



LIPA EFFICIENCY LONG ISLAND 2010 ANNUAL REPORT VOLUME I

Prepared for:

LONG ISLAND POWER AUTHORITY



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1. INTRODUCTION TO VOLUME I

1.1 *Structure of the Evaluation Report*

This report presents the results of the 2010 evaluation of LIPA's Efficiency Long Island (ELI) Renewable Energy and Demand Response programs conducted by the Opinion Dynamics Evaluation Team. The report is divided into two volumes. The information in this volume (Volume I) provides an overview of evaluation findings, including impact and process results for 2010. Volume II provides the appendices to Volume I including detailed program-by-program impact analysis results, specific findings of the evaluation team's engineering review of measure-level savings algorithms and assumptions, and program-level process findings, and is developed with the needs of LIPA's program planners and managers in mind.

1.2 *Key Definitions*

Below we provide definitions for key terms used throughout the report:

- **Gross Impacts:** The change in energy consumption and/or demand that results directly from program-related actions taken by participants, regardless of why they participated.
- **Net Impacts:** The total change in energy or demand that is attributable to the program.
- **Net-To-Gross factor (free ridership and spillover):** The factor that, when multiplied by the gross impact, provides the net impacts for a program. Free ridership reduces the factor to account for those customers who would have installed an energy efficient measure without the program. Spillover increases the factor to account for those customers who install energy efficient measures outside of the program (i.e., without an incentive), but due to the actions of the program.
- **Expected savings:** The net impacts expected by the program as found in the program tracking database. Also called ex ante impacts.
- **Evaluated savings:** The net impacts realized by the program after independent evaluation. Also called ex post impacts.
- **kW (demand or capacity):** The average level of power used over an hour. System coincident demand is the level of demand at the hour of the day when there is the maximum demand on the system grid. Peak power is the average power used across a four-hour period when there is high demand. For LIPA, peak demand takes place in the months from June to August, Monday to Friday (non-holiday), and from 2:00 to 6:00 p.m.
- **kWh (energy consumption):** The power consumed across several hours. Impacts are based on annual usage.

- **Program Administrator Cost Test:** A test that measures the net costs of an energy efficiency program as a resource option based on the costs incurred by the program administrator (including incentive costs) and excluding any net costs incurred by the participant.
- **Total Resource Cost Test:** A test that measures the net costs of an energy efficiency program as a resource option based on the total costs of the program, including both the participants' and the utility's costs.
- **Levelized cost of capacity:** The equivalent cost of capacity (kW) to be incurred each year over the life of the equipment that would yield the same present value of total costs, using a nominal discount rate of 5.643% to be consistent with the LIPA supply alternatives. The levelized cost is a measure of the costs of the program to the administrator in a form that can be compared to the cost of supply additions.
- **Levelized cost of energy:** The equivalent cost of energy (kWh) over the life of the equipment that would yield the same present value of costs, using a nominal discount rate of 5.643%. The levelized cost is a measure of the costs of the program to the administrator in a form that can be compared to the cost of supply additions.

2. EXECUTIVE SUMMARY

In 2010, LIPA took several key steps to complete the transition from the Clean Energy Initiative (CEI) (1999 through 2008) to the Efficiency Long Island initiative and improve program delivery and performance. These efforts include:

- **Implementation of Siebel:** Beginning at the end of the 2009 program year, LIPA and National Grid began to transition existing program tracking systems to a centralized database (Siebel). LIPA prioritized the implementation of Siebel for 2010 and significant progress was made toward full implementation. LIPA directed the evaluation team to work with stakeholders from National Grid, Applied Energy Group (AEG), and program implementation contractors to define the types of data to be tracked in the Siebel system. With system priorities defined, system development began in mid 2010 and the system was implemented early in Q1 2011. This new database will increase efficiency for both program implementation and evaluation in the future. To ensure this is the case, LIPA has directed the evaluation team to complete a QA/QC audit of the Siebel program prior to the development of the 2011 mid-year report.
- **Addition of Solution Provider:** The long term plans for the ELI portfolio call for increased savings from the commercial market sector. In response, LIPA was begun a process of revising the implementation strategy for the Commercial Efficiency program. The revised strategy called for the addition of two new implementation contractors to target specific segments of the commercial market. In 2010, LIPA signed a contract with a new Solution Provider contractor to work with commercial key account customers and facilitate program participation. The contractor was added late in the 2010 program year due to delays in the procurement process but will serve as a key component of the program in 2011.
- **Addressing Staffing Needs:** LIPA worked diligently in 2010 to assess staffing needs and add experienced staff to support the expansion of ELI—from program managers and directors to a new Director of Evaluation. LIPA is currently working to integrate LIPA and National Grid staff functionally and clarify roles and responsibilities across organizations to ensure optimized program management and delivery. This will be an ongoing effort and a point of focus for 2011.
- **Implementation of Evaluation Findings:** Because the 2009 evaluation findings and recommendations were not available until May of 2010, not all recommendations could be integrated into 2010 activities. For example, it was not possible to incorporate the results of the evaluation team's review of measure level savings values into the 2010 plan or tracking systems used to develop tracking estimates of program savings. However, the 2011 program plans were informed by the 2009 evaluation results, and LIPA has worked to embed evaluated savings estimates into the Siebel system for use in 2011 and future years.

The following sections review the ELI and Renewable Portfolio's program impacts for 2010 as well as the key process finding for the ELI and renewable energy programs.

Summary of Portfolio Performance

Through the combination of its ELI and Renewable portfolios, LIPA's goal in 2010 was to reduce coincident demand by 31.77 MW and overall energy used by 163,373 MWh. LIPA exceeded its demand goal, but fell short of the overall net energy savings goal (achieving 95% of its stated goal) as shown in Table 1.

In 2010, LIPA spent just over \$65 million implementing the ELI and Renewable portfolios—94% of the programs' budgets. Based on our analysis of portfolio impacts and costs, the savings generated by the portfolios are cost effective. The overall Benefit/Cost ratio, based on the Program Administrator test (PA)¹, is 3.4 (a PA value greater than 1 indicates that portfolio benefits outweigh costs). In addition, the levelized costs of the combined portfolio savings are \$0.052 per kWh, or \$219.62 per kW-yr. A levelized cost analysis is a way to quickly compare the cost of energy efficiency programs with energy or demand saved from the programs. Because levelized costs are expressed as \$/kW-yr or \$/kWh, they can be readily compared to the cost of alternative supply additions or the cost of generating electricity. The levelized costs of the ELI and Renewable portfolios combined are less than the comparable costs of generating the displaced energy.

¹ The PA test measures the net costs of an energy efficiency program as a resource option based on the costs incurred by the program administrator, including all program costs and any rebate and incentive costs, but excludes costs incurred by the participant. To allow for direct comparison with LIPA's assessment of all supply-side options, we applied the PA test as the primary method of determining cost effectiveness and used assumptions similar to those used by LIPA's resource planning team.

