. Organization of the Report

Six sections follow this introduction.

- Section II – SAVEGREEN Program: This section describes NJNG's SAVEGREEN design and implementation.

- Section III – Participant Feedback: This section summarizes the research conducted and feedback provided by SAVEGREEN participants.

- Section IV – Contractor Feedback: This section summarizes the research conducted and feedback provided by SAVEGREEN contractors.

- Section V – Energy Impacts: This section describes the methodology for the energy saving analysis and the impacts of the programs on natural gas and electric usage.

- Section VI – Non-Energy Benefits: This section summarizes the impacts of SAVEGREEN on the environment, the economy, and participant health and safety.

- Section VII – Summary of Findings and Recommendations: This section provides a summary of the key findings and furnishes recommendations for NJNG'S SAVEGREEN based on the analyses in this report.

APPRISE prepared this report under contract to NJNG. NJNG facilitated this research by furnishing data to APPRISE. Any errors or omissions in this report are the responsibility of APPRISE. Further, the statements, findings, conclusions, and recommendations are solely those of analysts from APPRISE and do not necessarily reflect the views of NJNG.

II. SAVEGREEN Program

NJNG'S SAVEGREEN Program provides incentives that are complimentary to the New Jersey Clean Energy Programs (NJCEP). The residential programs provide grants and/or on-bill repayment plans to assist with the purchase and installation of furnaces/boilers and water heaters and other whole house home performance work. The commercial program provides NJCEP Direct Install participants with a no-interest on-bill repayment plan for the value of the project not covered by the NJCEP incentive.

A. Background

In October 2008, Governor Corzine developed a plan to improve employment and economic activity in the short term and enhance New Jersey's business climate and economic prospects in the longer term. The plan included a call for electric and gas utilities to invest in utility energy efficiency programs. In response, NJNG filed a petition in January 2009 with the Board of Public Utilities (BPU) for three energy efficiency programs. The BPU approved these programs and additional programs, funding, and modifications in several rulings over the following years. This study focuses on the most recent program design and implementation in 2013 through 2015.

B. Program Overview

NJNG'S SAVEGREEN provides incentives to enhance those provided through the New Jersey Clean Energy Program (NJCEP). The following offerings were available in 2013.

- Residential Enhanced Rebate (Enhanced Rebate): This program provides a $500 rebate for the installation of a high efficiency gas furnace or boiler in addition to the $250 or $300 rebate provided through the NJCEP. Customers must participate in an audit provided by NJNG to receive the program rebate.

- Residential Non-Home Performance On-Bill Repayment ($6500 OBRP): This program provides On-Bill Financing of up to $6,500 over a five-year period for customers who install a high efficiency gas furnace as well as a high efficiency gas water heater. The amount allowed for the OBRP is net of the $900 rebate provided by the NJCEP.

- Residential Home Performance with Energy Star On-Bill Financing and Rebate (HPwES OBRP): This program provides On-Bill Financing of up to $10,000 over a ten-year period for customers who participate in an audit and install energy efficiency measures. Customers also receive a rebate of up to $5,000 from NJNG according to the NJ Clean Energy Program specifications.

- Commercial and Industrial Direct Install Program: This program provides On-Bill Financing of up to $53,571 for customers who participate in the NJ Clean Energy Direct Install Program. This is in addition to the 70 percent rebate (up to $125,000) provided by the NJ Clean Energy Program.

- OPower: NJNG implemented an OPower Pilot where customers were mailed Home Energy Reports comparing their usage to similar neighbors' usage in 2011, 2012 and 2013.

The current incentives offered by the NJNG SAVEGREEN and the NJCEP are summarized in the table below.

Table II-1
NJCEP and SAVEGREEN Program Benefits

<table>
<tr><th colspan="7">2013 Programs</th></tr>
<tr><th>Program</th><th colspan="4">NJCEP Benefit</th><th colspan="2">SAVEGREEN Benefit</th></tr>
<tr><td rowspan="3">Furnace/Boiler Enhanced Rebate</td><td></td><td colspan="2">Jan-June</td><td>July-Dec</td><td>Jan-June</td><td>July-Dec</td></tr>
<tr><td>Furnace</td><td colspan="2">$400</td><td>$250</td><td>$900</td><td>$500</td></tr>
<tr><td>Boiler</td><td colspan="2">$300</td><td>$300</td><td colspan="2">NJNG Audit Required</td></tr>
<tr><td>Furnace and Water Heater
$6500 On-Bill Financing</td><td colspan="4">$900</td><td colspan="2">Up to $6,500 OBRP
(net NJCEP rebate)
0% interest over 5 years
NJNG Audit Required</td></tr>
<tr><td rowspan="4">HPwES</td><td>Tier</td><td colspan="2">Savings</td><td>Rebate</td><td colspan="2" rowspan="4">Up to $10,000 OBRP
0% interest over 10 years
SAVEGREEN pays NJCEP rebate
when OBRP is used</td></tr>
<tr><td>II</td><td colspan="2">10%-19.99%</td><td>$2,000</td></tr>
<tr><td rowspan="2">III</td><td colspan="2">20%-24.99%</td><td>$4,000</td></tr>
<tr><td colspan="2">>25%</td><td>$5,000</td></tr>
<tr><td>C&I Direct Install</td><td colspan="4">70% of retrofit costs up to
$125,000</td><td colspan="2">Up to $53,571 OBRP
0% interest over 2 years</td></tr>
</table>

C. Goals and Resources

The goals of the SAVEGREEN program are as follows.

- Increase energy efficiency opportunities for customers.
- Promote and enhance the use of the NJCEP offerings.
- Raise awareness of the whole house approach to energy efficiency.
- Increase customer awareness of energy efficient appliances and weatherization measures.
- Increase NJ employment in energy efficiency and conservation.

Table II-2 displays the SAVEGREEN budget. Funding was provided in three different allocations, totaling $147.66 million from 2009 through 2015. The bulk of the funding was allocated for the Enhanced Rebate and the HPwES programs.

Table II-2
SAVEGREEN Budget by Program

Funding Source and Time Period		Residential				Commercial		Total
		Enhanced Rebate	HPwES	OPower	NJ Access[5]	Direct Install	Combined Heat and Power	
UE3	2009-2011	$8,566,501	$9,289,026			$665,108		$18,520,635
RGGI-1	2011-2012	$7,174,350	$5,787,842	$912,020			$1,000,000	$14,874,212
RGGI-2	2012-2013	$8,918,904	$13,270,883	$211,849	$1,000,000			$23,401,636
RGGI-3	2013-2015	$22,868,016	$60,500,000			$7,500,000		$90,868,016
Total	2009-2015	$47,527,771	$88,847,751	$1,123,869	$1,000,000	$8,165,108	$1,000,000	$147,664,499

D. Expenditure and Participation Statistics

Table II-3 displays the expenditures on the SAVEGREEN programs from 2009 through 2015 (partial year) by year and funding source. The table shows that expenditures ramped up quickly and reached a peak in 2013.

Table II-3
SAVEGREEN Expenditures by Funding Source and Year

Funding Source and Time Period		Year							Total
		2009	2010	2011	2012	2013	2014	2015	
UE3	2009-11	$1,450,185	$7,429,841	$2,407,729	$0	$0	$0	$0	$11,287,755
RGGI1	2011-12	$0	$200,000	$12,462,604	$4,656,604	$0	$0	$0	$17,319,208
RGGI2	2012-13	$0	$0	$0	$14,894,391	$13,977,605	$0	$0	$28,871,996
RGGI3	2013-15	$0	$0	$0	$0	$19,520,404	$31,345,336	$12,158,945	$63,024,685
Total	2009-15	$1,450,185	$7,629,841	$14,870,332	$19,550,995	$33,498,008	$31,345,336	$12,158,945	$120,503,643

Table II-4 displays the expenditures on the SAVEGREEN programs from 2009 through 2015 (partial year) by year and type of expenditure. The table shows that 85 percent of the funds were spent on rebates and On-Bill repayment.

[5] No ratepayer funds were spent on NJ Access, so it was not included in the evaluation.

Table II-4
SAVEGREEN Expenditures by Year and Activity

	Expenditure Type							Total
	Labor: Administration & Program Development	General Expenses: Sales, Call Centers, Marketing and Website	Rebates, Grants, and Other Direct Incentives	Labor: Rebate Processing, Inspections and Other Quality Control	OBRP	O% loan UCIS Billing	Training	
2009	$138,396	$560,546	$474,710	$276,332	$0	$0	$200	$1,450,185
2010	$388,362	$1,009,550	$5,451,590	$779,115	$0	$0	$1,225	$7,629,841
2011	$348,537	$1,923,513	$9,191,543	$1,050,801	$2,439,896	-$83,957	$0	$14,870,332
2012	$281,703	$1,682,786	$9,842,648	$1,188,269	$6,652,399	-$96,810	$0	$19,550,995
2013	$251,346	$1,941,029	$13,740,166	$1,224,056	$16,341,412	$0	$0	$33,498,008
2014	$261,637	$2,102,885	$9,971,807	$1,401,327	$17,607,681	$0	$0	$31,345,336
2015 (partial)	$147,345	$753,709	$3,695,707	$460,052	$7,102,132	$0	$0	$12,158,945
Total	$1,817,325	$9,974,017	$52,368,171	$6,379,952	$50,143,520	-$180,767	$1,425	$120,503,643

Table II-5 displays the expenditures on the SAVEGREEN programs by year and program. The table shows that the Home Performance and $6500 OBRP programs have succeeding in increasing participation over time, showing a movement towards more comprehensive services.

Table II-5
SAVEGREEN Expenditures by Program

	Residential					Commercial	Total
	Enhanced Rebate	HPwES	$6500 OBRP	OPower	UE3	Direct Install	
2009	$0	$0	$0	$0	$1,427,883	$22,302	$1,450,185
2010	$0	$200,000	$0	$0	$7,397,912	$31,929	$7,629,841
2011	$7,299,925	$5,029,928	$0	$132,750	$2,407,729	$0	$14,870,332
2012	$8,571,266	$10,670,834	$0	$308,895	$0	$0	$19,550,995
2013	$7,527,753	$24,992,462	$664,149	$313,645	$0	$0	$33,498,008
2014	$3,711,570	$24,572,752	$2,516,364	$304,500	$0	$240,150	$31,345,336
2015 (partial)	$1,493,327	$8,822,911	$1,298,586	$0	$0	$544,121	$12,158,945
Total	$28,603,841	$74,288,887	$4,479,100	$1,059,789	$11,233,524	$838,502	$120,503,643

Table II-6 displays participation in the programs. The table shows that the Rebate program has had the highest participation, with over 30,000 participants from inception through the end of 2014. The HPwES program also had substantial participation beginning in 2012. The annual number of rebates declined as the annual number of HPwES jobs increased.

Table II-6
SAVEGREEN Participation by Program
2009-2014

Year	Residential			C&I
	Rebates	OBRP		Direct Install
		$6500	HPwES	
2009	512	0	0	0
2010	4,881	0	0	0
2011	7,371	0	271	0
2012	6,973	0	721	0
2013	6,701	28	1,720	0
2014	4,218	246	1,721	16
2009-2014	30,656	274	4,433	16

E. Program Management and Administration

The SAVEGREEN Program is managed and supported by 26 NJNG staff members. The Energy Efficiency Marketing Manager oversees a staff of 13 and the Energy Efficiency Operations Manager oversees a staff of 11. These staff are also supported by members of NJNG's Regulatory, Performance Management and Support, Corporate Communications, Legal, and Customer Service departments and by the NJNG Service Company.

NJNG contracted with EnergySavvy to develop and implement a web-based software system following the two-year BPU approval of SAVEGREEN in 2013. Prior to the two-year approval, the BPU had only provided one year approval and NJNG was concerned that it would not be feasible or cost-effective to implement a new data system within that timeframe.

Prior to the implementation of EnergySavvy, NJNG kept track of all SAVEGREEN data in cumbersome spreadsheets that required additional administrative time to preserve the integrity of the information. The EnergySavvy data system has improved the efficiency and effectiveness of SAVEGREEN data and program management. The system has the following improvements for the program.

- Staff Management: NJNG can review the information in EnergySavvy to determine the workload of the SAVEGREEN staff. The manager can review the number of files each

processor is working on, how many files are waiting in intake, and how many files are waiting to receive promissory notes back, or are at other stages.

- Contractor Information: Contractors can review the status of their customers' jobs (i.e. waiting for credit approval, waiting to send or receive promissory notes, etc.). They no longer need to call NJNG to determine if the promissory note has been sent or when a check has been mailed to one of their customers. This is especially helpful for contractors who are in the field during the day and have a difficult time calling NJNG.

- Reporting: NJNG can now send CSG a weekly report of all jobs that are in the pipeline, and CSG can see the stage the customer is in, who the processor is, and who the contractor is.

- Program Management: NJNG can review how many jobs do not move forward because of credit, how many jobs are conversion jobs, and other counts.

- Customer Service: The system also improves customer service because if a NJNG staff member is out of the office, all of the information is captured in the system and another staff member can step in, provide information to the customer, and take comments from the customer. Customers can also log onto EnergySavvy and review the status of their job.

- Customer Participation: Customers can participate in an online energy audit using the EnergySavvy system. NJNG's online audit usage has increased since the implementation of this system because the audit is shorter and easier than NJNG's previous online audit, and customers don't need their account number to get started. This audit is also better integrated with SAVEGREEN than the previous online audit NJNG used. NJNG uses EnergySavvy to send follow-up email blasts to online audit participants, and NJNG can easily extract information and send messages based on customer characteristics.

- NJNG Audit Data: NJNG auditors enter data into the Surface and the data is updated in EnergySavvy when they connect to the internet. This has solved the problem of multiple data entry. Prior to the introduction of EnergySavvy, auditors were required to enter the data into Real Home Analyzer (RHA), the Home Energy Score data capture system, and NJNG's spreadsheet system.

- NJNG Audit Reports: NJNG auditors in the field can generate reports and provide immediate feedback to the customers. This helps the auditor to provide a presentation to the customer about additional energy efficiency opportunities. Previously, NJNG would mail out the audit report one to two weeks following the audit and some of the immediate impact was lost. NJNG has seen increased interest in installing the additional measures following this immediate reporting.

While there were challenges during the EnergySavvy implementation period, NJNG reports that the system is working very well now and doing most of what they hoped for. NJNG continues to meet with EnergySavvy and discuss tweaks needed or upcoming challenges.

F. NJNG Audits and Quality Control

NJNG has seven dedicated auditors and three additional staff members in the SAVEGREEN department who are qualified to perform audits. All audits include confirmation that the correct equipment was installed and a review of the health and safety conditions in the house consistent with BPI standards. Audits are required for receipt of the Enhanced Rebate or $6500 OBRP.

All of the NJNG auditors have the following BPI certifications.

- BPI Analyst
- Envelope Professional
- BPI Heating Professional
- Multi-Family Professional
- Air Conditioning and Heat Pump

The goal of the auditor training and certification is to understand the equipment in the field and how to communicate with customers and contractors. NJNG auditors continue to participate in webinars and seminars that offer BPI Continuing Education Unit (CEU) credits.

NJNG performs a BPI-certified audit, so this includes combustion testing on the equipment and an analysis of the installation. However, it does not include the blower door test. While an inspection is required by all municipalities, the follow through is up to homeowner or the contractor.

When a customer is considering further energy efficiency improvements as a result of information from their NJNG audit, a challenge is that contractors usually feel the need to perform their own audit to verify the findings and develop cost and savings estimates for the job. This can create confusion for the customer who feels they already had the audit and customers may resist if one of the subsequent contractors charges for the audit.

G. Contractors

Contractors must meet the following requirements to participate in SAVEGREEN.

- Enhanced Rebate: Any licensed contractor in NJ can participate in the SAVEGREEN Enhanced Rebate program. This is the same as what is required for the NJCEP WARMAdvantage Program. To date, 2,100 individual contractors have participated in the SAVEGREEN Enhanced Rebate program.

- $6500 OBRP: Each contractor is required to meet with NJNG and provide documentation of licensing and insurance. NJNG reviews the program requirements (in a

slide presentation) in detail with the contractor including the proposal, itemized pricing on the equipment, Manual J submission (software is not specified by NJNG), and the Manual S calculation. They have conducted group meetings and over 100 individual contractor meetings where they review the program guidelines. There are approximately 250 contractors certified to do the work and over 100 have performed these jobs.

- HPwES OBRP: CSG working for Honeywell as a NJCEP implementer has taken responsibility for the HPwES contractors. They require BPI certification and accreditation. There are 40 to 45 active HPwES contractors in the NJNG service territory. It has been challenging for NJNG to recruit additional contractors into this program because of the high initial cost that the contractor faces. The cost includes the BPI certification, accreditation, equipment, and additional paperwork for program submittals. Additionally, the contractors must have working capital because there is a lengthy (90-day) approval process for the NJCEP payments. NJNG has expressed strong interest in increasing the limited number of contractors primarily focused on the seal-up and insulation market.

- C&I Direct Install: There are three contractors assigned territorial responsibilities for the NJCEP Program within NJNG's service territory. Two are the main contractors and one is the refrigeration contractor throughout the state.

When SAVEGREEN was first implemented, fewer than 100 contractors were aware of the program and were recruiting customers to participate. NJNG originally purchased a list of HVAC licensed contractors in their service territory and began to spread the word about SAVEGREEN.

NJNG sends contractors information about programs and invite contractors for free training and informational sessions on a regular basis. They report that nearly every training they offer fills to capacity. In their most recent Manual S training (the 5th time this particular training was offered), NJNG had walk-ins that they had to turn away because the room could not fit them. They added additional classes to handle the interest.

NJNG has counter days at supply houses where they meet contractors. Some of the supply houses will send out information on the program to their mailing lists.

The BPI requirements have changed from a production-based fee to a lower flat fee that will be $1,200 per year. NJNG hopes that this change will bring more seal-up contractors into the program. Increased stability in the NJCEP has also helped to bring in more projects.

NJNG's success with contractors has been a result of constant outreach, as well as offering contractors free training and informational meetings. NJNG was the first to provide a class on the new water heater standards. NJNG has been working with Eastern Heating and Cooling Council (EHCC) since 2011 offering free training classes to contractors. These classes offer BPI and NATE CEUs. Over the years classes offered have included the following.

- Manual J
- Manual S
- Residential Duct Design & Sealing with ACCA Manual D
- Airflow and System Charging
- Gas Furnace Troubleshooting
- ECM Motors
- Heat Pump Troubleshooting
- Residential Airflow and System Charging
- Energy Efficiency – Beyond the Installation (NJNG worked with EHCC to develop this class that was designed to address the orphan hot water heater issues their auditors were seeing in the field.)

The contractors look to NJNG for the support that they need.

H. Marketing

NJNG has undertaken extensive marketing and outreach activities to promote SAVEGREEN. Table II-6 summarizes outreach activities undertaken between 2010 and 2014 and shows the large number of homeowners, contractors, realtors, and other businesses that have been reached.

Table II-6
NJNG SAVEGREEN Marketing and Outreach Activities, 2010-2014

Activity Type	Target	2010		2011		2012		2013		2014	
		#	Total Reached	#	Total Reached	#	Total Reached	#	Total Reached	#	Total Reached
Display	Homeowners	58	129,302	89	36,685	43	42,451	47	34,494	27	18,950
Display	Businesses	15	2,600	8	1,550	14	2,100	13	3,030	11	2,025
Display	Municipalities	3	0	4	3,500	3	1,000	4	8,025	3	7,775
Display	Schools	1	1,000	0	0	1	80	3	875	0	0
Display	Contractors	0	0	1	125	0	0	1	75	3	375
Display	Realtors	0	0	1	5,500	1	5,500	1	4,000	1	5,000
Presentation	Homeowners	60	161,905	42	2,985	13	550	24	1,125	9	183
Presentation	Contractors	6	10	1	700	0	0	1	55		
Presentation	Realtors	22	624	1	20	1	15	2	50	1	15
Presentation	Businesses	11	722	19	735	1	30	3	115	1	30
Presentation	Municipalities	7	40	5	60	10	315				
Presentation	Schools	0	0	0	0	10	120	4	195	3	175
Channel Presentation	Contractors	0	0	0	0	0	0	0	0	0	0
Channel	Realtors	0	0	12	320	0	0	0	0	0	0

Activity Type	Target	2010		2011		2012		2013		2014	
		#	Total Reached	#	Total Reached	#	Total Reached	#	Total Reached	#	Total Reached
Presentation											
Channel Program	Contractors	0	0	2	95	0	0	0	0	0	0
Email	Homeowners	6	270,666	5	197,741	5	273,159	10	383,841	13	546,476
Email	Contractors	7	1,538	22	8,468	24	129,797	21	13,837	17	13,091
	Realtor					2	375	3	766	3	981
DM	Homeowners	9	551,009	10	358,239	8	1,097,128			2	483,000
DM	Contractors	10	3,988	1	1,800	0	0	1	2,000	1	2,000
DM	Businesses	2	5,050	0	0	0	0	0	0	0	0
Meeting	Contractors	8	161	0	0	0	0	0	0	0	0
Meeting	Businesses	1	0	0	0	2	60	0	0	0	0
Meeting	Municipalities	2	12	0	0	0	0	0	0	0	0
Online Ad	Homeowners	12	0	0	0	0	0	0	0	0	0
Online Ad	Businesses	3	0	0	0	0	0	0	0	0	0
Mailing	Homeowners	2	0	0	0	0	0	0	0	0	0
Mailing	Contractors	0	0	0	0	0	0	0	0	1	1,867
Print Ad	Homeowners	44	661,742	0	0	0	0	0	0	0	0
Print Ad	Realtors	1	0	0	0	0	0	0	0	0	0
Print Ad	Businesses	4	33,500	0	0	0	0	0	0	0	0
Misc.	Homeowners	2	2,000	0	0	0	0				
Misc.	Contractors	1	125	0	0	0	0				
TOTAL		**297**	**1,825,994**	**223**	**618,523**	**138**	**1,552,680**	**138**	**452,483**	**96**	**1,081,943**

2010-2014 TOTAL	TOTAL NUMBER OF MARKETING ACTIVITIES	TOTAL NUMBER OF INDIVIDUALS REACHED
	892	**5,531,623**

NJNG tracks the source of their participant leads to assess how marketing activities are working. They have found that the print advertisements have not been as impactful as the other forms of outreach and that website banner advertisements provide the most leads, followed by contractors, and then friends or neighbors. NJNG has also undertaken other types of outreach.

- Targeting mailings to customers who have had audits to see if they are ready to undertake HPwES.

- Re-marketing to customers who have sent inquiries via the SAVEGREEN microsite or completed the online audit and were identified as good candidates for the program.

- Links from certain municipal websites to SAVEGREEN.

- Partnerships with the C&I Direct Install contractors to bring customers in and educate them about the program.

I. On-Bill Repayment

NJNG estimates that approximately 80 to 85 percent of applicants are approved for the On-Bill Repayment programs. They also estimate that fewer than ten customers have defaulted on their agreements.

The On-Bill Repayment loan period is ten years for HPwES jobs, five years for $6500 OBRP jobs, and two years for the C&I Direct Install Program.

Customers are required to pay off their loan amount before they close their NJNG account. The loan is taken out by the person at the property where the work was done.

If a customer wants to make additional payments, they must contact NJNG to make sure that additional money is credited to their outstanding OBRP instead of their gas bill. The additional payment must be 20 percent or more of the original loan amount because it is a manual adjustment process.

J. Enhanced Rebate Program

The Enhanced Rebate Program provides an incremental incentive to customers who install a qualified natural gas furnace or boiler. The program involves the following steps.

- Customer installs a WARMAdvantage qualified furnace or boiler.
- Customer contacts NJNG to set up the no-cost audit.
- The NJNG audit scheduler enters the customer information into EnergySavvy.
- The NJNG SAVEGREEN auditor performs the audit and confirms the eligibility of the furnace or boiler for the SAVEGREEN rebate.
- NJNG auditors review the audit report with the customer and process the rebate.
- If the customer sent in the rebate application but had not had the audit, NJNG will reach out to the customer three times by phone and by mail to schedule the audit.
- The NJNG rebate processor checks that the equipment was qualified and the audit was completed and enters the information into NJNG's central IT system.
- The NJNG supervisor reviews the entry and then the rebate is approved and vouchered, the job is closed in EnergySavvy, and the checks are mailed from NJNG's accounts payable department.

About 25 percent of customers who receive the audit sign the release for their information to be shared with contractors. This percentage has varied over time and NJNG has made recent efforts to improve that percentage. The use of infrared cameras that show customers where they are losing heat and the immediate presentation of the audit report are examples of changes NJNG made to help improve participation.

K. Home Performance with Energy Star On-Bill Repayment Program

The HPwES On-Bill Repayment Program (OBRP) provides On-Bill Financing of up to $10,000 over a ten-year period for customers who participate in the HPwES program offered through NJCEP. Customers who participate in the NJNG OBRP also receive their rebate from NJNG according to the NJ Clean Energy Program specifications. The steps in this process are as follows.

- The customer sends the application to NJNG.
- NJNG Intake checks the data and calls or emails the customer if there is any information missing on the application.
- The NJNG staff member enters the information into EnergySavvy.
- If the customer does not have a HPwES contractor listed, NJNG will call the customer to ask if a contractor is needed. If the customer has questions, the NJNG staff member will transfer the call to one of NJNG's SAVEGREEN energy consultants who can help the customer find a HPwES contractor on the NJCEP website.
- NJNG prints out the snapshot, deed, and the application. The applicant must be the homeowner and the name(s) on the application must match the name(s) on the gas account.
- NJNG processes the account through credit. If the customer has two or more late payments (30+ days), NJNG will send a denial letter. If payments have been on time, the information is sent to the NJNG credit department.
- NJNG's credit department runs a bankruptcy check.
- If the bankruptcy check comes back denied, NJNG sends a denial letter and enters the information into EnergySavvy.
- Both the customer and the contractor receive an automated email from EnergySavvy about the OBRP denial. The denial to the customer includes information about how the customer can apply to other financing programs offered by NJCEP. These include Energy Finance Solutions (EFS) or cuGREEN (the credit union program). There are cases where the customer may be able to obtain one of these loans even if denied by NJNG. NJNG must deny the customer for OBRP before the customer can apply to these other financing sources. Customers must supply a copy of the denial letter to EFS or cuGREEN when applying for their finance program.
- If the bankruptcy check is approved, the information is entered into EnergySavvy, and an approval email and hard copy letter is sent to the customer. The contractor is also sent an email informing him that the customer was approved for OBRP.
- A NJNG processor receives the file to complete the processing.

