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Energy Efficiency / Demand Response Plan: Plan Year 2 (6/1/2009-5/31/2010)

Evaluation Report: Community Energy Challenge

Presented to

Commonwealth Edison Company

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Presented by

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Section E. Executive Summary

This report by Navigant Consulting, Inc. presents an evaluation of Commonwealth Edison's Community Energy Challenge (CEC) pilot program of 2009-10. This evaluation combines impact evaluation and process evaluation.

E.1 Program Description

The 2009 ComEd Community Energy Challenge (CEC) was a one-year pilot program designed to test whether or not ComEd could ally with municipal governments to expand energy efficiency program participation, particularly among hard-to-reach populations.

ComEd selected Shaw Environmental & Infrastructure, Inc. to design and implement the 2009 CEC pilot program. With Shaw's support, nine municipalities designed their own individual municipal energy plans to reduce the amount of energy used by municipal operations, residents, and businesses while achieving complementary community objectives. Municipalities were encouraged to make use of the existing ComEd energy efficiency programs in their plans.

The pilot was designed as a competition between municipalities. The highest-ranked municipal energy plan, according to both the content of the energy plan and the ability of the municipality to implement the plan, received a cash award of $100,000 from ComEd. The winning community for the 2009 CEC pilot program was the Village of Schaumburg, IL.

E.2 Evaluation Objectives

The focus of this evaluation is how the pilot assisted ComEd in achieving their goal of increased electric energy efficiency. While the CEC had broad goals (such as sustainability, water conservation, job creation, etc.) to stimulate community participation, this evaluation looks only at the impact of the pilot on creation of electric energy savings. A key area of interest is an assessment of how electric savings in these communities compares to the electric savings that would have been expected from ComEd's regular portfolio of energy efficiency programs without the addition of the CEC activities. Electric energy savings that are the result of other funding sources, such as the Illinois Department of Commerce and Economic Opportunity's municipal building energy efficiency program, are not included in this evaluation.

The three major objectives of the evaluation are to:

1) Quantify net savings impacts from the CEC/ComEd programs during program year 2009 (June 2009 to May 2010);
2) Determine key process-related program strengths and weaknesses and identify ways in which the program can be improved; and

3) Assess the effectiveness of the program in bringing hard-to-reach customers into an efficiency related program activity.

E.3 Evaluation Methods

This study used a combination of evaluation methods to meet the evaluation objectives.

- Billing history from the ComEd customer information system, as well as participation data from their energy efficiency program tracking system, was used to analyze program impacts on energy use and participation rates.
- A total of 185 phone surveys were conducted with CEC residents who participated in ComEd programs to determine free ridership and assess process-related questions.
- Another 815 phone surveys were completed with CEC residents who did not participate in ComEd programs. At least 67 of these phone surveys were conducted in each municipality to assess the reach of CEC into each individual community.
- In-depth interviews were conducted with 27 stakeholders in the CEC program, including at least one program leader from each participating municipality.

Results from all of these evaluation methods were combined to answer the evaluation questions from multiple perspectives.

E.4 Quantified Net Savings Impacts

ComEd program savings impacts are normally reported at two levels: 1) Evaluation-adjusted Gross, and 2) Net of Free Riders. For the CEC evaluation, a third level is needed: 3) Net of Other ComEd Programs. The Gross Realization Rate converts gross savings from the program tracking database into evaluation-adjusted gross savings. The Net to Gross Ratio converts evaluation-adjusted gross savings into evaluation-adjusted net savings. It represents the combined effect of free ridership and spillover. In addition to these ratios, investigation was done to see if program participation rates increased in CEC communities and whether or not average energy savings per customer increased outside of the specific program areas. These were the "Net of other ComEd Programs" factors.

Table E-1 presents a high-level summary of what was learned about how the CEC program affected each of these factors for the ComEd programs of interest. All 'Regular Program' factors in this table come from the PY2 evaluation reports for the individual programs.

Table E-1. Summary of CEC Impact Factors

	Smart Ideas for Your Business	MF All-Elec Effic Upgrade	Appliance Recycling	Energy Star Lighting
GROSS REALIZATION RATE				
Regular Program	1.21	0.96	0.85	0.80
CEC	1.21	0.96	0.85	0.80
Different?	No	No	No	No
NET TO GROSS RATIO				
Regular Program	0.74	0.78	0.75	0.58
CEC	0.65	0.97	0.75	0.58
Different?	Yes	Yes	No	No
NET OF OTHER COMED PROGRAMS				
CEC increased participation rates?	Yes	Yes	No	No
CEC increased community energy savings outside of ComEd programs?	No	No	No	No

Source: Navigant Consulting analysis

The table shows that no differences were found in the Gross Realization Rates for CEC communities in any of the programs. This means that program-reported gross savings were equally reliable both in CEC and non-CEC communities. The CEC program did not have any impact on how the gross savings were tracked.

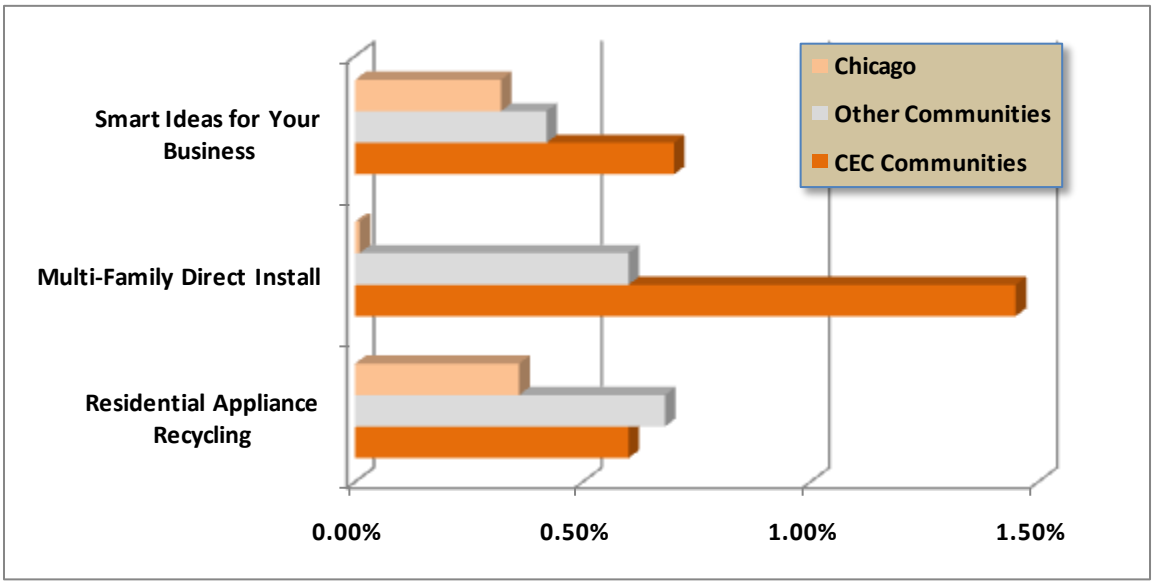
The story is different when looking at the Net To Gross Ratios. Free ridership was found to be higher in the CEC communities for the SIYB program,[1] while spillover was found to be higher in Carol Stream for the MF Efficiency Upgrade program. It is clear that Carol Stream participants in the MF Direct Install program went out and bought more CFLs on their own, and they also bought more CFLs per person than other ComEd MF Direct Install participants.

As for effect on participation rates, it was found that the CEC program was successful at increasing participation rates in the SIYB and MF Efficiency Upgrade programs. Figure E-1

[1]

shows that the participation rate for the SIYB program was 0.70% in CEC communities, compared to 0.32% in Chicago and 0.42% in other comparable non-CEC communities.[2]

Figure E-1. Participation Rates for ComEd EE Programs in CEC Communities



Source: Navigant Consulting analysis

Similarly, the same figure shows that the participation rate for the MF Direct Install program was more than double in CEC communities. The CEC communities achieved a participation rate of 1.45%, compared to 0.60% for other comparable non-CEC communities and zero for Chicago.

No difference was found in the participation rate for the Residential Appliance Recycling program in CEC communities.

Billing data from the year before the CEC pilot and the year during the pilot was analyzed to see if there were any overall electric energy savings outside of ComEd programs. There was no identifiable reduction in average energy consumption in CEC communities during the pilot compared to other non-CEC communities. It should be noted that it would be very difficult to achieve a significant reduction in average customer electric energy use outside of the ComEd programs in the first year of the CEC. For example, many customers in CEC communities

[2] It must be noted, however, that funding for the SIYB program ran out before the end of the program year with special funds set-aside for the CEC pilot. This undoubtedly contributed to holding down participation in the non-CEC communities. Even so, the CEC communities have demonstrated that they can bring in local businesses to the SIYB program.

signed-up for the Energy Star Pledge, but those commitments were made throughout the year and actions taken by the customers would create only partial-year energy savings. It is likely that this type of reduction in average energy use outside of ComEd programs will only be observable after several years of continued CEC activity in a community.

E.5 Process Evaluation Key Findings

Process evaluation results come from two sources: stakeholder interviews and customer surveys. The key findings from the process evaluation include:

- The Community Energy Challenge (CEC) was successful in terms of drawing community leader attention to the prospects and benefits of improved energy efficiency.

- Overall, communities were able to develop and implement some unique strategies to engage their businesses and residents. With more time, experience and resources, it is likely that local governments could discover additional innovative methods for recruiting customers to energy efficiency.

- Nearly 40 percent of residential customers surveyed reported an increase in favorability for ComEd due to ComEd's participation in the CEC. Even more (43% of 611) reported that their satisfaction with local government increased because of the government's involvement in CEC.

- Several municipalities reported that they intended to continue to promote ComEd energy efficiency programs continuously as part of outreach efforts created or bolstered by the CEC. The CEC was not billed as a "market transformation" project, but this sentiment indicates that the CEC investment will accrue benefits over a period of years. Spillover effects are expected.

- While community government leaders concluded the Community Energy Challenge pilot year with praise for ComEd's effort, the elected leaders revealed that their local governments suffered in the economic downturn in revenues and budgets. Thus, they were unable to deliver support at levels projected at the start of the Community Energy Challenge.

- The severity of the economic recession in CEC communities was measured by surveys conducted for this program evaluation. One-third of 611 residential households reported major economic setbacks since 2007, including job loss, wage cuts, home foreclosure or business foreclosure. Forty percent of 204 small business

customers acknowledged a drop in business activity since 2007, resulting in layoffs, encouragement of early retirements, changes in credit allowed customers, reduced hours of operation, or closed offices.

- Surveys of residential customers reveal a diversity of cultural patterns among the nine CEC communities with significant and direct impact on potential energy efficiency program participation. Some communities, such as Carol Stream and Evanston, have residents whose energy literacy is higher than others, such as Orland Park and Aurora. For example, perceived community recognition of the societal benefits of energy efficiency is high in the former and relatively lower in the latter.

- The process of ComEd partnering with local governments can be improved with earlier engagement and longer-term involvement. Local governments found that the CEC timeline did not align well with local government calendars for budgeting proposals, review and decision-making.

- The primary reasons that interview respondents reported for participating in the CEC were saving energy, saving water, creating a community energy plan or a sustainability plan; and public recognition for energy efficiency or green initiatives.

- Opinion was divided on the contest aspect of the CEC. Some communities reported that the idea of competing against each other to save energy was a motivating factor in accepting the challenge. However, other communities reported that the competition was a barrier to sharing information when formulating their energy plans and implementing the plans. Some municipal stakeholders responded that the CEC program design (e.g., a challenge, or having communities compete against each other) was contrary to typical ways in which the selected municipal governments typically operate.

- Many local government stakeholders offered unsolicited suggestions that the grant distribution process of the Illinois Department of Commerce and Economic Opportunity needs improvement. Navigant Consulting was not asked and did not assume responsibility for analyzing the performance of DCEO, so this finding is merely documented for consideration by any ComEd or regulatory authorities. We do not confirm nor deny the claims, but our work might be considered negligent if we did not mention it as a factor in the minds of stakeholders. For the sake of fairness to DCEO, it should be regarded as hearsay and not evidence that the purported difficulties affected the CEC.

E.6 Reaching Hard-to-Reach Customers

One of ComEd's goals for the CEC pilot was to investigate if communities could be used to engage traditionally hard-to-reach customer segments and get them to participate in ComEd programs. Many communities developed plans for reaching out to small businesses and/or multi-family buildings. Two communities went beyond these traditional hard-to-reach groups and identified hard-to-reach ethnic groups. Aurora identified a lower-income section of the city where Latino customers were dominant. Schaumburg identified a business section where South Asian business managers were common.

Data has already been presented which shows that CEC communities were very successful at encouraging **multi-family** building operators to participate in the Multi-Family Direct Install program. For example, Carol Stream gave Honeywell and ComEd help identifying all-electric multi-family buildings in their city and then recruiting those customers.

Some communities developed successful strategies for encouraging **small businesses** to participate in the SIYB program. For example, Evanston partnered with Northwestern University and local trade allies to train students to do energy audits for small businesses and help them fill out SIYB applications. We have already seen that the CEC communities were able to increase overall participation in the SIYB program. Looking at non-CEC communities, 15% of SIYB participants were small businesses. Using the strategy described above, Evanston was able to increase small business customers to 21% of their SIYB participation.

As for being able to increase program participation in particular **ethnic** customer segments, while a few communities made efforts in this area, it is not possible based on the pilot program to accept or reject this possibility. There was insufficient data available to make this determination. More attention would need to be given to collecting customer information regarding primary language, tenure as a resident in Illinois, and other demographics and firmographics in order to identify and monitor participation of hard-to-reach ethnic populations in both the residential and business sectors. This type of information would be needed in both the ComEd customer database and the EEDR program tracking database.

E.7 Recommendations

The following recommendations come from findings in both the impact and process evaluations. It should be noted that some of these recommendations may have already been anticipated and responded to by Shaw and/or ComEd since they were in close contact with the municipalities throughout the process. The fact that a recommendation is listed here indicates that it is based on findings from the independent evaluation process which took place over many months. All stakeholder interviews were conducted before the end of the pilot.

The following recommendations come from review of the findings in the impact evaluation. They relate both to improving actual energy efficiency impacts from ComEd program participation, and to improving the evaluation methods themselves in future CEC efforts.

1) Continue encouragement of unique community strategies for engaging business customers in the ComEd SIYB and MF Direct Install programs since CEC proved very effective for increasing participation in these programs.
2) Encourage communities to expand these efforts to residential customer programs like Appliance Recycling.
3) Continue to use communities to engage traditionally hard-to-reach customer segments since it has proven to be a successful strategy for encouraging small business and multi-family building operators to participate in ComEd programs.
4) Expand this effort to reach out to hard-to-reach ethnic customer segments, and collect the data needed to evaluate results.
5) Share Evanston's successful method for encouraging small businesses to participate in SIYB.
6) Share Carol Stream's successful method for encouraging multi-family building operators to participate in the MF Direct Install program.
    a) Investigate what component of that delivery may have encouraged participants to go out and invest in more CFL bulbs on their own.
7) Eliminate verification of the gross realization rate in future evaluations if it can reduce evaluation cost since this study proved the CEC program had no influence on that factor.
8) Reduce actual free ridership in the SIYB program in CEC communities and improve measurement of free ridership with the following steps:
    a) Emphasize that municipalities continue to find new energy efficiency opportunities in businesses and steer clear of reporting opportunities that are already planned.
    b) Provide more information on specific energy efficiency measures to the communities for them to use in their local campaigns with businesses.
    c) Adjust the responses to the program influence questions in the evaluation survey to include a specific option for citing CEC activities. This would likely contribute to a greater NTGR for the program.

The recommendations from our process evaluation are based upon research into the specifics of the ComEd CEC program but also on research on other community energy challenge programs. We reach rather broadly in our recommendations to provide fodder for discussion during deliberations on the future shape of the CEC program.

Eight process improvement recommendations are offered for consideration:

1) Engage stakeholders earlier
2) Leverage core competencies
3) Identify additional resources for outreach
4) Simplify the planning and scoring phase

5) Celebrate successful projects and community participation
6) Implement a strategy of continuous improvement
7) Collect data on non-participants of EEDR programs
8) Incorporate non-English communications for EEDR

More detail on each of these process recommendations can be found in the final section of this report.

Section 1. Introduction

This introduction will present a description of the ComEd Community Energy Challenge pilot, followed by a summary of the evaluation objectives for this report.

Program Description

The 2009 ComEd Community Energy Challenge (CEC) was a one-year pilot program designed to test whether or not ComEd could ally with municipal governments to expand EEDR program participation, particularly among hard-to-reach populations. Implicitly, such a partnership would have to perform in a cost-effective manner to achieve electric energy efficiency goals.

ComEd selected Shaw Environmental & Infrastructure, Inc. (also referred to as The Shaw Group[3]) to design and implement the 2009 CEC pilot program. The pilot encouraged local municipalities to develop individual energy plans and implement energy efficiency projects using existing ComEd energy efficiency programs.

The 2009 CEC pilot program was sponsored by ComEd in cooperation with the Illinois Department of Commerce and Economic Opportunity (DCEO) and the Metropolitan Mayors Caucus. The pilot program offered participating municipalities the opportunity to implement projects identified in their energy plans using financial incentives reserved through ComEd energy efficiency programs, reserved DCEO funding and technical resources delivered by the program implementer, Shaw Environmental & Infrastructure Group. Funding for local government energy projects also came from "the Stimulus Bill" (American Recovery and Reinvestment Act of 2009), but the impact and handling of those funds was not part of this evaluation.

ComEd invited 12 municipalities in its service territory to participate in the 2009 CEC pilot program. Shaw Environmental identified the communities to invite to the 2009 CEC pilot program based on a demonstrated commitment to leadership in energy and environmental issues. This commitment was measured by actions such as supporting the Metropolitan Mayors Caucus' Greenest Region Compact, building LEED-certified buildings, adopting advanced energy codes, and developing local climate action and sustainability plans.

The 12 municipalities were asked to design individual municipal energy plans to reduce the amount of energy used by municipal operations, residents, and businesses while achieving complementary community objectives. The implementation period of the municipal energy

[3] Shaw Environmental and Infrastructure, Inc. is a wholly-owned subsidiary of The Shaw Group, a Fortune 500 company providing engineering, energy, construction, fabrication, industrial and environmental services.

plans was June 1, 2009 to May 31, 2010, corresponding to ComEd EEPS Program Year 2. Nine of the 12 communities successfully completed the 2009 CEC pilot program.

The nine communities which completed the 2009 CEC pilot program are shown below, along with their population from Census 2000:

- City of Aurora (pop. 170,617)
- Village of Carol Stream (pop. 40,067)
- City of Elgin (pop. 101,903)
- City of Evanston (pop. 75,543)
- Village of Hoffman Estates (pop. 52,479)
- Village of Oak Park (pop. 50,272)
- Village of Orland Park (pop. 55,520)
- City of Schaumburg (pop. 72,690)
- Village of Wilmette (pop. 26,737)

Two of the invited communities (Northbrook and Palatine) declined the opportunity to participate. One community (Highland Park) accepted the invitation but had to drop out at mid-year due to the loss of personnel.

Historically, community-based projects originate when individuals start acting and encourage neighbors to join. Elementary school textbooks tell of Jane Addams and her community organizing in Chicago to deal with 1890s poverty relief. The Community Energy Challenge taps images at the surface of Chicagoland's cultural memory. A recent example is Chicago's own Center for Neighborhood Technology, a nationally-recognized non-profit that has worked with ComEd to test and promote real-time pricing for residential customers since 2000. Please see Appendix A for additional information, including a brief history and literature review of community based energy programs.

The competition evaluated and ranked municipal energy plans and subsequent implementation based on both quantitative and qualitative factors as defined in the Municipal Energy Plan Scoring Criteria document developed by Shaw Environmental. The quantitative ranking included total energy savings resulting from qualified energy efficiency projects completed during the implementation period. The qualitative credits were optional for municipalities to include in their municipal energy plans; however, plans with more qualitative credits scored higher than plans that did not include these factors.

Qualitative credits included:

- Total Greenhouse Gas (GHG) Emission Reduction
- Water Savings

- Municipal Authority to Promote Energy Efficiency
- Assisting ComEd to Deliver Incentives to Hard-to-Reach Customers
- Transforming the Market
- Demonstrating Superior Cost-Effectiveness in the Delivery of Incentives
- Creating Green Jobs

The Municipal Energy Plans and subsequent energy savings from project implementation were evaluated and ranked by an independent panel of experts in June 2010. The highest-ranked municipal energy plan, according to both the content of the energy plan and the ability of the municipality to implement the plan, received a cash award of $100,000 from ComEd. The winning community for the 2009 CEC pilot program was the Village of Schaumburg, IL.

The Municipal Energy Plans were scored according to the following criteria:

- Initial Plan Design 20%
- Total Energy Savings 50%
- Qualitative (Optional) Credits 30%

Table 1-1 presents a timeline of major events that occurred during the CEC pilot. Some are steps taken within the pilot; others are events which affected the pilot development and outcome.

Table 1-1. Timeline of Major Events Related to Community Energy Challenge Pilot

Date	Event
June 2007	Illinois legislation – Public Act 95-0481 – created a new section of the Illinois Utilities Public Act, which set forth new energy efficiency and demand response goals, mandating spending in the first year of $39.4 million and increasing spending to $126.7 million by the third year.
June 2008	ComEd signs contract with Shaw Environmental and Infrastructure, Inc. to manage a pilot community energy project.
July 2008	ComEd invites 12 suburban Chicago local governments to participate. Response is better than expected, ten of 12 invitees initially accept the challenge.
Sept 2008	Wall Street meltdown starts economic recession, though at the time it is highly uncertain how long the downturn would last.
Nov 2008	Kick-off with charrette involving mayors and city administrators from interested candidate municipalities.
Feb – April 2009	Feedback from planning charrette leads to identification of CEC strategies by each local government.
June 1, 2009	Start of the program year for purposes of outcome tracking.
Dec 2009	Highland Park withdraws from CEC participation in pilot due to internal staffing changes.
Feb 2010	Incentive funds for C&I projects in ComEd are exhausted due to heavy demand pressure; hundreds of applications are put on hold. Some funds are reserved for CEC communities.
May 31, 2010	Close of program year for purposes of outcome tracking
July 2010	Schaumburg is announced the winner of the CEC pilot prize competition.

Source: Navigant Consulting analysis.

Evaluation Objectives

The focus of this evaluation is how the pilot assisted ComEd in achieving their goal of increased electric energy efficiency. While the CEC had broad goals (such as sustainability, water conservation, job creation, etc.) to stimulate community participation, this evaluation looks only at the impact of the pilot on creation of electric energy savings. A key area of interest is an assessment of how electric savings in these communities compares to the electric savings that would have been expected from ComEd's regular portfolio of energy efficiency programs without the addition of the CEC activities. Electric energy savings that are the result of other

funding sources, such as the Illinois Department of Commerce and Economic Opportunity's municipal building energy efficiency program, are not included in this evaluation.

It is not the goal of this evaluation to judge or second-guess the scoring algorithm used by ComEd for determination of the winning community. The scoring algorithm is part of the program design and its primary purpose is to stimulate participant action. It uses a very broad set of criteria. The goal of this evaluation is to report if and how the overall program design of a competition and community involvement stimulated electric energy savings across all communities.

The three major objectives of the evaluation are to: (1) quantify net savings impacts from the CEC/ComEd programs during program year 2009 (June 2009 to May 2010); (2) determine key process-related program strengths and weaknesses and identify ways in which the program can be improved; and (3) assess the effectiveness of the program in bringing hard-to-reach participants into an efficiency related program activity.

Following is the list of detailed evaluation questions that were developed as part of the evaluation plan. These questions guided the development of the evaluation methodology.

Impact Evaluation Questions

1. Were the gross impacts reported by the municipalities achieved? What were the realization rates? (Defined as evaluation-adjusted gross savings divided by program-reported gross savings.)

2. What are the net impacts from this program? Net impacts will be expressed in two ways:
   - Net of free riders – participants who would have implemented the measure without the CEC and without other ComEd programs.
   - Net of other ComEd programs – participants whose efficiency implementation was influenced by the regular ComEd energy efficiency programs, but not by the approaches that were unique to the CEC program.

3. Did the program successfully recruit hard-to-reach populations? Which ones? (This is part of the "Net of the CEC program" issue from above.)

4. Did the individual municipalities meet their energy savings goals?

5. What are the normalized energy savings by municipality? What are alternative ways of normalizing the energy savings so that community results can be compared on an even footing?

Process Evaluation Questions

Marketing and Participation

6. Which strategies proved effective for recruiting participants and which did not?

7. Which strategies proved effective for recruiting hard-to-reach populations and which did not?

8. Is the program outreach to customers effective in increasing awareness of the Community program and other ComEd programs?
   - What is the format of the outreach?
   - What channels is the outreach using?
   - How often does the outreach occur?
   - Are the messages within the outreach clear and actionable?
   - What is the type of support that the program is giving the municipalities and is it sufficient?

9. How did customers become aware of the program? How did trade allies become aware of the program? How did customers become aware of ComEd's other program offerings? What marketing strategies could be used to boost program awareness?

10. Did the characteristics of the smart meter pilot help attract participants?

Program Characteristics and Barriers

11. After the planning phase, did the communities (and any cooperating community organizations) follow through on their planned activities? If not, why not? What characteristics of the communities or the plans were correlated with success or failure to follow through?

12. What are the characteristics of the customers, the participating municipalities, and any community organizations that facilitated the process? Who should have been more involved but was not, and how can the program increase their involvement?

13. What was the municipal-level program theory as expressed in the planning documents? What was the program theory as evidenced by how the program was actually implemented? How did the two differ? Were there disconnects in the theory that affected program implementation or success?

14. What are the barriers to program participation?

Administration and Delivery

15. How did the program evolve through the year? Why? Were the changes beneficial?

16. What challenges have occurred in implementation and how were they handled?

17. Are the program processes effective for smoothly providing incentives to customers and encouraging the municipalities to actively engage in the program?
    - Have the participation processes and program requirements been clearly explained to all involved?
    - What are the expectations of the municipalities and are they fulfilling those roles?
    - What suggestions do the municipalities have about the current program design and do they have any recommendations for improvement?
    - Are customers and municipal leaders satisfied with the program processes in which they were involved?
    - Do the communities perceive any part of the process to be onerous?
    - What type of follow up is provided to municipalities to assure that things are moving along and on-track?
    - Did the program have any impact on customer satisfaction with ComEd?

18. What areas could the program improve to create a more effective program for customers and municipalities and to help increase the energy impacts?

19. Is the program screening projects for likelihood of implementation and/or validation of the baseline to assure that the program obtains the expected net impacts?

Section 2. Evaluation Methods

For the Community Energy Challenge evaluation, the Navigant Consulting team used a wide variety of evaluation methods which included literature reviews, in-depth interviews, field surveys of both program participants and the general community populations, and quantitative analysis of program tracking data and customer billing data. These methods contribute to both the impact and process evaluations.

Impact Evaluation Methods

The impact evaluation methodology addresses a wide range of issues related to quantification of the electric energy savings that were a result of the CEC pilot. It starts with repetition of the impact evaluation steps that are regularly performed as part of the evaluation of ComEd's standard portfolio of energy efficiency programs. This includes the estimation of gross program savings and net program savings. An additional unique step is then added for evaluation of the CEC pilot – the estimation of additional savings that occurred in participating communities in response to the CEC activities. The rest of this section will describe these impact evaluation methods in more detail.