Table 1. Net Impacts: ELI & Renewable Portfolio Evaluated Impacts versus Goals

Program	Budget	Actual Cost	Coincident Demand Savings (MW)		Energy Savings (MWh)		Benefit Cost Ratio (PA)	PA Levelized Costs	
			Goal	Actual	Goal	Actual		\$/kW-yr	\$/kWh
Commercial Efficiency Program	\$26,023,195	\$8,648,061	10.13	10.60	45,023	47,580	10.0	78.78	0.018
EEP	\$9,235,587	\$6,535,303	8.72	9.97	92,959	80,474	8.7	110.42	0.014
Cool Homes	\$3,420,626	\$3,819,280	5.13	3.90	2,969	3,697	4.8	98.54	0.104
REAP	\$2,316,815	\$2,781,033	0.75	0.39	6,022	3,940	1.6	747.51	0.075
Information & Education	\$454,359	\$556,157	1.15	1.49	3,250	2,746	2.4	203.12	0.110
HPD/HPwES	\$7,241,964	\$5,660,650	2.72	0.49	5,710	2,851	1.1	1177.61	0.203
<i>Existing Homes Subtotal</i>	<i>\$13,433,763</i>	<i>\$12,817,119</i>	<i>9.75</i>	<i>6.27</i>	<i>17,951</i>	<i>13,234</i>	<i>2.4</i>	<i>216.07</i>	<i>0.104</i>
ES New Homes	\$2,295,902	\$1,994,126	0.38	0.81	739	1,449	3.9	248.71	0.138
Subtotal Residential	\$24,965,253	\$21,346,547	18.86	17.04	111,649	95,156	4.5	168.72	0.036
Subtotal ELI	\$50,988,447	\$29,994,608	28.99	27.64	156,672	142,737	6.1	126.94	0.027
Solar	\$16,567,669	\$34,884,220	2.72	4.57	5,869	12,297	1.1	575.75	0.214
Backyard Wind	\$2,114,577	\$368,062	0.06	0.02	832	168	0.9	1112.92	0.165
Subtotal Renewables	\$18,682,246	\$35,252,282	2.78	4.60	6,701	12,466	1.1	579.94	0.214
Total	\$69,670,693	\$65,246,890	31.77	32.23	163,373	155,203	3.4	219.62	0.052

Notes:

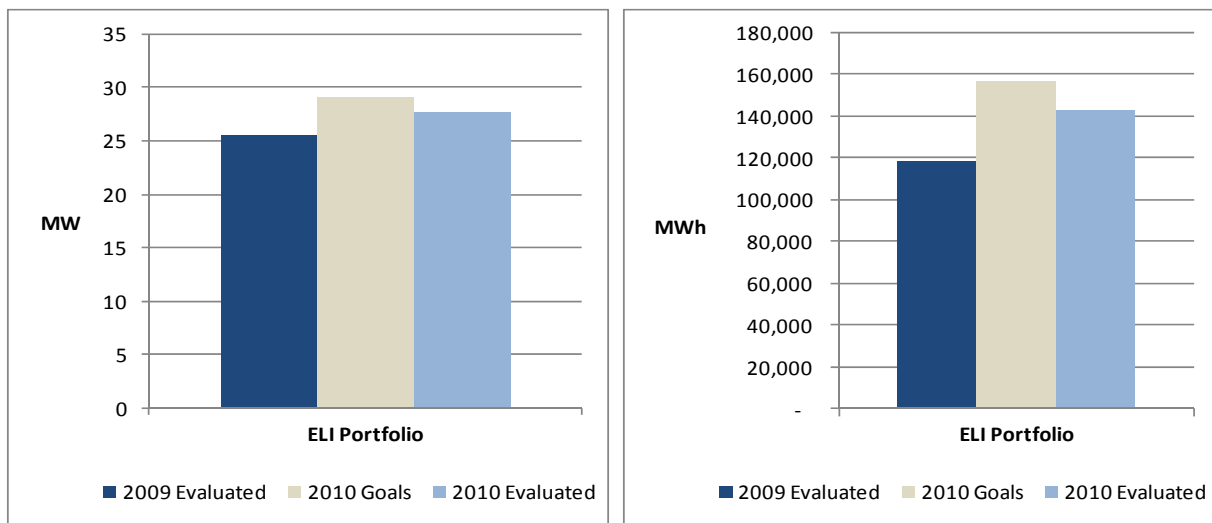
1. B/C ratio from Program Administrator perspective using comparison to baseload marginal supply costs. If B/C is greater than 1.0, program is cost-effective.
2. All levelized cost calculations use a discount rate of 5.643% to be consistent with supply-side alternatives.
3. Evaluated savings are compared to an adjusted savings goal. As was communicated in the 2010 Mid Year Report, because it was known that the SBDI component of the CEP program would not be implemented in 2010, LIPA and National Grid managed to a goal that did not include planned savings associated with SBDI. The adjusted savings goal, hereafter the "goal", does not include planned savings associated with the SBDI component of the CEP program which was not implemented in 2010."

ELI Portfolio Impacts

In 2010, LIPA spent approximately \$30 million on the ELI portfolio. Overall, evaluated savings from the ELI portfolio included over 27 MW of demand and nearly 143,000 MWh. The ELI portfolio resulted in the displacement of roughly 90,000 tons of CO₂, 313 tons of SO₂ and 97 tons of NO_x. This environmental savings represents the equivalent of removing approximately 15,000 cars from the road and a fuel savings of more than 190,000 barrels of oil.²

While the ELI portfolio performed well in 2010 and in line with the performance of similar portfolios the evaluation team has assessed, it fell short of the portfolio’s overall stated goals. ELI programs ended the year 5% below the overall net demand (MW) savings goal, and 9% below the overall the net energy (MWh) savings goal as shown in Figure 1. below.

Figure 1. 2010 ELI Portfolio MW & MWh Impacts



Total evaluated net savings for 2010 indicate that the Energy Efficient Products (EEP) program and the Commercial Efficiency (CE) program are key drivers to portfolio performance—combined accounting for 74% of evaluated net demand savings and 90% net energy savings. The CE program, and thus the Commercial portfolio, exceeded both net demand and energy goals for 2010. The EEP program accounts for the largest share of demand and energy savings among the residential programs and dictates the performance of the residential portfolio, particularly with respect to energy savings. EEP exceeded its net demand savings goal by 14% and did not exceed the energy savings goal by a similar margin causing the residential portfolio to fall short of its goal as well. The Cool Homes, REAP and Home Performance with ENERGY STAR® / Home Performance Direct programs fell short of their 2010 net demand goals offsetting the results of the EEP program when examined at the residential portfolio level. ENERGY STAR New Homes and Information/Education both

² Displacement and equivalent savings values based on NYS PSC calculator provided by LIPA.

exceeded their 2010 net demand savings goals by 114% and 29% respectively, but the Info/Ed program fell short of its 2010 energy goal by 15%.