- The contractor submits project information to CSG through Real Home Analyzer (RHA). The contractor uploads the proposed measures and customer contract to EnergySavvy. The audit data cannot currently be imported into EnergySavvy because of the version of RHA that is in use in New Jersey.
- Once a week, NJNG receives an incentive claim report from CSG that notifies NJNG that the contractor submitted the project information, CSG reviewed the proposed measures, and it is an official, approved HPwES project.
- NJNG then sends the customer a promissory note and a Truth in Lending statement. This agreement is between NJNG and the customer. NJNG is promising to loan up to $10,000 and the customer is promising to pay the funds back to NJNG.
- Any arrangement between the customer and the contractor is separate. Some contractors ask the customer for a deposit and some contractors wait for the customer's loan to come through.
- NJNG aims to receive the signed documents within 14 days. EnergySavvy automatically sends out email reminders if NJNG does not receive the paperwork.
- When the signed paperwork is returned, the NJNG processor notes this in EnergySavvy.
- When the project is completed, CSG sends the PDF of the signed work completion from the customer to Honeywell. Honeywell reviews the paperwork and then lets NJNG know to pay the customer. Twice a week NJNG receives a list of projects with a copy of the signed work completion.
- NJNG double checks that the completed job amount noted on the work completion are the same as the project information. If the amount is different, NJNG has to obtain a field change order from the contractor. They find that 85 percent of the time it is the same. The NJNG processor puts the paperwork together for a voucher, signs the voucher, and obtains two more signatures, from NJNG supervisors, managers, or the vice-president. The voucher is sent to accounts payable with instructions to return the check to the OBRP processor.
- The signed Truth and Lending form is given to a marketing CSR to enter the OBRP amount in special charges to initiate billing. A marketing supervisor or manager performs an audit to ensure that the data entry is correct. SAVEGREEN processing receives the checks back on Wednesday, and they are sent to the customer on Friday.
- Once the check is sent out, the job is complete. Clerical staff is given the paperwork to record the measures in EnergySavvy.

L. $6500 On-Bill Repayment Program

The $6500 On-Bill Repayment Program provides no-interest on bill financing for five years for up to $6,500 for customers who install a WARMAdvantage qualified furnace or boiler and a water heater at the same time. This $6500 OBRP option was introduced to reduce the problem of orphaned water heaters. When only the furnace is replaced with a high efficiency furnace and the chimney that had previously vented the gases from the furnace and water heater is now only venting the gases from the water heater, this creates unsafe water heater venting. The focus on replacing both systems simultaneously was also intended to eliminate a potential barrier to further seal-up and insulation.

NJNG also requires the Manual J and Manual S so they know that the equipment is sized properly and that the home is ready for home performance.

The steps for the $6500 OBRP process are as follows.

- A NJNG clerical staff member reviews all of these applications and handles intake.
- Once the application is complete, it is sent for the credit check and the approval or denial is sent to the customer.
- The contractor sends or uploads the proposal and .the Manual J and Manual S calculations to EnergySavvy or sends them to NJNG and NJNG uploads them to EnergySavvy.
- The proposal information is entered into EnergySavvy. This includes the measures, the OBRP amount, and the total project cost. The OBRP can be up to $6,500 on the heating and water heating measures. If the measures are at least $7,400, the customer would receive the $900 Clean Energy rebate and the maximum $6,500 OBRP.
- The NJNG SAVEGREEN Manager or SAVEGREEN contractor outreach supervisor reviews the proposal and the Manual J and Manual S calculations. If they do not meet the program's eligibility requirements, they will let the contractor know. Sometimes it is a matter of tweaking the equipment. They will then review the revised information when submitted by contractor.
- If the proposal does pass review, the NJNG processor sends the promissory note and Truth in Lending documents to the customer.
- After the job is complete, the customer calls to set up the mandatory audit.
- The auditor always tries to obtain the contractor release. The auditor's job is not only to do the audit and check equipment, but to show the customer additional opportunities to save energy, including how they may be able to participate in the HPwES program.
- Once the audit is completed, NJNG can issue the check. Checks are issued to the customer, as the agreement is with the customer.[6] The customer pays the contractor or may have already paid. That is between the contractor and the customer. The vouchering system is the same as in the HPwES.
- At the end of the process (both HPwES and non-HPwES OBRP), the check number and the tracking code is entered into NJNG's IT system.

Customers can move from the $6500 5-year OBRP to $10,000 10-year OBRP if they perform the HPwES work within six months. The new approved filing allows customers to have 18 months (as compared to the current six months) to convert their five-year $6500 OBRP to a ten-year HPwES OBRP when installing additional whole-house through the HPwES program.[7] Some customers need to experience a winter with the new furnace/boiler before deciding on additional work. Many customers think they are energy efficient after they replace the furnace. Although the audits show them they are not, it can take more than six months for them to be ready to make a decision about whether to move forward with additional work.

[6] Beginning October 1, 2015, financing is sent directly to the contractors.
[7] The increase to 18 months was implemented beginning October 1, 2015.

M. C&I Direct Install

The NJ Clean Energy Program offers a Commercial and Industrial Direct Install Program for small to mid-sized commercial, industrial, and local government buildings with a peak electric demand that did not exceed 200 kW in any of the preceding 12 months. The turnkey program provides access to approved participating contractors who conduct an assessment and install measures including lighting, HVAC, and refrigeration. The NJCEP provides reimbursement for 70 percent of the participant's costs up to a maximum of $125,000.

The NJNG SAVEGREEN program has increased the benefits offered through this program by providing two-year interest free on bill financing for up to the remaining 30 percent of the project cost or a maximum of $53,571.[8] NJNG customers who meet the NJCEP eligibility guidelines and meet NJNG's credit guidelines are eligible for the on bill repayment.

Within NJNG's service territory, there are two primary approved contractors, in addition to the statewide Direct Install refrigeration contractor.

N. OPower Pilot

NJNG contracted with OPower to provide mailings to customers with information on their energy usage compared to their similar neighbors. The objectives of the pilot were to provide measurable energy savings and to increase participation in energy efficiency programs.

OPower randomly assigned high usage customers to a group that received the reports and a group that did not. In the first year of the program 25,000 customers received six OPower reports and in the second and third years, 43,000 customers received four OPower reports.

OPower conducted surveys to measure whether the information impacted customers' perceptions of NJNG and knowledge about energy efficiency offerings. They found that the program did achieve these objectives.

O. Coordination with NJ Clean Energy Program

The NJCEP market managers and coordinator reported that NJNG has worked collaboratively to implement and coordinate SAVEGREEN with the NJCEP. They noted that NJNG has successfully developed programs that are complimentary to NJCEP and that address a market segment or product gap, an approach has worked well for the NJCEP. One manager stated that NJNG's coordination approach has been exceptional and that "there is an intelligence about their communications because they understand what the NJCEP is trying to do."

[8] This was increased from the initial maximum of $37,500 so that the OBRP would cover 30 percent of the project cost if the maximum incentive of $125,000 was reached on the 70 percent incentive.

An example is that the C&I Direct Install OBRP addresses a need in the Direct Install program. The small to medium sized commercial businesses had 30 percent of the improvement costs to cover after the NJCEP incentive, and that can be a hurdle, so the OBRP for the remaining cost helps to facilitate their participation in the program. Other examples are the OBRP that reduces the cost of financing for residential customers and the OPower Pilot, which was something that the NJCEP was interested in exploring.

When asked about the impact of SAVEGREEN on NJCEP participation, the market managers reported that they could not quantitatively address this issue, but had heard that SAVEGREEN helped to increase participation. NJNG SAVEGREEN has raised consumers' consciousness about energy efficiency. They reported that SAVEGREEN spurs customers to look deeper at home performance and the whole house concept. The program is only in NJNG's service territory, but the contractors who operate there are happy with the program and other contractors wish they had that opportunity. NJNG does a lot of marketing in their territory and they promote energy programs, and this helps in getting word out about the availability of the program. They noted that the number of Home Performance contractors and projects per customer are much higher in the NJNG service territory than in the other utility service territories.

NJCEP and SAVEGREEN managers have discussed a more coordinated marketing effort, but that is limited by what the NJCEP market managers' contract allows them to do. The NJCEP managers felt that more coordinated marketing and outreach could be helpful.

One challenge that was noted was barriers in sharing data due to confidentiality restrictions. These issues relate to both NJNG's requirements and the BPU's requirements. Another challenge is that all of the utilities developed their own programs on their own timelines. The utility filings are reviewed one at a time by the BPU, not in coordination, and the differences between the utility programs has been a challenge.

P. DOE Home Energy Labeling

NJNG SAVEGREEN has been an active participant in the DOE Home Energy Score (HES) Labelling Program, has scored thousands of homes, and has been DOE's largest partner in the program. NJNG has worked closely with DOE, providing feedback on how the HES was working and how it could be refined. DOE utilized the information from NJNG to make modifications to the HES in 2014 and DOE reported that they were extremely positive about the successful collaboration with NJNG on the HES.

The most significant change that DOE made in response to feedback from NJNG was a change to the scoring calculation. DOE did not change how the tool estimates the amount of energy used by the home. However, after getting feedback from NJNG, among other partners, that homeowners lacked mobility on the scale, DOE modified what it took into consideration to determine the HES as well as the energy values associated with the 10-point scale. While DOE previously included the baseload in the score, the score is now only based on estimated heating, cooling and hot water usage. This change relates to the fact that DOE is focused on energy usage that is related to the structure of the home and not to the behavior

of the individuals who live in the home. Since DOE does not allow the score to improve through changes in the plug load or baseload, they took this out of the home scoring.

DOE also made improvements to the HES software interface based on feedback from NJNG. NJNG was first to use DOE's software and they helped DOE to fix glitches in the documentation and work through problems in the software. The software now works more effectively.

NJNG assessors also provided input for DOE's training class that provides information on how to score homes and prepare assessors to take the certification test. Many assessors, including those from NJNG, helped DOE to confirm what skills are needed to provide a home assessment and what needed to be taught in the training.

NJNG was initially interested in the HES because they felt that it was difficult to transfer information to the customer about the home in the short amount of time they had available. They felt that the 10-point scale was simple to understand and easy to communicate to customers where their home was in terms of energy efficiency and the opportunities available for improvement. They also felt that the HES was a motivational tool to encourage the customers to move forward and install additional measures.

When NJNG initially researched the score, they found that there were only five or six additional data points that would need to be collected to compute the score. This only added about ten minutes to the process, so they felt it was worth participating.

All of the SAVEGREEN audited homes are scored and half of the customers receive a presentation of the HES. This is part of a research project to determine whether the presentation of the score increases the uptake of measures.

NJNG also feels that the relationship with DOE on the HES project has been important for the Company. SAVEGREEN is on the leading edge and NJNG has increased the credibility of the program audit because they are affiliated with the DOE project. NJNG is working on an additional project with DOE where they score homes at the beginning and end of the upgrades to compare the pre and post upgrade scores and compare the post upgrade score to the projected score.

Q. Program Challenges and Successes

NJNG has faced some challenges in the implementation of SAVEGREEN, primarily the short-term program approval, frequent changes in the NJCEP, and contractor education.

- Short-Term Approval: The primary challenge that the NJNG SAVEGREEN program has faced was their inability to develop long-term strategies for the programs due to the annual and now bi-annual BPU program approval. NJNG noted that the two-year approval was a great improvement that allowed for increased flexibility.

The short-term approach has challenged marketing, data system development, personnel, and job completion over the initial years of the program implementation.

- Marketing: NJNG cannot make solid commitments in terms of print advertisements or web-based materials and cannot start production of those materials until the program is approved. Each year as the program approval period was coming to an end, they could not book marketing engagements. The two-year approval received in 2013 provided more consistency with customers and contractors.

- NJNG Personnel: Most members of the SAVEGREEN department at NJNG would not be employed if SAVEGREEN was terminated. This has made it difficult for NJNG to retain staff who leave their positions for other opportunities that provide more stability and permanency. The longer approval period has made it easier for NJNG to retain staff.

- Job Completion: Home Performance jobs can take several months to complete. Therefore, it was difficult for contractors to begin work in the few months preceding the end of the approval period, with the concern that the program would not be continued or would be significantly altered.

- Contractors: A longer program horizon helps contractors to gear up marketing efforts and hire staff. After the two-year approval, one of the more active contractors opened up an office and began to concentrate efforts in NJNG's service territory.

- Changing NJCEP Requirements: Another challenge for SAVEGREEN is changes in the NJCEP requirements, as the SAVEGREEN program follows the NJCEP. Therefore, whenever there are changes in the NJCEP, NJNG must change its outreach, literature, and website. During 2010, the NJCEP was suspended for almost three months, and in September 2015 NJCEP stopped taking new DI assessments. These stoppages created additional challenges.

- Data Sharing: The BPU has been considering how to share data between the NJCEP and the utilities. NJNG proposed to offer a free audit to customers who installed a new water heater and received a NJCEP WARMAdvantage rebate to encourage those customers to participate in HPwES. However, there were restrictions that prevented the BPU from sharing the participant information that would allow for such targeting marketing.

- Contractor Education: Technological innovations in equipment has made it difficult for the contractors to keep up with installation requirements. NJNG has provided education and outreach to help contractors understand the requirements of installing high efficiency equipment. The education and outreach has had an effect, as the number of orphaned water heaters and the number of one pipe installations, where the intake requirements draw inside house air, have declined.

- Conversions to HPwES: NJNG has faced challenges in having customers who replaced equipment to complete whole house upgrades. There have been some changes in

SAVEGREEN and the NJCEP that should provide greater encouragement for the air sealing and insulation work.

  - Timing: NJNG has modified the program to allow customers to wait 18 months (instead of only six months) to move from a $6500 OBRP to an HPwES OBRP. It appeared that customers needed more time to see how their home performed in a winter after installation of the new system and to be ready to undertake additional work in their homes.

  - NJCEP Incentives: Under the prior program requirements, customers needed to obtain at least ten percent projected savings to receive a rebate under the NJCEP. It could be difficult for customers who had already replaced their HVAC systems to achieve this additional ten percent projected reduction. However, with the changes that were implemented in August 2015, participants can now receive the $2,000 rebate with five percent projected savings. One contractor let NJNG know that he would reach back out to customers who he had worked with and had not been able to reach the ten percent.

- Seal-Up Contractors: NJNG has faced challenges in recruiting air sealing and insulation contractors to participate in the program. These contractors are needed to provide services to customers who had already installed new HVAC and potentially water heating equipment, but had not yet implemented the whole house improvements.

- Participation in $6500 OBRP: NJNG reported that they have worked to increase participation in the $6500 OBRP through trainings and outreach, but that it took almost a year for contractors to be comfortable marketing the new program. One challenge is that some contractors do not install water heaters, only heating and air conditioning, and in that case part of the work crosses over into another trade.

  NJNG has had over 200 contractors attend a meeting or had a personal visit to review the program terms to be part of the $6500 OBRP program, but not all were willing to perform the Manual J and Manual S calculations that are required. (The contractors are required to perform those calculations for the $6500 OBRP, but not for the rebate. If the customer is just doing the WARMAdvantage and SAVEGREEN Enhanced rebate, the installations may already be completed before the customer applies for the SAVEGREEN rebate, and it is too late to do the sizing calculations.)

The major accomplishments of the program are the amount of outreach conducted and the high levels of participation achieved, improved health and safety in customers' homes, the number of contractors that they have trained, and the implementation of the DOE Home Energy Score.

- Outreach: NJNG has succeeded in promoting awareness of SAVEGREEN and has been in the homes of more than 30,000 customers. They have educated customers and contractors about SAVEGREEN and about energy efficiency.

- Improving Health and Safety: NJNG promoted the need for the combination rebate because it reduced the orphaned hot water heater issues.

- OBRP Offering: The average income of the participants is $61,000, as compared to $93,000 when NJNG only offered financing through EFS. SAVEGREEN is making the measures affordable for many more customers, and they have had fewer than ten defaults.

- Customer Service: NJNG continues to focus on excellent customer service to the large number of SAVEGREEN participants. The audit team had been in over 30,000 homes. In those visits NJNG has been able to put a face behind the company. Customers have been able to develop personal relationships with the utility. The SAVEGREEN staff are able to talk to the customer one-on-one about usage and what they can do to improve their individual situation.

- Connections to the Marketplace: NJNG is small enough that all of the SAVEGREEN staff members interact with customers and contractors. As a result, NJNG receives a lot of feedback that they use to try to make program improvements.

- NJNG Leadership Commitment: NJNG management has helped with the program, from the top down. For example NJNG received approval in October 2013 for the commercial OBRP and were able to launch it in January 2014 because they had the support of the Company.

- Contractor Training Programs: NJNG has successfully trained hundreds of contractors on SAVEGREEN and technical skills needed for energy efficiency work.

- Efficiency: SAVEGREEN has publicized the programs and served thousands of customers with only 29 staff members working on the program (previously fewer).

- DOE Home Energy Score: NJNG has provided constructive feedback that has helped shape the DOE Home Energy Score program. NJNG works closely with DOE to help shape and tweak the HES, and NJNG scored 54 percent of the homes scored across the U.S. prior to the program being picked up more broadly across the U.S.

- Participation: NJNG has only 15 to 17 percent of the residential customers in the state, but they have served 30 percent of the NJCEP participants in some programs. In a recent NJCEP update, NJNG's OBRP accounted for over 30 percent of HPwES in the state. This percentage has at times been as high 50 percent of the NJCEP activity. It is consistently much higher than the expected share of activity would be based on population served.

R. Program Modifications

NJNG proposed the following minor changes in their most recent filing. These changes were subsequently approved.

- Expand OPower in a few focused ways and continue to use a control group to test results.
- Extend C&I Direct Install to a three-year OBRP.
- Provide a small rebate for hot water heaters installed, following a required no cost audit to try to get those customers to install more measures through the HPwES program.

III. Participant Feedback

APPRISE conducted in-depth telephone interviews with participants in the following NJNG SAVEGREEN Programs.

- Residential Enhanced Rebate (Enhanced Rebate)
- Residential Non-Home Performance On-Bill Repayment ($6500 OBRP)
- Residential Home Performance with Energy Star On-Bill Financing and Rebate (HPwES OBRP)
- Commercial and Industrial Direct Install Program (C&I)

The goal of the participant interviews was to develop information on the following research issues.

- SAVEGREEN information source
- Motivation for SAVEGREEN participation
- Program impact on energy efficiency implementation
- Program impact on whole-house approach
- Other factors impacting measure selection
- Free ridership and spillover
- Impact of measures on bills and home comfort
- Contractor performance
- Use of SAVEGREEN web-based tool
- Interaction with NJNG representatives
- Plans for additional energy efficiency measures
- Program satisfaction and recommendations

A. Methodology

Table III-1 summarizes information on the sample frame, call attempts, field periods, and completed interviews. The goal of 50 interviews across the four programs was reached with between one and seven calls made to participants over a one to three week field period that varied in length by program.

Table III-1
Interview Methodology

	Residential Programs			C&I Program
	Enhanced Rebate	**HPwES OBRP**	**$6500 OBRP**	**Direct Install**
Participation Dates	6/1/14-12/31/14			2014
Excluded Cases	Fuel Switch[9]	Project Cost Missing	Fuel Switch	None
Sample Stratification	Signed Contractor Release Home Energy Score Presented	NJ Clean Energy Program Tier II or III	None	None
Sample Frame	1,513	807	179	13
Selected Sample	50	50	15	13
Call Attempts	1-7	1-4	1-2	
Field Period	4/16/15 – 5/8/15	4/24/15 – 5/12/15	4/23/15-4/29/15	4/28/15-5/1/15
Targeted Completes	20	20	5	5
Completed Interviews	20	20	5	5
Interview Length	10-35 minutes	16-45 minutes	15-22 minutes	11-20 minutes

B. Residential Program Findings

Results are presented in the following areas.

- Background
- SAVEGREEN Process
- Information and Communication
- HPwES Audit
- Efficiency Measures
- NJNG Audit for Enhanced Rebate and $6500 OBRP
- SAVEGREEN Impact
- Satisfaction and Recommendations

Background

Respondents were asked how they first heard about the NJNG SAVEGREEN residential programs. Table III-2 shows that the most common source of information was the contractor. Other sources that were frequently mentioned were the NJNG website, a friend or family member, or a neighbor.

Thirteen of the 20 Enhanced Rebate respondents stated that they learned about the program through the contractor and three stated that they learned through the NJNG website (one specifically mentioned the SAVEGREEN website.) However, there were several other

[9] There was an attempt to remove fuel switches so that the interviews focused on SAVEGREEN rather than other changes in the home.

information sources mentioned, including a NJNG representative who was in the neighborhood, a newspaper advertisement, a Home Depot salesperson, and a friend.

Some of the HPwES participants who noted that they learned about the program through a contractor stated that the contractor had been canvassing the neighborhood to see if additional NJNG customers were interested in participating.

Table III-2
SAVEGREEN Information Source

SAVEGREEN Information Source	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All Programs
Contractor	13	1	9	23
NJNG Website	3	2	0	5
Friend / Family	1	0	3	4
Neighbor	0	0	4	4
Newspaper Advertisement	1	1	1	3
NJNG Mailing	0	1	1	2
NJNG Representative in Neighborhood	1	0	0	1
Home Depot Salesperson	1	0	0	1
NJNG Representative	0	0	1	1
Research	0	0	1	1
Total	**20**	**5**	**20**	**45**

Customers who did not report that they first heard about the program through the contractor were asked whether they asked the contractor about the program or the contractor first offered information. Table III-3 shows that about half of the contractors offered information about the program and about half of the customers asked the contractor about the program. Only one customer stated that the contractor was not aware of the program.

Table III-3
Contractor Provided Information or
Customer Asked About SAVEGREEN

Contractor Provided Information	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All Programs
First Heard From Contractor	13	1	9	23
Contractor Offered Information	2	4	4	10
Customer Asked Contractor About Program	2	0	7	9
Contractor Did Not Mention Program	2	0	0	2
Contractor Not Aware of Program	1	0	0	1
Total	**20**	**5**	**20**	**45**

Customers provided varied responses when asked how long they had been considering replacing the furnace or boiler when they first heard about the rebate program. Table III-4 shows that ten customers had not been considering the work when they heard about the program, seven had been thinking about it for less than six months, seven had been thinking about it for six to nine months, ten had been thinking about it for 12 to 18 months, and 11 had been thinking about the work for more than 18 months.

Four of the Enhanced Rebate customers reported that they had a broken or failing furnace and two stated that they were replacing a broken air conditioner and decided to replace the furnace at the same time. Some Enhanced Rebate participants only heard about SAVEGREEN during or after the installation. Others needed to replace equipment or wanted to switch to natural gas.

Most of the HPwES OBRP customers had not been considering energy efficiency upgrades for very long when they first heard about the program. While seven of the 20 had not been considering it at all, five had been considering the upgrades for less than one year. Some HPwES OBRP participants had a specific issue that they had been thinking about addressing.

Table III-4
Length of Time Work was Considered
When Respondent Heard about SAVEGREEN

Months Considered	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All Programs
0	3	0	7	10
<1	2	0	0	2
1-2	2	0	1	3
3-4	0	2	0	2
6-9	2	1	4	7
12-18	2	1	7	10
24	4	0	0	4
36	2	0	0	2
60	1	0	0	1
10 Years	0	0	1	1
20 Years	0	1	0	1
Already was Replaced	1	0	0	1
Don't Know	1	0	0	1
Total	**20**	**5**	**20**	**45**

The HPwES OBRP participants were asked for the main reason that they decided to participate in the program. The respondents were most likely to state that they wanted to save money or energy, the attractive financing benefits, and their aging home equipment.

Table III-5
Main SAVEGREEN Participation Reason

Participation Reason	HPwES OBRP
Save Money/Energy	8
SAVEGREEN Financing	7
Home Energy Equipment Needed Replacement	7
Switch to Natural Gas	2
Improve Home Equipment	2
Rebate	1
Environmental Benefits	1
Contractor Solicitation	1
Home Comfort	1

*Customer can provide more than one response.

SAVEGREEN Process

Enhanced rebate respondents were told that even though they probably received a separate incentive from the NJ Clean Energy program, the questions about the rebate process relate only to the NJNG SAVEGREEN Program.

While 15 of the Enhanced Rebate customers applied for the rebate themselves, in five cases the contractor applied for the customer. Seven of the 15 customers who stated that they applied for the rebate said that the contractor helped fill in part of the application.

Table III-6
Rebate Applicant

Rebate Applicant	Enhanced Rebate
Customer	15
Contractor	5
Total	**20**

Table III-7 shows that 36 of the 45 participants said that the SAVEGREEN application process was very easy, four said it was somewhat easy, and five (all Enhanced Rebate) stated that the contractor applied.

Table III-7
SAVEGREEN Application Process

SAVEGREEN Application Process	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All Programs
Very Easy	14	5	17	36
Somewhat Easy	1	0	3	4
Contractor Applied	5	0	0	5
Total	**20**	**5**	**20**	45

Table III-8 shows that 33 of the participants said their application was accepted the first time, five said that the contractor applied, and four said that they had to send in additional information.

Table III-8
SAVEGREEN Application Acceptance

SAVEGREEN Application Acceptance	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All Programs
First Application	12	4	17	33
Sent in Additional Information	0	1	3	4
Don't Remember	3	0	0	3
Contractor Applied	5	0	0	5
Total	**20**	**5**	**20**	45

All of the Enhanced Rebate participants reported that the rebate was sent to them (not the contractor) and they received the incentive amount at a later point after paying for the equipment and installation. However, none felt that the wait for the Enhanced Rebate was a barrier to installing the high efficiency furnace or boiler. Table III-9 shows that 17 of the 20 Enhanced Rebate participants were very satisfied with the time to receive the SAVEGREEN rebate, two were somewhat satisfied, and only one was somewhat dissatisfied.

Table III-9 also shows that 42 of the 45 participants were very satisfied with the application process overall.

Table III-9
SAVEGREEN Process Satisfaction

	Satisfaction				
	Time to Receive SAVEGREEN Enhanced Rebate	Application Process			
		Enhanced Rebate	$6500 OBRP	HPwES OBRP	All Programs
Very Satisfied	17	17	5	20	42
Somewhat Satisfied	2	3	0	0	3
Somewhat Dissatisfied	1	0	0	0	0
Total	**20**	**20**	**5**	**20**	45

The Enhanced Rebate participants were asked if they received the NJ Clean Energy Rebate. Table III-10 shows that 14 of the 20 respondents reported that they received the NJ Clean Energy Rebate, two said they had not yet received it, and three did not know.

Table III-10
Received NJ Clean Energy Rebate

Received NJ Clean Energy Rebate	Enhanced Rebate
Yes	14
No	1
Not Yet	2
Don't Know	3
Total	**20**

The Enhanced Rebate customers did not have as high levels of satisfaction with the time to receive the NJ Clean Energy rebate or the rebate process as with the SAVEGREEN rebate. Table III-11 shows that four were somewhat or very dissatisfied with the time to receive the NJCEP rebate or the NJCEP rebate process.

Table III-11
NJ Clean Energy Program Satisfaction

	Enhanced Rebate Participants' Satisfaction with NJ Clean Energy Program	
	Time to Receive NJCEP Rebate	NJCEP Rebate Process
Very Satisfied	11	11
Somewhat Satisfied	1	2
Somewhat Dissatisfied	0	2
Very Dissatisfied	4	2
Not Applicable	4	3

	Enhanced Rebate Participants' Satisfaction with NJ Clean Energy Program	
	Time to Receive NJCEP Rebate	NJCEP Rebate Process
Total	**20**	**20**

Respondents were asked if they had any suggestions for improving the program process. Table III-12 shows that 40 of the 45 respondents did not have any suggestions. One $6500 OBRP participant said that it would be helpful to put a list of contractors on the website (note that there currently is a list of such contractors on the NJNG SAVEGREEN website.)