Gross Program Savings

When evaluating ComEd's regular energy efficiency programs, the evaluation, measurement, and verification (EM&V) team adjusts program-reported gross savings to calculate *evaluation-adjusted gross* by examining installation rates, baseline conditions, and operating parameters, and by verifying that the installed equipment matches the program-reported equipment. The gross realization rates are calculated as:

$$\frac{\textit{Evaluation-adjusted Gross kWh}}{\textit{Program-Reported Gross kWh}}$$

Since all reported savings for the CEC pilot are contained within the regular ComEd programs, it would be possible to use the gross realization rates reported for each of those programs to develop evaluation-adjusted gross kWh savings for the CEC pilot. However, it is possible that the unique program delivery approaches under this pilot have an effect on the factors that go into the evaluation-adjusted gross realization rate. As a result, separate surveys were done for the largest CEC programs to verify the gross realization rates used for the regular programs that they were a part of.

Survey verification for the CEC pilot focused on those issues that were believed to be more likely to vary because of the program delivery approach and not on those things that were

likely to be the same as the regular programs. Thus, through the participant surveys, we focused on:

» Verifying installation quantities; and
» Verifying as-installed equipment matches program records.

We did not address equipment operating conditions such as hours of operation, refrigerant charge, installation quality, etc. which are unlikely to vary because of the CEC program delivery approach.

Net Program Savings – Net of Free Riders

It seems possible that the free rider (FR) profile of participants in the CEC pilot might not match the profile of participants who come to the regular programs through the usual routes. We used a survey-based self-report approach for estimating free ridership for CEC. This is the method used for other ComEd program evaluations and allows for an appropriate comparison of free ridership scores.

We implemented a telephone survey with CEC participants and asked the same free rider battery of questions asked in other ComEd program evaluations. Since each community had a unique plan for achieving their own energy efficiency goals, not all communities had participation in the same ComEd programs. For each major program within the residential and business sectors, we selected the community with the greatest participation to receive the participant survey. This was done both to use evaluation resources efficiently and because it was likely that free ridership would be the most measurable in communities that had the strongest promotions.

Net Program Savings – Net of Other ComEd Programs

One of the most important questions for this program evaluation is: Does the CEC produce electricity savings that would not have been achieved without ComEd's investment in CEC?

The answer to this question was evaluated by examining data in the program tracking system alongside billing information and demographics and other community data available from ComEd and public secondary sources (e.g., U.S. Census). The data was used for two basic types of comparisons across CEC and non-CEC communities:

1. Comparison of participation rates in individual programs; and
2. Comparison of changes in average energy use per customer.

Program participation rates for each community, both CEC and non-CEC, were calculated using tracking system participation data and the appropriate customer count denominator based on

rate classification and market sector information obtained from the ComEd customer information system.

ComEd's customer database was also used to calculate the change in average kWh use in each community, comparing the year of the pilot to the year preceding the pilot. A copy of the ComEd customer database was delivered to Navigant Consulting in late June 2010 for analysis. It contained two years of kWh billing data for all current accounts in Rate Code 01-Residential and Rate Code 03-Commercial & Industrial. Where customer data was available from the pre-pilot year, that data was included in the dataset, but not all customers had two years of data. Customers who used kWh in the pre-pilot year but were not active customers in June 2010 were not included in the analysis dataset.

Based on the extract of the ComEd database supplied for this evaluation, there are three categories of customers discussed in this report:

- Total electric customers (N=3,780,099 in 4,141 taxing jurisdictions as small as pop.=2);
- Residential electric customers (N=3,434,636 in 818 communities with large pop.); and
- Commercial & Industrial electric customers (N=337,733 in N=382 communities).

While it is easy to look at one metric, such as residential participation rate, and rank communities from highest to lowest, it is problematic to do this for several different metrics and create an overall score for a community. For example, participation rates in the residential appliance recycling program may vary from zero to 2% across communities, while changes in average energy use vary from -5% to +5%. Working only with rankings does not accurately reflect the differences that may be occurring in metrics with large variation compared to metrics with small variation. If the top ten communities all have very similar values on a particular metric, we do not want the rankings to spread them across a one to ten scale. So, what can we do to make valid comparisons across the different outcome metrics for each community? The answer is standardization.

Standardization is the process used to make figures comparable, addressing the well-known problem referred to as "comparing apples and oranges." Standardization involves changing a number into another type of number without changing its intrinsic meaning. When numbers are standardized, they are "comparable."

Sometimes called normalization, standardization can be done with multiple techniques or formulas. Probably the most widely used today in American science and engineering is called the Z-score method.

In the Z-score transformation, the practitioner applies a formula to the variable "x" that involves descriptive measures of the family of numbers that "x" originates from. The formula is:

$$\frac{x - \mu}{\sigma}$$

where the Greek letter "mu" designates the mean of the population and "sigma" represents the standard deviation of that population.

Z-scores are so named after the Z-distribution, itself a discovered continuous series of numbers ranging from negative infinity through zero and on to positive infinity. Most numbers of the Z-distribution that are in common use for business and the social sciences range from -3 to +3 . Z-scores represent how much each community varies from the average for all communities on any given outcome metric, and the variation is measured relative to the mean. This makes the z-scores comparable across metrics even if the average for each metric is very different.

Process Evaluation Methods

Methods used for the CEC process evaluation included qualitative and quantitative techniques applied to four types of data:

1. Interviews conducted by Navigant of principal stakeholders in the CEC;
2. Phone surveys conducted by Opinion Dynamics Corporation of customers in CEC communities representing the two major sectors: Residential and Commercial & Industrial;
3. Records of customer participation in the ComEd Energy Efficiency & Demand Response participation tracking database; and
4. Billing meter data recorded in the ComEd customer information system.

In addition, evaluators kept themselves informed about CEC activities by monitoring the following media channels:

- Websites of participating local governments;
- E-letters sent by subscription;
- CEC-related websites from colleges, environmental and citizen groups;
- Local TV, radio, and newspaper websites;
- Blogs by citizens; and
- Facebook social media pages related to CEC efforts.

Each of these methods will now be discussed in more detail.

Interviews

To help answer research questions related to the process evaluation, experienced researchers used phone and face-to-face interviews as a major source of information. Interviews have advantages over so-called "hard data" in that substantial effects on program implementation come from human behavior that is often considered too mundane for inspection, but which, in hindsight, is recognized as having been significant in the course of events. In fact, some acts or decisions can only be understood some time after the actual occurrence. Interviews are an especially powerful way to study process performance and dysfunction for the purpose of identifying potential remedies. Long-term process improvement is the philosophy under which this evaluation was conducted

Most interviews were semi-structured, that is, guided by an ordered questionnaire. The interviewers were able to respond to unexpected information by probing for details and linkages previously unsuspected. Interviewees were encouraged to offer ideas, criticisms, and explanations of the evolution of their thinking during the CEC pilot. A copy of the interview guide can be found in Appendix B.

Persons interviewed included:

- Municipal government staff from Participating and Non-Participating Communities;
- Community-Based Leaders (elected or appointed officials under Illinois law);
- Metropolitan Mayor's Caucus staff;
- Shaw Group Environmental and Infrastructure staff;
- ComEd EE&DSM staff; and
- Illinois Department of Commerce & Economic Opportunity (DCEO) staff.

The complete list of persons who were interviewed can be found in Appendix C.

Phone Surveys

Six survey instruments were used to collect data from ComEd customers in the nine CEC communities. All surveys were fielded by phone interviewers between June 1 and September30, 2010.

Two of the six surveys addressed non-participants (customers who did not apply for an incentive for EEDR improvements during the pilot program year.) One survey addressed business customers participating in Smart Ideas for Your Business rebates. Two surveys addressed residential participants of the Appliance Recycling program or the Multi-family All-Electric Upgrade program. These two surveys were focused on a single community with high participation. A sixth survey was used throughout the ComEd service area for CFL lighting data collection, with an oversample of eight customers in each of the nine CEC communities.

Because of the lack of a CFL participant database, the CFL sample included both participants and non-participants in ComEd CFL programs. Although only part of the CFL data refers to CEC communities, mention is made of all-ComEd data to give perspective.

Details on sampling methods are presented later in Section 2.3 below.

Tracking System

ComEd has developed a program tracking database that keeps records of participation and energy savings achieved through most of their programs. Since the goal of the CEC from an impact evaluation point of view is to increase participation in the regular ComEd programs, most CEC participation relevant to this evaluation report was tracked in the ComEd program tracking database. The tracking system records the customer name, premise involved, and other program-specific details for each act of participation (e.g., appliance recycled, business lighting unit replaced.)

In addition to this core ComEd tracking system, Shaw maintained an additional quarterly tracking system with the participating communities which documented their efforts to recruit individual businesses into the Smart Ideas for Your Business (SIYB) program. Only businesses documented as being recruited by the communities were included in Shaw's final report on SIYB program savings.

For counting program-reported gross savings in other ComEd programs within the CEC communities, savings were counted directly from the ComEd tracking system without any additional adjustments by looking at city of residence for each program participant.

Sampling Plan

The sampling plan will be discussed in two pieces. First, the sampling plan for the non-participant surveys will be presented, followed by the sampling plan for the participant surveys.

Table 2-1 presents Navigant Consulting's survey sampling plan for the CEC non-participant surveys, alongside the actual responses achieved for each survey.

Table 2-1. Sampling Plan and Achieved Responses for CEC Non-Participant Surveys

	C&I		Residential	
CEC Community	Plan	Actual	Plan	Actual
Aurora	*68*	68	*68*	68
Carol Stream	*0*	0	*68*	68
Elgin	*0*	0	*68*	68
Evanston	*0*	0	*68*	68
Hoffman Estates	*0*	0	*68*	68
Oak Park	*68*	68	*68*	68
Orland Park	*0*	0	*68*	67
Schaumburg	*68*	68	*68*	68
Wilmette	*0*	0	*68*	68
TOTAL	*204*	204	*612*	611

Source: Navigant Consulting

C&I Non-Participant Surveys. These surveys were given in the three communities (Aurora, Oak Park, and Schaumburg) that put the greatest emphasis on the Smart Ideas for Business program in their individual action plans. Only three communities were chosen for this survey because it does not make sense to measure awareness of the CEC program in a community that did not actively promote it. It is necessary to have a separate valid sample for each community since each one used their own unique methods for encouraging program participation. Each method might have a different level of effectiveness and it is important to be able to distinguish those differences if they exist.

Residential Non-Participant Surveys. Similarly, a separate sample of non-participant residential customers was conducted in each community since each one used different methods to promote energy efficiency among their citizens.

The sampling list was drawn from ComEd's customer billing system using randomization to identify a call list. Demographic questions show that six percent of 591 respondents said "yes" to *"Do you consider yourself to be Spanish, Hispanic or Latino?"* (see Table 2-2). This is comparable to the 5 percent of respondents who identify themselves as Spanish/Hispanic/Latino in the

residential surveys conducted by the Navigant team for evaluation of the regular ComEd EEDR programs. [4]

Table 2-2. Ethnicity of Residential Survey Respondents in CEC Communities

D12. Do you consider yourself to be Spanish, Hispanic, or Latino?

	Frequency	Percent
Yes	37	6.26
No	526	89
Don't know	1	0.17
Refused	27	4.57
Total	591	100

Source: Navigant Consulting analysis of survey data.

In contrast, the US Census and Illinois state demographers report a much higher percentage of "Spanish, Hispanic or Latino." Using the Census' American Community Survey data, the Institute for Latino Studies at the University of Notre Dame reports that in 2006 the six-county Chicago metropolitan area was about 20% Latino (Source: Data for CMAP Latino Snapshot, June 2008). However, that 20% is about half under 18, suggesting that 5-6% may approach the proportion of adults who are "Spanish, Hispanic or Latino." The discrepancies are noted, but no adjustments or weighting has been done in the reporting of data.

Aware of language diversity in northeast Illinois, Navigant Consulting included a survey item on language spoken at home. The question read:

Please tell me the primary language spoken in your home:
1 ENGLISH
2 SPANISH
3 MANDARIN
4 CANTONESE
5 TAGALOG
6 KOREAN
7 VIETNAMESE
8 RUSSIAN
9 JAPANESE
10 OTHER (SPECIFY): _____
98 DON'T KNOW
99 REFUSED

[4] This refers to the Residential General Population Study conducted for evaluation of the PY2 Residential Energy Star Lighting program.

Of 611 residential customers interviewed, 22 declined to answer, 551 said English (90%), 11 said Spanish (2%), 6 mentioned an Asian language, and 1 said Russian. Schaumburg had the highest proportion of homes (21%, n=14) where a non-English language is primarily spoken.

The 2000 Census for the City of Aurora reported 35% of residents age 5 or older did not speak English as the primary language at home. About 20% of residents "speak English less than 'very well' " according to the same Census report.

These findings, which indicate under-representation of customer diversity within the non-participant sample response, become important later in this report in the evaluation of hard-to-reach populations.

Table 2-3 switches now to a summary of the CEC participant surveys conducted for this study. The survey sampling plan is shown alongside the actual responses achieved for each survey.

Table 2-3. Sampling Plan and Achieved Responses for CEC Participant Surveys

Program	CEC Community	Plan	Actual
C&I Smart Ideas for Your Business	All	*25*	20
MF All-Electric Efficiency Upgrade	Carol Stream	*68*	28
Residential Appliance Recycling	Aurora	*68*	69
Residential Energy Star Lighting	All	*68*	68

Source: Navigant Consulting

C&I Participant Surveys. There were a total of 82 participants within the CEC communities who received incentives under the Smart Ideas for Business Prescriptive options. Eleven of these participants became part of the sampling done for the evaluation of the regular Smart Ideas for Business Program and consequently were not available to participate in the added process evaluation questions for the CEC survey. A census was attempted of the remaining CEC participants not previously contacted, and nine additional completions were accomplished.

In summary, survey responses were received for 20 CEC SIYB participants. There were eleven participants in CEC communities that responded to the regular ComEd evaluation survey for the Prescriptive program, and nine participants in the CEC over-sample. All 20 responses were used to estimate realization rate adjustments and free ridership for the impact evaluation of the CEC. However, only nine response were available for evaluation of the process-related questions.

Residential Participant Surveys. For the residential sector, the three community programs with the largest contribution towards overall CEC residential electric savings were selected for participant surveys. These three are:

- Multifamily All Electric Efficiency Upgrade program in Carol Stream;
- Appliance Recycling Program in Aurora; and
- The CFL program for all CEC communities combined.

Over-sampling for the MF Direct Install and Appliance Recycling programs was restricted to a single community for each program. This is because each CEC community had its own unique methods for promoting the same program within their community and it is believed that the promotion method can have an influence on realization rates, free ridership levels and process evaluation results. Blending all CEC communities would not give good information on the results of any single promotion method. In fact, if some CEC communities did not actually include the given program in their efficiency plan, including participants from those communities in the CEC evaluation would give biased results of CEC impacts. To avoid these bias issues, evaluation of CEC results is restricted to the single CEC community that was known to have the program in their efficiency plan and achieved the most participation.

For example, several communities promoted participation in the MF Direct Install program by giving Honeywell/ComEd help in identifying all-electric buildings and recruiting those customers. However, not every community did this. Among those that did it, some put more resources into it than others. A survey of MF Direct Install participants across all CEC communities, even those that were not active in special promotion of the program, would have diluted the survey results. Instead, the MF Direct Install CEC participant survey was administered only to Carol Stream where both the promotion and the participation was strong. This survey strategy identifies the results achieved from the strongest CEC efforts.

An attempted census of all Carol Stream participants in the MF Direct Install program resulted in a total of 28 CEC responses instead of the originally planned 68. Twelve of these were part of the regular MF Direct Install evaluation, and an additional 16 came from the over-sample. The responses from these twelve were combined with the 16 responses in the over-sample to create a dataset of 28 responses that could be used for estimating realization rates and free ridership for the Carol Stream MF Direct Install program. Responses to the CEC process evaluation questions were only asked of the 16 participants in the over-sample.

Since the CFL program is an upstream program where incentives are provided to manufacturers, it is not possible for ComEd to track retail purchasers of bulbs in their program tracking system. For both the regular CFL program evaluation and the CEC equivalent, a general survey of the residential population is used to verify gross and net savings. That is why the CFL survey is administered to a random sample of residential customers in all of the CEC communities.

Section 3. Program Evaluation Results

This section of the report will present the results from both the impact and process evaluations of the CEC pilot.

Impact Evaluation Results

Each participating community prepared a plan at the beginning of the year which outlined the efforts they were going to make to save energy, as well as meet other CEC goals like water savings and reduced greenhouse gas emissions. Most of these plans included a quantification of electric kWh savings goals. The quantification of electric savings goals usually focused on participation in existing ComEd and DCEO programs.

The total quantified electric energy savings goals across all CEC communities was over 54 million annual kWh. These goals were not fully achieved, but that is not unusual for the first year of a new program. The goals were set as ambitious and optimistic targets, and the process evaluation section of this report describes many of the challenges that were faced in the start-up of the CEC program which made them difficult to achieve. Having a year of experience will likely bring any new goals into better alignment with future accomplishments. For that reason there is little to learn by doing a detailed analysis of why the original goals were too high. It is more enlightening to spend time understanding what was actually achieved, and why, so future goals can be based on solid information. In that light, we will quickly move on from discussion of the initial program goals to understanding the first year impacts of the program.

Quantifying annual electric energy savings impacts from a program as diverse and de-centralized as the CEC is a challenge, particularly in a first year effort. As new information became available after the end of the program year, total gross savings estimates continually improved. Table 3-1 summarizes Shaw's estimates of first year electric savings as of November 15, 2010.

Additional investigation is done through the remainder of this impact evaluation report to convert program-reported gross savings estimates to evaluation-adjusted gross savings and evaluation-adjusted net savings estimates. However, not all of the savings categories are within the scope of this report. For some savings categories, such as Retro-commissioning and New Construction, the gross savings are too small to warrant the cost of the type of research needed to reliably convert gross savings to net savings within the CEC footprint. For other categories, such as the DCEO –Public Sector, gross and net savings were not investigated because the programs were not funded with ComEd dollars.

Table 3-1. Reported First Year Savings for CEC

Program	Program-Reported Gross Savings (Annual MWH)	Additional Impact Analysis in this Evaluation Report?
C&I Smart Ideas for Your Business	8,163	Yes
Retro-Commissioning	337	No
New Construction	331	No
MF All-Electric Efficiency Upgrade[5]	870	Yes
Residential Appliance Recycling[6]	0	Yes
Energy Star Pledge	7,228	No
DCEO – Public Sector	2,660	No
Non-DCEO Public Sector Projects	7,659	No
Non-ComEd Residential Programs	1,653	No
Water Projects	833	No
TOTAL	29,735	

Source: Shaw Environmental for program-reported gross savings, Navigant Consulting for scope designation.

For the three programs that warrant additional impact evaluation, impact results are estimated at three levels: Evaluation-adjusted gross, Net of Free Riders, and Net of other ComEd Programs. The Gross Realization Rate converts gross savings from the program tracking database into evaluation-adjusted gross savings. The Net to Gross Ratio converts evaluation-adjusted gross savings into evaluation-adjusted net savings. It represents the combined effect of free ridership and spillover. In addition to these ratios, investigation was done to see if program participation rates increased in CEC communities and whether or not average energy savings per customer increased outside of the specific program areas. These were the "Net of other ComEd Programs" factors.

Table 3-2 presents a high-level summary of what was learned about how the CEC program affected each of these factors for the ComEd programs of interest. Note that information was also gathered and analyzed for the Residential Energy Star Lighting program because this is

[5] These were estimated as net savings rather than gross savings by Shaw.
[6] While residential customers in CEC communities did participate in the Appliance Recycling program, there were no associated savings claimed as part of CEC impacts in the draft "Report on the 2009-2010 ComEd Community Energy Challenge", prepared by Shaw Environmental & Infrastructure, Inc. on November 15, 2010

such a significant contributor to overall ComEd residential savings, even though total savings cannot be quantified at the community level. All 'Regular Program' factors in this table come from the PY2 evaluation reports for the individual programs.

Table 3-2. Summary of CEC Impact Factors

	Smart Ideas for Your Business	MF All-Elec Effic Upgrade	Appliance Recycling	Energy Star Lighting
GROSS REALIZATION RATE				
Regular Program	1.21	0.96	0.85	0.80
CEC	1.21	0.96	0.85	0.80
Different?	No	No	No	No
NET TO GROSS RATIO				
Regular Program	0.74	0.78	0.75	0.58
CEC	0.65	0.97	0.75	0.58
Different?	Yes	Yes	No	No
NET OF OTHER COMED PROGRAMS				
CEC increased participation rates?	Yes	Yes	No	No
CEC increased community energy savings outside of ComEd programs?	No	No	No	No

Source: Navigant Consulting analysis

The table shows that no differences were found in the Gross Realization Rates for CEC communities in any of the programs. This means that program-reported gross savings were equally reliable both in CEC and non-CEC communities. The CEC program did not have any impact on how the gross savings were tracked.

The story is different when looking at the Net To Gross Ratios. Free ridership was found to be higher in the CEC communities for the SIYB program, while spillover was found to be higher in Carol Stream for the MF Efficiency Upgrade program.

It was also found that the CEC program increased participation rates in the SIYB and MF Efficiency Upgrade programs. However, CEC was not found to have any impact on increased customer savings outside of the ComEd programs.

These CEC factors can be used to determine evaluation-adjusted net savings for the program. Table 3-3 shows that the CEC program resulted in 13,372 annual MWH of evaluation-adjusted gross savings and 9,285 annual MWH of evaluation-adjusted net savings. These values incorporate the effects of increased participation due to the CEC program. It is important to note that all of these savings have already been included within the regular evaluation of each individual ComEd program for PY2, therefore they are not additive to the already reported savings for each program.

Table 3-3. Summary of CEC/ComEd Gross and Net Savings

Program	Program-Reported Gross Savings (Annual MWH)	Gross Realization Rate	Evaluation-adjusted Gross Savings (Annual MWH)	Net To Gross Ratio	Evaluation-adjusted Net Savings (Annual MWH)
C&I Smart Ideas for Your Business	8,163	1.21	9,877	0.65	6,420
MF All-Electric Efficiency Upgrade	1,208*	0.96	1,160	0.97	1,125
TOTAL	9,371	1.18	11,037	0.68	7,545

*Note: * indicates that the program-reported values have been adjusted by Navigant to reflect gross savings instead of net savings to be consistent with the evaluation structure.*

Source: Navigant Consulting analysis

The following sections provide detailed descriptions of how each of the impact factors were developed.

Gross Program Savings

Gross program savings are generally changed from program-reported gross savings to evaluation-adjusted gross savings by the application of a realization rate. The realization rate represents how much of the reported, or tracked, savings was actually installed or realized. Each program has a slightly different twist on the specific definition of the realization rate. It depends on how participation and savings are tracked for that program, which values are most likely to be inaccurate, and what can be done to verify the data. The development of the realization rate for each of the CEC programs will be presented separately below.

C&I Smart Ideas for Your Business Rebates

A total of 20 customers in CEC communities were interviewed to assess evaluation-adjusted gross savings for the C&I Smart Ideas for Your Business (SIYB rebates program. They were

asked if the quantity and type of measures listed in the program tracking database were actually installed in their facility. All 20 responded "yes". In this manner, quantities and types were all 100% verified for the sample. This is identical to the accuracy found for the 81 non-CEC customers that were interviewed for the regular SIYB evaluation. We can conclude that the CEC program did not change the very high accuracy of the SIYB program tracking system related to quantity and type of measures installed.

The SIYB evaluation did additional investigation into components that contribute to the overall estimate of savings for each measure as part of their assessment of the realization rate. As discussed in the methodology section, these components (such as hours of use for lighting) are not considered part of what might be influenced by CEC participation. Instead, we assume that the overall realization rate for CEC SIYB would be equivalent to the realization rate found for the overall SIYB program since the accuracy of the installation rates is the same for both.

In the PY2 evaluation, the overall realization rate for the SIYB Prescriptive program was found to be 1.21 for energy savings and 0.99 for demand savings. The high realization rate for energy savings comes largely from survey information that customers were using lighting for more hours than originally assumed. Since the CEC projects were also primarily lighting projects, it is appropriate to apply these same realization rates to the CEC SIYB prescriptive savings.

Multi-Family All-Electric Efficiency Upgrade Program

Carol Stream was chosen as the community that had the most extensive promotion of the MF Direct Install Program. A total of 28 program participants in Carol Stream were interviewed to assess gross program savings. They were asked if the number of CFL bulbs listed in the program tracking database had been actually installed in their home, and if they were still installed. Following the same methodology for estimating the realization rate that was used in the evaluation of the general program, it was found that Carol Stream participant responses to these questions were not significantly different from the responses given by participants in other communities. The estimated realization rate of 96% used for CFL installation in the regular program is also appropriate for Carol Stream.

Residential Appliance Recycling Program

The community that had the most extensive promotion of the Residential Appliance Recycling Program was Aurora. A total of 69 program participants in Aurora were interviewed to assess gross program savings and other survey issues. In the regular evaluation for the Appliance Recycling Program, survey responses were used to estimate a Part-use Factor to adjust gross savings for the program. The Part-use Factor served as the program realization rate. Distinct Part-use Factors were developed for Refrigerators and Freezers. The survey questions collected information on what percent of the year the turned-in appliances had been in use for each of these appliance types.

Table 3-4. Comparison of Part-Use Factors for Appliance Recycling Program

	Aurora	All Other ComEd Communities	Statistically Significant Difference at 80% Confidence Level?
Sample Size	69	151	
Part-Use Factor for Refrigerators	90%	85%	No
Part-Use Factor for Freezers	94%	87%	No

Source: Navigant Consulting analysis

Table 3-4 shows that we can be more than 80% confident that there was no difference in Part-Use Factors for Aurora versus all other ComEd participants in the program. This is true for both refrigerators and freezers. These results are based on very healthy sample sizes. Part-Use factors were high for everyone and were not affected by Aurora's promotion of the program in their community.

Residential Energy Star Lighting

The evaluation surveys for the Residential Energy Star Lighting program were administered to a random sample of the residential customer population since no program tracking data is collected on who purchased the discounted light bulbs that are available to everyone in local stores. There were 526 total respondents to this general population survey, with 68 respondents coming from the CEC communities.

Table 3-5 compares results from the CEC communities to results from the non-CEC communities on a variety of CFL-related factors. It is of interest to note that residential customers in CEC communities are more likely to already have CFLs in use in their homes, compared to non-CEC communities. The percentage of homes with at least one CFL bulb is 78% for CEC communities and 69% for others. This is consistent with the program design feature of inviting communities that are most active in sustainability issues to join the CEC program. It shows that the community governments most active in sustainability issues are reflecting the interests of their citizens who are also more active in those issues within their own homes.

Table 3-5. Comparison of Installation Rates for Residential ES Lighting Program

	All CEC Communities	All non-CEC Communities	Statistically Significant Difference at 80% Confidence Level?
Sample Size – Total Respondents	68	458	
Respondents that have CFL bulbs in their home	53	317	
Percent of Total Respondents using CFL bulbs	78%	69%	Yes
Respondents that purchased CFL bulbs in PY2	37	214	
Percent of Total Respondents purchasing CFL bulbs in PY2	54%	47%	No
Percent of PY2 purchased bulbs that are Installed	78%	80%	No
Percent of PY2 purchased bulbs that are In Storage	17%	17%	No
Percent of PY2 purchased bulbs in Other Uses	5%	3%	No

Source: Navigant Consulting analysis

Aside from this difference, the survey data shows that there was no statistically significant difference between CEC communities and other communities related to the percent of customers who purchased the discounted bulbs, or the percent of purchased bulbs that were installed.

