PROGRAM SUMMARY
The Residential HVAC programs promote the replacement of old, inefficient HVAC equipment, with new, high-efficiency equipment by providing incentives to offset the higher cost of purchasing high-efficiency products. A number of heating and cooling efficiency retrofit measures are also included in the programs, with incentives offered to help defray the cost of these measures. The programs are open to customers in residential dwellings with one to four units who have either central air conditioning (electric program) or gas heating or hot water (gas programs).

The program has the following objectives:

• Increasing customer knowledge of the performance, reliability and energy savings associated with high-efficiency heating, cooling and water heating equipment and where to obtain energy efficient equipment;
• Increasing the market penetration of energy efficient heating, cooling and hot water equipment in customer homes;
• Helping customers to reduce energy costs and increase the comfort and value of their homes through the proper installation of high-efficiency heating, cooling and hot water equipment;
• Generating customer awareness of energy efficiency programs available through Con Edison and other entities to support their energy efficiency goals;
• Maximizing available energy and cost savings for every participant by recommending efficiency opportunities supported by NYSERDA and other programs;
• Monitoring customer perception of the performance and reliability of high-efficiency HVAC equipment and the savings achieved;
• Training program allies such as plumbing and HVAC contractors on the benefits of high-efficiency equipment and on quality installation and service procedures;
• Effectively driving the adoption of quality installation methods among residential HVAC installation contractors;
• Driving new participation in Con Edison’s Direct Load Control Program by cross promoting the program through Con Edison’s program service contractors.
• Building higher-level customer, trade ally and stakeholder relationships by providing value-added energy efficiency services, training, education, financial incentives, verification and customer support;
• Supporting the local economy by helping to reduce customer utility costs and promoting the adoption of high-quality equipment; and
• Reducing night-time peak demand in residential networks, reducing the need for transmission and distribution facilities and improving reliability in those networks, while also contributing to a reduction in coincident system peak demand.

EVALUATION OBJECTIVE AND HIGH LEVEL FINDINGS
Navigant Consulting, Inc.’s final process evaluation report for the program was submitted in October 2013, and covered results from the entire 2009-2011 program years. Table ES1 summarize the Residential HVAC programs savings goals and accomplishments through February 2011.
Table ES1: Con Edison Residential HVAC Program Savings Goals

<table>
<thead>
<tr>
<th>Program Type</th>
<th>Program Goal 2009-2011</th>
<th>Program Accomplishments through February 2011</th>
<th>Percent of Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric (MWh)</td>
<td>7,086 MWh</td>
<td>823 MWh</td>
<td>12%</td>
</tr>
<tr>
<td>Gas (dekatherms)</td>
<td>116,918 Dth</td>
<td>23,814 Dth</td>
<td>20%</td>
</tr>
</tbody>
</table>

The overall objective of the Residential HVAC program process evaluation was to assess the effectiveness and efficiency of program design, delivery and implementation processes. Specifically, the evaluation addressed six key program processes: program planning, infrastructure development, marketing and customer acquisition, program delivery, satisfaction with the program, and interactions with other programs.

Overall, the Con Edison Residential HVAC program was well run. However, Con Edison participation is lower than expected. The following factors are likely to be contributing to this:

- Program savings goals did not factor in the time necessary to bring a program implementer on board.
- Con Edison goals required a 40-62% participation rate of the eligible market of residential gas furnaces/boilers and central air conditioners, respectively, being turned over each year.
- Some program measures may not be applicable to the multi-family (2 to 4 unit buildings that qualify under the program) market predominant in the urban areas of Con Edison’s territory.

EVALUATION RECOMMENDATIONS AND PROGRAM ADMINISTRATOR RESPONSE

The following recommendations were made by the evaluators conducting this study. As noted above, the programs appear to be administered effectively and efficiently. Further, as potential issues were identified during the process evaluation, Con Edison typically either was already beginning to address the issues or had initiated efforts to do so.

Consolidated Edison’s initial responses to these recommendations are summarized below and will be tracked over time.

Recommendation 1: Program Planning and Design – Con Edison should revisit the assumptions around market size and housing stock that were used to develop the program goals.

Con Edison needs very high participation in terms of percentage of eligible customers in order to reach its program goals. Con Edison’s goals required a 40 to 62 percent participation rate of the eligible market, based on the estimated number of households with the targeted equipment and the expected annual turnover of gas furnaces/boilers and central air conditioners, respectively.

