

# APPENDIX A. ESTIMATING ENERGY SAVINGS FROM CEI

Cadmus recommends using a regression-based approach, similar to that described in Luneski (2011), to estimate energy savings at each facility participating in CEI. This approach was developed to estimate energy savings from O&M, and energy management measures in food processing and in pulp and paper processing facilities participating in the NEEA's Industrial Initiative.

Cadmus served as the independent evaluator of this program, assisting in development of this methodology. In particular, we significantly contributed to the development of the Intervention Trend model, and reviewed savings estimates for each participating facility.

An advantage this approach offers is that energy savings from O&M and behavioral measures can be differentiated from capital (equipment) measures. This is important as CEI advisors refer customers to other IOU programs for incentives for capital measures, and the energy savings from these measures are claimed by the other program. Estimating energy savings on a whole-facility level (including capital and non-capital measures) recognizes the overall impact of the CEI program. However, savings cannot be double counted, and so distinguishing between capital and non-capital measures allows the CEI program to claim the non-capital measure savings.

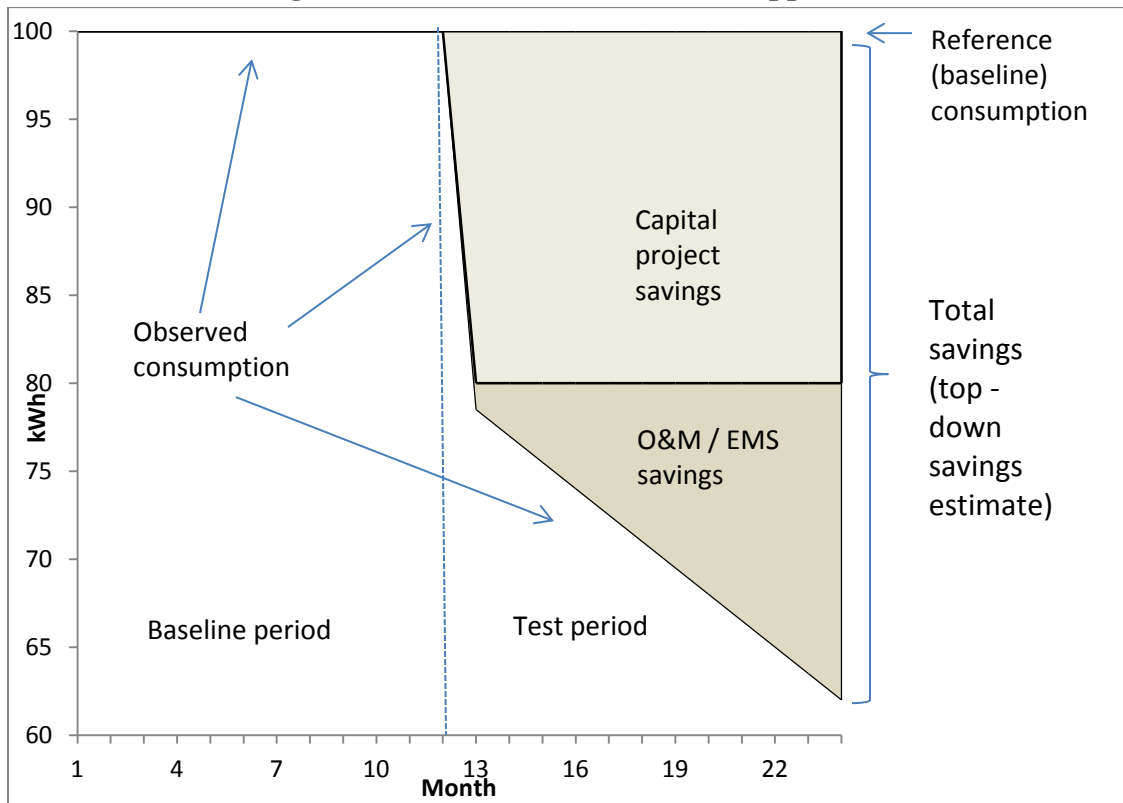
## Overview of Cadmus' Estimation Approach

Savings are estimated by comparing a facility's energy consumption in the period before the behavior changes (the baseline) with its consumption in the period after behavior changes (the test period). Analysis controls for weather, facility production, and other observable factors affecting energy consumption (including energy-efficiency capital investments).

Figure 1, which illustrates our approach, shows monthly consumption for a hypothetical industrial facility. In particular:

- The dashed line indicates the start of the treatment period. Energy savings in this period are a function of behavioral and capital measures, and are represented by the difference between observed consumption and reference consumption.
- Reference consumption—what consumption would have been without the measures—can be estimated using a regression model.
- Capital measures savings can be estimated using engineering estimates or deemed savings values. Some facility savings result from investments in capital measures.
- Behavioral savings are the difference between total savings and capital measure savings.

**Figure 1. Illustration of Estimation Approach**



Note: Reference consumption is estimated conditionally on output, weather, and other variables affecting energy use. O&M and EMS savings are estimated as the difference between observed consumption and reference consumption.

Eight steps estimate behavioral savings in each facility:

1. Collect billing and program participation data.
2. Clean and prepare billing data and other explanatory variable data for analysis.
3. Identify the baseline period (using program participation data).
4. Review facility operations and production data.
5. Develop a regression model for the facility.
6. Estimate the model parameters and total energy savings.
7. Conduct robustness and sensitivity checks of the regression model.
8. Estimate program behavioral savings utilizing information about capital measures using engineering and deemed savings values.

Details of each step follow below.

## Step 1. Collect Billing and Program Participation Data

The following data are required for each participating facility:

- **Billing data.** At a minimum, monthly-interval electricity and gas consumption data for at least 24 months of baseline-period consumption data, and 12 months of test-period data, are required for estimating savings. If daily- or hourly-interval consumption data are available, less data may be required from the baseline period. The amount of data required depends on the facility, and the relationship between energy consumption and facility production, and other variables. Facilities where energy consumption is highly dependent on weather may require more data.
- **Meter data.** Data from any individually metered facility processes.
- **Program data.** Information (such as implementation date, expected savings, and measure descriptions) about capital projects and behavioral measures implemented during the estimation period.
- **Facility production and operations data.** Data about facility production at monthly (or smaller) intervals, disaggregated by type of output. In addition, information about facility occupancy and production schedules from project reports, or interviews with facility staff.
- **Weather data.** Temperature data for each facility from the nearest weather station. This can be downloaded from National Climatic Data Center (NCDC). Not all facilities have weather-dependent energy consumption; weather data will only be used when appropriate.

## Step 2. Clean and Prepare Billing and other Data for Analysis

Billing and meter data are inspected for missing, erroneous, and otherwise anomalous values. This entails plotting each facility's consumption over time, which facilitates development of the regression model by illuminating consumption trends and other changes. Additionally, data are reviewed to verify the data account for all facility meters, and gas and electric consumption.

Using data from the nearest weather station, temperature data are matched to billing data. Daily weather data are used to calculate heating degree days and cooling degree days for use in the regression model.