The HPwES OBRP participants recommended providing an online application, providing accurate information about the program, keeping the current NJNG staff who were doing a very good job, and to conduct this survey sooner after services.

Table III-12
Participant Recommendations for SAVEGREEN Process

Recommendations for SAVEGREEN Process	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All Programs
Contractor List on Website	0	1	0	1
Online Application	0	0	1	1
Provide Accurate Information	0	0	1	1
Keep NJNG Staff (very satisfied)	0	0	1	1
Conduct Survey Earlier	0	0	1	1
None	20	4	16	40
Total	**20**	**5**	**20**	45

Information and Communication

Customers were asked whether they called NJNG to discuss SAVEGREEN (other than the call to schedule the audit). Table III-13 shows that 18 of the 45 respondents said that they did call NJNG.

Enhanced rebate participants who called did so for the following reasons.

- To discuss the rebate and to also discuss the insulation and other work recommended.
- About the audit and also to cancel the maintenance agreement.
- To ask questions about the program and to verify the information read online, and to make sure the equipment would be eligible for the program.
- To ask them to send information in the mail regarding the SAVEGREEN program.

Ten HPwES OBRP respondents reported that they called NJNG to discuss the SAVEGREEN Program. Three indicated that they called NJNG to discuss application-

related queries for SAVEGREEN, three were calling to find out more about the program, and two respondents said that they only called NJNG at the beginning of the process when they were looking into the program.

Table III-13
Called NJNG to Discuss SAVEGREEN

Called NJNG To Discuss SAVEGREEN	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All Programs
Yes	4	4	10	18
No	16	1	9	26
Don't Know	0	0	1	1
Total	**20**	**5**	**20**	**45**

Table III-14 shows that 13 of the 18 respondents who said they called NJNG said that NJNG was very responsive and three said NJNG was responsive.

Table III-14
NJNG Responsiveness to SAVEGREEN Phone Call

NJNG Responsiveness	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All Programs
Very Responsive	3	3	7	13
Responsive	1	0	2	3
Responsive by Email	0	0	1	1
Not Responsive	0	1	0	1
Did Not Call NJNG	16	1	10	27
Total	**20**	**5**	**20**	45

Table III-15 shows that 19 of the 45 respondents indicated that they did speak with a NJNG SAVEGREEN representative.

Table III-15
Spoke to NJNG SAVEGREEN Representative

Spoke with NJNG Representative	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All Programs
Yes	4	3	12	19
No	16	2	7	25
Don't Know	0	0	1	1
Total	**20**	**5**	**20**	**45**

Table III-16 shows that 17 of the 19 respondents that indicated they spoke with an NJNG SAVEGREEN representative were very satisfied and two were satisfied or somewhat satisfied.

Table III-16
Satisfaction with NJNG SAVEGREEN Representative

Satisfaction with Representative	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All Programs
Very Satisfied	3	3	11	17
Satisfied/Somewhat Satisfied	1	0	1	2
NA	16	2	8	26
Total	**20**	**5**	**20**	**45**

Enhanced rebate customers were asked whether they were aware that SAVEGREEN offers a website where one can download the audit report. Table III-17 shows that seven Enhanced Rebate participants were aware and three used it to download the report.

The $6500 OBRP and HPwES OBRP respondents were asked whether they were aware that SAVEGREEN offers a website where they can track the status of their SAVEGREEN OBRP application. Two $6500 OBRP participants said that they were aware and three said that they were not. The table also shows that 12 of the 20 HPwES OBRP respondents were aware and seven used the website. Respondents stated that the website was easy to understand and maneuver around, that it was easy to use, and that it was easy to find the status of the application.

Table III-17
SAVEGREEN Website Awareness and Use

	Enhanced Rebate SAVEGREEN Website Used to Download Audit		Website to Track OBRP Application			
			Aware		Used Site	
	Aware	Used Site	$6500 OBRP	HPwES OBRP	$6500 OBRP	HPwES OBRP
Yes	7	3	2	12	1	7
No	13	4	3	8	1	13
Not Aware	--	13	--	0	3	0
Don't Know	0	0	0	0	0	0
Total	**20**	**20**	**5**	**20**	**5**	**20**

Table III-18 shows that 18 of the 45 participants visited the SAVEGREEN program website to learn about the program and the incentives and that 17 of those 18 customers were able to find the information they were looking for.

The one customer who did not find the information he was looking for recommended that the website include more specifics about air sealing and other work to be performed in the home, and finer details about the program and its requirements.

Table III-18
Visited SAVEGREEN Website

	Visited SAVEGREEN Website To Learn about Program				Found Information Needed			
	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All Programs	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All Programs
Yes	6	1	11	18	6	1	10	17
No	14	4	8	26	0	0	1	1
Don't Know	0	0	1	1	0	0	1	1
Did not Visit	--	--	--	--	14	4	8	26
Total	**20**	**5**	**20**	**45**	**20**	**5**	**20**	**45**

HPwES OBRP Audit

This section provides information about the audits for the HPwES OBRP program. The HPwES audit is required to be completed by the contractor prior to installation of measures, and the Enhanced Rebate and $6500 OBRP audits are performed by the NJNG staff member after the high efficiency furnace or boiler and water heater are installed to verify the installation's requirements and to encourage the customer to undertake whole house improvements. Because of the difference in the audit purpose and scope, the audit for this program is discussed separately.

HPwES OBRP respondents were asked if they had more than one contractor come to their home, and if so how many they had. Table III-19 shows that while 12 customers had one contractor, eight had more than one and one even reported seven contactors.

Table III-19
Number of Contractors

Number of Contractors	HPwES OBRP
1	12
2	3
3	3
4	1
7	1
Total	**20**

HPwES OBRP respondents were then asked to provide information about the contractor they selected for the project. Table III-20 shows that customers were most likely to select their contractor as the result of a recommendation from a friend or family member, or a neighbor. Others stated that it was through the contractor's outreach, after a comparison of different contractors, through the NJNG website or a NJNG recommendation, an online search, or an advertisement on a neighbor's lawn.

Table III-20
How Participant Selected Contractor

How Participant Selected Contractor	HPwES OBRP
Family/Friend Recommendation	6
Neighbor Recommendation	3
Contractor Outreach	3
Compared Contractors	2
NJNG Website	1
NJNG Recommendation	1
Another Contractor Recommendation	1
Selector Contractor in Program	1
Online Search	1
Lawn Advertisement	1
Total	**20**

When asked what information the auditor provided during the audit, HPwES OBRP respondents were most likely to discuss options or recommendations for equipment or work, information on participating in SAVEGREEN, and the potential cost or energy savings. Others noted the On-Bill Repayment, pricing, energy usage characteristics of the home, air leakage in the home, or rebates. Many noted that the contractor provided detailed information on SAVEGREEN and some stated that the contractors discussed the potential energy savings.

Table III-21
Information Contractor Provided During Audit

Information Provided During Audit	HPwES OBRP
Equipment/ Work Options/Recommendations	9
SAVEGREEN Participation Information	8
Potential Cost Savings from New Equipment/ Efficiency Work	5
On-Bill Repayment	4
Pricing	4
Energy Usage Characteristics of Home/Equipment	4

Information Provided During Audit	HPwES OBRP
Air Leakage in Home	4
Rebates	3
Audit Length/Content	3
Attic Insulation Information/Savings	2
Air Sealing Opportunities	1
Service Contract	1
Total	**20**

When asked whether the auditor explained the purpose of the audit and what would take place, 19 of the 20 respondents said that the auditor explained the purpose and all 20 said the auditor explained what would take place during the audit. Several HPwES OBRP participants said that the auditor stated the purpose was to assess the energy saving opportunities that were present in the home. Other HPwES OBRP participants stated that the auditor said the purpose was to determine what was needed in the home or to comply with program requirements.

Table III-22
Auditor Explained Purpose and Process of the Audit

	HPwES OBRP	
	Auditor Explained	
	Audit Purpose	Audit Process
Yes	19	20
No	0	0
Don't Know	1	0
Total	**20**	**20**

Respondents were asked whether the contractor performed the full audit (including the blower door test) before or after the customer committed to have the work performed. When needed, the interviewer explained that the blower door test involves a tarp, a flexible frame, and a large fan set up in the doorway, and that the auditor would have turned on the fan and tested the pressure difference between the home's interior and exterior.

Table III-23 shows that nine respondents reported that the contractor performed the full audit before they committed to have the work done and six after they did so. Two respondents said that they did not receive a full audit and three respondents could not remember the details.

Table III-23
Auditor Conducted Full Audit

Conducted Full Audit	HPwES OBRP
Before Committed	9
After Committed	6
No Full Audit	1
No, Received Audit from NJNG	1
Don't Know	3
Total	**20**

Table III-24 shows that 11 of the 20 respondents stated that the contractor asked the participant to accompany him around the home during the audit, and 13 did accompany the auditor on the home walkthrough.

Table III-24
Audit Education and Participation

	HPwES OBRP	
	Auditor Asked Customer to Accompany	Customer Accompanied Auditor
Yes	11	13
No	8	7
Don't Know	1	0
Total	**20**	**20**

Table III-25 shows that almost all of the respondents stated that the auditor explained which tests would be performed and why each test is performed, conducted the blower door test, and explained why the blower door test is conducted.

With respect to the blower door test, 11 respondents specifically confirmed that the auditor conducted a blower door test both before and after work was performed, one respondent said that the auditor only conducted a blower door test before the work was started, and one thought that the auditor only conducted a blower door test after the work was completed.

Table III-25
Auditor Testing and Education

	HPwES OBRP			
	Auditor Explained		Blower Door Test	
	Tests to Be Performed	Why Each Test is Performed	Conducted	Explained Why
Yes	19	19	18	18
No	1	1	1	0
Don't Know	0	0	1	2
Total	**20**	**20**	**20**	**20**

Table III-26 shows that 19 of the 20 respondents said they felt they had a good understanding of the tests that were conducted.

Table III-26
Participant Had Good Understanding of Tests Conducted

Good Understanding	HPwES OBRP
Yes	19
No	1
Total	**20**

Table III-27 presents the following information.

- Seventeen of the 20 respondents stated that they received a home energy assessment report that explained the efficiency of their home and what they could do to improve the efficiency.

- Fourteen confirmed that the auditor presented the report in person, five at the time of the visit and nine said it was at a later time.

- All 17 customers who said that they received the report said they had a good understanding of the report.

Table III-27
Home Energy Assessment Report

	HPwES OBRP			
	Received Report	**Auditor Presented Report in Person**	**Report Presented at Audit Visit**	**Customer Has Good Understanding of Report**
Yes	17	14	5	17
No	2	0	9	0
Don't Know	1	4	4	1
Did Not Receive	--	2	2	2
Total	**20**	**20**	**20**	**20**

Table III-28 shows that 17 of the 18 respondents who remembered receiving a report said the audit report was very helpful in helping them make a decision about which measures to install and one said it was somewhat helpful, 14 said they understood the recommended measures very well and four said they understood them somewhat well, and 15 said that the home energy assessment report explained the costs for installing the measures very well and two said that then report did not explain the installation costs well. Some said that the costs were broken out by measure. Some said that the costs were only provided in total, or did not specify that they were broken down by measure, but still said they were explained very well.

Table III-28
Helpfulness of Assessment Report and Understanding of Measures

Helpfulness of Report	**HPwES OBRP**
Very Helpful	17
Somewhat Helpful	1
Not Helpful	0
Did Not Receive	2
Total	**20**

	HPwES OBRP	
	Understanding of Recommended Measures	**Explanation of Costs**
Very Well	14	15
Somewhat Well	4	0
Not Well	0	2
Did Not Receive	2	2
No Cost	--	1
Total	**20**	**20**

When customers were asked how well they understand the benefits provided by the NJ Home Performance with Energy Star Program, 15 said they understood them very well, 2 said they understood them somewhat well, and three said that they did not have a good understanding.

Table III-29
Customer Understanding of NJ Clean Energy Program Benefits

Understanding of NJCEP Benefits	HPwES OBRP
Very Well	15
Somewhat Well	2
Not Well	3
Total	**20**

Efficiency Measures

Enhanced rebate and $6500 OBRP customers were asked whether they conducted research on their own about high efficiency equipment and/or availability of rebates and incentives before they spoke to a contractor. Table III-30 shows that half of the respondents stated they had done such research.

Table III-30
Participant Conducted Research on
High Efficiency Equipment or Rebates

Participant Conducted Research	Enhanced Rebate	$6500 OBRP	Both Programs
Yes	10	2	12
No	10	3	13
Total	**20**	**5**	**25**

Customers were most likely to find the information online, either on an unspecified website, the NJNG website, a manufacturer's website, the NJ Clean Energy website, or a government website. Other sources of information were the contractors, a NJNG representative, or a consumer information source obtained through the mail. Several Enhanced Rebate customers used more than one source for their information.

Table III-31
Information Source When Conducting Research

Information Source	Enhanced Rebate	$6500 OBRP	Both Programs
Online, Website Not Specified	6	1	7
NJNG Website	3	1	4
Manufacturer websites	3	1	4
Contractors	2	1	3
NJ Clean Energy Website	1	0	1
NJNG Representative	1	0	1

Information Source	Enhanced Rebate	$6500 OBRP	Both Programs
Government websites	1	0	1
Mailed Consumer Information	1	0	1
Friends/Colleagues	0	1	1

*Customer can provide more than one response.

Customers were asked whether the contractor offered the standard equipment as an option in addition to the high efficiency equipment. Table III-32 shows that 11 of the 25 respondents stated that their contractor did offer the standard option as well as the high efficiency option.

Table III-32
Contractor Offered Standard Equipment Option
As Well as High Efficiency Option

Contractor Offered Standard Option	Enhanced Rebate	$6500 OBRP	Both Programs
Yes	10	1	11
No	8	4	12
Don't Know	2	0	2
Total	**20**	**5**	**25**

Customers who said that they received information about standard efficiency equipment were asked what information the contractor provided about the high efficiency furnace or boiler compared to the other option. Table III-33 shows that the contractor was most likely to discuss the price difference, followed by the energy savings or efficiency comparison.

Table III-33
Information Contractor Provided About
High Efficiency Compared to Other Options

Contractor Provided Information	Enhanced Rebate	$6500 OBRP	Both Programs
Price Difference	6	1	7
Energy Savings/Cost to Operate/Efficiency	5	1	6
Performance	2	0	2
Equipment Size	1	0	1
Recommended High Efficiency	1	0	1
Brochures for Different Equipment	1	0	1

*Customer can provide more than one response.

Customers who were offered various options were asked what information the contractor provided about the gas usage and annual cost of the high efficiency boiler compared to the other options. Table III-34 shows that four of the ten customers who said the contractor

offered various options stated that the contractor did not provide any information on gas usage or annual cost of the high efficiency unit compared to the standard option. Other customers stated that the contractor provided general information about costs and savings, specific cost information, a brochure, or the efficiency or BTU comparison.

Table III-34
Information Contractor Provided About Gas Usage and Annual Cost
Of High Efficiency Furnace/Boiler Compared to Other Options

Contractor Information about Gas Usage	Enhanced Rebate	$6500 OBRP	Both Programs
No Information	4	0	4
General Information about Gas/Cost Savings	3	0	3
Specific Cost Information	2	1	3
Brochure	2	0	2
Efficiency Comparison	2	0	2
BTU Comparison	2	0	2
Specific Cost Information	2	0	2

*Customer can provide more than one response.

Customers were also asked what information the contractor provided about the maintenance cost of high efficiency equipment compared to the standard option. Table III-35 shows that customers were most likely to state that the contractor did not provide information about comparative maintenance costs, but some said the high efficiency furnace would have lower costs, that they would need to replace the filter more often, or that there were more components that could go wrong.

Table III-35
Information Contractor Provided About Maintenance Cost
Of High Efficiency Furnace/Boiler Compared to Other Options

Contractor Provided Information	Enhanced Rebate	$6500 OBRP	Both Programs
No Information	5	1	6
Lower Cost	2	0	2
Need to Replace Filter More Often	2	0	2
More Components that Could go Wrong	1	0	1
Don't Know/Don't Remember	2	0	2

*Customer can provide more than one response.

When asked about the difference in cost between the high efficiency and standard options, there was a variety of responses. The wide range may relate to the fact that the incremental cost difference is greater for boilers than for furnaces. Additionally, some customers may remember the cost difference after factoring in the SAVEGREEN and NJ Clean Energy

rebates. The one customer who stated the $5,000 difference was remarking on the total difference for an air conditioning, heat, and dehumidifier package.

Table III-36
Difference between Quote for High Efficiency
Compared to Least Expensive Alternative

Cost Difference	Enhanced Rebate	$6500 OBRP	Both Programs
$300-$400	2	0	2
$400-$500	1	0	1
$600-$700	1	0	1
$800-$900	1	0	1
$2,000-$3,000	2	0	2
$5,000	1	0	1
Do Not Remember	2	1	3
Only Gave High Efficiency Quote	10	4	14
Total	**20**	**5**	**25**

The HPwES respondents were asked whether they installed all, most, or some of the measures on the audit report. Table III-37 shows that 14 reported they installed all of the measures on the audit report and six reported that they installed most of the measures.

Six of the respondents specifically mentioned that it didn't seem that they had the option to choose which measures were installed. Others indicated that it was their choice to install all measures.

Table III-37
Recommended Measures Installed

Recommended Measures Installed	HPwES OBRP
All	14
Most	6
Total	**20**

Customers were asked which measures they chose to install. Table III-38 shows that 19 respondents had their furnace replaced, 16 had attic insulation installed, 12 had their air conditioning replaced, and nine each had attic air sealing work done, other air sealing work, and their water heater replaced. Other common measures reported were thermostat replacement, garage sealing and insulation, attic hatch cover or insulation, and ventilation work.

Some HPwES OBRP participants stated that they chose to install the selected measures because of a desire to save energy or money. Other HPwES OBRP participants stated that they installed the measures because they had old equipment, they wanted to switch their fuel to natural gas, or to improve comfort or because of the program.

Table III-38
Installed Measures

Installed Measures	HPwES OBRP
Furnace Replaced	19
Attic Insulation	16
Air Conditioning Replaced	12
Attic Air Sealing	9
Air Sealing	9
Water Heater Replaced	9
Thermostat Replaced	5
Garage Sealing/ Insulation	5
Attic Hatch Cover/Insulation	4
Ventilation	4
Dryer Venting Improvement	3
Wall Insulation	1
New Gas Piping	2
Basement Insulation	1
Dehumidifier Replaced	1

*Customer can provide more than one response

Table III-39 displays information on recommended measures that were not installed by the HPwES OBRP participants. Three respondents stated that the contractor recommended that they replace the air conditioner, but they did not do so. Other measures that were not installed were attic insulation in the rafters, crawl space pipe insulation, and crawl space venting.

Table III-39
Recommended Measures Not Installed

Measures Not Installed	HPwES OBRP
Air Conditioning Replacement	3
Attic Insulation in Rafters	1
Crawlspace Pipe Insulation	1
Crawlspace Venting	1
All Measures Installed	14

Measures Not Installed	HPwES OBRP
Total	20

All respondents were asked what changes they noticed in their home after the efficiency improvements were made. Table III-40 shows that customers were most likely to report that their home is warmer or that that their gas bills are lower. Customers also reported that the heating is more even, the air conditioning works better, and the system is quieter. There were many comments about how pleased the customers were with the new system(s).

Table III-40
Changes Noticed in Home after Installation

Changes in Home	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All Programs
Home is Warmer	9	1	1	11
Lower Gas/Electric Bills	8	1	1	10
More Even Heating	4	0	5	9
Air Conditioning Works Better/Cooler in Summer	4	0	3	7
System is Quieter	4	1	2	7
Home is Less Humid	2	0	1	3
Improved Air Quality / Cleaner Exhaust	1	0	1	2
Does not Heat up as Fast / Some Rooms Not Heated Well	1	0	1	2
Heat Does Not Need to Be as High to Be Warm	1	1	0	2
Reduced Size – Combined Boiler for Heat/Hot Water	1	0	0	1
Home is Less Dry	1	0	0	1
Pipes No Longer Freeze	0	0	1	1
Less Dust	0	0	1	1
Hot Water is Hotter	0	0	1	1
Have Not Been in Home – Don't Know	1	1	1	3
Don't Know	0	1	0	1

*Customer can provide more than one response.

Respondents were asked whether they noticed any changes in the comfort of their home, their NJNG bills, and their NJNG usage. Table III-41 shows that of the 45 respondents, 36 respondents said they noticed changes in the comfort of their homes, 29 said they noticed changes in their bills, and 16 said they noticed changes in their usage.

Table III-41
Changes in Comfort of Home, Bills, and Usage

	Noticed Changes											
	Home Comfort				Energy Bills				NJNG Usage			
	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All 3	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All 3	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All 3
Yes	15	3	18	36	12	0	17	29	7	0	9	16
No	4	1	2	7	2	0	2	4	3	0	10	13
Don't Know	1	1	0	2	6	5	1	12	10	5	1	16
Total	**20**	**5**	**20**	**45**	**20**	**5**	**20**	**45**	**20**	**5**	**20**	**45**

NJNG Audit for Enhanced Rebate and $6500 OBRP

This section provides information about the audits for the Enhanced Rebate and $6500 OBRP residential programs. While the HPwES audit is required to be completed by the contractor prior to installation of measures, the Enhanced Rebate and $6500 OBRP audits are performed by the NJNG staff member after the high efficiency furnace or boiler and water heater are installed to verify the installation's requirements and to encourage the customer to undertake whole house improvements.

Table III-42 displays the information that Enhanced Rebate and $6500 OBRP participants reported that they learned from the audit about the potential to further increase the efficiency in their home. The table shows that respondents were most likely to report that they were told to install insulation and several other measures were mentioned by one or a few respondents.

Table III-42
What Customer Learned about Energy Efficiency Potential from Audit

Learned about Energy Efficiency Potential from Audit	Enhanced Rebate	$6500 OBRP	Both Programs
Install Insulation	11	2	13
Air Sealing	3	2	5
Replace Windows and Doors	2	1	3
Cover Vent in Laundry Room	1	0	1
Caulk One Window	1	0	1
Maintain Equipment	1	0	1
Add Vent in Attic Roof	1	0	1
Other Available Programs	1	0	1
Install Moisture Barrier (crawlspace)	1	0	1
Keep Windows Closed in Winter	1	0	1
Install Attic Cover	1	0	1

Learned about Energy Efficiency Potential from Audit	Enhanced Rebate	$6500 OBRP	Both Programs
Install Pipe Insulation	0	1	1
No Recommendations	2	0	2
Does Not Remember	1	1	2

*Customer can provide more than one response.

When asked about whether they had or were considering "do it yourself" efficiency work, only a few customers spoke about doing work on their own. Others mentioned upgrades that they had done or were planning on doing with contractors. These are shown in Table III-43 and were most likely to include attic insulation or new windows or doors.

Table III-43
Upgrades Considering or Completed

Upgrades Considering or Completed	Enhanced Rebate	$6500 OBRP	Both Programs
Attic Insulation	7	2	9
Replaced Windows	3	1	4
Replaced Hot Water Heater	2	0	2
New Doors	2	0	2
Insulated Exhaust Pipe	1	0	1
Installed Attic Cover	1	0	1
Crawl Space Insulation	0	1	1
Pipe Insulation	0	1	1
Recommended Work	1	2	3
None	8	2	10

*Customer can provide more than one response.

Enhanced rebate participants who were recorded in the database as having received a Home Energy Score were asked whether they remembered being given the report. Only two of the twelve who received the report remembered it. There were some issues faced with the reports that have since been addressed, so it is possible that the auditors did not focus on the reports for some of these customers. Those who remembered the score said that it was helpful to understanding the efficiency of their home. Two respondents stated that the score had a big impact on their decision to move forward with additional work.[10]

[10] NJNG expects the results of a separate DOE study focused on the impact of presenting the HES to be available soon.

Table III-44
Home Energy Score Presented

Home Energy Score Presented	Enhanced Rebate
Yes	2
No	10
Did Not Receive (according to database)	6
Total	20

Following the NJNG audit, customers are asked to sign a release so that their information about recommended measures can be sent to contractors for a bid. Four of the 25 interviewed participants reported that they were contacted by contractors to perform work that was recommended in the audit.

Table III-45
Contractors Contacted Customer to Perform Work Recommended in Audit

Contact from Contractors	Enhanced Rebate	$6500 OBRP	Both Programs
Yes	4	0	4
No	2	5	7
Did not Sign Release (According to Database)	14	0	14
Total	**20**	**5**	**25**

One of the Enhanced Rebate customers had all of the recommended work completed. This included the insulation work, air sealing, and sealing the light fixtures. Another was planning on replacing the attic insulation, and a third had planned on completing all recommendations, including replacing the water heater, sealing of the foundation and additional insulation in the roof.

One Enhanced Rebate customer said he was not planning on using the On-Bill Repayment Program, another said the On-Bill Repayment was extremely important and was the reason that he was planning on completing the additional measures, and the third said that he believes that the On-Bill Repayment Program definitely made a difference, and that he was more willing to complete the work knowing that they would pay for almost half of the project up front.

Three $6500 OBRP participants who planned to complete additional work said that the On-Bill Repayment Program would be important and one said he did not think his project would be covered.

The Enhanced Rebate participants who were not planning on doing the work said they were considering an addition first, it was too expensive and it would not be cost-effective, and that it was not their priority at the time.

SAVEGREEN Impact

Customers were asked whether they would have chosen the high efficiency equipment or performed the efficiency improvements if the SAVEGREEN rebate and/or On-Bill Repayment was not available. Table III-46 shows that 20 of the 45 respondents stated that they would have made the improvements even if the rebate were not available.

Five of the Enhanced Rebate customers stated that they would have purchased the high efficiency anyway and only found out about the rebate during or after the installation. Some of the other Enhanced Rebate respondents stated that they would have installed high efficiency equipment without the rebate because of the energy or cost savings. Other Enhanced Rebate participants were less certain but believed that they would have installed high efficiency without the rebate, and some Enhanced Rebate participants reported that they would not have purchased high efficiency without the rebate.

Some of the $6500 OBRP participants who stated that they would have purchased the high efficiency option without the program may not have done so right away or have purchased as efficient units.

Nine HPwES OBRP respondents stated that they would not have had the money to afford the energy efficiency upgrades without the program. Four HPwES OBRP respondents stated that they probably would have moved forward with a portion of the project because their home energy equipment needed to be replaced.

Table III-46
Customer would have Chosen the High Efficiency Equipment or Done Home Performance If SAVEGREEN Rebate Was not Available

Would Have Chosen High Efficiency or Performed Upgrades Without Rebate	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All Programs
Yes	14	2	4	20
Maybe	3	1	11	15
No	3	2	5	10
Total	**20**	**5**	**20**	**45**

When asked how important the SAVEGREEN program was in the decision to make the improvements, 29 of the 45 said it was very important, nine said it was somewhat important, and seven said it was not at all important. While 7 of the 20 Enhanced Rebate participants said SAVEGREEN was very important, four of the five $6500 OBRP and 18 of the 20 HPwES OBRP participants said that SAVEGREEN was very important.

