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Energy Efficiency / Demand Response Plan: Plan Year 3 (6/1/2010-5/31/2011)

Evaluation Report: Smart Ideas for Your Business Business Prescriptive Program

Presented to

Commonwealth Edison Company

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Presented by

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Section E. Executive Summary

E.1 Evaluation Objectives

The Commonwealth Edison Company (ComEd) Smart Ideas for Your Business program provides incentives for business customers who upgrade their facilities with energy efficient equipment. There were two program elements that were available to ComEd customers during program year 3: a Custom program and a Prescriptive program. The Prescriptive and Custom programs have evaluation results reported separately. The goal of this report is to present the results from the evaluation of the Program Year 3 Business Prescriptive program[1].

The primary objectives of the Prescriptive evaluation are to quantify gross and net impacts and to determine key process-related program strengths and weaknesses and identify ways in which the program can be improved. Elements of the Prescriptive program that factored into the PY3 evaluation include the following:

- The Business Prescriptive program provides an expedited incentive application approach targeting retrofit and replacement opportunities in lighting, HVAC equipment, variable speed drives, refrigeration, motors, and food service equipment. The PY3 Prescriptive program did not significantly exceed planned levels of participation prior to year end and accepted applications throughout the program year.

- Higher "bonus" incentives for select lighting measures were offered between October 25, 2010 and April 30, 2011 to encourage conversion of T12 fluorescent lighting and to increase participation for new T8 or T5 fluorescent fixtures and occupancy sensors.

- Relationships with trade allies are a key strategy for promoting prescriptive incentive availability to customers. Bonus incentives for trade allies were offered for a limited time in PY3 for submission of projects on a larger scale.

- In the second half of PY3, ComEd expanded its offering for Prescriptive variable speed drives by adding a new application form providing incentives for HVAC pumps, fans, and chillers, process pumps and fans, compressed air, and "other" fans and pumps.

ComEd introduced the Midstream Incentive Pilot program in the second half of PY3. This pilot worked with prequalified distributors to offer their customers a discounted price on CFL purchases. Due to the limited scale of the pilot offering in PY3, pilot evaluation was conducted as a sub-task under the Business Prescriptive evaluation. Reporting is compiled as Appendix

[1] The Program Year 3 (PY3) program year began June 1, 2010 and ended May 31, 2011.

5.4. Unless specifically noted, Midstream Incentive Pilot impacts are ***not*** included in tables summarizing Business Prescriptive results.

E.2 Evaluation Methods

The key evaluation activities to assess gross and net impacts of the Prescriptive program were:

- Reviewed tracking data and default savings assumptions used by the program.
- Implemented a stratified random sampling design on the population of 3,794 Prescriptive project applications with three strata of roughly equal ex ante energy savings allocation. Conducted a random selection of 90 projects, 30 from each stratum.
- Conducted on-site visits and measurement and verification (M&V) activities on a sample of 36 Prescriptive projects selected randomly from the 90 projects to support gross impact evaluation. An engineering review of project files and energy savings estimates was conducted on the remaining 54 projects from the sample of 90 projects.
- Completed computer assisted telephone interviews (CATI) with 108 Prescriptive project contacts to support the net impact approach.
- Questions in the CATI survey were asked regarding installed measures, removed equipment, and lighting hours of use, but responses were only considered for gross impact adjustments for projects in engineering file review sample.

Six research activities were conducted in support of the Prescriptive process evaluation: (1) interviews with program and implementation staff, (2) in-depth interviews with participating market actors, (3) in-depth interviews with ComEd Account Managers, (4) a quantitative telephone survey with 109 participating customers, (5) a quantitative telephone survey with 70 non-participating customers, and (6) a literature review and utility staff interviews regarding upstream bonuses for trade allies. These activities are further described in the main report.

Evaluation activities for the Midstream Incentive Pilot are described in the Appendices.

E.3 Key Impact Findings and Recommendations

As shown in Table E-1 and Table E-2, the PY3 Prescriptive evaluation found that verified gross energy savings were 1 percent higher than savings in ComEd's tracking system, as indicated by the realization rate (realization rate = verified gross / tracking system gross), while peak demand impacts were 11 percent lower. These realization rates are lower than PY2, where the energy realization rate was estimated to be 1.21 and peak demand was 0.99. The verified net-to-gross ratio (NTGR) for PY3 of 0.72 was slightly lower than the PY2 value of 0.74.

Table E-1. Prescriptive Program-Level Evaluation-Adjusted Net kWh Impacts for PY3

Segment	Ex Ante Gross kWh	Ex Post Gross kWh	kWh RR	Ex Post Net kWh	NTGR (ex post gross)
Prescriptive	258,385,882	260,236,777	1.01	188,462,660	0.72
Midstream	1,133,258	1,246,109	1.10	916,159	0.74
Total	259,519,140	261,482,886		189,378,819	

Source: Prescriptive: Analysis of tracking savings from ComEd online tracking system, August 3, 2011. Midstream: Analysis of tracking data from ComEd, provided August 12, 2011. The values displayed for RR and NTGR are rounded.

Table E-2. Prescriptive Program-Level Evaluation-Adjusted Net Peak kW Impacts for PY3

Segment	Ex Ante Gross kW	Ex Post Gross kW	kW RR	Ex Post Net kW	NTGR (ex post gross)
Prescriptive	52,300	46,553	0.89	33,713	0.72
Midstream	NA	236	NA	173	0.74
Total	NA	46,789		33,886	

Source: Prescriptive: Analysis of tracking savings from ComEd online tracking system, August 3, 2011. Midstream: Analysis of tracking data from ComEd, provided August 12, 2011. The values displayed for RR and NTGR are rounded.

The relative precision at a 90% confidence level for the Prescriptive projects in the sample is ±9% for the kWh realization rate and ±7% for the kW realization rate. The relative precision at a 90% confidence level for the program NTG ratio is ± 5%.

The Prescriptive realization rate for peak demand was 0.89, reflecting primarily the impact of relatively lower demand realization rates for some sampled variable speed drive measures, the removal of HVAC interaction factors on some sampled lighting projects that were not installed in conditioned spaces as assumed in the default values, and baseline adjustments applied to several projects that received on-site verification.

The primary factors lowering the demand realization rates also resulted in lower energy realization rates on individual projects. The primary factor that raised the Prescriptive energy realization to 1.01 was a common finding, through on-site verification and telephone interviews, of longer hours of use than assumed in the default savings. Longer hours of use has a disproportionately greater impact on energy than demand – for example, if an industrial plant is found to operate continuously throughout the year, the energy realization rate will increase by 104% over the default value (8,760 ex post hours / 4,290 ex ante hours), whereas the peak demand realization rate will only increase the coincident-diversity factor by 1% (1.00 ex post / 0.99 ex ante).

Impacts for the Midstream Incentive Pilot program show that the gross realization rate on energy is 10 percent higher than ComEd claimed savings because the evaluation team included

an HVAC interaction factor for energy impacts. ComEd did not provide an ex ante estimate for peak demand, so we could not estimate a gross impact realization rate on peak demand. The evaluation analysis method of calculating demand reduction for each CFL model resulted in a total connected load reduction of 257 kW for the Midstream program, compared with a value of 263 kW total connected load reduction from ComEd's delta watts assumptions, for a ratio of 0.98. This is due to minor differences in assumed incandescent wattage replaced, where the evaluation team used actual lumen values from product literature for specific CFL model numbers to select an incandescent base wattage. The net-to-gross ratio (NTGR) for PY3 of 0.74 was assumed based on results for lighting-only measures in the Business Prescriptive program.

Table E-3 below provides an overview of planned, reported ex ante, and evaluation-adjusted net savings impacts for the combined PY3 Prescriptive and Custom programs, including the Midstream pilot. Together, the Prescriptive and Custom programs exceeded ComEd's revised target for net MWh savings.

Table E-3. Comparison of Evaluation Findings to Program Goals for the Custom and Prescriptive Programs, Including Midstream Incentive Pilot Results

Net Savings Estimates	MWH
ComEd Revised PY3 Target	182,106
ComEd Reported for PY3 (ex ante)	219,759
Total PY3 Evaluation-Adjusted Net Savings (ex post)	215,813

Source: Revised Target and Reported: Communication from ComEd.

Table E-4 below provides an overview of gross impacts, net impacts, and other results that illustrate program accomplishments over the first three years of implementation. From PY2 to PY3, customer project count doubled and the share of non-lighting energy savings was substantially increased.

Table E-4. Prescriptive Program Results from PY1, PY2, and PY3

Program Result	PY1	PY2	PY3	Total
Ex Ante Gross MWhs	90,571	213,522	258,386	562,479
Ex Post Gross MWhs	120,550	259,093	260,237	639,879
Realization Rate (MWhs)	1.33	1.21	1.01	1.14
Ex Post Net MWhs	80,932	191,896	188,463	461,290
Net-to-Gross Ratio	0.67	0.74	0.72	0.72
Number of Projects	455	1,739	3,794	5,988
Percent of Ex Ante Gross MWh Savings from Lighting	92%	94%	85%	89%
Unique Contractors	156[2]	325	503	736

Source: Evaluation reports and ComEd tracking system. Values shown have been rounded.

ComEd should consider conducting a detailed review and testing of the implementation of the tracking system's handling of variable speed drive (VSD) projects. The ex ante impacts for variable speed drives did not match expected values in many instances, and contributed to significant deviations between ex ante and ex post findings on a project by project basis even when the evaluation team agreed with ComEd on the project details. Since there were a number of evaluator recommendations regarding VSDs in PY3 and ComEd has acted upon some of them since closing out PY3 projects, the evaluation team will assist ComEd in this effort in PY4 by producing updated recommendations and guidance for addressing VSD applications.

ComEd should consider working with the evaluation team to review PY3 site M&V and telephone survey data to identify potential refinements to default values that may be applied to PY5. Measures that weight baseline scenarios of wide variation into a single average, such as permanent lamp removal, contributed to significant deviations between ex ante and ex post findings even when default values were properly applied.

ComEd should consider placing tight restrictions on new construction projects admitted into the Prescriptive program, such as restricting maximum motor horsepower size for VSD measures. On four of nine variable speed drive measures claimed in a sampled new construction project (those involving larger motors 50 horsepower and above) the evaluation team concluded that system design and final control strategy as implemented by the customer

[2] It should be noted that the contractor used was identified as "unknown" for 23 of the 455 PY1 projects.

did not produce savings beyond code requirements. This resulted in a significant reduction in energy and demand impacts for the project.

When ComEd is adding a new end-use or new measure types to an existing end use, consider alerting the evaluation team who may need to revise data handling routines.

During PY4, prior to closing out year-end ex ante savings estimates, ComEd should consider working with the evaluation team to review multiple factors that can affect ex ante savings. The evaluation team can review default lookup values coded into the tracking system and check the values against the default values documentation, and advise ComEd on any differences. The evaluation team could also review the output of changes to ex ante calculations that are made in the tracking system.

ComEd should consider investigating customer satisfaction with light levels and consider strategies to reduce under-lit designs if dissatisfaction is common. Seven of 79 respondents in the CATI survey reported that they installed additional lighting fixtures in the same space at a later time to increase the amount of lighting. ComEd indicates they have taken steps to identify potential under-lit designs in the pre-approval stage and contact those customers to make them aware of the potential for lighting level reductions.

ComEd should consider discussing their experiences with potential spillover candidates and projects with the evaluation team. The Prescriptive evaluation team will be conducting an enhanced effort to identify potential spillover candidates and quantify spillover in PY4. If participant spillover can be reliably characterized and quantified, it may be possible for ComEd to develop strategies to encourage it.

For CFLs installed through the Midstream Incentive, the evaluation team recommends that ComEd consider including energy and demand interaction factors with the HVAC system when estimating claimed savings. If additional measures are added to the Midstream delivery approach, ComEd should consider including HVAC interaction factors, depending on the measure type.

E.4 Key Process Findings and Recommendations

Program Participation

Consider removing or increasing project incentive caps. Given the increasing program goals and the decreasing average project size, increasing project incentive caps may be beneficial in bringing in larger Prescriptive projects. ComEd has raised the per-premise cap from $400,000 in PY3 to $1,000,000 in PY4.

Consider special offerings for sectors with limited participation but high savings potential. The medical and lodging sectors have experienced stagnant participation growth, but they have

had relatively high per project savings. Further research might be required to identify industries to target for special promotions and identify their specific barriers to participation.

Consider offering special promotions for non-lighting measures. While lighting projects will continue to be critical to the success of the program, the program should consider offering special promotions for non-lighting measures to further encourage their implementation.

Trade Ally Network

Consider attempting to enhance and better communicate the benefits of becoming a trade ally. While the program was not actively seeking to add more trade allies to its network, providing attractive benefits for trade allies and disseminating this information will be important in further strengthening the network.

Consider options for Basic Training that reduce the time-burden for trade allies. While most interviewed trade allies saw no problems with the new trade ally requirements, active non-trade allies most often cite the time burden (including travel) of attending training in person as the main reason for not becoming a trade ally. While ComEd offers Basic Training as a webinar in certain situations, they consider in-person training to be more effective. The program should consider options such as offering a limited number of trainings via a web portal (in-whole or in-part) or in locations other than the KEMA office in Wheaton.

Trade Ally Bonus

Consider increasing the promotion of the trade ally bonus. Knowledge of the bonus offering was not widespread amongst interviewed contractors.

Consider additional communication of the new two-tiered bonus structure and bonus timing. Additional research into bonuses offered by Ameren Illinois and other utilities found that apart from the bonus structure, strong communication and clear expectations are crucial to the success of such an effort. The program should strive to communicate the modified bonus program early and clearly to both trade allies and non-ally contractors, and provide sufficient lead time for contractors to increase their promotion and take advantage of the offering to the fullest extent.

Account Managers

Consider implementing a formal process for tracking leads. No formal process for tracking customer leads exists in the Smart Ideas Program, although ComEd indicates systems are under development. Interviewed Account Managers indicated that such a system would be a useful tool for Account Managers and Smart Ideas staff alike.

Marketing and Outreach

Consider offering new attractions for future Energy Efficiency Expos. The program should find ways to keep the Expo attractive for returning customers and reflect that in outreach efforts, or consider adjusting Account Manager goals with respect to Expo recruitment.

E.5 Summary

For PY3, ComEd set a goal to achieve 182,106 MWh of energy savings from the combined results of the Business Prescriptive and Custom programs. The Business Prescriptive program contributed to exceeding this energy savings goal by achieving evaluation verified gross energy savings of 260,237 MWh and net energy savings of 188,463 MWh. The PY3 program was delivered at a benefit-cost ratio of 1.05 using the Illinois Total Resource Cost test. The PY3 program was delivered effectively, as indicated by process evaluation findings that participants were satisfied with most aspects of the program. Satisfaction for the program overall was highest, with 95% of PY3 customer participants surveyed indicating that they are satisfied. Almost all contractors (22 of 25 interviewed) were satisfied with the program. ComEd should consider the impact and process-related recommendations in this evaluation report to improve upon these results in future years.

E.6 Cost-Effectiveness Summary

ComEd uses DSMore™ software for the calculation of the Illinois TRC test[3]. Table E-6 summarizes the unique inputs used in the DSMore model to assess the TRC ratio for the Business Prescriptive program in PY3. Most of the unique inputs come directly from the evaluation results presented previously in this report. Measure life estimates and program costs come directly from ComEd. All other inputs to the model, such as avoided costs, come from ComEd and are the same for this program and all programs in the ComEd portfolio.

[3] Demand Side Management Option Risk Evaluator (DSMore) software is developed by Integral Analytics.

Table E-6. Inputs to DSMore Model for Business Prescriptive Program

Item	Value Used
Measure Life	12
Utility Administration and Implementation Costs	$7,292,352
Utility Incentive Costs	$20,178,985
Net Participant Costs	$85,359,656

Based on these inputs, the Illinois societal TRC for this program is 1.05 and the program passes the Illinois TRC test.

Section 1. Introduction to the Program

This evaluation report covers the Prescriptive program element of the ComEd Smart Ideas for Your Business incentive program.

1.1 Program Description

The Commonwealth Edison Company (ComEd) Smart Ideas for Your Business program provides incentives for business customers who upgrade their facilities with energy efficient equipment. This incentive program is available to all eligible, nonpublic, commercial and industrial customers in ComEd's service territory. There were two specific program elements that were available to ComEd customers during program year three (PY3) under the ComEd Smart Ideas for Your Business incentives program:

- **Prescriptive Incentives** were available for energy-efficiency equipment upgrades and improvements including lighting, cooling, food service, refrigeration, and motors. Incentives were paid based on the quantity, size, and efficiency of the equipment. Incentives were provided for qualified equipment commonly installed in a retrofit or equipment replacement situation.

- **Custom Incentives** were available to customers for less common or more complex energy-saving measures installed in qualified retrofit and equipment replacement projects. Custom measure incentives were paid based on the first year energy (kWh) savings. All projects were required to meet ComEd's cost-effectiveness and other program requirements.

Measures that are available through the Prescriptive program are not eligible for custom incentives. However, the applicant has the option to apply for a custom incentive if the entire project involves a combination of prescriptive and custom measures.

Additional ComEd program offerings are provided under the Smart Ideas business program umbrella, including retrocommissioning and new construction services. The Illinois Department of Commerce and Economic Opportunity (DCEO) is responsible for delivering programs to ComEd customers targeted towards public nonresidential buildings such as government, municipal, and public schools.[4] These ComEd and DCEO programs are evaluated and reported separately.

[4] For more information on the DCEO programs please refer to (www.illinoisenergy.org).

The Smart Ideas for Your Business program is a key part of ComEd's overall portfolio of programs approved by the Illinois Commerce Commission (ICC) as part of ComEd's Energy Efficiency and Demand Response Plan, filed in November 2007 and approved in February 2008.[5] The program is funded on an annual basis from June 1 to May 31 of each year.[6] Funding in any given program year is limited to that year's budgeted amount and, therefore, incentives are paid on a first-come, first-served basis until the program year's incentive funds are exhausted. It should be noted, however, that no Custom applicants or Prescriptive applicants were wait-listed in PY3 based on available funding. Wait-listing was required for all Prescriptive measures in PY1 and for Prescriptive lighting measures for a limited time in PY2.

ComEd manages the energy savings goal and program budget on a combined basis for the Prescriptive and Custom programs. The original plan net MWh savings goal for the 2010 (PY3) Prescriptive and Custom incentives program are presented in Table 1-1.

Table 1-1. Smart Ideas for Your Business PY3 Planned Net Savings for Prescriptive and Custom Programs

Net Savings Estimates	MWH
ComEd Original Plan Target	262,857
ComEd Revised Target	182,106

Source: Original Plan target: Commonwealth Edison Company's 2008 – 2010 Energy Efficiency and Demand Response Plan, Docket No. 07-0540, ComEd Ex. 1.0, November 15, 2007 that include a net-to-gross ratio of 0.8 and a gross realization rate of 0.95. Revised Target and Reported: Communication from ComEd.

1.1.1 Implementation Strategy

ComEd retained KEMA Services Inc. as its program administrator responsible for day-to-day operations. The Prescriptive program launched in June 2008. ComEd has provided the evaluation team with a detailed Operations Manual and a Policies and Procedures Manual that describe the details of program implementation.

Important aspects of PY3 program implementation are summarized below.

Incentive Caps: Incentives are subject to annual limits or caps that are set per facility premise per year, and these were modified for PY3. The Prescriptive incentive cap for PY3 was 100% of the calculated incentive up to $100,000 per facility, plus 50% of the calculated incentive above $100,000 up to a maximum Prescriptive incentive of $200,000. The Custom incentive cap was $200,000 per facility, and the combined cap was $400,000 per facility.

[5] Commonwealth Edison Company's 2008 – 2010 Energy Efficiency and Demand Response Plan, Docket No. 07-0540, ComEd Ex. 1.0, November 15, 2007.
[6] Program year 3 ran from June 1, 2010 through May 31, 2011.