Based on an analysis of portfolio impacts and costs, the savings generated by the ELI portfolio are very cost effective. As shown in Table 2, the benefit cost is 6.1 (a benefit cost value greater than 1 indicates that portfolio benefits outweigh costs). In addition, the levelized costs for ELI portfolio savings is \$126.94 per kW-yr or \$0.027 per kWh—less than the comparable marginal costs of supply-side alternatives.

Table 2. Summary of 2010 ELI Program Administrator Cost Test (PA) and Levelized Costs³

2010 Portfolio	Benefit Cost Ratio (PA)	Levelized Cost (\$/KW-yr)	Levelized Cost (\$/KWh)
Efficiency Long Island	6.1	126.94	0.027

Renewable Portfolio Impacts

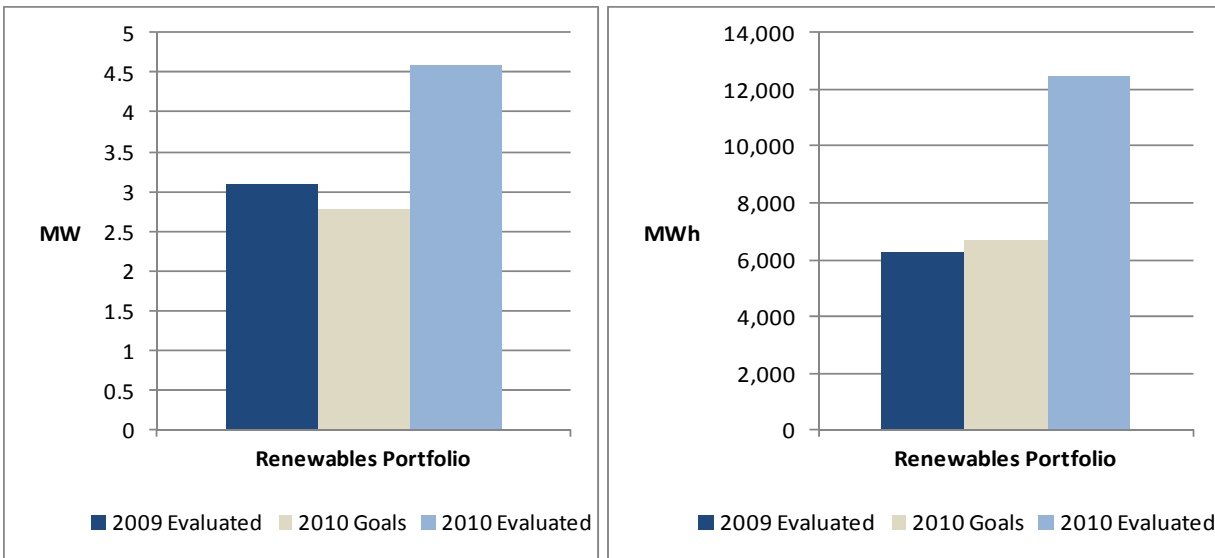
In 2010, LIPA spent approximately \$35 million on the Renewable portfolio. Overall, the portfolio resulted in more than 4.6 MW of demand savings and 12,400 MWh of reduced energy consumption. The Renewable portfolio resulted in displacement of almost 7,300 tons of CO₂, 11.2 tons of SO₂ and 7.5 tons of NO_x. This environmental savings represents the equivalent of removing more than 1,200 cars from the road and a fuel savings of more than 15,000 barrels of oil.⁴

The Renewable portfolio performed well in 2010, greatly exceeding its stated goals. The portfolio exceeded its net demand goal by 65% and its energy savings goal by 86%, as shown in Figure 2. below. Similar to the 2009 program year, these goals were achieved largely through the success of the Solar program. This program exceeded MW and MWh goals by 68% and 110%, respectively. This achievement was primarily due to the fact that the program provided rebates for more than 1,350 photovoltaic systems in 2010, far more than was originally planned. The Small Wind program reached 39% and 20% of its demand and energy savings goals, respectively. This was the second year of the program and a total of six installations, two residential and four commercial, were completed.

³ Research & Development and the LIPAEedge program were not included in the calculation of BC or Levelized Cost. All levelized costs are shown from the Program Administrator perspective.

⁴ Displacement and equivalent savings values based on NYS PSC calculator provided by LIPA.

Figure 2. 2010 Renewable Portfolio MW & MWh Impacts



The evaluation team also reviewed the cost-effectiveness of the Renewable portfolio. Based on an analysis of portfolio impacts and costs, the savings generated by the Renewable portfolio are cost effective. As shown in Table 3, the benefit cost is 1.1 (a benefit cost value greater than 1 indicates that portfolio benefits outweigh costs). The levelized costs for Renewable portfolio savings are \$579.94 per kW-yr or \$0.214 per kWh. While these costs appear to be somewhat higher than the comparable marginal costs of supply-side alternatives, payment for supply alternatives is typically made for both capacity and energy, whereas, in this analysis, the full program costs are assigned entirely to the energy charge to arrive at \$/kWh and then those same costs are allocated entirely to the demand charge to arrive at \$/kW. Moreover, as stated earlier, the levelized costs of the ELI and Renewable portfolios combined are less than the comparable costs of generating the displaced energy.

Table 3. Summary of 2010 Renewable PA and Levelized Costs

2010 Portfolio	Benefit Cost Ratio (PA)	Levelized Cost (\$/KW-yr)	Levelized Cost (\$/KWh)
Renewables	1.1	579.94	0.214

Progress Toward Long-Term ELI Goals

The ELI program has substantial annual goals set to meet the cumulative energy savings desired by 2018. Benchmarking annual usage to 2009, the goals call for an average 1.2% reduction in energy use year over year through 2018, resulting in a cumulative goal equal to a 10% reduction in energy use compared to 2009. This is an extremely ambitious goal compared to those established by other utilities.

Based on our analysis of cumulative evaluated capacity and energy savings attributable to ELI programs since 2009, the portfolio is on track to meet the long range capacity goals, but not the energy goals. Because of the cumulative nature of energy savings, the first years of

the planning horizon are essential to meeting long term goals. Evaluated performance of the ELI portfolio indicates that, at the portfolio level, cumulative energy savings through 2010 are 6% below goal. LIPA and the ELI planning contractor should work closely to assess options for increasing energy savings to close the gap with the long term goal while maintaining the portfolio's strong performance with respect to capacity savings.

Key Themes for Continued Success

As noted above, the ELI and Renewable Energy portfolios demonstrated strong performance in 2010 providing substantial capacity and energy savings in a cost effective manner. The long range goals for the both portfolios project annual increases in capacity and energy savings. To keep pace with increasing goals, LIPA must identify and consider emerging issues and challenges to success in its planning and management decisions. Below we provide an overview of the performance of the ELI and Renewable Energy programs for the 2010 evaluation cycle and identify challenges found through our research to be addressed in the future.

