LIPA EFFICIENCY LONG ISLAND 2011 ANNUAL EVALUATION REPORT

Prepared for:

LONG ISLAND POWER AUTHORITY

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TABLE OF CONTENTS

TABLE OF TABLES

TABLE OF FIGURES

1. INTRODUCTION TO ANNUAL REPORT

1.1 Structure of the Evaluation Report

This report presents the results of the evaluation of LIPA's 2011 Efficiency Long Island (ELI) and Renewable Energy programs conducted by the Opinion Dynamics evaluation team. The evaluation team produces two reports. This document provides an overview of evaluation findings, including impact and process results for 2011. The Program Guidance Document provides detailed program-by-program impact analysis results, process evaluation findings, and a discussion of data collection and analytic methods.

Key Definitions

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

- Gross Impacts: The change in energy consumption and/or demand at the generator that results directly from program-related actions taken by participants, regardless of why they participated. These impacts include line losses, coincident factors for demand, and waste heat factors and installation rate for lighting. Gross impacts are the demand and energy that LIPA's power plants do not generate due to program-related actions taken by participants.
- Net Impacts: The change in energy consumption and/or demand at the generator that results directly from program-related actions taken by participants, and would not have occurred absent the program. The only difference between the gross and net impacts is the application of the net-to-gross ratio (NTGR).
- Net-To-Gross Ratio (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. The free ridership component of the NTG factor can be viewed as a measure of naturally occurring energy efficiency, which may include efficiency gains associated with market transformation resulting from ongoing program efforts. Spillover increases the NTG 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.
- Evaluated Net Savings: The net savings by the program for purposes of comparison to program savings goals. Evaluated net savings are determined by applying program planning NTG values to the gross impact estimates determined by the evaluation team.
- 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 2011, LIPA continued expanding the Efficiency Long Island initiative to improve program delivery and performance and achieve higher goals. 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 full implementation of Siebel for 2011 for all programs. While progress was made, bringing the Commercial Efficiency program (CEP) and Renewable Energy programs (i.e. Solar Pioneer/Entrepreneur) into Siebel in 2011, full implementation was not realized. First priority was given to programs without existing contractor databases and therefore, a greater need for the Siebel database. All residential programs have third party databases which are currently being used to track and report participation. LIPA continues efforts to add functionality to Siebel and integrate the tracking data for all residential programs in 2012. 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 review of the Siebel program upon full implementation.

- Addition of Solution Provider: The long-term plans for the ELI portfolio call for increased savings from the commercial market sector and thus a significant expansion of the Commercial Efficiency program.. The CEP strategy called for the addition of two new implementation contractors to target-specific segments of the commercial market. In 2011, LIPA integrated a new Solution Provider contractor to program delivery to work with commercial key account customers and facilitate program participation. The contractor began operations in Q4 of 2010 and became a key component of the program in 2011.

- Addition of Small Business Direct Install Program: The implementation strategy for the commercial program also included a new program component targeting small business customers on select capacity constrained service areas. In 2011, LIPA added a new contractor to conduct targeted marketing and outreach to facilitate the installation of energy efficient lighting among small business customers. While this program component was not launched until late in the program year due to delays in the procurement process, it contributed savings in 2011 and will become an important element of the commercial program in 2012.

- Adoption of Evaluation Results into Annual Planning: Because final evaluation findings and recommendations are not available until the May that follows the close of a program year, it is not possible for LIPA to revise planning assumptions based on evaluation results until the following year. For example, it is not possible to incorporate the results of the 2010 evaluation into the 2011 plan or tracking systems used to develop tracking estimates of program savings. However, the 2012 program plans were informed by the 2010 evaluation results and LIPA is currently working to embed evaluated savings estimates into the Siebel system for use in future years.

The following sections review the ELI and Renewable portfolio's program impacts for 2011 as well as the key process findings for the ELI and renewable energy programs.

Summary of Portfolio Performance

LIPA established 2011 annual demand and energy savings goals of 50.45 MW and 230,545 MWh for the combined ELI and Renewable Energy portfolios. Combined evaluated net savings achieved 78% of goal for demand and 80% for energy as shown in Table 1. Program spending was consistent with this level of savings.