Lighting Bonus: Higher "bonus" incentives for select lighting measures were offered between October 25, 2010 and April 30, 2011 to encourage conversion of T12 fluorescent lighting and to increase participation for new T8 or T5 fluorescent fixtures and occupancy sensors.

Trade Ally Bonuses: Relationships with trade allies are a key strategy for promoting prescriptive incentive availability to customers. Bonus incentives for trade allies were offered for a limited time in PY3 for submission of projects on a larger scale.

Variable Speed Drives: In the second half of PY3, ComEd expanded its offering for Prescriptive variable speed drives by adding a new application form providing incentives for HVAC pumps, fans, and chillers, process pumps and fans, compressed air, and "other" fans and pumps.

Wait List: Prescriptive projects were not wait-listed in PY3. Lighting projects placed on the PY2 wait list were offered the opportunity to participate in PY2 or in PY3.

Additions to Application Forms: As part of annual updates to forms, new forms were added for outdoor lighting, food service measures, and sensors and controls.

1.2 Evaluation Questions

The evaluation sought to answer the following key researchable questions. Some of the researchable questions can be addressed in Program Year 3.

The impact evaluation questions focused on the following key areas:

1. What are the gross impacts from this program?
2. What are the net impacts from this program?
3. Did the program meet its energy and demand goals? If not, why not?
4. What is the program's benefit-cost ratio using the Illinois TRC test?

The process evaluation questions focused on the following key areas:

1. Program participation
2. Effectiveness of program design and implementation
3. Trade ally network
4. Marketing and outreach
5. Barriers to and benefits of participation
6. Participant satisfaction

The full list of researchable questions can be found in the Evaluation Plan.

Section 2. Evaluation Methods

This section describes the analytic methods and data collection activities implemented as part of the PY3 process and impact evaluation of the Prescriptive program, including the data sources and sample designs used as a base for the data collection activities.

The key evaluation activities to assess gross and net impacts of the Prescriptive program were:

- Reviewed tracking data and default savings assumptions used by the program.
- Implemented a stratified random sampling design on the population of 3,794 Prescriptive project applications with three strata of roughly equal ex ante energy savings allocation. Conducted a random selection of 90 projects, 30 from each stratum.
- Conducted on-site visits and measurement and verification (M&V) activities on a sample of 36 Prescriptive projects selected randomly from the 90 projects to support gross impact evaluation. An engineering review of project files and energy savings estimates was conducted on the remaining 54 projects from the sample of 90 projects.
- Completed computer assisted telephone interviews (CATI) with 108 Prescriptive project contacts to support the net impact approach.
- Questions in the CATI survey were asked regarding installed measures, removed equipment, and lighting hours of use, but responses were only considered for gross impact adjustments for projects in engineering file review sample.

Six research activities were conducted in support of the Prescriptive process evaluation: (1) interviews with program and implementation staff, (2) in-depth interviews with participating market actors, (3) in-depth interviews with ComEd Account Managers, (4) a quantitative telephone survey with 109 participating customers, (5) a quantitative telephone survey with 70 non-participating customers, and (6) a literature review and utility staff interviews regarding upstream bonuses for trade allies. These activities are further described in the main report.

The sections that follow provide a summary of the methods deployed, while full details may be found in Appendix 5.2.

2.1 *Analytical Methods*

2.1.1 Impact Evaluation Methods

Gross Program Savings

The objective of this element of the impact evaluation is to verify the veracity and accuracy of the PY3 ex ante gross savings estimates in the Prescriptive program tracking system. The savings reported in ComEd's online tracking system were evaluated using the following steps:

1. Engineering review at the measure-level for a sample of 90 project files, with the following subcomponents:
    a. Engineering review and analysis of measure savings based on project documentation, default assumptions, and tracking data.
    b. Review and application (if appropriate) of participant phone survey impact data (reported hours of use, reported baseline equipment, installation in non-air-conditioned space) to projects in the engineering review sample.
    c. On-site verification audits at 36 project sites selected randomly from the sample of 90 projects. Performance measurements included spot measurements and run-time hour data logging for selected measures. On-site data collection was concentrated in the June 1 through August 31 summer peak period.
    d. Calculation of a verified gross savings value (kWh and kW) for each project within the sample, based on measure-level engineering analysis.
2. Carry out a quality control review of the ex post impact estimates and the associated draft site reports and implement any necessary revisions.

A verified gross realization rate (which is the ratio of the ex post gross savings-to-reported tracking savings) was then estimated for the sample, by sampling stratum, and applied to the population of reported tracking savings, using sampling-based approaches that are described in greater detail in Sections 2 and 3 below. The result is an ex post estimate of gross savings for the Prescriptive program.

Net Program Savings

The primary objective of the net savings analysis for the Prescriptive program was to determine the program's net effect on customers' electricity usage. After gross program impacts have been assessed, net program impacts are derived by estimating a Net-to-Gross (NTG) ratio that quantifies the percentage of the gross program impacts that can be reliably attributed to the program.

For PY3, the net program impacts were quantified from the estimated level of free-ridership. Quantifying free-ridership requires estimating what would have happened in the absence of the program. A customer self-report method, based on data gathered during participant telephone

interviews, was used to estimate the free-ridership for this evaluation. The existence of participant spillover was qualitatively examined by identifying spillover candidates through questions asked in the participant interviews. If response data provides sufficient detail to quantify participant spillover, those impacts are estimated.

Once free-ridership and participant spillover has been estimated the Net-to-Gross (NTG) ratio is calculated as follows:

NTG Ratio = 1 – Free-ridership Rate + Participant Spillover

Free ridership was assessed following a framework that was developed for evaluating net savings of California's 2006-2008 nonresidential energy efficiency programs. This method calculates free-ridership using data collected during participant telephone interviews concerning the following three items:

- A **Timing and Selection** score that reflected the influence of the most important of various program and program-related elements in the customer's decision to select the specific program measure at this time.
- A **Program Influence** score that captured the perceived importance of the program (whether rebate, recommendation, or other program intervention) relative to non-program factors in the decision to implement the specific measure that was eventually adopted or installed. This score is cut in half if they learned about the program after they decided to implement the measures.
- A **No-Program** score that captures the likelihood of various actions the customer might have taken at this time and in the future if the program had not been available. This score accounts for deferred free ridership by incorporating the likelihood that the customer would have installed program-qualifying measures at a later date if the program had not been available.

For projects that receive greater program funding levels in excess of $50,000, an effort is made during the customer telephone interview to more completely examine project influence sources in order to allow for any adjustments to customer self-reported score.

The net-to-gross scoring approach is summarized in Table 2-1.

Table 2-1. Net-to-Gross Scoring Algorithm for the PY3 Prescriptive Program

Scoring Element	Calculation
Timing and Selection score. The maximum score (scale of 0 to 10 where 0 equals not at all influential and 10 equals very influential) among the self-reported influence level the program had for: A. Availability of the program incentive B. Recommendation from utility program staff person C. Information from utility or program marketing materials D. Endorsement or recommendation by utility account manager E. Other factors (recorded verbatim) F. Information provided through technical assistance received from utility or KEMA field staff G. Vendor Score (when triggered) H. Account Manager Score (when triggered)	Basic Rigor: Maximum of A, B, C, D, and E Standard Rigor: Maximum of A, B, C, D, E, F, G, and H
Program Influence score. "If you were given a TOTAL of 100 points that reflect the importance in your decision to implement the <ENDUSE>, and you had to divide those 100 points between: 1) the program and 2) other factors, how many points would you give to the importance of the PROGRAM?"	Points awarded to the program (divided by 10) Divide by 2 if customer learned about program AFTER deciding to implement the measure that was installed
No-Program score. "Using a likelihood scale from 0 to 10, where 0 is "Not at all likely" and 10 is "Extremely likely," if the utility program had not been available, what is the likelihood that you would have installed exactly the same equipment?" The NTG algorithm computes the Likelihood Score as 10 minus the respondent's answer (e.g., the likelihood score will be 0 if extremely likely to install exactly the same equipment if the program had not been available). Adjustments to "Likelihood score" are made for timing: "Without the program, when do you think you would have installed this equipment?" Free-ridership diminishes as the timing of the installation without the program moves further into the future.	Interpolate between Likelihood Score and 10 to obtain the No-Program score, where If "At the same time" or within 6 months then the No Program score equals the Likelihood Score, and if 48 months later then the No Program Score equals 10 (no free-ridership)
Project-level Free-ridership (ranges from 0.00 to 1.00)	1 – Sum of scores (Timing & Selection, Program Influence, No-Program)/30
"Our records show that <COMPANY> also received an incentive from <UTILITY> for a <different end use> project at <same ADDRESS>. Was the decision making process for the <different end use> project the same as for the <ENDUSE> project we have been talking about?"	If participant responds "same decision," assign free-ridership score to other end-uses of the same project
"Our records show that <COMPANY> also received an incentive from <UTILITY> for <number> other <ENDUSE> project(s). Was it a single decision to complete all of those <ENDUSE> projects for which you received an incentive from <UTILITY> or did each project go through its own decision process?"	If participant responds "single decision," assign free-ridership score to same end-use of the additional projects (projects with separate project ID's)
PY3 Project level Net-to-Gross Ratio (ranges from 0.00 to 1.00)	1 – Project level Free-ridership + Project-Level Participant Spillover

2.1.2 Process Evaluation Methods

Six research activities were conducted in support of the process evaluation: (1) interviews with program and implementation staff, (2) in-depth interviews with participating market actors, (3) in-depth interviews with ComEd Account Managers, (4) a quantitative telephone survey with 109 participating customers, (5) a quantitative telephone survey with 70 non-participating customers, and (6) a literature review and utility staff interviews regarding upstream bonuses for trade allies. These activities are further described in the next section.

2.2 Data Sources

Table 2-2 provides a summary of the principal data sources contributing to the evaluation of the PY3 Prescriptive Program. For each data element listed, the table provides the targeted population, the sample frame and design, the sample size, and the timing of data collection.

The interview guides and data collection instruments for telephone surveys are included in Appendix 5.1.

2.2.1 Tracking Data

The tracking data for this evaluation was extracted from a copy of the ComEd online database uploaded to the evaluation team SharePoint site on a periodic basis. The final ex ante tracking data used to provide program reported energy savings for this evaluation was uploaded on August 3, 2011.

Sampling was conducted from extracts produced earlier. For gross impact evaluation, a portion of sample projects were drawn from "population wave 1" of paid projects defined by the database extract dated March 22, 2011 to allow an early start of the impact efforts. The remaining sample projects were drawn from the population of projects paid after the March 22 extract: "population wave 2" as identified in a July 13, 2011 extract. The full Prescriptive phone survey sample was drawn from a database extract dated July 13, 2011.

2.2.2 Program and Implementation Staff Interviews

The evaluation team conducted one call with the Program Manager of the Prescriptive Program and other senior ComEd staff. This call covered key changes to the program design and implementation for PY3. We also conducted an interview with staff members at KEMA responsible for program implementation and marketing strategies.

Table 2-2. Principal Data Sources Contributing to the PY3 Evaluation

Data Collection Type	Targeted Population	Sample Frame	Sample Design	Sample Size	Timing
Tracking Data Analysis	Prescriptive Program Customers, Projects and Measures	Tracking Database, July 13, 2011 Extract	-	All	Ongoing
In-depth Telephone Interviews	ComEd Prescriptive Program Staff	Contact from ComEd	C&I Prescriptive Program Manager	1	April 2011
	Implementation Staff	Contact from ComEd	KEMA Manager	1	August 2011
	ComEd Account Managers	ComEd Account Manager List	Purposeful sample of Account Managers triggered by participant NTG responses; plus random sample of others	5	September/ October 2011
	Participating Market Actors	ComEd Trade Ally List	Mix of active and inactive market actors, as well as those who completed projects but are not a registered trade ally	25	September/ October 2011
	Program staff of utilities with trade ally bonus	Literature Review	Census Attempt (N=10)	7	August/ September 2011
CATI Telephone Survey	Prescriptive Program Participants	Tracking Database	Stratified Random Sample of Prescriptive Program Participants	109	August/ September 2011
CATI Telephone Survey	Non-Participating Customers	ComEd Database	Random sample, excluding small rate class	70	August/ September 2011
Engineering File Review	Projects in the Prescriptive Program	Tracking Database, March 22, 2011 and July 13, 2011 Extracts	Stratified Random Sample of 90 by Prescriptive Project-Level kWh (3 Strata) Randomly Assigned to On-Site or File Review	54	June 2011- September 2011
On-Site Visit M&V				36	

2.2.3 Account Manager Interviews

We conducted interviews with five ComEd Account Mangers as part of the PY3 evaluation of the Smart Ideas for Your Business Program. The interviews focused on program awareness and customer interest and participation. The five interviewed Account Managers represent a mix in

terms of the number of customers they represent and their customers' participation in the Smart Ideas for Your Business Program.

2.2.4 Market Actor In-Depth Interviews

We interviewed 25 market actors as part of the PY3 evaluation of the Prescriptive Program. The interviews focused on (1) how the Smart Ideas for Your Business Program has affected business practices and market trends, (2) net-to-gross questions for contractors identified by customers as having had a strong influence in the implementation of specific PY3 projects,[7] (3) barriers to installation of energy efficient equipment and customer participation in the program, and (4) satisfaction with the program and participation processes.

Of the 25 interviewed market actors, nine have completed projects in the Prescriptive Program but are *not* a registered trade ally. The remaining 16 interviews represent a mix of high activity and low activity *registered* trade allies who participated in the Prescriptive Program in PY3.

2.2.5 Interviews with Program Staff of Utilities with Trade Ally Bonus

The evaluation team conducted interviews with seven individuals presenting utility programs that have employed a trade ally bonus. These programs were identified through a literature review and included both residential and business programs.

2.2.6 CATI Telephone Survey of Participating Customers

A Computer-Assisted Telephone Interviewing (CATI) survey was conducted with a stratified random sample of participants in the Prescriptive Program. The survey was directed toward unique customer contact names drawn from the tracking system for PY3 paid Prescriptive projects. This survey focused on three key areas: (1) questions to estimate net program impacts (quantitative assessment of free-ridership and qualitative assessment of spillover), (2) hours-of-use for lighting projects in support of the gross impact analysis, and (3) questions to support the process evaluation. All interviews were completed in August and September of 2011.

2.2.7 CATI Phone Survey of Non-Participating Customers

A CATI survey was conducted with a random sample of non-participating customers. The survey excluded customers in the small rate class (C28 – customers with demand less than 100 kW). The survey included questions about barriers to participation, program awareness, customer decision making processes, and general energy efficiency behaviors and attitudes. All interviews were completed in August and September of 2011.

[7] Please refer to Section 2.1.1 on how these questions were used as an input to the NTG algorithm.

2.2.8 Project Application File Review

To support final application file review, project documentation in electronic format was obtained from the online tracking system for each sampled project and several others that were randomly inspected. Documentation included some or all of scanned files of hardcopy application forms and supporting documentation from the applicant (ex ante impact calculations, invoices, measure specification sheets, vendor proposals), pre-inspection reports and photos (when required), post inspection reports and photos (when conducted), a project summary report, and important email and memoranda.

2.2.9 On-Site Visits and Measurement

On-site surveys were completed for 36 of the applications sampled for M&V. During each on-site visit, data identified in the analysis plan is collected, including monitoring records (such as instantaneous spot watt measurements for relevant equipment, measured temperatures, data from equipment logs and EMS/SCADA system downloads), equipment nameplate data, system operation sequences and operating schedules, and a careful description of site conditions that might contribute to baseline selection.

2.3 Sampling

For gross impact evaluation, sampling was conducted in two waves to allow an early start of the impact efforts. The first wave of sampling was conducted on projects with a status of paid in a March 22, 2011 database extract. The second and final wave of sample projects were drawn from the end of year population of projects paid after the March 22 extract. The Prescriptive telephone sample for Net-to-Gross estimation and the process survey was drawn in one wave from a database extract representing the final population of projects.

Details of the sampling approach are provided in Appendix 5.2.

2.3.1 Gross Impact M&V Sample

For the PY3 program year, a statistically significant sample based on 90/10 confidence/precision level for program-level savings was drawn for the gross savings verification.

Table 2-3 provides a profile of the gross impact verification sample for the Prescriptive program in comparison with the Prescriptive program population. Shown is the resulting sample that was drawn, consisting of 90 projects, responsible for 26.5 million kWh of ex ante impact claim and representing 10% of the ex ante impact claim for the program population. Also shown are the ex-ante based kWh sample weights for each of three strata.

Table 2-3. Profile of the Gross Impact Sample by Strata

Prescriptive Population Summary				Impact Sample		
Sampling Strata	Number of Projects (N)	Ex Ante kWh Impact Claimed	kWh Weights	n	Ex Ante kWh	Sampled % of Population
1	139	88,442,741	0.342	30	19,205,786	22%
2	406	84,575,667	0.327	30	6,460,074	8%
3	3,249	85,367,474	0.330	30	845,031	1%
TOTAL	**3,794**	**258,385,882**	**1.000**	**90**	**26,510,891**	**10%**

Table 2-4 provides a comparison of the population profile to the sample analyzed by measure technology types that align with end uses. The sample reflects the dominance of lighting, somewhat over-represents variable speed drives, and provides some field M&V for refrigeration, HVAC cooling equipment, and premium efficiency motor measures.

Table 2-4. PY3 Prescriptive Sample End-Use Measure Technology Type Comparison

Consolidated End-Use Measure Technology Type	Ex-Ante Claimed Savings			
	Gross kWh, Population		Gross kWh, Sample	
LIGHTING	220,081,626	85%	21,040,421	79%
ALL VSDs	27,586,756	11%	4,966,909	19%
REFRIGERATION	7,132,166	3%	230,030	1%
HVAC EQUIPMENT	3,121,799	1%	205,560	1%
PREMIUM MOTORS	400,019	0%	67,971	<1%
FOOD SERVICE	63,516	0%	0	0%
Total	258,385,882	100%	26,510,891	100%

Source: Evaluation analysis of tracking savings from ComEd online tracking system, August 3, 2011.

Table 2-5 provides a comparison of the population profile to the sample analyzed by business type. The sample reflects the dominance of warehouses, although they are somewhat over-represented, as is medical. Industry is somewhat under-represented; however, the measures in industry and warehouses are commonly new T5/T8 fixtures and occupancy sensors, and both the population and sample have 50 percent of energy savings in these business types.

Table 2-5. PY3 Prescriptive Sample Business Type Comparison

Business Type	Ex-Ante Claimed Savings			
	Gross kWh, Population		Gross kWh, Sample	
Warehouse	56,019,530	22%	9,392,685	35%
Light Industry	46,374,552	18%	3,236,793	12%
Retail/Service	39,017,385	15%	3,871,977	15%
Office	26,315,976	10%	1,807,832	7%
Miscellaneous	26,076,783	10%	1,639,941	6%
Heavy Industry	24,774,149	10%	820,696	3%
Medical	20,740,511	8%	4,834,780	18%
Grocery	12,057,843	5%	534,865	2%
Hotel/Motel	3,397,208	1%	369,886	1%
College / University	2,189,815	1%	-	0%
Restaurant	735,230	0%	1,430	0%
K-12 School	686,900	0%	-	0%
Total	258,385,882	100%	26,510,891	100%

Source: Evaluation analysis of tracking savings from ComEd online tracking system, August 3, 2011.

Table 2-6 provides a profile of the 36 sites randomly selected from the impact sample for on-site M&V.

Table 2-6. Profile of the Gross Impact M&V On-Site Sample by Strata

On-Site Sample				
Sampling Strata	Number of Sites	Business Types	Ex Ante kWh Impact Claimed	Sampled % of Population
1	12	Warehouse, Light Industry, Medical, Retail/Service	7,361,557	8%
2	10	Warehouse, Light Industry, Heavy Industry, Office, Grocery, Miscellaneous, Retail/Service	1,955,561	2%
3	14	Warehouse, Light Industry, Office, Restaurant, Miscellaneous, Retail/Service	535,805	<1%
TOTAL	36		9,852,923	4%

2.3.2 CATI Telephone Survey for Participating Customers

A quantitative telephone survey was implemented with a stratified random sample of Prescriptive Program participants, resulting in 109 completed interviews.