Twelve of the HPwES OBRP respondents specifically mentioned that the loan was very important to their decision to pursue the upgrades because it reduced the amount of money they needed to pay up front.

Table III-47
Importance of SAVEGREEN Rebate in Decision to Purchase High Efficiency Furnace/Boiler or Upgrades

Rebate Importance	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All Programs
Very Important	7	4	18	29
Somewhat Important	6	1	2	9
Not At All Important	7	0	0	7
Total	**20**	**5**	**20**	**45**

When the Enhanced Rebate participants were asked if they felt the SAVEGREEN rebate amount was sufficient, 17 said it was adequate and two said it was low.

Table III-48
SAVEGREEN Rebate Amount is Sufficient

SAVEGREEN Rebate Amount is Sufficient	Enhanced Rebate
Adequate	17
Low	2
Don't Know	1
Total	**20**

When asked what other factors influenced the high efficiency purchase decision, customers were most likely to note the energy or cost savings, old equipment that needed replacement, and the environment. The Enhanced Rebate and $6500 participants were most heavily skewed towards the energy or cost savings, while the HPwES OBRP were about equally likely to mention their equipment that needed replacement.

Table III-49
Other Factors that Influenced Upgrade Decision

Other Factors that Influenced Upgrades	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All Programs
Energy/Cost Savings	15	4	6	25
Old Equipment Needed Replacement	3	0	7	10
Environment	3	0	3	6
Increased Comfort	1	0	3	4
Best System / High Quality System	3	1	0	4

Other Factors that Influenced Upgrades	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All Programs
Contractor Presentation	0	0	3	3
Longevity of New System	2	0	0	2
Home Re-Sale Value	2	0	0	2
Equipment Size	2	0	0	2
Health	1	0	0	1
Easier to Maintain	1	0	0	1
Quieter	1	0	0	1
Switch to Natural Gas	0	0	1	1
Work Completed Quickly	0	0	1	1
Price	0	0	1	1

*Customer can provide more than one response.

Customers were asked whether there were any barriers to moving forward with the high efficiency equipment and with participation in the SAVEGREEN program. Table III-50 shows that seven of the 45 respondents stated that there was a barrier to the new equipment and four stated that there was a barrier to SAVEGREEN participation.

The barriers were that it took a long time for the contractor to install the heating system (two days), a concern about paying off the upgrades over ten years given the respondent's age, and that the application for the new gas meter took about a month to be processed.

Table III-50
Any Barriers to Upgrades or SAVEGREEN

	Any Barriers To							
	Completing Upgrades				SAVEGREEN Participation			
	Rebate	$6500 OBRP	HPwES OBRP	All 3	Rebate	$6500 OBRP	HPwES OBRP	All 3
Yes	3	2	2	7	3	0	1	4
No	17	3	18	38	17	5	19	41
Total	**20**	**5**	**20**	**45**	**20**	**5**	**20**	**45**

Satisfaction and Recommendations

Table III-51 shows that 36 of the 45 respondents were very satisfied with the auditor, five were somewhat satisfied, and two were very or somewhat dissatisfied.

Table III-51
Satisfaction with Auditor

Satisfaction with Auditor	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All Programs
Very Satisfied	15	5	16	36
Somewhat Satisfied	2	0	3	5
Somewhat Dissatisfied	1	0	0	1
Very Dissatisfied	1	0	0	1
Don't Know/Refused	1	0	1	2
Total	**20**	**5**	**20**	45

Table III-52 displays respondent reports of satisfaction with the installation contractor. The table shows that 38 of the 45 were very satisfied, five were somewhat satisfied, and two were somewhat dissatisfied.

Table III-52
Satisfaction with Installation Contractor

Satisfaction with Installation Contractor	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All Programs
Very Satisfied	16	4	18	38
Somewhat Satisfied	3	0	2	5
Somewhat Dissatisfied	1	1	0	2
Total	**20**	**5**	**20**	**45**

Table III-53 shows that 43 of the 45 participants said that they would recommend their contractor to others. All 20 Enhanced Rebate respondents and all five $6500 OBRP participants said that they would recommend their contractor to others.

Table III-53
Would Recommend Contractor

Recommend Contractor	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All Programs
Yes	20	5	18	43
No	0	0	1	1
Don't know	0	0	1	1
Total	**20**	**5**	**20**	**45**

All 25 Enhanced Rebate and $6500 OBRP respondents reported that they were very satisfied with the new equipment. Two respondents noted that they encountered issues after the work was performed but that the contractor was very responsive and came back right away to fix

the identified issues. Many respondents noted that the contractors were professional, neat, on time, and efficient.

Table III-54
Satisfaction with New Equipment/Installation

New Equipment/Installation Satisfaction	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All Programs
Very Satisfied	25	5	19	44
Somewhat Satisfied	0	0	1	1
Total	**25**	**5**	**20**	**45**

When asked how satisfied they were with the program overall, 42 of the 45 respondents said they were very satisfied and three said they were somewhat satisfied. While 19 of the 20 HPwES OBRP respondents stated that they were very satisfied, one said he was somewhat satisfied because of issues experienced with their contractor. Four respondents specifically mentioned that they were very satisfied because they were able to save money through the program and that it was a good deal financially. Four respondents specifically mentioned that their participation in the program went very smoothly.

Table III-55
Overall SAVEGREEN Satisfaction

Overall SAVEGREEN Satisfaction	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All Programs
Very Satisfied	18	5	19	42
Somewhat Satisfied	2	0	1	3
Total	**20**	**5**	**20**	**45**

Table III-56 shows that 36 of the 45 participants said they told others about the program, affirming the level of satisfaction that they had. When asked if they knew if those they told the program about moved forward with energy efficiency, 13 said that they had, and nine said they had applied for SAVEGREEN incentives. One HPwES OBRP participant noted that she told everyone who wants to listen to her because she has not had this great of an experience doing work around her house before.

Table III-56
Told Others about SAVEGREEN

	Told Others about SAVEGREEN				Referrals Moved Forward with Energy Efficiency				Referrals Applied for SAVEGREEN Incentives			
	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All 3	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All 3	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All 3
Yes	13	4	19	36	3	1	9	13	2	1	6	9
No	7	1	1	9	3	1	6	10	4	1	6	11
No Referral	--	--	--	--	7	1	1	9	7	1	1	9
Don't Know	0	0	0	0	7	2	4	13	7	2	7	16
Total	**20**	**5**	**20**	**45**	**20**	**5**	**20**	**45**	**20**	**5**	**20**	**45**

Twenty-four of the 45 participants made recommendations when they were asked how NJNG could improve the program. The most common recommendation, made by ten participants, was to conduct more marketing. Other recommendations were to increase the rebate, provide a more thorough audit, provide more accessible program information, and provide more flexibility in the On-Bill Repayment terms.

Table III-57
How NJNG Could Improve Program

SAVEGREEN Recommendations	Enhanced Rebate	$6500 OBRP	HPwES OBRP	All Programs
More Program Advertising	3	2	5	10
Increase Rebate	3	0	0	3
More Thorough Audit	1	0	1	2
More Accessible Program Information	1	0	1	2
Increase On-Bill Repayment Flexibility	0	0	2	2
Shorter Wait for Rebate	1	0	0	1
Advertising Through the Mail	1	0	0	1
Other Advertising in Addition to Website	1	0	0	1
Lower NJNG Gas Prices	1	0	0	1
Improve Contractor Reliability	1	0	0	1
Improve Auditor Communication	1	0	0	1
List Contractors on Website	0	1	0	1
More Information on Choosing Measures	0	0	1	1
Provide Accurate Information	0	0	1	1
No Suggestions	9	2	10	21

*Customer can provide more than one response.

C. C&I Program Findings

Findings from interviews with the C&I Program participants are summarized in the following areas.

- Background
- SAVEGREEN Process
- Assessment
- Efficiency Measures
- SAVEGREEN Impact
- Satisfaction and Recommendations

Background

Participants of the NJNG C&I Direct Install program were asked how they first learned about the SAVEGREEN Project and the On-Bill Repayment. Three of the five respondents reported that their contractor told them about the program and two of these participants noted that the contractor approached them offering additional efficiency work through the program. One participant learned about the program through a customer and another through a business acquaintance.

Participants were asked how long they had been thinking about making the energy efficiency improvements to their business when they heard about the program. Four of the participants had not been planning on making energy efficiency improvements but upon learning about the program, decided to undertake the upgrades. One participant had been considering replacing his furnace for about a year prior to learning about the program.

Three of the five participants reported that the main reason that they decided to participate was that the program allowed them to complete upgrades to their businesses that they would not have been able to afford otherwise. While one participant noted that he felt the upgrades were good for the environment and it was nice to save money on his energy bills, another participant stressed that her motivation was strictly the monetary savings from the improvements.

SAVEGREEN Process

The C&I participants were asked how easy or difficult the SAVEGREEN On-Bill Repayment application process was. All participants reported that the application process was very easy. Two of the participants mentioned that the contractor handled the entire application process for them and that is was very easy to work with the contractor to complete it. While four of the participants did not need to send any additional information, one participant did need to send in copies of her electric and gas bills for the last 12 months after she sent in the initial application.

The five participants interviewed reported they were very satisfied with the length of time it took to receive their check from NJNG. Three of the participants mentioned that the check came much faster than expected, one stated that they had anticipated it taking a couple of

months but that it came much faster. The other two participants noted that they sent the check directly over to the contractor when they received it because the contractor had subtracted the amount from the cost of the project.

All five of the participants reported that they were very satisfied with the program process overall. Three participants did not have any suggestions for improving the program process and reported that they found the process very simple and easier than they expected. One participant suggested more advertising for the program so that more people know about it and so that the program generates additional work for contractors. Another participant suggested that the initial assessment should be more comprehensive to identify all possible project costs. This participant had additional costs come up as the project moved along.

Assessment

Participants were asked what information the contractor provided to them during the Direct Install assessment. Each participant reported slightly different information. While one participant stated that she received no information from the contractor during the assessment, another reported that he received information regarding the types of equipment that would be installed, overall cost of the project, expected time frame, information regarding the program and payment process. The other participants mentioned information regarding the equipment, expected energy savings, program details, project design and payback process.

All five participants reported that the contractor reviewed the assessment results, explained the measures that qualified and their portion of the project costs, and explained the On-Bill Repayment program. Two participants noted that they received a detailed written report with the assessment results.

The five participants all felt that the contractor did a good job of explaining the assessment. The one complaint one participant noted was that the contractor estimated that the project would take about two weeks but it took two months to complete the project. All five of the participants also felt that the assessment was very helpful in informing their decisions about which measures to install and they were all very satisfied with the assessment.

Efficiency Measures

While four of the five participants installed all of the measures recommended by the program, one participant installed most of the measures.

Participants of the C&I Direct Install program installed a variety of measures. One participant only installed high efficiency lighting, one installed new heating and air conditioning systems, and two installed both high efficiency lighting and new heating and air conditioning units. One participant had many measures installed including three new air conditioning units, a new furnace, programmable thermostats, an efficiency sensor on the boiler, faucet aerators, and high efficiency lighting. The participants reported that they chose to install these measures due to the expected cost savings, the cost and hassle of maintaining their older current equipment, and the impact on the environment.

One participant chose not to complete upgrades to the refrigeration. The return on the investment was not high enough to justify completing the upgrade and she did not anticipate completing it in the future. That participant also noted that she would have liked to have made upgrades to the outdoor lighting in the parking lot but it was not included in the original assessment.

While two of the participants reported that they had not noticed any changes in their business after the installation, two participants noticed that their monthly energy bills were lower, two that their new heating systems allow for a better balanced, more reliable temperature which has made their employees and customers happier, and one that the new lighting has improved employees' ability to see. One of the participants who did not notice any changes was surprised that she had not seen a decrease in her bills but she expects to see lower energy bills in the summer due to the new air conditioning unit that was installed.

When asked specifically about comfort, two reported that they had not noticed any changes in the comfort of their work place, three of the participants felt that their new heating units provided a more balanced, reliable temperature. One participant also added that the new heating unit was quieter.

When asked specifically about changes in energy bills, three reported that they noticed decreased energy bills, one had not noticed any changes, and one was unsure. The participant who was unsure reported that he is on the budget billing plan and it was a very cold winter so it is difficult for him to tell but he may receive a credit next year on his bill. One participant also noted that it was difficult to determine if her bills were lower due to the On-Bill Repayment added to her bill.

Participants were asked if they had noticed any changes in their natural gas or electric usage. While one participant had noticed lower gas and electric usage, one participant had only noticed lowered electric usage. Two participants had not noticed any changes in their gas or electric usage, but one participant anticipated lower usage in the summer. One participant was unsure if the usage had gone down because she does not handle the bills.

SAVEGREEN Impact

When asked if they would have moved forward with the project if the On-Bill Repayment program had not been available, four stated that they would not have moved forward, and one reported that he may have moved forward with the project at another time. Two participants mentioned that they would have waited for the equipment to fail to replace it.

All five participants felt that the NJ Clean Energy rebates were very important in their decision to pursue the energy efficiency upgrades. The participants reported that the rebate allowed them to afford the project and that it convinced them to participate.

All five of the participants felt that the On-Bill Repayment aspect of the program was very important in their decision to pursue the energy efficiency upgrades. The participants stressed that it allowed them to complete the upgrades when they would not have been able

to otherwise, even with the available grant money. The overall cost of the proposed project was still too high to pay all at once and their business could not handle the upfront cost.

When asked what other factors influenced their decision to make the energy efficiency upgrades, the participants noted the benefit to the environment, the monetary savings on their energy bills, and the age of their current equipment as motivating factors.

The five participants did not experience any barriers with the upgrades or with either program, NJNG SAVEGREEN and NJ Clean Energy. The participants noted that they found the process for both programs very easy.

Satisfaction and Recommendations

While three of the participants were very satisfied with their installation contractor, two participants were somewhat satisfied. The two participants who were only somewhat satisfied mentioned that the project could have been completed faster and that the contractor could have been more careful in completing all the details of the project. The participants who were very satisfied mentioned that the contractor was efficient and on time.

Three of the participants were very satisfied with the installation and reported that the contractors were fast, professional and completed the work as promised. One of the participants who was very satisfied runs a daycare and mentioned that the contractors were very understanding about the children and were flexible about the space and timing of the work.

Two of the participants were somewhat satisfied with the installation. One participant was disappointed that the project took longer than expected. However, the contractors were very understanding and accommodating of his day-to-day business and did a good job overall with the lighting improvements which have made a substantial difference to his workplace. The other participant who was somewhat satisfied with the installation noted that the contractor did not finish all the aspects of the project. When the inspector came through at the end of the project, there were several things that needed to be tied up in order to bring the project up to code. In the end, the contractor did return and finished the project. The participant felt that this type of issue is common in her experience with contractors so overall she was satisfied.

The five participants of the NJNG SAVEGREEN C&I Direct Install program were very satisfied with the program overall. One participant noted that the program allowed her to complete the project without needing to take a loan out from the bank.

Three of the participants did not have any suggestions for making improvements to the program and were impressed with the ease of the program and how quickly they received the check. One participant suggested that NJNG offer a similar program for residential customers. Another participant suggested that NJNG adjust the program so that the contractor can handle the entire project and receive the check directly, instead of going through the business owner.

D. Summary and Recommendations

This section provides an overview of the findings from the SAVEGREEN participant interviews.

Residential Programs

Key findings from the interviews with residential program participants in the Enhanced Rebate, $6500 On-Bill Repayment, and Home Performance with Energy Star On-Bill Repayment and Rebate programs are summarized below.

- *Information Source*: The most common source of SAVEGREEN information was the contractor. Other sources that were frequently mentioned were the NJNG website, a friend or family member, or a neighbor. However, there were several additional information sources that were also noted. *The importance of the contractor in program outreach as well as the many diverse information sources shows that NJNG should continue focusing on the contractors and continue their wide range of outreach methods.*

- *Participation Reason:* The respondents were most likely to state that they participated in SAVEGREEN because they wanted to save money or energy, the SAVEGREEN financing benefits, and the need to replace their aging home equipment. *These benefits should be emphasized in the program marketing.*

- *SAVEGREEN Application:* 36 of the 45 participants said that the SAVEGREEN application process was very easy, four said it was somewhat easy, and five (all Enhanced Rebate) stated that the contractor applied. 42 of the 45 participants were very satisfied with the program process overall. *The program process appears to be working well and does not need to be refined.*

- *SAVEGREEN Website:* 18 of the 45 participants visited the SAVEGREEN program website to learn about the program and the incentives and 17 of those 18 customers were able to find the information they were looking for. *The website is an important source of information and has provided participants with desired information. NJNG should continue to update the site if changes are made to the program.*

- *HPwES OBRP Audit:* The participants reported that the auditors provided detailed information, including recommendations for efficiency work, SAVEGREEN participation information, potential cost savings from the work, and information on the home's efficiency. All or almost all explained the purpose and content of the audit, the majority accompanied the auditor on the home walkthrough, almost all explained which tests would be conducted and why, and almost all participants said they felt they had a good understanding of the tests and the audit report. *NJNG should continue to provide training and information to HPwES participating contractors.*

- HPwES OBRP Measures: 14 of the 20 participants reported they installed all of the measures on the audit report and six reported that they installed most of the measures. Six of the respondents specifically mentioned that it didn't seem that they had the option to choose which measures were installed. Some mentioned that they chose based on total cost or age of home equipment. While 19 of the 20 HPwES participants had their furnace replaced, 16 installed attic insulation, 12 had their air conditioning replaced, nine had air sealing in their attic, and nine had their water heater replaced. *Contractors should be trained to clearly educate participants on their options for installation and how those decisions will or will not affect program benefits.*

- Impact on Home: Customers were most likely to report that their home was warmer or that that their gas bills were lower after participating in the program. When asked specifically about comfort and bills, 36 of the 45 respondents said they noticed changes in the comfort of their homes, and 29 said they noticed changes in their bills. *These program benefits should be included in marketing materials.*

- NJNG Audit for Enhanced Rebate and $6500 OBRP: Customers were most likely to say that they learned that there is potential to increase the efficiency of their home by installing insulation, or performing air sealing work. However, they were not very likely to undertake additional measures. *Auditors should provide additional information about SAVEGREEN benefits and the expected impacts of undertaking the additional measures.*

- Home Energy Score: Only two of the 12 Enhanced Rebate participants who were recorded in the database as having received the Home Energy Score remembered that they received it. Because there were some problems with the score that were being addressed at this time, it is possible that auditors may not have placed much emphasis on the score for some of these customers. The two who remembered the report said that it was helpful to understanding the efficiency of their home and it had a big impact on their decision to move forward with the additional work. *Given that most did not recall the report, it has not had that large of an impact. However, for those that did undertake the measures, the report appeared to be important, and that is validation to continue to provide the report, given that the investment in its development has been completed.*

- SAVEGREEN Importance: While 20 of the 45 respondents stated that they would have made the improvements even if the rebate were not available, some stated that they would not have done so right away or have purchased as efficient units. The HPwES OBRP participants were less likely to say that they would have moved forward with the improvements without the program.

  When asked how important the SAVEGREEN program was in the decision to make the improvements, 29 of the 45 said it was very important, nine said it was somewhat important, and seven said it was not at all important. However, 18 of the 20 HPwES OBRP participants said that the SAVEGREEN program was very important. *The On-Bill Repayment was extremely important to the HPwES OBRP participants and should*

be continued to encourage the adoption of whole house improvements as long as the budget for this program is available.

- Barriers: Only 7 of the 45 participants stated that they experienced any barriers completing the upgrades and only four experienced any barriers participating in the program. The barriers to the upgrades related to the ventilation required for the high efficiency systems, a separate inspection required by the customer's development, the time the contractor took for the installation, and having the new gas meter installed. The program barriers related to the need to find specific information for the application or the wait for the rebate. *Given the small number of participants who experienced barriers and the fact that most of these issues are not in the control of NJNG, there are no recommendations for addressing these.*

- Satisfaction: Participants expressed very high levels of satisfaction. 41 of the 45 were very or somewhat satisfied with the audit, 43 were very or somewhat satisfied with the installation contractor, 44 were very satisfied and one was somewhat satisfied with the installation work, and 43 were very satisfied and three were somewhat satisfied overall with SAVEGREEN. *The high levels of satisfaction show that the program is working well and there is little room for improvement.*

- Participant Recommendations: Only about half had one or more recommendations for the program. The most common recommendation was to increase the amount of marketing that is conducted. *While the participants had learned about the program through various sources, they were under the impression that many were not aware of SAVEGREEN.*

Commercial and Industrial Programs

Key findings from the interviews with C&I Direct Install program participants are summarized below.

- *Information Source*: The C&I Direct Install participants heard about the program through contractors and through personal acquaintances. Two of the five noted that the contractor approached them and informed them of the program. *NJNG should work with the C&I Direct Install contractors to provide additional outreach about the program.*

- *Program Process*: All five respondents reported that the SAVEGREEN application process was very easy, that they were very satisfied with the length of time to receive their program incentive, and that they were very satisfied with the program process overall. *There are no recommendations for the program process.*

- *Assessment*: All five participants reported that the contractor reviewed the assessment results, explained the measures that qualified and their portion of the project costs, and explained the On-Bill Repayment program. All five of the participants also felt that the assessment was very helpful in informing their decisions about which measures to install

and they were all very satisfied with the assessment. *The contractors appear to be doing a good job with the assessment and with customer communication.*

- *Measures*: While four of the five participants installed all of the measures recommended by the program, one participant installed most of the measures. The participants reported that they chose to install these measures due to the expected cost savings, the cost and hassle of maintaining their older current equipment, and the impact on the environment.

  When asked specifically about comfort, three felt that their new heating units provided a more balanced, reliable temperature, and one noted that the new heating unit was quieter. When asked specifically about changes in energy bills, three reported that they noticed decreased energy bills, one had not noticed any changes, and one was unsure.

  The benefits of reduced bills and improved comfort should be included in the program marketing materials.

- *SAVEGREEN Importance*: Four of the five respondents had not been planning on making energy efficiency improvements but upon learning about the program, decided to undertake the upgrades. When asked if they would have moved forward with the project if the On-Bill Repayment program had not been available, four stated that they would not have moved forward, and one reported that he may have moved forward with the project at another time. *The program appears to have a large impact on the uptake of energy efficiency and should be continued in its form if budget is available.*

- *Satisfaction*: All of the participants were very or somewhat satisfied with the contractor and the installation. All were very satisfied for the program. *The high levels of satisfaction show that the program is working well and there is little room for improvement.*

IV. Contractor Feedback

APPRISE conducted in-depth telephone interviews with ten contractors who served customers in the various NJNG SAVEGREEN Programs and combinations of programs.

The goal of the contractor interviews was to develop information on the following research issues.

- Participants' SAVEGREEN information source
- Information that contractor provided to customers about SAVEGREEN
- Availability and performance of qualifying equipment
- Customers' decision factors for high-efficiency equipment
- Program impact on energy efficiency implementation
- Program impact on whole-house approach
- Other factors impacting measure selection
- Free ridership
- Barriers to program participation
- Program satisfaction and recommendations

A. Methodology

An individual interview script (six in total) was developed for each type of contractor based on the combination of programs that the contractor participated in.

NJNG SAVEGREEN Managers selected ten contractors to target for the interviews with and provided names and contact information for each.

The two C&I contractors were selected as they are the appointed (NJCEP) Direct Install contractors for NJNG's service territory. NJNG selected the other contractors based on volume and/or the amount of time they have been participating in SAVEGREEN, as well as what program or programs they participate in.

Contractors were selected in this manner so that they would be able to provide detailed information about the SAVEGREEN program(s). For example, one contractor has been participating in SAVEGREEN since the programs were first implemented, they are a Century Award Winner (100+ jobs), and they have begun to participate in the $6500 OBRP in addition to the HPwES OBRP program they were already participating in. They were able to speak on both the HPwES and non-HPwES OBRP programs. Another example is a contractor that is a newer SAVEGREEN contractor, but has been very active in moving customers from rebates into the HPwES OBRP through seal-up and insulation. Other contractors have been participating in the SAVEGREEN Enhanced Rebate program for years and are some of the higher volume contractors.

Because these contractors were selected by NJNG and are the more active contractors, their responses are not representative of the SAVEGREEN contractors as a whole. However,

there are many small contractors and it was important to interview contractors who have sufficient experience with the program to provide detailed information. While not representative, these contractors provided important information about marketing, participation, program logistics, and program impact.

Two of the contractors were not reached despite at least five contact efforts over a two-week period so two replacement contractors were provided by NJNG and were interviewed. The following number of contractors in each category were interviewed.

- Enhanced Rebate Contractors
  - Enhanced Rebate Only (2 contractors)
  - Enhanced Rebate and $6500 OBRP (2 contractors)

- HpwES OBRP Contractors
  - HPwES OBRP Only (1 contractor)
  - HpwES OBRP and $6500 OBRP (1 contractor)
  - Seal-up (2 contractors)

- C&I Direct Install Contractors (2 contractors): The two contractors who are approved to participate in the NJ Clean Energy Direct Install program in NJNG's service territory were interviewed.

B. Findings

Findings from the interviews are summarized with respect to the following areas.

- Program Information and Participation
- SAVEGREEN Process
- NJNG Information and Communication
- Contractor Assessments and Audits
- Efficiency Measures
- SAVEGREEN Impact
- Contractor Satisfaction and Recommendations

Program Information and Participation

Residential program contractors reported that they learned about the SAVEGREEN programs through a letter or email received from NJNG (3 contractors), a NJNG contractors' meeting (2 contractors), CSG, and the NJ Clean Energy program.

Residential program contractors were asked to report how many of their customers participated in SAVEGREEN. Many also provided the percent of their customers who participated. Table IV-1 shows that the interviewed contractors who reported the percent participating usually had a high percentage of their customers in one of the programs, ranging from 80 percent to almost all, and only one contractor reported that it was ten

percent. The number of participants reported ranged from 30 to 80 for the $6500 OBRP, from 35 to 600 for the HPwES OBRP, and from 200 to 5,000 for the Enhanced Rebate.

Table IV-1
Number of Customers who Participated in SAVEGREEN
Reported by Each Residential Program Contractor

Contractor Type	Contractor	Enhanced Rebate		$6500 OBRP		HPwES OBRP	
		Percent of Customers	Number of Customers	Percent of Customers	Number of Customers	Percent of Customers	Number of Customers
Enhanced Rebate	1	85%	5,000	--	--	--	--
	2	Most	500-600	--	--	--	--
Enhanced Rebate & $6500 OBRP	3	Not Reported	200-300	Not Reported	80		
	4	95%	DK	95%	DK	--	--
HPwES OBRP Only	5	--	--	--	--	80%	300
HpwES OBRP & $6500 OBRP	6	--	--	Not Reported	30	Not Reported	600
Seal-Up	7	--	--	--	--	10%	35
	8	--	--	--	--	Nearly All	260

Table IV-2 displays contractors' reports of how often their customers were aware of the SAVEGREEN programs, WARMAdvantage, and HPwES. Responses were quite varied.