Commercial ELI Programs:

Overview of performance

The Commercial Efficiency (CE) program showed strong performance in 2010 achieving program savings goals despite not fully implementing a key element of the program design until late in the program year and delaying another element until 2011. The savings goals for the CE program reflect the expectation that an additional third party contractor, the Solution Provider, would be engaged to help deliver the program in 2010. Due to delays in the procurement process, the Solution Provider was not engaged until late in the program year and did not become fully integrated in program implementation in 2010. Additionally, a Direct Install component of the program was delayed until 2011. LIPA and National Grid program staff effectively managed this adjustment to the program implementation plan and exceeded the capacity and energy goals for the year, excluding the direct install component.

The evaluation team found that the program processes overall are functioning reasonably well as participating customers and contractors are satisfied with the program participation process and the level of support provided by the program team. Participants are less satisfied with the time it took to receive the program rebate suggesting rebate processing procedures could be improved. In addition, while the program offers a comprehensive suite of technical support services to customers, including audits and technical assistance studies, these offerings are not well integrated with the overall program delivery. Finally, while program staff have a detailed and accurate understanding of the status each project implemented through the program, there is room to improve the quality of the program tracking data systems.

Challenges for Future

The annual capacity and energy savings goals for the CE program have increased significantly for 2011. To meet the aggressive savings goals, the CE program needs to dramatically increase program participation and improve current processes for managing leads. To address this challenge, LIPA and National Grid program staff should work to improve the integration of existing program audit and technical assistance components and

use these components to generate leads and channel customers into the program. Further, the program will require more aggressive marketing and outreach tactics to ensure the breadth and depth of reach. This includes not only employing a variety of marketing strategies, but also more active involvement of the program implementation staff in identifying potential projects, proactively marketing the program to their customer base, and leveraging the existing trade ally base to reach commercial customers.

The 2011 program plan calls for a significant revision to the implementation strategy, in large part to expand the reach of the program and increase participation. Specifically, the Solution Provider was fully integrated at the beginning of 2011 and a second contractor targeting direct installation for small commercial customers will be added later in the program year. This change in program implementation strategy may introduce challenges to program delivery as the new contractors are integrated and specific roles and responsibilities are defined. LIPA will need to carefully manage this process for the program to achieve increased goals.

Shortcomings in the current program tracking database presents a challenge for effective program management and evaluation. For the program to achieve the increased savings goals, timely and accurate reporting of program performance and tracking of potential leads is essential. While Siebel is expected to address the vast majority of the current issues, rigorous QA/QC of program tracking data is needed to ensure Siebel is populated with accurate and complete data.

Residential ELI Programs:

Overview of performance

The ELI portfolio offers a comprehensive suite of residential programs for LIPA customers. Collectively, the programs provided substantial capacity and energy savings however annual savings at the residential portfolio level fell somewhat below established goals for each metric. Individually, the programs are effectively delivered and are well received by customers as participation exceeded goals for most programs and there exists a well established network of participating contractors and retailers working with program staff to help implement the programs. Program participants are generally satisfied with the program participation process, contractors and measures.

The evaluation team found that the program processes across all programs are effective though there is room to improve the quality and consistency of program tracking data. While we expect that the implementation of the Siebel database will address many of the issues identified by the evaluation team, each residential program should develop data quality and format protocols for each residential implementation contractor to allow LIPA to derive full value from the Siebel system. Currently, no such protocols appear to exist leading to inefficiencies producing program status reports and challenges in reconciling participant and measure level data with reports containing aggregated data.

Challenges for Future

With respect to capacity and energy savings, the performance of the Energy Efficient Products (EEP) program drives the performance of the residential portfolio. Further, savings associated with a single measure, CFLs, drives the performance of the EEP program. The CFL market is evolving and the baseline efficiency of residential lighting is increasing driven

in part by the Energy Independence and Security Act of 2007 (EISA) which requires the phasing out of inefficient 100 watt incandescent light bulbs beginning in 2012, and other incandescent bulbs in future years. CFLs will remain an important part of the residential portfolio into the future; however, in future years they will gradually yield lower savings per unit as the baseline efficiency of residential lighting increases. While the heavy reliance on CFLs for residential energy and demand savings is common among utilities implementing energy efficiency programs, the reduction in unit savings presents a challenge. LIPA is currently working with its planning contractor, Applied Energy Group (AEG), to adjust the portfolio to accommodate this reduction in CFL savings while striving to meet future efficiency goals.

Renewable Energy Programs:

Overview of performance

The Renewable Portfolio has performed extremely well, both in terms of achieving net capacity and energy goals and, in particular, with respect to its role in the development of a renewable energy industry on Long Island. The Solar PV program (Solar Pioneer and Solar Entrepreneur) and wind programs have, over time, effectively developed a strong PV market infrastructure on Long Island and knowledgeable trade ally base. Program processes function extremely well, particularly considering the intricacies associated with system interconnection.

Challenges for Future

Customers installing PV systems have enjoyed support from LIPA rebates as well as federal and state tax credits. Participants report that all three areas were equally influential in their decision to install a PV array. Future participation may be adversely affected by elimination of tax credits.

PV systems seem to be a natural to play a large part in reducing demand during hot, sunny summer days. However, through metered data from installed PV arrays the evaluation team determined that installed PV systems produce 31% less of the expected demand savings during the peak hours from 2 to 6 PM. LIPA should reduce the planned peak demand savings expected from this measure.

The backyard wind program is still in the nascent stage, although customers are expressing interest in the technology. To obtain greater presence, code changes across throughout LIPA service territory needs to occur. Staff are currently working with local code departments to help alleviate this barrier.

3. IMPACT RESULTS

This section presents the evaluated net energy and demand impacts for the ELI and Renewable Portfolios. This section also documents portfolio and sector (residential and commercial) Program Administrator (PA) cost test and levelized cost values as described in Section 1.3 Key Definitions.

3.1 ELI Portfolio Impacts

Energy and Demand Impacts

The portfolio of ELI programs delivered considerable energy and demand savings to electric customers on Long Island. Specifically, the ELI Portfolio accounted for more than 27 MW and 142,737 MWh in total evaluated net savings for 2010. This compares favorably to the evaluated results from 2009 which were 25 MW and 118,651 MWh. Despite these achievements, the ELI Portfolio fell short of its stated goals. As shown in Table 4, the portfolio reached 95% of its net demand savings goal and 91% of its net energy savings goal.