As needed, a timeline can be constructed for each facility, showing when and what kinds of measures have been installed or undertaken in each facility. This information is used in constructing the regression model and estimating behavioral savings.

Production data are plotted to ensure they are consistent with qualitative information about facility operations and production schedules.

## Step 3. Identify the Baseline and Test Periods

By studying program data to determine when measures have been implemented, a separate baseline period is established for each facility.

The baseline period is the period before adoption of program measures, and the test period is the period after measures have been adopted. Defining the baseline period correctly proves critical for accurately estimating program savings, as a facility's baseline is used to predict what consumption would have been, had the facility not participated. If a facility's baseline period includes months after measures were adopted, or excludes months before measures were adopted, the savings estimate will be biased downward.

Depending on whether the first measures were installed at the beginning or end of a billing month, the baseline period may be extended by one month. Measures adopted at the end of a month will not be reflected in that month's bill. Cases where measures were installed over several months are accounted for by allowing ramping of savings during the treatment period. At the end of the analysis, the sensitivity of savings estimates to alternative definitions of the baseline is tested.

#### **Step 4. Review Facility Operations and Production Data**

Each facility's production and energy use data are plotted, with the resulting series compared to examine correlations between the two. (A high correlation suggests production can largely explain energy use; a low correlation suggests other variables are necessary to explain consumption. In the latter case, it is important to consult facility reports to understand other variables influencing facility operations and production.)

A facility's operations and production are the most significant drivers of its energy consumption. Thus, to model consumption accurately, it is important to understand a facility's operations and production, including when production occurs, what is being produced, and what fuels are used to produce each output. Much about a facility's operations and production will be evident from the facility's output data, but some information only may be obtainable by reading facility reports and documentation. (For example, a change in a facility's management may result in a change in how energy is consumed, without affecting total production. Such information is necessary to estimate energy savings.)

#### **Step 5. Develop a Regression Model for the Facility**

Using information about the facility's operations and production obtained in the review, a regression model can be developed for each facility. Each model differs, depending on the following elements:

- When measures were installed;
- Types of outputs and a facility's operating schedule; and
- Other observable, facility-specific factors.

A separate model is developed for each facility's fuel, rather than converting electricity and gas use to Btus, and then estimating a single model with Btus as the dependent variable. Thus, analysis would result in separate estimates of gas and electricity savings.

As an example of a regression model, consider a facility where electricity consumption depends in a strong linear way on production and weather. Also, suppose a well-defined baseline period exists. Electricity consumption in the facility might be modeled as follows:

$$\text{kWh}_t = \alpha + \text{Degreedays}_t' \beta + \theta \text{Output}_t + \gamma \text{Test}_t + \varepsilon_t \quad (\text{Equation 1})$$

where,

- $\text{kWh}_t$  is the facility's electricity consumption in month  $t$ .
- $\text{Degreedays}_t$  is a vector that includes separate variables for heating and cooling degree days. Beta coefficients show impacts of heating and cooling degree days on kWh use.
- $\text{Output}_t$  is the output produced by the facility in month  $t$ . If the facility produces several different outputs, this variable would be a vector of different output variables. The coefficient  $\theta$  shows electricity use per unit of output.
- $\text{Test}_t$  is a variable, indicating whether month  $t$  is in the Test period ( $=1$  if program measures were adopted in month  $t$  or a previous month, and  $=0$ , otherwise). The coefficient  $\gamma$  shows the average monthly impact of adoption on energy use.
- $\varepsilon_t$  is the random, error term of the model, reflecting unobserved effects on the facility's consumption in month  $t$ .

Unbiased estimation of  $\gamma$  requires any unobserved effects on demand be uncorrelated with  $\text{Test}_t$ . For example, if a facility switched to a more energy-intensive form of production during the test period, this would result in decreasing the savings estimate. (This serves as an example of the importance of studying operations and production history of the facility during the estimation period.)

This model assumes energy-efficiency measures result in a level shift (a decrease) in electricity consumption in the test period. The coefficient  $\gamma$  is an estimate of this change. Savings in the facility would equal the product of the number of months in the test period and  $\gamma$ . If instead of constant savings, energy savings increased in the test period, the coefficient shows average monthly savings over the test months. Consequently, it would overstate monthly savings at the beginning of the test period, and understate savings at the end.

### Accounting for Variable Savings in the Test Period

A flexible alternative to Equation 1 allows savings to change over time in the test period (say, by a quarter—a three-month period—of the year). Suppose the four quarters in the test period are denoted,  $q=1, 2, 3, 4$ . The regression model then will be:

$$\text{kWh}_t = \alpha + \text{Degreedays}_t' \beta + \theta \text{Output}_t + \sum_{q=1}^4 \gamma_q \text{Test}_{qt} + \varepsilon_t \quad (\text{Equation 2})$$

where  $\text{Test}_{qt}$ ,

- $q=1, 2, \dots, 4$  is an indicator variable equaling 1, if month  $t$  is in quarter  $q$ , but equals 0 otherwise.
- The coefficient  $\gamma_q$  shows the average monthly savings impact in quarter  $q$ .

Other variables are defined as before. Annual savings in the facility would equal  $\sum_{q=1}^4 3\gamma_q$ .

A related approach, offering less flexibility, might be justified to make the Test variable a linear time trend:

$$\text{kWh}_t = \alpha + \text{DegreeDays}_t \beta + \theta \text{Output}_t + \tau \text{TestTrend}_t + \varepsilon_t \quad (\text{Equation 3})$$

$\text{TestTrend}_t$  would equal one, if month  $t$  was in the first month of the test period, two if month  $t$  was in the second month, and so on. The coefficient  $\tau$  shows the monthly *change* in savings. The model assumes savings increase by a constant amount in each month. Annual savings would equal  $\sum_{i=1}^{12} i * \tau$ .

### Accounting for Trends in Energy Use

It is also possible to account for underlying trends in energy use over the estimation period that are unrelated to production. For example, it may be that energy use trends upwards for unknown reasons. If so, it would be important to control for the trend by including a time trend variable. Omitting the time trend would bias savings down. Interpretation of the test period variables would be unchanged.

## Step 6. Estimate the Model Parameters and Total Energy Savings

After specifying a regression model to represent a facility's energy use, the model is estimated by ordinary least squares (OLS). The model is tested for heteroskedastic errors, auto-correlated errors, and other violations of the assumptions used in the classical regression model.

In the presence of autocorrelation and heteroskedasticity, OLS estimates remain unbiased, but are inefficient. In addition, conventional standard errors are incorrect. If evidence of heteroskedasticity is found, the model is re-estimated by weighted least squares if the error variance takes a known form or re-estimated by OLS with heteroskedasticity-corrected standard errors if the error variance form is unknown. Similarly, if evidence of autocorrelation is found, the model is re-specified with an autoregressive error process and re-estimated by feasible generalized least squares.

Model coefficients are used to estimate total facility savings (which include savings from capital projects and behavioral measures). Step 5 describes formulas for savings.

Measures of uncertainty in savings estimates are reported, including standard errors and 95% confidence intervals.