Net Program Savings – Net of Free Riders

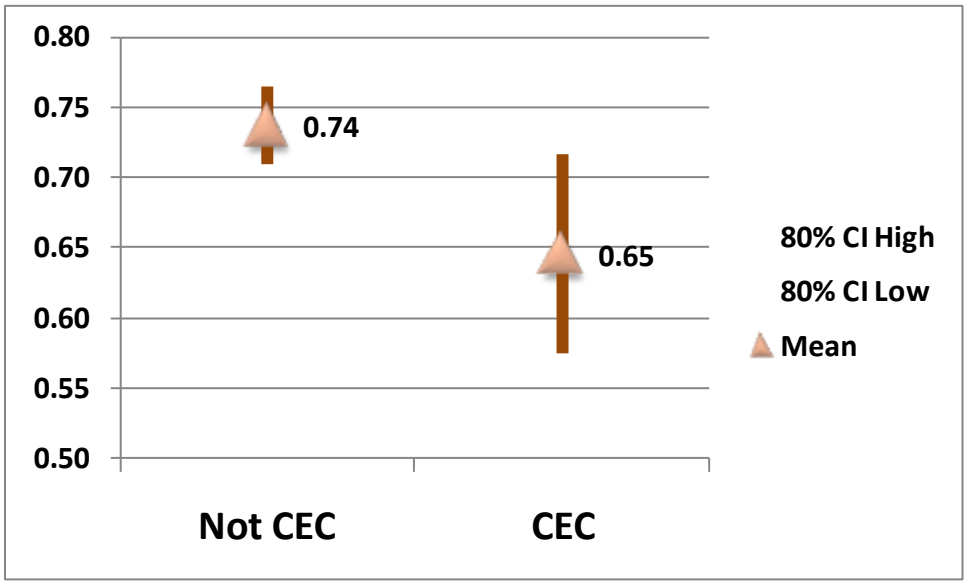
We will now discuss the detailed development of the free ridership and spillover factors that contribute to the Net To Gross Ratio (NTGR) which changes evaluation-adjusted gross savings to evaluation-adjusted net savings.

C&I Smart Ideas for Your Business Prescriptive Rebates

Survey responses from the 20 SIYB Prescriptive customers who were from CEC communities were analyzed using the same free ridership estimation algorithm used for the regular SIYB evaluation. Results are reported here as Net To Gross Ratio, which is one minus the free ridership rate. Figure 3-1 shows that at the 80% confidence level there is a statistically

significant difference in the Net to Gross Ratio between program participants in CEC communities vs. the rest of the service territory.[7]

Figure 3-1. Compare Net to Gross Ratio for SIYB Customers



Source: Navigant Consulting analysis

The NTGR of 0.74 is based on a sample size of 81 customers and has a very low error margin at the 80% confidence interval (plus or minus 4%). The mean value of 0.74 matches what was reported in the PY2 SIYB Prescriptive program evaluation. The NTGR of 0.65 for CEC communities is based on a smaller sample size of 20 customers and has a much larger error margin (plus or minus 11% at the 80% confidence interval). Even with this large error margin, there is little overlap between the bottom bound on the 0.74 estimate and the upper bound on the 0.65 estimate, indicating a high likelihood that free ridership (1 – NTGR) was higher in the CEC communities.

A detailed look at responses to individual survey questions provides some explanation for this difference. The most influential finding is that 50% of CEC participants reported that they learned about the SIYB program after they installed their measures. This should be compared to the 29% of non-CEC participants who reported the same thing. Overall, CEC had more participants with a very high free ridership score.

[7] This difference is not statistically significant at the 90% confidence level because there is a 20% chance that the difference in NTGR is just a result of sampling, rather than a real difference. For this report, eighty percent confidence is the standard used to test if differences between the CEC and non-CEC groups is real.

Other responses support this finding. Few CEC participants assigned importance to support from the Utility Account Manager, Utility Staff or marketing materials. Presumably, this is because they were encouraged to participate in the program by others in their community rather than the normal channels for non-CEC participants.

There is some evidence that not having this type of access may have been detrimental to the level of energy efficiency installed since 40% of CEC participants say they were "extremely likely" to have installed the same equipment without the program while only 9% of non-CEC participants gave that response. It may be helpful in future CEC efforts to provide more information on energy efficiency options to the communities .

The importance of incentives is approximately the same on average for CEC and non-CEC participants, even though there is a sizable group of CEC customers that say the incentive was not at all important. This could support the observation that some CEC participants were motivated by their community rather than the incentives. However, incentives were obviously important to some CEC participants because the average importance score is the same for CEC and non-CEC participants.

It is also important to consider the influence of the methodology on the estimation of free ridership in the CEC communities. It is possible that the NTGR is lower in CEC communities because the standard free ridership estimation algorithm does not specifically account for the influence of the CEC program in bringing participants in. This can be seen in the finding that 12 out of the 20 CEC respondents reported that "other factors" were a significant influence in their participation in the program while only 22 out of 81 non-CEC respondents made this same claim. Citing "other factors" can reduce the program influence score which has a negative impact on the NTGR. So, even if the SIYB program was not a strong influence on participation for these customers, it is possible that the CEC program may have been the "other factor" that encouraged them to participate but this CEC influence does not get reflected in the NTGR under the standard free ridership methodology.

While the "other factors" were not explicitly defined in the survey responses, there are some verbatim comments from CEC participants that support the influence of the CEC program:

> *"The fact that we wanted to be part of the Green Team is another factor that was influential in our decision to install the lighting."*
>
> *"Only my business neighbors happiness"*
>
> *"Community did a competition challenge where most businesses in the area participated in soliciting/contributing to the Village of xxx making businesses more aware of energy efficiency."*
>
> *"Newsletter from city".*

Overall, these findings suggest several actions for reducing actual free ridership and improving measurement in future community efforts:

1. Emphasize that municipalities continue to find new energy efficiency opportunities in businesses and steer clear of reporting opportunities that are already planned.
2. Provide more information on energy efficiency measures to the communities for them to use in their local campaigns.
3. Adjust the responses to the program influence questions in the evaluation survey to include a specific option for citing CEC activities that would contribute to a greater NTGR for the program.

Multi-Family All-Electric Efficiency Upgrade Program

Survey responses related to CFL savings from the 28 MF Direct Install customers who were from Carol Stream were analyzed using the same net savings estimation algorithm used for the regular MF Direct Install evaluation. The MF Direct Install evaluation modified the free ridership score with the spillover rate to get the final Net to Gross Ratio for savings. The Net To Gross Ratio is calculated as follows:

Net to Gross Ratio = (1 – Free Ridership Score) + Spillover Rate

Table 3-6 shows that free ridership scores were not very different for Carol Stream compared to the other ComEd communities. However, there is a big difference in the spillover rate.

Table 3-6. Compare Free Ridership and Spillover for MF Direct Install Program

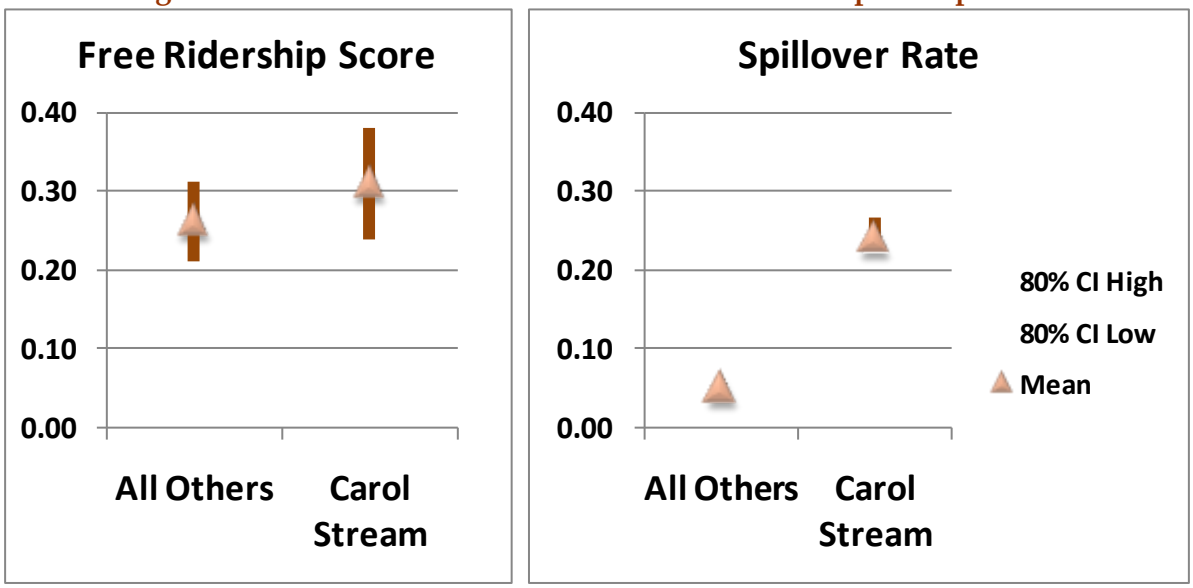
Customer Group	Free Ridership Score		Spillover Rate		
	Average Value	Percent Error at 80% Confidence Level	Average Value	Percent Error at 80% Confidence Level	Net to Gross Ratio
Carol Stream	.31	±23%	.24	±11%	.93
All Other ComEd Communities	.26	±20%	.05	±6%	.79
All ComEd Communities *	.27		.08		.81

*Note: * indicates results were taken from the PY2 evaluation report for the MF Direct Install program.*
Source: Navigant Consulting analysis

Statistical testing was done at the 80% confidence level to check for significant differences between Carol Stream and the others. Figure 3-2 illustrates the error ranges presented in the table above. It is obvious that there is a great deal of overlap between Carol Stream and the others in the program when looking at the error around the free ridership scores. This means that we cannot prove the Carol Stream free ridership score is actually different from everyone else at the 80% confidence level. Given the small sample sizes we are working with and the variation in the scores across customers, they may actually be equal to each other in the real world.

The situation is very different for the spillover rate where there is no overlap between the two estimates. It is highly likely that there was greater spillover in Carol Stream than in other areas.

Figure 3-2. 80% Confidence Intervals for Free Ridership and Spillover



Source: Navigant Consulting analysis

From the statistical perspective, note that the error range is very tight for each of the spillover estimates because we are estimating a proportion rather than a continuous variable. The key question related to spillover is whether or not the customer installed more CFLs after receiving their free CFLs from the program, and whether or not they attributed that action to their participation in the program. Each customer either falls in the 'spillover bucket' or they don't, meaning that there are only two possible answers for each customer. There is less variation when you have only two different possible answers than when you have a range of different possible answers, like the free ridership score that can be anything between 0 and 1 for an individual customer. This greater variation in free ridership scores is what contributes to the wider error range for that estimate even though the sample sizes are the same in both comparisons.

The spillover rate is actually calculated from several values. Here is how the basic algorithm is described in the PY2 MF All-Electric Efficiency Upgrade Program Evaluation Report:

> *"The objective of the spillover assessment is to estimate the impact arising from efficient measures installed as a result of the program that were not incented by the program. The evaluation relies on self-reported data collected during the telephone survey to identify these measures and assess the role of the program in the decision to install. For each participant receiving a given direct install measure category, the following spillover battery is posed:*
>
> > *SP1. Have you installed any more [MEASURE] since you received the ones through the program?*
> >
> > 1. *Yes*
> > 2. *No*
> > 8. *Don't know/Refused*
> >
> > *SP2. How many additional [MEASURE] have you installed?*
> >
> > *SP3. How influential was the program in encouraging you to install the additional [MEASURE]? Please rate this on a 0-10 scale, where 0 means not at all influential and 10 means very influential.*
>
> *For scoring, the survey data was assembled into an assessment of spillover impact through application of the following method:*
>
> > *If the customer installed additional units of the direct install measure following their participation, and the program was highly influential in the decision to install those measures, the adoption is considered to be potentially program spillover.*
> >
> > 1. *[If SP1=1 and SP3 is greater than or equal to 8, then adoption is spillover]"*

After determining if the customer was a spillover customer, the average number of additional bulbs purchased by spillover customers was estimated from the responses to SP2. These two results from the survey sample (the percent of spillover customers and the average number of extra bulbs purchased) were applied to the population of program participants to come up with an estimate of the total number of spillover bulbs that were purchased. This spillover bulb count is then compared to the total count of bulbs installed through the program to get an initial spillover rate. There is then a discussion about the fact that some of these purchases may have been counted as part of the Residential CFL Upstream Lighting Program. To account for this possibility, the initial spillover rate is reduced by 50% .

The same method was followed in this study. Table 3-7 shows how the primary components of this algorithm compare for Carol Stream vs. all other communities. It is clear that not only did more Carol Stream participants go out and buy more CFLs, but they also bought more CFLs than other spillover customers. It would be worth some additional investigation to find out if there were any unique aspects in the way Carol Stream delivered this program that might have contributed to this outcome.

Table 3-7. Detail on Estimation of Spillover Rate

	Carol Stream	All Other ComEd Communities
Sample Size	28	63
Percent of respondents that bought additional CFL bulbs after participating in the program and said that the program had a high influence (>=8) on their decision	33%	16%
Average number of extra bulbs bought by each spillover customer	6.8	3.7
Total program participants in population	410	3,460
Total bulbs delivered through program	1,911	19,970
Estimated spillover bulbs in the population	926	2,003
Initial spillover rate	.48	.10
Adjustment for overlap with CFL Upstream	50%	50%
Final spillover rate	.24	.05

Source: Navigant Consulting analysis

Residential Appliance Recycling Program.

The PY2 evaluation for the overall ComEd Appliance Recycling Program defines free ridership and spillover in the following way:

> *"The NTG ratio is equal to 1 minus the percentage of free riders plus spillover. For this program because the program approach does not support a theory for how meaningful spillover might occur, and because it does seem unlikely to be significant, we have not estimated spillover.*
>
> *In this program, free ridership is defined based on the percentage of program participants that would have disposed of their units absent the program in a manner that would have permanently removed the unit from the grid. This includes participants who indicated they would have otherwise:*
>
> - *Sent the unit to a recycling facility, or*
> - *Taken the unit to a landfill"*

This same algorithm was repeated to check if the Aurora promotion of Appliance Recycling in their community affected free ridership scores in any way. Table 3-8 shows that there was not a statistically significant difference in free ridership scores between Aurora and the other ComEd communities for either refrigerators or freezers.

Table 3-8. Comparison of Free Ridership Scores for Appliance Recycling

		Aurora	All Other ComEd Communities	Statistically Significant Difference at 80% Confidence Level?
Refrigerators	Sample Size	53	113	No
	Free Ridership	23%	27%	
Freezers	Sample Size	16	38	No
	Free Ridership	19%	18%	
Room Air-Conditioners	Sample Size	1	30	NA
	Free Ridership	*Sample Size too small for estimation*		

Source: Navigant Consulting analysis

Refrigerators showed a 23% free ridership score for Aurora and 27% for others. A Chi-squared test was used to check for differences between the two groups. The chi-squared statistic is 0.5 for refrigerators, meaning there is only a 50% chance that the free ridership proportion is actually different for these two groups. This is not a statistically significant difference at the 80% confidence level which is the standard for this study.

Similarly, freezers showed a 19% free ridership score for Aurora and 18% for others. The chi-squared statistic is 0.98, meaning there is little chance that the free ridership proportion is actually different for these two groups. Again, this is not a statistically significant difference at the 80% confidence level.

Under the program protocols, room air-conditioners were only picked-up as an add-on to an already scheduled pick-up for a refrigerator or freezer. Consequently, the number of room air-conditioners picked up as part of the program was small. Over-sampling of room air-conditioners was done to get a sample that was large enough for estimating free ridership in the regular Appliance Recycling evaluation. Combining that Room AC over-sample with the additional surveys in Aurora, there was only one Aurora respondent that had a room air-conditioner picked up. Given this small sample size, we cannot draw any conclusions about the free ridership rate for room air-conditioners in Aurora.

As stated previously, spillover is not a meaningful measurement for this program and was not done.

Residential Energy Star Lighting

The regular program evaluation report for Residential Energy Star Lighting covered the details of the free ridership and spillover algorithms used for this program. Due to the importance and the difficulty of estimating free ridership for this program, several different methods were used:

1) Customer self-reported FR based on a general population surveys
2) Customer self-reported FR based on in-store intercept surveys
3) Supplier self-reported FR from in-depth interviews, and
4) Revealed preference scores.

Only the first method was replicable for comparing CEC community results to non-CEC results. The PY2 Residential Energy Star Lighting program evaluation reported free ridership of 48%. Applying the same free ridership algorithm to each group, CEC and non-CEC, it was found that there was no difference at all between the two groups.

Spillover was found to be low for the regular program evaluation at 5% for participant spillover and 1% for non-participant spillover. Given the smaller size of the CEC sample, there were not sufficient cases of spillover to develop reliable comparison estimates for these values. We can assume that spillover was the same for both CEC and non-CEC communities. This is consistent with the finding that free ridership was the same for both groups.

Net Program Savings – Net of Other ComEd Programs

A key question for this study is whether or not electric energy savings were greater in the CEC communities than they would have been without the CEC pilot. Since it cannot be known for certain what would have occurred in those communities without the CEC program, the best that can be done to answer this question is to compare electric energy savings in the CEC communities to what happened in similar non-CEC communities during the same time period.

This comparison can be done at two different levels:

1. Changes in the general level of electric use; and
2. Participation rates in ComEd energy efficiency programs.

Examining changes in the general level of electric use will reveal whether or not the awareness of the CEC in the participating communities encouraged customers to voluntarily reduce their use of electricity in support of the community effort. Looking at participation rates in ComEd energy efficiency programs will indicate if CEC communities were able to get additional customers to participate in the ComEd programs.

Changes in General Level of Electric Use

Examination of changes in the general level of electric use was done separately for three customer groups: Residential, Small Business (< 100 kW), and Large Business (> 100 kW).

The data for the analysis came from the ComEd customer information system. Two years of historical billing data was supplied for 3,780,148 customer accounts that were active as of May 31, 2010. The first year of historical billing data covered the period of June 1, 2008 through May 31, 2009 and represented the baseline year before the start of the CEC. The second year of historical billing data covered June 1, 2009 through May 31, 2010 and covered the CEC pilot year.

The goal of this comparison is to look at the change in average use per customer between the pre-CEC year and the CEC year, and to compare this difference across communities. Many factors in addition to the CEC pilot affected changes in electric use between the first year and the second. The primary factors were weather and the economy. Weather was much cooler in the second year, causing reduced need for air-conditioning and reduced electric energy use across all communities. The economic recession, which started in September, 2008, also reduced energy use during the two-year period due to loss of jobs and income.

It is unknown exactly how much electric energy use changed due to each of these three factors: CEC pilot, weather, and economy. However, the assumption is that the weather and the economy affected all ComEd communities equally while the CEC pilot would have only affected the CEC communities. While it is true that one particular community may have experienced a greater reduction due to one of these factors, such as a small town where a large employer goes out of business, in general most communities will have similar reactions to the weather and the economy. If we compare the CEC communities to all other ComEd communities that are of a similar size, it is possible to get a sense of whether or not the CEC pilot itself had an impact on general electric energy use.

Residential Customer Electric Energy Use

To compare changes in electric energy use across communities, average annual kWh consumption per customer[8] was calculated for each ComEd community of record. This is a crude metric of electric intensity, used because the data was readily-available. Assuming the CEC pilot had had an immediate impact on behavior, one would expect to see a drop between the pre-CEC year and the CEC year in the per customer average electricity use (kWh/year.)

[8] For this study, the term "customer" is synonymous with "account."

To strengthen the validity of the method, only customers with two full years of billing data were included in this analysis. This meant the change over time was made by examining the 75% of accounts that had two full years of billing data. Also, billing data was normalized to a standard 365-day year for each account for each year. However, billing data was not weather-normalized given that it could not be easily ascertained how much each customer used electricity for winter space heating or summer space cooling.

The analyst prepared spreadsheets using rows for communities and columns for each year of measurement. For example, City A had 7,498 kWh/year for "average kWh/customer" where customers are all residential rate=01. City B had 7,127 kWh/year. So for this year, City B was more efficient electrically than City A. We created a list of community electric intensity for the pre-CEC year and another list for the CEC pilot year. Comparing the row for City A, there was an increase from 7,498 kWh/year to 7,661 kWh/year between the pre-CEC year and the CEC year. City A became less efficient—contrary to expectations.

The spreadsheet could be manipulated such that communities could be ordered from most efficient to least efficient based on the admittedly crude metric of electric use per customer. Since the list of communities included both CEC and non-CEC communities, a determination could be made whether CEC communities were substantially more efficient than non-CEC communities.

For this comparison, it was appropriate to limit the list of communities to those that were in the same size range as the participating communities. The City of Chicago was eliminated because of its size and unique complexities. For the remainder, a community was defined as those customers within a taxing district (City, Village, or Township) as recorded in ComEd's customer information system. The method could lead to misinterpretation by persons unaware of its definitional limitations. The ComEd service territory was created in part by municipal franchises such that all residences in the franchise would be ComEd customers. However, ComEd also extended power lines to certain customers within other taxing districts. Thus, some taxing districts are partially served by ComEd. For example, if only 50 residences in City A are served by ComEd while another 2,000 residences in City A get power from Ameren, the 50 ComEd customers are reported as "City A" in this process. It would not make sense for this evaluation to compare a metric for City A based on an average of only 50 customers with CEC communities based on averages of thousands of customers.

Data for the CEC communities was reviewed and it was found that the smallest community had 8,699 valid Residential accounts with two full years of billing history and the largest community had 44,785. Based on this, it was decided that all comparison communities should have data for at least 6,000 residential customers to be a good comparison. There were a total of 115 communities in the ComEd service area that fit this requirement (nine of the 115 were CEC communities).

As shown in Table 3-9, residential electric intensity dropped 5.9% between the pre-CEC year to the CEC year. This was true both for non-CEC communities and for CEC communities. In other words, we did not detect evidence of an impact from the CEC pilot in this summary statistic. This does not mean that the CEC was without value in the regional effort to promote electric efficiency. It is widely accepted that changing energy behavior is a long-term proposition, and the CEC was a short-term campaign in a pilot "learning mode."

Table 3-9. Change in Electric Energy Use for Residential Customers

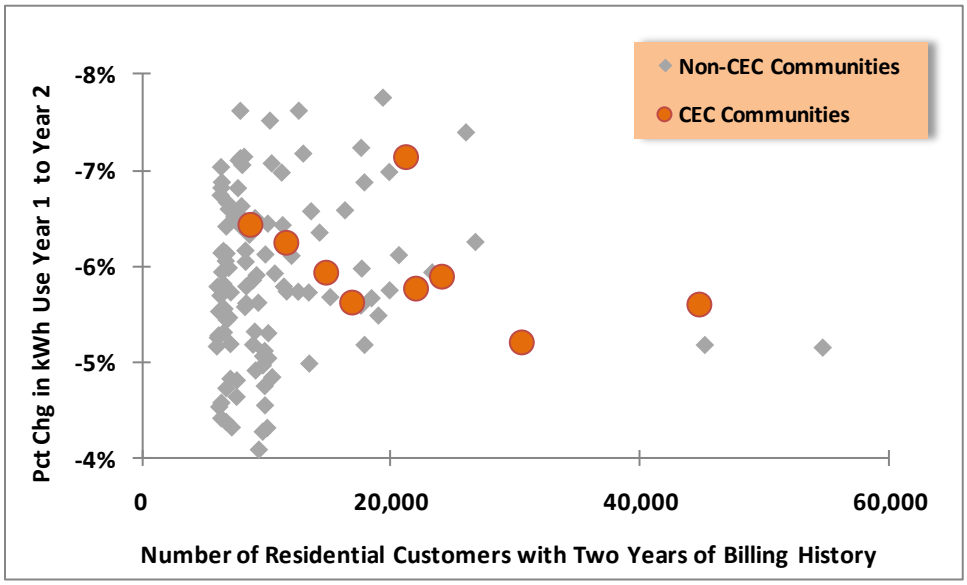
Customer Group	Annual kWh/Cust (Year 1)	Annual kWh/Cust (Year 2)	Change in kWh/Cust (Yr1 – Yr2)	Percent Change in kWh/Cust (Yr1 – Yr2)
Non- CEC Communities	8,307	7,816	-491	-5.9%
CEC Communities	8,739	8,228	-511	-5.9%

Source: Navigant analysis of ComEd customer billing data. Note that the average residential customer in the CEC communities uses more than the typical ComEd residential customer. This is likely related to the CEC communities having higher income levels and larger housing units.

The CEC communities metrics are also summary statistics. Since each CEC community had a unique energy efficiency plan, it is possible that some individual communities had more influence on its residents than other communities. The scatter plot of Figure 3-3 gives more detail about how each individual CEC community compares to non-CEC communities.[9] All communities are designated by population size on the horizontal axis, given by the number of residential customers with two full years of billing history. CEC communities are shown as large orange dots; comparison communities are shown as small gray diamonds. The plot shows that the change in per-residence electric use ranged from -4% to -8% , with CEC communities falling in the mid-range of -5% to -7%. If the CEC pilot were a strong influence changing total electric use, we would expect to see at least some orange dots at the top of this plot. Since they are not at the top, but are instead scattered across the middle, indications are that the CEC pilot either did not have an immediate impact on electric use, or that the changes are small and hidden in the fog of aggregated data.

[9] The scatter plot does not show the data point for the city of Chicago since it is so much larger than all other communities.

Figure 3-3. Percent Change in Residential Energy Use by Size of Community



Source: Navigant analysis of ComEd customer data.

As a caution to the casual reader, this data is useful for evaluating general changes in electric energy consumption from the CEC pilot, but it's not sufficient for comparing the achievements of one CEC community with another. The use of aggregate statistics hides the changes that could be traced—given considerably more effort—to parsing changes due to weather variations versus loss of employment versus CEC-induced conservation and efficiency.

Small Business Customer Electric Energy Use

The comparison of changes in the small business sector follows the method outlined for residential customers. Small business customers, for this evaluation, were defined by Navigant as those customers with an electric demand < 100 kW. Small business customers were separated from large customers for this analysis because there is such a substantial difference in average energy use for small customers versus large customers in the business sector. The loss of one very large business due to the economic recession could have substantial impact on a community's "average use per customer." Separating large from small removes this influence from the comparison for small businesses. For business customers, 77% of all the accounts had two full years of billing data and provided usable data. Billing month data was normalized to a standard 365-day year for each account for each year.

The smallest CEC community was found to have 594 small business accounts with two full years of billing history; the largest community had 3,845. Based on this, it was decided that all comparison communities should have data for at least 500 small business customers. A total of

115 communities in the ComEd service area fit this requirement, with nine of the 115 being the CEC communities.

As in the residential sector, the billing records show a drop in average electricity use (Table 3-10) between the pre-CEC year and the CEC year. The drop was slightly larger for non-CEC communities (4.9%) than for the CEC communities (4.6%). This suggests that the CEC pilot failed to create enough reduction in use to overcome the limitations of aggregate statistics. Efficiency and savings may have occurred, but without detailed energy use logs or surveys for significant numbers of customers it is not possible to identify and disaggregate the separate contributors to the overall decreased usage within each group. It is noted that the average small business customer in the CEC communities uses close to the same electric energy as the average non-CEC small business customer.