In 2011, LIPA spent just over $67 million implementing the ELI and Renewable portfolios – 78% of the programs' available 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 (PA) test[1], is 3.4 for the combined portfolio savings (a PA value greater than 1 indicates that portfolio benefits outweigh costs). In addition, the levelized costs of the combined portfolio savings are $0.055 per kWh, or $234.05 per kW-yr. A levelized cost analysis is a way to quickly compare the cost of energy efficiency programs with energy or demand savings 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	Evaluated	Goal	Evaluated		$/kW-yr	$/kWh
CEP Mid Market	$8,882,323	$4,552,184	5.96	3.31	26,080	12,132	4.2	174.98	0.047
Solution Provider	$14,090,199	$16,266,471	9.47	12.89	41,796	57,690	5.0	158.96	0.035
SBDI	$12,036,231	$532,586	5.56	0.27	23,717	988	4.2	221.62	0.060
Commercial Efficiency Program	**$35,008,753**	**$21,351,241**	**20.99**	**16.46**	**91,593**	**70,809**	**4.8**	**163.30**	**0.038**
EEP	$10,669,264	$9,156,325	11.88	11.41	105,363	86,487	7.1	138.92	0.018
Cool Homes	$4,772,166	$5,016,425	7.42	4.08	6,941	4,769	3.7	131.62	0.128
REAP	$2,822,095	$2,706,413	0.63	0.24	6,270	1,791	0.5	1,813.01	0.240
HPwES	$3,025,572	$3,616,835	0.75	0.24	1,046	2,441	1.3	2,110.27	0.200
HPD	$3,993,758	$2,312,526	1.04	0.43	3,679	2,281	0.7	1,129.15	0.130
Existing Homes Subtotal	*$14,613,591*	*$13,652,200*	*9.84*	4.99	*17,936*	*11,282*	*1.9*	*349.56*	*0.176*
ES New Homes	$2,580,981	$2,614,664	0.54	1.19	1,043	2,309	5.4	186.36	0.096
Subtotal Residential	**$27,863,836**	**$25,423,188**	**22.26**	**17.59**	**124,342**	**100,078**	**4.2**	**213.65**	**0.042**
Subtotal ELI	**$62,872,589**	**$46,774,429**	**43.25**	**34.05**	**215,935**	**170,886**	**4.4**	**187.29**	**0.040**
Solar PV	$21,021,950	$28,255,303	6.76	5.44	13,346	13,995	1.7	392.34	0.153
Solar PV (ARRA Grant)	N/A	($8,344,500)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backyard Wind	$1,160,615	$308,590	0.04	0.03	341	320	1.9	705.34	0.073
Solar Hot Water	$622,450	$83,885	0.4	0.003	932	10	0.3	1,912.92	0.738
Subtotal Renewables	**$22,805,015**	**$20,303,278**	**7.2**	**5.48**	**14,610**	**14,325**	**1.7**	**395.15**	**0.151**
Total	**$ 85,677,604**	**$67,077,707**	**50.45**	**39.53**	**230,545**	**185,211**	**3.4**	**234.05**	**0.055**

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. ARRA Grant funds were used to offset Solar PV program costs. Evaluated savings and benefit/cost results for Solar PV reflect results for all LIPA and ARRA funded installations.

An important catalyst in LIPA's decision to invest in the ELI and Renewable Energy portfolios was the desire to offset the need to develop approximately 520 MW of new generating capacity on Long Island required to satisfy forecasted energy demand. As such, performance relative to the annual capacity savings goals is the primary performance metric for LIPA's programs. LIPA derived its annual savings goals from planning assumptions regarding key inputs to the estimation of expected gross and net savings attributable to program-incented energy efficiency measures. To allow for consistency and direct comparison between evaluated program performance and established savings goals, the evaluation team developed evaluated net savings estimates for each ELI and Renewable Energy program, as shown in Table 1 and presented throughout this report, for purposes of assessing goal attainment. We calculated evaluated net savings by applying LIPA's planning assumptions for the net-to-gross factor to the gross demand and energy savings estimates determined through our evaluation.

Among other inputs, the benefit/cost assessment requires an estimate of net program savings. The best-practice approach to this assessment dictates that the net savings used to develop the benefit/cost ratio reflect current levels of naturally occurring energy efficiency, free ridership, and spillover to provide an estimate of the benefits associated with the current year's investment in the programs. As such, the evaluation team used evaluated net-to-gross factors to develop the net energy savings estimates included in the benefit/cost ratio calculation.

ELI Portfolio Evaluated Impacts

In 2011, LIPA spent approximately $47 million on the ELI portfolio. Overall, evaluated net savings from the ELI portfolio included 34 MW of demand and nearly 171,000 MWh. The ELI portfolio resulted in the displacement of roughly 108,000 tons of CO2, 375 tons of SO2, and 116 tons of NOx. This environmental savings represents the equivalent of removing approximately 18,000 cars from the road and a fuel savings of roughly 228,000 barrels of oil.[2]

While the ELI portfolio performed well in 2011, delivering increased demand and energy savings as compared to 2010, and operating on par 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 at 79% of the overall net demand (MW) savings goal, and 79% of the overall net energy (MWh) savings goal. Figure 1. presents the steadily increasing evaluated savings across the three years since ELI's inception.

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

Figure 1. 2011 ELI Portfolio Evaluated Net MW & MWh Savings

LIPA's program tracking estimates of net savings indicate that the combined ELI portfolio achieved 78% and 79% of the annual demand and energy savings goal.. While there were some variances between LIPA's tracking estimates of program savings and the established savings goals across programs, more than half of the shortfall in both demand and energy savings at the portfolio level is attributable to the delay in launching the Small Commercial Direct Install (SBDI) program component due to delays in the procurement process. This procedural delay resulted in a delay in implementation until the final two months of the program year. The result was that LIPA invested 4% of the more than $12 million implementation budget for this program component over the course of the program year.