## Step 7. Conduct Robustness and Sensitivity Checks of the Regression Model

Savings estimates depend on a few key assumptions about the definition of the treatment period and omitted variables. Specifically, key assumptions concern:

- Definition of the baseline period;
- No omitted variables correlated with adoption of program measures; and
- Trends in energy savings.

For example, if uncertainty exists about when some program measures were installed, the baseline period may not be clearly defined. Thus, how savings estimates depend upon alternative definitions of the baseline period would be examined.

In another example, suppose a management change occurred in the facility midway through the test period, and may have impacted energy use. The management change could affect the savings estimate. An alternative regression model, including an indicator variable for months following the management change, would be estimated, and be compared to the first model.

## **Step 8. Estimate Program Savings**

The regression model estimates energy savings at the whole-facility level, which includes savings from capital projects, behavioral or education-based initiatives, and O&M projects. If sufficient data are provided for capital measures, energy savings from capital measures can be determined separately from behavioral and O&M projects. Behavioral savings from O&M and energy management measures are the difference between total facility savings and capital project savings. After reviewing project data for total capital project savings estimates, regression results are used to estimate total facility savings in each month of the test period. At each facility for each month, an estimate of behavioral savings is reported with 95% confidence intervals.

### **Meter Data**

If meter data are available, and metered industrial processes have been unaffected by capital projects, these data may be used to estimate O&M and energy management savings for processes directly. For each process, a regression model of energy use will be specified as a function of output, the production schedule, and program measures to estimate savings. If the industrial process has been affected by capital projects, behavioral savings will be estimated for the process by following the approach described for the whole facility.

Estimates of behavioral savings for industrial processes may be used as a check on behavioral savings estimates for the whole facility. The sum of behavioral savings for metered processes should be less than or equal to behavioral savings for the whole facility.

## APPENDIX B. LITERATURE REVIEW REFERENCES

Program	Source	URL
BC Hydro PSP Program	Program Website	<a href="http://www.bchydro.com/powersmart/commercial/power_smart_partners.html">http://www.bchydro.com/powersmart/commercial/power_smart_partners.html</a>
	"F2011 Demand Side Management Milestone Evaluation Summary Report" (Dec. 2011)	<a href="http://www.bchydro.com/etc/medialib/Internet/documents/planning_regulatory/rev_req/directive_66_f2011_DSM_eval_summ_rpt.Par.0001.File.directive-66-f2011-DSM-eval-summ-rpt.pdf">http://www.bchydro.com/etc/medialib/Internet/documents/planning_regulatory/rev_req/directive_66_f2011_DSM_eval_summ_rpt.Par.0001.File.directive-66-f2011-DSM-eval-summ-rpt.pdf</a>
	BC Hydro presentation: "Motor Decisions Matter Spotlight Call" (Motor Management Planning, Feb. 21, 2008)	<a href="http://www.docstoc.com/docs/40429797/BC-Hydro--Power-Smart-Industrial-Programs">http://www.docstoc.com/docs/40429797/BC-Hydro--Power-Smart-Industrial-Programs</a>
	BC Hydro presentation: "Power Smart Partners Transmission Industrial Program: An Energy Management program for BC's Industrial Sector" (Consortium of Energy Efficiency, June 4, 2009)	<a href="http://www.cee1.org/cee/mtg/06-09mtg/files/BIGInd1Adams.pdf">http://www.cee1.org/cee/mtg/06-09mtg/files/BIGInd1Adams.pdf</a>
BPA Energy Management Program	Program Website	<a href="http://www.bpa.gov/energy/n/industrial/index.cfm">http://www.bpa.gov/energy/n/industrial/index.cfm</a>
	"Energy Efficiency Implementation Manual" (Oct. 1, 2011)	<a href="http://www.bpa.gov/energy/n/implementation.cfm">http://www.bpa.gov/energy/n/implementation.cfm</a>
	BPA presentation: "Energy Smart Industrial" (Oct. 7, 2009)	<a href="http://www.bpa.gov/Energy/N/utilities_sharing_ee/Energy_Smart_Awareness/pdf/ESIPrgmOverview-100709.pdf">http://www.bpa.gov/Energy/N/utilities_sharing_ee/Energy_Smart_Awareness/pdf/ESIPrgmOverview-100709.pdf</a>
DOE BBBP Program	Program Website	<a href="http://www1.eere.energy.gov/manufacturing/tech_deployment/betterplants/index.html">http://www1.eere.energy.gov/manufacturing/tech_deployment/betterplants/index.html</a>
	Program frequently asked questions	<a href="http://www1.eere.energy.gov/manufacturing/tech_deployment/betterplants/faqs.html">http://www1.eere.energy.gov/manufacturing/tech_deployment/betterplants/faqs.html</a>
	"Guide for Better Buildings, Better Plants Program Partners" (Nov. 2011)	<a href="http://www1.eere.energy.gov/manufacturing/pdfs/betterplants_guide.pdf">http://www1.eere.energy.gov/manufacturing/pdfs/betterplants_guide.pdf</a>
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DOE SEP Program	Program Website	<a href="http://www.superiorenergyperformance.net/">http://www.superiorenergyperformance.net/</a>
	SEP Demonstrations	<a href="http://www1.eere.energy.gov/manufacturing/tech_deployment/sep_demonstrations.html">http://www1.eere.energy.gov/manufacturing/tech_deployment/sep_demonstrations.html</a>
DOE Energy EnPI Tool	Tool Website	<a href="https://save-energy-now.org/SiteDirectory/acme/Pages/BaselineTool.aspx">https://save-energy-now.org/SiteDirectory/acme/Pages/BaselineTool.aspx</a>
DOE ePEP Tool	Tool Website	<a href="https://save-energy-now.org/em/tools/Pages/ePEP.aspx">https://save-energy-now.org/em/tools/Pages/ePEP.aspx</a>
ETO Industrial Energy Improvement Program	ETO presentation: "Energy Trust of Oregon's Industrial Energy Improvement Pilot Process Evaluation" (Mar. 29, 2011)	<a href="http://neea.org/participate/docs/Degens_ETO_SEM%20Workshop_03-29-11.pdf">http://neea.org/participate/docs/Degens_ETO_SEM%20Workshop_03-29-11.pdf</a>
	ETO presentation: "Strategic Energy Management for Industry" (Sept. 17, 2010)	<a href="http://www.cee1.org/cee/mtg/09-10mtg/Presentations/Fri_IndEnergy_West.pdf">http://www.cee1.org/cee/mtg/09-10mtg/Presentations/Fri_IndEnergy_West.pdf</a>