- One contractor said that customers were usually aware of the SAVEGREEN Enhanced Rebate program, one said they were frequently aware, and two said they were infrequently aware. They reported that 10 to 75 percent of their customers were aware of the Enhanced Rebate program.

- One contractor stated that customers were never aware of the WARMAdvantage program and one said they frequently were aware.

- Two contractors said that customers were infrequently aware of the $6500 OBRP program and one said they usually were aware.

- One contractor said customers were infrequently aware of HPwES OBRP and one contractor said customers were always aware.

Table IV-2
Customer Awareness of SAVEGREEN and NJCEP

Contractor		Enhanced Rebate		WARMAdvantage Rebate		$6500 OBRP		HPwES OBRP		NJCEP HPwES	
Type	**#**	**%**	**Frequency**	**%**	**Frequency**	**%**	**Frequency**	**%**	**Frequency**	**%**	**Frequency**
Enhanced Rebate	1	25%	Infrequently	0%	Never						
	2	50%	Frequently	50%	Frequently						
Enhanced Rebate & $6500 OBRP	3	75%	Usually			Not Reported	Infrequently				
	4	10%	Infrequently			50%	Infrequently				
HPwES OBRP Only	5							10%	Infrequently	Not Reported	Infrequently
HPwES OBRP & $6500 OBRP	6					80%	Usually	Almost 100%	Always		

Contractors were most likely to report that customers learned about SAVEGREEN through the contractor, followed by learning about it through NJNG. All of the contractors stated that they would educate customers about the programs if the customer was not aware.

One of the interviewed contractors served customers under both the $6500 OBRP and the HPwES OBRP. This contractor was asked when they recommend one program rather than the other. The contractor stated that he almost always recommended the HPwES OBRP first, but that some customers were not willing to do the full project. He noted that it is simpler for customers who are converting from electric to gas to participate in the $6500 OBRP because of the structure of the program. It is difficult to reach 25 percent savings with a conversion and it becomes more complicated.

The two C&I Direct Install contractors were asked whether they conduct outreach to businesses to encourage participation in the NJ Clean Energy and SAVEGREEN programs. Both contractors reported that they did conduct outreach.

The two contractors reported that the joint outreach events with NJNG were helpful. One stated that he believes they need to do many more to get a significant number of participants. He noted that NJNG has been very helpful with the marketing, but that their company needs to hold more events.

When asked why they thought there had not been more participation in the C&I Direct Install Program, one contractor thought it was a lack of awareness and the other stated that it is difficult for customers to understand the offering.

SAVEGREEN Process

Contractors were asked whether they apply for the rebate or the customer applies. Three of the four interviewed contractors who participate in the SAVEGREEN Enhanced Rebate program stated that they apply and one stated that the customer applies. All of the rebate contractors who did the application for the customer felt that it was easy and straightforward. The C&I Direct Install contractors stated that they fill out part and the customer fills out part of the application.

The Enhanced Rebate and C&I contractors stated that the rebate is sent directly to the customer. One C&I contractor stated that the customer must pay the 30 percent of the cost up front, but that lately they have not required this deposit because it can be difficult for the customers.

The contractors were asked whether they thought there were any barriers to customers participating in SAVEGREEN. Four of the eight residential contractors noted one or more barriers to participation and one of the two C&I Direct Install contractors noted a barrier to participating. One referred to the hot water heater replacement requirement, three to the credit requirement for the loan, one to the equipment efficiency requirements which can be expensive, one to clutter in the attic, and one to the difficulty with scheduling.

When asked about barriers to customers participating in the NJ Clean Energy Direct Install program, one contractor noted the kWh demand usage threshold and one noted the equipment restrictions.

The C&I Direct Install Contractors were asked whether they coordinate with the refrigeration contractors to help the customers obtain all eligible measures. One noted that he reaches out to the refrigeration contractor when there are opportunities and one noted that they only do so if the customer specifically asks about those measures.

When asked about suggestions for improving the C&I OBRP process, both contractors recommended that the funds be sent directly to the contractor instead of to the customer, and one recommended more integration among the programs.

NJNG Information and Communication

When the residential contractors were asked whether they attended the NJNG SAVEGREEN contractor trainings, all stated that either they or their manager/partner and their staff had done so. They reported that they participated in the following types of trainings.

- Training to qualify to participate in SAVEGREEN
- Manual J training (2 contractors)
- Annual program information meeting (3 contractors)
- Loan calculation
- Duct sizing

When asked how these sessions impacted how they perform their work, they noted that the trainings provided a better understanding of SAVEGREEN, provided technical information, and helped them to do their work more efficiently.

All of the contractors who attended (rather than someone else from their company) reported that the trainings were very helpful. When asked what types of training they feel NJNG should offer to help the business and participation in SAVEGREEN, four responded that the current offerings are what is needed. Others requested the following training sessions.

- Selling the high-efficiency option
- Manual J (provide more often)
- Explaining the rebate
- Understanding the programs

All eight of the residential program contractors stated that they had visited the SAVEGREEN Project website to learn about the program and the benefits that are offered, and they all stated that they were able to find the information that they were looking for.

Seven of the eight residential contractors stated that they used the SAVEGREEN contractor portal or microsite to learn about program updates and four of the eight stated that they used it as a source of marketing information. They stated that they used the information on gas savings and that they used the materials when they were creating their own brochures.

The three contractors interviewed who participate in the $6500 OBRP were asked whether they were listed on the NJNG Contractor site as a company that provides this financing option and how much business they had gotten as a result. All three said that they were listed and estimates of the amount of business that resulted ranged from 35 customers, to 50 customers, to ten percent of the company's leads.

Four HPwES and Seal-up contractors were asked if they bid on jobs on the NJNG Contractor Portal and three of the four contractors stated that they did so. The one that did not stated that he did not know that it existed. Only one of the four stated that it had been an important source of business. Estimates of jobs for the three who used it were less than ten, about 15, and 35.

Contractors recommended that NJNG email contractors to let them know when the portal is updated, that the portal is limited to BPI-certified contractors, that customers must provide email addresses, and that NJNG let customers know they may receive fewer than three bids.

The eight residential contractors were asked what the best way was for NJNG to reach contractors with information about SAVEGREEN. While six stated that email was the best method, and some noted that the email should alert them to an update on the Portal, others stated the best way was through the website, training sessions, a mailing, or a phone call.

When asked, both C&I Direct Install contractors stated that they had called NJNG to discuss the SAVEGREEN OBRP. Both C&I contractors stated that they found that NJNG was very responsive.

Contractor Assessments and Audits

Contractors who participate in the Enhanced Rebate program were asked what information they provide to customers about the high efficiency equipment compared to the other options. Two stated that they provide information on gas savings, one stated that they refer the customer to the NJNG website to use the gas savings calculator, one stated that they explain the efficiency levels and usage, and one stated that they provide information about the rebate.

When asked if they provide information about the maintenance costs of the high efficiency equipment compared to the standard equipment, three contractors stated that they did let the customers know there was no difference in maintenance costs and one stated that he did not discuss this because there was no cost difference.

The rebate contractors were asked whether they routinely provided the calculations that are required by the NJNG SAVEGREEN program and both Enhanced Rebate contractors stated that they did. When the $6500 OBRP contractors were asked whether they were performing the sizing analysis prior to becoming a SAVEGREEN contractor, one stated that they were performing it for new construction and most other homes, one stated that they were performing it on natural gas conversions but not on all homes, and one stated they were doing it for all homes. They estimated that the sizing analysis allows them to downsize the system between 20 and 25 percent of the time.

The HPwES contractors were asked whether the full audit, including the blower door test, is conducted before or after the customer commits to the work. One contractor stated that it was done before and one stated it was done after.

Seal-up contractors were asked whether they use the information from the NJNG audit or perform a separate audit prior to performing the air sealing and insulation work. Both stated that they perform their own audit.

C&I contractors were also asked about their assessment process. They provided varied responses about the type of information provided to customers. One stated that they explain the return on investment and the financing, and one stated that they only discuss the proposal at a later point in time.

Both C&I contractors stated that they review the assessment with the company representative. Both affirmed that they explain the following.

- The NJNG OBRP
- Measures that qualify for the program.
- How much will be covered by the NJ Clean Energy Program
- What can be paid for with OBRP
- Expected energy savings

When asked what questions or concerns customer have about the upgrades and related costs, they stated that the customers usually ask about the savings or return on investment, pricing, and the financing.

Efficiency Measures

The four Enhanced Rebate contractors had no issues with the program requirements, but two of the three $6500 OBRP contractors had one or more suggestions for the program requirements. One of the three contractors who perform HPwES also had an issue with the program requirements.

The Enhanced Rebate contractors' comments related to explaining the benefits of the high efficiency equipment and that it is problematic that the rebate check is sent to the customer.

The $6500 OBRP contractors commented that they would like an OBRP option without a requirement to replace the water heater and that the program is too strict about oversizing boilers.

The one HPwES contractor who had an issue with the program requirements stated that the OBRP approval requirements were too strict. Other comments related to sending the check to the contractor rather than the customer and speeding up the OBRP approval process.

Contractors were asked whether there were any barriers to customers moving forward with the high efficiency equipment. Two of the four Enhanced Rebate contractors noted that the venting requirements could be a barrier. Neither of the two HPwES contractors felt that there were barriers to participation in the program.

The four Enhanced Rebate contractors noted that they were satisfied with the efficiency requirements for the equipment that qualifies for the rebates. One of the two HPwES contractors noted that the equipment requirements were fair and the other noted that there could be some improvement in the equipment requirements.

One of the two $6500 OBRP contractors noted barriers to implementing the furnace/boiler and hot water heater upgrades as the higher cost of the equipment.

Three of the four HPwES and seal-up contractors noted one or more barriers to implementing the upgrades. They mentioned the expense of duct improvements, denial of loans, and township permitting requirements. One of the C&I Direct Install contractors also remarked on the permitting requirements as a barrier.

When asked whether the qualifying equipment was readily available, all six Enhanced Rebate and HPwES contractors stated that it was.

The HPwES and seal-up contractors were asked whether customers usually chose to install all, most, or some of the measures recommended on the audit report. One said all measures, two said most measures, and one said some measures.

One C&I contractor said that customers install some and one said they must install all measures.

When asked which measures were most common, two HPwES contractors stated heating and air conditioning and one stated insulation. Two seal-up contractors noted air sealing and one noted insulation as the most common measures.

The HPwES contractors stated that customers were least likely to install water heaters and foam insulation.

Two C&I contractors stated that lighting was most common and one also noted HVAC. One C&I contractor stated that expensive HVAC units were least common. The C&I contractors stated that they did follow up with customers to see if they were interested in installing additional measures at some point in the future.

SAVEGREEN Impact

The contractors generally reported that the incentives were large enough, that they were important in the decision to install the measures, and that customers would not have done the upgrades without the programs.

All four Enhanced Rebate contractors and the two $6500 OBRP contractors stated that the rebates were enough to convince customers to install the high-efficiency equipment option. One stated that the decline in the rebate had been problematic.

When asked how much of an impact the rebate was to the installation of high-efficiency equipment, three Enhanced Rebate contractors stated that it was very important and one said it was somewhat important. Both $6500 OBRP contractors felt that the OBRP for the furnace/boiler and water heater was very important in the customers' decision to install the high-efficiency equipment. Both HPwES contractors felt that the SAVEGREEN rebate and OBRP were very important in the customers' decision to pursue the energy efficiency upgrades through the HPwES program. Both seal-up contractors also felt that the SAVEGREEN OBRP was very important in the customers' decisions to pursue energy efficiency upgrades.

Both C&I contractors also felt that the SAVEGREEN OBRP and the NJ Clean Energy rebate was very important in their customers' decisions to pursue the energy efficiency upgrades.

Responses to these questions about the importance of SAVEGREEN and NJCEP incentives are summarized in Table IV-3.

Table IV-3
Importance of Program Incentives

Contractor Type	Enhanced Rebate			$6500 OBRP		
	Rebate Enough	Rebate Importance	High Efficiency Without Rebate	OBRP + NJCEP Rebate Enough	OBRP Importance	High Efficiency Without OBRP
Rebate	Yes	Very	No			
	Yes	Very	Maybe			
Rebate & $6500	Yes		No	Yes	Very	No
	Yes		Maybe	Yes	Very	No

Contractor Type	HPwES OBRP	
	OBRP & Rebate Importance	Project Without OBRP & Rebate
HPwES Only	Very	No
HPwES & $6500	Very	No

	HPwES OBRP	
	OBRP Importance	Project Without OBRP
Seal-Up	Very	Yes
	Very	Maybe

	C&I Direct Install			
	Importance		Project Without	
	OBRP	NJCEP Rebate	OBRP	NJCEP Rebate
C&I Direct Install	Very	Very	Maybe	No
	Very	Very	No	No

Contractors were asked what other factors in addition to the program incentives influenced customers' decision to purchase high efficiency equipment or to move forward with the home performance project. Seven of the ten contractors noted the importance of saving energy, reducing bills, or the return on the investment. Three contractors noted that if the equipment was older or not working well and three noted that if there were comfort issues the customer would be more likely to undertake the project. Others mentioned the financing options offered by the company, health and safety issues, and lighting quality.

Enhanced Rebate contractors were asked whether customers ask them about additional work on their home to conserve energy, such as insulation and air sealing. One contractor stated that customers asked somewhat often, two stated that customers did not often ask, and one stated that customers never asked about this.

Three of the four Enhanced Rebate contractors, both HPwES contractors, and both seal-up contractors reported that the SAVEGREEN program influences customers to perform whole house improvements.

When asked what more the program could do to encourage customers to move forward with whole house upgrades, three contractors recommended more marketing, and others recommended higher rebates for the furnace and boiler, increased financing options, free audits, increased emphasis on the importance of the audit, and better communication about the contractor release that the customer signs.

Enhanced Rebate contractors were asked whether they considered becoming an HPwES contractor in NJ and if they had, why they decided not to pursue the certification. Contractors noted that changes and uncertainty in the program, the high cost and long payback of the investment, and the fact that their clientele did not fit well for the company were the reasons they did not pursue the certification.

Many of the contractors felt that SAVEGREEN has positively impacted customers' awareness of energy efficiency options and programs. While seven contractors said that the impact had been significant, one said that customers are made aware if they call NJNG and two did not know what the impact had been.

Contractor Satisfaction and Recommendations.

When asked about satisfaction, all four Enhanced Rebate contractors were very satisfied with the rebate process and both $6500 OBRP contractors were satisfied with the OBRP process. All of the ten contractors were very satisfied with SAVEGREEN overall, except for one seal-up contractor who was somewhat satisfied.

Enhanced Rebate contractors' recommendations related to increasing the rebate amount, keeping the rebates available, having the rebates go directly to the contractor, and not requiring the water heater replacement for OBRP.

One HPwES contractor recommended that the check be sent directly to the contractor.

Seal-up contractors recommended that contractors should be required to be BPI-certified and that NJNG increase program marketing.

C&I contractors recommended more marketing and that payments go directly to the contractor.

C. Summary and Recommendations

This section provides a summary of the findings from the contractor interviews and recommendations based upon those findings.

Program Information and Participation

- SAVEGREEN Contractor Information Source: Residential program contractors reported that they learned about the SAVEGREEN programs through a letter or email received from NJNG (3 contractors), a NJNG contractors meeting (2 contractors), CSG, and the NJ Clean Energy program.

- SAVEGREEN Customer Information Source: Contractors were most likely to report that customers learned about SAVEGREEN through the contractor, followed by learning about it through NJNG. Contractors noted that NJNG conducts a lot of marketing for the program in the gas bill, online, in a mailed flyer, or through a NJNG auditor.

- Customer Participation: Most residential program contractors reported that a high percentage of their customers participated in one of the SAVEGREEN programs.

- Customer Awareness: Contractor reports of how often their customers were aware of the SAVEGREEN programs, WARMAdvantage, and HPwES were quite varied.

    - SAVEGREEN Enhanced Rebate: One contractor said that customers were usually aware of the SAVEGREEN Enhanced Rebate program, one said they were frequently aware, and two said they were infrequently aware.

    - WARMAdvantage: One contractor stated that customers were never aware of the WARMAdvantage program and one said they frequently were aware.

    - $6500 OBRP: Two contractors said that customers were infrequently aware of the $6500 OBRP program and one said they usually were aware.

    - HPwES OBRP: One Contractor said customers were infrequently aware of HPwES OBRP and one contractor said customers were always aware.

- C&I Direct Install Marketing: One C&I contractor stated that telemarketing was most effective and one stated that in-person visits where they offer free energy audits and education were the most successful.

- C&I Direct Install Participation: When asked why they thought there had not been more participation in the C&I Direct Install Program, one contractor thought it was a lack of awareness and the other stated that it is difficult for customers to understand the offering.

Recommendation: NJNG should continue to market SAVEGREEN to contractors with emails and training sessions and they should continue to market SAVEGREEN to customers through print and web-based advertisements.

SAVEGREEN Process

- Barriers to Participation: Four of the eight residential contractors noted one or more barriers to customer participation and one of the two C&I Direct Install contractors noted a barrier to participation. One residential contractor referred to the hot water heater replacement requirement, three to the credit requirement for the OBRP, one to the equipment efficiency requirements which can be expensive, one to clutter in the attic, and one to the difficulty with scheduling.

Finding: It does not appear that there are significant barriers that SAVEGREEN can or should address with program changes.

- C&I Coordination: The C&I Direct Install Contractors were asked whether they coordinate with the refrigeration contractors to help the customers obtain all eligible measures. One noted that he reaches out to the refrigeration contractor when there are

opportunities and one noted that they only do so if the customer specifically asks about those measures.

Recommendation: NJNG should discuss the potential for additional coordination with refrigeration contractors with the C&I contractors and the NJCEP managers who have direct control over the program.

NJNG Information and Communication

- NJNG SAVEGREEN Contractor Trainings: When the residential contractors were asked whether they attended the NJNG SAVEGREEN contractor trainings, all stated that either they or their manager/partner and their staff had done so. The contractors noted that the trainings provided a better understanding of SAVEGREEN, provided technical information, and helped them to do their work more efficiently. All reported that the trainings were very helpful. When asked for recommendations about the format or time of the training sessions, two contractor noted that the early morning sessions are most convenient.

- Training Needs: When asked what types of training they feel NJNG should offer to help the business and participation in SAVEGREEN, four responded that the current offerings are what is needed. Others requested trainings on selling the high-efficiency option, explaining the rebate, understanding the programs, and more often Manual J trainings.

Recommendation: NJNG should continue to provide trainings as they increase SAVEGREEN awareness and provide important information to contractors.

- SAVEGREEN Project Website: All eight of the residential program contractors stated that they had visited the SAVEGREEN Project website to learn about the program and the benefits that are offered, and they all stated that they were able to find the information that they were looking for.

- SAVEGREEN Contractor Portal: Seven of the eight residential contractors stated that they used the SAVEGREEN contractor portal or microsite to learn about program updates and four of the eight stated that they used it as a source of marketing information. They stated that they used the information on gas savings and that they used the materials when they were creating their own brochures.

  Four HPwES and Seal-up contractors were asked if they bid on jobs on the NJNG Contractor Portal and three of the four contractors stated that they did so. The one that did not stated that he did not know that it existed. Only one of the four stated that it had been an important source of business. Estimates of jobs for the three who used it were less than ten, about 15, and 35.

  Contractors recommended that NJNG email contractors to let them know when the portal is updated, that the portal is limited to BPI-certified contractors, that customers must

provide email addresses, and that NJNG let customers know they may receive fewer than three bids.

Recommendation: NJNG should continue to update and maintain the SAVEGREEN Project Website and the Contractor Portal as these are important sources of information for contractors. NJNG should send emails to alert contractors when program updates are posted on the Portal.

- Contacting Contractors: The eight residential contractors were asked what the best way was for NJNG to reach contractors with information about SAVEGREEN. While six stated that email was the best method, and some noted that the email should alert them to an update on the Portal, others stated the best way was through the website, training sessions, a mailing, or a phone call.

Recommendation: NJNG should use email as the primary source of contractor communication.

Contractor Assessments and Audits

- High Efficiency Information Provided to Customers: Contractors who participate in the Enhanced Rebate program were asked what information they provide to customers about the high efficiency equipment compared to the other options. Two stated that they provide information on gas savings, one stated that they refer the customer to the NJNG website to use the gas savings calculator, one stated that they explain the efficiency levels and usage, and one stated that they provide information about the rebate.

- Seal-up Audit: Seal-up contractors were asked whether they use the information from the NJNG audit or perform a separate audit prior to performing the air sealing and insulation work. Both stated that they perform their own audit. One stated that it was required by the NJCEP and one stated that they rely on their own audit to determine pricing and air sealing opportunities.

- C&I Assessment: Both C&I contractors stated that they review the assessment with the company representative. When asked what questions or concerns customers have about the upgrades and related costs, they stated that the customers usually ask about the savings or return on investment, pricing, and the financing.

Efficiency Measures

- Program Requirements: The four Enhanced Rebate contractors had no issues with the program requirements, but two of the three $6500 OBRP contractors and one of the three contractors who perform HPwES had an issue with the program requirements.

    - The $6500 OBRP contractors commented that they would like an OBRP option without a requirement to replace the water heater and that the program is too strict about oversizing boilers.

  - The one HPwES contractor who had an issue with the program requirements stated that the OBRP approval requirements were too strict.

- Barriers to Participation or High Efficiency Equipment: Contractors were asked whether there were any barriers to participation or installation of high efficiency equipment. Two of the four rebate contractors noted that the venting requirements could be a barrier. One of the two $6500 OBRP contractors noted that the cost of the high-efficiency equipment could be a barrier to implementing the furnace/boiler and hot water heater upgrades. Three of the four HPwES and seal-up contractors noted one or more barriers, including the expense of duct improvements, denial of loans, and township permitting requirements. One of the C&I Direct Install contractors also remarked on the permitting requirements as a barrier.

SAVEGREEN Impact

- Enhanced Rebate Impact: All four rebate contractors and the two $6500 OBRP contractors stated that the rebates were enough to convince customers to install the high-efficiency equipment option.

  When asked how much of an impact the rebate had on the installation of high-efficiency equipment, three rebate contractors stated that it was very important and one said it was somewhat important.

  When asked if customers would install the high-efficiency option without the SAVEGREEN Enhanced Rebate, two contractors said customers would not and two said they may or may not.

- $6500 OBRP Impact: Both $6500 OBRP contractors felt that the OBRP for the furnace/boiler and water heater was very important in the customers' decision to install the high-efficiency equipment.

  When asked if customers would install the high-efficiency option without the SAVEGREEN $6500 OBRP, all three contractors said that customers would not.

- HPwES Impact: Both HPwES contractors felt that the SAVEGREEN rebate and OBRP were very important in the customers' decision to pursue the energy efficiency upgrades through the HPwES program. Both seal-up contractors also felt that the SAVEGREEN OBRP was very important in the customers' decisions to pursue energy efficiency upgrades.

  One seal-up contractor said that customers would move forward with the project without the OBRP and one said that they may or may not.

- C&I Impact: Both C&I contractors also felt that the SAVEGREEN OBRP and the NJ Clean Energy rebate was very important in their customers' decisions to pursue the energy efficiency upgrades.

One C&I contractor stated that customers would not move forward with the project of the OBRP was not available and one said that they may. One said that the OBRP influences the scope of the project, encouraging customers to do higher cost measures like HVAC, and one stated that it did not. Both said that customers would not move forward with the project if the NJ Clean Energy Program rebate was not available.

- Other Factors Influencing Projects: Contractors were asked what other factors in addition to the program incentives influenced customers' decision to purchase high efficiency equipment or to move forward with the home performance project. Seven of the ten contractors noted the importance of saving energy, reducing bills, or the return on the investment. Three contractors noted that if the equipment was older or not working well and three noted that if there were comfort issues the customer would be more likely to undertake the project. Others mentioned the financing options offered by their company, health and safety issues, and lighting quality.

- Whole House Upgrades: Three of the four rebate contractors, both home performance contractors, and both seal-up contractors reported that the SAVEGREEN program influences customers to perform whole house improvements.

  When asked what more the program could do to encourage customers to move forward with whole house upgrades, three contractors recommended more marketing, and others recommended higher rebates for the furnace and boiler, increased financing options, free audits, increased emphasis on the importance of the audit, and better communication about the contractor release that the customer signs.

- SAVEGREEN Impact on Energy Efficiency Awareness: Many of the contractors felt that SAVEGREEN has positively impacted customers' awareness of energy efficiency options and programs. While seven contractors said that the impact had been significant, one said that customers are made aware if they call NJNG and two did not know what the impact had been.

Recommendation: The SAVEGREEN Programs appear to have a big impact on customer implementation of energy efficiency upgrades, and on whole house upgrades and customer awareness. NJNG should continue to offer the programs if funding is available.

Contractor Satisfaction and Recommendations

- SAVEGREEN: When asked about satisfaction, all four rebate contractors were very satisfied with the Enhanced Rebate process and both $6500 OBRP contractors were satisfied with the OBRP process. All of the ten contractors were very satisfied with SAVEGREEN overall, except for one seal-up contractor who was somewhat satisfied.

- Rebate Recommendations: Contractors' recommendations related to increasing the rebate amount, keeping the rebates available, having the rebates go directly to the contractor, and not requiring the water heater replacement for OBRP.

- HPwES Recommendations: One contractor recommended that the check be sent directly to the contractor.

- Seal-up Contractors Recommendations: These contractors recommended that contractors should be required to be BPI-certified, that NJNG increase program marketing, that NJNG provide additional incentives in the summer when work is slow, and that NJNG notify the contractors when new gas lines are brought into the area.

- C&I Recommendations: Both C&I contractors recommended that payments go directly to the contractor (NJNG made this change in October 2015.). They also recommended more marketing and that there is better integration among the programs.

Recommendation: NJNG should ensure that contractors know there is an option for contractors to receive the incentive directly for programs where this is available and NJNG should consider providing this option for programs where it is not available. (Note: NJNG made this change in October 2015.)

V. Energy Impacts

The evaluation included an analysis of the impacts of the SAVEGREEN programs on participants' natural gas and electric usage. This section provides a summary of the methodology and findings from the SAVEGREEN Usage Impact Analysis.

A. Methodology

The analysis group for the evaluation was comprised of customers who received a SAVEGREEN enhanced furnace or boiler rebate in 2013 and customers who participated in the SAVEGREEN HPwES OBRP and rebate program in 2013. The $6500 On-Bill Repayment participants were not included in the analysis because only 28 customers participated in 2013 and the C&I Direct Install participants were not included because participation in this program did not begin until 2014.

The first step in the analysis was to identify and remove customers who performed a fuel switch to natural gas as part of their heating system replacement or home performance work, as the change in usage for these customers could not be attributed to the program intervention. There were some challenges in identifying these customers and we attempted to err in the side of removing too many customers rather than bias the results through the inclusion of fuel switch customers. We used three methods to identify and remove customers who switched fuels. The following customers were removed.