Total evaluated net savings for 2011 indicate that the Energy Efficient Products (EEP) program and CEP are key drivers to portfolio performance – combined, accounting for 82% of evaluated net demand savings and 92% of evaluated net energy savings. While in total the combined evaluated net savings for CEP and SBDI fell short of the annual savings goal, the shortfall in CEP is entirely associated with the delay in launching the SBDI program. Due to this delay, evaluated demand and energy savings for the SBDI program component were approximately 5% and 4% of the full-year goal. In contrast, CEP, comprising the integrated efforts of the Solution Provider and CEP Mid-Market implementation teams, exceeded its demand and energy goals by 5% and 3%, respectively.

It is important to note that evaluated KW savings were set equal to LIPA's program tracking estimates for all custom measures and prescriptive lighting measures to determine evaluated KW savings for CEP, and that combined, these measures account for 52% of evaluated savings for the program. Tracking estimates were used for custom measures due to the high relative precision of the evaluated demand savings results (19%) and because the evaluation schedule did not allow sufficient time to conduct metering of custom measures coincident with LIPA's system peak. Tracking estimates were used for prescriptive lighting measures because the Seibel tracking system did not include sufficient measure-level data to develop evaluated savings estimates using the program deemed savings algorithms.

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 fell short of the annual demand and energy savings goal, realizing evaluated net demand savings equal to 96% of the goal and evaluated net energy savings equal to 82% of goal. This shortfall in EEP energy savings is the driver to the shortfall in energy savings at the

residential portfolio level. The Cool Homes program also fell short of both demand and energy goals, realizing net evaluated demand savings equal to 55% of goal and evaluated net energy savings equal to 69% of goal. This shortfall in Cool Homes demand savings is the key factor in the deficit in demand savings at the residential portfolio level. For both EEP and Cool Homes, the majority of the difference between evaluated net savings and goal can be attributed to differences between program planning assumptions regarding measure savings and those developed and used by the evaluation team as opposed to issues with program delivery. For the vast majority of measures, the 2011 evaluated savings are based on savings algorithms developed as part of the 2010 evaluation. LIPA has integrated 2010 evaluation results into its 2012 planning assumptions and program tracking estimates of savings, which should mitigate this issue going forward.

Based on an analysis of portfolio impacts and costs, the savings generated by the ELI portfolio are cost-effective. As shown in Table 2, the benefit/cost is 4.4 (a benefit/cost value greater than 1 indicates that portfolio benefits outweigh costs). In addition, the levelized costs for ELI portfolio savings is $187.29 per kW-yr or $0.040 per kWh – less than the comparable marginal costs of supply-side alternatives.

Table 2. Summary of 2011 ELI Program Administrator Cost Test (PA) and Levelized Costs[3]

2011 Portfolio	Benefit/Cost Ratio (PA)	Levelized Cost ($/KW-yr)	Levelized Cost ($/KWh)
Efficiency Long Island	4.4	187.29	0.040

Economic Impacts of ELI

As part of the 2011 evaluation effort, LIPA directed the evaluation team to conduct an assessment of the economic impact of its investment in the ELI and Renewable Energy portfolios on the economy of Long Island. The evaluation team developed an Input-Output (I-O) model of the Long Island regional economy using IMPLAN modeling software to estimate these impacts. Central to the input-output model approach is the development of a static model for the effects of program spending based on a matrix of relationships among economic sectors, including industries, households, government, and foreign trade. The model requires inputs on spending, avoided cost, electric rates and other parameters from LIPA and draws on the net savings information included in the benefit/cost assessment.

The evaluation team first estimated one-year and ten-year economic impacts associated with LIPA's 2011 investment, where the 10-year economic impact estimates benefits accruing from installed measures in 2011 over their remaining measure life. We then extrapolated these impacts to the prior two years of ELI implementation (assuming similar multipliers of economic impact) to arrive at a portfolio-to-date estimate.

As shown in Table 3, our analysis of economic benefits found that LIPA's $47 million investment in the ELI portfolio in 2011 returned $61.6 million in total economic benefits to the Long Island regional economy in 2011, including an additional 445 full-time equivalent (FTE) employees. Over ten years, these 2011 investments are expected to return $71.9 million in total economic benefits to the regional economy (in 2011 dollars[4]), with an employment benefit of 560 new FTEs over the time period.

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

[4] Using energy supply discount rate assumption of 5.643%

Extrapolating these results over the three-year life of the portfolio, LIPA's $105 million investment to date in ELI produced approximately $138.8 million in cumulative economic benefits in first of each program year ($145.2 million in 2011 dollars), with an employment benefit of 1,003 FTE employees. Over the 10 years following each program year investment, these three-year investments are expected to return $161.9 million to the Long Island regional economy ($169.6 million in 2011 dollars), and result in 1,260 FTEs between 2009 and 2020.