Program	Source	URL
	news article by Kim Crossman, senior industrial sector manager at ETO: "Saving by changing how you use energy" (Sept. 16, 2010)	<a href="http://www.sustainablebusinessoregon.com/columns/2010/09/saving_by_changing_how_you_use_energy.html">http://www.sustainablebusinessoregon.com/columns/2010/09/saving_by_changing_how_you_use_energy.html</a>
EPA ENERGY STAR Certification	Program Website	<a href="http://www.energystar.gov/index.cfm?c=business.bus_bldgs">http://www.energystar.gov/index.cfm?c=business.bus_bldgs</a>
International Organization of Standards 50001	ISO Website	<a href="http://www.iso.org/iso/iso_catalogue/management_and_leadership_standards/specific-applications_energy.htm">http://www.iso.org/iso/iso_catalogue/management_and_leadership_standards/specific-applications_energy.htm</a>
MidAmerican Nonresidential Energy Analysis Program	Program Website	<a href="http://www.midamericanenergy.com/ee/il_bus_energy_analysis.aspx">http://www.midamericanenergy.com/ee/il_bus_energy_analysis.aspx</a>
	Program brochure	<a href="http://www.midamericanenergy.com/ee/include/pdf/il_energy_analysis.pdf">http://www.midamericanenergy.com/ee/include/pdf/il_energy_analysis.pdf</a>
	"Process Evaluation of MidAmerican Energy's 2004-2005 Nonresidential Energy Efficiency and Load Management Programs" (Nov. 30, 2006)	<a href="http://www.cee1.org/eval/db_pdf/1073.pdf">http://www.cee1.org/eval/db_pdf/1073.pdf</a>
	MidAmerican presentation: "Evolution – How Commercial Programs Use Whole Building Approaches to Make the Most of Program \$\$" (CEE June Program Meeting, June 14, 2007)	<a href="http://www.cee1.org/cee/mtg/06-07mtg/thursday/.../09dWalker.ppt">www.cee1.org/cee/mtg/06-07mtg/thursday/.../09dWalker.ppt</a>
NEEA CEI	NEEA industrial homepage	<a href="http://neea.org/ourwork/industrial.aspx">http://neea.org/ourwork/industrial.aspx</a>
	Program Website	<a href="http://www.energyimprovement.org/getstarted.php">http://www.energyimprovement.org/getstarted.php</a>
	"NEEA Market Progress Evaluation Report #6: Evaluation of NEEA's Industrial Initiative" (Jan. 28, 2011)	<a href="http://neea.org/research/reports/E11-220A.pdf">http://neea.org/research/reports/E11-220A.pdf</a>
NYSERDA Industrial and Process Efficiency Program	Program Website	<a href="http://www.nysesda.ny.gov/Page-Sections/Commercial-and-Industrial/Programs/Industrial-and-Process-Efficiency/Manufacturers.aspx">http://www.nysesda.ny.gov/Page-Sections/Commercial-and-Industrial/Programs/Industrial-and-Process-Efficiency/Manufacturers.aspx</a>
	"Industrial and Process Efficiency Program Opportunity Notice (PON) 2456"	<a href="http://www.nysesda.ny.gov/Funding-Opportunities/Current-Funding-Opportunities/-/media/Files/FO/Current%20Funding%20Opportunities/PON%202456/2456summary.ashx">http://www.nysesda.ny.gov/Funding-Opportunities/Current-Funding-Opportunities/-/media/Files/FO/Current%20Funding%20Opportunities/PON%202456/2456summary.ashx</a>
	Program frequently asked questions	<a href="http://www.nysesda.ny.gov/en/Page-Sections/Commercial-and-Industrial/Programs/Industrial-and-Process-Efficiency/FAQs.aspx">http://www.nysesda.ny.gov/en/Page-Sections/Commercial-and-Industrial/Programs/Industrial-and-Process-Efficiency/FAQs.aspx</a>
	"New York's System Benefits Charge Programs Evaluation and Status Report" (final report May 2011, revised Nov. 2011)	<a href="http://www.nysesda.ny.gov/-/media/Files/Publications/NYES%20Program/2011/2011q1_nyes_sbcreport.ashx">http://www.nysesda.ny.gov/-/media/Files/Publications/NYES%20Program/2011/2011q1_nyes_sbcreport.ashx</a>
PPL Electric Utilities CEI Program	PPL Electric recruiting webinar registration page	<a href="http://webinar.pplelectric.com/">http://webinar.pplelectric.com/</a>
	Strategic Energy Group presentation: "PPL EU's Continuous Energy Improvement Program" (Sept. 20, 2011)	<a href="http://www.pplelectric.com/NR/rdonlyres/E73EC8B7-F259-4457-8861-1DB02BC81E22/0/RecruitingWebinarFinal9703.pdf">http://www.pplelectric.com/NR/rdonlyres/E73EC8B7-F259-4457-8861-1DB02BC81E22/0/RecruitingWebinarFinal9703.pdf</a>

Program	Source	URL
PSE RCM Program	Program Website	<a href="http://pse.com/savingsandenergycenter/ForBusiness/Pages/Resource-Conservation-Manager.aspx">http://pse.com/savingsandenergycenter/ForBusiness/Pages/Resource-Conservation-Manager.aspx</a>
	PSE paper: "Implementing a Resource Conservation Manager Program at Puget Sound Energy" (2008 ACEEE Summer Study on Energy Efficiency in Buildings)	<a href="http://eec.ucdavis.edu/ACEEE/2008/data/papers/4_267.pdf">http://eec.ucdavis.edu/ACEEE/2008/data/papers/4_267.pdf</a>
	PSE presentation: "Resource Conservation Management" (Oregon APEM 2011 Summer Forum, June 03, 2011)	<a href="http://oregonapem.org/Portals/0/pdf/Sheryl_Anayas.pdf">http://oregonapem.org/Portals/0/pdf/Sheryl_Anayas.pdf</a>
	PSE presentation: "Identifying the Right Information for the Right Audiences: The Feedback Opportunity" (CEE Industry Partners Meeting, Oct. 5, 2011)	<a href="http://www.cee1.org/cee/mtg/10-11mtg/Wed_GeneralSession_Landers.pdf">http://www.cee1.org/cee/mtg/10-11mtg/Wed_GeneralSession_Landers.pdf</a>
Xcel Energy Process Efficiency Program	Program Website	<a href="http://www.xcelenergy.com/Save_Money_&amp;_Energy/For_Your_Business/Customized_Solutions/Process_Efficiency_-_CO">http://www.xcelenergy.com/Save_Money_&amp;_Energy/For_Your_Business/Customized_Solutions/Process_Efficiency_-_CO</a>
	Program information sheet	<a href="http://www.xcelenergy.com/staticfiles/xcel/Marketing/Managed%20Documents/co-mn-bus-process-efficiency-info-sheet.pdf">http://www.xcelenergy.com/staticfiles/xcel/Marketing/Managed%20Documents/co-mn-bus-process-efficiency-info-sheet.pdf</a>
	Program flow chart	<a href="http://www.xcelenergy.com/staticfiles/xcel/Marketing/Files/CO-MN-Bus-Process-Efficiency-Flow-Chart.pdf">http://www.xcelenergy.com/staticfiles/xcel/Marketing/Files/CO-MN-Bus-Process-Efficiency-Flow-Chart.pdf</a>
	Xcel Energy's Colorado "2012/2013 Demand-Side Management Plan" (Aug. 2011)	<a href="http://www.xcelenergy.com/staticfiles/xcel/Regulatory/2012-2013%20Biennial%20DSM%20Plan.pdf">http://www.xcelenergy.com/staticfiles/xcel/Regulatory/2012-2013%20Biennial%20DSM%20Plan.pdf</a>
	Xcel Energy presentation: "Xcel Energy Industrial Process Efficiency" (CEE Winter Program Meeting, Jan. 25, 2012)	<a href="http://www.cee1.org/cee/mtg/01-12mtg/Wed4_Klemm_Industrial.pdf">http://www.cee1.org/cee/mtg/01-12mtg/Wed4_Klemm_Industrial.pdf</a>
	Xcel Energy presentation: "Xcel Energy's Process Efficiency Program" (Enterprise Minnesota's "GreenLean Equals Business Growth" event, Aug. 17, 2011)	<a href="http://www.enterpriseminnesota.org/assets/documents/xcel-green.pdf">http://www.enterpriseminnesota.org/assets/documents/xcel-green.pdf</a>