1. Customers listed in the program database as fuel switchers (rebate participants only).
2. Customers with no usage in the pre-treatment period.
3. Customers with more than one rate type during the analysis period.

The fuel switch customers were not considered to be eligible for inclusion in the analysis.

Customers were also removed from the analysis group if they did not have close to a full year of usage data in the year before and the year after treatment, had very low usage in the pre or post period, or were outliers in terms of total, baseload, or heating usage. Table V-1 displays the data attrition for the analysis. Approximately 53 percent of the eligible rebate participants were included in the analysis and 70 percent of the eligible HPwES participants were included. A lower percentage of participants were included in the PRISM analysis because this model did not predict a good fit for a small percentage of the participants.

Table V-1
Natural Gas Usage Data
Participant and Later Comparison Group Attrition

	Enhanced Rebate Analysis				HPwES Analysis			
	Treatment		Later Comparison		Treatment		Later Comparison	
	#	%	#	%	#	%	#	%
Original population	6,240	100%	3,868	100%	1,720	100%	1,721	100%
Not in Both Groups	6,219	>99%	3,847	99%	1,720	100%	1,721	100%
No Fuel Switch in Program Data	6,116	98%	3,066	79%	1,720	100%	1,721	100%
Remove 0 usage in Pre Period	6,085	98%	3,056	79%	1,669	97%	1,189	69%
Remove Multiple Rate Codes	6,014	96%	3,056	79%	1,648	96%	1,189	69%
Remove 0 Usage in Post Period	5,982	96%	3,055	79%	1,648	96%	1,189	69%
Eligible population	**5,982**	**100%**	**3,055**	**100%**	**1,648**	**100%**	**1,189**	**100%**
Received usage data	5,973	>99%	3,050	>99%	1,648	100%	1,189	100%
Enough pre and post usage data	4,369	73%	2,310	76%	1,264	77%	1,079	91%
Pre and Post Usage > 300 ccf	3,812	64%	2,112	69%	1,219	74%	1,048	88%
Usage change <65%	3,439	57%	2,012	66%	1,198	73%	1,039	87%
No usage outliers	3,435	57%	2,007	66%	1,197	73%	1,037	87%
No baseload/heating usage outliers	3,168	53%	1,892	62%	1,156	70%	982	83%
Degree Day analysis group	**3,168**	**53%**	**1,892**	**62%**	**1,156**	**70%**	**982**	**83%**
PRISM analysis group	**2,697**	**45%**	**1,695**	**55%**	**1,068**	**65%**	**893**	**75%**

The Enhanced Rebate and HPwES programs are expected to impact electric usage as well as natural gas usage. Therefore, a subset of the treatment group customers was selected for potential inclusion in this study. As most of these customers have JCP&L as their electric utility, a group of customers in the zip codes served by JCP&L were selected to be included in the usage request authorization in the following steps.

1. Participants with enough gas usage data to be included in the gas usage impact analysis were targeted.
2. Participants who had the top and bottom two percent gas savings were removed from the targeted group.
3. Participants who had more than one rate code were removed, to reduce the likelihood that the customers analyzed had switched fuels.
4. Participants who did not have complete address information were removed, as the authorization request was conducted via mailed requests.
5. A random sample of 500 Enhanced Rebate and 500 HPwES participants were selected from these remaining participants.

These 1,000 selected participants were mailed an authorization form request where they were asked to provide authorization for their electric usage data to be provided by JCP&L and used in the electric impact analysis. The request asked the customer to provide the name on the JCP&L account, the customer's signature, and the JCP&L account number.

One initial request was sent and a follow-up request was sent two weeks later to those who had not yet returned the release. Data requests were sent to JCP&L on a rolling basis for those completed authorization forms that were returned. After eight weeks, the final data request was sent to JCP&L. Complete and approved authorization forms were received from 216 unique customers.[11] In total, electric usage data were received for 90 Enhanced Rebate participants and 126 HPwES participants. Table V-2 displays the attrition for these customers. The table shows that 92 percent of the rebate participants and 94 percent of the HPwES participants that had usage data could be included in the degree day electric usage impact analysis. There was no comparison group available for the electric impact analysis due to the need for the authorization forms.

Table V-2
Electric Usage Data Attrition

	Enhanced Rebate		HPwES	
	#	%	#	%
Received usage data	90	100%	126	100%
Enough pre and post usage data	88	98%	126	100%
Usage change <65%	87	97%	122	97%
Usage change <5,000 kWh	83	92%	119	94%
Degree Day Analysis Group	**83**	**92%**	**119**	**94%**
PRISM Analysis Group	**57**	**63%**	**68**	**54%**

Usage data were weather normalized in the pre and the post usage period to ensure that changes in energy usage were due to changes in usage patterns, rather than due to changes in weather. We used both the degree-day weather normalization method and the PRISM software weather normalization. Additionally, a fixed effects regression approach was employed for the electric analysis due to the difference found between the degree day and PRISM estimates.

We used two different comparison groups for the natural gas usage impact analysis to control for other exogenous factors that could impact gas usage between the year prior to and following the furnace replacement. The two comparison groups were as follows.

1. Later SAVEGREEN Participants – These are customers who participated in SAVEGREEN in 2014. These customers are a good comparison group because they also

[11] JCP&L rejected a small number of forms where the name on the form did not match the name on the customer's account.

self-selected into the program. However, they may be different than the treatment group in some unobservable ways because they participated one year later. We examine their usage in the two years prior to participating to control for changes in usage that are not related to program participation.

2. Matched Comparison Group – We requested a sample of 100,000 NJNG residential customer accounts and conducted analysis to select customers whose 12-month usage patterns were most similar to those in the treatment group prior to services. This is a good comparison group because the usage patterns are very similar to those who participated in the year before installation, and are likely to be a good representation of what the participants' usage would have been the following year if they had not participated in the program. However, these customers may be different than the participants in unobservable ways because they did not choose to participate.

   The usage match was conducted in the following steps.

   - Average daily gas usage was calculated for each billing month, where average daily gas usage is equal to the total gas usage in the bill cycle divided by the number of days in the billing cycle.
   - The Sum of Squared Differences (SSD) in average daily gas usage between the participants and the nonparticipants for the 12-month period prior to participation was calculated.
   - We selected nonparticipants for the comparison group with the minimum SSD for the 12-month period. One nonparticipant match was selected to serve as a comparison for each participant.

B. Natural Gas Impacts

This section provides the results for the natural gas usage impacts for both Enhanced Rebate and HPwES participants.

Enhanced Rebates

Table V-3 displays the change in usage for customers who participated in the Enhanced Rebate program and the later participant comparison group. The table shows that the weather-normalized change in usage was 61 Therms, a savings of 5.5 percent of the pre-treatment usage. The results are the same when restricted to the population with PRISM results for both the PRISM and degree-day analysis methods.

Table V-3
Enhanced Rebate Participant Natural Gas Savings Estimates
Later Participant Comparison Group

	Treatment					Later Participant Comparison Group					Net Savings	
	Obs	Pre	Post	Savings		Obs	Pre	Post	Savings			
				Therm	%				Therm	%	Therm	%
All Survived Attrition												
Raw	3,168	1,028	1,099	-71**	-6.9%	1,892	1,115	1,258	-143**	-12.8%	72**	7.0%
Day-Adjusted		1,031	1,101	-70**	-6.8%		1,119	1,260	-140**	-12.5%	70**	6.8%
Degree-Day		1,102	1,026	75**	6.8%		1,196	1,182	14**	1.2%	61**	5.5%
With PRISM Results												
Degree-Day	2,697	1,109	1,035	74**	6.7%	1,695	1,185	1,172	14**	1.1%	60**	5.4%
PRISM		1,110	1,008	101**	9.1%		1,182	1,141	41**	3.5%	60**	5.4%

**Denotes significance at the 99 percent level.

Table V-4 displays the change in usage for customers who participated in the Enhanced Rebate program and the matched nonparticipant comparison group. This table shows higher savings than the later participant comparison group of 76 Therms, a savings of 6.9 percent of the pre-treatment usage. The results are the same when restricted to the population with PRISM results but the PRISM estimate is somewhat higher than the degree-day estimate.

We believe that the matched nonparticipant comparison group may be a better comparison for the analysis than the later participants for three reasons.

1. The later comparison group customers were much more likely to be identified as fuel switchers than the treatment group, potentially indicating that we were better able to identify the fuel switchers in this group because these data were only being recorded beginning on October 2013 (near the end of the treatment group participation). This suggests that we may not have successfully removed all fuel switchers from the treatment group and that a better comparison is the matched comparison where we also cannot identify fuel switchers through a database. While only four percent of the treatment group was identified as fuel switchers, 21 percent of the later participant comparison group were identified as fuel switchers.

   Another hypothesis is that the later participants were different from the earlier participants in that they were more likely to be fuel switchers (as this was the case with the HPwES analysis, where the program data was not available for either group.) This also suggests that the later comparison group is not as good of a comparison group because they may also differ in other unobservable characteristics from the treatment group. For example, different types of customers may have been recruited into the SAVEGREEN program in 2014 than in 2013.

2. The later comparison group has pre-treatment usage that is about nine percent higher than the treatment group, whereas the matched comparison group, by definition has pre-treatment usage that is almost identical to that of the treatment group.

3. The matched comparison group provides a comparison for each treatment group customer, as compared to the later comparison group that has only 60 percent as many cases to compare.

Therefore, we take the matched comparison group, degree day savings estimate of 76 Therms as the preferred estimate of the Enhanced Rebate program savings.

Table V-5A
Enhanced Rebate Participant Natural Gas Savings Estimates
Matched Nonparticipant Comparison Group

	Treatment					Matched Nonparticipant Comparison Group					Net Savings	
	Obs	Pre	Post	Savings		Obs	Pre	Post	Savings			
				Therm	%				Therm	%	Therm	%
All Survived Attrition												
Raw	3,168	1,028	1,099	-71**	-6.9%	3,168	1,036	1,178	-143**	-13.8%	72**	7.0%
Day-Adjusted		1,031	1,101	-70**	-6.8%		1,039	1,180	-141**	-13.5%	71**	6.9%
Degree-Day		1,102	1,026	75**	6.8%		1,098	1,098	>-1	>-0.1%	76**	6.9%
With PRISM Results												
Degree-Day	2,697	1,109	1,035	74**	6.7%	2,697	1,112	1,114	-2	-0.2%	76**	6.8%
PRISM		1,110	1,008	101**	9.1%		1,103	1,089	14**	1.3%	88**	7.9%

**Denotes significance at the 99 percent level.

We conducted one additional check of the nonparticipant matching methodology.

- Instead of matching nonparticipant usage with the participants for the twelve months prior to treatment, we matched the nonparticipant usage for the 4 to 15 months prior to treatment, again a 12-month match, but not using the three months just prior to treatment as a match.

- We selected one comparison customer that had the best match in usage with each participant for this time period.

- We then checked how well these chosen nonparticipants fit with their matched participants in the three months just prior to treatment.

- We identified the half of the participant group that had the worst matches based on the three months prior to treatment. For those participants, we selected an additional 10

matches for the 4 to 15 month period and checked how well each of these matched in the three months prior to treatment.

- We then selected a replacement match that did the best in terms of the sum of the difference for the 4 to 15 month match and the one to three month match, and selected these as the final match. These final selections are shown in Table V-5B.

Table V-5B shows that this second match methodology yielded slightly higher savings results, of 80 Therms saved for the degree-day methodology, as compared to 76 in the original match methodology shown in Table II-2A. As a more conservative estimate, we continue to use the original match methodology shown in Table II-2A as the final impact estimate for the Enhanced Rebates.

Table V-5B
Enhanced Rebate Participant Natural Gas Savings Estimates
Matched Nonparticipant Comparison Group –
Additional Match Methodology for Comparison

	Treatment					Matched Nonparticipant (Second Methodology) Comparison Group					Net Savings	
	Obs	Pre	Post	Savings		Obs	Pre	Post	Savings			
				Therm	%				Therm	%	Therm	%
All Survived Attrition												
Raw	3,168	1,028	1,099	-71**	-6.9%	3,168	1,037	1,191	-153**	-14.8%	83**	8.0%
Day-Adjusted		1,031	1,101	-70**	-6.8%		1,040	1,192	-152**	-14.6%	82**	8.0%
Degree-Day		1,102	1,026	75**	6.8%		1,103	1,108	-5#	-0.5%	80**	7.3%
With PRISM Results												
Degree-Day	2,559	1,115	1,039	76**	6.8%	2,559	1,121	1,129	-7**	-0.7%	84**	7.5%
PRISM		1,114	1,012	102**	9.2%		1,117	1,104	13**	1.2%	89**	8.0%

**Denotes significance at the 99 percent level. #Denotes significance at the 90 percent level.

Table V-6 displays the baseload and heating savings using the matched nonparticipant comparison group. The table shows that approximately two thirds of the savings result from heating usage and approximately one third from baseload usage.

Table V-6
Enhanced Rebate Participant Natural Gas Savings Estimates
By Heating and Baseload Usage

		Treatment Group					Comparison Group					Net Savings	
		Obs	Pre	Post	Savings		Obs	Pre	Post	Savings			
					Therm	%				Therm	%	Therm	%
Later Participant Comparison Group													
Degree-Day	Baseload	3,168	280	271	8**	3.0%	1,892	318	330	-12**	-3.8%	20**	7.3%
	Heating		822	755	67**	8.1%		878	852	26**	3.0%	41**	4.9%
Matched Nonparticipant Comparison Group													
Degree-Day	Baseload	3,168	280	271	8**	3.0%	3,168	283	302	-19**	-6.9%	28**	9.9%
	Heating		822	755	67**	8.1%		815	796	19**	2.3%	48**	5.8%

**Denotes significance at the 99 percent level.

Table V-7 displays savings by heating system type for the Enhanced Rebate participants. The table shows that savings were greater for the boilers than the furnaces when the matched comparison group was used. Savings were estimated to be 68 Therms or 6.2 percent of pre-treatment usage for furnaces and 103 Therms or 9.3 percent of pre-treatment usage for the boilers.

Table V-7
Enhanced Rebate Participant Natural Gas Savings Estimates
By Heating System Type

Heating Type	Treatment					Comparison Group					Net Savings	
	Obs	Pre	Post	Savings		Obs	Pre	Post	Savings			
				Therm	%				Therm	%	Therm	%
Later Participant Comparison Group												
Furnace	2,468	1,097	1,029	68**	6.2%	1,544	1,199	1,190	9*	0.8%	59**	5.4%
Boiler	693	1,112	1,009	103**	9.3%	343	1,175	1,138	37**	3.1%	66**	5.9%
Matched Nonparticipant Comparison Group												
Furnace	2,468	1,097	1,029	68**	6.2%	3,161	1,097	1,097	>-1	>-0.1%	68**	6.2%
Boiler	693	1,112	1,009	103**	9.3%						103**	9.3%

†7 treatment group customers and 5 later participant comparison group customers had conflicting heating types and were excluded from this analysis.
**Denotes significance at the 99 percent level. *Denotes significance at the 95 percent level.

Table V-8 shows that participants with higher capacity replacement systems had greater savings, both in terms of Therms saved and the percentage of pre-treatment natural gas usage.

Table V-8
Enhanced Rebate Participant Natural Gas Savings Estimates
By Capacity

Capacity	Treatment					Comparison Group					Net Savings	
	Obs	Pre	Post	Savings		Obs	Pre	Post	Savings			
				Therm	%				Therm	%	Therm	%
Later Participant Comparison Group												
≤70	626	984	924	60**	6.1%	496	1,112	1,102	11	1.0%	49**	5.0%
71-100	1,730	1,080	1,011	70**	6.4%	1,058	1,173	1,163	10*	0.9%	59**	5.5%
>100	750	1,217	1,117	100**	8.2%	293	1,345	1,313	33**	2.4%	67**	5.5%
Matched Nonparticipant Comparison Group												
≤70	626	984	924	60**	6.1%	3,106	1,090	1,091	-1	-0.1%	61**	6.2%
71-100	1,730	1,080	1,011	70**	6.4%						70**	6.5%
>100	750	1,217	1,117	100**	8.2%						100**	8.2%

†62 treatment group customers and 45 later participant comparison group customers had conflicting capacity data and were excluded from this analysis.
**Denotes significance at the 99 percent level. *Denotes significance at the 95 percent level.

Table V-9 shows savings by heating type and efficiency level. The table shows that the systems with efficiency of 94 or greater had greater savings than those with an efficiency level of 93 or below.

Table V-9
Enhanced Rebate Participant Natural Gas Savings Estimates
By Efficiency and Heating Type
Matched Comparison Group

Efficiency	Treatment					Comparison Group					Net Savings	
	Obs	Pre	Post	Savings		Obs	Pre	Post	Savings			
				ccf	%				ccf	%	ccf	%
Furnace†												
≤93	177	1,023	970	54**	5.3%	2,460	1,097	1,102	-5#	-0.5%	59**	5.8%
94-95	553	1,084	1,008	76**	7.0%						81**	7.5%
>95	1,730	1,110	1,042	67**	6.1%						72**	6.5%

Efficiency	Treatment					Comparison Group					Net Savings	
	Obs	Pre	Post	Savings		Obs	Pre	Post	Savings			
Boilers[†]												
≤93	600	1,082	981	101**	9.3%	700	1,105	1,087	18**	1.6%	83**	7.7%
94-95	91	1,372	1,260	112**	8.2%						94**	6.9%

[†]15 treatment group customers and 4 later participant comparison group customers had conflicting efficiency data and were excluded from this analysis. [†]1 later participant comparison group customer had conflicting efficiency data and was excluded from this analysis.
**Denotes significance at the 99 percent level. #Denotes significance at the 90 percent level.

Table V-10 displays savings by the pre-treatment weather normalized usage calculated in this evaluation. The table shows that participants with higher pre-treatment usage had greater savings from the heating system replacement. While customers with pre-treatment usage of less than 800 Therms saved an average of 37 Therms, those with pre-treatment usage between 800 and 1,200 Therms saved an average of 79 Therms, and those with pre-treatment usage over 1,200 Therms saved an average of 105 Therms.

Table V-10
Enhanced Rebate Participant Natural Gas Savings Estimates
By Pre-Treatment Usage

Installed Therms/Yr	Treatment					Comparison Group					Net Savings	
	Obs	Pre	Post	Savings		Obs	Pre	Post	Savings			
				Therm	%				Therm	%	Therm	%
Later Participant Comparison Group												
≤800	890	632	616	16**	2.6%	413	643	653	-10*	-1.6%	26**	4.2%
801-1,200	1,249	990	920	70**	7.1%	725	999	994	5	0.5%	65**	6.5%
>1,200	1,029	1,643	1,510	133**	8.1%	754	1,687	1,651	36**	2.1%	97**	5.9%
Matched Nonparticipant Comparison Group												
≤800	890	632	616	16**	2.6%	890	641	661	-20**	-3.2%	37**	5.8%
801-1,200	1,249	990	920	70**	7.1%	1,249	991	1,001	-9**	-0.9%	79**	8.0%
>1,200	1,029	1,643	1,510	133**	8.1%	1,029	1,623	1,595	28**	1.7%	105**	6.4%

**Denotes significance at the 99 percent level. *Denotes significance at the 95 percent level.

Home Performance

Table V-11 displays the change in usage for customers who participated in the HPwES program and the later participant comparison group. The table shows that the weather-normalized change in usage was 168 Therms, a savings of 16 percent of the pre-treatment usage. The results are the same when restricted to the population with PRISM results for both the PRISM and degree-day analysis methods.

Table V-11
HPwES Participant Natural Gas Savings Estimates
Later Participant Comparison Group

	Treatment					Later Participant Comparison Group					Net Savings	
	Obs	Pre	Post	Savings		Obs	Pre	Post	Savings			
				Therm	%				Therm	%	Therm	%
All Survived Attrition												
Raw	1,156	1,023	899	125**	12.2%	982	1,034	1,126	-92**	-8.9%	217**	21.2%
Day Adjusted		1,025	901	123**	12.0%		1,036	1,127	-91**	-8.8%	214**	20.9%
Degree Day		1,048	849	199**	19.0%		1,090	1,059	31**	2.8%	168**	16.0%
With PRISM Results												
Degree Day	1,068	1,043	843	200**	19.2%	893	1,083	1,053	30**	2.8%	170**	16.3%
PRISM		1,039	814	225**	21.6%		1,082	1,027	56**	5.1%	169**	16.3%

**Denotes significance at the 99 percent level.

Table V-12A displays the change in usage for customers who participated in the HPwES program and the matched participant comparison group. This table shows higher savings than the later participant comparison group of 221 Therms, a savings of 21 percent of the pre-treatment usage. The results are the same when restricted to the population with PRISM results but the PRISM estimate is slightly higher than the degree-day estimate.

As above, we take the matched nonparticipant comparison group as the preferred estimate.

Table V-12A
HPwES Participant Natural Gas Savings Estimates
Matched Nonparticipant Comparison Group

	Treatment					Matched Nonparticipant Comparison Group					Net Savings	
	Obs	Pre	Post	Savings		Obs	Pre	Post	Savings			
				ccf	%				ccf	%	ccf	%
All Survived Attrition												
Raw	1,156	1,023	899	125**	12.2%	1,156	1,027	1,144	-117**	-11.4%	242**	23.6%
Day Adjusted		1,025	901	123**	12.0%		1,029	1,147	-118**	-11.5%	241**	23.5%
Degree Day		1,048	849	199**	19.0%		1,050	1,072	-22**	-2.1%	221**	21.1%
With PRISM Results												
Degree Day	1,068	1,043	843	200**	19.2%	1,068	1,048	1,070	-21**	-2.0%	222**	21.2%
PRISM		1,039	814	225**	21.6%		1,037	1,048	-11**	-1.0%	235**	22.6%

**Denotes significance at the 99 percent level.

We conducted an additional check of the nonparticipant matching methodology using the same additional methodology described in the Enhanced Rebate impact section above. Table V-12B shows that the degree-day estimate of savings using this second match methodology was 224 Therms, very similar to the 221 Therms show in Table V-12A. As with the rebates, we use the original matching methodology as our final impact estimate.

Table V-12B
HPwES Participant Natural Gas Savings Estimates
Matched Nonparticipant Comparison Group – Additional Match Methodology for Comparison

	Treatment					Matched Nonparticipant (Second Methodology) Comparison Group					Net Savings	
	Obs	Pre	Post	Savings		Obs	Pre	Post	Savings			
				ccf	%				ccf	%	ccf	%
All Survived Attrition												
Raw	1,156	1,023	899	125**	12.2%	1,156	1,033	1,160	-127**	-12.3%	251**	24.5%
Day Adjusted		1,025	901	123**	12.0%		1,034	1,162	-129**	-12.4%	252**	24.6%
Degree Day		1,048	849	199**	19.0%		1,059	1,084	-25**	-2.4%	224**	21.4%
With PRISM Results												
Degree Day	1,048	1,043	842	201**	19.2%	1,048	1,053	1,075	-22**	-2.0%	222**	21.3%
PRISM		1,039	814	225**	21.7%		1,046	1,052	-5*	-0.5%	230**	22.2%

**Denotes significance at the 99 percent level. *Denotes significance at the 95 percent level.

Table V-13 displays the baseload and heating savings using the later participant and matched nonparticipant comparison groups. The table shows that approximately 75 percent of the savings result from heating usage and approximately 25 percent from baseload usage.

Table V-13
HPwES Participant Natural Gas Savings Estimates
Later Participant Comparison Group
By Heating and Baseload Usage

		Treatment Group					Comparison Group					Net Savings	
		Obs	Pre	Post	Savings		Obs	Pre	Post	Savings			
					Therm	%				Therm	%	Therm	%
Later Participant Comparison Group													
Degree-Day	Baseload	1,156	279	265	15**	5.3%	982	295	314	-19**	-6.3%	33**	12.0%
	Heating		769	584	184**	24.0%		794	745	50**	6.3%	135**	17.5%
Matched Nonparticipant Comparison Group													
Degree-Day	Baseload	1,156	267	253	14**	5.1%	1,156	283	320	-36**	-	51**	18.3%
	Heating		776	589	187**	24.1%		767	752	14**	1.9%	170**	22.1%

Table V-14 displays the savings estimates by the total amount of the rebate and on-bill payment agreements, a proxy for the total job cost which was not available. The table shows that participants with larger jobs had greater savings. The matched comparison estimate for those with the combined program benefit of over $14,000 had savings of 251 Therms or almost 24 percent of pre-treatment gas usage.

Table V-14
HPwES Participant Natural Gas Savings Estimates
Degree Day Analysis
By Total Rebate and On-Bill Payment Amount

OBRP and Rebate Amount	Treatment					Comparison Group					Net Savings	
	Obs	Pre	Post	Savings		Obs	Pre	Post	Savings			
				ccf	%				ccf	%	ccf	%
Later Participant Comparison Group												
≤ $10,000	452	992	830	162**	16.3%	103	1,085	1,038	47**	4.3%	115**	11.6%
$10,001-$14,000	131	1,187	988	199**	16.7%	199	1,199	1,170	30*	2.5%	169**	14.2%
> $14,000	573	1,060	832	229**	21.6%	680	1,058	1,029	29**	2.7%	200**	18.8%
Matched Nonparticipant Comparison Group												
≤ $10,000	452	992	830	162**	16.3%	1,156	1,050	1,072	-22**	-2.1%	184**	18.5%
$10,001-$14,000	131	1,187	988	199**	16.7%						221**	18.6%
> $14,000	573	1,060	832	229**	21.6%						251**	23.6%

**Denotes significance at the 99 percent level. *Denotes significance at the 95 percent level.

Table V-15 shows that participants with greater pre-treatment usage had greater savings from the program. The matched comparison estimate of savings for participants with

pre-treatment usage of over 1,200 Therms was 329 Therms or 22 percent of pre-treatment usage.

Table V-15
HPwES Participant Natural Gas Savings Estimates
By Pre-Treatment Usage

Installed Therms/Yr	Treatment					Comparison Group					Net Savings	
	Obs	Pre	Post	Savings		Obs	Pre	Post	Savings			
				ccf	%				ccf	%	ccf	%
Later Participant Comparison Group												
≤800	255	664	567	96**	14.5%	179	672	689	-17**	-2.6%	114**	17.1%
801-1,200	593	991	804	187**	18.9%	500	995	964	31**	3.1%	156**	15.7%
>1,200	308	1,475	1,168	307**	20.8%	303	1,492	1,433	59**	4.0%	248**	16.8%
Matched Nonparticipant Comparison Group												
≤800	255	664	567	96**	14.5%	255	678	702	-24**	-3.5%	120**	18.1%
801-1,200	593	991	804	187**	18.9%	593	999	1,020	-21**	-2.1%	208**	21.0%
>1,200	308	1,475	1,168	307**	20.8%	308	1,455	1,478	-22*	-1.5%	329**	22.3%

**Denotes significance at the 99 percent level. *Denotes significance at the 95 percent level.

C. Electric Impacts

This section provides the results for the electric usage impacts for both Enhanced Rebate and HPwES participants.