Table 3. Economic Impact of PY1-PY3 Efficiency Program Investments

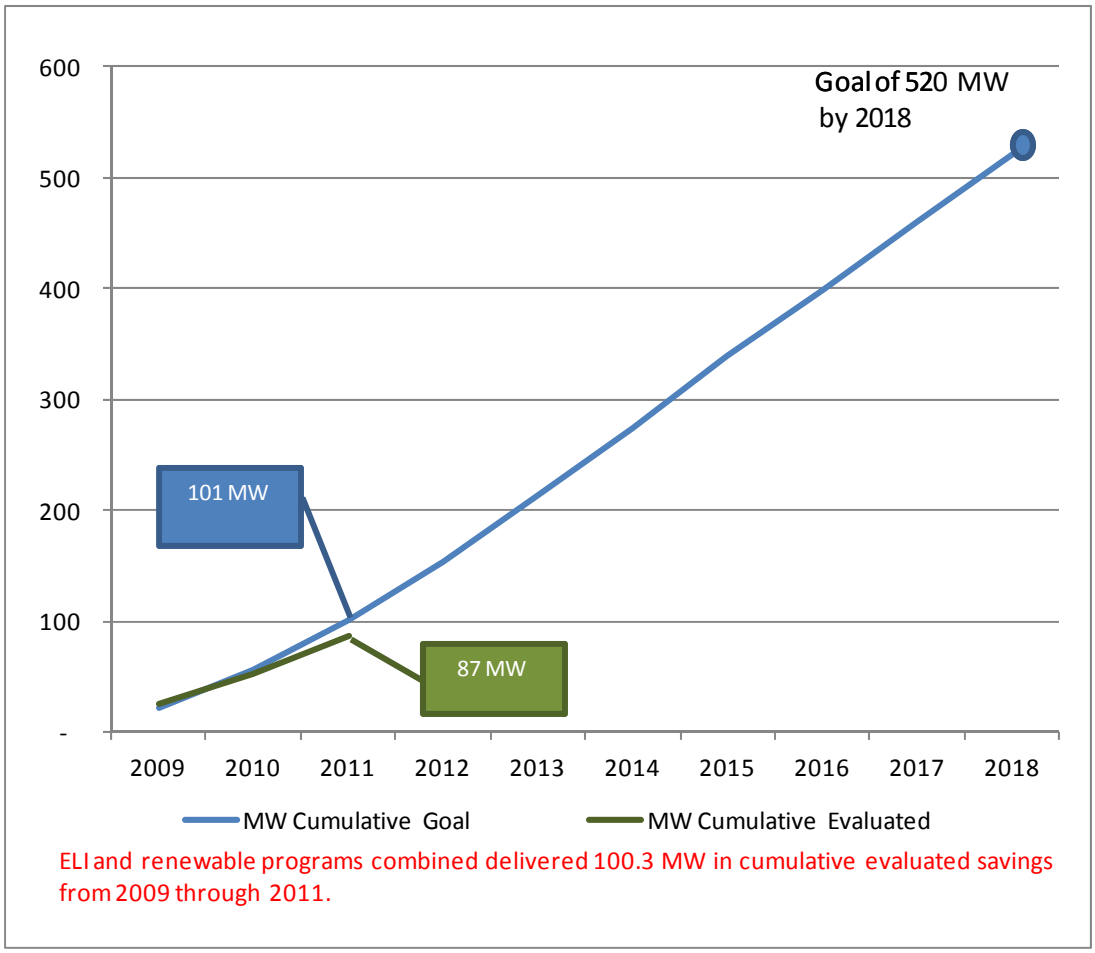
Effect	Impact of 2011 Program Investment		Impact of 2009-2011 Program Investment	
	First-Year Impact	*Impact over 10 years*	*First-Year Impact*	*Impact over 10 years*
Total Economic Output[5] (2011 $1M)	$61.6	$71.9	$145.2	$169.6
Full-Time Employees	445	560	1,003	1,260

Progress Toward Long-Term ELI Goals

LIPA has established aggressive annual and cumulative demand savings goals for the ELI portfolio. Specifically, the goals call for a cumulative reduction of 520 MW in system coincident peak demand by 2018.

[5] Total economic output is the value of industry production. In IMPLAN these are annual production estimates in producer prices.

Figure 2. Progress Toward Demand Goal



LIPA continues to make progress toward the long-range goal having achieved 104% and 95% of the cumulative goal in 2009 and 2010, respectively. Based on our analysis of cumulative evaluated net capacity savings attributable to ELI programs since 2009, the portfolio is slightly further behind the long-range capacity goals. Evaluated performance of the ELI portfolio indicates that, at the portfolio level, cumulative evaluated net demand savings through 2011 are 14% below goal. However, during the same three-year period, the ELI Program has also under spent the cumulative ELI budget (associated with the cumulative MW goal) by 29% while each year evaluated KW savings has increased. Also, when the cumulative demand savings associated with renewable programs since 2009 are added to ELI savings, the total cumulative evaluated demand savings increases to 100 MW.