## **APPENDIX C. PROGRAM STAFF AND CPUC STAFF INTERVIEW GUIDES**

## Continuous Energy Improvement Pilot Program Manager Interview Guide

Interviewer:

Date:

Name:

IOU:

Title:

### Introduction

Hello, my name is [X] and I'm calling from the Cadmus Group. As you know, we are conducting a process evaluation of the Continuous Energy Improvement, or CEI, pilot program. As part of this evaluation, we are interviewing program staff to gather feedback on program design, delivery, and perceived customer perceptions. Thank you for taking the time to speak with me today.

### Program Involvement

First, I'd like to get an idea of your involvement in the CEI pilot program.

1. Can you provide a general overview of your roles and responsibilities?
2. Please briefly describe the roles and responsibilities of other parties involved in delivering the program.
3. Do you have any past experience delivering CEI to large commercial, industrial, or agricultural customers? [If yes] Please describe your experience.

### Program Goals and Objectives

Now, I'd like to talk about the goals and objectives of the CEI pilot program.

4. What are the short-term goals of the program? [If needed, probe for savings targets, participation targets, persistence targets, market transformation, and customer satisfaction.]
5. What are the long-term program goals? [If needed, probe for savings targets, participation targets, persistence targets, market transformation, and customer satisfaction.]
6. Are these goals clearly defined for participants? How?

7. What is the target market for the CEI program? Do you think this an appropriate target market? Are there customer types that you don't think CEI should target? Are there customer types not currently targeted that you think would be good candidates for CEI?
8. How large is the target market in [Utility's] service territory?

## Program Design

9. Were you involved in program design? [If yes] Please describe the program design process.
10. [If 9 = Yes] What key issues did you consider during the program design phase?
11. [If 9 = Yes] Did you face any challenges during program design? [If yes] How were they resolved?
12. Are there any program design issues that still need to be addressed?
13. How does this program's approach to CEI differ from other programs? How do CEI programs in general differ from typical energy-efficiency programs?

## Marketing and Outreach

14. Can you please describe the marketing and outreach strategy for the CEI program?
15. What is the role of Account Executives in marketing and outreach?
16. Is the current marketing and outreach strategy effective in motivating customers to commit to the program?
17. How could program marketing and outreach be improved?
18. What steps are in place to help ensure the level of customer commitment is sufficient for successful implementation of CEI?
19. In your opinion, how could the customer recruitment process be improved?

## Program Implementation

20. Please briefly describe the program implementation and delivery strategy from your perspective.
21. What is the role of Account Executives in program implementation? What skills are necessary for Account Executives to successfully recruit customers and maintain their commitment to CEI?
22. What successes have you experienced implementing CEI?

23. What challenges have you experienced implementing CEI? How were they resolved?
24. Are there any program implementation issues that still need attention?
25. In your experience, does CEI fit in well with other “green” initiatives and objectives?
26. Does CEI fit in well with other utility program offerings?

## Program Participation

27. In your opinion, how satisfied are participants with program processes, such as enrollment, audits, and energy-efficiency improvements?
28. In your experience, do participants understand the benefits of CEI?
29. In your experience, what percent of participants think they are benefiting financially? Does this differ between customer groups? [If yes] In your opinion, what factors explain these differences?
30. Are participants reporting any other benefits associated with participation in the program?
31. Is there a system in place for your customers to provide feedback? If so, how does this process work?
32. In your experience, what factors motivate customers to participate in the CEI program?
33. How important are certifications such as SEP, ISO, LEED, or Energy Star in programs like CEI?
34. Is the Energy Information System (EIS) software offered as part of CEI beneficial to participants? Roughly what percent of current participants use EIS? In general, is EIS effective in the context of CEI?

## Market Barriers

35. What prevents customers from enrolling in the program?
36. What are the barriers to obtaining the initial commitment from participants?
37. What barriers do customers experience regarding installation or implementation of recommendations from the assessment and audit phase of the program?
38. What barriers keep participants from fully engaging in CEI?

39. In your opinion, is the CEI program effectively addressing barriers to initial commitment and sustained participation in CEI?
40. Do lack of human resources, specifically, pose a barrier to successful implementation of CEI? [If yes] What can the program do to address this barrier?
41. In your experience, do different market segments encounter different participation barriers?
42. Are certain customer types more or less willing to commit to the long-term timeframe of CEI?
43. What other services could the program offer to improve a customer's likelihood of participating and maintaining their commitment to CEI?

## Persistence and Involvement in Other Programs

44. Are participants staying engaged in the program?
45. Have any participants dropped out of the program?
46. What features of the program keep customers engaged?
47. What additional features could the program offer to keep participants engaged?
48. Do participants show interest in participating in other IOU program offerings?
49. Is there a system in place to refer participants to other IOU program offerings? If so, how does this process work? Has it been easy to enroll customers in other programs?

## Program Tracking

50. What is your role in the program data tracking process?
51. What data are collected from participants and what reports are produced?
52. What additional information could be obtained from participants to facilitate program improvements?
53. Are there QA/QC protocols in place for data collection and tracking? [If yes] Please describe the QA/QC procedures.

## Communication with Participants

54. How often do you communicate with program participants?

55. In your opinion, how frequently do participants need contact or support from the IOUs or implementation contractors to remain active in the program?
56. Is the current level of communication sufficient to keep customers engaged?
57. Do you have any suggestion to improve communication between the IOUs and participating customers?

## Communication with Other IOUs and Implementation Contractors

58. How often do you communicate with the other IOUs that are delivering the CEI pilot program?
59. Is this level of communication sufficient to successfully implement the program?
60. Do you have any suggestion to improve communication between IOUs?
61. How often do you communicate with the implementation contractor?
62. Again, is this level of communication adequate?
63. Do you have any suggestions to improve communication between the IOUs and implementation contractors?

## Program Evaluation

64. What can Cadmus ask of the implementation contractors to help inform the implementation of the program?
65. What can Cadmus ask of program participants and nonparticipants to help inform the implementation of the program?
66. What information can the evaluation provide that will be of most use to the IOUs?