Table 3-10. Change in Electric Energy Use for Small Business Customers

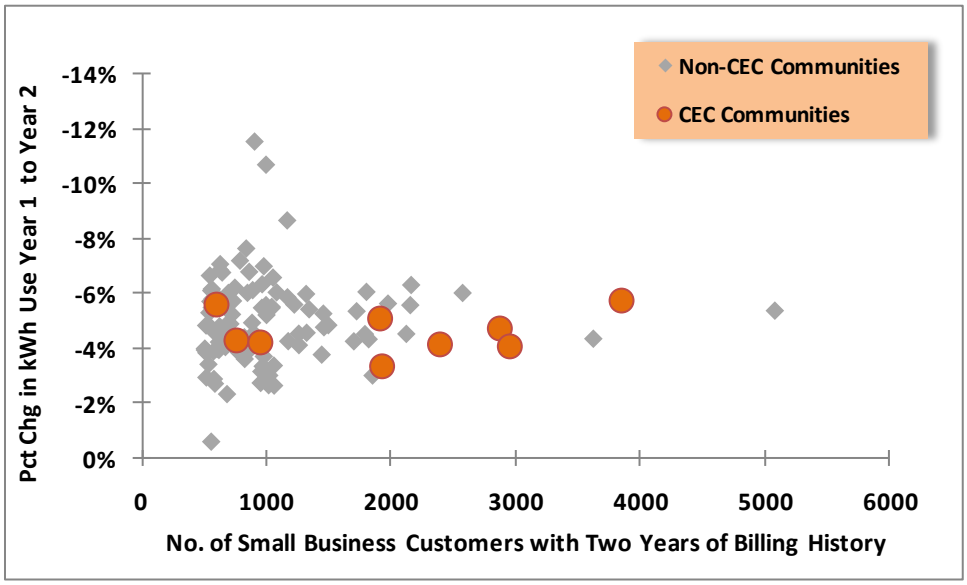
Customer Group	Annual kWh/Cust (Year 1)	Annual kWh/Cust (Year 2)	Change in kWh/Cust (Yr1 – Yr2)	Percent Change in kWh/Cust (Yr1 – Yr2)
Non- CEC Communities	44,016	41,852	-2,164	-4.9%
CEC Communities	43,760	41,733	-2,027	-4.6%

Source: Navigant analysis of ComEd customer data.

Figure 3-4 shows how each individual CEC community compares to non-CEC communities.[10] This scatter plot shows that the change in electric energy use ranged from 0% to -12% across all communities, and the CEC communities were clustered in the mid-range of -3% to -6%. If the CEC pilot had achieved immediate impact on small business customers, we would expect one or more of the orange dots at the top of the plot. Since none are not at the top, but are instead scattered across the middle, indications are that the CEC pilot did not have an immediate, strong impact on reducing electricity use for the average small business customer in those communities. Another complexity in this type of analysis is the small business use is related to business output. If small business customers in City B increased output per kWh, the business could be more successful and more efficient, but City B's kWh/customer would not reflect it.

[10] The scatter plot does not show the data point for the city of Chicago since it is so much larger than all other communities.

Figure 3-4. Percent Change in Small Business Energy Use by Size of Community



Source: Navigant analysis of ComEd customer data.

While the data might be valuable for detecting very large effects (i.e., on all CEC communities), it is not sufficient for comparing one CEC community's accomplishments to another. The use of aggregate statistics hides the changes that could be traced—given considerably more effort—to weather variations or to loss of customers or to CEC-induced conservation and efficiency.

Large Business Customer Electric Energy Use

The same comparison of changes was completed for large business customers with electric demands greater than 100 kW. For business customers, 77% of all the accounts had two full years of billing data and provided usable data. Billing month data was normalized to a standard 365 day year for each account and each year.

The CEC communities were reviewed, and it was found that the smallest community had 54 valid large business accounts with two full years of billing history and the largest community had 367. It was decided that all comparison communities should have data for at least 50 large business customers. There were a total of 100 communities in the ComEd service area that fit this requirement, including the nine CEC communities.

Among large business customers (Table 3-11) average electric energy use dropped by 4.1% for non-CEC communities and by only 3.0% for CEC communities between the pre-CEC and CEC pilot years. Thus, whatever efficiency improvements might have been made due to the CEC were too small to penetrate aggregation. It is of interest to note that the average large business

customer in the CEC communities uses less electricity per year than the typical non-CEC large business customer.

Table 3-11. Change in Electric Energy Use for Large Business Customers

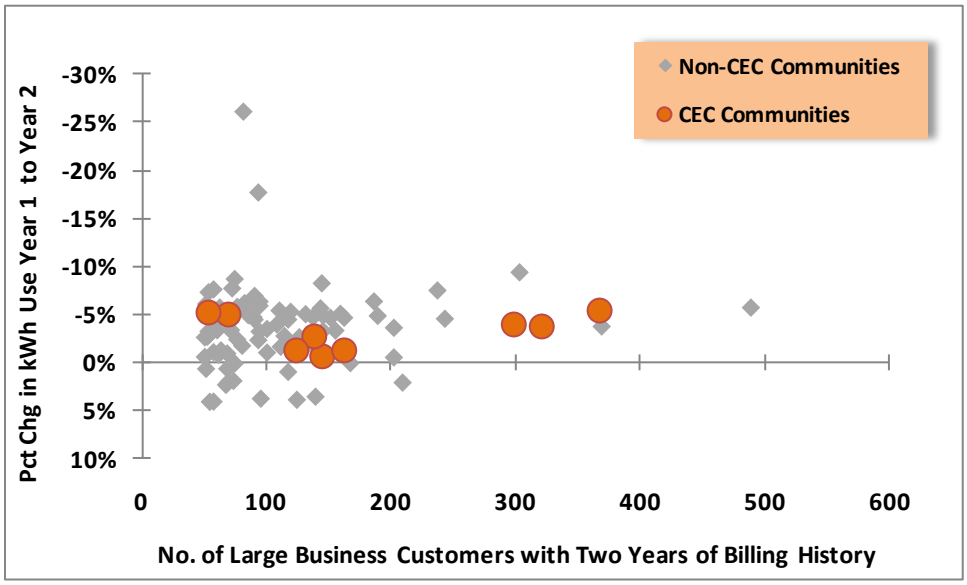
Customer Group	Annual kWh/Cust (Year 1)	Annual kWh/Cust (Year 2)	Change in kWh/Cust (Yr1 – Yr2)	Percent Change in kWh/Cust (Yr1 – Yr2)
Non- CEC Communities	2,054,842	1,971,418	-83,424	-4.1%
CEC Communities	1,794,497	1,740,632	-53,865	-3.0%

Source: Navigant analysis of ComEd customer data.

The scatter plot (Figure 3-5) shows how CEC communities compare to non-CEC communities[11] in the large business sector. The vertical axis shows that the range of change in electric energy use varied from +5% to -25% across all communities, with CEC communities clustering in the mid-range of 0% to -5%. If the CEC pilot had been a strong influence at the community level, we would expect to see at least one orange dot at the top of this plot. Since they are not at the top, but are instead scattered across the middle, indications are that the CEC pilot did not have a considerable influence on reducing energy use for the average large business customer in those communities.

[11] The scatter plot does not show the data point for the city of Chicago since it is so much larger than all other communities.

Figure 3-5. Percent Change in Large Business Energy Use by Size of Community



Source: Navigant analysis of ComEd customer data.

While the data might be valuable for detecting very large effects (i.e., on all CEC communities), it is not sufficient for comparing one CEC community's accomplishments to another. The use of aggregate statistics hides the changes that could be traced—given considerably more effort—to weather variations or to loss of customers or to CEC-induced conservation and efficiency.

Conclusions on General Changes in Electric Energy Use

The preceding analysis concluded that billing data did not show evidence of program effects on the aggregate level of energy use for any rate sector grouping of customers. With this conclusion, it should be noted that it is very difficult for any program or action to make substantial changes in the overall level of electric energy use across a whole community in a single year. Also, the absence of evidence of change—at this level of analysis and over this short time period—does not give convincing evidence of failure in the overall program concept.

As will be discussed in the process evaluation results ahead in this report, many participating CEC communities reported difficulties getting started in this initiation year. Municipal governments noted experiencing insufficient resources to implement their plans due to the economic recession and unusually large budget shortfalls. These factors compounded the normal difficulty of making significant community-wide energy efficiency gains in a single year. A multi-year program would have a better chance of creating significant community-wide results.

Participation Rates in ComEd Electric Energy Efficiency Programs

Given the difficulty of creating large community-wide energy efficiency improvements in a single year, it makes more sense to examine if the goal of increasing participation in ComEd programs was noticeable in the pilot year. Evaluation of participation rates in CEC communities versus non-CEC communities will be presented for the three most active ComEd programs with sufficient tracking data for analysis:

1. Residential Appliance Recycling;
2. Residential Multi-Family Direct Install; and
3. Smart Ideas for Your Business (SIYB – custom and prescriptive rebates).

The data for the analysis came from two sources. The ComEd customer information system was used to determine the number of eligible accounts for each program in each community. Eligible accounts were based on the number of active electric accounts as of May 31, 2010. The ComEd program tracking system was used to identify the number of participants in each of the three programs, including identification of the community that the participant was in. By combining these two sets of data, a participation rate for each program could be calculated for each community. The following sections will report on how participation rates for CEC communities compared to participation rates in non-CEC communities during the CEC pilot year.

Participation Rates for Residential Appliance Recycling

The eligible population for the Appliance Recycling program is all Residential customers. The number of active Residential electric accounts in each CEC community at the end of May 2010 ranges from 10,081 for the smallest community to 60,611 for the largest. Based on this information, only communities with at least 10,000 Residential customers were used for the comparison group. There are a total of 73 communities with at least 10,000 Residential customers (nine of these are CEC communities).

Table 3-12 shows that the participation rate for each of the three community groups is less than 1%. Chicago is treated as its own group for this analysis since it is so large and has a very different make-up of residential customers compared to the outlying communities. Many more residential customers are multi-family in the Chicago community. The high preponderance of multi-family homes probably explains why Chicago has the lowest participation rate for the Appliance Recycling program. Fewer customers own their own appliances, such as refrigerators, which are a mainstay of this program.

Other non-CEC communities show a participation rate of 0.68% compared to 0.60% for CEC communities. These two participation rates are very close, but given that the CEC rate is actually lower than the non-CEC rate, it would be difficult to argue that the CEC communities significantly improved overall participation in the Appliance Recycling program.

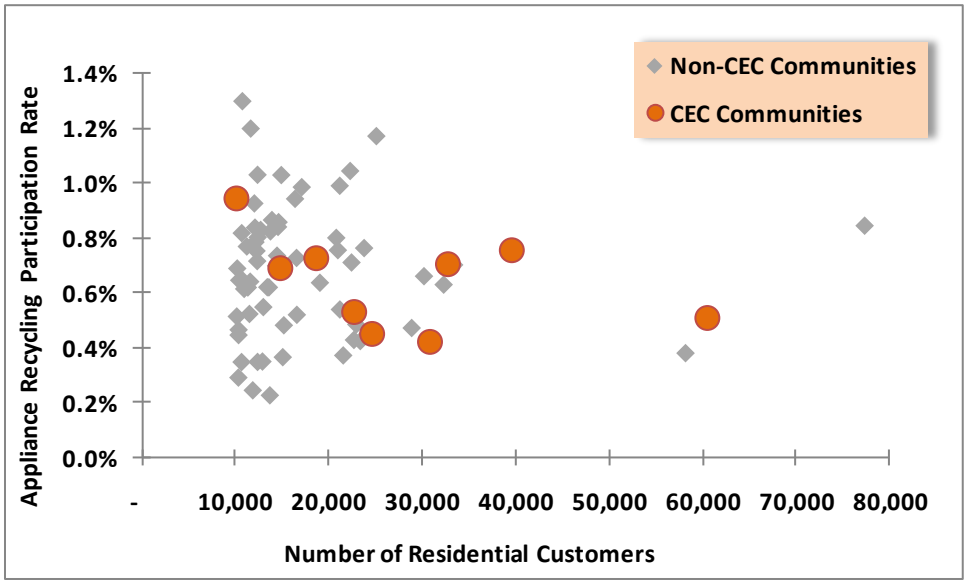
Table 3-12. Participation Rate Comparison for Appliance Recycling

Group	Number of Communities	Residential Customers	Participation Rate
Chicago (Non-CEC)	1	1,061,136	0.36%
Other Comparable Non-CEC Communities	63	1,104,754	0.68%
CEC Communities	9	255,112	0.60%

Source: Navigant analysis of ComEd customer and program tracking data.

However, since each CEC community had a unique energy efficiency plan, it is possible that some individual communities had more of an influence than others. Figure 3-6 shows how each individual CEC community compares to non-CEC communities.[12] All communities are displayed by size, which is measured as the number of Residential customers in that community. CEC communities are shown as large orange dots while all other comparison communities are shown as small gray diamonds. This scatter plot shows that the participation rate in the Appliance Recycling program ranged from 0.2% to 1.4% across all communities, and the CEC communities were in the mid-range of 0.4% to 1.0%. If the CEC pilot was a strong influence on the participation rate in each community, we would expect to see all of the orange dots at the top of this plot. Since they are not at the top, but are instead scattered across the middle, indications are that the CEC pilot did not have an overall influence on increasing participation in the Appliance Recycling program. The one exception to this finding is the community of Wilmette, which showed a higher than average participation rate of 0.9%.

Figure 3-6. Participation Rates for Appliance Recycling by Size of Community



Source: Navigant analysis of ComEd customer and program tracking data.

[12] The scatter plot does not show the data point for the city of Chicago since it is so much larger than all other communities.

Table 3-13 provides a numerical look at the Appliance Recycling participation rates for each individual CEC community. In addition to showing the participation rate, it provides a Z-score which compares the CEC community's rate to the average across all ComEd communities. A Z-score of zero means that the participation rate for the community matches the average for all communities. A positive Z-score means that the community's rate is higher than the average, and a negative Z-score means it is lower than the average. A Z-score of +/- 1.5 means that the community's rate is in the extreme five percent of the group, either greatly above average or greatly below average.

Evaluating the Z-scores in this table, five CEC communities did better than the ComEd service area average; four CEC communities did more poorly than average. Those that did "better than average" did greatly exceed the average. For example, Wilmette had the highest rate, but a Z-score of 1.18 for Wilmette indicates that this community clustered close to the average community rate for the Appliance Recycling program.

Table 3-13. Appliance Recycling Participation Rates for CEC Communities

CEC Community	Residential Customers	Participation Rate	Z-Score on Participation Rate
Aurora	60,611	0.51%	-0.69
Carol Stream	14,890	0.69%	0.09
Elgin	39,628	0.76%	0.38
Evanston	30,914	0.42%	-1.08
Hoffman Estates	18,655	0.72%	0.23
Oak Park	22,767	0.53%	-0.62
Orland Park	24,728	0.45%	-0.94
Schaumburg	32,838	0.70%	0.14
Wilmette	10,081	0.94%	1.18

Source: Navigant analysis of ComEd customer and program tracking data.

Participation Rates for Multi-Family Direct Install

The eligible population for the Multi-Family Direct Install program is all Residential multi-family customers. The number of active Residential multi-family electric accounts in each CEC community at the end of May 2010 ranges from 1,654 for the smallest community to 16,788 for the largest. Based on this information, only communities with at least 1,500 Residential multi-family customers were used for the comparison group. There are a total of 94 communities with at least 1,500 Residential multi-family customers (nine of these are CEC communities).

Table 3-14 shows that there is a great difference in the participation rate for each of the three community groups. Chicago participation in the Multi-Family Direct Install program is close to zero. Other non-CEC communities show a participation rate of 0.60%, while the participation rate in CEC communities is more than double that amount at 1.45%. This data indicates that the CEC communities significantly improved overall participation in the Multi-Family Direct Install program.

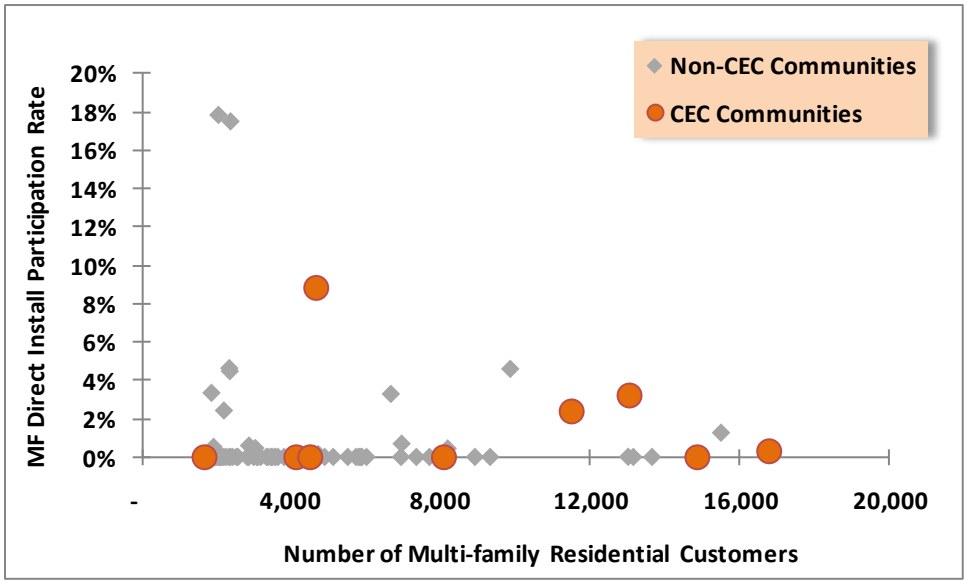
Table 3-14. Participation Rate Comparison for Multi-Family Direct Install

Group	Number of Communities	Residential Customers	Participation Rate
Chicago (Non-CEC)	1	635,617	0.00%
Other Comparable Non-CEC Communities	84	349,918	0.60%
CEC Communities	9	79,252	1.45%

Source: Navigant analysis of ComEd customer and program tracking data.

Figure 3-7 shows how each individual CEC community compares to non-CEC communities.[13] All communities are displayed by size, which is measured as the number of Residential multi-family customers in that community. This scatter plot shows that the participation rate in the Multi-Family Direct Install program was zero for most communities. In communities where it was active, the participation rate ranged from 1% to 5%, reaching 18% in two small communities. Three CEC communities were very active in this program, delivering participation rates of 2% to 10%. It is easy to see that the percentage of CEC communities participating in the Multi-Family Direct Install program was greater than what was seen in non-CEC communities, which explains the overall increase in participation due to CEC. This indicates that the CEC pilot may have been responsible for encouraging communities to participate in the Multi-Family Direct Install program.

Figure 3-7. Participation Rates for Multi-Family Direct Install by Size of Community



Source: Navigant analysis of ComEd customer and program tracking data.

[13] The scatter plot does not show the data point for the city of Chicago since it is so much larger than all other communities.

Table 3-15 provides a numerical look at the Multi-family Direct Install participation rates for each individual CEC community. In addition to showing the participation rate, it provides a Z-score which compares the CEC community's rate to the average across all ComEd communities. The Z-scores show that Aurora, Carol Stream, and Oak Park all did much better than average, with Carol Stream showing exceptional achievement.

Table 3-15. Multi-Family Direct Install Participation Rates for CEC Communities

CEC Community	Residential Multi-Family Customers	Participation Rate	Z-Score on Participation Rate
Aurora	13,040	3.20%	0.84
Carol Stream	4,649	8.82%	2.82
Elgin	8,105	0.00%	-0.29
Evanston	16,788	0.27%	-0.19
Hoffman Estates	4,129	0.00%	-0.29
Oak Park	11,486	2.36%	0.54
Orland Park	4,534	0.00%	-0.29
Schaumburg	14,867	0.03%	-0.28
Wilmette	1,654	0.00%	-0.29

Source: Navigant analysis of ComEd customer and program tracking data.

Participation Rates for Smart Ideas for Your Business

The Smart Ideas for Your Business (SIYB) program provides custom and prescriptive rebates to help finance electric energy efficiency improvements for business customers of all sizes. The eligible population for the SIYB program is all business customers. The number of active business electric accounts in each CEC community at the end of May 2010 ranges from 814 for the smallest community to 5,430 for the largest. Based on this information, only communities with at least 800 business customers were used for the comparison group. There are a total of 100 communities with at least 800 business customers (nine of these are CEC communities).

Table 3-16 shows that there is a difference in the participation rate for each of the three community groups. Chicago participation in the SIYB program is the lowest at 0.32%. Other non-CEC communities show a greater participation rate of 0.42%, while the participation rate in CEC communities is the highest at 0.70%. This data indicates that the CEC communities significantly improved overall participation in the SIYB program. It must be noted, however, that funding for the SIYB program ran out before the end of the program year with special funds set-aside for the CEC pilot. This undoubtedly contributed to holding down participation in the non-CEC communities. Even so, the CEC communities have demonstrated that they can bring in local businesses to the SIYB program.

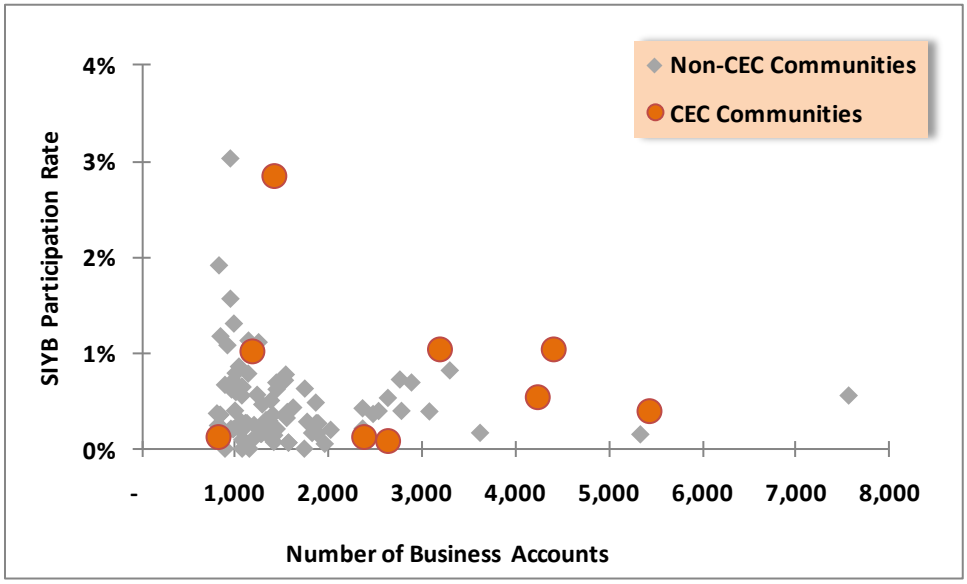
Table 3-16. Participation Rate Comparison for Smart Ideas for Your Business

Group	Number of Communities	Business Customers	Participation Rate
Chicago (Non-CEC)	1	95,130	0.32%
Other Comparable Non-CEC Communities	90	140,999	0.42%
CEC Communities	9	25,697	0.70%

Source: Navigant analysis of ComEd customer and program tracking data.

Figure 3-8 shows how each individual CEC community compares to non-CEC communities.[14] All communities are displayed by size, which is measured as the number of business customers in that community. This scatter plot shows that the participation rate in the SIYB program ranged from 0% to 3% across all communities. Participation rates in CEC communities spanned this same range, but were more likely to be on the high end, particularly for larger communities. Again, this may be the result of reserved funding for the CEC communities, but it does show that they can deliver on the funds if they are available.

Figure 3-8. Participation Rates for SIYB by Size of Community



Source: Navigant analysis of ComEd customer and program tracking data.

Table 3-17 provides a numerical look at the SIYB participation rates for each individual CEC community. In addition to showing the participation rate, it provides a Z-score which compares the CEC community's rate to the average across all ComEd communities. The Z-scores show that Carol Stream, Evanston, and Schaumburg all did much better than average, with Hoffman Estates showing exceptional achievement for their size.

[14] The scatter plot does not show the data point for the city of Chicago since it is so much larger than all other communities.

Table 3-17. SIYB Participation Rates for CEC Communities

CEC Community	Business Customers	Participation Rate	Z-Score on Participation Rate
Aurora	5,430	0.39%	-0.18
Carol Stream	1,184	1.01%	1.07
Elgin	4,228	0.54%	0.13
Evanston	3,194	1.03%	1.11
Hoffman Estates	1,411	2.83%	4.70
Oak Park	2,385	0.13%	-0.70
Orland Park	2,633	0.08%	-0.80
Schaumburg	4,418	1.04%	1.12
Wilmette	814	0.12%	-0.71

Source: Navigant analysis of ComEd customer and program tracking data.

In addition to encouraging overall participation in the SIYB program, another goal of the CEC was to test if communities could engage traditionally hard-to-reach customers like small businesses.[15] Some communities embraced this challenge and implemented strategies aimed at getting small businesses to participate in the SIYB program. For example, Evanston partnered with Northwestern University and local trade allies to train students to do energy audits for small businesses and help them fill out SIYB applications.

The first step in assessing how well CEC communities were able to engage small businesses was the determination of a definition for 'small business'. ComEd was interested in two different small business groups: customers less than 100 kW in size, and customers with 100 to 400 kW loads.

Given these definitions, the next step was to look at all SIYB participants and determine how many were from each of these small business size categories. This was done for Chicago, the CEC Communities, and all other non-CEC communities. The results are shown in Table 3-18 and illustrated in Figure 3-9.

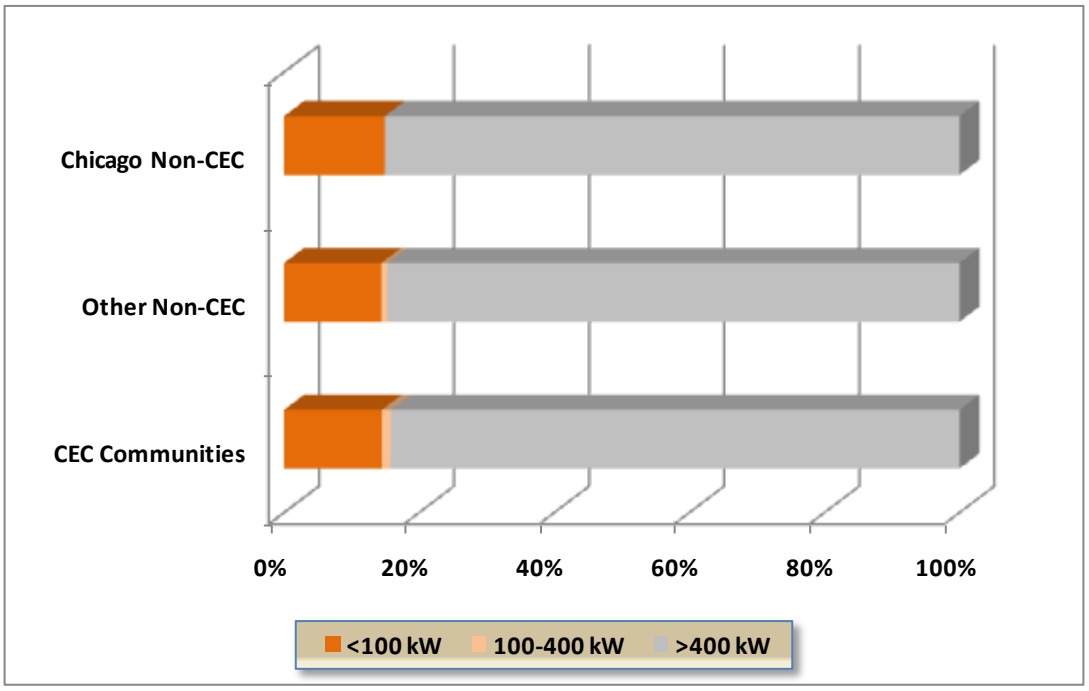
[15] Additional information on hard-to-reach ethnic groups is presented in later sections of this report that discuss survey results. Success with small business is addressed here since the information is in the ComEd customer and program tracking data.