It is important to note that delays in the procurement process for two commercial program implementation contractors over the last two years accounts for a large share of the budget not spent. While these delays are not uncommon after substantial expansions in programmatic efforts or changes in program design, with all contractors now online, LIPA expects to fully utilize the allocated budgets going forward. As program spending increases to planned levels, we anticipate that customer participation will increase to targeted levels, and the gap between evaluated MW and the cumulative MW goal will close. LIPA and the ELI planning contractor are working closely to assess options for building on the portfolio's strong performance with respect to delivering capacity savings

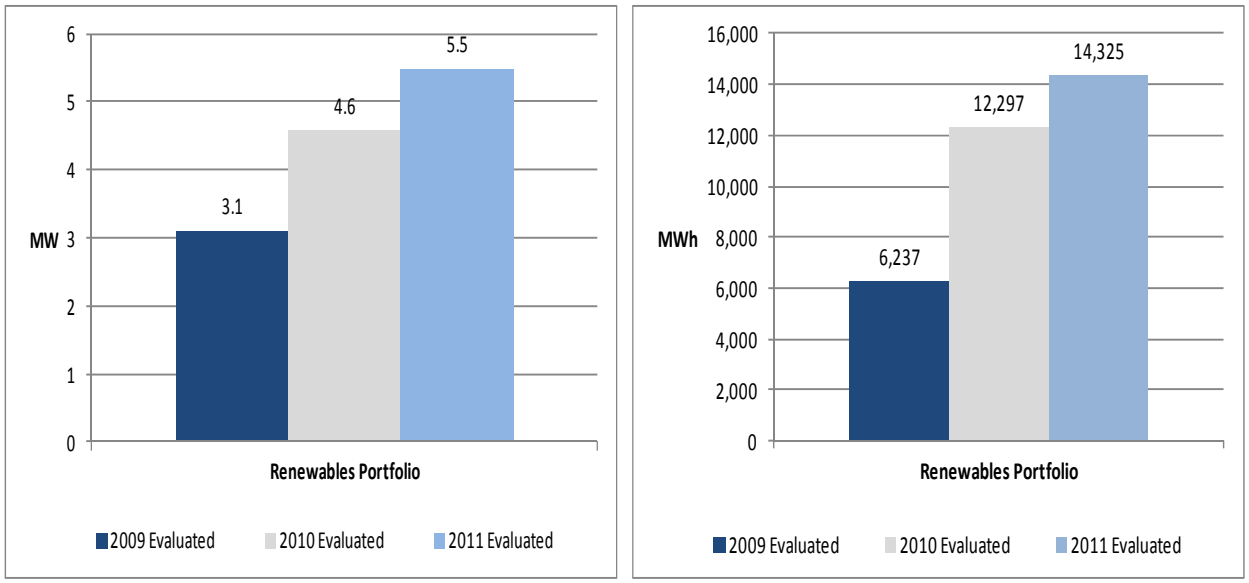
to increase savings as necessary to close the current gap between evaluated savings and the established goal.

Renewable Portfolio Impacts

In 2011, LIPA spent approximately $20 million in ratepayer funds and an incremental $8 million in funding from an American Reinvestment and Recovery Act (ARRA) grant on the Renewable portfolio. Overall, the portfolio resulted in roughly 5.5 MW of demand savings and more than 14,000 MWh of reduced energy consumption. The Renewable portfolio resulted in displacement of more than 8,000 tons of CO_2, nearly 13 tons of SO_2, and roughly 9 tons of NOx. This environmental savings represents the equivalent of removing nearly 1,400 cars from the road and a fuel savings of more than 17,500 barrels of oil.[6]

The Renewable portfolio performed well in 2011, but fell short of the established goals, achieving 76% of its net demand goal and 98% of its energy savings goal. The Solar PV program is the clear driver of portfolio performance. The shortfall in savings relative to the portfolio demand goal is entirely attributed to differences between program planning assumptions regarding the coincident demand factor used to determine tracked demand savings for the Solar PV program and the factor developed and used by the evaluation team as opposed to issues with program delivery. Adjustments to the summer peak coincidence factor, determined as part of the 2010 evaluation, were not available until after the 2011 plan was developed. LIPA has integrated the evaluated coincidence factor into its 2012 planning assumptions and program tracking estimates of savings to address this issue going forward. Both the Small Wind and Solar Thermal programs are in the early phases of program implementation and completed a very limited number of projects in 2011.

Figure 3. 2011 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 4,, the benefit cost is 1.7 (a benefit/cost value greater than 1 indicates that portfolio benefits outweigh costs). 2011 levelized cost (excluding about $0.09 net-metering

[6] Displacement and equivalent savings values based on NYS PSC calculator provided by LIPA.

costs) is $0.151 per kWh, and costs for solar are trending down. Table 4. Summary of 2011 Renewable PA and Levelized Costs

2011 Portfolio	Benefit Cost Ratio (PA)	Levelized Cost ($/KW-yr)	Levelized Cost ($/KWh)
Renewables	1.7	395.15	0.151

Economic Impacts of Renewable Portfolio

As noted above, the 2011 evaluation effort included an assessment of the economic impact of its investment in the ELI and Renewable Energy portfolios on the economy of Long Island. The evaluation team developed an I-O model of the Long Island regional economy using IMPLAN modeling software to estimate these impacts. The evaluation team estimated economic impacts associated with LIPA's 2011 investment first and extrapolated those results over the prior two years of implementation of the Renewable programs to arrive at a portfolio-to-date estimate.