Table 4. Net Impacts: ELI Portfolio Evaluated Impacts versus Goals

Program	Evaluated Net Impacts		2010 Net Impact Goals		Percent of Goal	
	MW	MWh	MW	MWh	MW	MWh
Commercial Efficiency	10.60	47,580	10.13	45,023	105%	106%
Total Commercial	10.60	47,580	10.13	45,023	105%	106%
Efficient Products	9.97	80,474	8.72	92,959	114%	87%
Cool Homes	3.90	3,697	5.13	2,969	76%	125%
Residential Energy Affordability Partnership	0.39	3,940	0.75	6,022	52%	65%
Home Performance with ENERGY STAR / Home Performance Direct	0.49	2,851	2.72	5,710	18%	50%
Information / Education	1.49	2,746	1.15	3,250	130%	84%
ENERGY STAR New Homes	0.81	1,449	0.38	739	213%	196%
Total Residential	17.04	95,156	18.86	111,649	90%	85%
Total ELI	27.64	142,737	28.99	156,672	95%	91%

The commercial programs accounted for about one-third of total evaluated net energy savings of the ELI portfolio. This program exceeded its 2010 net demand and energy savings goals by 5% and 9%, respectively. Residential programs accounted for the other two-thirds of total ELI evaluated net energy savings. Residential programs fell short of their overall demand and energy savings goals by 10% and 15%, respectively.

As the EEP program accounts for the largest portion of energy and demand savings within the residential portfolio, the performance of this program has a substantial impact on the ability of the portfolio to achieve savings goals. The EEP program exceeded its demand savings goal by 14%, but this was more than offset by lower than anticipated demand savings from the Cool Homes, Home Performance with ENERGY STAR / Home Performance Direct, and Residential Energy Affordability Partnership programs. The EEP program fell short of its net energy savings goal by 13%, despite having exceeded participation goals, significantly contributing to the overall shortfall in energy savings from the residential programs in comparison to goals.

The shortfall in evaluated net energy savings attributable to the EEP program primarily relates to the estimated hours of use for residential lighting. A residential baseline study conducted by the evaluation team determined that over the years, the EEP program has been successful in significantly increasing the average number of CFLs in use in customer homes (socket saturation). As the average number of CFL's per home increases, the average hours of use typically declines as customers to install CFLs in sockets with relatively lower hours of use. Based on this research, and a thorough review of secondary sources, the evaluation team used a lower hours of use assumption to calculate evaluated savings (2.8 hrs/day) as compared to the program planning assumption (3.2 hrs/day) yielding a lower energy savings estimate.

A review of the program level savings and cost effectiveness results also indicates that the Home Performance with ENERGY STAR / Home Performance Direct program provides relatively lower capacity and energy savings compared to goals, and is somewhat less cost effective than other residential programs. It is important to note that these programs have the goal of long-term market transformation, and as such have high up-front costs, which are expected to decline in the future as more participants enroll. Program changes in 2011 are expected to improve the cost-effectiveness of this program.

3.2 Renewable Portfolio Impacts

Energy and Demand Impacts

The portfolio of renewable programs exceeded net demand and energy goals by 165% and 186%, respectively. These goals were achieved largely through the success of the Solar program, as shown in Table 5. This program exceeded MW and MWh goals by 168% and 209%, respectively. This achievement is primarily due to the fact that the program provided rebates for more than 1,350 photovoltaic systems in 2010, far more than was originally planned. The Small Wind program reached 39% and 20% of its demand and energy savings goals, respectively. This was the second year of the program and a total of six installations, two residential and four commercial, were completed.

Table 5. Net Impacts: Renewable Portfolio Evaluated Impacts versus Goals

Program	Evaluated Net Impacts		2010 Net Impact Goals		Percent of Goal	
	MW	MWh	MW	MWh	MW	MWh
Solar	4.57	12,297	2.72	5,869	168%	209%
Backyard Wind	0.02	168	0.06	832	39%	20%
Total Renewable	4.60	12,466	2.78	6,701	165%	186%

4. PROCESS RESULTS

The evaluation found that program processes overall are functioning reasonably well and ultimately lead to the implementation of effective programs which perform at a level commensurate with other programs the evaluation team has assessed. However, there is always room for improvement. Below we present key process findings and recommendations for program improvement.

Commercial Program

Findings

- **Satisfaction is High Among Participants and Contractors.** In general, participating end-use customers and trade allies were satisfied with the program overall and participation processes. Most customers also report satisfaction with the different components of the program and the level of support provided by program staff. Program participants overwhelmingly find participating contractors to be knowledgeable about the program and are nearly universally satisfied with the quality of work that contractors perform, as well as contractor professionalism. Participant satisfaction lagged for rebate processing times. Notably, overall however 62% of customers indicate that their experience with the program was positive and that they would be likely to participate in the program in the future.
- **Program Marketing was Limited in 2010.** Program marketing and outreach relies primarily on word-of-mouth, Major Account Executives and Commercial Energy Consultants to educate customers and promote energy efficient equipment installations. It appears that little is currently done outside of these efforts to engage a varied spectrum of available program outreach activities and outlets, such as trade ally network, Chambers of Commerce, trade associations and organizations, mailing lists and blasts, and case studies.
- **Integration of Audits and Technical Assessments Could Be Improved.** While the program offers a comprehensive suite of technical support services to customers, including audits and technical assistance studies, these offerings are not well integrated with the overall program delivery. Historically, the Audit and Technical Assistance (TA) programs have neither been overtly promoted nor utilized as marketing and channeling mechanisms. In fact, the Audit program has been functioning independently from the other components of the program with its own tracking system and limited ability to link the audit data to program data. This represents a missed opportunity to expand program participation.
- **Program Data Tracking Systems in Need of Improvement.** The collection and management of program data in an accurate and timely manner is required for effective program management, performance tracking and evaluation. The evaluation team identified the need for the development and implementation of

protocols to ensure the timely entry of program data into a centralized tracking system and robust QA/QC of contractor and participant provided information on program application forms. We fully expect that the recently implemented Siebel tracking system will dramatically improve existing issues with the consistency and completeness of program tracking data.

Recommendations

- **Expand Program Marketing and Outreach.** A more proactive marketing and outreach approach is required to meet the increased savings goals for the CE program. Toward this end, LIPA is currently working to implement two new implementation contractors to aggressively target specific segments of the commercial market. The evaluation team would recommend that LIPA also increase efforts to engage the existing trade ally base to market the program. Further, LIPA and National Grid program staff should work to improve the integration of the existing Audit and TA program components to identify and track leads and channel interested customers into the program.
- **Develop and Implement Protocols for Tracking Data QA/QC.** LIPA and National Grid successfully implemented the Siebel tracking system early in the 2011 program year. As part of the process, LIPA engaged program managers, implementation contractors, the program planning contractor and the evaluation team to help define the data requirements for the new system. Given this effort, we anticipate that the Siebel database will address the vast majority of the data tracking shortfalls identified by the evaluation team through this and the 2009 evaluation effort. However, to ensure that Siebel is populated with complete and accurate data we recommend the program implement procedures for auditing the completeness and accuracy of information recorded on program applications prior to data entry. In addition, we suggest the LIPA establish protocols specifying when applications should be entered into Siebel to allow program staff to manage the flow of projects, develop an understanding of typical project timelines, and track expected savings and anticipated rebates against goals and budgets.