## Continuous Energy Improvement Pilot CPUC Staff Interview Guide

Interviewer:

Date:

Name:

Title:

### Introduction

Hello, my name is [X] and I'm calling from the Cadmus Group. As you know, we are conducting a process evaluation of the Continuous Energy Improvement, or CEI, pilot program. As part of this evaluation, we are interviewing staff involved with the program to gather feedback on program design, delivery, and perceived customer perceptions. Thank you for taking the time to speak with me today.

### Program Involvement

First, I'd like to get an idea of your involvement in the CEI pilot program.

1. Can you provide a general overview of your roles and responsibilities?
2. Please briefly describe the roles and responsibilities of other parties at the CPUC who are involved in the program.
3. Do you have any past experience with CEI programs? [If yes] Please describe your experience.

### Program Goals and Objectives

Now, I'd like to talk about the goals and objectives of the CEI pilot program.

4. What are the goals of the program? [If needed, probe for savings targets, participation targets, persistence targets, market transformation, and customer satisfaction.]
5. What is the CPUC hoping to learn from the Pilot program?
6. What is the target market for the CEI program? Do you think this an appropriate target market? Are there customer types that you don't think CEI should target? Are there customer types not currently targeted that you think would be good candidates for CEI?

## Program Design and Implementation

7. Were you involved in program design? [If yes] Please describe the program design process.
8. [If 7 = Yes] What key issues did you consider during the program design phase?
9. [If 7 = Yes] Did you face any challenges during program design? [If yes] How were they resolved?
10. Are there any program design issues that still need to be addressed or ways you would like to see the program changed in the future?
11. What successes have you seen with the implementation of the CEI program (utility and CPUC successes)?
12. What challenges have there been with the implementation of CEI (utility challenges as well as CPUC challenges)? How were they resolved?
13. What role does the CPUC see for CEI in the future? What about in relation to other utility program offerings?
14. If CEI is included in the next IOU planning cycle, what changes to the program would you like to see? [discuss claiming energy savings, offering incentives, target customers, etc]

## Program Participation

15. What factors motivate customers to participate in the CEI program?
16. What features of the program keep customers engaged?
17. What additional features could the program offer to keep participants engaged?
18. How important are certifications such as SEP, ISO, LEED, or Energy Star in programs like CEI?

## Market Barriers

19. In your opinion, what prevents customers from enrolling in the program?
20. Are there any other barriers that prevent customers from moving forward in the program (creating a CEI plan, installing equipment, fully engaging)?
21. Do you think that different market segments encounter different participation barriers?

22. In your opinion, are the IOUs and their implementation contractors effectively addressing barriers to initial commitment and sustained participation in CEI?
23. What other services could the program offer and IOUs/implementation contracts provide to improve a customer's likelihood of participating and maintaining their commitment to CEI?

### Communication with Other IOUs and Implementation Contractors

24. How often do you communicate with the IOUs that are delivering the CEI pilot program?
25. Is this level of communication sufficient?
26. How often do you communicate with the implementation contractors?
27. Again, is this level of communication adequate?
28. Do you have any suggestions to improve communication between the CPUC, the IOUs and the implementation contractors?

### Program Evaluation

29. What can Cadmus ask of program participants and nonparticipants to help inform the implementation of the program?
30. What information can the evaluation provide that will be of most use to the CPUC?

## **APPENDIX D. CEI ADVISOR INTERVIEW GUIDE**



## Continuous Energy Improvement Pilot CEI Advisor Interview Guide

Interviewer:

Date:

Name:

Company:

Title:

### Introduction

Hello, my name is [Name] and I'm calling from the Cadmus Group. As you know, we are conducting a process evaluation of the Continuous Energy Improvement, or CEI, pilot program run by [Utility]. As part of this evaluation, we are interviewing program implementation staff to gather feedback on program design, delivery, and perceived customer perceptions. Thank you for taking the time to speak with me today.

### Program Involvement

First, I'd like to get an idea of your involvement in the CEI pilot program.

1. Can you provide a general overview of your roles and responsibilities?
2. Please briefly describe the roles and responsibilities of other parties involved in delivering the program.
3. Do you have any past experience delivering CEI to large commercial, industrial, or agricultural customers? [If yes] Please describe your experience.

### Program Goals and Objectives

Now, I'd like to talk about the goals and objectives of the CEI pilot program.

4. What are the short-term goals of the program? [If needed, probe for savings targets, participation targets, persistence targets, market transformation, and customer satisfaction.]
5. What are the long-term program goals? [If needed, probe for savings targets, participation targets, persistence targets, market transformation, and customer satisfaction.]
6. Are these goals clearly defined for participants? How?

7. What is the target market for the CEI program? Do you think this an appropriate target market? Are there customer types that you don't think CEI should target? Are there customer types not currently targeted that you think would be good candidates for CEI?
8. How large is the target market in [Utility's] service territory?

## Program Design

9. Were you involved in program design? [If yes] Please describe the program design process.
10. [If 9 = Yes] What key issues did you consider during the program design phase?
11. [If 9 = Yes] Did you face any challenges during program design? [If yes] How were they resolved?
12. Are there any program design issues that still need to be addressed?
13. How does this program's approach to CEI differ from other programs? How do CEI programs in general differ from typical energy-efficiency programs?

## Marketing and Outreach

14. Can you please describe the marketing and outreach strategy for the CEI program?
15. What is the role of Account Executives in marketing and outreach?
16. Is the current marketing and outreach strategy effective in motivating customers to commit to the program?
17. How could program marketing and outreach be improved?
18. What steps are in place to help ensure the level of customer commitment is sufficient for successful implementation of CEI?
19. In your opinion, how could the customer recruitment process be improved?

## Program Implementation

20. Please briefly describe the program implementation and delivery strategy from your perspective.
21. What is the role of Account Executives in program implementation? What skills are necessary for Account Executives to successfully recruit customers and maintain their commitment to CEI?
22. What successes have you experienced implementing CEI?

23. What challenges have you experienced implementing CEI? How were they resolved?
24. Are there any program implementation issues that still need attention?
25. In your experience, does CEI fit in well with other “green” initiatives and objectives?
26. Does CEI fit in well with other utility program offerings?

## Program Participation

27. In your opinion, how satisfied are participants with program processes, such as enrollment, audits, and energy-efficiency improvements?
28. In your experience, do participants understand the benefits of CEI?
29. In your experience, what percent of participants think they are benefiting financially? Does this differ between customer groups? [If yes] In your opinion, what factors explain these differences?
30. Are participants reporting any other benefits associated with participation in the program?
31. Is there a system in place for your customers to provide feedback? If so, how does this process work?
32. In your experience, what factors motivate customers to participate in the CEI program?
33. How important are certifications such as SEP, ISO, LEED, or Energy Star in programs like CEI?
34. Is the Energy Information System (EIS) software offered as part of CEI beneficial to participants? Roughly what percent of current participants use EIS? In general, is EIS effective in the context of CEI?

## Market Barriers

35. What prevents customers from enrolling in the program?
36. What are the barriers to obtaining the initial commitment from participants?
37. What barriers do customers experience regarding installation or implementation of recommendations from the assessment and audit phase of the program?
38. What barriers keep participants from fully engaging in CEI?
39. In your opinion, is the CEI program effectively addressing barriers to initial commitment and sustained participation in CEI?