As shown in Table 5, our analysis of economic benefits found that LIPA's $28 million investment in the ELI portfolio in 2011 (including $8.3 million in funds from the ARRA grant) returned $23.6 million in total economic benefits to the Long Island regional economy in 2011, including an additional 164 FTEs. Over the ten year period, these 2011 investments are expected to return $36.0 million in total economic benefits to the regional economy (2011 dollars[7]), with an employment benefit of 278 new FTEs.

Extrapolating these results over the three-year life of the portfolio, LIPA's nearly $75 million investment in Renewable programs has produced approximately $69.4 million in cumulative economic benefits in first of each program year ($72.9 million in 2011 dollars) with an employment benefit of 480 FTE employees. Over the ten years following each program year investments, these three year investments are expected to return $105.6 million to the Long Island regional economy ($111 million in 2011 dollars), and result in 815 FTEs between 2009 and 2020.

Table 5. Economic Impact of PY1-PY3 Renewables Program Investments

Effect	Impact of 2011 Program Investment		Impact of 2009-2011 Program Investment	
	First-Year Impact	*Impact over 10 years*	*First-Year Impact*	*Impact over 10 years*
Total Economic Output[8] (2011 $1M)	$23.7	$36.0	$72.9	$111.0
Full-Time Employees	164	278	480	815

[7] Using energy supply discount rate assumption of 5.643%

[8] Total economic output is the value of industry production. In IMPLAN these are annual production estimates in producer prices.

Key Themes for Continued Success

As noted above, the ELI and Renewable Energy portfolios demonstrated strong performance in 2011, providing substantial capacity and energy savings in a cost-effective manner though falling short relative to the established goals. The long-range goals for 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 2011 evaluation cycle and identify challenges found through our research to be addressed in the future.

Commercial ELI Programs:

Overview of performance

LIPA's portfolio of commercial programs showed strong performance in 2011 despite the delay in the implementation of a key program component until late in the program year. The savings goals for CEP reflect the expectation that a new program component would be implemented, SBDI, which accounted for 26% of the CEP program's demand and energy goals. Due to delays in the procurement process, the SBDI contractor was not engaged until late in the program year and did not become fully integrated in program implementation in 2011. Due to the late start to programmatic efforts, the program spent 4% of the $12 million implementation budget for this program component and achieved a fraction of the program goals. Program staff effectively managed the balance of the commercial portfolio with CEP, as the integrated efforts of the Solution Provider and CEP Mid-Market implementation teams exceeded the combined demand and energy goals.

The evaluation team found that the program processes overall are functioning reasonably well as participating customers and contractors are generally satisfied with the program overall. With changes to the program implementation strategy for 2011, two contractors currently deliver the CEP program to different customer segments. This change required revisions to program procedures and changes in internal communication and management protocols, which continue to evolve. As should be expected with this type of change in program delivery, 6% of participating customers and contractors reported some dissatisfaction with some elements of program implementation. LIPA is working to continue streamlining processes during 2012. Finally, while substantial progress has been made in transitioning program tracking information to the Siebel system, there remains room to further improve the functionality and quality of the program tracking data system, however, such improvements will likely come with additional technical and financial challenges.

Challenges for Future

The annual capacity and energy savings goals for CEP continue to increase. To meet the aggressive savings goals, the program must continue to dramatically increase participation and refine the implementation procedures that will allow for seamless coordination across all program components. To address this challenge, the program will require more aggressive marketing and outreach tactics to ensure the breadth and depth of program reach. This includes not only employing a variety of marketing strategies, but also continuing efforts to leverage the existing trade ally base to reach commercial customers. LIPA has already incorporated important changes in 2012 including the use of contractor incentives, trade ally seminars and weekly meetings to review applications.

The 2011 program year saw a significant expansion 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, the SBDI contractor, targeting direct installation for small commercial customers, was added late in the program year. Program staff has developed and documented program implementation protocols to address these additions and to define specific roles and responsibilities of the various parties involved in program delivery. In 2012, LIPA will need to carefully monitor these new program procedures and make the necessary revisions as gaps and performance issues are identified for the program to achieve the increased goals.

The current program tracking database is not yet optimized to support the efficient 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 are essential. While Siebel has been largely implemented, additional time and resources are required in order to achieve full functionality. . Further, once fully implemented, 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 as participation is strong and there exists a well-established network of participating contractors and retailers working with program staff to help implement the programs.

The evaluation team found that while the programs are well managed, there is room to improve the quality and consistency of program tracking data. While LIPA planned to fully implement the Siebel tracking system in 2011, final implementation did not occur for any of the residential programs.

Challenges for Future

Achieving the aggressive Cool Homes targets will be a challenge. LIPA's 2012 plan for the Cool Homes program calls for increased participation of customers that retire working central air conditioners and replace them with energy efficient equipment which reduces peak demand. To meet the program goal, about 50% of all central air conditioners installed through the Cool Homes program will need to be in this early retirement category.