The sampling unit for the CATI telephone survey was the unique program contact phone number. Overall, there were 1,853 unique phone numbers associated with 3,794 completed projects. Participants who completed both prescriptive and custom projects were also removed from the sample for the prescriptive survey (given the smaller population of custom projects, the custom program was given priority for calling overlapping project contacts). The resulting sample frame included 1,783 unique phone numbers.

We completed net-to-gross interviews with 109 participants, resulting in a precision level of +/-5% (at a 90% confidence level).[8] We completed process interviews with 104 participants, resulting in a precision level of +/-8% for process questions (at a 90% confidence level).[9,10]

The highest number of survey respondents is from the light industry sector (19%), followed by the warehouse (17%) and office (16%) sectors. Both the warehouse and heavy industry sectors are somewhat overrepresented in the survey, compared to the population. This is not surprising given that the sampling strategy focused on projects with the highest savings, and projects in these sectors tend to be larger than projects in the other sectors.

On the other hand, the retail/service sector is underrepresented in the survey, and the restaurant sector is not represented at all. These two sectors have among the smallest per project savings and were therefore not as heavily targeted in the survey. Overall, however, the distribution of survey respondents is largely similar to that of the population of PY3 Prescriptive Program participants.

Table 2-7 presents the comparison of business sectors for survey respondents and the overall population of participants.

Details on survey disposition are provided in Appendix 5.2.

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[8] One of the 109 respondents did not answer enough of the net-to-gross questions to be scored.

[9] After reaching the target number of interviews (104), we conducted an additional five impact-only interviews with participants with non-lighting projects. These interviews were added to improve the precision levels for non-lighting net impact estimates.

[10] The difference in precision between net-to-gross questions and process questions is the result of net-to-gross findings being based on savings and process findings being based on respondents. Since larger projects were oversampled, precision levels are slightly higher for net-to-gross results.

Table 2-7. Business Sector of Participant Survey Respondents

Sector	Respondents (n=109)	Population* (N=1,783)
Light Industry	19%	19%
Warehouse	17%	13%
Office	16%	17%
Heavy Industry	14%	7%
Retail/Service	8%	19%
Grocery	3%	2%
Medical	2%	3%
Hotel/Motel	2%	1%
K-12 School	2%	1%
College / University	1%	1%
Restaurant	–	2%
Miscellaneous	17%	15%

**Note: The population is based on the sample frame and excludes contact phone numbers that were set aside for the Custom participant survey.*
Source: Program Tracking Database; results of CATI telephone survey.

2.3.3 CATI Telephone Survey for Non-Participating Customers

A quantitative telephone survey was implemented with a random sample of business customers who have not participated in the Smart Ideas for Your Business Program in the first three program years. This survey resulted in 70 completed interviews.

The sample of non-participants was based on the database of all business customers provided by ComEd. One of the objectives of the Smart Ideas for Your Business Program in PY3 was to generate more large projects. The non-participant survey therefore focused on delivery service classes for customers with medium and large energy demand. Excluded from the sample frame were customers with small energy demand.

Removing the small class customers resulted in 23,130 records in the sample frame. We also removed from the sample frame 11,272 records associated with customers who participated in the program, or submitted applications, in the first three program years. We then randomly selected 1,500 customers for the sample frame. After removing duplicate contacts, our final sample frame consisted of 1,439 unique contacts.

Surveyed non-participants come from a variety of business sectors. Sixteen percent classify their business as a government/public sector or non-profit entity, 11% as retail/service, and 10% as light industry. A majority of respondents (80%) own their facility. In addition, 44% of the businesses only operate at one location, 43% have several locations, and 10% are located at the headquarters of their company.

Section 3. Program Level Results

This section presents the Prescriptive program impact and process evaluation results.

3.1 Impact Analysis

3.1.1 Tracking System and Default Savings Review

Tracking System Review

To support the impact evaluation, the evaluation team was given direct access to ComEd's on-line tracking system and data. The on-line system was easy to work with and provided viewing access to the project tracking data plus downloading rights to project documentation in electronic format for each project. This documentation was complete and greatly facilitated the evaluation, while removing a step that commonly impedes evaluation progress: a data request for the very information that ComEd made available in the tracking database itself. This level of access and documentation is highly commendable and represents best practice in this area for a Prescriptive program.

The evaluation team works off of copies of the tracking system data uploaded by ComEd to their secure SharePoint site on a periodic basis. ComEd's tracking system provides on-line access to standard reports developed for internal program reporting and management functions.

The Evaluation team produced an estimate of PY3 year end ex ante energy and peak demand impacts for the Prescriptive program, for comparison with ComEd internal reporting. The initial comparison of July 2011 revealed a minor difference of about 1 million kWh, less than 1% of total ex ante energy savings. After closer scrutiny by the Prescriptive and Custom evaluation teams, we found that the Prescriptive routine for creating datasets from the ComEd tracking extracts was missing the prescriptive measure savings from guest room energy management and food service measures (the only PY3 measure was hot food holding cabinets). These two prescriptive measures were assigned to the "Other" end use, which had been used only for custom measures. Correcting the Prescriptive routine resolved the discrepancy in Prescriptive claimed savings between ComEd and the evaluation team. After this correction, the estimate of combined Prescriptive and Custom claimed savings produced by the evaluation team also matched ComEd's combined estimate.

- ***Recommendation: When ComEd is adding a new end-use or new measure types to an existing end use, consider alerting the evaluation team who may need to revise data handling routines.***

Although this discrepancy was uncovered prior to the telephone survey and all PY3 projects were available for sampling for telephone verification, twelve projects that had only "other"

measures in the project were excluded from the sample frame for engineering review. However, both guest room energy management and hot food holding cabinets were measures represented in the impact sample frame because they were a part of larger multi-measure projects in the sample frame. We have concluded it is not necessary to apply weighting factors to the impact analysis to account for this minor factor.

Default Savings Review

The evaluation team reviewed ComEd's measure default savings for PY3 as documented in Appendix A of the Business Prescriptive program operations manual.[11] The PY3 review was less extensive than conducted in PY1 and PY2 because ComEd has addressed previous recommendations, and many measures and assumptions are unchanged.

To facilitate discussion and technical review, ComEd and the evaluation team met in the Wheaton offices of KEMA on November 3, 2010 for a full day discussion, focused on evaluation issues and default values used for PY3 and PY4. ComEd also created a SharePoint site dedicated to default savings where the extensive reference materials and supporting documentation for default savings could be made available to the evaluation team. This was very helpful.

Measures reviewed by the evaluation team in greater detail after the November 3 meeting for PY3 were refrigeration measures, food service measures, and variable speed drives. ComEd had made extensive updates to refrigeration measures for PY3 to factor local weather into the impact calculations. Based on secondary research conducted by KEMA, ComEd chose to drop door gaskets for refrigeration as a measure early in PY3. Projects implemented in PY3 were assigned zero savings by ComEd.

The refrigeration and food service default values were judged to be reasonable by the evaluation team. Results of variable speed drive default values review are described below.

Variable Speed Drive Tracking System and Default Value Review

In the second half of PY3, ComEd expanded its incentive offering for Prescriptive variable speed drives by adding a new customer application form targeting a broader range of VSD installations. The form continued Prescriptive incentives for HVAC pumps, fans, and chillers and added process pumps and fans, compressed air, and "other" fan and pump applications. ComEd set project size limits for Prescriptive projects, above which customers are instructed to take the Custom program path. ComEd also required a detailed variable speed drive information sheet on motors over 100 horsepower. The parameters describing HVAC VSD installations on the application form were greatly diversified to describe a range of fan and

[11] KEMA, *Appendix A - Prescriptive Measures,* (file provided: "ComEd Workpapers 6-1-10.doc"). This document is sometimes referred to as a Technical Reference Manual (TRM) or as "ComEd Workpapers June 1, 2010 version".

pump installation, equipment type, and control configurations, which greatly expanded the matrix of default savings values assigned.

As a result of this expanded offering, customer application forms, default values, and tracking system deployment changed throughout PY3. The evaluation team engaged with ComEd from November 2010 through March 2011 to review application materials, savings estimation methodologies, and default values.

Three sources for VSD ex ante savings estimates were reviewed by the evaluation team prior to deployment by ComEd in PY3:

- The default values documented in the ComEd Workpapers June 1, 2010 version.
- A spreadsheet based VSD savings calculation tool, described in a November 22, 2010 email attachment memo from ComEd that could be used to override programmed default values.[12]
- An expanded and updated variable speed drive savings workpaper describing the methodology and default values for ComEd's expanded offering.[13]

For impact evaluation on variable speed drive projects in our sample (12 projects, 62 measures), we utilized site M&V data when a site visit was conducted (4 projects), we verified the spreadsheet calculation tool if that was used by ComEd for ex ante (2 projects), and used the expanded workpaper of March 14, 2011 for engineering verification. The March 14, 2011 workpaper was used in our review of projects completed early in PY3 that used the June 1, 2010 workpapers as defaults, because we judged the updated workpaper as the better estimate.

Our review of ex ante savings in ComEd's tracking system revealed numerous inconsistencies with the values we were expecting to find. Our attempt to "back out" PY3 default savings values on completed projects found the following:

- HVAC VSDs in some office fan and pump projects had 241 kWh/hp – this is a default value from PY1 (PY3 defaults were 216 kWh/hp). The peak impact on the same projects did reflect PY3 defaults, which were unchanged since PY1.
- Similarly, some retail and industry projects were seen with default values used in PY1.
- Seven projects with a combined 13 measures had ex ante claimed savings, but the Prescriptive quantity installed and incentive was zero, and for several measures the horsepower size was also zero. It appears these measures were intended to be removed

[12] Attachment to a November 22, 2010 email from David Nichols of ComEd, *ComEd SIFYB, Variable Speed Drives – Prescriptive and Custom, Measure Update.*

[13] Attachment to a March 14, 2011 email from Karen Maoz of KEMA, *Variable-Speed Drives for HVAC and Process Applications*, Filename: *VSD Workpaper 3_14_11 final.docx.*

from the Prescriptive program, but the Prescriptive impacts were not zeroed out. The total ex ante claim for this group was 260,073 kWh and 33.8 kW (Application numbers 4179, 5201, 5920, 6455, 7685, 8568, and 8570).

- One retail chain implementing similar projects at four locations had per unit ex ante impacts that ranged from 859 kWh/hp to 20,604 kWh/hp, suggesting a programming error in the tracking system (Application numbers 3769, 3770, 3771, and 3772).

Although we did not adjust gross impacts for projects and measures outside of our impact verification sample, we recommend that ComEd consider reviewing its implementation of variable speed drives in the tracking system.

- ***Recommendation: ComEd should consider conducting a detailed review and testing of the implementation of tracking system handling of variable speed drive projects.***

Tracking System Check for Default Values Implementation

ComEd's tracking system extract contains measure lookup tables that identify per unit savings by measure type and business type. The evaluation team has previously checked lighting lookup tables. In PY3, the non-lighting measure lookup tables were checked against values documented in the *Appendix A - Prescriptive Measures* workpapers. Based on our review and understanding of the tracking system, it appears documented default values for some PY3 cooling and refrigeration measures do not match lookup values. Our comparison is attached in Appendix 5.3.

Since the program is already into PY4, we recommend that ComEd consider reviewing our PY3 comparison and check whether our assessment is correct, and if so, whether similar measures need revision in PY4 lookup values.

- ***Recommendation: During PY4, prior to closing out year-end ex ante savings estimates, consider providing the evaluation team with the default lookup values coded into the tracking system. The evaluation team will check the values against the default values documentation, and advise ComEd on any differences. As revisions to handling of ex ante calculations are made in the tracking system, consider alerting the evaluation team.***

3.1.2 Gross Program Impact Parameter Estimates

Ex post gross program impacts were developed for the Prescriptive program based on engineering file review, participant interviews, and site M&V for a sample of applications.

Gross Impact Adjustments Triggered by the Participant Phone Survey

A brief set of questions in the CATI survey was asked regarding installed measures, removed equipment, installation in non-air-conditioned space, and lighting hours of use to support the gross impact evaluation. Gross impacts were adjusted *only* for those projects in the engineering

file review group. Of the 109 completed phone interviews, 23 covered projects that were also in the engineering review sample for gross impact evaluation.

Table 3-1 identifies the survey question or issue that was addressed, the participant responses, and conclusions. The evaluation team only adjusted impacts based on participant responses when additional follow-up through engineering review of project files, conversations with site personnel, or on-site inspection could be conducted. Responses may be used to inform future adjustments to default savings and identify issues for PY4 M&V activities.

When the finding the seven of 79 respondents adding fixtures to increase lighting levels was brought to ComEd's attention, ComEd indicated they have taken steps to identify potential under-lit designs in the pre-approval stage and contact those customers to make them aware of the potential for lighting level reductions. ComEd indicated they will conduct a pre-inspection on projects where there are significantly fewer lighting fixtures installed than taken out. ComEd also indicated they will call the customer when there is a large reduction in the total lumens from the existing system to the installed system, and let the customer know that based on the lumen output of the installed system compared to the old system they can expect a reduction in lighting levels of "x%".

Table 3-1. Participant Reponses to CATI Impact Questions

Survey Question	Participant Responses	EM&V Conclusion
After you completed the installation of the new fixtures, did you install additional lighting fixtures in that same space at a later time to increase the amount of lighting?	Yes: 7 of 79 respondents added fixtures. Respondents added an additional 26, 24, 15, 12, 8, 4, or 2 fixtures making a total of 91 additional "New T5/T8 fixtures"	In PY2, 1 of 27 respondents added fixtures, so the PY3 incidence is higher. ComEd should consider investigating customer satisfaction with light levels and consider strategies to reduce under-lit designs if this is an issue.
What types of linear fluorescent lights were removed?	Of 31 respondents: 5 reported standard performance T8; 20 reported T12 fixtures only; 4 reported "other" but did not specify; and 2 did not know any of removed fluorescent types	Four of five projects reporting existing T8s removed were allowable in baseline measure definition. One project reported removing standard T8s and installing high wattage CFLs, which is not an eligible retrofit.
If type of linear fluorescent lights removed were T12 fixtures: "What types of ballasts were in use on the linear fluorescent fixtures you removed?"	Of 20 respondents reporting T12s, 15 identified ballast type: (2) electronic, (13) magnetic ballast, (3) "other" but did not specify; (2) don't know	For the respondents that claimed electronic ballasts, installed measures allowed electronic ballasts in the baseline.
If you had not participated in the program, when would you have replaced your T-12 lighting?	There were 36 responses made by 30 respondents. Among responses, 23 (64%) were chosen as "Don't Know", while 11 (31%) were chosen as "2 or more years later". One was chosen as "within one year" and one was chosen "between one and two years".	This question was asked to obtain qualitative baseline feedback on whether the T12 systems being upgraded were early replacements or replacements due to failure. Only 2 of 36 (6%) of responses indicated intentions to replace a T12 lighting system within the next two years - the scenarios aligned a replacement that was required or imminent due to failing equipment. This is further explored in Section 3.1.4 of the net-to-gross analysis.
Placed lighting equipment in storage or installed lighting equipment at another location?	Yes: 1 of 94 respondents (placed 50% in storage), refused regarding other location	This project was in the on-site sample and ex post impacts reflect as found conditions. The project involved a storage warehouse, and the respondent may have been confused by that coincidence.
Was the new lighting equipment installed in air conditioned (cooled) space?	(30 yes, 32 no, 15 some was/some wasn't, 32 blank)	Adjust impacts for 7 projects in verification sample where respondent answered "no". For PY4, ComEd has factored prevalence of non-cooled space into HVAC interaction factors for warehouse and industry.
Type of exit sign removed	1 incandescent, 1 CFL	Sample too small to draw conclusions. Stated CFL baseline was not in impact review sample.

Table 3-2 below provides the un-weighted average annual equivalent full load hours (EFLH) of operation for lighting among all respondents (64) who provided complete responses to the lighting hours of operation questions.

Table 3-2. Participant Reponses to Lighting EFLH Questions by Business Type

Business Type	Respondent Count	Un-weighted Average Annual Lighting EFLH
College / University	1	4,357
Grocery	2	7,053
Heavy Industry	12	6,850
K-12 School	1	3,855
Light Industry	18	4,830
Miscellaneous	11	4,592
Office	4	3,880
Retail/Service	6	4,200
Warehouse	9	4,873
Total	64	5,102

Realization Rates for the Prescriptive Program

There are two basic statistical methods for combining individual realization rates from the sample projects into an estimate of verified gross kWh savings for the population when stratified random sampling is used. These two methods are called "separate" and "combined" ratio estimation.[14] In the case of a separate ratio estimator, a separate gross kWh savings realization rate is calculated for each stratum and then combined. In the case of a combined ratio estimator, a single gross kWh savings realization rate is calculated directly without first calculating separate realization rates by stratum.

The separate ratio estimation technique was used to estimate verified gross kWh savings for the Prescriptive program. The separate ratio estimation technique follows the steps outlined in the California Evaluation Framework. These steps are matched to the stratified random sampling method that was used to create the sample for the program. The standard error was used to estimate the error bound around the estimate of verified gross kWh. The results are summarized in Table 3-3, Table 3-4, and Table 3-5 below.

[14] A full discussion and comparison of separate vs. combined ratio estimation can be found in Sampling Techniques, Cochran, 1977, pp. 164-169.

Table 3-3. Gross Impact Realization Rate Results for the Prescriptive Sample

Sampling Strata	Sample-Based Ex Ante kWh Impact Claimed	Sample-Based Ex Ante kW Impact Claimed	Sample-Based Ex Post Gross kWh Impact	Sample-Based Ex Post Gross kW Impact	Sample-Based Ex Post Gross kWh Realization Rate	Sample-Based Ex Post Gross kW Realization Rate
1	19,205,786	3,451	18,478,833	2,962	0.96	0.86
2	6,460,074	1,241	6,496,780	1,158	1.01	0.93
3	845,031	181	889,266	159	1.05	0.88

Table 3-4. Gross kWh Realization Rates and Relative Precision at 90% Confidence Level

Sampling Strata	Relative Precision ± %	Low	Mean	High
Stratum 1	15%	0.82	0.96	1.11
Stratum 2	8%	0.93	1.01	1.09
Stratum 3	20%	0.84	1.05	1.27
Total kWh RR	9%	0.92	1.01	1.10

Table 3-5. Gross kW Realization Rates and Relative Precision at 90% Confidence Level

Sampling Strata	Relative Precision ± %	Low	Mean	High
Stratum 1	12%	0.76	0.86	0.96
Stratum 2	6%	0.88	0.93	0.99
Stratum 3	15%	0.75	0.88	1.01
Total kW RR	7%	0.83	0.89	0.95

The realization rates analyzed by strata form the basis for estimating the overall realization rate applied to total ex-ante gross program savings at the stated confidence level and relative precision. Below we present additional summaries of the verification sample results by other factors, including M&V approach, business type, and end-use, to provide insight into the findings. Realization rates shown below are not statistically valid at the 90/10 level of confidence and relative precision. The results are summarized in Table 3-6, Table 3-7, and Table

3-8 below. A comparison of relative precision for the on-site M&V sample, the file review sample, and the combined sample is provided in Table 3-9 and Table 3-10.