40. Do lack of human resources, specifically, pose a barrier to successful implementation of CEI? [If yes] What can the program do to address this barrier?
41. In your experience, do different market segments encounter different participation barriers?
42. Are certain customer types more or less willing to commit to the long-term time frame of CEI?
43. What other services could the program offer to improve a customer's likelihood of participating and maintaining their commitment to CEI?

### Persistence and Involvement in Other Programs

44. Are participants staying engaged in the program?
45. Have any participants dropped out of the program?
46. What features of the program keep customers engaged?
47. What additional features could the program offer to keep participants engaged?
48. Do participants show interest in participating in other IOU program offerings?
49. Is there a system in place to refer participants to other IOU program offerings? If so, how does this process work? Has it been easy to enroll customers in other programs?

### Program Tracking

50. What is your role in the program data tracking process?
51. What data are collected from participants and what reports are produced?
52. What additional information could be obtained from participants to facilitate program improvements?
53. Are there QA/QC protocols in place for data collection and tracking? [If yes] Please describe the QA/QC procedures.

### Communication with Participants

54. How often do you communicate with program participants?
55. In your opinion, how frequently do participants need contact or support from the IOUs or implementation contractors to remain active in the program?
56. Is the current level of communication sufficient to keep customers engaged?



57. Do you have any suggestion to improve communication between the IOUs and participating customers?

## Communication with IOUs

58. How often do you communicate with the IOU?

59. Is this level of communication sufficient to successfully implement the program?

60. Do you have any suggestion to improve communication between the implementation contractors and IOUs?

## Program Evaluation

61. What can Cadmus ask of program participants and nonparticipants to help inform the implementation of the program?

62. What information can the evaluation provide that will be of most use to the implementation contractors?

# **APPENDIX E. ACCOUNT EXECUTIVE INTERVIEW GUIDE**



## Continuous Energy Improvement Pilot Account Executive Interview Guide

Interviewer:  
Date:  
Name:  
IOU:  
Title:

### Introduction

Hello, my name is [X] and I'm calling from the Cadmus Group. We are conducting an evaluation of the Continuous Energy Improvement, or CEI, pilot program. As part of this evaluation, we are interviewing account executives to gather information on their involvement in and experience with the program as well as their suggestions for improvement. Thank you for taking the time to speak with me today.

### Program Involvement & Awareness

First, I'd like to get an idea of your involvement in the CEI pilot program.

1. Can you provide a general overview of your role at \_\_\_\_\_ [INSERT UTILITY NAME] and specifically describe what your role is in the CEI program?
2. How did you first hear about the program?
3. Did you get information about the program from any other sources (probe for presentations/trainings/marketing materials)?
4. As you were first learning about the program did you discuss it with any of [INSERT UTILITY NAME]'s CEI advisors who are administering the program?

[If yes to 4, ask 5 through 8 otherwise skip to 9]

5. Do you feel the CEI advisor was well informed about the program and that they could clearly explain the details of the program?

6. Do you feel like the CEI advisor provided you with enough information about the program?
7. Do you think that the CEI advisor was good at promoting the program to all account executives in general? Why or why not?
8. Why did you decide to become an active promoter of the program?
9. What other energy-efficiency programs do you promote to your customers?

## Program Goals and Objectives

Now, I'd like to talk about the goals and objectives of the CEI pilot program.

10. In your opinion, what are the goals of the program?
11. What do you think are the main benefits for customers who participate in the program?
12. Do you think these goals or benefits are different from other utility sponsored programs? If so, how?
13. What is the market that you target when promoting the CEI program? (Probe for customer type, size, resources, etc.)
14. Are there customer types that you don't think CEI should target? Are there customer types not currently targeted that you think would be good candidates for CEI?

## Marketing and Outreach

Next, I would like to hear a little more about how promote the program to your customers.

15. Can you please describe the marketing and outreach strategy you employ for the CEI program?
16. Do you have any marketing materials you use while promoting the program? What about key messages?
17. What role do the CEI advisors have in recruiting customers?

18. Have you participated in any joint outreach or marketing with the CEI advisors? If so, did you think this joint effort was successful? Are there any improvements you would suggest?
- 19.
20. Do you think the current marketing and outreach strategy is effective in motivating customers to commit to the program?
21. How could program marketing, outreach and recruitment process be improved?

## Program Participation

22. What motivates customers to commit to the program?
23. In your experience, do participants understand the benefits of CEI? (Probe for financial benefits, energy savings, etc.) Does this differ between customer groups? [If yes] In your opinion, what factors explain these differences?
24. Once a customer has expressed interest in the program what steps do you take to enroll them in the program?
25. What role do you play in your customers' ongoing participation in the program? (Probe for regular CEI meeting, checking in with the customer, enrolling them in other programs, working with the CEI advisor.)
26. Are participants staying engaged in the program? Have any participants dropped out of the program?
27. What features of the program keep customers engaged?
28. What additional features could the program offer to keep participants engaged?
29. Is there a system in place for your customers to provide feedback? If so, how does this process work?
30. In your opinion, how satisfied are participants with program processes, such as enrollment, audits, and energy-efficiency improvements?
31. Do participants show interest in participating in other IOU program offerings?

32. Is there a system in place to refer participants to other IOU program offerings? If so, how does this process work? Has it been easy to enroll customers in other programs?

## Communication

33. How often do you communicate with program participants? Is the current level of communication sufficient to keep customers engaged?
34. In your opinion, how frequently do participants need contact or support from the IOUs or CEI advisors to remain active in the program?
35. Do you regularly communicate with the CEI advisor? If so, in what capacity (meetings with the customer, check ins, ongoing promotion of the program)?
36. Are you satisfied with the level and type of communication you have with the CEI advisor?
37. Do you have any suggestions to improve communication between the IOUs, CEI advisors, and participating customers?

## Market Barriers

38. What prevents customers from enrolling in the program?
39. What barriers do customers experience regarding installation or implementation of recommendations from the assessment and audit phase of the program?
40. In your opinion, is the CEI program effectively addressing barriers to initial commitment and sustained participation in CEI? Why or why not?
41. In your experience, do different market segments encounter different participation barriers? Why or why not?
42. Are certain customer types more or less willing to commit to the long-term timeframe of CEI? Why or why not?
43. What other services could the program offer to improve a customer's likelihood of participating and maintaining their commitment to CEI?
44. What are the barriers to account executives promoting the program?
45. What improvements can be made to the program and the outreach strategy to encourage more account executive involvement in the program?

## Closing

46. Overall, what do you think are the programs strengths?

47. What program improvements could be made?

Thank you for your time.