Table 3-18. Small Business Comparison for Smart Ideas for Your Business

Group	Percent of Participants < 100 kW	Percent of Participants 100-400 kW	Percent of Participants >400 kW
Chicago (Non-CEC)	14.9%	0.0%	85.1%
Other Non-CEC Communities	14.4%	0.9%	84.7%
CEC Communities	14.5%	1.3%	84.2%

CEC communities as a group had the highest percentage of SIYB participants in the small business size categories. 15.8% of their SIYB participants were small businesses, compared to 14.9% for Chicago and 15.3% for other non-CEC communities.

Figure 3-9. SIYB Participants by Size of Customer



While this is encouraging, it does not tell the whole story since only a few CEC communities focused their efforts on attracting small businesses to SIYB. Table 3-19 shows how well each individual CEC community did in engaging small business.

Table 3-19. SIYB Small Business Participation for CEC Communities

CEC Community	SIYB Participants	Percent of Participants < 100 kW	Percent of Participants 100-400 kW	Percent of Participants that are Small Business	More Small Businesses than Average?
Aurora	27	8%		8%	
Carol Stream	14	21%	7%	28%	YES
Elgin	22	5%		5%	
Evanston	24	21%		21%	YES
Hoffman Estates	8	13%		13%	
Oak Park	6	33%		33%	YES
Orland Park	8	0%		0%	
Schaumburg	41	17%	2%	19%	YES
Wilmette	2	50%		50%	YES

Source: Navigant analysis of ComEd customer and program tracking data.

Evanston was able to increase small business involvement to 21% of SIYB participants with their innovative program. Carol Stream, Oak Park, Schaumburg and Wilmette also showed small business involvement better than the overall average.Process Evaluation Results

Process evaluation results come from two sources: stakeholder interviews and customer surveys. Results from the stakeholder interviews will be presented first, followed by the survey results. While some process findings are unique to each source, others are consistent across both sources. This section concludes with a verification assessment of the data tracking system used for the CEC pilot.

Process Evaluation Findings from Stakeholder Interviews

Community based energy programs provide the opportunity to explore and discuss a large number of topics during a process evaluation. This section presents findings for three general themes related to the Community Energy Challenge. Those themes are:

- Municipal Stakeholder Satisfaction
- Stakeholder Rationale for Participation
- Program Barriers

Municipal Stakeholder Satisfaction

Overall, municipal stakeholders interviewed for this evaluation were generally "satisfied" or "very satisfied" with the ComEd Community Energy Challenge. Many felt that learning about their community's energy profile was one of the most valuable pieces of information they gained from participating in the CEC.

In terms of long-term impact, this may be the most powerful impact of the pilot year of the Community Energy Challenge. Since the dawn of franchised energy utilities in the early 1900s, local government leaders have generally given low priority to the task of community energy management. Only history will reveal whether the CEC pilot of 2009-10 marks a transition to greater local government involvement in community energy management, but the CEC was precedent-setting in making such a transition accessible to local government elected leaders and staff.

Supported by the national context of a historic increase in federal support for energy efficiency, ComEd's CEC has helped put local energy management squarely on the local government agenda. The CEC arrived in an era of surprise budget collapses among state and local governments across the nation. Although an additional burden for local governments, the CEC drew the attention to the payoff of improved energy efficiency. This was an unexpected bonus, particularly in areas of municipal water supply and wastewater treatment.

On the other side of the ledger, electric savings directly traceable to ComEd customer incentive programs were lower than the communities' original expectations. Undoubtedly, part of the inability to meet their early expectations can be explained by the major economic downturn that grew worse from kickoff in September 2008 to the pilot's conclusion in June 2010. Another contributing explanation is the learning curve. As communities learned more about the realities of implementing energy efficiency programs, they continually revised and improved their plans. The revisions created new goals that were lower, but more realistic and achievable.

Municipal stakeholders found that learning about their community's energy profile was one of the most valuable pieces of information they gained from participating in the CEC.

Some municipal stakeholders reported that the CEC provided them with an opportunity to engage end-user target markets (as defined by each municipality individually) and other, non-participating end-use customers. In addition, in some cases, the CEC provided a mechanism to strengthen currently existing relationships between a municipal government and key community organizations (e.g., Chamber of Commerce or Business Association, civic,

environmental, and educational organizations, large commercial customers). For example, Evanston and Elgin city governments used the CEC to create a broad public participation process incorporating schools and college students. Students were used as a link to approach traditionally "hard-to-reach" small businesses. Oak Park also involved local schools to increase CFL use in the students' homes. While this leveraging was productive, many communities did not have personnel to enact similar outreach and education.

Several municipalities reported that they intended to promote ComEd energy efficiency programs continuously as part of outreach efforts created or bolstered by the CEC. Some communities reported that they were considering designing their own internal community challenges, inspired by the ComEd CEC, where the municipal stakeholders would challenge neighborhoods or businesses to save energy and/or water.

Based on these statements by community leaders, it would appear that municipal stakeholders solidly support the concept of community-based energy programs in their municipalities. That said, municipal stakeholders differed in their ideas about the most effective avenue to deliver cost-effective energy savings and how best to leverage core competencies from the public sector.

The CEC was not billed as a "market transformation" project, but Navigant's assessment is that the CEC investment will accrue benefits over a period of years. Spillover effects are expected. One relevant, late-breaking news item reports that local governments are now being offered expanded federal/state monies for energy efficiency projects. The September 2010 issue of the Illinois Municipal League reports:

"The Illinois Energy Office at the Department of Commerce and Economic Opportunity (DCEO) recently announced a significant increase in energy efficiency rebates for public schools, community colleges, municipalities, public universities and state and federal facilities located in ComEd and Ameren Illinois Utilities electric service territories."

Stakeholder Rationale for Participation

Opinion was divided on the contest aspect of the CEC. Some communities reported that the idea of competing against each other to save energy was a motivating factor in accepting the challenge. However, other communities reported that the competition was a barrier to sharing information when formulating their energy plans and implementing the plans. Some municipal stakeholders responded that the CEC program design (e.g., a challenge, or having communities compete against each other) was contrary to typical ways in which the selected municipal governments typically operate.

While the $100,000 cash prize was an additional enticement to participation, several representatives interviewed reported that they thought that their communities invested well over $100,000 in staff time and municipal resources in order to participate in the CEC. In

addition, while all of the communities would have accepted the cash prize for winning the challenge, most communities stated that winning the cash prize was not the primary reason they participated in the CEC.

Instead of the cash prize, the primary reasons that interview respondents reported for participating in the CEC were:

- Saving energy;
- Saving water;
- Creating a community energy plan or a sustainability plan; and
- Public recognition for energy efficiency or green initiatives.

Public recognition of accomplishment (whether the winning municipality or not) is one of the primary factors in helping to justify the significant investment of staff time and energy and budget that municipalities put into the CEC, at a time when many municipal governments are severely cutting programs and services and/or laying off employees.

Barriers to Program Participation: Scarce Municipal Resources in Economic Downturn

Respondents reported that expending scarce municipal resources on participation in the CEC was, in some cases, difficult to justify during the current period of economic downturn. In one case, an invited community declined to participate in the CEC due to their perception that the costs of participation in the pilot program would outweigh the benefits they would receive by participating. Participation in the CEC created additional workload for municipal staff for which the municipalities generally were not prepared to budget or allocate resources unless they previously had a sustainability or energy efficiency plan in place or a dedicated staff person to implement sustainability or energy efficiency projects. Even when a municipality did have a dedicated staff person or other resources to participate in the CEC, the reporting requirements and uncertainty regarding qualifying projects, funding sources, and technical resources created additional barriers for successful implementation in some cases. Some of these challenges can be attributed to the fact that the CEC was a pilot program involving a variety of stakeholders, funding sources, and market actors who had previously not worked together on such a project.

Some communities were able to adapt pre-existing energy or sustainability plans to the CEC with minimal effort. Other communities leveraged the CEC to bolster or accelerate their pre-existing plans to write their own community energy or sustainability plan for implementation outside the CEC framework. For communities that did not already have a written plan or strategy to create a plan in the short term, the time frame to submit an energy plan for the CEC, even with the technical resources provided, was somewhat rushed compared to comparable municipal projects. Those communities that did not have a dedicated CEC staff person frequently had to use staff that were not trained in energy efficiency engineering, leading to

frustration among some municipal stakeholders. In addition, several participating communities were affected by unforeseeable staffing changes and/or staff personal leave time during the planning or implementation phase of the CEC.

As economic hardship hit businesses and homeowners, tax receipts were being delayed and, in the case of sales tax, simply lost. Also, state aid to municipalities has faced cuts. The Illinois League of Women Voters reported:

> "The State of Illinois is operating at a deficit. It cannot pay its bills as they come due. Schools, health care providers, social service providers and other businesses are not being paid on time by the state for work they have performed. This deficit continues despite the state's long- and short-term borrowing and many cuts in services." [Source: http://www.lwvil.org/fiscalpolicy.asp]

Uncertainty about Technical and Financial Resources Available

Communities requested a wide range of technical resources to implement their role in the CEC. The wide range related to differing expectations of the roles of the different players, such as ComEd staff and account representatives, Shaw staff, DCEO staff, and KEMA staff. Tracing things back, the wide discrepancy in expectations suggests that communities were not equally knowledgeable about technical resources that Shaw could provide. Another possibility is that municipal staff did not see value in requesting technical resources. Some communities reported that they would have liked a menu of energy efficiency ideas to select for implementation rather than have to write their own plan from scratch.

Many local government stakeholders offered unsolicited suggestions that the grant distribution process of the Illinois Department of Commerce and Economic Opportunity needs improvement. Navigant Consulting was not asked and did not assume responsibility for analyzing the performance of DCEO, so this finding is merely documented for consideration of any ComEd or regulatory authorities. We do not confirm nor deny the claims, but our work might be considered negligent if we did not mention it as a factor in the minds of stakeholders. For the sake of fairness to DCEO, it should be regarded as hearsay and not evidence that the purported difficulties affected the CEC.

Burdensome Reporting Requirements

Municipal staff members generally felt that the initial reporting requirements were burdensome. Some stakeholders reported confusion regarding available levels of technical and financial resources, definitions of qualifying projects and how to finance those projects, what projects would receive credit for CEC scoring, and how the scoring process worked.

Complicated Plan Scoring

The scoring and judging of the plans and implementation of the plans was quite complicated, including both quantitative and qualitative elements among communities with highly unique populations and characteristics. It is understood that there is no simple way to accomplish normalization of energy efficiency achievements across disparate communities. However, the unavoidable complexity of the scoring exercise, even though it was clearly defined and presented, was difficult for the communities to manage to with their limited resources.

Communications to the Public

Participating municipalities planned to use a variety of communications strategies to engage residents, businesses and non-profit organizations in their communities. Implementation of communications plans varied as budget realities changed. However, some efforts were implemented.

Most visible were government newsletters to residents (example: Carol Stream) and municipal websites. Community access television—usually awarded to local governments at little or no cost in cable franchise agreements—was used in Aurora, Schaumburg and Evanston. Viewership of such channels is relatively low, apparently, as none of the 611 randomly-sample residents reported viewing anything about the CEC on community cable. That said, some municipal websites incorporate video clips made by local residents, business groups, or government agencies. Also, local bloggers sometimes incorporate such video clips on private, non-governmental websites. Oak Park is most noteworthy in this regard.

Web searches did not locate many non-governmental publications in the nine communities that mentioned the CEC. One exception was the Elgin Chamber of Commerce. As noted in the survey results section, only one-quarter of small businesses in CEC communities belong to the local chamber or other regional business association. This was not known when initial municipal plans mentioned Chambers as a partner.

A few communities maintained Facebook social media pages for their CEC participation. Evanston, Elgin and Schaumburg did so, but the impact is not measured in this evaluation.

Community Survey Results

The following sections will turn our attention to the process-related results from the customer surveys.

Sudden Change in Economic Status of Customers

The economic status of customers in CEC communities set a cap on the community's ability to pursue energy efficiency improvements, with or without incentive from the Community Energy

Challenge. Responding to legislative decisions in 2007, ComEd started the CEC. As it happened, the startup coincided with the start of the current economic downturn, regarded as one of the worst the United States has endured in at least 75 years.

The date marking the start of the downturn is generally regarded as mid-2007, although the most severe and newsworthy signal made headlines in September 2008. By their own report, customers say the downturn definitely affected investments in energy efficiency technologies and definitely affected broad consumer sentiment. In recognition of this turn of events, an item was added to the survey of residential and small business customers in CEC communities to help quantify the breadth of the hardship.

RESIDENTIAL Random samples of residential customers from all nine CEC communities were quizzed about common effects of the downturn on personal household economics like job loss, cut in hours of work, foreclosure, etc.

Residential item wording: *"Since late 2007, has anyone in your household or immediate family lost a job, had work hours reduced, or had a home or business foreclosure?"*

In the residential CEC fielding, only 64% said their households had <u>not</u> been affected by one of the four economic hardship examples mentioned in the question. In other words, more than one third (36%) reported major economic impacts (loss of job by household member, work hours reduced, home foreclosure, business foreclosure.) While this 36% measure may seem high, comparable national figures collected in May 2010 by the Pew Research Center suggest the national figure to be 55%.

All four hardship options fall into the category of "socially undesirable" responses from a surveys perspective. It is a safe interpretation to assume that the percent of customers adversely impacted by the economy is at least equal to the 28% confirming "yes" plus the 8% declining to respond by saying "don't know" or simply refusing to answer. (Yes=28%; Don't Know/declined to answer=8%) This is particularly true since some who said "no hardship here" were likely bending the truth without using silence.]

Some communities were hit harder by the downturn than others, but Table 3-20 shows that all nine have suffered. Carol Stream and Schaumburg reported the highest incidence of economic hardship among samples (each N>65) of residential customers from each of the nine CEC communities. Converted to Z-scores, Carol Stream and Schaumburg households suffered to a much wider extent than the CEC average. It should be noted that most residents of Chicago suburbs work in a different municipality than where they reside. Therefore, Schaumburg residential hardship cannot be equated to Schaumburg's labor market or Schaumburg business health.

Table 3-20. Economic Hardship in CEC Communities

CEC Community	Residential customer count	% of households reporting economic hardships since 2007	Z-Score
Aurora	59,705	33%	-0.4
Carol Stream	14,700	46%	1.5
Elgin	39,212	40%	0.6
Evanston	30,329	32%	-0.6
Hoffman Estates	9,090	35%	-0.1
Oak Park	22,363	28%	-1.1
Orland Park	24,659	33%	-0.4
Schaumburg	32,400	47%	1.6
Wilmette	10,038	29%	-1.0
Nine CEC average		**36%**	

Source: Navigant analysis of ComEd customer data and survey data.

For comparative national statistics on household hardships, see Pew Research Center report of June 30, 2010 titled "A Balance Sheet at 30 Months: How the Great Recession Has Changed Life in America," available at www.pewsocialtrends.org .

SMALL BUSINESS Random samples of small business customers from three CEC communities were asked a) was your business activity reduced because of the downturn? and, b) if there was a reduction in activity, did your business enact layoffs, wage cuts or other responses? The three "small business communities" were Aurora, Oak Park and Schaumburg.

Small business item wording: *"Thinking about the economic downturn that started in late 2007, has your level of business activity been substantially reduced as a result?"*

1. *Yes*
2. *No*
3. *Don't know*
4. *Refused*

[If the small business respondent replied with a "yes," the following was also asked:

Has your business been forced to do any of the following since late 2007:

[READ LIST, record multiples responses]

1. *Lay off or reduce hours of employees*
2. *Required wage or other compensation reductions*
3. *Closed some offices or other locations*
4. *Encouraged early retirement*
5. *Reduced hours of operation*
6. *Changed credit practices with customers*

Between 43-47% of small business respondents in the three communities said their business activity did not suffer following 2007 (the survey being conducted in August 2010). This implies that half of businesses did indeed suffer. Because only three CEC communities had small business surveys on the economic downturn, there is no data to compare business hardship among the nine CEC communities. Note that this type of question faces a similar "social desirability" bias as the residential question for households. American business managers, in general, do not want to report "business is bad." In fact, there is a strong bias to say "business is good" even when it is not. Therefore, the 53-57% admitting loss is likely to be an underestimate of those harmed by the recession.

Small businesses are heavily dependent on credit availability. Northern Illinois banks have been seriously hurt and many suspended making new business loans during the time period of the pilot. According to a Medill Reports story of August 24, 2010:

< http://news.medill.northwestern.edu/chicago/news.aspx?id=168780 >

> "Since 2007, Illinois has seen 37 of its community banks succumb to failure, with Friday's ShoreBank closure being the most recent. Illinois places third behind Florida and Georgia in bank failures over the past three years, according to the Federal Deposit Insurance Corp., the agency that steps in to protect depositors when a bank fails.
>
> "Heading into the second half of 2010, roughly 35 community banks in Illinois had Texas ratios (a measure of a bank's charge offs and non-performing loans against its equity) of 100 percent or more, including ShoreBank, a key sign that a bank is struggling to stay solvent."

Awareness of the Community Energy Challenge

Community action can be analyzed as a process over time. The first step in the ladder leading to behavior change is awareness. People cannot respond to a campaign that they are not aware of.

A popular model of learning breaks the process into five stages: awareness, knowledge, attitude change, skill training, and repetition with self-observation.

- **Awareness--** "Hey, if I leave my computer on, I will have a larger electric bill. I didn't know that before."
- **Knowledge--** "An average computer left running will use 5 dollars a month."
- **Attitude change--** "Wow, I can save $20 a month, and it won't be that hard."
- **Skill training--** "If I put a reminder sign on the bathroom mirror, I'll remember to check to see if it's off every night when I brush my teeth."
- **Repetition--** by the student combined with feedback on performance by self or by coach.

The stages are not necessarily sequential or mutually exclusive. In many ways, they are stages in a recurring cycle. As we become aware that we can advance our skills even more, we return to "awareness" to learn even more.

Awareness is a large concept, like a word in the dictionary with a choice of 12 definitions. The parts of "awareness" for this research are: "campaign name," "campaign goal/content," and "campaign name/goal/content/sponsorship."

People can become aware that "some campaign is happening" (as in, "I heard the mayor is on a campaign about energy"). Alternatively, people can become aware of a campaign by hearing the name (e.g., "Community Energy Challenge") although they may not know the specific participants or goal. In other words, "name awareness" can be present even though the person doesn't know what it means. That is, less than 100% of those recalling the name "Community Energy Challenge" would be able to describe what a "community energy challenge" is. Of what use is "name recall"? People may find it difficult to decipher communications, but recognizing the name might make them ask questions when given the opportunity (Imagine a resident bumping into their mayor at the grocery store: "What is this community energy challenge I hear advertised?")

Another level of awareness metric relates to campaign content regardless of campaign name ("I know my brother is involved in some village campaign to reduce energy waste, but I don't know what they call the campaign.")

Awareness of inter-community contest about energy, and/or, the campaign-name "Community Energy Challenge"

Table 3-21 shows that one of five residential customers (20 percent) recognized the campaign name, "community energy challenge." One could safely infer that, at a minimum, these customers recognized that energy was a concern of some segment of their community. Among small business customers, 27% of respondents reported prior awareness of the Community Energy Challenge.

Exact wording of question: *Have you heard of the "ComEd Community Energy Challenge" sponsored by ComEd?*

Table 3-21. Awareness of Community Energy Challenge, July 2010

	Name recognition	CEC concept understanding
Residential	20%	15%
Commercial & Industrial*	27%	20%

** Due to budgetary constraints, only three CEC communities were fielded for the CI Non-participant survey. Aurora, Oak Park and Schaumburg, total N=204.*
Source: Navigant analysis of survey data

When given only a product name, it is common for people to over-report their recognition of the name because of the existence of similar names and also the need to present themselves as informed and intelligent. To get a clearer understanding of awareness, a follow-up probe was added, giving the respondent a sentence describing the Community Energy Challenge. For both residential and small business customers, about 25 percent of those saying they were "aware of name" were not fully aware that it meant a competition among local communities for energy efficiency. The resulting level of CEC concept understanding was 15 percent for residential customers and 20 percent for small business customers.

As a reference comparison, Table 3-22 shows the results of a ComEd survey fielded in June 2010 where 474 residential customers were asked if they had heard of the Smart Ideas campaign, and 19 percent replied "yes" [Source: PY2 ComEd General Population Lighting Survey.]

Table 3-22. Have you heard of the Smart Ideas program offering discounts on energy-efficient lighting for your home?

Residential customers *in ComEd service area N= 474*	Percent
Yes	19%
No or Don't Know	81%

Source: ComEd customer phone survey by Opinions Dynamics Corp., May 2010.

Due to the brevity of the phone survey in both cases, it's likely that the respondents saying "yes," reflected a range of degrees of awareness and a range of knowledge going from a "vague recall" to a certain and detailed knowledge. A 20 percent level of awareness is comparable to

what other U.S. utilities find in surveys about new programs with weak advertising budgets, in the first year of operation (see Figure 3-10).

Figure 3-10. Customer Awareness of Utility Information Programs

Rules of Thumb for Judging Customer Awareness Success in Utility Information Programs

- Non-existent programs. Surprisingly, even fictitious, non-existent programs can attain 5-10 percent awareness response on residential surveys.
- New programs advertised only by bill inserts and a single news release often reach 10-15 percent.
- Weakly advertised programs in the second year of operation may reach 20-25 percent.
- Consistently but weakly advertised utility programs commonly reach 30-35 percent, primarily among older customers.
- After multiple years of weakly, but consistently advertised programs, awareness levels of 40-50 percent are commonly obtained.
- For heavily advertised utility programs after four years or more: 60-90 percent (example: Energy Star

Source: Navigant analysis of multiple sources involving multiple audiences for a diverse assortment of utility information programs, 1990-2007.

Table 3-23 shows that the "percent aware of" given the CEC name and ComEd sponsor association varied between 12% for Aurora and 27% for Carol Stream. Statistical testing shows that only the difference between Aurora and Carol Stream can be shown unlikely to be due to chance. In other words, we can conclude that awareness was lower in Aurora than in Carol Stream, but it is likely that there was no real difference in awareness rates among the other communities.

Table 3-23. Awareness of CEC Name and ComEd Sponsor Association

COMM * E1. ***Have you heard of the 'ComEd Community Energy Challenge' sponsored by Commonwealth Edison, your electricity supplier?***

			Yes	No	Total
COMM	Aurora	Count	8	58	66
		% within COMM	12.1%	87.9%	100.0%
	Carol Stream	Count	18	47	65
		% within COMM	27.7%	72.3%	100.0%
	Elgin	Count	10	53	63
		% within COMM	15.9%	84.1%	100.0%
	Evanston	Count	12	54	66
		% within COMM	18.2%	81.8%	100.0%
	Hoffman Estates	Count	16	51	67
		% within COMM	23.9%	76.1%	100.0%
	Oak Park	Count	14	52	66
		% within COMM	21.2%	78.8%	100.0%
	Orland Park	Count	13	53	66
		% within COMM	19.7%	80.3%	100.0%
	Schaumburg	Count	10	57	67
		% within COMM	14.9%	85.1%	100.0%
	Wilmette	Count	16	49	65
		% within COMM	24.6%	75.4%	100.0%
Total		Count	117	474	591
		% within COMM	19.8%	80.2%	100.0%

Source: Navigant analysis of CEC survey data.

Self-reported impacts on attitudes toward ComEd and toward Local Government

The Community Energy Challenge provided a measure of goodwill to both major sponsoring parties: local governments and ComEd. The positive impact was seen in both the residential

and small business samples after a minimal explanation of the Community Energy Challenge was given to add to their existing knowledge.

Regardless of a respondent's previous awareness of the CEC, all 611 randomly-selected residential customers were asked if, now that they were definitely aware of their local community's involvement in the CEC, would it affect their favorability toward their municipal government or toward ComEd? Separate questions asked about ComEd and about city/village government, and the order of presentation was randomly switched to avoid order effects.

The exact structure of the question was: *"Thinking about <COMMUNITY NAME> government--would you say that knowing your city government participated in the Community Energy Challenge has made you feel more favorable, less favorable, or no different about <COMMUNITY NAME> government?" (The interviewer knew and inserted the community name for more personable and direct communication.)*

1. *More favorable about <COMMUNITY NAME> government*
2. *Less favorable about <COMMUNITY NAME> government*
3. *Neither more nor less favorable about <COMMUNITY NAME> government*

98. (Don't know)

99. (Refused)

Table 3-24 shows that nearly 40 percent of the 611(38%) residential customers surveyed reported an increase in favorability for ComEd due to ComEd's participation in the CEC. Even more (43% of 611) reported that their satisfaction with local government increased because of the government's involvement in CEC. Only 9 (<2%) reported lower satisfaction with ComEd, and only 13 (2%) reported lower satisfaction with their local government as result of co-sponsorship of CEC.

Table 3-24. Change in Favorability by Residential Customers due to Co-sponsorship of the Community Energy Challenge, July 2010

Co-Sponsorship	More favorable due to co-sponsorship	No Change in favorability	Less favorable toward co-sponsorship	Don't Know or refused
Favorability toward ComEd	38% (235)	56% (342)	1.5% (9)	4% (25)
Favorability toward Local Government	43% (263)	50% (306)	2% (13)	5% (29)

Source: Navigant analysis of survey data. Random sample approx n=68 in each of nine CEC communities

The small business CEC-impact item was worded like this in the phone interview: *"Knowing that the community where your business is located participated in the Community Energy Challenge, does that make you feel more favorable, less favorable, or no different about ComEd?"*

For small business customers in the three CEC communities surveyed, a range of 37-41% (n=204) of respondents reported increased favorability knowing that ComEd sponsored the CEC. The same three groups reported that of 40-47% of small business customers felt increased favorability toward their local government knowing it was participating in the CEC. Because of the small sample size, statistical tests could not identify differences in favorability change among the three communities. Overall results for small business customers are presented in Table 3-25.

Table 3-25. Change in Favorability by Small Business Customers in Aurora, Oak Park and Schaumburg due to Co-sponsorship of the Community Energy Challenge, July 2010

Co-Sponsorship	More favorable due to co-sponsorship	No Change in favorability	Less favorable due to co-sponsorship
Favorability toward ComEd	39% (80)	59% (119)	2% (5)
Favorability toward Local Government	43% (83)	54% (111)	2% (6)

Source: Navigant analysis of survey data. Based on phone survey of randomly-selected customers in Aurora, Oak Park and Schaumburg, August 2010.

As a guide to interpretation, note that not all small business managers/owners were residents of the CEC community they were questioned about. In fact, only 42% of small business respondents were also residents of the community where their business was located, a proportion that was stable across the three surveyed communities of Aurora, Oak Park and Schaumburg.

Another characteristic of small business owners is that a small minority belong to local business associations and Chambers of Commerce. Across the three communities, between 16-25% reported such membership, and the proportions were not statistically different across communities.