Table 3-6. Gross Impact Realization Rate Results for the Prescriptive Sample – by M&V Approach and Strata

M&V Approach	Strata	Project Count	Sample-Based Ex Ante kWh Impact Claimed	Sample-Based Ex Ante kW Impact Claimed	Sample-Based Ex Post Gross kWh Impact	Sample-Based Ex Post Gross kW Impact	Sample-Based Ex Post Gross kWh Realization Rate	Sample-Based Ex Post Gross kW Realization Rate
On-Site	1	12	7,361,557	1,295	4,641,653	848	0.63	0.66
	2	10	1,955,561	349	1,808,554	328	0.92	0.94
	3	14	535,805	107	528,927	99	0.99	0.93
File Review	1	18	11,844,229	2,157	13,837,180	2,114	1.17	0.98
	2	20	4,504,513	892	4,688,226	830	1.04	0.93
	3	16	309,226	74	360,339	60	1.17	0.81
Total		90	26,510,891	4,873	25,864,879	4,279	0.98	0.88

Table 3-7. Gross Impact Realization Rate Results for the Prescriptive Sample – By End-use

End Use	Measure Count	Sample-Based Ex Ante kWh Impact Claimed	Sample-Based Ex Ante kW Impact Claimed	Sample-Based Ex Post Gross kWh Impact	Sample-Based Ex Post Gross kW Impact	Sample-Based Ex Post Gross kWh Realization Rate	Sample-Based Ex Post Gross kW Realization Rate
Lighting	202	21,040,421	3,917	21,336,135	3,530	1.01	0.90
VSD	62	4,966,909	725	4,057,361	520	0.82	0.72
Refrig.	7	230,030	17	231,225	17	1.01	1.01
HVAC	1	205,560	203	205,560	203	1.00	1.00
Motors	5	67,971	10	34,598	9	0.51	0.87
Total	277	26,510,891	4,873	25,864,879	4,279	0.98	0.88

Table 3-8. Gross Impact Realization Rates for the Prescriptive Sample – by Business Type

Business Type	Project Count	Sample-Based Ex Ante kWh Impact Claimed	Sample-Based Ex Ante kW Impact Claimed	Sample-Based Ex Post Gross kWh Impact	Sample-Based Ex Post Gross kW Impact	Sample-Based Ex Post Gross kWh Realization Rate	Sample-Based Ex Post Gross kW Realization Rate
Warehouse	22	9,392,685	1,666	10,045,048	1,368	1.07	0.82
Light Industry	13	3,236,796	791	2,942,210	791	0.91	1.00
Retail/ Service	21	3,871,977	848	3,209,640	808	0.83	0.95
Office	14	1,807,832	277	1,852,421	257	1.02	0.93
Miscellaneous	7	1,639,942	304	1,855,233	274	1.13	0.90
Heavy Industry	3	820,696	207	1,297,385	175	1.58	0.85
Medical	5	4,834,782	666	3,609,881	486	0.75	0.73
Grocery	3	534,865	64	560,954	53	1.05	0.83
Hotel/Motel	1	369,886	50	490,229	66	1.33	1.32
College / University	0	-	-	-	-		
Restaurant	1	1,430	0	1,879	0	1.31	1.28
K-12 School	0	-	-	-	-		
Total	90	26,510,891	4,873	25,864,879	4,279	0.98	0.88

Table 3-9. Gross kWh Realization Rates and Relative Precision at 90% Confidence Level

Sampling Group	Strata	Relative Precision ± %	Low	Mean	High
On-Site M&V	1	36%	0.41	0.63	0.86
	2	14%	0.80	0.92	1.05
	3	29%	0.70	0.99	1.28
	Overall	**17%**	**0.72**	**0.86**	**1.01**
Engineering File Review	1	16%	0.98	1.17	1.36
	2	10%	0.94	1.04	1.14
	3	25%	0.88	1.17	1.45
	Overall	**10%**	**1.01**	**1.12**	**1.23**
Total kWh RR	**Overall**	**9%**	**0.92**	**1.01**	**1.10**

Table 3-10. Gross kW Realization Rates and Relative Precision at 90% Confidence Level

Sampling Group	Relative Precision ± %	Low	Mean	High
On-Site M&V	11%	0.76	0.85	0.95
Engineering File Review	9%	0.83	0.91	0.99
Total kW RR	7%	0.83	0.89	0.95

3.1.3 Gross Program Impact Results

Based on the gross impact parameter estimates described previously, gross program impacts were derived for the PY3 Prescriptive program. The results are provided in Table 3-11.

Table 3-11. Gross Parameter and Savings Estimates

Segment	kWh, Ex Ante	kWh, Ex Post	kWh RR	kW, Ex Ante	kW, Ex Post	kW RR
Total	258,385,882	260,236,777	1.01	52,300	46,553	0.89

Some general observations from the gross impact sample:

- The realization rate for kWh was 1.01 in PY3. Individual measures and projects had realization rates greater and less than 1.0, however the overall value of 1.01 is substantially lower than the value of 1.21 observed for PY2. A substantial factor in the decrease in realization rate between PY2 and PY3 was due to characteristics of participants. In PY3, lighting projects did not provide as large of an increase in ex post savings through adjustment for lighting hours of use. Compared with PY2, the PY3 population and sample ex ante energy savings had a lower percentage of industry and warehouse business types which in PY2 samples had implemented lighting projects with long hours of use. In PY2, industry and warehouse lighting projects comprised 75 percent of ex ante savings in the sample, and had a combined energy realization rate of 1.34 (unweighted). In PY3, industry and warehouse projects (primarily lighting) comprised 51 percent of ex ante savings in the sample, and had an unweighted energy realization rate of 1.06. Retail businesses comprised 11 percent of ex ante savings in the PY2 sample and had an energy realization rate of 0.94, while in PY3 retail comprised 15 percent of ex ante energy savings and had a realization rate of 0.83. Also, the PY3 program and sample had a greater percentage of non-lighting savings, and the energy realization rate for non-lighting savings was lower than for lighting.

- A factor that reduced both the kWh and kW realization rates was a finding that some projects in the 90 project sample had installed lighting measures in non-cooled spaces, and the ComEd default savings value for those measures in those building types included an HVAC interaction factor.

- Adjustment factors that increased or decreased ex post impacts, depending on the project, include quantity adjustments and baseline equipment not matching default assumptions. The overall impact of these adjustments on the energy realization rate was less than the hours of use adjustments.

- Longer hours of use have a disproportionately greater impact on energy than demand. For example, if an industrial plant is found to operate continuously throughout the year, the energy realization rate will increase by 104% over the default value (8,760 ex post hours / 4,290 ex ante hours), whereas the peak demand realization rate will only increase the coincident-diversity factor by 1% (1.00 ex post / 0.99 ex ante).

- The ex ante savings for variable speed drives in many cases did not match any of the three default savings methods for PY3 accepted by the evaluation team during interaction with ComEd during PY3. This resulted in substantial reductions and increases for ex post impacts even when the evaluation team agreed with ComEd on the project details.

- Default savings for measures that weight multiple variations into a single average, such as permanent lamp removal, contributed to significant deviations between ex ante and ex post findings, even though the ex ante estimate adhered to the default savings methodology.

- The realization rate for peak demand was 0.89, reflecting the impact of relatively lower demand realization rates for some variable speed drive measures, the removal of HVAC interaction factors on some lighting projects, and on-site verification at projects that received substantial reductions in peak demand savings: three warehouse projects with low baseline use of installed fixtures (hence low coincident-diversity factors), and a variable speed drive project in a new medical facility where four of the nine variable speed drive measures were judged to be code-required baseline.

- In the case of the variable speed drive project at the new medical building receiving a substantial reduction for ex post savings (Project Number 8527), the evaluation finding required detailed knowledge of the energy code and the final facility design and operating control strategy. On major building projects with long design and construction timelines, various code compliance options may be considered and dropped or altered for different building systems by the time of final completion. The Prescriptive program typically interacts with project actors within a short window of time, presenting a challenge for assessing new construction code compliance. In this particular case, ComEd indicates the customer was not aware of the ComEd New Construction program during the design phase, and the project was admitted into the Business Prescriptive program. The ComEd implementer performed a detailed post inspection and code compliance review and identified five variable speed drive

measures, implemented on smaller motors under 20 horsepower, where the evaluation agreed with the claim of energy savings beyond energy code. On four other measures, involving larger motors 50 horsepower and above, the evaluation concluded that system design and final control strategy, as implemented by the customer, did not produce savings beyond code requirements. ComEd should consider placing tight restrictions on new construction projects admitted into the Prescriptive program, such as restricting maximum motor horsepower size for VSD measures.

- As in PY1 and PY2, warehouses in PY3 were found to have an energy realization rate greater than 1.0. In PY3, the evaluation team was able conduct on-site M&V at 11 warehouses. The on-site findings suggest the default value for coincident-diversity factor of 0.84 was too high. ComEd has reduced this to 0.70 for PY4, which is in line with PY3 findings.

- The mean energy realization rate for projects that were evaluated through on-site M&V (0.86) was substantially lower than projects that received an evaluation engineering file review (1.12), as shown in Table 3-9, however the overall relative precision of the on-site sample was low at ±17 percent. In particular, the relative precision in stratum 1 for the on-site sample was quite low, at ±36 percent. This reflects the high variability in realization rate for the twelve sites randomly selected for on-sites in stratum 1. For these twelve large projects, six received substantial reductions in energy savings, one a substantial increase, and the remaining five were closer to 1.0, above and below. The evaluation file review sample for stratum 1 also showed high variability, at ±16 percent, suggesting random factors were an issue in the differences between the two verification approaches.

- The mean realization rates for demand were closer and had better relative precision, at 0.85 (±11%) for on-site versus 0.91 (±9%) for file review. Both impact evaluation methods resulted in realization rates that were higher and lower than 1.0 for individual projects. The primary factor for increases in energy realization rates in evaluation engineering file review projects, higher ex post hours of use, was also found in several site verified projects resulting in increased savings for those projects. The evaluation file review sample also experienced projects that had energy impacts lower than default values based on CATI responses.

- Beyond such differences due to random sampling, the on-site M&V approach identified issues that resulted in energy impact reductions on some stratum 1 projects that may not have been captured from the engineering file-review-only process employed in impact evaluation. Examples of issues identified through on-site M&V that might not be found during the evaluation file-review-only verification approach include the following:

- The VSD project in the new medical facility where the baseline for four of nine measures was judged to require a VSD for code compliance was based on a detailed examination of on-site conditions.

- The three warehouse projects with low usage of baseline and post-retrofit fixtures employed operating strategies that would potentially be captured by the telephone survey, but might have resulted in responses that could not be interpreted.

- A project involving time-clocks where the difference between pre-retrofit and post-retrofit hours of operation was much less than the default value used in the ex ante savings calculation, based on site verified operating strategies.

- We note that on-site M&V can identify numerous adjustments to impacts that will increase energy realization rates that are not possible to identify through file review. For example, site measurements can identify energy savings for occupancy sensors that are greater than default values, and this cannot be captured through file review or a telephone interview. For example, data collected on-site in PY1 on 57 measures at 16 on-sites resulted in a significant increase to verified gross savings (24,607 MWh ex post versus 15,708 MWh ex ante for the 16 sites, an energy realization rate of 1.57). In PY1, occupancy sensor measures evaluated at 8 sites had a combined gross realization rate of 1.40. Six of the measures provided higher savings, while two provided lower energy savings. In PY1, there were 14 HVAC VSD measures verified at four office sites, installed on fans and pumps. The combined gross realization rate for these measures was 2.76 (3,057 MWh ex post, 1,107 MWh ex ante). Only two of the 14 VSD measures in PY1 had impacts reduced.

- Consideration was given to weighting on-site results more heavily than engineering file reviewed projects, because a greater variety of adjustments can be identified through on-site verification. We concluded that not giving weighting preference to M&V methods was consistent with our original sample design for PY3, where the M&V approach was randomly assigned.

- In PY3, on-site verification provided 40% of our sample points (36 out of 90). Given the results of PY3, we conclude that the proportion of on-site verification audits in the PY4 sample should be increased relative to the overall sample size, especially in stratum 1 (large projects) that in PY3 exhibited high variability in realization rates. Increasing the proportion of on-site verification audits in our PY4 sample is consistent with our draft PY4 evaluation plan.

3.1.4 Net Program Impact Parameter Estimates

Once gross program impacts have been estimated, net program impacts are calculated by multiplying the gross impact estimate by the program Net-to-Gross (NTG) ratio. As mentioned

above, the NTG ratio for the PY3 Prescriptive program was estimated using a customer self-report approach supplemented by vendor and account manager interviews. This approach relied on responses provided by program participants during the CATI telephone survey to determine the fraction of measure installations that would have occurred by participants in the absence of the program (free-ridership).

For participants receiving more than $50,000 of incentives in PY3, vendor interviews were attempted to assess program influence on vendors identified by the participant as influential the decision to install program measures. Account Manager interviews were triggered on projects that were managed accounts where the customer had not already assigned a maximum program influence score to one of the other program components.

If the customer has additional projects at other sites covering the same end-use, the survey asks whether the responses also apply to the other projects. If that is the case, the additional projects are given the same score and included in the sample.

The NTG ratio and relative precision at a 90% confidence level for the overall program is provided in Table 3-12.

Table 3-12. NTG Ratio and Relative Precision at 90% Confidence Level - Overall

Sample Strata	Population (N=3,794)	NTG Interviews (n=108)	NTG Sample (n=292)	Sample kWh Wgts.	Relative Precision ± %	Low	NTGR Mean	High
1	139	27	28	0.342	8%	0.68	0.74	0.79
2	406	40	47	0.327	6%	0.65	0.69	0.73
3	3,249	41	217	0.330	2%	0.73	0.74	0.75
Total	3,794	108	292	1.000	5%	0.69	0.72	0.76

Comparing PY2 and PY3, the mean NTG ratio decreased slightly from PY2 (0.74) to PY3 (0.72), but is essentially the same. Although the PY3 results experienced a large increase in the number of smaller projects and in multiple-site third party rebate aggregator activity, as seen in stratum 3, this did not have a dramatic impact on the NTG ratio relative to other strata or PY2 overall results.

Similar to PY2, the NTG ratio estimate for PY3 included a more complex "standard rigor" level of analysis conducted on larger projects, defined as those with incentives greater than $50,000 for a single project or multiple projects under a single contact name. The expanded standard rigor analysis included additional questions regarding non-program influence factors and the possibility of triggering an interview with the vendor to determine the extent of program influence on the vendor, if the participant said the vendor was important to the decision to proceed with the project. For PY3, 30 of 108 respondents in our sample went through the

standard rigor approach, and two of the 30 standard rigor interviews had responses that triggered follow-up interviews with two different vendors. One vendor interview resulted in an increase in the NTG ratio for that project, the other did not. Three projects were triggered for an Account Manager interview, and one account manager described program influence not uncovered during the participant interview, and this resulted in a slightly higher score for the Timing and Selection component on one project. As in PY2, the impact on overall NTG ratio of follow-up interviews was small, about 1 percent.

No adjustments were made to increase or decrease free-ridership for non-program influences, based on a qualitative review of participant responses. Non-program influences were weighed against program influences in the Timing & Selection score on a project-by-project basis.

In PY3, the evaluation team examined NTG ratios for three other subgroups of the overall population: Lighting, non-lighting, and projects that received a bonus payment for one or more lighting measures.

The NTG ratio and relative precision at a 90% confidence level for projects with lighting energy savings, based only on the lighting portion of project-level savings, is provided in Table 3-13.

Table 3-13. NTG Ratio and Relative Precision at 90% Confidence Level - Lighting

Sample Strata	Population (N=3,003)	NTG Interviews (n=93)	NTG Sample (n=276)	Sample kWh Wgts.	Relative Precision ± %	Low	NTGR Mean	High
1	120	24	25	0.340	8%	0.69	0.75	0.81
2	358	35	42	0.339	5%	0.67	0.71	0.75
3	2,525	34	209	0.321	1%	0.73	0.75	0.76
Total	3,003	93	276	1.000	5%	0.70	0.74	0.77

The NTG ratio and relative precision at a 90% confidence level for projects with non-lighting energy savings, based only on the variable speed drive, HVAC equipment, or motors portion of project-level savings, is provided in Table 3-14 (no interviews were completed with participants regarding refrigeration projects).

Table 3-14. NTG Ratio and Relative Precision at 90% Confidence Level – VSD/HVAC/Motors

Sample Strata	Population (N=320)	NTG Interviews (n=15)	NTG Sample (n=16)	Sample kWh Wgts.	Relative Precision ± %	Low	NTGR Mean	High
1	19	3	3	0.435	39%	0.38	0.63	0.88
2	48	5	5	0.310	23%	0.43	0.56	0.69
3	253	7	8	0.255	24%	0.52	0.68	0.84
Total	320	15	16	1.000	30%	0.43	0.62	0.81

The NTG ratio and relative precision at a 90% confidence level for projects that received a bonus payment for a lighting measure is provided in Table 3-15.

Table 3-15. NTG Ratio and Relative Precision at 90% Confidence Level – Bonus Recipients

Sample Strata	Population (N=1,641)	NTG Interviews (n=60)	NTG Sample (n=191)	Sample kWh Wgts.	Relative Precision ± %	Low	NTGR Mean	High
1	72	14	15	0.332	7%	0.66	0.71	0.76
2	228	22	25	0.350	7%	0.68	0.74	0.79
3	1,341	24	151	0.318	1%	0.77	0.78	0.78
Total	1,641	60	191	1.000	5%	0.70	0.74	0.78

Comparing the NTG ratio for lighting versus non-lighting projects, the lighting-only projects have a NTG ratio above the mean (0.74 versus 0.72 for the mean). The NTG ratio for non-lighting measures is substantially lower than the overall mean, but the relative precision of that estimate is quite low because the available sample in strata 1 and 2 was exhausted after reaching eight completed interviews. The non-lighting NTG ratio is reflective almost entirely of variable speed drive projects. The No-Program scoring component of the non-lighting NTG ratio was especially low, 0.54, compared with the No-Program score for the overall population of 0.72. A low No Program score is indicative, in the extreme case, of customers that would have done exactly the same measure at exactly the same time.

The NTG ratio of bonus recipients implementing small projects provides the highest mean value in any strata, at 0.78. This suggests bonuses may be effective at inducing small lighting projects would not have been undertaken in the absence of the program.

The net-to-gross scores were also examined for the subgroup of 30 telephone survey respondents that identified T12 lighting as the baseline for one or more measures in their projects. As noted in Table 3-1, the impact survey questions found that only two respondents indicated an intention to replace their T12 lighting within the next two years, although many answered "don't know" at that point early in the interview. The net-to-gross survey provided

more thorough questioning on the timing of these projects containing measures with T12 baselines. We found that the overall net-to-gross ratio for the 30 projects with T12 lighting baselines had an overall net-to-gross ratio of 0.71, when weighting scores by ex ante energy savings. This overall score is very close to the program mean NTG ratio of 0.72. The "No-program" scoring component of these projects, which asks "Without the program, when do you think you would have installed this equipment?" provides further insight into timing. We found that the "No-Program" score for the 30 projects with T12 lighting baselines had an average score of 0.69, when weighting scores by ex ante energy savings, which is very close to the overall "No Program" score of 0.72. Among respondent projects, 13 of the 30 indicated they would have replaced the lighting two or more years later, and an additional five were not asked timing because they indicated a score of zero likelihood that they would have done the project without the program (zero free-ridership).

Participant Spillover

The evidence of spillover from the CATI participant survey for the Prescriptive program is presented in Table 3-16 below. These findings suggest that participant spillover effects for PY3 are relatively small, with only three respondents pursuing five measures (two VSDs, two T5s, one CFLs) where a strong influence was indicated for the ComEd program. The three respondents were not in the impact sample and the potential savings could not be quantified from the responses. While participating customers are installing other energy efficiency improvements outside of the program, respondents to the telephone survey attribute little influence to the program in their decision to install these additional measures and further state that these actions generally would have been implemented regardless of their program participation experiences.