Residential Programs

Findings

- **Satisfaction is Generally High Across Programs.** In general, participating end-use customers and trade allies were extremely satisfied with all programs. In fact, using a scale of 1 to 7, where 1 is "extremely dissatisfied" and 7 is "extremely satisfied," nearly all programs averaged a score of at least 6.0 in terms of participant satisfaction. The one area where satisfaction typically lagged was on rebate processing time.
- **Investigation of Net-to-Gross (NTG) Found a Number of Measures with High Free Ridership.** Opinion Dynamics conducted primary research on a number of LIPA measures in the 2010 programs, including dehumidifiers, refrigerator recycling, and Home Performance measures such as lighting and air/duct sealing. The NTG factors—particularly for dehumidifiers—were lower than planning estimates. LIPA has

already increased the dehumidifier incentive from \$10 to \$20 for 2011, which could help reduce the free ridership value as the higher incentive could induce more people who would not otherwise purchase an ENERGY STAR model because of the higher price to make the purchase. The evaluation team has discussed these findings with LIPA management and will be working to conduct additional research in the next evaluation cycle to investigate the issue of free-ridership more completely.

- **The Conversion and Measure Adoption Rates for the Home Performance Programs Exceeded the Planning Estimates.** Nearly half (49%) of HPD participants select to continue to HPwES, and approximately half of all HPwES participants installed all the recommended measures.
- **Program Data Tracking Systems in Need of Improvement.** LIPA continues to work diligently update and centralized the tracking data systems for the ELI and Renewable Energy programs. The implementation of the Siebel system was implemented early in 2011 and should address the vast majority of the shortcomings identified by the evaluation team. The 2010 evaluation process and program tracking effort were hampered due to inconsistencies in the program tracking data. The evaluation team was unable to reconcile all inconsistencies for at least one program.

Recommendations

- **Ensure that the Data Tracking Process is Collecting and Entering Customer and Measure Information.** LIPA is working towards improving the data tracking system, but the evaluation found a number of areas where LIPA needs to ensure that sufficient information is collected, entered, and reviewed. For example, all programs should prioritize the entry of customer contact information, particularly telephone numbers, into the program database. In addition, participating contractors should be required to properly fill out all rebate applications; for example, the evaluation found that a sizable number of lighting retailer coupons (32%) were not filled out completely but were still paid by the program. Further, LIPA should develop data quality and format protocols for each residential program implementation contractor to ensure that complete and accurate data are entered into the Siebel system and supporting documentation is maintained to allow for QA/QC audits.
- **Carefully Track and Report on Measure Verification Efforts.** Measure verification is an important QA/QC component of energy efficiency programs, and LIPA does currently conduct some on-site verification. However, LIPA should consider updating the program-tracking database to include more information about pre- and post-inspections by flagging those applications that received an inspection. In addition, LIPA could consider developing a system that tallies the number of jobs inspected for each contractor, allowing more transparency into whether the QA guidelines and quotas are being met.

- **Improve Rebate Processing Communication and Timing.** While participants were generally satisfied with all the residential programs, the one area for improvement was in rebate processing time. We recommend that LIPA set rebate processing expectations early in the participation process, and where applicable explaining how third-party verification could affect timing. Status updates on rebate processing or a rebate confirmation (e.g., postcard) might also improve customer satisfaction during the processing period. LIPA should also consider implementing application deadlines (such as 60 days from installation of the equipment) to better space out the incoming applications and manage rebate processing. If feasible, additional resources in the rebate-processing department would help address bottlenecks.

Renewable Energy Programs

Findings

- **Solar PV Program is Effective at Building Customer Interest and a Trade Ally base.** The marketing and outreach strategies of the Solar PV program staff have been successful in continuing to generate high levels of customer participation, given that the program had twice the planned participants in 2010. This can be attributed to the program's success and pivotal roll over the years in establishing a viable renewable energy industry on Long Island and extensive network of informed trade allies to market and support the program.
- **Satisfaction Generally High Among Customers and Contractors Participating in Renewable Energy Programs.** The majority of participating residential and business customers are satisfied with their experience with LIPA's renewable programs. The majority of respondents reported that it was easy to access information about how to participate, and also found their contractor to be professional and took the time to clearly explain the program. In fact, participants have a more favorable overall opinion of LIPA as a result of participating in the Solar PV program. Contractors are satisfied with the renewable energy programs because they have expanded the market for renewable energy installations, particularly Solar PV. The one area where both contractors and customers express frustration is the installation rebate processing time and time to install net meters.
- **Quality Assurance Procedures.** The considerable success and strengths of the Solar PV program notwithstanding, as of the close of the 2010 program year, the program did not implement formal QA/QC procedures which can identify key areas for program improvement and data that can assist in providing enhanced training and support to participating contractors. The evaluation team understands that LIPA is currently working to address the issue and plans to issue an RFP for a contractor to conduct QA/QC evaluations of PV installations in the 2011 program year.

Recommendations

- **Marketing and Outreach.** The program's success relies heavily on building a growing network of trade allies to enroll customers. As such, LIPA should continue to market the Solar PV program at trade associations and industry events to increase awareness and expand the existing word-of-mouth network. Given the importance of contractors on the success of the program, it is important that LIPA provide participating contractors with the most up-to-date program information, including information on timing for rebates, to set appropriate expectations such they change in a timely manner. This includes having the most updated information available on the LIPA program website page, sending information to contractors via email and inviting them to call LIPA support for additional information about any program questions and/or changes.
- **Develop Formal QA/QC Procedures.** As indicated above, while participants and contractors are generally satisfied with the Solar PV program, the one area for improvement was in rebate processing time. As such we recommend that LIPA conduct a QA/QC evaluation to examine the reason for the delay in the installation rebate processing time and time needed to install the net meter. This information will help LIPA identify possible inefficiencies that could reduce rebate processing and installation time and thereby increase participant and contractor satisfaction. Additional areas of the program where QA/QC procedures are likely warranted are the program tracking database (as noted above) and the post-installation inspection to ensure the proper location, tilt and shading of the PV system.

Cross Cutting Process Issues

Through discussions with LIPA, National Grid and the third party implementation contractors, in the course of the 2009 evaluation effort, the evaluation team identified eight cross-cutting areas where LIPA and their partners are working to make improvements to enhance future program efforts. Below we provide an update with respect to each of these cross cutting areas.