Beyond local government, it's possible that CEC affected favorability of state and federal government. However, because of limited survey length, the survey did not probe attitudes toward state government (DCEO) or federal government (ARRA) nor attitude changes involving other significant participants (e.g., water utilities, Chambers of Commerce, local schools, etc.)

Indicators of community progress toward efficiency culture

One objective of the evaluation was to provide ComEd with alternative methods for ranking communities based on their progress as a community in moving toward greater energy efficiency. Several alternative indicators are described below.

CFL (compact fluorescent lamp) saturation as indicator of community commitment

One measure of a community's energy awareness is CFL use by residential households. A reasonable hypothesis is that communities with higher awareness/attitude toward energy efficiency will reflect this awareness through actions such as installing CFLs. The random sample of more than 600 asked residential customers three questions about CFLs. They involved:

- Awareness of CFL or "compact fluorescent light" term (showing some crude level of attention to lamp efficiency)
- Understanding of CFL size, looks (showing deeper level of awareness)
- Installation of CFL in household (showing behavioral change)

The most significant of the three in showing transition toward an efficiency culture is installation of CFLs. In Table 3-26, the comparison of the nine CEC communities shows only two communities varying from the average of 85%. The community that appears to be the strongest on CFL installation is Aurora with 95% of randomly-selected households reporting at least one CFL installed. The community with the lowest reported saturation was Schaumburg with 75% saturation for this admittedly fuzzy marker of an energy efficiency ethic. [Note: Both Schaumburg and Aurora has z-scores greater than +/-1.5, the conventional demarcation of significant difference.]

Table 3-26. CFL Installation Rate for CEC Communities

CEC Community	% of households	Z-score	Residential Customers
Aurora	95%	**1.72**	59,705
Carol Stream	85%	-0.06	14,700
Elgin	85%	-0.06	39,212
Evanston	91%	1.01	30,329
Hoffman Estates	82%	-0.59	9,090
Oak Park	85%	-0.06	22,363
Orland Park	83%	-0.42	24,659
Schaumburg	75%	**-1.84**	32,400
Wilmette	87%	0.30	10,038
All 9 CEC avg.	85%		

Source: Navigant analysis of phone survey data collected expressly for CEC evaluation.

The CEC communities appear to rank "above average" for CFL use relative to all of ComEd's service area. According to ComEd's summer 2010 General Population Lighting Survey (GPLS), household saturation for CFLs stood at 70% based on the retrospective reporting of 246 households that reported "purchasing" a CFL in PY2. (These 246 households reported having one or more CFLs installed prior to June 2009.) The question wording for the GPLS did not allow easy calculation of socket penetration for all residential customers surveyed for summer 2010. Many who installed CFLs did not purchase them, since millions of free CFLs have been distributed in ComEd's service areas by numerous parties. These sources included the Community Energy Challenge, the Northern Illinois Energy Project, Home Depot, Ace Hardware, the Chicago Bulls basketball organization and the Citizens Utility Board.

Attention to Efficiency Programs/Bill Inserts

Another crude measure of energy-efficiency awareness is paying attention to efficiency literature or ads. Randomly-selected residents in each CEC community were asked if they recalled receiving information about ComEd's Smart Ideas for Your Home (SIYH). The modern consumer tosses many, if not most, bill inserts without reading them. For a person to stop, read and remember the content of a bill insert is a higher form of attention. Residents were asked the following question in the phone survey, with eight possible positive responses.

K1. Thinking of the last 12 months, do you recall receiving information about Commonwealth Edison's "Smart Ideas for Your Home" Program through any of the following ways? [READ LIST, MULTIPLE RESPONSE]

1. *TV advertisements*
2. *Radio advertisements*
3. *Newspaper advertisements*
4. *Internet/social media advertisements*
5. *Printed handouts/newsletters/direct mail*
6. *Bill Inserts*
7. *In-person contact (family, friends, colleagues, church group, general announcements, events)*

00. *(Other, specify)*

For the last two years, SIYH branded info has been included in ComEd bill inserts to all customers as well as advertised. In the recent CEC year, special efforts were made by municipalities to promote SIYH information. A complicating factor boosting positive reports is that ComEd also has a program with a similar brand name: Smart Ideas for Your Business (SIYB). Thus, a residential customer in a managerial or executive role in a business could easily confuse the two in a simple recall question.

Recall was high in all nine communities, but there was one CEC community that showed better-than-average recall, and that community was Wilmette. Wilmette is one of the smallest CEC communities in terms of customer count. It is also the highest in per capita income of the CEC communities, and it is known for being the residential community of senior executives in Chicagoland corporations.

Besides bill inserts, the overwhelming majority of residential customers in each community report they haven't seen anything although they were quizzed about modes such as public radio and internet ads. The statistical analysis of the various modes (mail, mass media, etc.) is not reported by individual community because the numbers per mode are too small for conventional significance tests. The strongest non-bill insert mode was commercial TV with 38 of 611 randomly selected households reporting hearing about the CEC that way.

Word-of-mouth received two positive replies in Carol Stream and one positive reply each in Elgin, Evanston, Hoffman Estates, Orland Park and Schaumburg. The wording was "in-person contact: friends, family, colleagues, church, general announcements."

Table 3-27 below presents the percentage of residential customers in each of the nine CEC communities who reported getting SIYH info from any of the eight source options in survey question K1.

Table 3-27. Percent of households that recall hearing about SIYH in last 12 months

CEC Community	% recall hearing about SIYH in last 12 months	Z-Score on Recall Rate
Aurora	52%	-0.95
Carol Stream	57%	-0.27
Elgin	53%	-0.82
Evanston	66%	0.95
Hoffman Estates	52%	-0.95
Oak Park	65%	0.82
Orland Park	63%	0.54
Schaumburg	52%	-0.95
Wilmette	71%	**1.63**
All-CEC average	59%	

Source: Navigant analysis of phone survey done with CEC instrument.

Self-perception of the community norm for energy efficiency

Psychologists, economists and sociologists are in agreement that people behave according to their perceptions of "the social norm." In other words, an unspoken social agreement develops among a group of people. The perception of this agreement guides what people judge as right or wrong to do in matters like paying taxes, obeying traffic laws, friendliness to strangers, etc. For example, people in Los Angeles generally agree what type of language is acceptable in making public comments to the city council, but that norm differs from the norm in St. Paul, Minnesota. That is, there are differences in agreement "between cities," but also general agreement "within each city" about what is inappropriate.

A similar situation happens with energy efficiency. The greater the perception that "standards are high" within a group, the more likely members will self-discipline their behavior to meet that expectation. In the area of community "ethics," a similar situation arises. People mow their lawns according to what they think their neighbors expect, even if the topic is never openly discussed.

Randomly-selected residents in each of the nine CEC communities were asked their perceptions of the community norm toward energy efficiency. [Caveat: In the realm of peer-reviewed academic journals, a brief two-question survey would not be enough to prove the existence of a

social norm, but it is offered as an exploratory effort that does inform and provide justification for further investigation.] Two questions were used to probe attitudes with the following 0-10 rating system:

Please tell me how strongly you agree or disagree to the following statements using a scale that ranges from 0 to 10 where 0 means "strongly disagree" and 10 means "strongly agree".

> Energy efficiency Norm: *"A majority of people in my community are working hard to save electricity."*
>
> Libertarian, No-reason-for-limits Norm: *"The only good reason for conserving electricity is to save money. If someone can afford it, there's no reason for that person to worry about how much electricity they use."*

The survey findings suggest a hypothesis about the types of suburban culture near Chicago. Admittedly, these samples were small. The pattern may be due to random sampling, or it may be due to some underlying social dynamics regarding norm formation. That warning given, two tendencies in community response to the Energy Efficiency norms were noted.

- One type of community (3 communities) had roughly half of residents believing that "a majority of people" in their community were working to save electricity. Labeled the Efficiency Norm group, these include Oak Park, Aurora and Carol Stream.
- The second type of community (6 communities) were more pessimistic in their assessment of community culture, with two-thirds of respondents rejecting the suggestion that most neighbors were working for conservation. For this report, they are labeled "Pessimistic/Discouraged" and include the other six CEC communities [Elgin, Evanston, Hoffman Estates, Orland Park, Schaumburg and Wilmette.]

Table 3-28 presents results for the Efficiency Norm question. In terms of Z-scores, only Oak Park showed a mean rating that was statistically different from the overall average of all nine CEC communities, in this case significantly higher in believing there was a community energy efficiency norm [z-score = 1.83].

Table 3-28. Energy Efficiency Norm in CEC Communities

CEC Community	Residential Customers	Yes, high expectation of norm	Z-Score on Participation Rate
Aurora	59,705	48%	1.2
Carol Stream	14,700	45%	0.7
Elgin	39,212	36%	-0.7
Evanston	30,329	36%	-0.7
Hoffman Estates	9,090	36%	-0.7
Oak Park	22,363	52%	**1.8**
Orland Park	24,659	36%	-0.7
Schaumburg	32,400	35%	-0.9
Wilmette	10,038	40%	-0.1
All-CEC average		40%	

Source: Navigant analysis of phone survey done with CEC instrument.

For perspective, modern Americans have long reported that wasting electricity or other forms of energy is "not right" or even "wrong." Recall the mixed but often emotional feelings regarding tax-deductible Hummer SUVs in 2003-07. Even though we collectively acquiesced to it, many quietly lamented it.

National polls since the 1970s have repeatedly shown that most Americans think energy waste or inefficiency represents failings of society, though not our greatest "sin". In addition, the majority of the population is aware of some negative effects from electricity production.

The question asked steers clear of asking for a moral judgment. Instead it asked what respondents think others in their community are doing, not what is good or bad. It indirectly asks, are your neighbors actively supportive of electricity conservation? Do you feel that the norm in your community leans toward restraint in consumption?

Interpreted with a positive, optimistic attitude, one could interpret the survey data as saying, "Sure, the Pessimistic/Discouraged communities have two-thirds disagreeing with the claim that their community has an efficiency norm. But the data also show a large minority in Pessimistic/Discouraged communities implicitly identify themselves with efficiency, and if they think their neighbors support efficiency, too, then somehow they see like-minded consumers in their community."

Libertarian, "No reason for limits" Ethic

For the no-limits claim, a weaker pattern was observed across the CEC communities. Those who strongly agreed with the "no reason for limits belief" (7, 8, 9, 10 on the 0-10 scale) were categorized as followers in a libertarian ethic. Table 3-29 shows that there was less variation across the nine CEC communities for this measure than for the Efficiency Norm measure.

However, one community (Evanston) strongly rejected the Libertarian, No-reason-for-limits claim with 87% rejecting, 13% accepting [z-score -1.57]. Evanston is known for its influential university community bordering Northwestern University and four independent colleges. The percent of residents with a 4-year degree is more than 30% compared to 12% for the City of Chicago. Could it be that Evanston residents have greater awareness and knowledge about damages associated with electric production?

Two CEC communities proved slightly "above average" in accepting the Libertarian, No-limits claim (Aurora, Orland Park.) This makes the previous finding of an Efficiency Norm in Aurora interesting. The same sample of 65 from Aurora believes the community is uniting to reduce waste, but at the same time assents to the claim that there's no good reason except money to conserve energy. Aurora is known for a large Latino community, and one hypothesis is that this aligns with a Latino norm whereby conservation efforts may be more acceptable solely as a home budgetary concern. As a caveat, the statistical evidence from Navigant's survey regarding Aurora and Orland Park is weaker than that mentioned for Evanston above.

Table 3-29. Perception of "no reason for limits" on electric use

CEC Community	% Yes, no reason for limits	Z-Score on Participation Rate
Aurora	27%	1.3
Carol Stream	16%	-1.0
Elgin	18%	-0.6
Evanston	13%	**-1.6**
Hoffman Estates	19%	-0.3
Oak Park	24%	-0.7
Orland Park	27%	1.3
Schaumburg	23%	0.5
Wilmette	19%	-0.3

Source: Navigant phone survey data with CEC instrument.

Methods of communication regarding Smart Ideas for Your Home

The primary method by which residential customers heard about Smart Ideas for Your Home was the ComEd bill insert. This was according to a probe question in a Navigant CEC survey instrument. It presents the following contradiction: While 59% of CEC residential customers reported hearing about SIYH through any media in the last 12 months, a separate survey (general pop. CFL) of residential customers at the same time reported only 19% recall/awareness of Smart Ideas for Your Home. The discrepancy could be explained several ways. In the Navigant/CEC survey, the survey was longer and probed multiple media by use of a list (i.e., radio? TV? Newspaper? Word of mouth?) In the process of slowing the customer's thought process down, it could be that the probing list retrieved more memories, hence better recall. This is understandable since SIYH has been an actively-promoted trademark for the last two years, while the CEC had a one-year life.

Hard-to-reach audiences

One of ComEd's goals for the Community Energy Challenge was to extend the reach of EEDR programs to customer segments that—for whatever reason—ignore opportunities available to them.

Some traditional hard-to-reach customer segments are multi-family and small businesses. Multi-family is hard to reach because the owners of large energy-using devices are often not the same people as the users of the equipment. An investment by the owner translates into a direct savings for the user, not the owner. This creates a split incentive structure that does not encourage the installation of energy efficient equipment. As for small businesses, the small business owner often wears many hats and does not have a great deal of time to investigate and understand new energy efficiency opportunities for their business. The CEC program's success in reaching each of these segments, multi-family and small business, has already been assessed and presented in a previous section of this report. Participation rates for these two hard-to-reach segments are easy to assess because the ComEd customer database includes information on the size and type of customers.

However, there are additional hard-to-reach populations based on ethnic subgroups that are more difficult to both address and assess. The supposition of EEDR planners was that culture makes some customers hard-to-reach. Barriers could include English not being the customer's primary language, or that certain customers don't use the same news media as most other ComEd customers.

The existence of hard-to-reach ethnic segments has been discussed by EEDR professionals for at least a decade. [See "More and Faster: Increasing the Achievable Energy Efficiency Potential through Best-Practice Processes and Data Management Tools," by Steven Meyers, Rational Energy Network and Stephen Guthrie, EnerPath, 2006 at

http://www.rationalenergy.net/pdf/meyers_aceee.pdf .] The Community Energy Challenge seemed a good way to approach this acknowledged gap. Leaders of smaller communities might easily read their local culture and identify who was reluctant to participate and which customers needed a special approach in order to get a sign up.

One research barrier encountered when investigating this issue was lack of data. In order to optimize efficiency, ComEd has not traditionally collected information on customers that it didn't need in order to provide electric service and collect payment. Obviously, ComEd has some data on every customer getting electricity through field engineering reports and billing account information.

However, existing ComEd customer databases don't hold many customer-specific details on demographics and firmographics. For example, ComEd doesn't know which of its residential customers lack good English language skills. ComEd doesn't know which businesses are managed by persons new to the United States and therefore new to the services that American utilities commonly provide.

In the municipal energy plans filed at the start of the Community Energy Challenge, each of the nine participating communities had the option of identifying "hard-to-reach" segments (Evaluation Credit 5: Assisting ComEd in Delivering Incentives to Hard-to-Reach Customers in the 5-page handout, "Municipal Energy Plan Scoring: Assumptions and Methodology.") Evaluation Credit 5 was not a requirement, but extra points were awarded if communities did supply it, thus helping the community's chances for the $100,000 cash prize.

Most communities did mention "hard-to-reach" segments in their initial plans and focused on multi-family and/or small business segments. Two communities went beyond these traditional groups and identified hard-to-reach ethnic groups. Aurora identified a lower-income section of the city where Latino customers were dominant. Schaumburg identified a business section where South Asian business managers were common.

While both Aurora and Schaumburg performed well in advancing ComEd incentives, no records could be found regarding the ethnic characteristics of participants. Unfortunately, data wasn't collected in the SIYH and SIYB programs for ethnicity or primary language. The most favorable interpretation of the CEC's performance is that "the issue" of language, national origin and minority participation was indeed raised to community leaders. In any future iteration of the Community Energy Challenge, a process will need to be developed to capture and store such data.

Energy Literacy and the Community Energy Challenge

ComEd gave special attention to 'hard-to-reach' customers in the design of the Community Energy Challenge because they wanted to learn more about ways to motivate customers to

participate in their energy efficiency programs. Motivation involves the mental web of beliefs, knowledge and emotions (i.e., culture). While ComEd can tap existing culture to promote action, it cannot tap it effectively or efficiently without knowing the pattern of differences across communities and other sub-populations.

To better understand these cultural differences in the context of energy issues, questions related to energy literacy were analyzed across different residential customer groups. As used here, "energy literacy" encompasses awareness, knowledge, attitude, beliefs and behavior. Descriptions of how these mental constructs cohere to produce action can be found in college textbooks about environmental education.

Navigant developed a structured battery of questions to directly assess energy literacy issues, and this battery was added to the CEC residential non-participant survey and the over-sample residential CEC participant surveys for Aurora and Carol Stream. This battery of questions is shown in Figure 3-11.

Figure 3-11. Navigant Battery of Energy Literacy Questions

Please tell me how strongly you agree or disagree to the following statements using a scale that ranges from 0 to 10 where 0 means "strongly disagree" and 10 means "strongly agree".

a) A majority of people in my community are working hard to save electricity. [PERCEPTION OF LOCAL NORM]

b) My city/town government is working hard to reduce its own use of electricity. [PERCEPTION OF LOCAL NORM]

c) The typical household would have much lower electric bills if they installed new, high-efficiency appliances. [ENERGY LITERACY: ACTIONABLE KNOWLEDGE]

d) The only good reason for conserving electricity is to save money. If someone can afford it, there's no reason for that person to worry about how much electricity they use. [ENERGY LITERACY: LACK OF KNOWLEDGE ABOUT LIMITS, ECO & SOCIAL IMPACTS]

e) A household could pay for new, high-efficiency appliances just from the money they'd save on lower electricity bills over several years. [ENERGY LITERACY: ACTIONABLE KNOWLEDGE]

f) I actively participate in or provide financial support to community groups and organizations whose main mission is to raise awareness of environmental issues, and/or protect the environment. [BEHAVIOR: PERSONAL ECO-RESPONSIBILITY]

It was found that the Navigant energy literacy questions shared some similarity with a battery of questions that were already part of the General Population Lighting Survey (GPLS), so the GPLS survey results were also incorporated into this analysis. By using both the CEC surveys and the GPLS survey we were able to examine energy literacy differences across a wider range of customer groups.

While the two survey batteries are different, they are united by the theme of energy literacy. Both batteries were used to question customers about environmental attitudes, energy efficiency attitudes and expectations, and energy efficiency behaviors. The two batteries varied such that no one item appeared in both batteries in an exactly comparable form.

- The CEC battery included six items about environmental beliefs and attitudes, efficiency beliefs and social norm perceptions (see above).
- The Residential Lighting battery included seven items about environmental attitudes and efficiency knowledge and attitudes

Table 3-30 identifies the populations surveyed with each of two batteries, one written for the General Population Lighting Survey (GPLS), the other for the CEC evaluation. All of these surveys were fielded between May-September 2010.

Table 3-30. Survey Populations for the Two Energy Literacy Batteries

Population studied	GPLS battery	CEC battery
Aurora (CEC) residents		68 appliance recycling participants
Carol Stream (CEC) residents		16 multi-family direct install participants
All CEC community residents	68 random CEC households	
CEC residents not screened for EE participation		611 random CEC households
Non-CEC residents	458 random non-CEC households	

Source: Navigant Consulting analysis

The CEC battery of questions was used in 68 phone interviews of Aurora customers who participated in the Appliance Recycling program and 16 interviews of Carol Stream customers who participated in the Multi-Family direct install program. The CEC battery was also included in the August-September 2010 fielding of an evaluation survey randomly selected from residential households in the Community Energy Challenge communities.

The GPLS battery was part of the General Population Lighting Survey (GPLS). It's major purpose was to estimate the impacts of the Residential Energy Star Lighting Program in residential households of ComEd's service area. Phone interviews for the GPLS were made in May 2010.

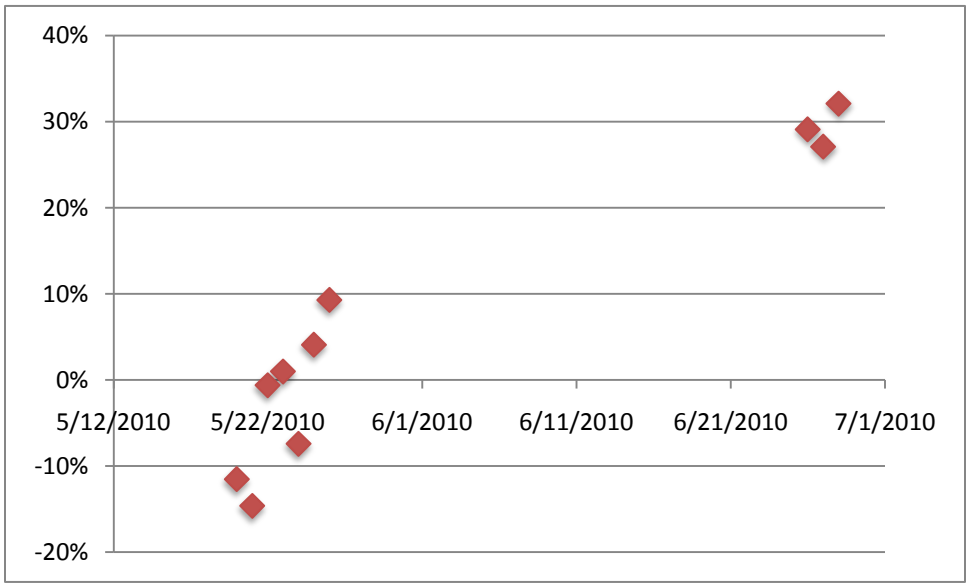
Some households in the GPLS first wave happened to be in CEC communities, but not enough to meet the EM&V requirement of 68 CEC residents. Thus, after completing the first-wave quota for general purposes, the EM&V team contacted additional customers to boost CEC representation to N=68. Combined, the CEC and non-CEC respondents to the 2010 GPLS numbered 526 (458 in non-CEC areas, 68 in CEC municipalities).

The energy literacy data that became available from these surveys was used to analyze differences in the following study populations:

1. All-CEC group (random sample of residential customers from nine communities participating in the Community Energy Challenge)
2. Appliance Recycling participants from Aurora (2nd largest city in Illinois)
3. Multifamily participants from Carol Stream (apartment and condo residents)
4. White/non-white residential customers
5. Latino/non-Latino residential customers

While performing initial analysis of the data, it was discovered that the timing of the phone interviews may have had an influence on some of the energy literacy measures. For example, at first glance, CEC residents appeared to differ from non-CEC residents in levels of worry about future supplies of fossil fuels. However, a day-by-day look at the data showed concerns increased dramatically during critical parts of the Deepwater Horizon oil spill in the Gulf of Mexico (May 25-29) and most CEC respondents were interviewed in late June. Plotting this data along a time dimension based on when the surveys were conducted indicates that the difference may be due to timing rather than being a CEC community. Figure 3-12 illustrates this finding.

Figure 3-12. Variation from Mean for "Greatly Concerned" or "Concerned a Fair Amount" about Running Out of Fossil Fuels



Source: Navigant Consulting analysis

The scatter plot shows that respondents on the upper right of the plot, who were mostly from the oversample for CEC communities, were interviewed one month after the others (lower left). In many situations, one month will not make a difference for beliefs and attitudes. In this case, something extraordinary happened. Reviewing the news of May and June, the major news focus was the Deepwater Horizon oil spill and failure to control the flow.

For example, the Atlanta Journal Constitution on May 25, 2010 reported: "Thirty-six days after the Deepwater Horizon exploded, killing 11 crew members and setting off a massive oil leak, BP may finally be ready to attempt to seal the drill site with a 'top kill' of heavy mud followed by cement. I've seen estimates of success at 60 to 70 percent, so keep your fingers crossed. All of them. It's a critical moment, the last best chance to stop the flow for weeks if not months. If this doesn't work…" It is likely that news like this influenced scores over this time period.

Learning that this temporal factor may be influencing results, care was taken to keep this factor in mind as the primary findings from the energy literacy comparisons were developed. Following is a list of the primary findings from the energy literacy analysis which shed light on the sociology affecting the Community Energy Challenge.

- CEC program participants were more aware of the "Community Energy Challenge" than non-participants in CEC communities. Among Aurora participants in the appliance recycling program, nearly 30% were aware of the existence and substance of the CEC campaign. This compares with 20% for the general population of residential customers in CEC communities and only 12% awareness among the general Aurora population.
- Oil supply is a greater worry than other fuel supplies. The May-June 2010 survey of residential customers representing all of ComEd's service area found residential customers twice as likely to be "greatly concerned" about oil dependence (39%) than they were "greatly concerned" about running out of fossil fuels (21%). This finding was based on the N=511 General Population Lighting Survey and was not dramatically damaged by the Deepwater Horizon news event.
- White and non-white customers view the future of energy differently. Self-reported Non-white residential customers are 2.3 times more likely than self-reported Whites to identify "great concern" over running out of fossil fuels like oil, coal, and gas. This finding was based on the N=511 General Population Lighting Survey and was not dramatically damaged by the Deepwater Horizon news event.
- Latino and non-Latino customers differ in concern level. Latinos are nearly twice as likely to express "great concern" than are non-Latinos about running out of fossil fuels. However, because the number of Latino respondents was small, we cannot declare the difference as statistically significant.

Data Tracking System Review

Shaw Environmental provided Navigant Consulting with a list of Smart Ideas for Your Business (SIYB) participants within the CEC municipalities. This list was collected directly from communication with the CEC communities. Navigant merged this participating customer list with ComEd's database of program participation to verify that the list of customers provided by

Shaw Environmental was included in ComEd's database. All listed customers were found in the database.

Navigant Consulting found that the information provided by ComEd in their program tracking database regarding measures installed and savings expected was verifiable and in good order. Shaw Environmental responded to all data requests promptly. Navigant Consulting did not find any areas of concern related to data tracking for the pilot program.

Section 4. Conclusions and Recommendations

This section presents conclusions and recommendations based on the study findings.

Conclusions

Conclusions will be presented separately for the impact and process evaluation work.

Program Impacts

The total quantified electric energy savings goals across all CEC communities was over 54,000 annual kWh. These goals were not fully achieved, but that is not unusual for the first year of a new program. In-depth evaluation was done to investigate potential differences in realization rates, free ridership and spillover for the ComEd programs that were part of the CEC.

No differences were found in the Gross Realization Rates for CEC communities in any of the programs. This means that program-reported gross savings were equally reliable both in CEC and non-CEC communities. The CEC program did not have any impact on how the gross savings were tracked.

The story is different when looking at the Net To Gross Ratios. Free ridership was found to be higher in the CEC communities for the Smart Ideas for Your Business (SIYB) rebate program, however it is possible the survey technique, which was identical to that used in the standard program, may have under-captured the program's effects.

Spillover was found to be higher in Carol Stream for the Multifamily All Electric Efficiency Upgrade program.

It was also found that the CEC program increased participation rates in the SIYB and MF Efficiency Upgrade programs. However, CEC was not found to have any impact on increased customer savings outside of the ComEd programs.

These factors can be used to determine evaluation-adjusted net savings for the ComEd programs within the CEC. Application of these factors show that the CEC program resulted in 13,372 annual MWH of evaluation-adjusted gross savings and 9,285 annual MWH of evaluation-adjusted net savings. These values incorporate the effects of increased participation due to the CEC program. It is important to note that all of these savings have already been included within the regular evaluation of each individual ComEd program for PY2, therefore they are not additive to the already reported savings for each program.