Recommendation:
Con Edison should revisit the assumptions around market size and housing stock that were used to develop the program goals. Revised targets should consider the characteristics of the housing stock in the urban areas of the service territory, such as the presence of ducted HVAC systems. There is also uncertainty that the market size used in developing program goals is realistic.

Response to Recommendation 1:

This recommendation has been implemented. On August 15, 2012, Con Edison petitioned the New York Public Service Commission (NYPSC) to redesign the Residential Electric programs. The recommended assumptions were imbedded into the petition, including a revision of goals and budgets. On June 19, 2013, the NYPSC approved the proposed revisions, and consolidated the Residential Electric programs.

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1 Reported energy savings acquired are ex ante and have not been confirmed by an independent impact evaluation.
Recommendation 2: Program Planning and Design – Investigate adding commercial measures more appropriate for 2-4 unit multi-family buildings and seek approval from the NYPSC for the additional measures.

Some program measures may not be applicable to the multi-family market predominant in the urban areas of Con Edison’s territory. Low program participation rates in Manhattan, Brooklyn, and the Bronx support this theory. Key observations include:

- Multifamily units are unlikely to have ducted central air or gas furnace systems, reducing the demand for central air conditioning and gas furnaces;
- Central cooling systems for three- and four-unit buildings would likely require a cooling capacity higher than 5.4 tons which is the highest SEER-rated capacity available.
- Electric heat pump central air conditioners and water heaters are not attractive options because of the higher electric costs relative to natural gas. For three- and four-unit buildings, the available heat pump water heater products do not have sufficient capacity.

Recommendation:

Investigate adding commercial measures more appropriate for 2-4 unit multi-family buildings and seek approval from the NYPSC for the additional measures including:

- Air conditioning equipment greater than 5.5 tons with an appropriate EER; and
- Furnaces and boilers using appropriate thermal efficiency rating rather than AFUE.

Response to Recommendation 2:

Con Edison has amended the program’s terms of boiler eligibility requirements to align with industry specifications. Con Edison will address residential air conditioning measures as it becomes necessary; to date, no customer applications have been received for the recommended type of air conditioning equipment.

Recommendation 3: Program Planning and Design – Con Edison should investigate the requirements for claiming additional energy savings for equipment that is replaced prior to burnout.

Although most participants replace their HVAC systems due to old age or poor/no performance, a surprising number report they are making upgrades to improve the efficiency of the system. Twenty-one percent of Con Edison electric and 19 percent of Con Edison gas indicate that they installed their equipment for this reason. This suggests early replacement of these units and potentially greater savings for the program if equipment baseline information can be documented. However, claiming savings for early replacement would need to meet the rigorous requirements of the New York Technical Manual’s Appendix M.

Recommendation:

Con Edison should investigate the requirements for claiming additional energy savings for equipment that is replaced prior to burnout and the extent to which the data needed to claim savings is being collected. Con Edison would need to revise its program applications to include fields to collect information on the equipment being replaced and the reason for purchasing the new equipment. The administrative process for estimating the energy savings may be burdensome and should be weighed against the potential benefits. Lastly, Con Edison would need to seek approval from the NYPSC to claim savings for early replacement.

Response to Recommendation 3:

Con Edison has revised the program applications to collect information on housing types and the model numbers of the equipment being replaced. Claiming savings for early replacement is being assessed.

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2 The DPS has since issued detailed protocols for how to claim such savings.

3 The DPS has since issued detailed protocols for how to claim such savings.
Recommendation 4: Program Planning and Design - Con Edison program marketing should encourage customers to consider lifecycle costs, rather than just first costs, when purchasing new heating and cooling equipment.

A significant percentage of non-participants indicate that they would not participate when purchasing new, eligible equipment due to the high cost of energy efficient options. This suggests an opportunity to educate customers on the benefits of energy savings and lower utility costs.

**Recommendation:**
Con Edison program marketing should encourage customers to consider lifecycle costs, rather than just first costs, when purchasing new heating and cooling equipment. In addition, the program web sites are an excellent venue for information and resources to customers for calculating the potential energy savings and lifecycle cost analysis.

**Response to Recommendation 4:**
This recommendation has been implemented. The Energy Efficiency/Demand Management (EE/DM) Department has made many changes and enhancements to its Energy Efficiency Portfolio Standard (EEPS) Marketing efforts since this process assessment was conducted, including its high profile Green Team campaign, indirectly addressing energy savings potential, and lowering of utility bills; program awareness has since increased.

Recommendation 5: Program Planning and Design – Con Edison should consider removing Building Performance Institute (BPI) certification requirement for duct and air sealing.