Improved Communication Across Programs and Organizations

LIPA management identified a need to integrate programs and organizations better: "because the old CEI programs were structured along vertical markets, there were insufficient opportunities for program managers and other stakeholders to communicate with each other."⁵ The evaluation team found that communications across programs and organizations has improved significantly since the 2009 evaluation. LIPA has taken steps to improve collaboration across the three organizations that support LIPA in the delivery of ELI programs. For example, LIPA's decision to transition to Applied Energy Group (AEG) as the ELI planning contractor and directing them to engage the expertise of LIPA and National Grid resources in the program planning and goal setting process has dramatically improved the process and added transparency to the resulting goals. In addition, LIPA directed a collaborative process including AEG, the evaluation team, ELI program implementation contractors and National Grid program staff to define the specific data elements that should

⁵ LIPA 2009 Program Portfolio Marketing Plan, pp. 8

be tracked in the new Siebel system to support enhanced program management, marketing, and the evaluation process.

Further, according to ELI staff interviews, the evaluation team found that improvements are being made to facilitate better communication among program managers and enhance program tracking. In particular, the integration of Siebel will encourage greater collaboration and better information tracking and sharing.

The evaluation team provides the following recommendations are mechanisms to further support LIPA's ongoing efforts to improve communication across programs and organizations:

- Continue to convene a variety of regular meetings to discuss ELI programs (e.g. ELI monthly meetings with LIPA, National Grid and AEG staff, monthly National Grid sector meetings, and weekly meetings among LIPA senior staff).
- Focus meeting agendas on timely programmatic issues, include only relevant staff, and document and disseminate outcomes (including action items with associated deadlines and responsible party) to relevant stakeholders.
- If possible, stagger monthly sector-level meetings so that pooled resource staff can attend, or, ensure that relevant staff receive copies of meeting minutes.
- Identify staff members who will take ownership of documenting and disseminating key information and meeting action items. We suggest that these staff members ensure that 1) presentations of key information for all ELI staff are scheduled, and 2) key programmatic decisions are documented, such as those made in the meetings, in minutes or in written memos that are emailed to all staff or relevant parties.
- Create an information flow chart to track different types of information, identify users of the information, and describe how the information should move through all organizations engaged in the delivery of ELI programs.

Clearer Delineation of Roles and Responsibilities

Based on information gleaned from interviews with LIPA and National Grid program staff, the evaluation team found that organizational roles and responsibilities were clear at the macro level, such as identifying which organizations take the lead or participate in functional responsibilities such as goal setting, planning and oversight.

The evaluation team also identified opportunities to enhance the manner in which LIPA and National Grid staff work together to deliver and manage individual programs. Our research identified a perceived need among National Grid program staff to clarify, day to day roles and responsibilities across programmatic activities associated with program delivery, particularly in cases where roles and functions seem to overlap with LIPA staff. We provide recommendations below to address this need.

- Clearly document LIPA and National Grid roles and responsibilities across organizations with respect to specific program implementation and management functions to reduce possible redundancies in effort and clarify expectations across organizations. This process should include documentation of how National Grid and LIPA manager roles are intended to intersect and collaborate.
- Clarify functional roles within and between organizations and, where practical, assign these functions to one position. In cases where roles overlap, discuss how these responsibilities overlap and determine how to best coordinate efforts.
- Develop and/or update existing job descriptions for National Grid program staff and an integrated organizational chart for all ELI program staff to differentiate program roles and responsibilities by function. We found that while both LIPA and National Grid maintain individual organizational charts, none of these charts linked National Grid and LIPA employees together in a systematic way.

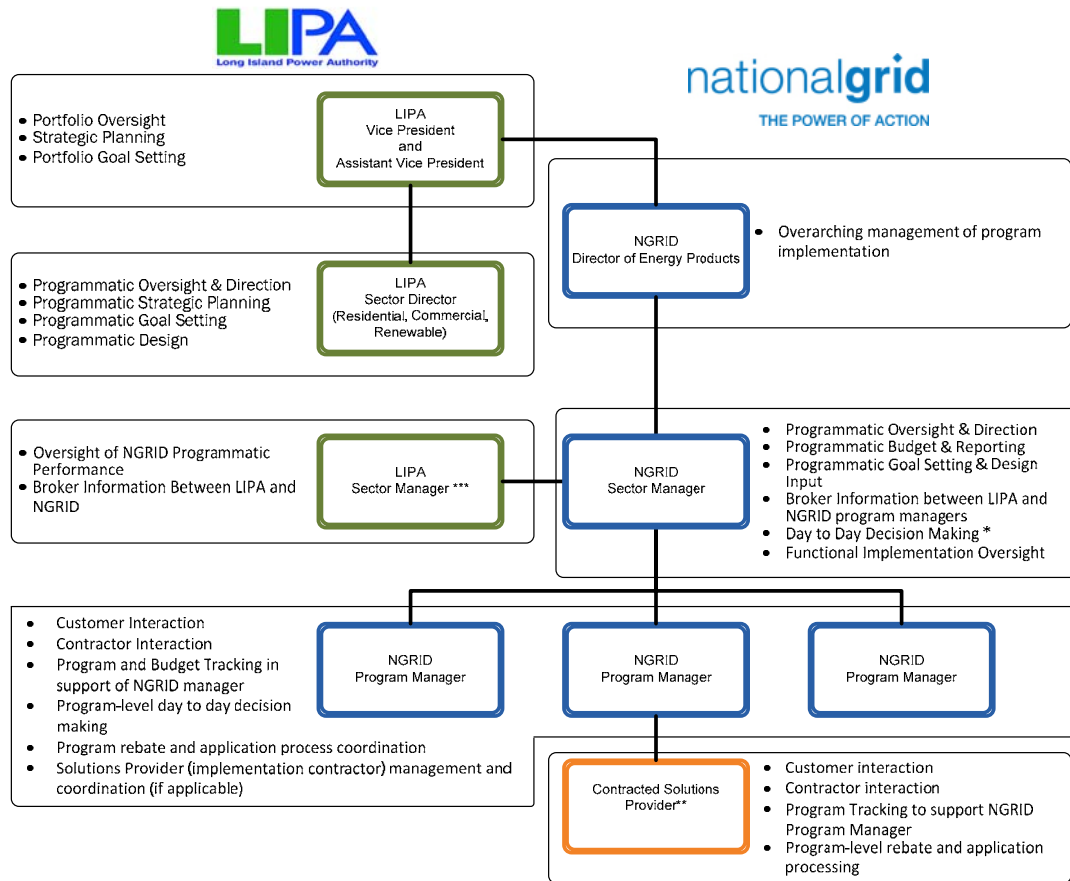
The evaluation team developed a hypothetical organizational chart of suggested functional roles and responsibilities for ELI program delivery to clarify organizational, programmatic, and individual roles within a sector, e.g. residential, commercial, and renewable. This organizational chart is hypothetical and provided an example of something that may serve as a starting point for this effort. Because this is a hypothetical structure, we note that roles and responsibilities and links between individuals likely do not reflect what happens on the ground.