With respect to capacity and energy savings, the performance of the EEP program is a significant contributor to the performance of the residential portfolio with Compact Fluorescent Lamps (CFL) savings accounting for a substantial proportion of savings from the EEP program. The CFL market is evolving and the baseline efficiency of incandescent bulbs will increase going forward due to code changes introduced as part of the Energy Independence and Security Act (EISA) of 2007, which requires the phasing out of inefficient 100-watt incandescent light bulbs beginning in 2012, and other incandescent bulbs in future years. 100 watt incandescent bulbs represent less than 10% of the market, so 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 and has begun the transition to the next generation of efficient lighting (e.g., rebating Solid State lighting) continue to meet future efficiency goals.

Renewable Energy Programs:

Overview of Performance

The Renewable portfolio has performed extremely well, both in terms of delivering substantial demand and energy savings 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 Small 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

Through metered data from installed PV arrays, the evaluation team determined that installed PV systems produce 69% of the expected demand savings during the peak hours from 2 to 6 p.m. LIPA has reduced the planned peak demand savings expected from this measure in 2012 and is planning additional analysis to determine factors, such as orientation, that will maximize the coincident peak demand delivered by program-incentivized PV systems.

The Backyard Wind and Solar Thermal programs are still in the early phases of implementation, although customers are expressing interest in these technologies. To obtain greater presence, code changes throughout LIPA service territory need to occur. Staff is 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.

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 34 MW and 170,886 MWh in total evaluated net savings for 2011. This compares favorably to the evaluated results from 2010, which were approximately 28 MW and 142,737 MWh. Despite these achievements, the ELI portfolio fell short of its stated goals. As shown in Table 6, the portfolio reached 79% of its net demand and energy savings goals. The 2011 goal was 43 MW, program tracking reported 37 MW, and after a rigorous evaluation, we find evaluated net savings of 34 MW.

Table 6. Net Impacts: ELI Portfolio Evaluated Savings versus Goals

Program	2011 Net Savings Goals		Evaluated Net Savings		Percent of Goal	
	MW	MWh	MW	MWh	MW	MWh
CEP Mid-Market	5.96	26,080	3.31	12,132	55%	47%
Solution Provider	9.47	41,796	12.89	57,690	136%	138%
Direct Install	5.56	23,717	0.27	988	5%	4%
Total Commercial	***20.99***	***91,593***	***16.46***	***70,809***	***78%***	***77%***
Energy Efficient Products	11.88	105,363	11.41	86,487	96%	82%
Cool Homes	7.42	6,941	4.08	4,769	55%	69%
Residential Energy Affordability Partnership	0.63	6,270	0.24	1,791	38%	29%
Home Performance with ENERGY STAR®	0.75	1,046	0.24	2,441	32%	233%
Home Performance Direct	1.04	3,679	0.43	2,281	41%	62%
Residential New Homes	0.54	1,043	1.19	2,309	220%	221%
Total Residential	***22.26***	***124,342***	***17.59***	***100,078***	***79%***	***80%***
ELI Total	***43.25***	***215,935***	***34.05***	***170,886***	***79%***	***79%***

The commercial programs accounted for nearly half of total evaluated net demand savings of the ELI portfolio. At the portfolio level, commercial programs achieved 78% of their 2011 net demand savings goal and 77% of their energy savings goals.. Residential programs accounted for the remainder of total ELI evaluated net energy savings. Residential programs also fell somewhat short of their overall demand and energy savings goals, achieving 79% and 80% of the goals, respectively.

The SBDI program accounted for 24% of the annual demand and energy goal for the commercial portfolio but, due to the delay in program launch, the program-evaluated net demand and energy

savings for the SBDI program component were 5% and 4% of the full-year goal, respectively. In contrast, CEP, comprising the integrated efforts of the Solution Provider and CEP Mid-Market implementation teams, exceeded its demand and energy goals by 5% and 3%, respectively.

The EEP program accounts for the largest portion of energy and demand savings within the residential portfolio, and performance of this program, along with the Cool Homes program, has a substantial impact on the ability of the portfolio to achieve savings goals. The EEP program fell short of the demand savings goal by 4%, while the Cool Homes program missed the demand goal by 45%, accounting for the majority of the portfolio-level shortfall for this metric. The EEP program fell short of its net energy savings goal by 18%, significantly contributing to the overall shortfall in energy savings from the residential programs in comparison to goals.

The shortfall in evaluated demand savings attributable to the Cool Homes program is primarily due to differences in baseline efficiency assumptions between program planning assumptions and those used to calculate evaluated net impacts. The evaluation team reviewed the program planning assumptions and supporting documentation and felt that the evidence did not support the planning value. As such, the evaluation savings uses nameplate efficiency data, yielding lower evaluated net demand impacts.

The shortfall in evaluated net energy savings attributable to the EEP program primarily relates to the estimated hours of use for residential lighting. Research conducted during the 2010 evaluation cycle resulted in the adoption of 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. As the evaluation results were not available for 2011 program planning, the 2011 goals were based on the old assumption. LIPA has addressed this issue for the 2012 plan.

3.2 Renewable Portfolio Impacts

Energy and Demand Impacts

The portfolio of Renewable programs fell short of net demand and energy goals by 24% and 2%, respectively. The performance of the portfolio is driven by the performance of the Solar PV program, as shown in Table 7. This program fell short of the demand goal by 19% but exceeded the energy goal by 5%. The shortfall in savings relative to the portfolio demand goal is entirely attributed to differences between program planning assumptions regarding the coincident demand factor used to determine tracked demand savings for the Solar PV program and the factor developed and used by the evaluation team as opposed to issues with program delivery. LIPA has integrated the evaluated coincidence factor into its 2012 planning assumptions and program tracking estimates of savings to address this issue going forward.