Table 3-16. Evidence of Spillover in PY3 Prescriptive from Participant Telephone Survey

Spillover Question	Evidence of Spillover
Since your participation in the ComEd program, did you implement any additional energy efficiency measures at this facility that did NOT receive incentives through any utility or government program?	Of the 100 survey respondents that responded to this question, 23 said "Yes" (23%).
What type of energy efficiency measure was installed without an incentive?	(5) T5 or T8 lamps or Lighting upgrades (3) CFLs or LED lamps (5) VSD in HVAC (3) Efficient motors (1) Lighting controls (2) Unitary and room air conditioners (13) "Other" measures
On a scale of 0 to 10, where 0 means "not at all significant" and 10 means "extremely significant," how significant was your experience in the ComEd program in your decision to implement this energy efficiency measures?	Fourteen respondents provided a score of zero regarding one or more measures, but 8 respondents provided a non-zero score on one or more measures: (1) Rating between 1 and 3 (4) Rating between 4 and 6 (3) Rating between 7 and 10
If you had not participated in the ComEd program, how likely is it that your organization would still have implemented this measure? Use a 0 to 10, scale where 0 means you definitely would NOT have implemented this measure and 10 means you definitely WOULD have implemented this measure?	Seventeen respondents provided a score of 10 regarding one or more measures, but for the 5 respondents who provided an answer less than 10: (2) Rating between 0 and 3 (2) Rating between 4 and 6 (1) Rating between 7 and 9

3.1.5 Net Program Impact Results

Net program impacts were derived by multiplying gross program savings by the estimated NTG ratio. Table 3-17 and Table 3-18 provide the program-level evaluation-adjusted net impact results for the PY3 Prescriptive program. The NTG ratio is the same for energy and demand savings, 0.72, due to the use of the identical responses from each contributing participant (and other sources) and the nearly identical sample-based weights for both calculations.

Table 3-17. Program-Level Evaluation-Adjusted Net kWh Impacts for PY3

Segment	Ex Ante Gross kWh	Ex Post Gross kWh	kWh RR	Ex Post Net kWh	NTGR (ex post gross)
Total	258,385,882	260,236,777	1.01	188,462,660	0.72

Table 3-18. Program-Level Evaluation-Adjusted Net kW Impacts for PY3

Segment	Ex Ante Gross kW	Ex Post Gross kW	kW RR	Ex Post Net kW	NTGR (ex post gross)
Total	52,300	46,553	0.89	33,713	0.72

3.2 *Process Evaluation Results*

The process component of the Smart Ideas for Your Business Prescriptive Program evaluation focused on program participation, program design and implementation, the trade ally network, marketing and outreach, and barriers to and benefits of participation, and participant satisfaction. The primary data sources for the process evaluation included the telephone survey with 104 program participants, the survey with 70 non-participants, and the in-depth interviews with market actors and Account Managers. Please refer to Section 2 for more information on the primary research conducted in support of this evaluation.

3.2.1 Participant Profile

PY3 Participation by Sector

In PY3, 1,779 companies completed 3,794 projects that accounted for 258.4 GWh of ex ante gross savings. PY3 participants represent a range of business sectors. Key observations, by business sector, are:

- The retail/service sector accounts for the largest share of projects (37%) and participants (20%) but only for 15% of program energy and demand savings. Projects in this sector have among the smallest average energy savings of all sectors (28 MWh per project).
- Projects in the warehouse sector account for the most energy savings (22%). This sector had five of the 10 largest prescriptive projects in PY3.
- Light industry represents the largest share of demand savings (22%) and the second largest share of participants (19%) and energy savings (18%).
- The medical sector had the highest average ex ante gross energy savings (over 50 GWh per project), completing 103 projects in PY3. Three of the 10 largest PY3 prescriptive projects were completed in this sector.
- The grocery sector has the highest number of projects per participant (6.5). One grocery chain completed over 140 prescriptive projects in PY3.

Table 3-19 summarizes the distribution of PY3 participants, projects, and energy and demand savings by business sector.

Table 3-19. Participants, Projects, and Ex Ante Gross Savings by Business Sector

Sector	Projects		Participants		Projects / Part.	Ex Ante Gross Energy Savings		kWh / Project	Ex Ante Gross Demand Savings	
	#	%	#	%		kWh	%		kW	%
Retail/Service	1,415	37%	348	20%	4.1	39,017,385	15%	27,574	7,832	15%
Office	599	16%	299	17%	2.0	26,315,976	10%	43,933	6,493	12%
Light Industry	404	11%	334	19%	1.2	46,374,552	18%	114,788	11,396	22%
Warehouse	292	8%	221	12%	1.3	56,019,530	22%	191,848	9,898	19%
Grocery	195	5%	30	2%	6.5	12,057,843	5%	61,835	1,730	3%
Heavy Industry	156	4%	122	7%	1.3	24,774,149	10%	158,809	5,890	11%
Medical	103	3%	50	3%	2.1	20,740,511	8%	201,364	3,201	6%
Restaurant	61	2%	39	2%	1.6	735,230	0%	12,053	123	0%
College / University	38	1%	11	1%	3.5	2,189,815	1%	57,627	450	1%
Hotel/Motel	33	1%	26	1%	1.3	3,397,208	1%	102,946	457	1%
K-12 School	30	1%	24	1%	1.3	686,900	0%	22,897	155	0%
Miscellaneous	468	12%	275	15%	1.7	26,076,783	10%	55,720	4,675	9%
TOTAL	**3,794**		**1,779**		**2.1**	**258,385,882**		**68,104**	**52,300**	

Source: PY3 Program Tracking Database.

Participation Trends by Sector

Overall, PY3 program participation increased substantially compared to PY2, from 1,739 projects completed by 958 companies to 3,749 projects completed by 1,779 companies. Although participation levels doubled in PY3, the resulting energy savings only increased by 20%, from 213.5 GWh of ex ante gross savings in PY2 to 258.4 GWh in PY3. PY3 projects were, on average, much smaller than PY2 projects (68,104 kWh per project in PY3 compared to 122,784 per project in PY2). According to program staff, the smaller savings per project was the result of increased participation by chain accounts who often implement many projects but of smaller size. Although project size has decreased considerably in PY3, 11% of surveyed participants indicated that the scope of their project was limited by the incentive cap.

Key changes in participation over the three program years include:

- The retail/service sector had the largest increase in the number of projects, from 73 projects (or 16% of all PY1 projects) in PY1 to 462 projects (27%) in PY2 and 1,415 projects (37%) in PY3. This increase was largely driven by heavier involvement of

chain companies. However, because projects in this sector tend to be small, the overall impact on program savings is smaller than for other sectors.

- Warehouses accounted for the largest gain in energy savings from PY2 to PY3 (17 GWh). This was the result of the number of projects in this sector almost doubling between PY2 (157 projects) and PY3 (292 projects).
- Light and heavy industry, which had both experienced a substantial increase in energy savings in PY2, were the only two sectors that had lower ex ante gross energy savings in PY3 compared to PY2. In both sectors, the average project size decreased significantly compared to PY2.
- All sectors experienced a decrease in project size over the three-year period. In most sectors, the average project size decreased between 20% and 40% from PY2 to PY3.

The figures below compare the number of projects, participants, ex ante gross energy and demand saving, and average project size by business sector and program year.

Figure 3-1. Projects by Business Sector and Program Year

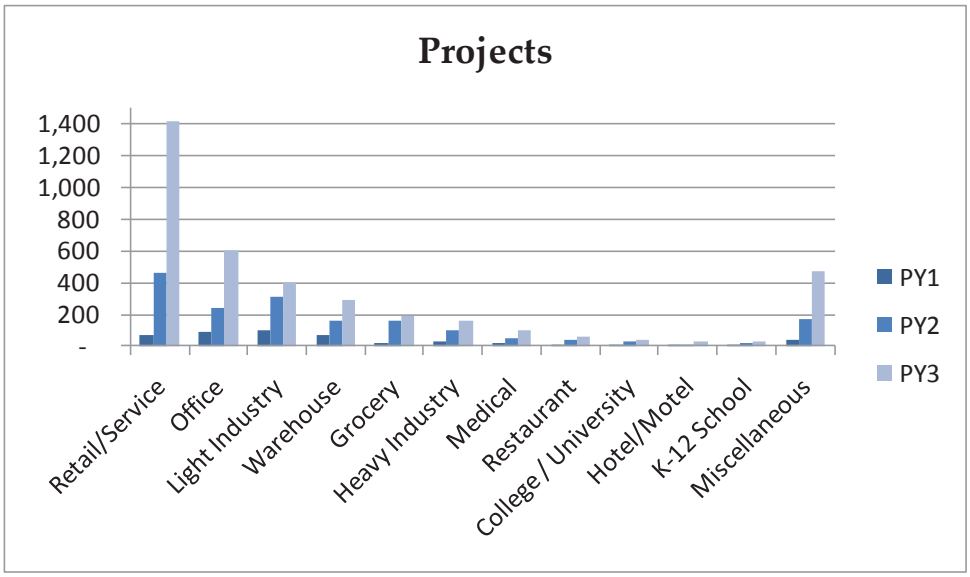


Figure 3-2. Participants by Business Sector and Program Year

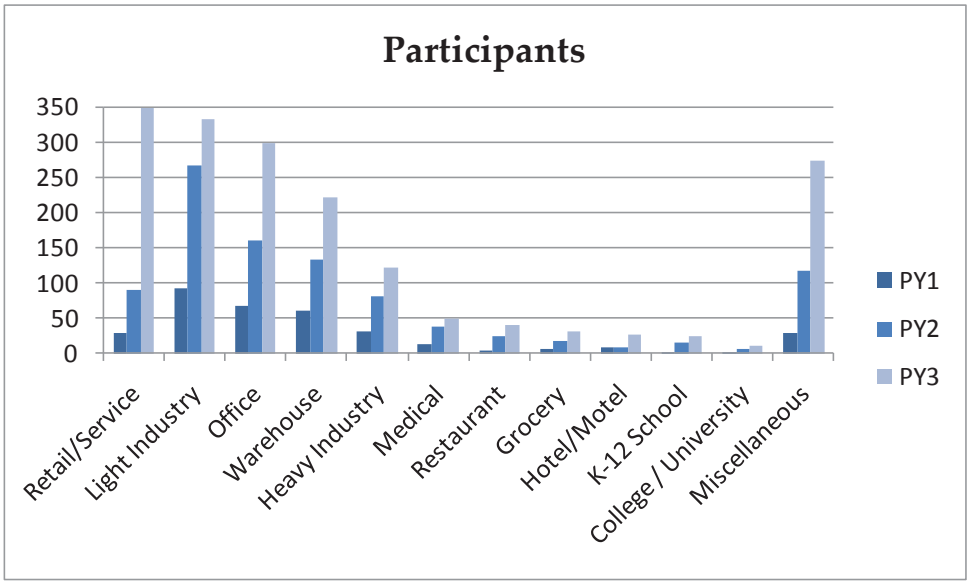


Figure 3-3. Energy Savings by Business Sector and Program Year

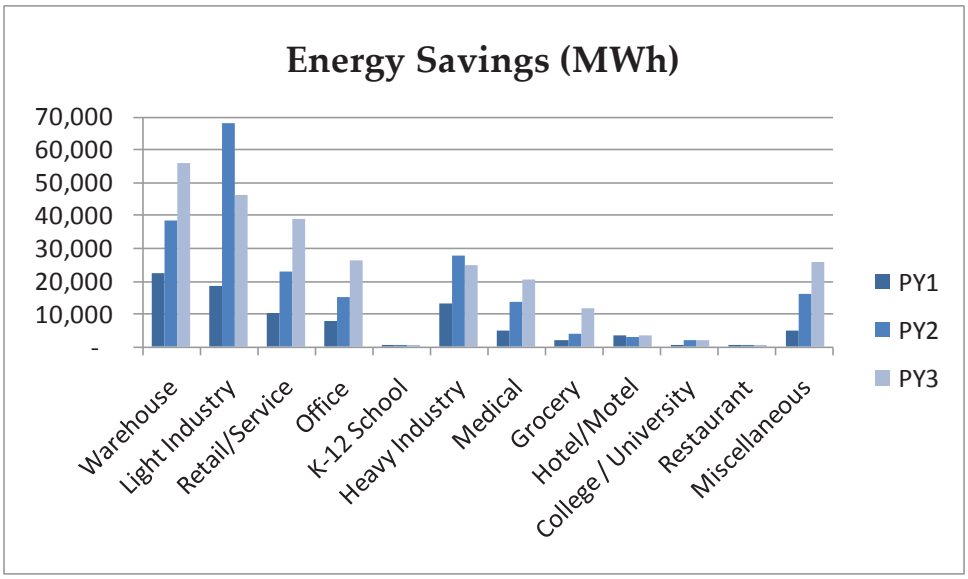


Figure 3-4. Demand Savings by Business Sector and Program Year

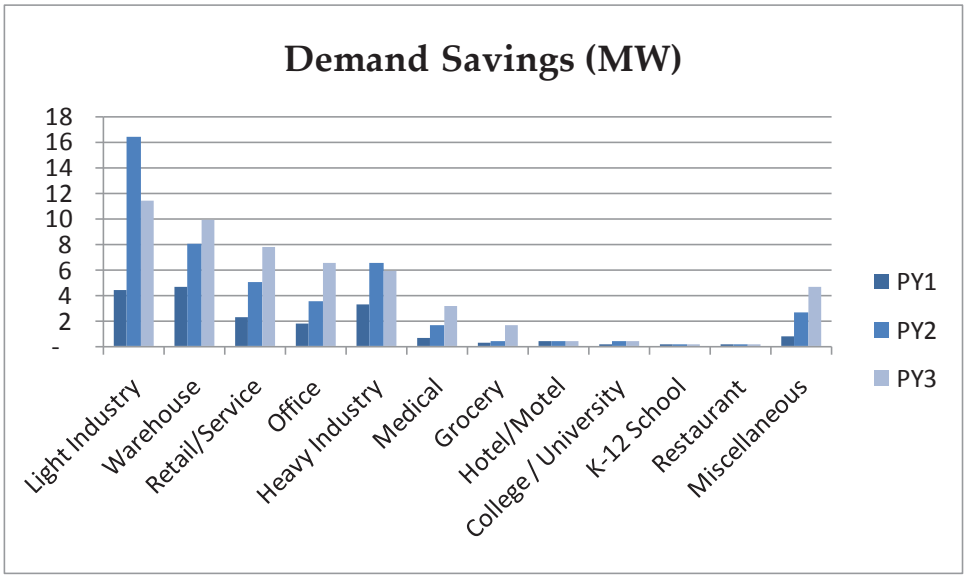
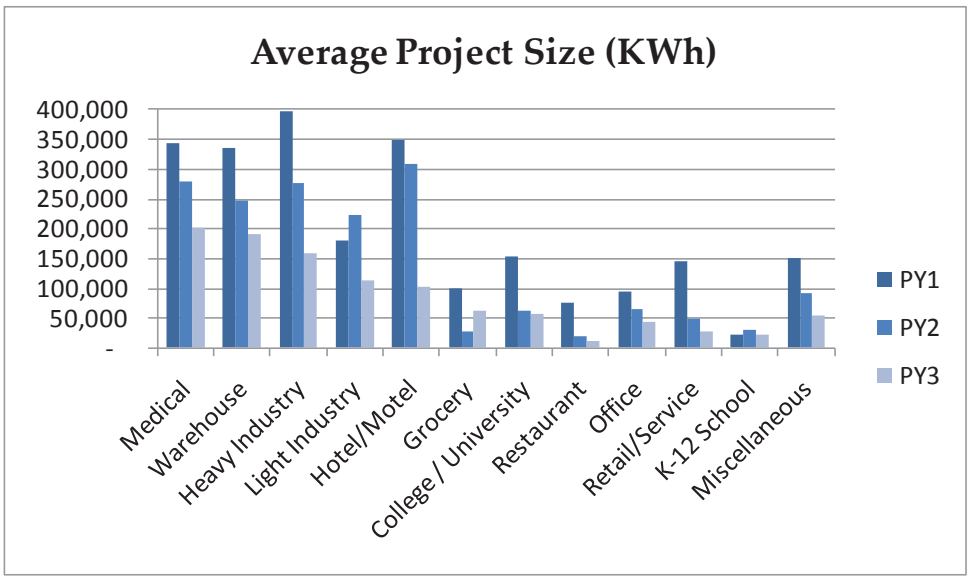


Figure 3-5. Average Project Size by Business Sector and Program Year



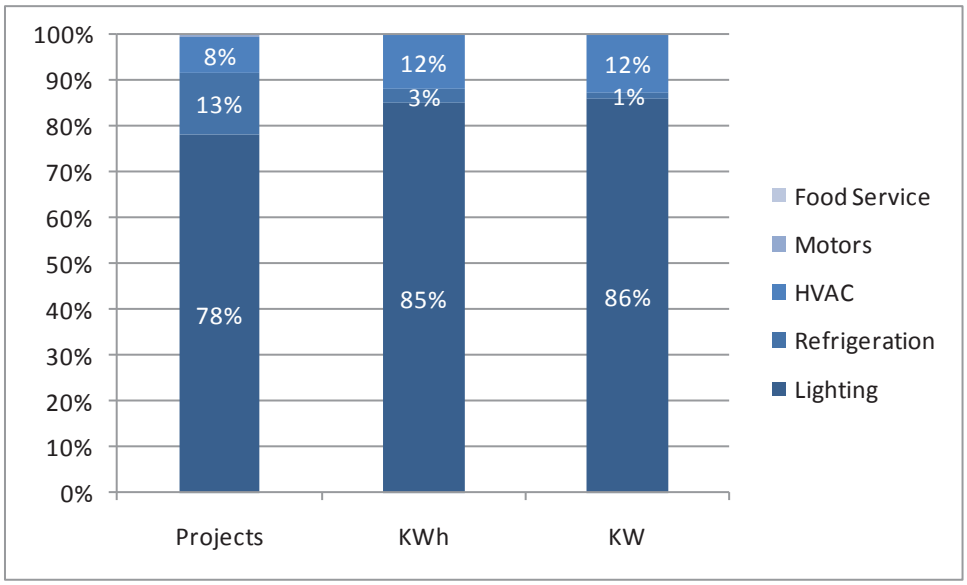
Source: PY3 Program Tracking Database.

PY3 Participation by End Use

In PY3, the vast majority of projects (78%), energy savings (85%), and demand savings (86%) were associated with the implementation of lighting measures. Although lighting still is a large part of the Prescriptive Program, the number of PY3 lighting projects and the percent of savings

associated with lighting measures decreased relative to PY2. This is to be expected as the portfolio of projects continues to diversify. In PY3, refrigeration measures accounted for 13% of projects, but only 3% of energy savings and 1% of demand savings. HVAC accounted for 8% of projects and 12% of energy and demand savings. Program staff noted that the increased number of projects implementing variable speed drives (VSD) had the most impact on driving HVAC energy savings; projects including a VSD accounted for 69% of all HVAC projects.

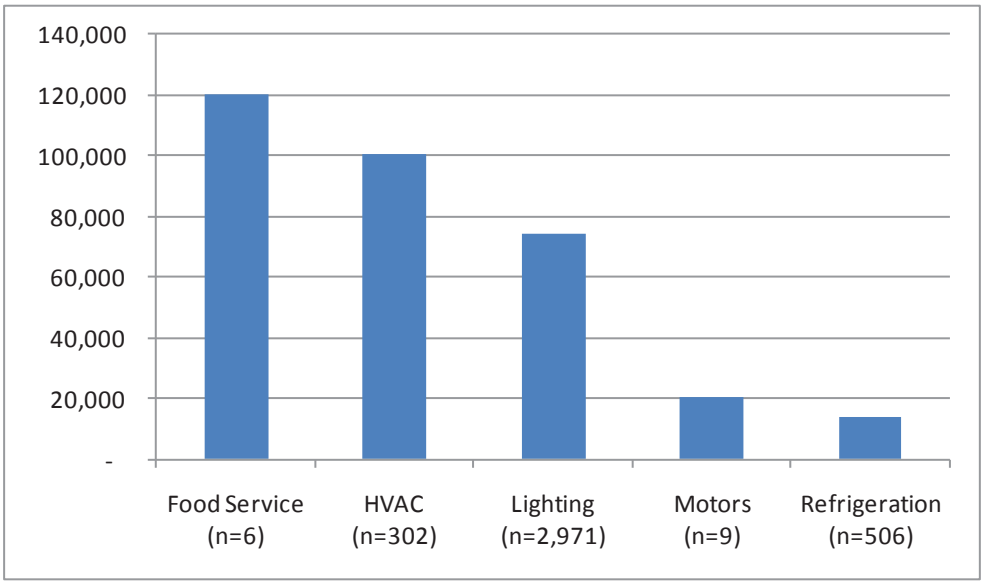
Figure 3-6: Distribution of Projects and Savings by End Use



Source: PY3 Program Tracking Database.