HVAC contractors indicate that the BPI certification is expensive and requires a significant time commitment. While weatherization contractors were not interviewed as part of the process evaluation (because the primary focus of the evaluation was on HVAC equipment measures), such contractors may have similar concerns regarding air sealing. In any case participation in the duct sealing and air sealing program components at the time of the evaluation was minimal for both utilities, suggesting that a different approach may be required.

**Recommendation:**
Con Edison should consider removing the BPI certification requirement for duct and air sealing, but maintain a requirement for training and ensure that the inspection protocol for the program is robust.

- For new programs such as Con Edison’s, a phase-in of the BPI certification is likely to be more effective. As a condition for air/duct sealing rebates, the utilities could require proof that the contractor has undergone air/duct sealing training from a recognized organization – to establish a firm knowledge base and build an infrastructure of knowledgeable contractors – without requiring the BPI certification, while encouraging such certification and indicating that it will become a program requirement at some point in the future. This training should be both less time-consuming and less expensive than BPI certification. This would allow contractors to establish a foothold in this business area, gain valuable experience and understand its benefits as a revenue source.

- Air and duct sealing rebates should also require a contractor checklist indicating the work that has been done to seal the home or ducts, so that inspectors can verify that such work has been done (and an inspection protocol should confirm that these activities were undertaken). Pre- and post-sealing duct blaster and/or blower door readings alone may not provide sufficient information to prevent fraudulent reporting.

**Response to Recommendation 5:**
In reality, this requirement had little impact during the initial EEPS Cycle. However, Con Edison fully understands the barriers and burdens involved with meeting BPI certification requirements. Although the requirement adds value to the quality of work performed, Con Edison will investigate the practicality of implementing this recommendation versus the alternative solution of allowing this capability to remain for vendors and customers who recognize the additional value.
Recommendation 6: Infrastructure Development – Con Edison should include additional data fields on its rebate application.

The robustness of Con Edison’s data can be improved for the purposes of impact evaluation by collecting and tracking additional fields.

Recommendation:

Con Edison should capture the housing type, home square footage (or more specifically, the square footage of the area affected by the new unit), and equipment vintage on the rebate application and track these data in the database.

Response to Recommendation 6:

The application has been revised to collect additional information (excluding home square footage).

Recommendation 7: Infrastructure Development – Con Edison should consider providing additional staffing capacity to oversee Residential HVAC program implementation.

Con Edison’s staffing levels for program oversight are low compared to that of other program administrators. Con Edison has about 1 Full Time Employee (FTE) providing oversight for a program with a budget over $18 million. A rule of thumb for management oversight of programs is 1 FTE for every $1 to $3 million.

Recommendation:

Con Edison should consider providing additional staffing capacity to oversee Residential HVAC program implementation.

Response to Recommendation 7:

This recommendation has been implemented. We have hired an implementation contractor with appropriate staffing levels for program implementation and oversight.

Recommendation 8: Marketing & Customer Acquisition – Enhance the program “pull” through program marketing directed at customers.

The vast majority of program participants heard about the program through their contractor (74 percent Con Edison electric and 55 percent Con Edison gas). Other key findings include:

- In a balanced “push/pull” marketing strategy, more participants would have heard about the program through customer marketing efforts.
- Participating contractors believe there should be more program marketing directed to customers.
- Participants indicate that their contractors were influential in their decision to participate in the program (71 percent Con Edison electric and 54 percent Con Edison gas).

Recommendation:

Enhance the program “pull” through program marketing directed at customers. This will increase the number of customers who hear about the program through channels other than their contractors and request high efficiency equipment.

Response to Recommendation 8:

The EE/DM Department has made many changes and enhancements to its EEPS Marketing efforts since this process assessment was conducted, including its high profile Green Team campaign, and with its hiring of a new advertising agency “The Gate.”

Recommendation 9: Marketing & Customer Acquisition – Capture a portion of the remaining non-participating contractors through outreach by circuit riders.

There’s an opportunity to expand participation by engaging non-participating contractors.
Non-participating contractors report lack of information about the program as the main reason why they are not participating, indicating that they would have participated had they known about the program. Contractors also listed lack of direct contact from Con Edion as an important reason for non-participation. Overall, non-participating contractors show interest and would like more information.

Recommendation:
Capture a portion of the remaining non-participating contractors through outreach by circuit riders

Promote the program’s value proposition that customers are motivated to upgrade to high efficiency equipment by program rebates and long-term cost reductions.