Table V-16 displays the savings estimates for the Enhanced Rebate participants. The table shows that the savings estimates were not statistically significant and differed between the degree day, pooled regression, and PRISM approaches. However, the differences between the estimates were not statistically significant. Given the high variance in savings, the low mean estimated savings, and the small sample sizes, it was not possible to obtain a good estimate of the change in electric usage that resulted from the Enhanced Rebate program.[12] While the degree day and pooled regression approaches showed small increases in electric usage, the PRISM analysis showed virtually no change in usage.

One reason that usage for rebate participants may have increased is that condensing furnaces use more electricity than non-condensing furnaces. One NYSERDA study shows an increase of 50 percent of electricity for heating usage when the furnace has a permanent-split-

[12] Given the small size of the impact and the high variance of the change in usage, we estimate that a sample size of approximately 2,500 would be necessary to find a 60 kWh increase in usage to be statistically significant at the 95 percent level. If we only required that a five percent change could be measured as statistically significant the sample size of 83 would be sufficient to state that the change was statistically significant.

capacitor (PSC) motor, which is estimated to be used in 75 to 95 percent of these systems.[13] Another potential reason for increased electric usage is that customers may have installed a central air conditioning unit at the same time as the HVAC system, and this information is not available to NJNG.

Table V-16
Enhanced Rebate Participant Electric Savings Estimates

	Treatment				
	Obs	Pre	Post	Savings	
				kWh	%
All Survived Attrition					
Raw	83	10,130	9,670	460**	4.5%
Day-Adjusted		10,147	9,716	431**	4.2%
Degree-Day		10,281	10,342	-61	-0.6%
Pooled Regression		9,652	9,808	-155	-1.6%
With PRISM Results					
Degree-Day	57	10,823	10,975	-152	-1.4%
PRISM		10,722	10,695	27	0.3%
Pooled Regression		10,314	10,478	-163	-1.6%

**Denotes significance at the 99 percent level.

Table V-17 displays the savings estimates for the HPwES participants. The table shows that the savings estimates were not consistent across the various approaches. While the degree day method estimated an increase in usage, the pooled regression and PRISM approaches estimated savings that ranged from under one percent to 3.6 percent. Again, it appears that a larger sample size would be needed to develop a reliable estimate of the change in usage.[14]

Table V-17
Home Performance Participant Electric Savings Estimates

	Treatment				
	Obs	Pre	Post	Savings	
				kWh	%
All Survived Attrition					
Raw	119	11,624	10,509	1,115**	9.6%
Day-Adjusted		11,619	10,676	943**	8.1%
Degree-Day		11,658	11,736	-78	-0.7%
Pooled Regression		11,235	10,873	362**	3.2%

[13] Gas Furnace Electricity Usage, April 15, 2013, NYSERDA. Available at: http://www.taitem.com/wp-content/uploads/tt_furnace_electricity_use_20130507.pdf

	Treatment				
	Obs	Pre	Post	Savings	
With PRISM Results					
Degree-Day	68	11,456	11,849	-393#	-3.4%
PRISM		11,490	11,082	408*	3.6%
Pooled Regression		11,077	10,995	82	0.7%

**Denotes significance at the 99 percent level. *Denotes significance at the 95 percent level. #Denotes significance at the 90 percent level.

D. Summary of Findings

This section provided an analysis of the impacts of the Enhanced Rebate and HPwES programs on energy usage. Key findings from the analysis were as follows.

- Enhanced Rebate Natural Gas Savings: The Enhanced Rebate savings (using the matched comparison group) were estimated to be 76 Therms, a savings of 6.9 percent of the pre-treatment usage.
    - Furnace and Boiler Savings: Natural gas savings were higher for customers who replaced boilers. Savings were estimated to be 68 Therms or 6.2 percent of pre-treatment usage for furnaces and 103 Therms or 9.3 percent of pre-treatment usage for the boilers.
    - Savings by Pre-Treatment Gas Usage: Participants with higher pre-treatment usage had greater savings from the heating system replacement. While customers with pre-treatment usage of less than 800 Therms saved an average of 37 Therms, those with pre-treatment usage between 800 and 1,200 Therms saved an average of 79 Therms, and those with pre-treatment usage over 1,200 Therms saved an average of 105 Therms.
- Home Performance Natural Gas Savings: The HPwES savings (using the matched comparison group) were estimated to be 221 Therms, a savings of 21 percent of the pre-treatment usage.
    - Savings by Rebate and On-bill Financing: Participants with higher job costs had greater savings. The matched comparison estimate for those with the combined program benefit of over $14,000 had savings of 251 Therms or almost 24 percent of pre-treatment gas usage.
    - Savings by Pre-Treatment Gas Usage: Participants with higher pre-treatment usage had greater savings from the program. The matched comparison estimate of savings was that participants with pre-treatment usage of over 1,200 Therms had savings of 329 Therms or 22 percent of pre-treatment usage.

- Electric Usage Impacts: The electric usage impact analysis did not produce reliable or consistent estimates due to the small sample size and the high variability in savings. The Enhanced Rebate savings estimates were not statistically significant and differed between the degree day, pooled regression, and PRISM approaches. While the degree day and pooled regression approaches showed small increases in electric usage, the PRISM analysis showed virtually no change in usage. However, the differences between the estimates were not statistically significant.

  The HPwES savings estimates were not consistent across the various approaches. While the degree day method estimated an increase in usage, the pooled regression and PRISM approaches estimated savings that ranged from under one percent to 3.6 percent. Again, it appears that a larger sample size would be needed to develop a reliable estimate of the change in usage.

VI. Non-Energy Benefits

The evaluation included an assessment of the non-energy benefits of the Residential Enhanced Rebate (Rebate), Residential On-Bill Repayment ($6500 OBRP) and Residential Home Performance with Energy Star On-Bill Financing and Rebate (HPwES OBRP) programs. This section provides a summary of the methodology and calculations for each of the following three non-energy benefit categories.

- Environmental (Rebate and HPwES OBRP)
- Economic (Rebate and HPwES OBRP)
- Health and Safety (Rebate and $6500 OBRP)

Benefits for each program were assessed based on the availability of data for these programs, as described in the following sections.

A. Environmental

Environmental benefits result from the SAVEGREEN energy efficiency programs, as the programs reduce energy usage and the negative environmental impacts that are associated with that usage. This section provides a description of the methodology used to estimate the environmental impacts.

Methodology

Environmental benefits attributable to energy efficiency measures include reductions in air pollution resulting from decreases in household energy usage. The major air pollutants associated with consumption of natural gas and electricity are the following.

- Greenhouse gases (represented in CO2-equivalent)
- Sulfur dioxide (SO2)
- Nitrogen oxide (NOx)
- Fine particulate matter less than 2.5 micrometers in diameter (PM 2.5)
- Volatile organic compounds (VOCs)

Environmental benefits were estimated for the Enhanced Rebate and HPwES OBRP programs because these programs were implemented before 2013 and there was sufficient pre and post energy usage data to calculate the impacts of these programs on energy usage.

The estimation of the environmental benefits associated with the Rebate and HPwES OBRP programs involved three steps.

1. *Energy Usage Reductions by Fuel Type*: Natural gas usage savings for the Enhanced Rebate and HPwES OBRP programs were estimated through a weather-normalized, comparison group adjusted billing analysis of natural gas usage data. A similar electric usage impact analysis was conducted for a subset of SAVEGREEN participants who

replied to a request for authorization to provide JCP&L electric usage data. However, due to the small sample size, small average changes in electric usage, and high variability of the change in electric usage, this analysis did not estimate a clear and consistent impact of the NJNG SAVEGREEN programs on electric usage. Therefore, electricity usage impacts are excluded from the analysis that follows.

2. *Quantity of Avoided Emissions by Pollutant:* Published data sources were used to estimate the emissions that were avoided as a result of natural gas usage reductions. The analysis estimated the total tons of avoided CO2, SO2, NOx, PM 2.5, and VOC emissions in the state of New Jersey due to the 2013 program's natural gas savings.

3. *Value of Avoided Emissions by Pollutant:* The dollar value of avoided SO2, NOx, PM 2.5 and VOC emissions was computed using values estimated by the Office of Management and Budget (OMB)[15] and Air Pollution Emission Experiments and Policy (APEEP) Model[16] as recommended by the National Research Council (NRC) in its 2010 report to Congress.[17] The analysis estimates the total dollar value of the emissions avoided in the state of New Jersey.

   The APEEP Model calculates the marginal damage of emissions by first calculating total damages due to all sources at a baseline level, and then re-computing total damages after adding one ton of one pollutant from one source. The modeled physical effects include premature mortality, illness, reduced timber and crop yields, and other impacts. A dollar value is then assigned to each effect, the market value of goods and services, the values attributed to chronic illness from the nonmarket valuation literature, or the value of a statistical life. The model does not test for interactions among the emissions of various pollutants.

   The APEEP Model computes exposures by multiplying county-level populations by county-level pollution concentrations. It is necessary to account for population because the amount of damage caused by any pollutant is greater in an area that is more highly populated, as more individuals are affected.

   Highly populated areas are also exposed to more emissions because the pollutants that result from burning natural gas are released from all homes and buildings where natural gas is consumed, not from a single location such as a power plant. It is therefore necessary to determine the level of avoided emissions in each county to determine the amount of damage in each county. To do this, the state-wide levels of avoided pollutants were weighted by county population using data from the 2010 US census. The APEEP damage values for each county were multiplied by these weighted values.

[15] OMB (2013). p18.
[16] Muller (2008).
[17] NRC (2010). p241.

The marginal value of avoided CO2-eq emissions was calculated by the OMB in a 2013 report entitled "The Social Cost of Carbon." The 2013 value was used because it was the most recent value available.

The following calculation of environmental benefits was performed.

- *CO2-eq Savings = Gas Savings * CO2-eq Emission Rate * Marginal Value of Avoided CO2 Emissions*
- *SO2 Savings = Gas Savings * SO2 Emission Rate * Marginal Value of Avoided SO2 Emissions*
- *NOx Savings = Gas Savings * NOx Emission Rate * Marginal Value of Avoided NOx Emissions*
- *PM2.5 Savings = Gas Savings * PM2.5 Emission Rate * Marginal Value of Avoided PM2.5 Emissions*
- *VOC Savings = Gas Savings * VOC Emission Rate * Marginal Value of Avoided VOC Emissions*

- *Total Savings = CO2 Savings + SO2 Savings + NOX Savings + PM2.5 Savings + VOC Savings*

Benefit Calculation

Table VI-1 displays the natural gas savings from the two SAVEGREEN programs. Natural gas usage savings were found by calculating the weather-normalized, comparison group adjusted reduction in SAVEGREEN participants' gas usage from the year prior to participation compared to the year following program participation.

Savings in Therms were converted to MMBtu savings. The Rebate program resulted in a total reduction in natural gas usage of 50,663 MMBtu and the HPwES OBRP program resulted in a total reduction in natural gas usage of 38,032 MMBtu per year for the 2013 participants.

Table VI-1
Natural Gas Usage Savings for 2013 Participants

	Enhanced Rebate	HPwES OBRP
2013 Participants	6,700	1,720
Natural Gas Savings Per Participant (Therms)	76	221
Total Natural Gas Savings (Therms)	506,631	380,316
Total Natural Gas Savings (MMBtu)	50,663	38,032

Table VI-2 displays the emissions rates for each pollutant and the tons of avoided emissions. The natural gas emissions rates are developed at the national level because the composition of natural gas does not vary greatly across the country. The tons of avoided emissions values were calculated by multiplying each program's energy usage savings by the emission rates for each pollutant.

Table VI-2
Emission Rates and Avoided 2014 Emissions from Natural Gas Savings

	Natural Gas Emission Rate (Tons CO2-eq/1,000 MMBtu)[1]	Avoided Emissions (Tons)	
		Enhanced Rebate[1]	HPwES OBRP[1]
CO2-eq[2]	62	3,139	2,356
SO2[3]	0.000293	0.015	0.011
NOx[3]	0.046	2.32	1.74
PM 2.5[3]	0.000927	0.047	0.035
VOC[3]	0.00268	0.136	0.102

[1]Avoided emissions for CO2-eq are in metric tons. Avoided emissions for all other air pollutants are in short tons.
[2]NRC (2010). The CO2-eq emissions rate is the near term value for upstream emissions.
[3] EPA (1998). The NOx emissions rate is the uncontrolled value for residential furnaces, and the PM 2.5 emissions rate is the value for filterable emissions.

Table VI-3 presents the estimates of the marginal values of avoided emissions that are used to monetize the environmental benefits associated with the programs.

Table VI-3
Marginal Value of Avoided Emissions from Natural Gas

	Marginal Value of Avoided Emissions (2015 dollars /Ton) [1]
CO2-eq[2]	$41.4
SO2[3]	$111,573
NOx[3]	$23,023
PM 2.5[3]	$468,563
VOC[3]	$44,180

[1] Avoided emissions for CO2-eq are in metric tons. Avoided emissions for all other air pollutants are in short tons.
[2] OMB (2013). Dollar values were converted from 2007 dollars to 2015 dollars using the CPI inflation index inflation of 1.15, obtained on July 21, 2015 from http://www.bls.gov/data/inflation_calculator.htm.
[3] APEEP values from Muller (2008). Dollar values were converted from 2000 dollars to 2015 dollars using the CPI inflation index inflation of 1.39, obtained on July 23, 2015 from http://www.bls.gov/data/inflation_calculator.htm.

The benefits of each avoided pollutant were estimated by multiplying the amount of avoided 2014 emissions by the marginal damage values. These values were summed to obtain an estimate of the total environmental benefits resulting from each SAVEGREEN program.

Because the upgrades installed as a result of NJNG SAVEGREEN reduce natural gas usage over the lifetime of the measures, the emissions savings accumulate over this time period. To estimate the lifetime environmental benefits that result from the SAVEGREEN programs, the present discounted value (PDV) of these one-year benefits were calculated over the 15-year measure lifetime. The PDV was calculated using the following formula, assuming a three percent discount rate.

$$PDV = (1 - 1.03^{-15})/0.03 * \text{first year savings}$$

Table VI-4 displays the results of these benefit calculations. The total value of all emissions avoided by the Rebate program is $213,091 in 2014, and the lifetime value of these avoided emissions is $2,543,862. The total value of all 2014 emissions avoided by the HPwES OBRP program is $159,963, and the lifetime value of these avoided emissions is $1,909,622. Together, these two programs resulted in a 2014 benefit of $373,054 and a lifetime benefit of $4,453,491.

Table VI-4
Environmental Benefits by Program

	Enhanced Rebate				HPwES OBRP				SAVEGREEN Environmental Benefits[2]	
	Avoided Emissions[1]		Monetized[2]		Avoided Emissions[1]		Monetized[2]			
	Tons	$ per Ton	2014	Lifetime	Tons	$ per Ton	2014	Lifetime	2014	Lifetime
CO2-eq	3,139	$41.4	$129,945	$1,551,275	2,356	$41.4	$97,547	$1,164,506	$227,492	$2,715,781
SO2	0.015	$111,573	$1,654	$19,751	0.011	$111,573	$1,242	$14,826	$2,896	$34,577
NOx	2.32	$23,023	$53,485	$638,497	1.74	$23,023	$40,150	$479,305	$93,634	$1,117,802
PM 2.5	0.047	$468,563	$22,002	$262,657	0.035	$468,563	$16,516	$197,170	$38,518	$459,827
VOC	0.136	$44,180	$6,005	$71,689	0.102	$44,180	$4,508	$53,815	$10,513	$125,504
Total			**$213,091**	**$2,543,862**			**$159,963**	**$1,909,622**	**$373,054**	**$4,453,491**

[1]Avoided emissions for CO2-eq are in metric tons. Avoided emissions for all other air pollutants are in short tons.
[2]Monetary values shown in 2015 dollars

Table VI-5 displays a summary of the estimated environmental benefits from the two SAVEGREEN programs. The total first year environmental benefits of the Rebate and HPwES OBRP programs are valued at $373,054 and the lifetime environmental benefits are valued at $4.45 million.

Table VI-5
Summary of Environmental Benefits

Time Period	Enhanced Rebate	HPwES OBRP	Total Benefit
2014	$213,091	$159,963	$373,054
Lifetime	$1,909,622	$2,543,862	$4,453,491

B. Economic

The SAVEGREEN programs result in economic benefits because they shift expenditures from those industries that have lower multipliers in the economy to industries that have higher multipliers. Two key expenditure shifts occur as a result of the program.

1. *SAVEGREEN expenditures replace general retail expenditures*: Funding for both the SAVEGREEN and the NJ Clean Energy Program rebates are derived from additional charges for each Therm and kWh of energy consumed. We assume that these expenditures replace retail purchases that otherwise would have been made in the absence of these charges.

2. *Retail expenditures replace natural gas expenditures*: SAVEGREEN results in reductions in natural gas usage and natural gas costs for program participants who undertake the energy efficiency improvements. We assume that when natural gas costs decline as a result of the program, participants increase spending on retail goods.

The economic benefits result because of the following.

1. Expenditures on energy upgrades create more economic activity than expenditures on retail goods.

2. Expenditures on retail goods create more economic activity than expenditures on natural gas.

These differences result from the labor-intensity of each industry and the percentage of expenditures that are made in New Jersey.
The macroeconomic effects of any economic activity are generally divided into three categories:

- *Direct effects*: The direct effects are jobs and output created from the initial investment in a program. For NJNG SAVEGREEN, examples include the salaries of program administrators or the salaries of workers hired to install energy efficiency upgrades.

- *Indirect effects*: The indirect effects are jobs and output in industries that supply goods and services to the program. For NJNG SAVEGREEN, an example would be the jobs created by the contractors' expenditures on supplies to perform the energy efficiency upgrades.

- *Induced effects*: The induced effects are jobs and output created when the individuals who are directly and indirectly affected by the program spend their earnings.

These effects can be calculated using economic multipliers. A multiplier shows the change in jobs or output that results from a change in final demand in any given industry. A multiplier is defined as follows.

$$Multiplier = \frac{direct\ effect + indirect\ effect + induced\ effect}{direct\ effect}$$

We estimate the impact of SAVEGREEN on output and employment by comparing the multipliers for the industries that are most impacted by NJNG SAVEGREEN to those that would have been affected in the absence of the program.

Methodology

We focus on the 2013 Enhanced Rebate and HPwES OBRP programs, as this is the year for which the natural gas savings were estimated. To perform this calculation, a simplified model of the savings and expenditures that result from the program was developed.

When estimating the economic impact of any expenditure it is necessary to compare the economic output from the activity to the economic output that would have been created from those expenditures in the absence of the activity. Because there is an opportunity cost to all spending decisions, it is not sufficient to only examine the economic impact of how funds were spent through NJNG SAVEGREEN. For example, it would be incorrect to conclude that rebates create jobs by employing contractors if, in the absence of the program, customers would have spent that same money on other uses that created even more jobs. Assessing how funds would be spent in the absence of the program is therefore a key part of calculating the net economic impact.

The following is simplified list of all sources of economic impact for the NJNG Rebate and HPwES OBRP programs.

- *NJNG Administrative Spending*: NJNG SAVEGREEN administrative costs are divided in to three categories.
    - Labor: administration and program development
    - General: sales, call center, marketing, website
    - Labor: rebate processing, inspections, and other quality control

    These expenditures are funded through the ratepayer charges. We assume that in the absence of the SAVEGREEN program, ratepayers would spend these funds on consumer goods.

- *NJNG HPwES Incentives, NJNG Enhanced Rebates, and NJCEP Rebates:* These expenditures are made on energy efficiency upgrades, including energy equipment and

the labor needed to install that equipment. The source of this funding is also the ratepayer charge, so we assume that these expenditures would also be spent on consumer goods in the absence of the program.

- *Customer Net Costs:* This is the cost that SAVEGREEN participants contribute for the energy efficiency upgrades in the Rebate and HPwES OBRP programs. The expenditures are paid both out-of-pocket and through on bill repayment, and exclude costs covered by NJNG SAVEGREEN rebates or NJCEP incentives. In the absence of the NJNG SAVEGREEN programs, customers would again spend this amount on consumer goods.

- *Participant Natural Gas Savings:* This is the amount that NJNG SAVEGREEN participants save on their natural gas bills as a result of the energy efficiency upgrades installed through the program. We assume that customers spend these savings on consumer goods. In the absence of the NJNG SAVEGREEN programs, customers would spend this money on their higher natural gas bills.

  For the following reasons, it was assumed that all spending from these sources occurs within New Jersey.

  - NJNG employees work in New Jersey.
  - SAVEGREEN contractors' businesses are located in New Jersey.
  - Energy equipment purchased as a result of the program is usually bought in New Jersey.
  - A significant portion of consumer spending on retail goods occurs within the state.

Each source of economic impact was matched with the appropriate industry multipliers. The multipliers used in the analysis were obtained from the Regional Input-Output Modeling System II (RIMS-II) produced by the Bureau of Economic Analysis (BEA). To calculate the RIMS-II multipliers, the BEA uses a set of national input-output accounts that record the goods and services used by each industry. The input-output accounts used for RIMS-II were last updated in 2002.[18]

The most important assumptions underlying the multipliers are as follows.

- *Backward Linkages:* The calculation assumes backward linkages, meaning that an increase in demand for outputs results in an increase in the demand for inputs (as opposed to a forward linkage model in which an increased supply of inputs results in an increased supply of output).

- *No Time Dimension:* Because it is assumed that there is no time dimension, multipliers hold no predictions about how long it will take for the calculated economic benefits to be realized.

[18] The multipliers can be purchased at this website: https://www.bea.gov/regional/rims/rimsii/

- *Industry Homogeneity:* It is assumed that industries are homogenous, meaning that all business in a single industry use the same inputs to make the same outputs in the same way.

Multipliers are also affected by local supply conditions. The BEA takes this into account by adjusting each regional industry multiplier by the industry's concentration in the region relative to its concentration in the nation. The multipliers used to calculate the impact of NJNG SAVEGREEN are adjusted for Monmouth County and Ocean County, NJ.

RIMS-II Type II multipliers were used because these include not only direct and indirect effects but also induced effects. As described above, induced effects capture the impact of the increased spending by individuals' whose income has risen as a direct or indirect result of the program. Accounting for induced effects is necessary to calculate the full economic impact of the SAVEGREEN programs.

The output multipliers that were used in the analysis are displayed in Table VI-6A. The output multipliers represent the dollars of output created per one dollar change in final demand. The table also displays the change in the multiplier as the difference between the multiplier with the SAVEGREEN program and in the absence of SAVEGREEN.

Table VI-6A
Output Multipliers for NJNG SAVEGREEN Economic Impact

Source of Economic Impact	Output Multiplier With Program			Output Multiplier Without Program			Output Multiplier Increase
	Sector		Output Multiplier	Sector		Output Multiplier	
	Code	Description		Code	Description		
NJNG Admin Spending							
Labor: Admin, Prog Dev.	561100	Office admin services	1.9212	4A0000	Retail trade	1.7112	0.2100
General: Sales, Marketing	561400	Business supply services	1.7661	4A0000	Retail trade	1.7112	0.0549
Labor: Rebates, Inspect, QC	5419A0	Misc. prof, scientific, tech serv	1.9241	4A0000	Retail trade	1.7112	0.2129
NJNG & NJCEP Incentives							
NJNG HPwES Incentives	561700	Services to buildings/dwellings	1.7845	4A0000	Retail trade	1.7112	0.0733
NJNG Enhanced Rebates	561700	Services to buildings/dwellings	1.7845	4A0000	Retail trade	1.7112	0.0733
NJCEP Rebates	561700	Services to buildings/dwellings	1.7845	4A0000	Retail trade	1.7112	0.0733
Customer Net Costs							
HPwES Customer Net Costs	561700	Services to buildings/dwellings	1.7845	4A0000	Retail trade	1.7112	0.0733
Rebate Customer Net Costs	561700	Services to buildings/dwellings	1.7845	4A0000	Retail trade	1.7112	0.0733
Customer Total Savings							
Natural Gas Savings	4A0000	Retail trade	1.7112	221200	Natural gas distribution	1.2638	0.4474

The employment multipliers that were used in the analysis are displayed in Table VI-6B. The employment multipliers represent the job-years created per one million dollar change in final demand.

Table VI-6B
Employment Multipliers for NJNG SAVEGREEN Economic Impact

Source of Economic Impact	Employment Multiplier With Program			Employment Multiplier Without Program			Employ Multiplier Increase
	Sector		Employ Multiplier	Sector		Employ Multiplier	
	Code	Description		Code	Description		
NJNG Admin Spending							
Labor: Admin, Prog Dev.	561100	Office admin services	14.0136	4A0000	Retail trade	16.7121	-2.6985
General: Sales, Marketing	561400	Business supply services	16.3152	4A0000	Retail trade	16.7121	-0.3969
Labor: Rebates, Inspect, QC	5419A0	Misc. prof, scientific, tech serv	13.6578	4A0000	Retail trade	16.7121	-3.0543
NJNG & NJCEP Incentives							
NJNG HPwES Incentives	561700	Services to buildings/dwellings	22.062	4A0000	Retail trade	16.7121	5.3499
NJNG Enhanced Rebates	561700	Services to buildings/dwellings	22.062	4A0000	Retail trade	16.7121	5.3499
NJCEP Rebates	561700	Services to buildings/dwellings	22.062	4A0000	Retail trade	16.7121	5.3499
Customer Net Costs							
HPwES Customer Net Costs	561700	Services to buildings/dwellings	22.062	4A0000	Retail trade	16.7121	5.3499
Rebate Customer Net Costs	561700	Services to buildings/dwellings	22.062	4A0000	Retail trade	16.7121	5.3499
Customer Total Savings							
Natural Gas Savings	4A0000	Retail trade	16.7121	221200	Natural gas distribution	2.7693	13.9428

Calculations were performed using the following formulas.

- Output Change = Expenditures * (Output Multiplier with Program – Output Multiplier Without Program)
- Employment Change = (1/$1,000,000) * Expenditures * (Employment Multiplier with Program – Employment Multiplier Without Program)

These two calculations were performed for each source of economic impact. The change in output and the change in employment due to each source was summed to find the total economic impact of the programs.

Benefit Calculation

The calculations of the dollar amount of each source of economic impact are described below.

Data on NJNG Administrative Spending was provided directly by NJNG. All 2013 expenditures from the three categories displayed below were used.

Table VI-7
NJNG SAVEGREEN Administrative Expenditures

Category	Expenditures
Labor: administration and program development	$251,346
General: sales, call center, marketing, website	$1,941,029
Labor: rebate processing, inspections, and other quality control	$1,224,056

The total NJNG HPwES OBRP incentives distributed in 2013 was calculated using the following data.

- Number of HPwES OBRP Participants: The 2013 HPwES OBRP was obtained from the NJNG data.

- Average HPwES Check Amount (Rebate and OBRP): Data on the rebate and OBRP amounts were not available until the implementation of EnergySavvy in October 2014. Therefore, the mean 2014 value was computed from the EnergySavvy data and used as a proxy for the 2013 program benefits.