The Small Wind program reached 83% and 94% of its demand and energy savings goals, respectively. The Solar Thermal program, in its first year of implementation, achieved 1% if its demand and energy goals.

Table 7. Net Impacts: Renewable Portfolio Evaluated Savings versus Goals

Program	2011 Net Savings Goals		Evaluated Net Savings		Percent of Goal	
	MW	MWh	MW	MWh	MW	MWh
Solar PV	6.76	13,346	5.44	13,995	81%	105%
Small Wind	0.040	341	0.033	320	83%	94%
Solar Thermal	0.400	932	0.004	10	1%	1%
Total Renewable	**7.20**	**14,610**	**5.48**	**14,325**	**76%**	**98%**

4. PROCESS RESULTS

The process evaluation focused on two aspects of LIPA's program implementation: 1) documentation and assessment of the procedures used to generate, manage, and perform the QA/QC on program tracking data, and 2) an assessment of the expanded implementation strategy for commercial program offerings. Below we present key process findings and recommendations for program improvement.

Assessment of Program Tracking Data

At the direction of LIPA, the process assessment focused on the QA/QC processes in place for each program. Specifically, LIPA was interested in documenting and evaluating the program protocols for creating, managing, and ensuring the quality and accuracy of program data. With the implementation of the Siebel tracking system, LIPA's protocols for data management and QA/QC are being developed and revised on an ongoing basis. As such, while the evaluation team has completed the documentation of current procedures for each program, it was not possible to complete the assessment of the implementation of these protocols in time for this report. The evaluation team will continue to work with LIPA staff to complete the assessment of these protocols in the coming months until they are finalized and fully implemented.

Because of the focus on the QA/QC processes, our evaluation did not look closely at the program processes for any program except CEP. LIPA was interested in understanding the possible ramifications of the CEP expansion, so the evaluation team conducted a process assessment for CEP, presented next.

Assessment of CEP and SBDI

In 2011, the Commercial Efficiency program saw multiple changes to its design structure and implementation processes. The most considerable ones included:

- **Full transition of program tracking to Siebel:** In 2011, the LIPA Commercial Efficiency program fully transitioned its data generation, data management, and program tracking into Siebel. Siebel is an Oracle-based relational database with a wide array of data storage and data manipulation capabilities. Throughout 2011, LIPA Commercial Efficiency program staff worked with the Siebel team to configure Siebel to support program tracking and reporting needs. The work on fine-tuning continues, including the ability to extract data, the ability to enter additional data, and expanded access to Siebel by program implementers (primarily TRC, APT, and Lime Energy).
- **Program implementation across two implementation contractors:** In 2011, program implementation among large accounts (both unmanaged and managed) was fully transitioned to TRC, LIPA's Commercial Efficiency program Solution Provider. National Grid continued implementing the "mid-market" program among all medium and small accounts, and was also charged with overseeing the Solution Provider using a dedicated program manager.
- **Launch of the Small Business Direct Install program component:** In the fall of 2011, LIPA launched the SBDI program, hiring Lime Energy as their implementation contractor. This component is very focused. Business customers qualifying for this component have been pre-selected based on load pockets by circuit (LIPA selected anyone with a loading of 80%

or more in their circuit as qualifying business customers for SBDI).[9] Program design includes a no-cost assessment, and an installation of energy efficient lighting improvements. LIPA covers 70% of the total project cost, and customers are responsible for the remaining 30%. A dedicated program manager at National Grid oversees Lime Energy.

Throughout 2011, the program also saw changes to its incentive structures and a variety of incented energy efficiency measures. In 2012, LIPA is continuing to work toward streamlining the process by giving project managers more responsibility and ownership of a project from start to finish.

Programs undergoing significant change, such as CEP did in 2011, invariably have many small issues to work through as processes are implemented. This program was no exception as specific points around communication difficulties arose from trade allies and about one quarter of customers. These communication issues generally arise from the integration of the Solution Provider implementation contractor. While the program is marketed to customers as a single program offering, two implementation contractors as well as National Grid work to deliver the program to different groups of commercial customers based on customer size. Contractors and customers are generally unaware that two organizations are responsible for processing applications leading to some confusion when they contact the utility regarding the status of an application review or incentive payment. Many of these issues will most likely be resolved during 2012, as we understand that LIPA is already aware of some of areas of difficulty and is facilitating change. For example, in 2012, LIPA is becoming even more aggressive in their outreach to trade allies to help alleviate any communication difficulties.

Even given the changes seen, the program has maintained high levels of satisfaction. Nearly all trade allies we interviewed were satisfied with the program, while 85% of CEP Mid-Market and Solution Provider customers and 93% of SBDI customers are satisfied with the program overall.

[9] This was the definition of the customer base qualifying for the Small Business Direct Install program component in 2011.