Response to Recommendation 9:
Program awareness has been greatly increased among non-participating customers and contractors by the ongoing Green Team campaign since the initial process assessment was conducted for this program. Additionally many enhancements have been implemented with our implementation contractor; Honeywell.

Recommendation 10: Marketing & Customer Acquisition – Update the entry points from the Con Edison website to the Honeywell Residential HVAC web site.

The entry point from the Con Edison website to the Honeywell Residential HVAC web site should be updated so that all information is easily accessible to customers.

Recommendation:
Update the entry points from the Con Edison website to the Honeywell Residential HVAC sub site

Response to Recommendation 10:
This recommendation has been implemented; several improvements have been made to the website that has made it easier to access the program information.

Recommendation 11: Program Delivery – Con Edison should increase the level of support provided to the customers and contractors.

Contractors indicate that the program paperwork requires a significant time commitment. A review of Con Edison files indicates that many are returned for missing manufacturer’s specification sheets. Con Edison could look up this information up in the AHRI database. Alternately, a small incentive provided to the contractors could compensate them for the administrative burden and might increase the likelihood that they promote the program to all of their customers.

Recommendation:
The program can increase the level of support provided to the customers and contractors. The program budgets seem to be sufficient to provide for the one of following:

- Con Edison could look up missing manufacturer certification sheets instead of sending them back to the customer or contractor.
- Provide a small incentive to contractors to compensate them for the administrative burdens associated with the application requirements.
- Con Edison could add circuit riders to conduct more personal outreach to both participating and non-participating contractors and conduct field verifications with a shorter turn around, thereby reducing rebate payment times.

Response to Recommendation 11:
This recommendation has been implemented; circuit riders have been provided for support to the contractors; we’ve also improved the application process. As a result, the program has experienced an increase in participation.
Recommendation 12: Satisfaction with the Program – Con Edison should work to reduce the average time between application submission and rebate payment.

Participants’ satisfaction with the timing of receiving their rebate varied between Con Edison gas and electric customers. The average satisfaction for Con Edison gas customers was 6.58; the average of Con Edison electric customers was 8.16. The program data indicates that, on average, Con Edison customers wait eight weeks between the submission of their applications and the payment of rebates. Con Edison electric customers were notably more satisfied with the timing of their rebate payments than their gas counterparts, with 73 percent giving a mark of eight or higher (versus 47 percent for gas).

**Recommendation:**
To increase program satisfaction, Con Edison should work to reduce the average time between application submission and rebate payment and to ensure that all rebates are paid within eight weeks. Despite the disclaimers about the timing of rebate payments in the program materials, customers are still frustrated.

**Response to Recommendation 12:**
Great strides have been made in this area, since the program’s process assessment was initially conducted. Current data suggests that customers now receive their rebates in 6-8 weeks.

Recommendation 13: Satisfaction with the Program – Con Edison should provide training to call center representatives.

On average, Con Edison gas participants indicated making 3.80 calls and Con Edison electric indicated making 2.08 calls. The average satisfaction with contacting the utility was reported to be 7.16 and 8.10 (on a 10 point scale) by Con Edison gas and Con Edison electric participants, respectively. Multiple call attempts were the biggest source of dissatisfaction with the call centers.

**Recommendation:**
Provide training to call center representatives so that they are able to respond to customer inquiries and resolve issues on the first call.

**Response to Recommendation 13:**
This recommendation has been implemented; training has been increased, and is being conducted quarterly. In addition, incoming calls are now routed.

Recommendation 14: Interactions with Other Programs – Ensure that customer and equipment eligibility is aligned with the National Grid Residential HVAC program.

Con Edison electric customers are National Grid gas customers in Staten Island. Con Edison report that they have received gas program applications for customers that belong to another utility and that they refer these customers to the proper utility.

**Recommendation:**
Ensure that customer and equipment eligibility is aligned with the National Grid Residential HVAC program. When customers served by both utilities inadvertently submit their rebate application to the wrong utility, the projects can be referred to the correct utility without the risk of being ineligible.

**Response to Recommendation 14:**
This is being done, and is no longer an issue.
EVALUATION METHODS AND SAMPLING
The research and the findings expressed in the report are based upon the following evaluation activities:

- Review of program and marketing materials;
- Review of program tracking system, data, and other documents;
- In-depth interviews with:
  - Con Edison staff
  - Honeywell staff delivering the Con Edison Residential HVAC programs
  - 12 Participating HVAC contractors
  - 12 Non-Participating HVAC contractors
- Customer telephone surveys with:
  - 401 Program participants
  - 202 Program non-participants