Program Processes

The central theory of ComEd's Community Energy Challenge (CEC) is to test whether or not municipal governments can be an effective ally for ComEd to engage potential customers in a cost-effective manner and to engage hard-to-reach customers. Overall, the central program theory of the ComEd Community Energy Challenge is a viable one. While there were some opportunities that were missed in this pilot program (a result that is commonplace among pilot programs), there are many successes to highlight.

The CEC program provided an avenue for municipal governments to learn more about their community's energy usage, engage with community stakeholders, and create opportunities for ComEd to achieve kWh savings from traditionally non-participating customers and/or hard-to-reach customers. Municipal stakeholders overwhelmingly supported the design of future programs to engage municipalities to collaborate with ComEd to promote energy efficiency, water efficiency, and sustainability initiatives. Municipal stakeholders expressed interest in sharing information and best practices upon the completion of the CEC through case studies and internet-based information resources. They reported that they felt it was very important to leverage the investments made both by ComEd and the municipalities during the past year. Several municipalities reported that they intended to continue to promote ComEd energy efficiency programs continuously as part of outreach efforts created or bolstered by the CEC.

Based on these observations, it would appear that participating municipal stakeholders solidly support the concept of community-based energy programs in their municipalities. While the concept of implementing a public-private partnership to promote community-based energy programs appears to be universally favored among participating municipalities, municipal stakeholders had different thoughts about the most effective avenue to deliver cost-effective energy savings and leverage core competencies from the public sector.

For a pilot program, the CEC provided a wealth of insight into a small sub-section of municipal governments in ComEd territory from which ComEd should be able to extract important information to design the next generation of community-based energy efficiency and demand response programs. By carefully applying additional technical and financial resources and seeking stronger collaboration among funders, ComEd can create a series of public-private partnerships to more fully utilize municipal governments in helping to deliver community-based energy efficiency programs. Through these public-private partnerships, ComEd and local governments can provide targeted end-use customer market engagement in energy efficiency and demand side management programs.

Recommendations

The findings and conclusions of this evaluation led to the following recommendations.

Impact Recommendations

The findings from the impact evaluation of the SIYB program suggest several actions for reducing actual free ridership and improving measurement in future community efforts:

1. Emphasize that municipalities continue to find new energy efficiency opportunities in businesses and steer clear of reporting opportunities that are already planned.
2. Provide more information on energy efficiency measures to the communities for them to use in their local campaigns.
3. Adjust the responses to the program influence questions in the evaluation survey to include a specific option for citing CEC activities that would contribute to a greater NTGR for the program.

As for the Multifamily All Electric Efficiency Upgrade program, it would be worth some additional investigation to find out if there were any unique aspects in the way Carol Stream delivered this program that might have contributed to the high spillover of CFL installations in that community.

Process Recommendations

Our process improvement recommendations are based upon research into the specifics of the ComEd CEC program but also on research on other community energy challenge programs. We reach rather broadly in our recommendations to provide fodder for discussion during ComEd's deliberations on the future of the CEC program.

Eight process improvement recommendations are discussed below:

1. Engage stakeholders earlier
2. Leverage core competencies
3. Identify additional resources for outreach
4. Simplify the planning and scoring phase
5. Celebrate successful projects and community participation
6. Implement a strategy of continuous improvement
7. Collect data on non-participants of EEDR programs
8. Incorporate non-English communications for EEDR

Engage Stakeholders Earlier

Effective deployment of municipal resources frequently requires a good deal of advance planning in order to be integrated into municipal budgets and operations plans. Future CEC programs should be communicated to municipal governments well in advance to provide them with the opportunity to synch their planning and budgeting with CEC program implementation. Future CEC programs should account for the fact that municipal energy

efficiency and renewable energy projects frequently require more than 12 months to plan and implement.

For future CEC programs, consider requiring municipalities to submit a letter of interest (or pledge) through an RFQ or RFI process instead of inviting communities directly. One way to potentially gauge community interest would be to involve the Metropolitan Mayor's Caucus or other appropriate forum to conduct a survey of municipalities and/or convene a series of stakeholder discussions. Interested communities could self-identify their willingness to participate in one or more elements of a future CEC and potentially create clusters of participating communities. The stakeholder discussions will likely uncover additional opportunities to design and implement energy efficiency and demand response programs that fit the needs of local governments and their stakeholders.

Leverage Core Competencies

Communities responded that they felt the best use of their time was interacting with end-use customers to promote the benefits of energy efficiency and educating them about ComEd energy efficiency programs and other resources, such as DCEO funding.

One of the delivery channels with the biggest opportunity for efficient education and outreach is identifying opportunities for communities to leverage their current municipal authority or functions (e.g., fire inspection, building permitting, municipal operations) to effectively integrate the promotion of ComEd and DCEO resources within their previously existing scope of work.

Identify Additional Resources for Outreach

Future CEC programs would benefit from having more funding available for outreach efforts within each community. One idea is to allocate a portion of the marketing funds from the regular ComEd EEDR programs to the participating CEC communities for their use. Another would be sharing of ComEd media resources with the communities, such as their Web site, bill inserts, events and/or local radio and newspaper spots.

Beyond ComEd's funding, further investigation should be made of resources available through the U.S. Environmental Protection Agency (EPA) to support community energy programs. For example, many similar "Community Energy Challenge" programs have been implemented since 2006 through EPA's Region 1-New England. The EPA website has a wealth of technical resources, including an EPA Challenge Toolkit. For more information about the EPA Challenge Toolkit, visit webpage (viewed July 13, 2010) at http://www.energystar.gov/index.cfm?fuseaction=challenge_community.show and also Appendix A of this report: "Primer on Community-Based Energy Projects."

Simplify the Planning & Scoring Phase

It would be possible to create Municipal Energy Plan template modules based on successful elements of municipal energy plans from the pilot program. This would enable interested communities to select template modules to comprise their Municipal Energy Plan without having to write a plan from scratch. Including options for customization would allow for flexibility.

If a competition is repeated, a simplified scoring algorithm is recommended. This would improve understanding and use by program participants and add transparency for additional program stakeholders

Celebrate Successful Projects and Community Participation

Increased public recognition of municipal accomplishments could be used to expand awareness and participation in the overall Community Energy Challenge and its goals. Opportunities for recognition include written or video case studies for ComEd's website and/or the participating community's websites, including webinars and other internet-based education planning. Case studies need not be confined to the winning community. They could also be shared through the Metropolitan Mayors Caucus (MMC), United States Green Building Council-Illinois Chapter (USGBC), and/or other municipal government information sharing channels.

Opportunities for creative recognition of municipal community accomplishments abound, such as eco-friendly awards and web-based media. Engage young people in helping to celebrate the success of the first CEC and leverage those stories to a broader audience through new media channels.

It would be possible to moderate the motivational competitive nature of the program with a cooperative spin if recognition thresholds were created where more than one participating community could be considered a winner and receive public recognition for implementation accomplishments. For example, ComEd could recognize any community that implemented enough projects to save 1,000,000 kWh or for engaging 100 new customers who have not previously participated in ComEd energy efficiency programs. Several thresholds could be established with correspondingly higher levels of recognition, financial, and/or technical resources.

Implement a Strategy of Continuous Improvement in the Program

On-going forums should be convened to share best practices among communities. There should be a sustainable continuation of efforts to fund technical resources for the implementation of cost-effective programs for hard-to-reach customers or non-participating customers, potentially through MMC, USGBC Illinois Chapter, or other appropriate organizations.

Identify and Collect Data for Hard-to-Reach Ethnic Customers

ComEd recognizes that there are customer segments which, for different reasons, are resistant to current EEDR programming. Are there groups who are not responding to ComEd messages being broadcast? ComEd guesses so and tasked the participating communities with identifying and engaging those segments.

Several communities identified multi-family buildings and small businesses as hard-to-reach. Special promotions were focused on these groups and results could be easily assessed using available data on customer type and size in the ComEd database.

However, other hard-to-reach customer groups were identified by ethnicity in some community plans. For example, South Asian businesses were identified as a hard-to-reach population in Schaumburg. That said, customers accepted for SIYB incentives during the CEC pilot were not asked to report on ethnicity of business manager(s). The same inability to collect ethnicity data occurred with residential programs (appliance recycling, CFL rebates, multifamily.)

It is a truism that the most difficult part of ignorance is being unable to identify important things that you don't know. In sales and marketing, this is the fundamental question of the overlooked market segment. Being able to engage the hard-to-reach ethnic customer segments will require collecting additional customer characteristics data for both non-participants and participants in the ComEd service area.

Incorporate Non-English Communications for EEDR

The Navigant team found that about five percent of households phoned for ComEd EM&V surveys have respondents who are unable to communicate effectively in English. US Census data reports that 20% of households in ComEd's service area have substantial difficulty speaking English well. In addition to Latinos, there are large populations of Asians in CEC communities and northeast Illinois in general. Even if a residential customer can "make it by" in English, if English isn't their first language, they will have difficulty understanding and therefore be resistant to trying new options offered them. Expanding the reach of EEDR programs into hard-to-reach areas suggests more exploration and experiments in reaching persons who do not have fluency in English.

The ComEd website does offer a Spanish-language conservation pamphlet, but it is a nationally-focused PDF from the US Department of Energy. There are no pages or downloads explaining ComEd EEDR programs in Spanish. ComEd also offers two safety videos in Spanish language. That said, ComEd EEDR programs are not promoted in any language but English. By contrast, Nicor, a regional natural gas supplier has what appears to be a complete replicate of their website in Spanish [<http://www.nicor.com/en_us/residential/espanol/>]. More non-English translations

of information on the ComEd EEDR programs will be needed to improve their participation rates.

Appendix A. Primer on Community-Based Energy Projects

Appendix A Table of Contents

A.1 Ideas for taking Community Energy Challenge to a Higher Level

The following Q-and-A reviews what other people have done with community-based energy projects. Suggestions are given for ComEd to consider in similar future efforts. The Q&A format is designed to make it easier to read.

Q: What is a community-based energy project (CBEP)?

A: In its most commonly used form, a "community-based energy project" is a limited-term collaboration to improve the energy security of a jurisdiction or subarea (neighborhood, downtown). Often, CBEPs involve special efforts to "help the needy" whether those be lower-income households or the elderly. The collaboration could involve any number of parties, including limited help from persons or groups not resident to the community. In the mythical sense of barn-raising or levee-building, such projects call on community members to exert effort for the common welfare. Therefore, some measure of volunteerism is expected to signify "grassroots involvement." Also common is a campaign atmosphere of kickoff and ending date along with ad hoc committees and work teams.

Q: What are the strengths and weaknesses of a community-based energy project (CBEP)?

A: Because it has a "grassroots feel," CBEP have special value in engaging the layperson who may know little about energy. Also, because it has a limited time frame, media news reporting and social buzz are stimulated *(How is the Project going? How much progress has been made? Will they reach their target?)* A benefit of CBEP is that it can build a community's social capital and increase investment in the community in preference to spending elsewhere.

Q: Who started the first community-based energy project (CBEP)?

A: That information is not well recorded, but we do know that community-based energy projects entered popular consciousness during the 1970s following the surprise of the two Oil Embargos along with US natural gas shortages and rapid inflation of fuel prices worldwide. The emphasis was on emergency conservation measures like home insulation and replacing large windows in budget-strapped public schools. The USA and Europe witnessed the

sprouting of CBEPs in efforts to help those—like retirees on fixed pensions-- whose lifestyles took the hardest hits. In the USA, federal weatherization assistance became institutionalized, replacing the need for volunteer labor.

Q: Do community-based energy projects involve solar and other renewable energy?

A: Yes, they increasingly do. As the CBEP concept evolved after the 1970s, it produced a hybrid offspring. CBEPs were organized by social strata of means, such as farmers in Denmark and Germany who organized wind farm cooperatives. Thus, these community energy projects became long-term projects. Similarly, groups of dairy farmers in Pennsylvania organized a community energy project to create a shared system for converting cow manure into methane fuel gas.

Q: Can community-based energy projects help my community become sustainable and reduce its carbon footprint?

A: In an unexpected transition, utility professionals are bringing expertise to help communities move toward sustainability. Green electricity has been a service sold to environmentally-conscious homeowners and businesses to get regional renewable electricity. In an adaptation, communities can gather community support for green electricity. PECO, an Exelon affiliate, is helping Pennsylvania communities purchase wind power www.pecowind.com from a local independent wind farm operator.

Q: Where has it been tried before? How much testing has the concept had?

A: Community-based energy projects are today found on every continent, including in foreign aid efforts by non-profits and Western governments. However, the nature of CBEP changes drastically when one goes from an industrial city to a Third World village.

Q: What principles do CBEP's operate under? What makes one successful and another a failure?

A: Because a CBEP attempts to build collaboration, trust is paramount. Collaboration infers a relationship. Maintaining a relationship requires continual reassurance. In the case of ComEd's Community Energy Challenge, community participants who made sacrifices are going to need some type of update that tells them their efforts were valuable. This need was hinted at by several individuals at the closing luncheon in Oak Brook Terrace. As mayors and government staff at the CEC closing luncheon commented, "This effort was indeed valuable to both of us. Wouldn't it be right to continue working together?"

Q: How could ComEd make the next Community Energy Challenge more successful?

A: Changing behavior is probably the most difficult task in energy efficiency today. It is simpler to change a light bulb than to ensure that unused lights are turned off. Predictably, most CBEPs have focused on material hardware. One way to make a community project legendary would be to successfully make inroads on human behavior. An option raised during evaluation interviews by ComEd's Mike Brandt is to use behavior modification tools. The leading edge today is OPOWER's system, though there may be other options. OPOWER could be formatted to report on progress compatible with a Community Energy Challenge format. (That is, friendly competition between suburbs and city wards with residents cheering their own team.)

Q: But didn't mayors tell ComEd that the competitive aspect of the CEC was deleterious?

A: Yes, mayors of participating communities told Navigant Consulting that the prize seemed to get in the way. They explained that competition for a prize got in the way of their supervisory staff sharing tips and ideas with other competing communities. We'd like to collaborate, they said. Consider a very different sequence that might occur at the level of neighborhoods. If a neighborhood (or village) were competing based on the collective performance of households, the neighbors in a community would be incented to share tips and encourage change (among their neighbors) in pursuit of a collective prize. Consider also that, compared to the complexity and uniqueness of each local government's operations, energy use at the household level is much simpler. Tips and ideas are all well known.

Q: What CBEP's in history have been comparable to ComEd's CEC pilot?

A: Navigant was unable to locate reports of a sizeable cash prize to a local government. So it appears that ComEd's CEC was unique in that regard. The concept is not completely new, but the application was. Some utilities (and some cable TV shows) have done something similar by having households "compete" in a lottery to win a "free energy makeover" for their residence.

Q: **Are community-based energy projects the same as community energy planning (CEP)?**

A: Yes and No. CBEP's can be used as a tool in CEP, but CEP does not usually involve a CBEP. Community energy planning (CEP) incorporates energy management into the traditional function of urban planning. While CEP talks about "complete communities" and "green cities," this primarily is the province of the urban planner. Energy concepts indeed may be applied in CEP, including energy cascading, demand-side management and integrated resource planning.

CEP can be applied at the level of neighborhoods, cities and even small regions in order to exploit the synergies between urban design objectives and energy management objectives. CEP is a long-term goal to minimize energy use to increase funds available for other uses. An indirect benefit of energy minimization is reduction of environmental impacts at multiple levels

beyond the purely local. CEP encompasses (A) land use planning, (B) transportation management, (C) site design, and (D) local energy supply and delivery system planning.

A.2 Brief History of Community-based Energy Programs

Community-based programs have been used since the 1970s to reduce fuel use while providing essential energy services.

Rewards were multiple. Community projects altered energy use for the benefit of the bill payer. In many cases, also for the benefit of taxpayers, who were paying the annual cost of helping the lower income households.

The Community Energy Challenge taps images close to the surface of Chicagoland's cultural memory. Elementary school textbooks tell of Jane Addams and her community organizing in Chicago to deal with 1890's poverty relief. Addams' Hull House worked to develop collaboration and skill building among part of the community to help all of northeast Illinois in the era of massive European immigration.

Marginally, community projects reduced total societal costs for energy. In terms of long-term upgrades to buildings, host communities emerged with increased value in building stock. In terms of economic development potential, host communities retained increased social capital, a soft, but functional form of energy infrastructure.

Early efforts in energy-related community programs include the 1970s Community Energy Project of Portland, Oregon. Typically, such efforts have focused on lower-income populations who had neither technical training nor financial resources to improve their household energy situation. Federal and state funds for weatherization were used to deliver residential improvements to income-qualified households.

Idealistic government staffers in several states have left government payrolls to start or join social entrepreneurial organizations. Often non-profit, these firms transferred the lessons of these charitable efforts to larger, break-even or for-profit enterprises (energy service providers like ESI and the Wisconsin Energy Conservation Corp.)

Starting in the 1980s, these groups advanced community-based programs, basing them on market principles such as payback requirements, shared savings, etc. Also, some became government contractors, working to achieve social goals under the oversight and short-term "rational economic decision making" of state regulators. The service provided began with information and education—allowing building owners to contract for labor and equipment improvements. To the needy, installation was done for the building owner. For those persuaded but not financially independent, action was encouraged by other innovations. Some community-based programs effectively paid the building owner a share of the social benefit of

energy efficiency; practically, this meant utility funds converted into government-authorized rebates or other financial instruments.

Historically, community-based projects were born when individuals started acting and encouraging neighbors to join. In the modern era of advanced organizational management, charitable support is solicited from corporations, philanthropists and government.

As success accrues, projects that provide benefits are adopted for large-scale, long-term use. They become institutionalized and thereby become part of the culture, making long-term contributions to the broader community. In socioeconomic terminology, it's called "market transformation." A prime example of a group making the transition is Chicago's own Center for Neighborhood Technology (CNT). CNT is today a nationally-recognized non-profit that has worked with ComEd to test and promote real-time pricing for residential customers since 2000.

A.3 Communications Terminology used in Community Energy Projects

To accomplish energy use reductions, Community Energy Projects use multiple messaging strategies, including

- conservation (stop using it; turn out the lights) and
- energy efficiency (install better technology to get more done per unit of energy like motion-sensitive light switches; higher efficiency refrigerators).

Conservation can mean traditional denial conservation (suffer discomfort and do without AC) or lifestyle change (I really don't mind it being two degrees warmer; I can turn the desk fan on if I need to, no big deal.)

To achieve both conservation and energy efficiency, Community Energy Projects rely heavily on persuasion to encourage changes in energy use, often with the benefit being "the common good." Persuasion requires communication, do CEPs use communication processes and media. Together they fit the rubric of "social marketing."

Multiple forms of media are used, including traditional media (direct mail, newspapers, speeches), electronic mass communications (radio, community cable TV, e-newsletters) and social media (personal email campaigns, Facebook, Twitter, cell phone texting.) Bridging these media types are multi-form media (stage performances, film showings, community book readings, street theater, songwriting contests.)

Understanding and articulating the communication subprocess

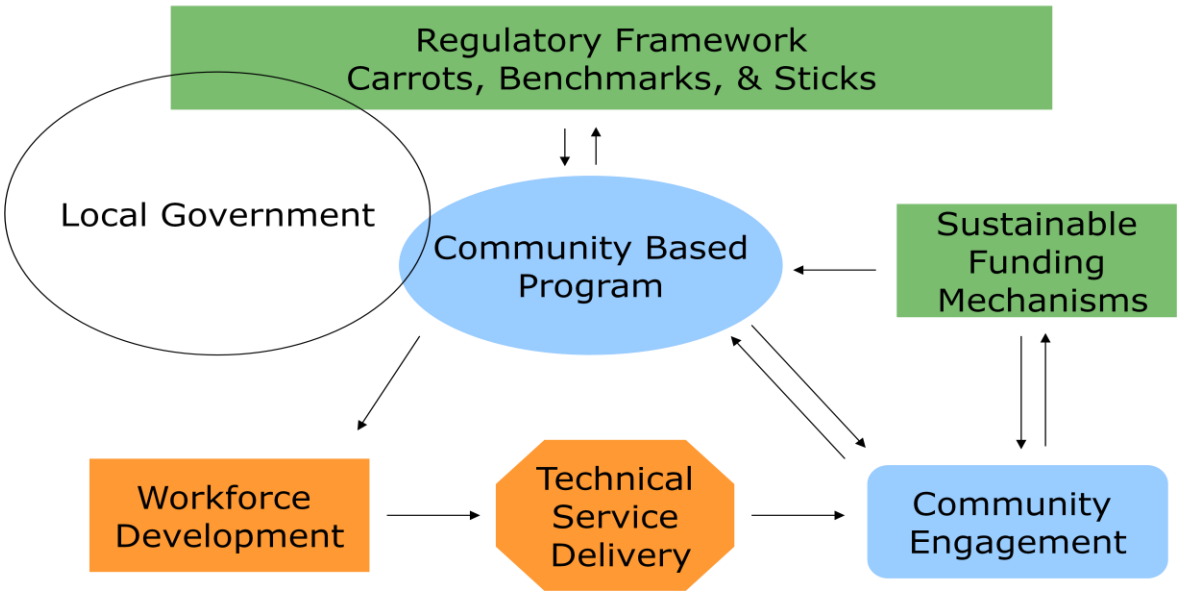
It is valuable for internal team communications if all parties have a common conceptual understanding of what they are doing as a team. The graphic below is a conventional model of communication to change behavior. More elaborate and detailed diagramming of the process is available in social marketing textbooks.

- Exposure – Programs vary in how audiences are exposed to program messages. The evaluation approach will use program-appropriate methods to determine the frequency and reach of the messaging efforts.
- Awareness/Knowledge – The evaluations will assess the change in the level of issue awareness resulting from the program, and the related change in customer valuing of that issue and in the knowledge of their ability to address it.
- Intention to act and behavior change – The evaluations will identify actions, either planned or taken as a result of the behavior based program. This includes the timing of the completed or planned action and the potential influence of the action on energy use, based on information available from secondary sources such as past evaluations of IPL programs and reports available from evaluations of similar programs.

A Schematic for Thinking about Community-based Energy Efficiency Programs

Planning for a community energy projects means thinking about the parts and their interactions. The diagram below is one reference to guide thinking.

Figure A-1. Community-Based Program Schematic



Source: presentation by Ian Fischer, Clean Energy Solutions, Inc. to Environment Virginia, April 1, 2009.

The text below was adapted from the article "Capturing Conservation through Community Energy Management," by Paul Berkowitz, Sabrina Karl, Judith Ramsay; published in Home Energy Magazine, Mar/Apr 1994, http://www.homeenergy.org/archive/hem.dis.anl.gov/eehem/94/940309.html

In 1994, there were three basic types of community energy-management projects common to the United States: the Marketing Model, the Partnership Model, and the Developmental Model.

Marketing Model, an organization--usually a utility--initiates, designs, and implements programs to meet its objectives. The utility views the community as a marketing arena or distribution mechanism for its demand-side management programs.

Partnership Model A party outside the community (e.g., utility) initiates the process but invites the local community to partner in developing its own conservation objectives and programs. Partnership programs involve negotiations between the outside organization and the community.

Developmental Model Community organizations and/or local government design and control the programs, while outside organizations (state energy departments and/or utilities) act as enablers of community objectives, providing funding and other support.

The text below comes from a May 27, 2009 talk "Community-based Energy Efficiency and Renewable Programs: Aggressive Goals, Comprehensive Services" to DOE National Residential Energy Efficiency Business Model Summit. Presented by Steve Morgan, Clean Energy Solutions, Inc.

How Should Communities Proceed

- Create an energy team and identify a coordinator or "champion"
- Identify opportunities and needs
- Obtain technical assistance as required
- Develop strategic energy plan
- Address community's goals and needs across sectors
- Prioritize projects
- Secure funding and support services
- Leverage funding streams
- Comply with key grant requirements
- Engage partners
- Implement plan

A.4 Historic Pioneers in Community Energy Projects

Community organizing attracts people who are typically not in positions of official power for the purposes of social change—in this case, a change in human habits of using electricity. Up to the present time, electric efficiency has been the task of engineers and business managers carefully monitoring their electric bills. The Community Energy Challenge and similar projects around the world produce that remarkable opportunity for everyone. Table A-1 lists a few noteworthy community-based energy projects.

Table A-1. Predecessor Community Based Energy Projects
Preceding the CEC were the following community energy projects

Project Name	Location	Sponsor	Year
California Sustainability Alliance	California	Sustainca.org	2006-present
Wisconsin Demand-Side Research Project	Several cities in Wisconsin	www.ecw.org	1991-93
New London Resource Project	New London, WI (pop. 5,000)	www.weccusa.org	1991-94
Model Energy Demonstration Communities	California	Pacific Gas& Electric	1991-93
Hood River Conservation Project	Oregon	Bonneville Power Administration	1983-85

Source: Navigant analysis of secondary data.

A.5 Ongoing Community Energy Projects-2010

US DOE staff selection of exemplary recent or ongoing CEP

- Cambridge Energy Alliance
- Southeast Energy Efficiency Alliance
- Cincinnati Energy Alliance
- New York City: via Natural Resources Defense Council
- New Hampshire's Jordan Institute

What Others have done in cities from Portland to Berkeley to Babylon to San Francisco and Palm Springs

Other ongoing CEP, no critique offered:

MARYLAND-- The Baltimore Neighborhood Energy Challenge (BNEC). BNEC is a pilot program of the Baltimore Office of Sustainability (part of the Baltimore City Department of Planning) and the Baltimore Community Foundation, a tax-exempt, publicly supported organization serving the Greater Baltimore region www.baltimoreenergychallenge.org

COLORADO-- The FortZED Community Energy Challenge is a program that kicks off at the Sustainable Living Fair this September. It is the organization's first effort to reach

out to the estimated 15,307 residents - 6,200 households – that are living in the FortZED district http://fortzed.com/

MINNESOTA-- Rothsay, Minnesota since April 2009 has worked with Ottertail Power Company on a community project with aims to reduce the entire community's energy use by 15% over the next 5 years. http://www.energychallengeison.com/rothsay/

WASHINGTON, DC-- WeatherizeDC launched in September 2009 and is the nation's most robust community engagement campaign around home efficiency, proving that it's really possible to save homeowners money while taking action on climate change and creating good green jobs. WeatherizeDC views home weatherization as the linchpin of a revitalized community and a model green city for families, businesses and the environment. http://www.weatherizedc.org/

NEW ENGLAND-- EPA/DOE Community Energy Challenge, Region 1 –New England states. *The Community Energy Challenge is an opportunity for municipalities across New England to identify simple and cost-effective measures that increase energy efficiency and renewable energy use while reducing air pollution and saving money.* http://www.epa.gov/region1/eco/energy/mitigation-efforts-epane.html#CEC

A.6 Support organizations for community energy programs

National and international organizations have formed to support municipalities and their utility partners in pursuit of sustainable energy systems. These include:

- International Congress of Local Governments for Sustainability. ICLEI is an international membership association of local governments dedicated to climate protection and sustainable development. The organization was established in 1990 when more than 200 local governments from 43 countries convened at the World Congress of Local Governments for a Sustainable Future, at the United Nations in New York. Established as the International Council for Local Environmental Initiatives, the official name is now ICLEI-Local Governments for Sustainability. The US branch of the group is ICLEI USA with website http://www.iclei.org/.