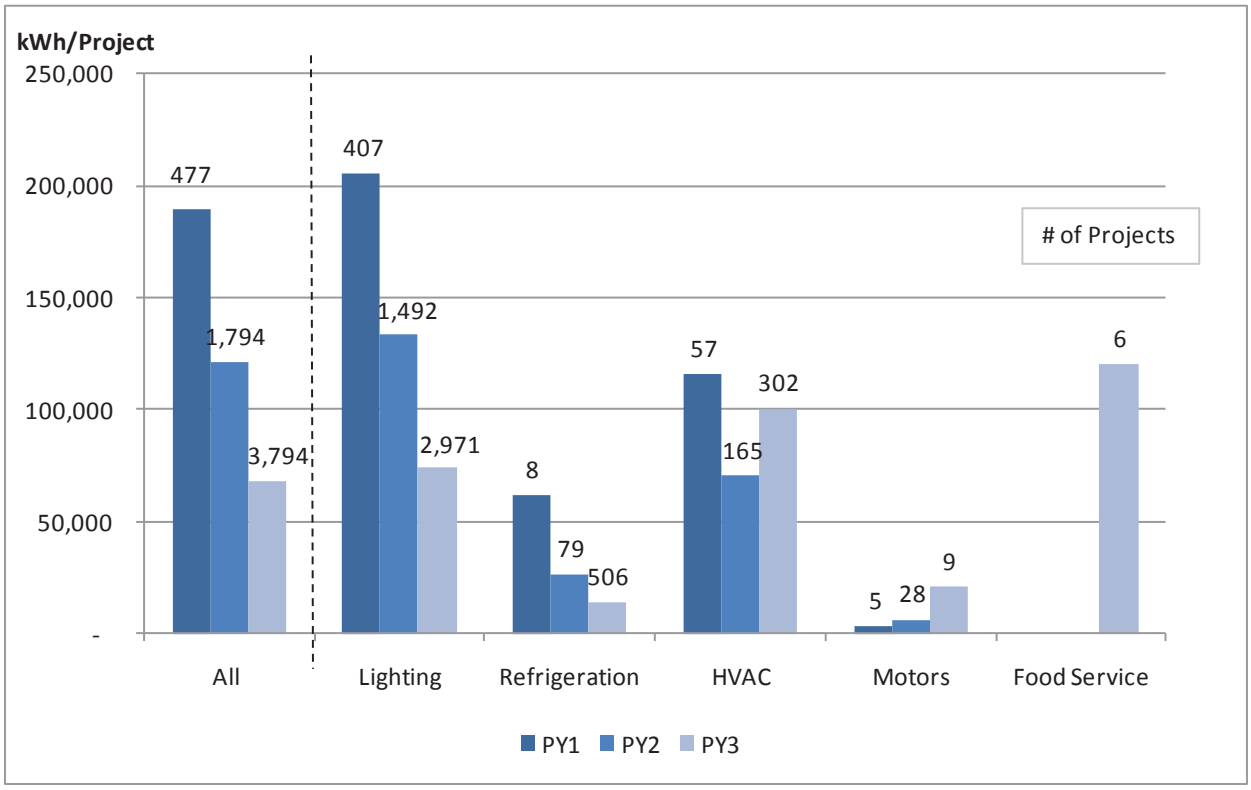
Projects that included food service equipment had the largest per project energy savings. However, food service equipment was newly introduced in PY3, and the number of projects (6) is too small to draw conclusions about the potential of this end use to be a driver in generating more large projects for the program. Refrigeration and motors, conversely, have low levels of savings per project.

Figure 3-7. Average Project Size by End Use (kWh/Project)



As noted above, the average projects size in PY3 was smaller than in the first two program years. A comparison by end use shows that lighting projects contributed most to this decline. In PY1, the average lighting project generated just above 200,000 kWh compared to less than 75,000 kWh in PY3.

Figure 3-8. Average Project Size by End Use and Program Year



3.2.2 Program Design and Implementation

ComEd's Smart Ideas for Your Business Prescriptive Program offers incentives designed to encourage the implementation of energy-efficiency measures. The Prescriptive Program targets specific retrofits and replacement opportunities in lighting, HVAC, refrigeration, food service, and motor systems.

The participation process has not changed since PY2. Program implementers still have several project milestones at which they communicate with the participant, including a reservation letter following receipt of the pre-approval application, a reminder letter and phone call when it is getting close to the date of the reservation expiring, an extension letter when an extension is granted, a cancellation letter if the reservation expires, and a final letter with the rebate check to close out completed projects.

A majority of respondents filled out either the initial or final program application themselves (64%). Of these participants, most feel that the application forms clearly explain the program requirements and participation process (92%) and rate the application process as easy (75%).[15] The share of participants who find the application form clear has increased since the inception of the Smart Ideas for Your Business Program, from 80% in PY1 to 87% in PY2 and 92% in PY3. The implementer has improved application clarity while substantially increasing the number of measures offered each program year. When participants do not fill out the applications themselves, this is most often done by a contractor (42%).

However, some participating contractors think that the application process is still rather onerous and time-consuming. As part of recommendations on how to improve the program, many cited that a streamlined application would be beneficial. As one contractor explained:

> *"I would simplify the application, the specifics of it. It seems like they have pages and pages on descriptions of types of fixture and stuff like that, it's not necessary"*

Account Managers

In PY2, program staff began to more actively engage ComEd Account Managers. The program developed a toolkit for Account Mangers and also began providing training opportunities and "Lunch and Learns." In PY3, program staff continued to work to improve the relationship between Account Managers and the Smart Ideas Program. Given their pre-existing relationship with customers who are the largest users of energy, the main goal for PY3 was to *"provide them with better tools to sell the program."* Program staff have simplified the "tool-kit" as they found that Account Managers were not using it. The addition of more KEMA outreach staff has allowed Account Managers to now have one point of contact for all questions pertaining to the program in an effort to increase communication and provide greater outreach support.

Additionally, PY3 marked the introduction of Smart Ideas goals for Account Managers. PY3 goals included recruiting customers to attend the Energy Efficiency Expo and attending "Lunch and Learns. "[16] All interviewed Account Managers were generally receptive to the introduction of these goals; they thought the goals were both realistic and achievable. As one Account Manager noted: *"I think the goals were realistic. It's good for us to support our company goal. So it's good that we have a stake in supporting our company's goals."* However, three of the five did note that continuing to recruit customers to the Energy Efficiency Expo will become increasingly difficult, unless the Expo offers something new to entice customers to return again.

[15] A score of 7 or higher on a scale from 0 to 10, where 0 is "very difficult" and 10 is "very easy."
[16] In early PY3, an additional savings goal for Account Managers was contemplated but ultimately not implemented.

The Account Managers also agreed that the "Lunch and Learns" were very successful and helpful in providing information about the program. One Account Manager mentioned that the "Lunch and Learns" were especially valuable when other Account Mangers discussed different approaches that have been successful in promoting the program to their customers. Interviewed Account Managers feel that, overall, they have enough knowledge of the program to effectively promote it and assist their customers through the participation process. Given that all five Account Managers consider themselves very knowledgeable about the program, it is not surprising that all of them promote the program to their customers quite frequently.

Overall, 1,633 of the 3,794 PY2 projects (43%) were implemented by customers with an Account Manager. Program participants report the following involvement of Account Managers during PY3:

- About 15% of participants with an Account Manager first heard about the Smart Ideas program from their Account Manager.
- About 60% of participants with an Account Manager discussed the program with their Account Manager.

In general, despite efforts to better engage Account Managers, program staff noted that there is still huge variability in the efforts of Account Managers:

> *"Some are extremely active. They're always asking questions and being involved, and are very comfortable talking about the program. And then we have some that aren't very involved at all."*

3.2.3 ComEd Trade Ally Network

Trade allies, i.e., contractors and other market actors registered with the Smart Ideas Program, continue to be an important part of the Prescriptive Program. In PY3, in order to remain a trade ally a contractor[17] had to complete one project through the program and attend a basic training. These new requirements were initiated as program staff shifted their focus from the quantity of trade allies to the quality of the applications (i.e., projects) submitted. While the total number of trade allies did not go down as a result of the new requirements, PY3 trade allies are generally more active compared to PY2 ones, as about 75 to 100 of the least active PY2 trade allies were dropped at the end of the program year. Program staff also noticed an improvement in the quality of applications received in PY3.

[17] Most of the Smart Ideas trade allies are contractors. However, in some cases, other market actors assist customers in implementing Smart Ideas projects, including consultants, engineers, suppliers, and manufacturers.

More than half of the contractors interviewed for this evaluation (16 of 25) are "approved" trade allies. Most of the trade allies (12 of 16) have no problem with the new requirements; however, a few noted that attending trainings is difficult due to geographical distance. Trade allies generally did not report a change in their business practices as a result of their trade ally designation but three did indicate a change in their marketing. When asked about the main benefits of becoming a registered trade ally, the use of branded marketing materials and increased credibility in the eyes of the customer were frequently cited.

> *"I just think that in an area like Chicago or any other part of the country that your power company is one of your most recognizable brand names that are out there and if somebody wants to decide whether or not they want to trust you, if you're good enough to be working with the power company you're probably good enough for them."*

However, one trade ally felt that the large number of trade allies on the website dilutes the value of the designation.

Nine of the interviewed contractors participated in the Prescriptive Program in PY3 but are not "registered" trade allies. Reasons for not becoming a ComEd trade ally range from lack of knowledge of the new requirements to difficulty attending the training because of their distance from the training locations. About half of the interviewed non-allies (four of nine) are interested in becoming a trade ally because they think that having their name on the website would lead to more credibility with customers. Others are not interested because it is not required to obtain incentives for customers.

Based on the Prescriptive Program database, 503 unique contractors were involved in a program project in PY3. Of these, 153 (30%) are ComEd trade allies. Overall, 76% of Prescriptive projects were implemented with the support of a contractor. Contractor-implemented projects tend to be larger than those implemented without a contractor (79,000 kWh compared to 35,000 kWh). While only 30% of participating contractors are registered trade allies, they account for more than two-thirds (69%) of PY3 contractor-implemented projects.

About half of the contractors (52%) involved in prescriptive projects implemented a single project in PY3, while 11 contractors (2%) completed 50 or more projects (10 of these 11 contractors are trade allies). However, the contractors that completed 50 or more projects accounted for 41% of all contractor projects.

Table 3-20. PY3 Contractor Projects

Contractors with…	Prescriptive Projects		
	Number of Contractors	Percent of Contractors (n=325)	Percent of Contractor Projects (n=1,492)
1 project	263	52%	9%
2 projects	76	15%	5%
3 projects	40	8%	4%
4 projects	31	6%	4%
5-9 projects	38	8%	8%
10-19 projects	32	6%	15%
20-49 projects	12	2%	13%
50+ projects	11	2%	41%

Source: PY3 Program Tracking Database.

The telephone survey with program participants included questions about their use of contractors, their contractors' affiliation with the ComEd Trade Ally Network, and satisfaction with their contractors. Approximately three-quarters of interviewed participants report having used a contractor to complete the project. Responses to the survey show that contractors play an important role in the implementation of projects. However, many participants do not believe that it is important that the contractor is registered with the program. Specific findings from the survey include:

- **Participants are satisfied with their contractors:** Almost all interviewed program participants (97%) who used a contractor to install their project report that their contractor met their needs (a score of 7 or higher on a scale from 0 to 10). Ninety-five percent of participants would recommend their contractor to others.

- **Participants discuss the program with their contractor:** 73% of prescriptive participants have discussed the Prescriptive Program with a contractor or trade ally.

- **Contractors are vital to the Prescriptive program:** 26% of Prescriptive Program participants first heard about the program through a contractor. Additionally, 35% report that it was the contractor who identified the opportunity for the ComEd incentive.

- **Contractors play an important role in designing or specifying the installed equipment:** 29% of participants report that a contractor was most influential in identifying and recommending the installed equipment.

- **Participants do not believe it is important to use contractors that are registered trade allies:** Over half (52%) of respondents do not know if the contractor they used was a

registered ComEd Trade Ally. Additionally, 34% of participants believe that when implementing an energy efficiency project it is not at all important (a score of 0 on a scale from 0 to 10) to use a contractor that is affiliated with the Smart Ideas for Your Business Program.

Similar to participants, non-participants most often look towards contractors (43%) for information and guidance when purchasing new equipment. [18]

Most interviewed contractors indicated that the Smart Ideas for Your Business Program influenced their business. While many of these contractors had already adopted business models that focused on energy efficiency and were recommending energy efficient equipment before participating in the program,[19] most believe that the program was influential in increasing their overall sales. Almost one-half of the interviewed contractors (11 of 25) indicated that they changed the type of equipment they supply and sell as a result of their involvement with the program. Additionally, seven of the trade allies changed their marketing practices, and four trade allies report that they hired additional staff due to their participation in the Smart Ideas program.

Trade Ally Bonus

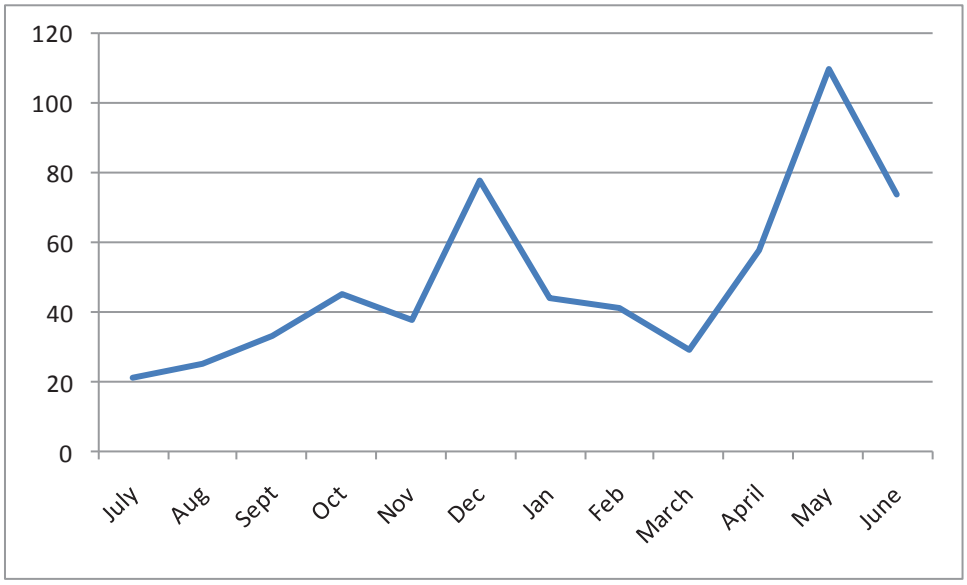
PY3 also marked the introduction of a trade ally bonus. The bonus was in effect from September 1st through November 30th, 2010 (the day by which final applications had to be submitted). It was only available to registered trade allies and consisted of 5% of the total incentive amount for projects with incentives of $10,000 or more. The trade ally bonus was designed to encourage implementation of larger projects. However, program staff believes that the main outcome was to clear the project pipeline more quickly, rather than to generate additional large projects.

As shown in Figure 3-9 below, the number of projects receiving an incentive of $10,000 or more did increase during the trade ally bonus. However, the subsequent drop-off and relatively low number of projects over the next three months supports the hypothesis that the project pipeline had been cleared.

[18] Note that the research with non-participants excluded customers with demand of less than 100 kW (delivery service class C28). As such, any non-participant findings presented in this report only represents customers with demand of 100 kW or more.

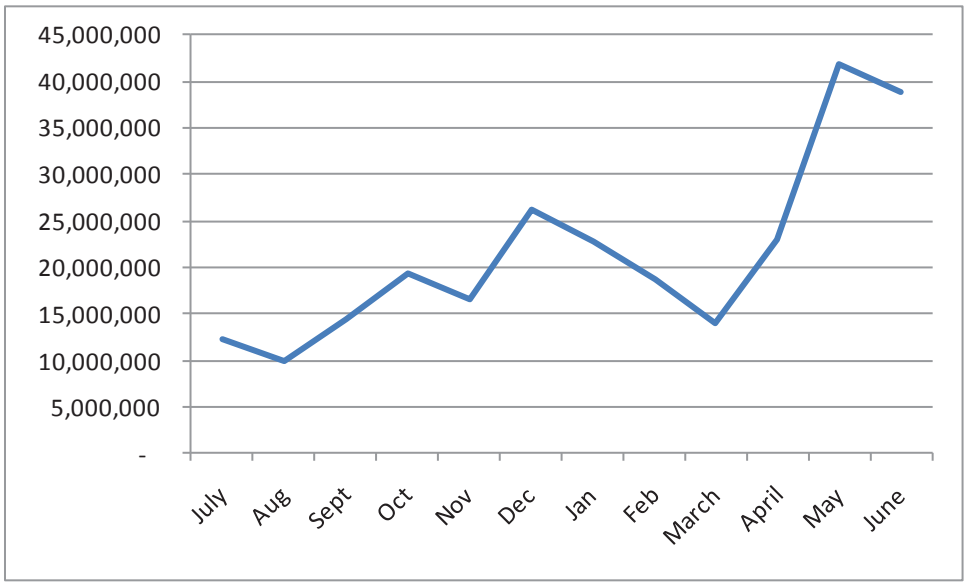
[19] It should be noted that while the respondents considered the recommended equipment energy efficient, it is unknown if the equipment would have met the efficiency standards of the Smart Ideas Program.

Figure 3-9. Number of Projects of $10,000 and Above (Date Incentive Check Mailed)



Similarly, Figure 3-10 highlights the increase in program savings during the months the trade ally bonus was offered. However, the drastic drop-off indicates that the bonus may have persuaded participants to finish their project quicker – instead of generating additional leads. Initiating a bonus when there are many projects with the "reserved" status may be beneficial in pushing them to complete their project.

Figure 3-10. Program Savings (KWh) by Month



Knowledge of the trade ally bonus offering in PY3 was not universal amongst interviewed contractors. Only 10 of the 16 interviewed trade allies were aware of the bonus, and only four received a bonus payment. Many of the contractors who are not registered with the program were unaware of the bonus offering, but expressed interest and noted that they completed projects that would have qualified for the bonus payment. Additionally, almost half of those unaware of the bonus report that they would have increased their promotion of the program had they been aware of this offering. These responses indicate that trade ally bonuses have the potential to increase promotion of the program and also provide a reason for more contractors to register as a trade ally.

In order to inform potential changes to the trade ally bonus, the evaluation team conducted telephone interviews with utility program managers who oversee programs with similar contractor bonus offerings across the country. These programs varied in both incentive size and savings targets. Two of the most relevant structures for encouraging greater trade ally activity and larger C&I projects were implemented by two utilities in the Midwest and the Northeast, respectively:

- The Midwest utility has a trade ally bonus structure that is based on two tiers: Tier 1 trade allies are those who have implemented projects with combined savings of at least one million kWh in the previous program year. They are eligible for a bonus equal to 10% of the customer incentive, for all savings above one million kWh. Tier 2 trade allies are eligible for a bonus of between $500 and $4,000, depending on the amount of savings they achieve in the program year. This is a significant change from the previous program year, when both Tier 1 and Tier 2 trade allies were eligible for a flat $2,500 incentive per project. The utility made the change after determining that the previous incentives were not spurring as many projects as anticipated. In addition, the incentives were not offered for the full program year and had a number of requirements which were somewhat difficult to communicate to trade allies. The new structure was designed to be more straightforward and predictable for trade allies.