This multiplication of number of participants by average benefit resulted in an estimated cost of $23,694,270 for all 2013 HPwES OBRP incentives. Note that the OBRP amount are included in this figure as this is how these data reported. This amount could instead be included as a customer net cost. However, the categorization into one or the other of these categories does not affect the calculation of economic benefits because in both cases the funds are spend on "Services to Buildings or Dwellings" with the program and to "Retail Trade" without the program.

Table VI-8
Calculation of 2013 HPwES Incentives

Average 2014 Check Issued	Number of 2013 Participants	All 2013 HPwES Incentives
$13,776	1,720	$23,694,720

The total dollar amount of NJNG Enhanced Rebates distributed in 2013 was calculating using the following data.

- Number of Enhanced Rebate Participants: The number of participants was obtained from the NJNG data.

- Enhanced Rebate Amount: The Enhanced Rebate amount was that defined by the program and was $900 from January through June 2013 and was $500 from July through December 2013.

This calculation resulted in a total rebate amount of $4,804,500, as displayed in Table VI-9.

Table VI-9
Calculation of 2013 NJNG Enhanced Rebate

Time Period	Number of 2013 Enhanced Rebate Participants	Enhanced Rebate Amount	Total 2013 Rebate Amount
Jan-June	3,635	$900	$3,271,500
July-Dec	3,066	$500	$1,533,000
2013 Total	6,701	--	$4,804,500

The total dollar amount of NJCEP WARMAdvantage rebates distributed in 2013 was calculated using the NJCEP WARMAdvantage rebate amount.

- Number of NJCEP Rebates: The number of NJCEP Rebates is assumed to be the same as the number of SAVEGREEN rebates, although it is possible that some customers who submitted the NJNG SAVEGREEN rebate application did not submit the NJCEP rebate application or receive the NJCEP rebate.

- NJCEP WARMAdvantage Rebate Amount: The NJCEP WARMAdvantage rebate also changed in June 2013 and varied by whether a furnace or boiler was installed. The NJNG data showed that 80 percent of the SAVEGREEN rebates were for furnaces and 20 percent were for boilers, so these percentages were applied to the number of rebates received to calculate the total amount of NJCEP WARMAdvantage Rebates provided.

This calculation resulted in a total 2013 NJCEP rebate amount of $2,178,460, as displayed in Table VI-10.

Table VI-10
Calculation of 2013 NJCEP WARMAdvantage Rebate

Time Period	Number of 2013 Rebate Participants	Rebate Type	% of Rebate Issued	Rebate Amount	Total 2013 Rebate Amount
Jan-June	3,635	Furnace	80%	$400	$1,163,200
		Boiler	20%	$300	$218,100
July-Dec	3,066	Furnace	80%	$250	$613,200
		Boiler	20%	$300	$183,960
2013 Total	6,701	--	--	--	$2,178,460

The net cost to 2013 HPwES OBRP participants was calculated using the following data.

- Mean Project Cost: The mean project cost was only available starting when the EnergySavvy database began being used. Therefore, the mean project cost for 2014 HPwES NJNG jobs was used as a proxy for the 2013 job cost.

- Mean HPwES Check Amount: As above, the 2014 HPwES check amount was used as a proxy for the 2013 HPwES check amount.

- The net cost of each project was calculated as the difference between the mean cost of the 2014 HPwES OBRP jobs and the mean 2014 HPwES check amount.

This calculation resulted in total net cost for 2013 HPwES customers of $1,568,640, as displayed in Table VI-13.

Table VI-13
Calculation of 2013 HPwES Net Customer Costs

Mean 2014 Project Cost	Mean 2014 HPwES Check Amount	Number of 2013 HPwES Participants	Total 2013 HPwES Net Customer Cost
$14,688	$13,776	1,720	$1,568,640

The net cost to 2013 rebates customers was calculated using the following data.

- Boiler and Furnace Cost: Data on boiler and furnace costs were not recorded for the Enhanced Rebate program. However, these costs were recorded in EnergySavvy as a component of the total HPwES project costs. Therefore, these 2014 HPwES furnace and boiler costs were used as a proxy for the 2013 Enhanced Rebate furnace and boiler costs.

- The NJNG and NJCEP rebate amounts and number of rebates were calculated in the same manner described above.

- The net cost of each new furnace or boiler was calculated as the difference between the mean cost of the boilers or furnaces and the mean rebates from NJNG and NJCEP.

This calculation resulted in a total net cost to all 2013 Rebate participants of $35,030,970. These data displayed in Table VI-14.

Table VI-14
Calculation of 2013 Rebate Net Participant Costs

Time Period	2013 Rebate Participants	Rebate Type	Percent of Rebates	Mean Cost	Rebate Amount		Total 2013 Participant Costs
					NJCEP	NJNG	
Jan-June	3,635	Furnace	80%	$5,659	$400	$900	$12,675,972
		Boiler	20%	$8,713	$300	$900	$5,461,951
July-Dec	3,066	Furnace	80%	$5,659	$250	$500	$12,040,795
		Boiler	20%	$8,713	$300	$500	$4,852,252

Time Period	2013 Rebate Participants	Rebate Type	Percent of Rebates	Mean Cost	Rebate Amount		Total 2013 Participant Costs
					NJCEP	NJNG	
2013 Total	6,701	--	--	--	--	--	$35,030,970

The total value of participants' natural gas savings was calculated using the following data.

- The mean of participants' natural gas savings for 2013 Enhanced Rebate and HPwES OBRP participants was calculated with natural gas usage data provided by NJNG. The methodology for the analysis is described in detail in the energy usage impact analysis section.

- The dollar value of each participant's savings was calculated by applying a cost of $0.95 for each Therm saved.

- Because savings accumulate each year over the lifetime of the measures, the economic impact of these savings was calculated using the present discounted value (PDV) of savings over time. The PDV was calculated for 15 years of savings using the following formula, assuming a three percent discount rate.

$$PDV = (1 - 1.03^{-15})/0.03 * \text{first year savings}$$

- This value was multiplied by the number of 2013 participants to estimate the dollar savings for all 2013 participants.

Table VI-15 displays the calculation for the total savings for 2013 participants in the Rebate and HPwES OBRP programs, which are estimated to be $10,086,713.

Table VI-15
Calculation of Total Customer Gas Savings

Program	2013 Participants	Average Gas Savings			Total 2013 Participant Savings
		Therms	$	15 Year PDV	
Rebate	6,701	76	$72	$862	$5,775,718
HPwES	1,720	221	$210	$2,506	4,310,995
2013 Total	8,421	--	--	--	$10,086,713

A similar calculation would be used to estimate the total customer savings on electricity, assigning a cost of $0.10 to each kWh saved. However, the electric analysis was conducted with a smaller subset of program participants because it was necessary to send data authorization requests to these customers to receive electric usage data from JCP&L. Because of the small sample size, the small magnitude of the change in usage, and the

variance in changes in usage, this did not provide a significant and consistent estimate of the impact of SAVEGREEN on electric usage. Therefore, electric usage changes are not included in the economic benefits analysis.

The inputs described above were used to calculate the impact of the NJNG SAVEGREEN Rebate and HPwES OBRP programs. Table VI-16 displays the calculation for the impact of NJNG SAVEGREEN on the output of the state of New Jersey. The estimated increase in output is $9,864,167.

Table VI-16
NJNG SAVEGREEN Economic Impact
2013 Enhanced Rebate and HPwES OBRP Participants

Source of Economic Impact	Base Amount	Output Multiplier			Economic Impact ($)
		With Program	Without Program	Change	
NJNG Admin Spending					
Labor: Admin, Prog Dev.	$251,346	1.9212	1.7112	0.2100	$52,783
General: Sales, Marketing	$1,941,029	1.7661	1.7112	0.0549	$106,562
Labor: Rebates, Inspect, QC	$1,224,056	1.9241	1.7112	0.2129	$260,602
NJNG & NJCEP Incentives					
NJNG HPwES Incentives	$23,694,720	1.7845	1.7112	0.0733	$1,736,823
NJNG Enhanced Rebates	$4,804,500	1.7845	1.7112	0.0733	$352,170
NJCEP Rebates	$2,178,460	1.7845	1.7112	0.0733	$159,681
Customer Net Costs					$0
HPwES Customer Net Costs	$1,568,640	1.7845	1.7112	0.0733	$114,981
Rebate Customer Net Costs	$35,030,970	1.7845	1.7112	0.0733	$2,567,770
Customer Total Savings					
Natural Gas Savings	$10,086,713	1.7112	1.2638	0.4474	$4,512,795
Total Economic Impact					$9,864,167

Table VI-17 displays the calculation for the impact of NJNG SAVEGREEN on employment in the state of New Jersey. It was estimated that 495 job years were created as a result of the programs. Most of these gains come from the labor needed to install energy efficiency upgrades; the administrative expenditures resulted in a net loss of jobs.

Table VI-17
NJNG SAVEGREEN Employment Impact
2013 Enhanced Rebate and HPwES OBRP Participants

Source of Employment Impact	Base Amount	Employment Multiplier			Employment Impact (Job-Years)
		With Program	Without Program	Change	
NJNG Admin Spending					
Labor: Admin, Prog Dev.	$251,346	14.0136	16.7121	-2.6985	-1
General: Sales, Marketing	$1,941,029	16.3152	16.7121	-0.3969	-1
Labor: Rebates, Inspect, QC	$1,224,056	13.6578	16.7121	-3.0543	-4
NJNG & NJCEP Incentives					
NJNG HPwES Incentives	$23,694,720	22.062	16.7121	5.3499	127
NJNG Enhanced Rebates	$4,804,500	22.062	16.7121	5.3499	26
NJCEP Rebates	$2,178,460	22.062	16.7121	5.3499	12
Customer Net Costs					
HPwES Customer Net Costs	$1,568,640	22.062	16.7121	5.3499	8
Rebate Customer Net Costs	$35,030,970	22.062	16.7121	5.3499	187
Customer Total Savings					
Natural Gas Savings	$10,086,713	16.7121	2.7693	13.9428	141
Total Employment Impact					495

Table VI-18 summarizes the economic impact of the Rebate and HPwES OBRP programs on the state of New Jersey.

Table VI-18
Summary of NJNG SAVEGREEN Economic Benefits

Type of Impact	Impact
Output ($)	$9,864,167
Employment (job-years)	495

C. Health and Safety

Energy efficiency programs often identify and resolve important health and safety issues that can impact the welfare of program participants. All Enhanced Rebate participants and $6500 OBRP participants must receive an audit conducted by a NJNG employee. These audits serve the following purposes.

1. Confirm that the valid rebated equipment was installed in the participant's home.
2. Check for health and safety issues that may be present in the customer's home.
3. Calculate the Home Energy Score.

4. Assess the opportunity for additional energy efficiency measures, primarily air sealing and insulation, that could be installed through the HPwES OBRP program.
5. Collect the customer's consent to post the job on NJNG's Contractor Portal for bids by up to three interested contractors.

Data on important health and safety issues are collected during these audits and beginning with the implementation of the EnergySavvy data system in October 2013, are entered into this database. Health and safety issues are also identified during the HPwES OBRP audits, but these data are not recorded in a database and therefore HPwES identified health and safety issues cannot be quantified.

Methodology

The EnergySavvy data were used to estimate the number of health and safety issues identified during the NJNG Enhanced Rebate and $6500 OBRP audits. This analysis focuses on 2014 participants because the EnergySavvy data are available for the full year.

For both Rebate and $6500 OBRP participants, data on the following health and safety indicators were available and analyzed.

- Gas piping leaks
- Gas piping leaks at the dryer
- Proper dryer venting
- Proper bath venting
- Oven inspection
- Moisture issues
- Structure issues
- Asbestos issues

For Rebate participants, the following additional indicators were available and analyzed.

- Depressurization test (worst case)
- Water heater draft test (natural)
- Water heater draft test (worst case)
- CO readings over 100ppm by the water heater
- CO readings over 100ppm in the combustion air zone (CAZ)

Health and Safety Issues Identified

The following tables display the health and safety issues that were identified during the Enhanced Rebate and $6500 OBRP audits conducted in 2014. While these issues were identified and reported to the participants, the percentage of participants who subsequently addressed these issues is not known.

Table VI-19 displays the number of 2014 Rebate participants whose equipment did not pass the depressurization and draft tests during their NJNG SAVEGREEN audits. Two percent of participants' homes did not pass the worst-case scenario depressurization test, less than one percent did not pass the water heater draft test under natural conditions, and one percent did not pass the water heater draft test under worst-case conditions. However, these data were

missing for at least two thirds of the audits. It is not clear if the tests were not conducted in the homes with missing data, if some of these homes had electric water heaters, or if these tests were passed but not recorded in the database. NJNG noted that in instances where systems are located in a garage or similar area several of the tests, including depressurization cannot be completed. Also, where they find a power vented or sealed combustion unit water heater or an electric water heater, they do not conduct the tests because the numbered readings can easily be skewed. NJNG does conduct ambient CO testing in all instances, as well as gas leak testing and follows BPI and internal NJNG protocols regarding those tests.

Table VI-19
Depressurization and Draft Tests
Enhanced Rebate Audits

	Depressurization Worst Case		Water Heater Draft Natural		Water Heater Draft Worst Case	
	#	%	#	%	#	%
Passed	1,031	27%	41	1%	1,226	32%
Did Not Pass	76	2%	15	<1%	52	1%
Missing	2,761	71%	3,812	99%	2,590	67%
Total	**3,868**	**100%**	**3,868**	**100%**	**3,868**	**100%**

Table VI-20 displays the number of 2014 Enhanced Rebate participants who had carbon monoxide readings over 100ppm by the water heater and in the CAZ. Less than one percent of customers had readings over 100ppm by the water heater, and no customer had such a high reading in the CAZ. Again, a large percentage are missing data for the CO at the water heater.

Table VI-20
CO Readings Over 100ppm for Water Heater and CAZ
Enhanced Rebate Audits

	CO Water Heater		CO CAZ	
	#	%	#	%
<100ppm	1,270	33%	3,564	92%
≥100ppm	8	<1%	0	0%
Missing	2,590	67%	304	8%
Total	**3,868**	**100%**	**3,868**	**100%**

Table VI-21 displays the number of 2014 participants in both the Enhanced Rebate and $6500 OBRP programs who had gas piping leaks. Leaks were discovered in two percent of homes for both Enhanced Rebate and $6500 OBRP participants. Leaks were discovered at

the dryer for one percent of Enhanced Rebate participants, but none were found among $6500 OBRP participants.

Table VI-21
Gas Piping Leaks
Enhanced Rebate and $6500 OBRP Audits

	Gas Piping Leaks				Gas Piping Leaks at Dryer			
	Enhanced Rebate		$6500 OBRP		Enhanced Rebate		$6500 OBRP	
	#	%	#	%	#	%	#	%
Leak	90	2%	4	2%	28	1%	0	0%
No Leak	3,474	90%	235	96%	2,545	66%	118	48%
N/A	0	0%	0	0%	779	20%	113	46%
Missing	304	8%	7	3%	516	13%	15	6%
Total	**3,868**	**100%**	**246**	**100%**	**3,868**	**100%**	**246**	**100%**

Table VI-22 displays the number of 2014 participants in both the Enhanced Rebate and $6,00 OBRP programs whose dryers and baths were improperly vented. This issue was very common: 23 percent of Enhanced Rebate participants and 25 percent of $6500 OBRP participants had improper dryer venting, while 19 percent of Enhanced Rebate participants and 25 percent of $6500 OBRP participants had improper bath venting.

Table VI-22
Proper Dryer and Bath Venting
Enhanced Rebate and $6500 OBRP Audits

	Proper Dryer Venting				Proper Bath Venting			
	Enhanced Rebate		$6500 OBRP		Enhanced Rebate		$6500 OBRP	
	#	%	#	%	#	%	#	%
Yes	2,294	59%	169	69%	2,628	68%	169	69%
No	894	23%	61	25%	724	19%	62	25%
N/A	164	4%	1	<1%	0	0%	0	0%
Missing	516	13%	15	6%	516	13%	15	6%
Total	**3,868**	**100%**	**246**	**100%**	**3,868**	**100%**	**246**	**100%**

Table VI-23 displays the number of 2014 participants in both the Enhanced Rebate and $6500 OBRP programs whose ovens did not pass inspection. Five percent of Enhanced Rebate participants had ovens that did not pass, while two percent of $6500 OBRP participants' ovens did not pass.

Table VI-23
Oven Passed Inspection
Enhanced Rebate and $6500 OBRP Audits

	Oven Passed Inspection			
	Enhanced Rebate		$6500 OBRP	
	#	%	#	%
Yes	2,669	69%	216	88%
No	189	5%	6	2%
Missing	1,010	26%	24	10%
Total	**3,868**	**100%**	**246**	**100%**

Table VI-24 displays the number of 2014 participants in both the Enhanced Rebate and $6500 OBRP programs who had moisture, structural, or asbestos issues in their homes. Three percent of Enhanced Rebate participants and four percent of $6500 OBRP participants had moisture issues. Less than one percent of Enhanced Rebate participants had structural issues and less than one percent of Enhanced Rebate participants had asbestos issues, while no $6500 OBRP participant had either issue.

Table VI-24
Moisture, Structure and Asbestos Issues
Enhanced Rebate and $6500 OBRP Audits

	Moisture Issues				Structure Issues				Asbestos Issues			
	Enhanced Rebate		$6500 OBRP		Enhanced Rebate		$6500 OBRP		Enhanced Rebate		$6500 OBRP	
	#	%	#	%	#	%	#	%	#	%	#	%
Yes	132	3%	10	4%	7	<1%	0	0%	15	<1%	0	0%
No	3,220	83%	221	90%	3,345	86%	231	94%	3,337	86%	231	94%
Missing	516	13%	15	6%	516	13%	15	6%	516	13%	15	6%
Total	**3,868**	**100%**	**246**	**100%**	**3,868**	**100%**	**246**	**100%**	**3,868**	**100%**	**246**	**100%**

Table VI-25 summarizes Tables VI-19 though VI-24, displaying the number of customers with each health and safety issue. In total, 3,868 health and safety issues were uncovered. The most common issues were improper bathroom and dryer venting.

Table VI-25
Summary of Health and Safety Issues

	Houses With Issue			
	Enhanced Rebate		$6500 OBRP	
	#	%	#	%
Improper Dryer Venting	894	23%	61	25%
Improper Bath Venting	724	19%	62	25%
Did Not Pass Oven Inspection	189	5%	6	2%
Moisture Issues	132	3%	10	4%
Gas Piping Leaks	90	2%	4	2%
Did Not Pass Depressurization Worst Case Test	76	2%	--	--
Did Not Pass Water Heater Draft (Worst Case)	52	1%	--	--
Gas Piping Leaks at Dryer	28	1%	0	0%
Did Not Pass Water Heater Draft (Natural)	15	<1%	--	--
Asbestos Issues	15	<1%	0	0%
CO ≥100ppm by Water Heater	8	<1%	--	--
Structure Issues	7	<1%	0	0%
CO ≥100ppm in CAZ	0	0%	--	--

Table VI-26 displays the number of customers who had any of the issues discussed above. NJNG SAVEGREEN revealed at least one health and safety issue in 42 percent of the homes audited through the Enhanced Rebate program 40 percent of those audited through the $6500 OBRP programs in 2014.

Table VI-26
Participants with Any Issue

	Customer Has Any Issue			
	Enhanced Rebate		$6500 OBRP	
	#	%	#	%
Yes	1,616	42%	99	40%
No	1,969	51%	147	60%
No Health & Safety Data	283	7%	0	0%
Total	**3,868**	**100%**	**246**	**100%**

D. Summary

The energy efficiency installations under the Enhanced Rebate and HPwES OBRP programs resulted in 2014 savings of $373,054 by avoiding emissions of air pollutants associated with

natural gas and electricity generation. The lifetime benefits from these avoided emissions is $4,453,491.

The Rebate and HPwES OBRP program also increased both output and employment in the state of New Jersey. Output increased by $9,864,167 as a result of the program, and 495 jobs were created.

In total, 3,868 health and safety issues were discovered as a result of the Enhanced Rebate program and 246 were discovered as a result of the $6500 OBRP program. Health and safety issues were identified in 42 percent of Rebate participants' homes and in 40 percent of the buildings audited through the $6500 OBRP program.

VII. Summary of Findings and Recommendations

NJNG's SAVEGREEN Program has achieved many successes since its implementation in 2009.

- Customer Participation – SAVEGREEN has succeeded in obtaining high levels of participation in the Enhanced Rebate and Home Performance programs.
- Contractor Recruitment – NJNG has significantly increased contractors' participation in the programs.
- Contractor Training – Through its training sessions, NJNG has provided contractors with important technical and program information.
- Satisfaction – Participants and contractors expressed high levels of satisfaction with the SAVEGREEN program.
- Gas Usage Impacts – SAVEGREEN achieved significant gas savings through the Enhanced Rebate and Home Performance programs.
- Non-Energy Benefits – SAVEGREEN achieved significant environmental, economic, and health and safety benefits.

Key findings and recommendations relating to program design and administration, marketing and participation, contractors, and program impact are provided below.

A. Program Design and Administration

Recommendations with respect to program design and administration relate to BPU requirements, EnergySavvy data and capabilities, Real Home Analyzer, electric usage data, and the NJNG audit.

1. BPU Communication: The short-term approval and frequent NJCEP changes have posed challenges for SAVEGREEN. *NJNG should continue to make the BPU aware of the impact that short-term program approval and frequent program design changes have on their ability to effectively manage and implement the SAVEGREEN program.*

2. EnergySavvy Capabilities: Additional summary reports could be useful. For example, the software could provide reports on the percent of On-Bill Repayment participants who were approved, the percent of HPwES participants who installed various measures, the percent of participants who were fuel switchers, and the percent with various health and safety issues identified during the audit. *NJNG should assess which reports would be most useful and work with the EnergySavvy to develop these reports.*

3. Real Home Analyzer: The contractor submits project information to CSG through Real Home Analyzer (RHA) and uploads the proposed measures and customer contract to EnergySavvy. However, the audit data cannot currently be imported into EnergySavvy because of the version of Real Home Analyzer that is in use in New Jersey. *NJNG should request that the RHA software be updated so that these uploads can be implemented. If this is not possible, NJNG should receive a copy of the RHA audit data for analysis purposes.*

4. EnergySavvy Fields: Additional data fields in EnergySavvy could be useful for documenting program impacts. For example, health and safety data for HPwES jobs, information on health and safety issues resolved, and measures installed in HPwES are not currently available in EnergySavvy. *NJNG should work with EnergySavvy to make additional data fields available.*

5. Electric Usage Data: The SAVEGREEN programs are expected to impact electric as well as natural gas usage. *NJNG should work with JCP&L to add a sign-off on the SAVEGREEN application to allow NJNG to obtain JCP&L customers' electric usage data. This would allow for a greater number of customers to have their electric usage impacts assessed in a future evaluation.*

6. Application Process: Most participants were very or somewhat satisfied with the SAVEGREEN application process. *The program process appears to be working well and does not need to be refined.*

7. NJNG Audit: Enhanced Rebate and $6500 OBRP participants were unlikely to undertake additional measures. *Auditors should provide additional information about SAVEGREEN benefits and the expected impacts of undertaking the additional measures. Recent program changes including the increased timeframe to 18 months and the reduced savings requirement for the NJCEP should increase uptake as well.*

B. Marketing and Participation

NJNG has been very successful in marketing SAVEGREEN and increasing participation in the program. They should continue their current outreach methods, engage C&I contractors in marketing, include information on program benefits in marketing materials, and continue to update the SAVEGREEN website.

1. Marketing Methods: Participant interviews found that the most common source of SAVEGREEN information was the contractor. Other sources that were frequently mentioned were the NJNG website, a friend or family member, or a neighbor. However, there were several additional information sources that were also noted. *The importance of the contractor in program outreach as well as the many diverse information sources*

shows that NJNG should continue focusing on the contractors, and also continue their wide range of outreach methods.

2. C&I Contractor Engagement: The C&I Direct Install participants heard about the program through contractors and through personal acquaintances. Two of the five noted that the contractor approached them and informed them of the program. *NJNG should work more closely with the C&I Direct Install contractors to provide additional outreach about the program.*

3. Marketing Content: Participants were most likely to state that they participated in SAVEGREEN because they wanted to save money or energy, the SAVEGREEN financing benefits, and the need to replace their aging home equipment. They reported that their home was warmer and their gas bill was lower after participating. *These benefits should be emphasized in the program marketing with testimonials from former program participants.*

4. Participation Barriers: Most participants did not experience barriers to participating in SAVEGREEN or installing the upgrades. *Given the small number of participants who experienced barriers and the fact that most issues were not in the control of NJNG, there are no recommendations for addressing these.*

5. C&I Coordination with Refrigeration: C&I contractors reported that they do not proactively coordinate services with the refrigeration contractor. *NJNG should discuss the potential for improved coordination with refrigeration contractors with the C&I contractors*

6. SAVEGREEN Website: Almost half of the residential participants interviewed reported that they visited the SAVEGREEN program website to learn about the program and that they were able to find the information they were looking for. *The SAVEGREEN website is an important resource for the program and has provided participants with desired information. NJNG should continue to update the site if changes are made to the program.*

C. Contractors

Contractors make use of the Contractor Portal and prefer email as a contact method. NJNG should continue to use these approaches and continue to provide contractor training sessions.

1. Contractor Portal: Seven of the eight residential contractors stated that they used the SAVEGREEN Contractor Portal or microsite to learn about program updates and four of the eight stated that they used it as a source of marketing information. *NJNG should continue to update and maintain the SAVEGREEN Website and Portal.*

2. Email Contractors When Portal is Updated: *Contractors recommended that NJNG email contractors to let them know when the Portal is updated.*

3. Email as Primary Contact Method: Six of the eight residential contractors stated that email was the best way was for NJNG to reach contractors with information about SAVEGREEN. *NJNG should use email as primary source of contractor communication.*

4. Contractor Training: The contractors reported that the trainings provided a better understanding of SAVEGREEN, provided technical information, and helped them to do their work more efficiently. All reported that the trainings were very helpful. *NJNG should continue to provide contractor training sessions.*

5. Measure Installation Decisions: Some HPwES respondents reported that they did not seem to have the option to choose which measures were installed. *While NJNG may have limited control over this issue, contractors should be trained to clearly educate participants on their options for installation and how those decisions will or will not affect program benefits.*

6. C&I Assessments: Participants reported that the assessments provided important information and were very helpful in informing their decisions about which measures to install. *The contractors appear to be doing a good job with the assessment and with customer communication.*

7. Contractor Payment: Contractors recommended that SAVEGREEN rebates and financing be sent directly to the contractor. This change was implemented in October 2015.

D. Program Impact

SAVEGREEN has increased uptake of program measures, reduced gas usage, and provided important non-energy benefits. *SAVEGREEN should be continued if budget is available.*

1. SAVEGREEN Importance: Participants and contractors reported that SAVEGREEN is very important in customers' decisions to install energy efficiency upgrades.

2. Gas Savings: SAVEGREEN has achieved significant gas savings for program participants.

3. Non-Energy Benefits: SAVEGREEN has achieved significant environmental, economic and health and safety benefits.