Notably, the organizational chart does not reflect our recommendation for how staff should be organized to implement and manage programs. Rather, we provide this chart as an example that is intended to foster a collaborative discussion regarding how roles and responsibilities are assigned across organizations and individual staff members. The figure below provides an example for a single program sector and does not include pooled resource staff.⁶

Implementing the aforementioned recommendations will serve to 1) increase awareness of job responsibilities and keep staff informed of programmatic issues and tasks, 2) empower ELI staff, such as LIPA Directors or National Grid managers, to make decisions appropriate to their functional responsibilities, and 3) improve communication and alleviate information gaps across organizations and within sector-level teams by clarifying responsibilities, fostering accountability, and enhancing information flows.

⁶ Pooled resources staff includes staff that work on issues that cut across sectors, such as marketing, finance, and evaluation.

Figure 3. Example of Potential Roles and Responsibilities for ELI Team7



* Note that National Grid managers report to National Grid Director for operational issues and high-level programmatic problem solving.

** Note that only some programs contract with Solutions Providers.

*** We acknowledge that LIPA Sector Managers will work directly with National Grid Program Managers on program level issues. However, this organizational chart formalizes the process and indicates that information flows and managerial direction should flow through the National Grid Sector Manager.

Adherence to Program Goals by National Grid

Prior to the transition to the ELI portfolio and AEG as the program planning contractor, LIPA and National Grid staff indicated that, while the energy goals for programs were well documented and communicated to relevant parties, the process of setting goals was not fully transparent. Goal setting prior to 2010, was directed by LIPA’s former planning contractor, Optimal Energy.

LIPA has taken steps to improve the level of collaboration across the three organizations that support LIPA in the delivery of ELI programs. With respect to planning, to address the issue described above, LIPA has directed AEG to engage the respective expertise of LIPA and National Grid resources in the program planning and goal setting process. Moreover, AEG, under LIPA’s direction, has begun to leverage evaluation results to improve program planning assumptions. This effort dramatically improved the program planning and goal setting process, introduced full transparency of the resulting goals and completely addressed the issues experienced in prior planning cycles.

⁷ Note that this represents a hypothetical overview of a mechanisms to delineate roles and responsibilities.

Enhancement of Current Marketing and Outreach Efforts

Based on the results of the 2009 evaluation, LIPA convened discussions among program staff, AEG, and the evaluation team to prioritize research for enhancing the marketing and outreach efforts. Multiple discussions led to the development and implementation of two onsite baseline studies (one for residential and one for commercial) and two large scale telephone surveys of LIPA residential and commercial customers. Onsite audits provide a baseline of the current equipment within the service territory while the phone surveys collect information about awareness of the LIPA programs and overall attitudes towards energy efficiency. The data collection for all efforts has been completed and partial results shared with LIPA and AEG, leading to some mid-program activities to address awareness issues within specific programs. Additionally, a characterization of the HVAC market is underway.

This primary research enables LIPA to more fully understand their market and better target marketing and outreach efforts. Additionally, AEG will use onsite information in planning assumptions.

Consistency of Verification and Quality Control Data

LIPA is working with National Grid to improve the verification and quality control for program tracking data and has appropriately prioritized this effort to be undertaken after the full implementation of Siebel. Siebel is expected to be the repository of all data generated through QA/QC efforts. We recommend LIPA focus on the documentation of data input from the QA/QC procedures for each program to ensure Siebel is populated with complete and accurate data. We also recommend that documentation be created to make clear how the results of program specific QA/QC efforts are integrated into Siebel. For example, LIPA should document how the results of ongoing QA/QC audits completed as part of the program delivery process will be used to adjust program tracking data (e.g. adjustments to the reported quantity and/or impacts of installed measures) and how this information will be used to provide feedback to implementation contractors to improve program delivery, if at all.

Centralization of Data Tracking and Reporting

Management of program tracking data was one of the key process discussions in the 2009 report. At the end of 2009, LIPA and National Grid began to transition the program tracking data to a centralized database (i.e., the Siebel database). Early in 2010, the evaluation team, at the behest of LIPA, was involved in determining variables within the database to ensure that needed information for evaluation purposes was adequately tracked.

LIPA contractors continued work throughout 2010 on the Siebel database, but the roll out was delayed until early 2011. This failure to fully implement Siebel presented serious issues for the evaluation team as we gathered the portfolio data. Working through data compilation across multiple databases, determining if data was missing and figuring out how to work with incomplete secondary data (i.e. customer contact info) required substantially more effort and resources than planned.

The evaluation team expects Siebel will address many of the program tracking issues identified during the last two evaluation cycles. We recommend QA/QC of monthly extracts by the evaluation team for at least the first quarter of Siebel implementation to assure that data are input in sufficient quantity and quality to support the next evaluation cycle.

More Thorough Documentation and Transparency of Savings Estimates

The documentation and transparency of algorithms used to develop program expected savings estimates was identified as a priority area through the 2009 evaluation. Best practices suggest that the algorithms on which program planning and goals are based should be well documented, including all inputs such as hours of use and run times for equipment. As such, LIPA directed the evaluation team to conduct an engineering review and update (as necessary) all existing algorithms and assumptions used to develop program and measure level expected savings estimates.

Since the evaluation team's engineering review was not completed until May 2010, the ELI and Renewable program expected program savings estimates for 2009 and 2010 were based on the CEI algorithms developed by the prior planning contractor. While these estimates served as a starting point, evaluation team identified that some assumptions were not clearly documented. For those assumptions, the team worked with LIPA, National Grid and implementation contractors to determine the appropriate assumptions (and document the source of each assumption for future efforts). For assumptions that were already documented through earlier CEI efforts, the team revisited the assumptions to determine whether they needed to be updated to reflect current market conditions. This engineering review produced several recommendations for revisions to existing savings algorithms for use by LIPA's current planning contractor. Because these recommendations were provided after the 2010 plans were developed and well into the 2010 program year, the recommendations were not implemented in the 2010 program tracking systems used to develop estimates of expected savings for the 2010 program year. However, LIPA directed AEG to develop the 2011 plan using the updated algorithms. Moreover, these revised algorithms have been embedded in the new Siebel tracking system such that 2011 monthly status reports reflect the revised savings assumptions.

Better Integration and Formalization of Evaluation Efforts

In 2009, LIPA brought on a contractor (Opinion Dynamics) to act as the sole evaluation contractor for all ELI, Renewable, and demand response programs. Since that time, LIPA has taken the necessary steps to create a partnership between the evaluation team, the planning contractor (AEG), third party implementation contractors, National Grid and itself in order to enhance program performance and support evaluation. In addition to the annual program evaluation efforts, LIPA has directed the evaluation team to provide input to the program planning process and participate in defining the data requirements of the new program tracking system. In addition, the evaluation team is conducting three difference market assessments to support enhanced program planning and marketing and outreach efforts.