- The Northeast utility also has a bonus based on savings. Once a project reaches 500,000 kWh savings, trade allies are eligible to receive one cent per kilowatt hour saved. This was recently increased from a half cent incentive in July 2011, which was found to be too small to encourage the implementation of larger projects.

Other utility program managers had several pieces of advice for any utility looking to start a trade ally bonus program. Several mentioned the need for clear communication and setting expectations at the beginning of the bonus offering. This minimized trade ally confusion and let them set realistic goals. Further, face-to-face communication, as well as frequent contact, was mentioned. Finally, clear deadlines for when an incentive period would start and end increased trade ally confidence and gave them a measure of budgetary stability. Program managers

believed that strong bonds between their program and trade allies increased the likelihood that new and larger projects would be generated.

According to interviews with ComEd program staff, the program completely restructured its trade ally bonus program for PY4. ComEd staff decided to model the trade ally performance award after Ameren Illinois using a two tiered approach, where the top ten trade allies would be rewarded for achieving a specified increase in participation from the prior year, and other trade allies would be rewarded for reaching set kilowatt hour goals.

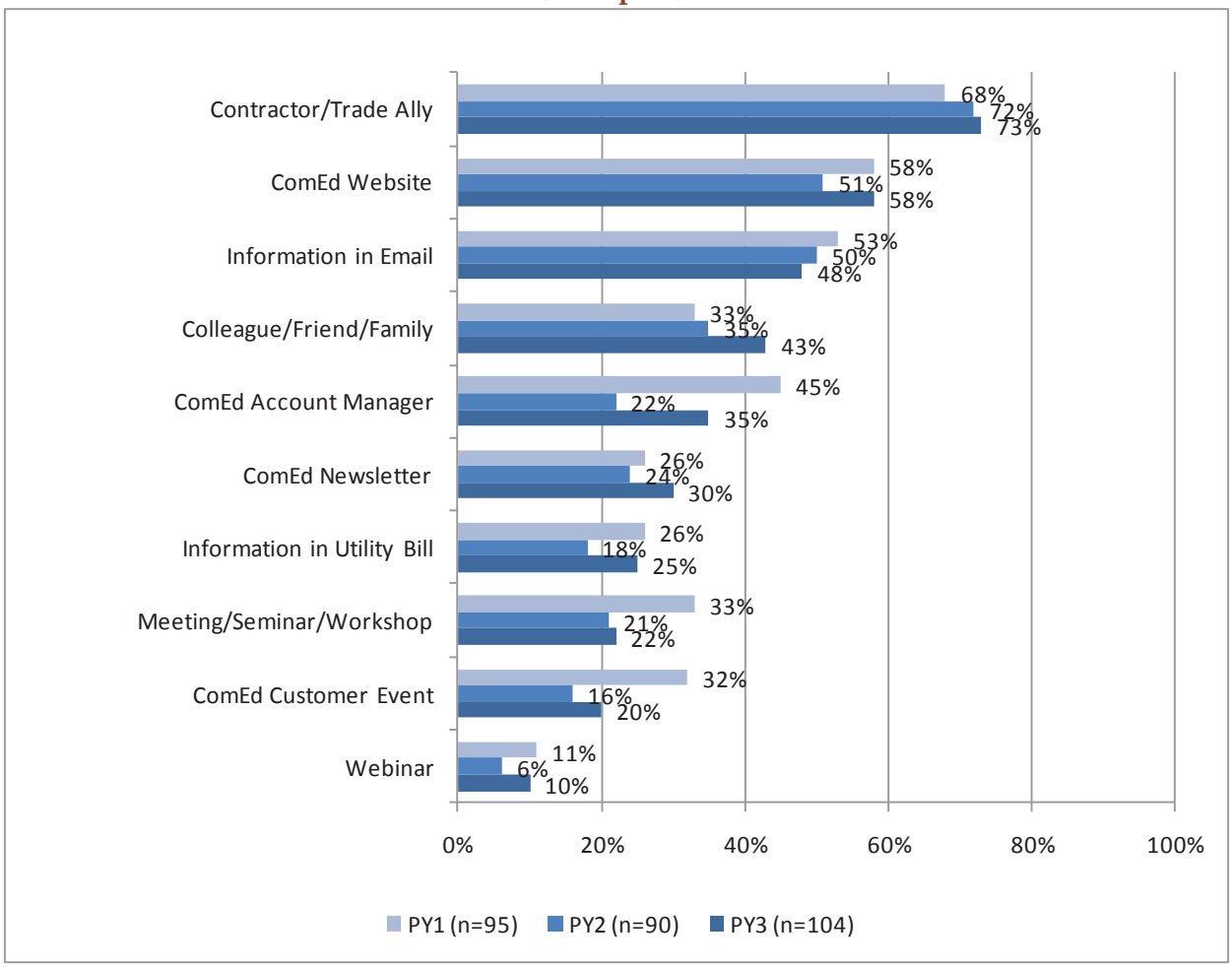
3.2.4 Program Marketing and Outreach

In the first two program years, the Smart Ideas program experienced oversubscription relatively early in the program year, stymieing program marketing efforts. However, with an increased budget and goals the marketing and outreach plans changed substantially for PY3. To support the new activities, the program increased its marketing and outreach staff from one dedicated staff person to five by the end of the program year.

The marketing plan for PY3 included trigger tactics that were initiated throughout the program year. These tactics included increased outreach to targeted customer groups such as trade associations and customers who attended the Energy Efficiency Expo. Program staff also followed up on leads from PY1 and PY2 by checking in on those that submitted applications but cancelled their projects. The frequency with which staff sent the electronic newsletter increased from quarterly to six times a year in PY3. Additionally, program staff implemented a direct mailing, sending program information to approximately 5,000 of their larger customers. However, program staff noted that the mailing was largely ineffective because their database contains billing addresses and is not meant as a marketing database.

As a result of the increased marketing, 32% of Prescriptive participants recall having been directly contacted by ComEd or KEMA. Not surprisingly, larger participants and those with an Account Manager are more likely to have been directly contacted. Despite the increase in marketing efforts in PY3, recall of various methods of outreach has been relatively static throughout the first three program years (see Figure 3-11).

Figure 3-11. Sources of Program Information (Prompted)



Source: PY1, PY2 and PY3 CATI Participant Surveys.

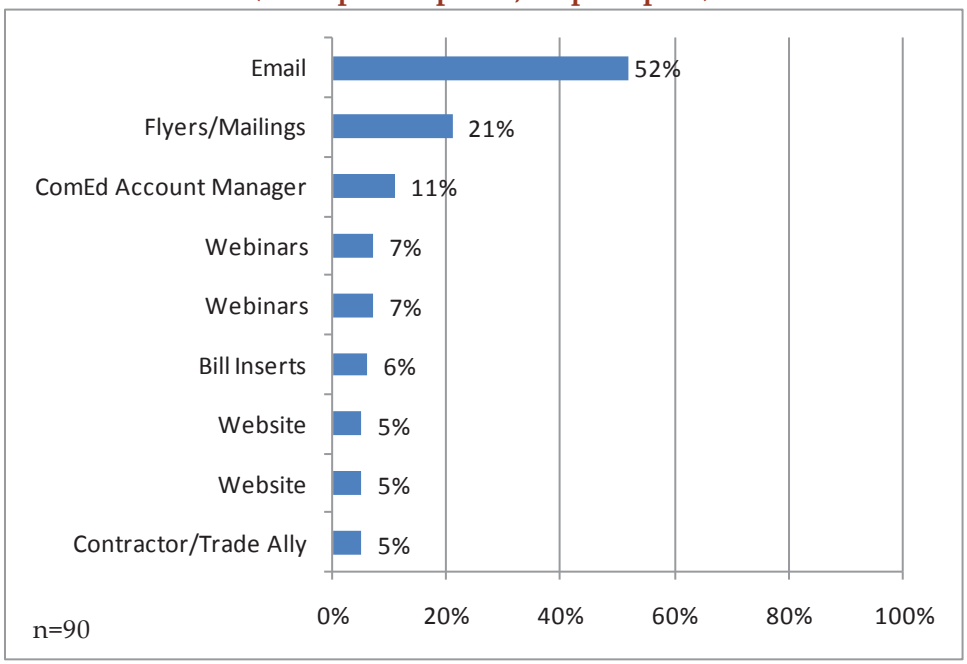
Respondents generally find the program marketing materials useful, with 28% indicating that they are "very useful" and another 41% considering them "somewhat useful."

The five interviewed Account Managers also found the program's marketing materials very helpful and easily accessible on the ComEd Smart Ideas for Your Business website. Interviewed Account Managers most often utilize the program's fact sheets and case studies.

Only half of the interviewed contractors (13 of 25) reported that they have received materials to promote the program to their customers. Furthermore, only seven of the contractors who have received these materials found them useful, and several indicated that they would like more marketing materials from the program. The request for certain program aids varied and included calculation sheets, a timeline of the rebate process, and general handouts about the program.

Although contractors are the most common source of program awareness, participants generally do not believe that contractors are the best way to provide them with information regarding energy efficiency opportunities. Instead participants indicate that they prefer to receive this information through email (52%) or flyers/mailings (21%).

Figure 3-12. Preferred Methods of Contact (Multiple Response, Unprompted)



Source: PY3 CATI Participant Survey, note that responses under 5% are not included.

Non-participants also note that, in general, email (50%) and flyers/mailings (37%) are the best ways to reach them regarding energy efficient offerings. Overall, 57% of non-participating customers are aware that ComEd offers energy efficiency programs to their commercial customers, and 31% have heard of the Smart Ideas for Your Business Program. Of those who have heard of the program, almost one-third (32%) indicate that they are either not very familiar or not at all familiar with the program.

Interviewed contractors were asked to gauge their customer's awareness of the Smart Ideas for Your Business Program. Responses varied, with ten contractors saying their customers are not very aware or not at all aware of the program and 15 contractors indicating that their customers are either somewhat aware or very aware. However, many contractors do agree that awareness of ComEd's program offerings has increased over the years. As one trade ally explained:

> *"We've noted in the last year and a half or so that it's become something they're much more aware of. The first couple of years of the program they had no idea what we were talking about, and now we actually have customers that call us looking to try to utilize the benefits of that program"*

Despite reporting different levels of awareness of the program, all contractors indicate that their customers are interested in the program once they are educated about it. More importantly, all interviewed contractors report that they always promote the program when discussing the possibility of implementing a project with customers that falls under the scope of the Smart Ideas for Your Business Program.

The initial trigger tactics employed by program staff in PY3 were all low cost or no cost efforts. However, as the program year continued and targets for reserved projects were not being met, more costly tactics were initiated. The more costly efforts included the trade ally bonus, which is discussed in more detail in Section 3.2.3, and the increased incentive amounts as part of the bonuses on certain lighting equipment, e.g., T12 replacements and occupancy sensors. Program staff indicated that they learned from their bonuses - "*raising incentives will get you more applications and then if you need to close those applications you can deploy a trade ally bonus and that will seem to get people to finish their projects.*"

According to a review of the program tracking database, 55% of lighting projects (1,641, or 43% of all PY3 projects), had a bonus incentive paid out. Given that these incentives ran from the end of October through May (with the addition of the "May Special"), it is not surprising how many bonus incentives were paid out.

Among survey respondents, 50% received a bonus incentive for their lighting project. However, only 68% of them were aware that their project included a bonus amount, and 31% of those aware, learned about the bonus payouts after they decided to implement their lighting project. When asked how likely they would have been to implement the exact same project without the bonus amount, the average score – on a 0 to 10 likelihood scale where 0 means "not at all likely" and 10 means "extremely likely" – was a 7.6; 40% of respondents said they would have been "extremely likely" to implement the same project. Given these responses, it is unclear how effective the bonus incentives was in attracting new projects.

3.2.5 Barriers to Participation

Customer barriers

Lack of program awareness is a key barrier to participation in the Smart Ideas program, with 43% of non-participants not aware that ComEd offers energy efficiency programs for business customers and 69% not aware of the Smart Ideas program. Of those aware of the Smart Ideas program, approximately two-thirds (68%) consider themselves very or somewhat familiar with the program.

Reaching the correct decision-maker is a major hurdle both in increasing awareness of the program and encouraging participation. Program staff noted that broad-based outreach to business customers is difficult as their database only contains contact information for billing purposes; as a result, program-related communications often do not reach the energy decision-

maker. Account Managers also noted that the decision-making process in some cases presents a barrier to participation:

> *"For the customer, especially with the national accounts, they in turn cannot just make a decision based on their store. They have to go through corporate, and it becomes a much more time consuming process."*

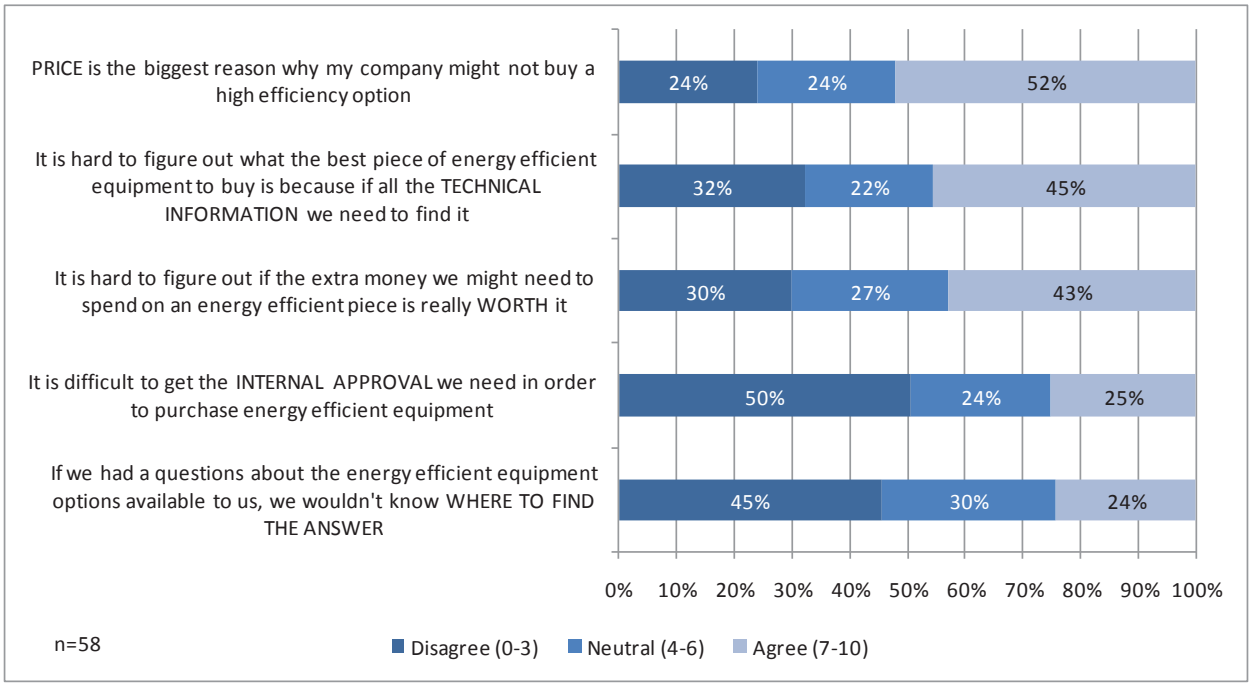
According to interviews with non-participants, 63% have the decision-maker for equipment installations at their facility. An additional 13% noted that the decision-maker was within their company but at a different location (possibly a corporate office). Only 19% indicated that equipment decisions were made by a landlord or property management firm.[20]

The non-participant survey also explored potential barriers to the installation of energy efficient equipment, including price, lack of information or technical expertise, and internal approval processes. Respondents were asked to state their agreement with a series of statements describing common barriers to becoming more efficient.

Not surprisingly, price is a major barrier to energy efficiency, with 52% of respondents agreeing that price is the biggest reason for not buying a high efficiency option. After price, respondents most often cite informational barriers: 45% of respondents agree that it is difficult to find the necessary technical information and 43% agree it is difficult to determine whether efficient equipment is worth its cost. Figure 3-13 summarizes these responses.

[20] Note that the non-participant survey excluded customers in the small delivery service class (<100 kW demand) who would be more likely to rent their facility and not make equipment decisions.

Figure 3-13. Non-Participant Barriers



Interviewed contractors largely agree that cost and the ability to secure upfront capital remains the largest barrier to the installation of energy efficient equipment. Many contractors have found that this barrier tends to disproportionately affect smaller companies. As explained by one contractor:

> *"Nobody wants to spend the money because a lot of them [smaller companies] feel that they don't have it, if they realize there are energy savings that will pay for itself maybe they'd find a way to do it but the larger companies seem to be more willing to spend the money to do it."*

Not surprisingly, the current economic environment contributes to cost barriers. When asked to what extent the current economic downturn has affected investment decisions with respect to purchasing *any* new equipment, 29% of non-participants indicate that it has affected them "a great deal" (a rating of 10 on a scale of 0 to 10). Slightly fewer (21%) indicate that the economic situation has affected their investments in *energy efficient* equipment "a great deal."

Despite these barriers, opportunities to increase participation in the Smart Ideas program among current non-participants exist. Almost two-thirds of non-participants (64%) indicate that there have been installations of equipment, or other upgrades, at their facility in the past three years. The most frequent installations were of lighting or HVAC equipment. While most of these respondents (91%) indicate that the equipment was energy efficient, it is unlikely that all of these projects would actually have qualified for incentives through the Smart Ideas program.

Energy/money savings was cited as the major reason for choosing an energy efficient option (73%). However, it was lack of knowledge about the Smart Ideas program that prevented them from implementing these projects through the program. Sixty-three percent of those who implemented "energy efficient" equipment are not aware of the Smart Ideas program, and an additional 20% – while aware of the program – did not have enough information about the program at the time of implementation.

Looking forward, many non-participants plan to install new equipment within the next two years at their facility (58% indicate yes and another 12% say maybe). Notably, 76% of those non-participants indicate that they are very likely to install energy efficient equipment and another 12% indicate that they are somewhat likely. Whether or not this equipment would meet the standards of the Smart Ideas program is unclear. However, these responses suggest that 1) despite the economic climate, customers are active in installing new equipment and 2) there is an interest in energy efficiency. This presents an opportunity for the program to encourage customers to install equipment that will meet the standards of the Smart Ideas program and further increase its participant base.