- U.S. Environmental Protection Agency.

  a. Community Energy Challenge programs have been implemented through the U.S. Environmental Protection Agency Region 1. The EPA website has a wealth of technical resources, including an EPA Challenge Toolkit. For more information about the EPA Challenge Toolkit, please see: http://www.energystar.gov/index.cfm?fuseaction=challenge_community.show.

b. State and Local Climate and Energy Program offers assistance to state and local governments. Established in 2007, the Local Climate and Energy Program (then known as the Clean Energy-Environment Municipal Network) help local and tribal governments assess and adopt available policies and programs that effectively integrate clean energy into a low-cost, clean and reliable energy system. See http://www.epa.gov/statelocalclimate/index.html for description of technical assistance, analytical tools, and outreach support to state, local, and tribal governments. Specific assistance includes:

c. The Climate Showcase Communities grant program extends EPA's capacity to share with the public best practices by funding projects that can serve as living models of innovation and education that help meet the 6 livability principles. Projects are intended to build capacity within their own communities to create lasting change and serve as models for local and tribal governments across the nation who can learn from and adapt successful strategies as needed for their own communities.

- Housing and Urban Development.

a. The Department of Housing and Urban Development (HUD) is launching a $100 million Sustainable Communities Regional Planning Grant program, designed to create stronger, more sustainable communities by connecting housing to jobs, fostering local innovation and building a clean energy economy. The Regional Planning grants will be awarded competitively to multi-jurisdictional and multi-sector partnerships as well as regional consortia consisting of state and local governments, metropolitan planning organizations, educational institutions, non-profit organizations and philanthropic organizations. Grant applications, which will be reviewed not only by HUD, but also by the Department of Transportation (DOT) and the Environmental Protection Agency (EPA), were due August 23, 2010.

- American Council for an Energy Efficient Economy (ACEEE)

Federal Dollars Fuel Local Efficiency: Cities Ready to Lead

December 23, 2009

Media Contact(s):

Glee Murray, 202-507-4010, Associate Director for Outreach and Communications

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Washington, D.C. - In a new report released today, ACEEE presented profiles of over 40 municipal energy efficiency programs as a guide for cities and counties preparing to implement federally-funded energy efficiency and conservation plans.

"The passage of the ARRA economic stimulus package was the largest single investment in energy efficiency to date, and the first time federal money has been directed specifically to municipal energy efficiency efforts," said ACEEE policy researcher Michael Sciortino, referring to the Energy Efficiency and Conservation Block Grant (EECBG) program included in the *American Recovery and Reinvestment Act of 2009* (ARRA). "It is essential that local governments use proven program models like those featured in this report to ensure success."

Cities and counties have long been active developers of successful energy efficiency programs, and with the release of EECBG funds, local governments are poised to further their critical role. ACEEE's new report, *Energy Efficiency Program Options for Local Governments under the American Recovery and Reinvestment Act of 2009* examines a number of innovative energy efficiency programs implemented by American towns and cities prior to the passage of ARRA. The EECBG program will dispense more than 3 billion dollars to cities and states, creating jobs while improving U.S. energy efficiency through a variety of initiatives, including building retrofits, incentives, and audit programs. Some block grant recipients have already received funding to execute their chosen "shovel-ready" projects; however, many cities and towns are still waiting to put project plans into action.

"The EECBG program is an opportunity for all municipalities to become leaders in energy efficiency," said Sarah Black, report lead author. "This report provides concrete examples of how American towns and cities can take action now to launch innovative and meaningful programs that save energy and create jobs."

The full report is available for free download here or a hard copy can be purchased for $25 plus $5 postage and handling from ACEEE Publications, 529 14th Street N.W., Suite 600, Washington, D.C. 20045, phone 202-507-4017.

The American Council for an Energy-Efficient Economy is an independent, nonprofit organization dedicated to advancing energy efficiency as a means of promoting economic prosperity, energy security, and environmental protection. For information about ACEEE and its programs, publications, and conferences, contact ACEEE, 529 14th Street N.W., Suite 600, Washington, D.C.20045 or visit www.aceee.org.

Appendix B. Interview Guide – Community Champions

Interview Guide – Community Champions Process Evaluation of Community Energy Challenge, for Commonwealth Edison of Illinois

This interview guide is intended for persons assigned to be "community leaders" for Commonwealth Edison's Community Energy Challenge program of 2009-10. The individuals identified are elected officials or local government administrative employees. Their role as champions is to promote the CEC within the community (residential, commercial, industrial, municipal agencies). They are spokespeople providing the face of CEC to public and news media, and they act as the major liaison between their local government and Commonwealth Edison.

a) Background data on the "champion" position: ask first if formal CV/bio is available, if not, ask about years with city, education, relevant prior experiences that person drew from
b) How did first you get introduced to the CEC? How did ComEd handle things procedurally? When and how did Shaw enter the picture? How could Shaw's function be improved?
c) Did the competitive aspect of the process help or hinder your community's efforts? (competition in writing best plan) How much the $100,000 cash prize drive participation in your community? (Who seemed to respond to the cash prize?) What is the lowest award threshold that would still have motivated them to participate?
d) How did your community's plan get put together? Were there any major problems that could be avoided if CEC were done again? Electric efficiency was only one part of the CEC; how did it rank in the hearts and minds of the plan authors and leading members of the community support arm?
e) How did you summarize the community plan in explaining it to other city officials or business groups? (ask if any internal PowerPoint developed by the community exist and can be shared) From what you know, what distinguished your community approach from the others?
f) What area of the plan was your community most successful at? (why do you think you were so successful in this part?)
g) What about what we term "hard-to-reach" populations? Did the group there come up with solutions or novel ideas?
h) Thinking of the electric portion of the work, how strong was support from contractors, builders, retail stores, other municipal govt. arms (e.g., park districts, school districts, etc.), community groups, local business organizations, e.g., chambers of commerce, etc. What community leaders, if any, should we talk with about the CEC?
i) Is there any firm you wanted and hoped would be more supportive, but they just weren't?

j) Stepping back, if we were going to start all over…what areas could the program improve to create a more effective program for customers and municipalities and help increase the energy and demand impacts?
k) Who else should we talk with from your community?

Appendix C. Participants in Stakeholder Interviews

Navigant Consulting, Inc. wishes to thank the following individuals for participating in our stakeholder interviews:

City of Aurora
Karen Zilly
Special Projects Manager

Village of Oak Park
Tom Barwin
Village Manager

K.C. Poulos
Sustainability Manager

Village of Schaumburg
Martha Dooley
Senior Landscape Planner

Village of Carol Stream
Chris Oakley
Assistant to the Village Manager

Village of Hoffman Estates
Ashley Monroe
Assistant Planner

Gary Skoog
Economic Development

Village of Orland Park
Ellen Baer
Assistant Village Manager

Terry Pittos
Development Services

Village of Wilmette
John Adler
Director of Community Development

Erika Fabisch
Community Planner

City of Evanston
Carolyn Collopy
Sustainable Programs Coordinator

City of Elgin
Cherie Murphy
City Manager's Office

Aaron Cosentino
Sustainability and Grants Coordinator

Sigi Psimenos
Elgin Climate Change Organization

Dave Kaptain
Elgin City Council Member

Jordan Powers
Elgin Grow Wise

Village of Northbrook
Dan Kaup
Assistant to the Village Manager

City of Highland Park
Emily Palm
Management Analyst

Village of Palatine
Elias Koutas
Director of Public Works

ComEd
Michael S. Brandt
Manager, Energy Efficiency & Demand Side Management

Claire Saddler
Energy Efficiency & Demand Side Management

Illinois Department of Commerce & Economic Opportunity (DCEO)
Byron Lloyd

Shaw Environmental & Infrastructure Group
William Haas
Erin Daughton
William Abolt
Antonia Ornelas

Appendix D. Surveys

INTRODUCTION

Hello, this is _____ from Opinion Dynamics calling on behalf of ComEd. May I please speak with <LIST NAME>?

This is not a sales call. We all know that electricity is important, and that families and businesses are facing tight economic times. To help Commonwealth Edison help <COMMUNITY NAME> we're calling you to get information about electricity use in your household. This survey will take about 10 minutes. Your household has been chosen in a scientific manner to fairly represent your community, so it's important that you participate. Is now a good time? [If no, schedule call-back]
[IF NEEDED: It's part of Commonwealth Edison's efforts to help customers cut costs and use electricity wisely.]

A1. Are you a resident of this household who is 18 years or older?

1. Yes
2. No → THANK AND TERMINATE

A2. Do you live in <COMMUNITY NAME>?

1. Yes
2. No
3. (Recently moved, but lived in this community for some time in the last year)
98. (Don't know) → THANK AND TERMINATE
99. (Refused) → THANK AND TERMINATE

[SKIP TO E1 IF A2=1]
A3. Did you live in <COMMUNITY NAME> at any time between June 2009 and July 2010?

1. Yes
2. No → THANK AND TERMINATE
98. (Don't know) → THANK AND TERMINATE
99. (Refused) → THANK AND TERMINATE

E1. Have you heard of the "ComEd Community Energy Challenge" sponsored by ComEd?

1. Yes
2. No
98. (Don't know)
99. (Refused)

E2. The ComEd Community Energy Challenge is a competition in which your local government is competing with eight other municipalities to develop energy efficiency projects that will make your community more sustainable and energy efficient. The competition began in June 2009.
Is that what you heard about it?

1. (Yes, I knew that general idea)
2. (Yes, heard of the name/concept but didn't know what you just told me about it)
3. (No, never heard of the name or idea you just told me about)
98. (Don't know)
99. (Refused)

SAT1. On a scale of 0 to 10 where 0 is extremely dissatisfied and 10 is extremely satisfied, how satisfied are you with ComEd overall?? [REPEAT SCALE IF NECESSARY]

_____ [RECORD RATING 0-10]

98. (Don't know)
99. (Refused)

[ROTATE ORDER OF SAT2, and SAT3]

SAT2. Knowing that your community participated in the Community Energy Challenge, has that made you feel more favorable, less favorable, or no different about ComEd?

1. More favorable about ComEd
2. Less favorable about ComEd
3. Neither more nor less favorable about ComEd
98. Don't know
99. Refused

SAT3. Thinking about <COMMUNITY NAME> government-- would you say that knowing your city government participated in the Community Energy Challenge has made you feel more favorable, less favorable, or no different about <COMMUNITY NAME> government?

1. More favorable about <COMMUNITY NAME> government
2. Less favorable about <COMMUNITY NAME> government
3. Neither more nor less favorable about <COMMUNITY NAME> government
98. (Don't know)
99. (Refused)

AB1. **Next** I'd like to ask you a few questions about your awareness of different types of light bulbs. Have you ever heard of compact fluorescent light bulbs, sometimes called by the initials C-F-Ls?

1. Yes
2. No

8. (Don't know)
9. (Refused)

[SKIP TO AB3 IF AB1=1]

AB2. Compact fluorescent light bulbs – also known as CFLs – usually do not look like regular incandescent light bulbs. The most common type of CFL has a spiral or corkscrew shape and it fits in a regular light bulb socket. Before today, were you familiar with traditional compact fluorescent light bulbs?

1. Yes
2. No → K1
98. (Don't know) → K1
99. (Refused) → K1

AB3. Do you have any CFLs installed in your home lighting fixtures?

not including long tube fluorescents,
not including solar LEDs
not including CFLs stored for future use
but yes, including CFLs in any outdoor porch or garage]

1. Yes
2. No
98. (Don't know)
99. (Refused)

K1. Thinking of the last 12 months, do you recall receiving information about Commonwealth Edison's "Smart Ideas for your Home" Program through any of the following ways? [READ LIST, MULTIPLE RESPONSE]

1. TV advertisements
2. Radio advertisements
3. Newspaper advertisements
4. Internet/social media advertisements
5. Printed handouts/newsletters/direct mail
6. Bill Inserts
7. In-person contact (family, friends, colleagues, church group, general announcements, events)

00. (Other, specify)
98. (Don't know)
99. (Refused)

[SKIP IF K1<>1]

K1a. Thinking of the TV advertisements that you saw, do you recall if they were on a commercial television station (ABC, NBC, FOX..),a public TV station (PBS) or a local cable access TV station that is specific to your community?

1. Commercial TV

2. Public TV
8. (Don't know)
9. (Refused)

[SKIP IF K1<>2]
K1b. Thinking of the radio advertisements that you heard, do you recall if they were on a commercial radio station, or on a public radio station?

1. Commercial radio
2. Public radio
8. (Don't know)
9. (Refused)

[SKIP IF K1<>4]
K1c. You indicated that you saw printed handouts or newsletters with information about ComEd's "Smart Ideas for your Home" Program. Were these... (MULTIPLE RESPONSE)

1. Newsletters from local government
2. Information brought home from school children (from schools, youth groups, religious clubs, camps)
3. Direct mail from ComEd
00. (Other, specify)
98. (Don't know)
99. (Refused)

[SKIP IF K1<>6]
K1d. Were the bill inserts about ComEd's "Smart Ideas for your Home" program in your ComEd bill or some other bill? (MULTIPLE RESPONSE)

1. Inserts in ComEd bill
2. Inserts in some other bill (water, garbage removal, bank, phone...)
8. (Don't know)
9. (Refused)

[SKIP IF K1<>7]
K1e. You indicated that you got information about ComEd's "Smart Ideas for your Home" Program through in-person contact. Did you learn about it from... (MULTIPLE RESPONSE)

1. Friends/family/neighbor
2. Announcements at church, community center, service club...
3. Announcements at work
4. Public announcements at an event
5. (Other, specify)
8. (Don't know)
9. (Refused)

AT1. Please tell me how strongly you agree or disagree to the following statements using a scale that ranges from 0 to 10 where 0 means "strongly disagree" and 10 means "strongly agree".
0. -0- Strongly disagree
1. -1-
2. -2-
3. -3-
4. -4-
5. -5-
6. -6-
7. -7-
8. -8-
9. -9-
10. -10- Strongly agree
98. (Don't know)
99. (Refused)

a) A majority of people in my community are working hard to save electricity. [EFFICIENCY NORM]
b) My city/town government is working hard to reduce its own use of electricity.
c) The typical household would have much lower electric bills if they installed new, high-efficiency appliances. [ACTIONABLE KNOWLEDGE]
d) The only good reason for conserving electricity is to save money. If someone can afford it, there's no reason for that person to worry about how much electricity they use. [LIBERTARIAN, NO-LIMITS NORM]
e) A household could pay for new, high-efficiency appliances just from the money they'd save on lower electricity bills over several years. [ACTIONABLE KNOWLEDGE]
f) I actively participate in or provide financial support to community groups and organizations whose main mission is to raise awareness of environmental issues, and/or protect the environment. [PERSONAL ECO-RESPONSIBILITY]

DEMOGRAPHICS [adopted from the 2010 "general population lighting survey"]
READ "I have just a few questions left for statistical purposes only"

D1. Are you NOW self-employed, working for an employer, are you retired, or are you not employed for pay?

1. Self-employed
2. Working for an employer
3. Retired
4. Not employed
5. (Homemaker) (VOL.)
6. (Student) (VOL.)
7. (Disabled) (VOL.)

8. Other
98. (Don't know)
99. (Refused)

[SKIP IF D1=4 OR 5 OR 6 OR 8 OR 98 OR 99]
D2. Does your employer, business or school support the idea of "green business" or "sustainability"?

i. Yes
ii. No
iii. Don't know

D3. What type of home do you live in? Is it a …?

1. Single family detached (no common walls)
2. Single family attached, townhouse, or duplex
3. Apartment building with 2-4 units
4. Apartment building with 5 or more units
5. A mobile home or trailer
00. (Other, Specify)
98. (Don't know)
99. (Refused)

D4. Do you or members of your household own this home or do you rent?

1. Own
2. Rent
3. Occupied without payment of rent
4. Other
98. (Don't know)
99. (Refused)

[SKIP D2 IF D1=1 AND D3=1]
D5 . Do you pay your electric bill directly, or is your electricity included in your rent or condo fee?

1. Pay directly to electric company
2. Electricity Included in Rent or Condo Fee
3. Paid for in some other way
98. (Don't know)
99. (Refused)

D6. Counting yourself, how many people live in your household year round?

[RECORD NUMBER PEOPLE]
98 DON'T KNOW
99 REFUSED

D7. Are any of these individuals less than 18 years of age?

1 Yes
2 No
98 DON'T KNOW
99 REFUSED

D8. Is your home…

1 All electric
2 Gas and electric
3 Some other combination of energy sources
98 Don't know
99 Refused

D9. How long have you lived at your current residence?

[ENTER YEARS]
0. Less than a year.
98. (Don't know)
99. (Refused)

D10. What is the highest level of education that the head of household has completed so far?

1. Less than 9th grade
2. 9th to 12th grade; Non-high school graduate
3. High school graduate or equivalent (e.g., GED)
4. Attended some college, no degree (includes junior/community college)
5. Associates degree.
6. Bachelors degree
5. Graduate or Professional degree
6. (Other, Specify)
98. (Don't know)
99. (Refused)

D11. Please tell me the primary language spoken in your home.

1 ENGLISH
2 SPANISH
3 MANDARIN
4 CANTONESE
5 TAGALOG
6 KOREAN
7 VIETNAMESE
8 RUSSIAN
9 JAPANESE
10 OTHER (SPECIFY): _____
98 DON'T KNOW
99 REFUSED

D12. Do you consider yourself to be Spanish, Hispanic, or Latino?

1 YES
2 NO
98 DON'T KNOW
99 REFUSED

D12A. Do you consider yourself to be . . .?

[SELECT ONE RESPONSE ONLY. IF MIXED RACE OR MULTIPLE RACES, RECORD IN 'OTHER']

1 White
2 Black or African-American
3 American Indian, Native Hawaiian, Pacific Islander, or Alaska Native
4 Chinese
5 Japanese
6 Korean
7 Vietnamese
8 Filipino
9 Other (Specify): _____
98 DON'T KNOW
99 REFUSED

D13. Which category best describes your total household income in 2009 before taxes? Please stop me when I get to the appropriate category.

1 $14,999 or less
2 $15,000 to $19,999
3 $20,000 to $29,999
4 $30,000 to $39,999
5 $40,000 to $49,999
6 $50,000 to $74,999
7 $75,000 to $99,999
8 $100,000 to $149,999
9 $150,000 or more
98 DON'T KNOW
99 REFUSED

Q3. Since late 2007, has anyone in your household or immediate family lost a job, had work hours reduced, or had a home or business foreclosure?

a) Yes
b) No
c) Don't know
d) Refused

RESPONSES A, C AND D WERE COMBINED FOR CONSERVATISM BASED ON RECOGNIZED SOCIAL DESIRABILITY BIAS IN SELF-REPORTING OF HARDSHIP

O. GENDER (interviewer judgment OK)

1. Male
2. Female
3. Unknown/ambiguous/declined

END1. That is all of the questions I have for you today. Thank you very much for your time.

SMALL COMMERCIAL SURVEY OF THREE COMMUNITY ENERGY CHALLENGE COMMUNITIES, NON-PARTICIPANTS IN REBATE/EE INCENTIVES PROGRAM

NAVIGANT

COMMERCIAL and INDUSTRIAL non-PARTICIPANT SURVEY

INTRODUCTION

[READ <CUSTOMER CONTACT NAME> IF IT IS PROVIDED]

Hello, this is _____ from Opinion Dynamics calling on behalf of ComEd. This is not a sales call. We all know that electricity is important, and that businesses are facing tight economic times. To help Commonwealth Edison help <COMMUNITY NAME>. we're calling you to get information about electricity use in your business. This survey will take about 10 minutes. I would like to speak with the person most knowledgeable about cooling, lighting, or other energy-related equipment for your firm at this location. Would that be you?

[If no, ask to speak to person and repeat introduction]

A2. Is your facility located in <COMMUNITY NAME>?

1. Yes
2. No
3. (Recently moved, but was located in this community for some time in the last year)
8. (Don't know) → THANK AND TERMINATE
9. (Refused) → THANK AND TERMINATE

[SKIP TO E1 IF A2=1]

A3. Was your facility located in <COMMUNITY NAME> at any time between June 2009 and July 2010?

1. Yes
2. No → THANK AND TERMINATE
8. (Don't know) → THANK AND TERMINATE
9. (Refused) → THANK AND TERMINATE

A4. Do you reside in the same community your business/organization is located (i.e., where measure was installed as noted above)?

1. Yes
2. No
8. (Don't know)
9. (Refused)

A5a. Do you belong to the local chamber of commerce or business association focused on your community (examples: shopping district business association, "Main Street program)

1. Yes
2. No
8. (Don't know)

9. (Refused)

A5b. Do you belong to a area trade association specific to your type of business (examples: independent restaurants of suburban Chicago, wholesalers of northern Illinois, nursing homes of Greater Chicago, Church Council of northern Illinois)

1. Yes
2. No

8. (Don't know)
9. (Refused)

[SKIP IF A5A AND A5B=2,8,9]

A6. Did any of these business associations (that you belong to or attend meetings of) publicize or inform you—in the period since June 1 of 2009-- about the Community Energy Challenge or about ComEd programs for energy efficiency?

1. Yes
2. No
3. Maybe, but don't recall anything in particular
8. (Don't know)
9. (Refused)

A7. Did your business participate in any Commonwealth Edison electric efficiency or conservation program before June 2009?

1. Yes [definitely yes]
2. No [definitely not, or probably not]
3. [DO NOT READ] probably, but don't know for certain [included for "qualified yes" offered by respondent]
8. (Don't know)
9. (Refused)

E1. Before today, were you aware of the "ComEd Community Energy Challenge" sponsored by ComEd and the local government where your business is located?

1. Yes
2. No
8. (Don't know)
9. (Refused)

E2. The ComEd Community Energy Challenge is a competition in which your local government serving your business is competing with nine other municipalities to develop energy efficiency projects. The goal is to make the community more sustainable and energy efficient. The competition began in June 2009.

[IF E1 = 2 OR 8 OR 9 ASK] Now that you know more about it, do you recall hearing about the ComEd Community Challenge before today?
[IF E1=1 ASK] Is that what you heard about it?

1. (Yes, I knew that general idea)
2. (Yes, heard of the name/concept but didn't know what you just told me about it)
3. (No, never heard of the name or idea you just told me about)
8. (Don't know)
9. (Refused)

SAT1. On a scale of 0 to 10 where 0 is extremely dissatisfied and 10 is extremely satisfied, how satisfied are you with ComEd overall?? [REPEAT SCALE IF NECESSARY]

_____ [RECORD RATING 0-10]
98. (Don't know)
99. (Refused)

[ROTATE ORDER OF SAT2, and SAT3]
SAT2. Knowing that the community where your business is located participated in the Community Energy Challenge, does that make you feel more favorable, less favorable, or no different about ComEd?

1. More favorable about ComEd
2. Less favorable about ComEd
3. Neither more nor less favorable about ComEd
8. (Don't know)
9. (Refused)

SAT3. Thinking about <COMMUNITY NAME> government-- would you say that knowing your city government where your business is located participated in the Community Energy Challenge does that make you feel more favorable, less favorable, or no different about <COMMUNITY NAME> government?

1. More favorable about <COMMUNITY NAME> government
2. Less favorable about <COMMUNITY NAME> government
3. Neither more nor less favorable about <COMMUNITY NAME> government
8. (Don't know)
9. (Refused)

PERSONAL CONTACT

G1. Has your business had personal contact with a ComEd energy advisor (account manager) since June 2009?either on the phone, face to face, or personal email?

1. Yes
2. No
8. Don't know
9. Refused

. [If G1=yes, how? (read choices a-d below, check all that apply)]

G1a. How do you communicate with your account manager?

1. Phone
2. Face to face (including "audience contact" such as speaker at my service club or church)
3. Personal correspondence (including what customer considers as "personal e-mail")
4. Relative or friend works for ComEd (includes retirees)

K1. Thinking of the last 12 months, do you recall receiving information about Commonwealth Edison's "Smart Ideas for your Business" Program through any of the following ways? [READ LIST, MULTIPLE RESPONSE]

1. TV advertisements
2. Radio advertisements
3. Newspaper advertisements
4. Internet/social media advertisements
5. Printed handouts/newsletters/direct mail
6. Bill Inserts
7. In-person contact (family, friends, colleagues, church group, general announcements, events)

00. (Other, specify)
96. (Have not received information)
98. (Don't know)
99. (Refused)

[SKIP IF K1<>1]

K1a. Thinking of the TV advertisements that you saw, do you recall if they were on a commercial television station (ABC, NBC, FOX..),a public TV station (PBS) or a local cable access TV station that is specific to your community?

1. Commercial TV
2. Public TV
8. (Don't know)
9. (Refused)

[SKIP IF K1<>2]

K1b. Thinking of the radio advertisements that you heard, do you recall if they were on a commercial radio station, or on a public radio station?

1. Commercial radio
2. Public radio
8. (Don't know)
9. (Refused)

[SKIP IF K1<>4]

K1c. You indicated that you saw printed handouts or newsletters with information about ComEd's "Smart Ideas for your Business" Program. Were these... (MULTIPLE RESPONSE)

1. Newsletters from local government
2. Information brought home from school children (from schools, youth groups, religious clubs, camps)
3. Direct mail from ComEd
00. (Other, specify)
98. (Don't know)
99. (Refused)

[SKIP IF K1<>6]

K1d. Were the bill inserts about ComEd's "Smart Ideas for your Home" program in your ComEd bill or some other bill? (MULTIPLE RESPONSE)

1. Inserts in ComEd bill
2. Inserts in some other bill (water, garbage removal, bank, phone...)
8. (Don't know)
9. (Refused)

[SKIP IF K1<>7]

K1e. You indicated that you got information about ComEd's "Smart Ideas for your Business" Program through in-person contact. Did you learn about it from... (MULTIPLE RESPONSE)

1. Friends/family/neighbor
2. Announcements at church, community center, service club...
3. Announcements at work
4. Public announcements at an event
00. Other, specify
8. (Don't know)
9. (Refused)

F1- Do employees at this location (of this biz/org) have significant influence in the amount of electricity used; in other words, do employee habits or choices substantially raise electric use beyond the minimum required for business functions?

1. Yes
2. No [include "don't think so"]
3. Really don't know; have no idea
4. Never thought about it
8. (Don't know)
9. (Refused)

F2 – Is the building (address cited above)

1 Owned by the business/organization
2 Rented or leased by the business/organization
8. (Don't know)
9. (Refused)

F3 – How is your business organized? Is it a…

1. sole proprietorship
2. family-owned business
3. partnership
4. corporation (including LLC)
5. government (other than public school)
6. public school or other tax-exempt educational
7. non-profit or religious/church
8. (Other, specify)
9. (Don't know)
10. (Refused)

F4 – Approximately how many full plus part time employees are employed at this facility? Would you say it is...?

1. Less than 10
2. 10-49
3. 50-99
4. 100-249
5. 250-499
6. 500 or more

F5. Thinking about the economic downturn that started in late 2007, has your level of business activity been substantially reduced as a result?

1. Yes
2. No
8. (Don't know)
9. (Refused)

[SKIP IF F5=2 OR 8 OR 9]

F6. Has your business been forced to do any of the following since late 2007:

[READ LIST, MULITPLE RESPONSE]

1. Lay off or reduce hours of employees,
2. Required wage or other compensation reductions,
3. Closed some offices or other locations
4. Encouraged early retirement
5. Reduced hours of operation
6. Changed credit practices with customers

SEX (interviewer judgment OK)

4. Male
5. Female
6. Unknown/ambiguous/declined