Contractor barriers

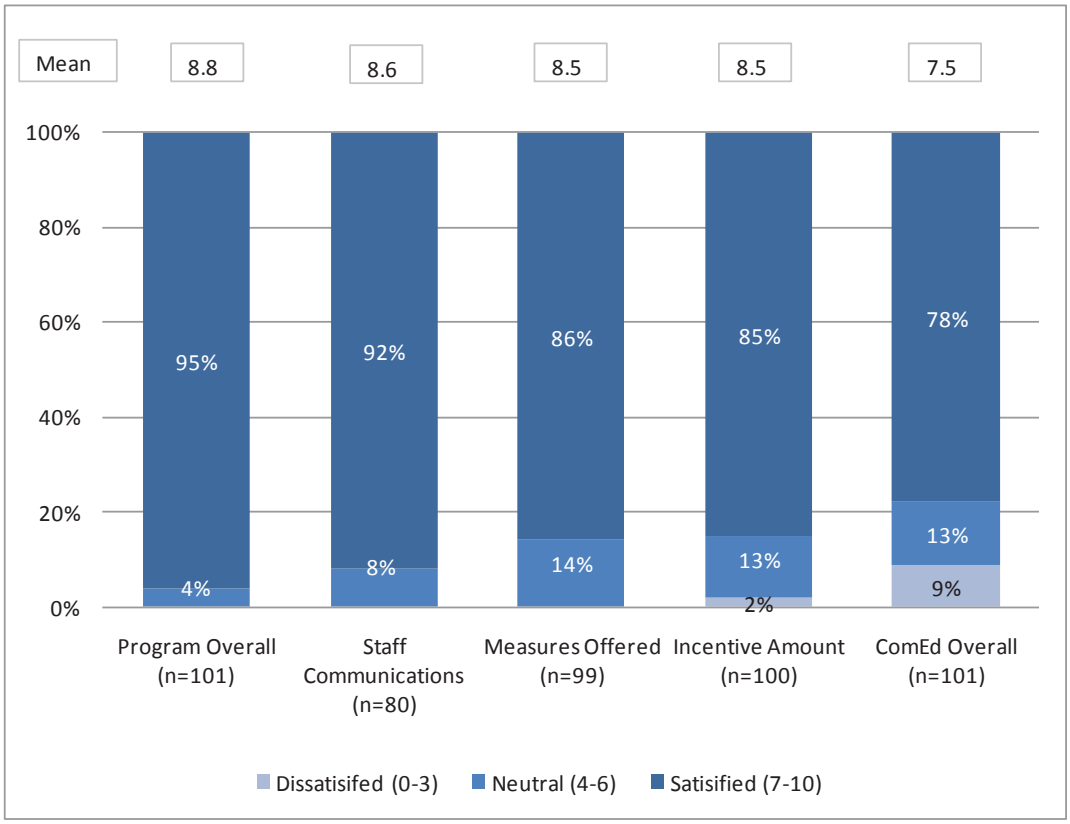
According to the program tracking database, five of the interviewed contractors had limited activity in the Smart Ideas program in PY3, completing less than four projects. However, two of these contractors explained that shared recognition of projects – where they were not acknowledged on the final application – is the reason that they do not have more completed projects on file, despite their active participation in the program. The other three contractors noted that they did not complete more projects because market saturation prevented them from establishing a foothold and because ComEd is a small part of their national reach.

3.2.6 Participant Satisfaction

Customer satisfaction

Participants are satisfied with most aspects of the program. Customers were asked to rate – on a scale of 0 to 10, where 0 means "very dissatisfied" and 10 means "very satisfied" – several aspects of the program. Satisfaction for the program overall is the highest, with 95% of participants indicating that they are satisfied. About 78% of participants are satisfied with ComEd overall.

Figure 3-14. Program Satisfaction



Note: This graph presents valid percentages, i.e., don't know, refused, and not applicable responses are excluded. Individual values may not add up to 100% due to independent rounding.
Source: PY3 CATI Participant Survey.

Satisfaction with all program processes has remained consistently high throughout the three program years. Given the high satisfaction scores, it is not surprising that 67% of participants plan to participate again in the future.

Contractor satisfaction

Almost all contractors (22 of 25) are satisfied with the program. Of the contractors who expressed dissatisfaction, one finds it time consuming to educate customers and participate in the program, and the other, a trade ally, expressed disappointment with the decline in T12 incentives for PY4. Most interviewed contractors note pleasant and knowledgeable interactions with the program staff as the driving force behind their satisfaction. Other points of satisfaction include ease of access to online marketing materials, short processing time associated with their applications, and a high degree of certainty about the expected incentive.

Of the interviewed contractors who offered recommendations for improving the Smart Ideas for Your Business Program, four recommended streamlining the application process and five

recommended increasing incentives. Other recommendations included extending training sessions to the web to include geographically isolated clients, educating designers and architects to design and craft proposals with program incentives in mind, and allowing for shared recognition on applications when projects are completed jointly with other contractors.

3.3 Cost Effectiveness Review

This section addresses the cost effectiveness of the Business Prescriptive program. Cost effectiveness is assessed through the use of the Illinois Total Resource Cost (TRC) test. The Illinois TRC test is defined in the Illinois Power Agency Act SB1592 as follows:

> *'Total resource cost test' or 'TRC test' means a standard that is met if, for an investment in energy efficiency or demand-response measures, the benefit-cost ratio is greater than one. The benefit-cost ratio is the ratio of the net present value of the total benefits of the program to the net present value of the total costs as calculated over the lifetime of the measures. A total resource cost test compares the sum of avoided electric utility costs, representing the benefits that accrue to the system and the participant in the delivery of those efficiency measures, to the sum of all incremental costs of end-use measures that are implemented due to the program (including both utility and participant contributions), plus costs to administer, deliver, and evaluate each demand-side program, to quantify the net savings obtained by substituting the demand-side program for supply resources. In calculating avoided costs of power and energy that an electric utility would otherwise have had to acquire, reasonable estimates shall be included of financial costs likely to be imposed by future regulations and legislation on emissions of greenhouse gases.*[21]

ComEd uses DSMore™ software for the calculation of the Illinois TRC test.[22] The DSMore model accepts information on program parameters such as number of participants, gross savings, free ridership, program costs and CO_2 reductions. It then calculates a TRC that fits the requirements of the Illinois Legislation.

One important feature of the DSMore model is that it performs a probabilistic estimation of future avoided energy costs. It looks at the historical relationship between weather, electric use and prices in the PJM Northern Illinois region and forecasts a range of potential future electric energy prices. The range of future prices is correlated to the range of weather conditions that could occur, and the range of weather is based on weather patterns seen over the historical record. This method captures the impact that extreme weather has on electricity prices. Extreme weather generally results in electricity price spikes and creates a skewed price distribution. High prices are going to be much higher than the average price while low prices are going to be

[21] Illinois Power Agency Act SB1592, pages 7-8.
[22] Demand Side Management Option Risk Evaluator (DSMore) software is developed by Integral Analytics.

only moderately lower than the average. DSMore is able to quantify the weighted benefits of avoiding energy use across years which have this skewed price distribution.

Results

Table 3-21 summarizes the unique inputs used in the DSMore model to assess the TRC ratio for the Business Prescriptive program in PY3. Most of the unique inputs come directly from the evaluation results presented previously in this report. Measure life estimates and program costs come directly from ComEd. All other inputs to the model, such as avoided costs, come from ComEd and are the same for this program and all programs in the ComEd portfolio.

Table 3-21. Inputs to DSMore Model for Business Prescriptive Program

Item	Value Used
Measure Life	12
Utility Administration and Implementation Costs	$7,292,352
Utility Incentive Costs	$20,178,985
Net Participant Costs	$85,359,656

Based on these inputs, the Illinois societal TRC for this program is 1.05 and the program passes the Illinois TRC test.

Section 4. Conclusions and Recommendations

This section highlights the findings, conclusions and recommendations from the PY3 evaluation of ComEd's Smart Ideas for your Business Prescriptive Program. The primary evaluation objectives include quantifying the gross and net energy and demand impacts resulting from the rebated measures and assessing program marketing and delivery. Below are the key conclusions and recommendations.

4.1 Key Impact Findings, Conclusions and Recommendations

In conducting the PY3 Prescriptive program impact evaluation, the evaluation team has drawn a number of conclusions and recommendations that are presented in this section.

Overall Findings

The PY3 Prescriptive impact evaluation estimated that verified gross energy savings were 1 percent higher than savings in ComEd's tracking system, as indicated by the realization rate (realization rate = verified gross / tracking system gross), while verified peak demand impacts were estimated to be 11 percent lower. These realization rates – 1.01 for energy and 0.89 for peak demand – are lower than PY2, where the energy realization rate was estimated to be 1.21 and peak demand was 0.99. The verified net-to-gross ratio (NTGR) for PY3 of 0.72 was slightly lower than the PY2 value of 0.74.

The relative precision at a 90% confidence level for the Prescriptive projects in the sample is ±9% for the kWh realization rate and ±7% for the kW realization rate. The relative precision at a 90% confidence level for the program NTG ratio is ± 5%.

The Prescriptive realization rate for peak demand was 0.89, reflecting primarily the impact of relatively lower demand realization rates for some sampled variable speed drive measures, the removal of HVAC interaction factors on some sampled lighting projects that were not installed in conditioned spaces as assumed in the default value, and baseline adjustments applied to several projects that received on-site verification.

The primary factors lowering the demand realization rates also resulted in lower energy realization rates on individual projects. The primary factor that raised the Prescriptive energy realization to 1.01 was a common finding, through on-site verification and telephone interviews, of longer hours of use than assumed in the default savings. Longer hours of use has a disproportionately greater impact on energy than demand – for example, if an industrial plant is found to operate continuously throughout the year, the energy realization rate will increase by 104% over the default value (8,760 ex post hours / 4,290 ex ante hours), whereas the peak demand realization rate will only increase the coincident-diversity factor by 1% (1.00 ex post / 0.99 ex ante).

In PY3, on-site verification provided 40% of our sample points (36 out of 90). Given the results of PY3, we conclude that the proportion of on-site verification audits in the PY4 sample should be increased relative to the overall sample size, especially in stratum 1 (large projects) that in PY3 exhibited high variability in realization rates. Increasing the proportion of on-site verification audits in our PY4 sample is consistent with our draft PY4 evaluation plan.

Findings

For PY3, ComEd set a goal to achieve 182,106 MWh of energy savings from the combined results of the Business Prescriptive and Custom programs. The Business Prescriptive program contributed to exceeding this energy savings goal by achieving evaluation verified gross energy savings of 260,237 MWh and net energy savings of 188,463 MWh. The PY3 program was delivered at a benefit-cost ratio of 1.05 using the Illinois Total Resource Cost test.

Specific Recommendations

- **ComEd should consider conducting a detailed review and testing of the implementation of the tracking system's handling of variable speed drive projects.** The ex ante impacts for variable speed drives did not match expected values in many instances, and contributed to significant deviations between ex ante and ex post findings on a project by project basis even when the evaluation team agreed with ComEd on the project details. Since there were a number of evaluator recommendations regarding VSDs in PY3 and ComEd has acted upon some of them since closing out PY3 projects, the evaluation team will assist ComEd in this effort in PY4 by producing updated recommendations and guidance for addressing VSD applications.

- **ComEd should consider working with the evaluation team to review PY3 site M&V and telephone survey data to identify potential refinements to default values that may be applied to PY5.** Measures that weight baseline scenarios of wide variation into a single average, such as permanent lamp removal, contributed to significant deviations between ex ante and ex post findings even when default values were properly applied.

- **ComEd should consider placing tight restrictions on new construction projects admitted into the Prescriptive program, such as restricting maximum motor horsepower size for VSD measures.** On four of nine variable speed drive measures claimed in a sampled new construction project, those involving larger motors 50 horsepower and above, the evaluation concluded that system design and final control strategy, as implemented by the customer, did not produce savings beyond code requirements. This resulted in a significant reduction in energy and demand impacts for the project.

- **When ComEd is adding a new end-use or new measure types to an existing end use, consider alerting the evaluation team who may need to revise data handling routines.**

- **During PY4, prior to closing out year-end ex ante savings estimates, ComEd should consider working with the evaluation team to review multiple factors that can affect ex ante savings.** The evaluat**ion team can review default lookup values coded into the tracking system and check the values against the default values documentation, and advise ComEd on any dif**ferences. We identified several HVAC and refrigeration measures that appear to have default values programmed into the tracking system that differ from documented values. The evaluation team could also review the output of changes to ex ante calculations that are made in the tracking system.

- **ComEd should consider investigating customer satisfaction with light levels and consider strategies to reduce under-lit designs if dissatisfaction is common.** Seven of 79 respondents in the CATI survey reported that they installed additional lighting fixtures in the same space at a later time to increase the amount of lighting. This is a significant increase over PY2 (one of 27 respondents added fixtures). Respondents added an additional 26, 24, 15, 12, 8, 4, or 2 fixtures making a total of 91 additional "New T5/T8 fixtures". ComEd indicates they have taken steps to identify potential under-lit designs in the pre-approval stage and contact those customers to make them aware of the potential for lighting level reductions.

- **ComEd should consider discussing their experiences with potential spillover candidates and projects with the evaluation team.** The Prescriptive evaluation team will be conducting an enhanced effort to identify potential spillover candidates and quantify spillover in PY4. Spillover effects identified through the participant telephone survey in PY3 were relatively small, with only 3 of 100 telephone respondents in the survey mentioning pursuing a total of 5 projects (two VSDs, two T5s, one CFLs) where a strong influence was indicated for the ComEd program. The three respondents were not in the impact sample and the potential savings could not be quantified from the telephone responses. Although spillover effects identified in the participant telephone survey were relatively small, an increase in net-to-gross ratio due to spillover for the Prescriptive program of one or two percent would appear possible, if it could be quantified and verified. In PY3, one percent of Prescriptive verified gross impacts amounts to 2.6 million kWh. If participant spillover can be reliably characterized and quantified, it may be possible for ComEd to develop strategies to encourage it.

4.2 Key Process Conclusions, Findings and Recommendations

Finding. The PY3 program was delivered effectively, as indicated by process evaluation findings that participants were satisfied with most aspects of the program. Satisfaction for the program overall was highest, with 95% of PY3 customer participants surveyed indicating that they are satisfied. Almost all contractors (22 of 25 interviewed) were satisfied with the program. ComEd should consider the impact and process-related recommendations in this evaluation report to improve upon these results in future years.

Program Participation

Finding. Although participation levels doubled in PY3, energy savings only increased by 20%. PY3 projects were, on average, much smaller than PY2 projects (68,104 kWh per project in PY3 compared to 122,784 per project in PY2).

Finding. The medical and lodging sectors have experienced stagnant participation growth, but they have had relatively high per project savings. The medical sector, in particular, had three of the 10 largest PY3 projects and the highest average PY3 savings, generating over 200,000 kWh per project.

- **Recommendation:** Consider special offerings for sectors with limited participation but high savings potential. Hard-to-engage industries with high savings potential might benefit from special offerings to encourage more participation. Such an approach has been successfully employed by other utility programs, e.g., through targeted RFP programs that have packaged prescriptive and custom measures into one comprehensive offering. Further research might be required to identify industries to target for special promotions and identify their specific barriers to participation.

Finding. Relative to lighting, savings from non-lighting measures have increased substantially. In addition, the average size of lighting projects has declined significantly from PY1 and PY2 levels. In contrast, the size of prescriptive HVAC projects has increased since PY2, and the introduction of food service equipment generated six projects that had the highest average savings in PY3.

- **Recommendation:** Consider offering special promotions for non-lighting measures. While lighting projects will continue to be critical to the success of the program, the program should consider offering special promotions for non-lighting measures (if cost effective) to further encourage their implementation.

Finding. Eleven percent of surveyed Prescriptive Program participants noted that the scope of their project was limited by the incentive cap.

- **Recommendation:** Consider removing or increasing incentive caps. This may help in bringing in larger prescriptive projects and meeting increasing savings goals. ComEd has raised the per-premise cap from $400,000 in PY3 to $1,000,000 in PY4.

Participant Satisfaction

Finding. Participants and contractors are satisfied with the program. The highest participant satisfaction was with the program overall and staff communications. Sixty-seven percent of PY3 participants plan to participate again in the future. Contractors noted the helpfulness of KEMA staff and their responsiveness to inquiries. Other points of satisfaction include ease of access to

online marketing materials, short application processing time, and a high degree of certainty about the expected incentive.

Trade Ally Network

Finding. A smaller share of prescriptive projects was implemented with contractor support in PY3 (76% compared to 86% in PY2 and 92% in PY1). This trend closely mirrors the decreasing average project size since program inception and reflects the fact that contractor-implemented projects tend to be larger than those implemented without a contractor (79,000 kWh compared to 35,000 kWh).

Finding. Most interviewed contractors indicated that the Smart Ideas for Your Business Program influenced their business. Reported effects of the program include increased sales, changes in the type of equipment they supply and sell, changes in their marketing practices, and hiring additional staff.

Finding. The requirements and benefits of becoming a ComEd trade ally do not always seem to be communicated well to contractors. Interviewed non-trade allies were generally not aware of the benefits of the trade ally designation.

- **Recommendation:** Attempt to enhance and better communicate the benefits of becoming a registered trade ally. By offering additional benefits, such as more co-branding opportunities, more contractors may be enticed to register with the program.

Finding. PY3 marked the introduction of the new trade ally requirements. While most interviewed trade allies saw no problems with these requirements, active non-trade allies most often cite the time burden of attending the training in person as the main reason for not becoming a trade ally.

- **Recommendation:** Consider options to reduce the time-burden of Basic Training. The program should consider options such as offering a limited number of trainings via a web portal or in locations other than the KEMA office in Wheaton. This will allow more contractors to take advantage of the training opportunities and would reduce a barrier to becoming a trade ally.

Trade Ally Bonus

Finding. Only 11 of the 25 interviewed trade allies were aware of the bonus, all but one of them trade allies. However, some of the interviewed non-trade ally contractors expressed interest in the bonus offering and indicated that they would have increased promotion of the program had they been aware of the offering.

- **Recommendation:** Consider increasing the promotion of the trade ally bonus. By leaving interested contractors unaware, the program might have missed opportunities to attract more large projects.

Finding. Additional research into bonuses offered by Ameren Illinois and other utilities found that apart from the bonus structure, strong communication and clear expectations are crucial to the success of such an effort.

- **Recommendation:** The Smart Ideas program has already modified its bonus offering for PY4, adopting a two-tiered system modeled after Ameren Illinois' trade ally incentive structure. The program should strive to communicate the modified bonus program early and clearly to both trade allies and non-ally contractors, and provide sufficient lead time for contractors to increase their promotion and take advantage of the offering to the fullest extent.

Program Outreach and Marketing

Finding. Marketing and outreach increased substantially in PY3. The marketing plan for PY3 included trigger tactics that were initiated throughout the program year. Initial tactics included several low or no cost measures such as targeted outreach to customer groups (e.g., trade associations) and customers who attended the Energy Efficiency Expo, following up on leads from PY1 and PY2, increasing the frequency of the electronic newsletter, and a direct mailing to larger customers. As a result of the increased marketing, 32% of Prescriptive participants recall having been directly contacted by ComEd or KEMA.

Finding. Lack of program awareness is still a key barrier to participation in the Smart Ideas program. In addition, reaching the correct decision-maker is a major hurdle both in increasing awareness of the program and encouraging participation. However, opportunities to increase participation in the Smart Ideas program among current non-participants exist. Almost two-thirds of non-participants indicate that there have been installations of equipment, or other upgrades, at their facility in the past three years. Despite the economic climate, customers are active in installing new equipment and have an interest in energy efficiency. This presents an opportunity for the program to encourage customers to install equipment that will meet the standards of the Smart Ideas program and further increase its participant base.

- **Recommendation:** The program should attempt to develop a more targeted database of energy decision makers at their larger customers. To start this database, Account Managers could be engaged to provide decision maker contact information for each of their managed accounts.

Finding. Many of the participants receiving a bonus incentive on their lighting project reported that they likely would have implemented the same project without the bonus amount.

Account Managers

Finding. All interviewed Account Managers were generally receptive to the introduction of new Smart Ideas goals for Account Managers. They thought the goals were both realistic and achievable. While interviewed Account Managers generally found their new Smart Ideas goals reasonable, several noted that it would become increasingly difficult to recruit their customers to the Energy Efficiency Expo, if largely similar information was provided.

- **Recommendation:** Consider offering new attractions for future Energy Efficiency Expos. The program should find ways to keep the Expo attractive for returning customers and reflect that in outreach efforts, or consider adjusting Account Manager goals with respect to Expo recruitment.

Finding. No formal process for tracking customer leads exists in the Smart Ideas Program. However, interviewed Account Managers indicated that such a system would be a useful tool for Account Managers and Smart Ideas staff alike. ComEd indicates systems are under development.

- **Recommendation:** The program should implement a more formal system of tracking leads, especially among large managed accounts. This would facilitate more coordinated follow-up by program staff and could also help in building a more useful marketing database for targeted outreach towards large customers.