## **APPENDIX F. PARTICIPANT INTERVIEW GUIDE**





## Continuous Energy Improvement Pilot Participant Interview Guide

Interviewer:  
Date:  
Contact Name:  
Company:  
Phone Number:  
Sector:  
Date of enrollment:  
Stage in CEI:  
Utility:  
CEI Advisor:

### Introduction

Hello, my name is [X] and I'm calling from the Cadmus Group. Your name was provided by [UTILITY] as the lead for your company's Continuous Energy Improvement Efforts. We are currently conducting an evaluation of the Continuous Energy Improvement program offered by [UTILITY] and are interviewing participants to gather information on their involvement in and experience with the program as well as their suggestions for improvement.

1. Do you have some time today to discuss the CEI program?
  1. Yes
  2. No (reschedule for a better time)

Thank you for taking the time to speak with me today.

### Program Involvement & Awareness

First, I'd like to get an idea of your role at [COMPANY NAME] and your involvement in the CEI pilot program.

1. Can you tell me what your title is and give a general overview of what you do at [COMPANY NAME]?
2. How do your job duties relate to energy use at your facility?
3. What role do you play in your company's participation in the CEI program?

4. How did you first hear about the CEI program?
  1. Account Executive
  2. CEI Advisor
  3. CEI Advisor and Account Executive
  4. Other
    - a. *[IF 4=4]* As you were first learning about the program did you discuss it with anyone from [CEI ADVISOR FIRM] or your account executive from [UTILITY NAME]?
    - b. *[IF 4=1]* As you were first learning about the program did you discuss it with anyone from [CEI ADVISOR FIRM]?
    - c. *[IF 4=2]* As you were first learning about the program did you discuss it with your account executive from [UTILITY NAME]?
5. *[ASK ABOUT THE AE AND/OR THE CEI ADVISOR BASED ON RESPONSES TO THE QUESTIONS ABOVE]* Do you feel your account executive was well informed about the program and that they could clearly explain the details of the program? What about the person from [CEI ADVISOR FIRM]?
6. *[IF 5 = No or a negative response]* What could the [CEI ADVISOR/ACCOUNT EXECUTIVE] have done better?
7. Before participating in the CEI program, had you participated in one of the [UTILITY NAME'S] energy-efficiency programs before? If yes, what program? When? What was installed?
8. What motivated you and your company to participate in the CEI program?
9. Before participating in the CEI program, were there any practices or corporate philosophies in place at your company that made it easier to implement CEI?

## Program Enrollment and Staff Interactions

Now, I'd like to talk about your enrollment process and the activities you are currently undertaking through CEI.

10. Once you decided to participate in the program, what steps did you take to become enrolled?  
*(Probe for assistance from CEI Advisor and Account Executive)*

11. Overall, how satisfied were you with the enrollment process?
  1. Not at all satisfied
  2. Not too satisfied
  3. Neutral (*do not read*)
  4. Somewhat satisfied
  5. Very satisfied
12. Since enrolling in the program, what interactions have you had with [CEI ADVISOR FIRM]?
13. What have the staff from [CEI ADVISOR FIRM] done well?
14. What could they improve?
15. Is there additional support you would like to receive from program staff?
16. Since enrolling in the program, what interactions have you had with your account executive in conjunction with the CEI program?
17. What has your account executive done well?
18. What could they improve?
19. Is there additional support you would like to receive from your account executive in regards to the CEI program?

## CEI Activities

20. What activities have you undertaken so far as part of CEI?
  1. Kickoff meeting
  2. Energy Audit
  3. Organization Assessment
  4. CEI Plan
  5. Implementation of measures
  6. Changes to O&M or processes
  7. Changes to organization structure in regards to energy management
  8. Distributed Generation
  9. Demand Response
  10. [Others: \_\_\_\_\_]
21. [IF 20 = 5 or 6] How did you decide which items to implement?
22. [IF 20 = 5, 6, or 7] Have the changes you made had an impact on energy usage?

23. [IF 20 = 5,6, or 7] Are all of the changes you made still in place? If not, why not?
24. How useful have the activities you completed so far through the program been? (After they provide a rating probe for feedback/details)
1. Not at all useful
  2. Not too useful
  3. Neutral (*do not read*)
  4. Somewhat useful
  5. Very useful
25. Are there any activities you have not yet completed through CEI that you would like to?
26. Has your CEI Advisor encouraged you to include demand response or distributed generation in your CEI plan?
27. Do you see any potential for demand response or distributed generation at your facility?
28. Is there anything [UTILITY] or your CEI Advisor could do to help you implement demand response or distributed generation?
29. Since enrolling in CEI have you participated or considered participating in any other utility programs? Why or why not?
30. [IF29 = yes] How influential was your participation in CEI influence your decision to pursue these other utility offerings?
1. Not at all influential
  2. Not too influential
  3. Neutral (*do not read*)
  4. Somewhat influential
  5. Very influential
31. Since enrolling in CEI do you feel you are more aware of available utility programs?
1. No change
  2. More aware
32. Is there any training that can be offered to the staff at your facility that can improve energy performance? If so, on what topics specifically?
33. Are there any barriers to participating in utility-offered training? If so, what are they (location, time, budget, etc.)?

## Market Barriers

Next I would like to discuss any barriers there may be to participating in CEI.

34. Generally, what barriers do you think exist for large [INSERT SECTOR] companies to enroll in a CEI program?
35. What challenges did you encounter when you were deciding to participate in the program?
36. Do you feel like you have enough staff and capital resources to participate in CEI over the long term?
37. What are attitudes and perceptions of upper management about CEI?
38. What are the attitudes of other staff?
39. Are there any other barriers that may prevent you from continuing with CEI over the long term (5 years)?

## Satisfaction

Finally, I would like to ask you about your satisfaction with the program.

40. Overall, how satisfied are you with the program? *(After they provide a rating probe for feedback/details)*
  1. Not at all satisfied
  2. Not too satisfied
  3. Neutral *(do not read)*
  4. Somewhat satisfied
  5. Very satisfied
41. Do you plan to continue to participate in CEI?
42. As the program ends and the CEI advisor is no longer available to assist you, do you think your CEI commitment level will remain the same? Why or why not?
43. What was the program's most useful aspect?
44. Do you think you think other [SECTOR] companies would find the same features valuable?
45. What do you think is the best way to promote this program to [SECTOR] companies like you?

46. Do you have any suggestions for improvement regarding the following components of the program:
1. Account executives
  2. CEI Advisors
  3. Developing a CEI plan
  4. Implementing projects/improvements
  5. Availability of incentives (capital, funding for staff)
  6. Other?
47. Finally, would you be interested in attending workshops with other companies that are implementing CEI so you can discuss different strategies and experiences? Why or why not?

## **APPENDIX G. NONPARTICIPANT INTERVIEW GUIDE**

## Continuous Energy Improvement Pilot

### Nonparticipant Interview Guide

Interviewer:  
Date:  
Contact Name:  
Company:  
Phone Number:  
Sector:  
Utility:

#### Introduction

Hello, my name is [X] and I'm calling from the Cadmus Group. We are currently conducting an evaluation of the Continuous Energy Improvement program offered by [UTILITY] and are surveying customers who were approached about the program but decided not to participate, to gather information about their awareness of the program as well as their suggestions for improvement. Your name was provided by [UTILITY] as someone who was contacted about the program, but chose not to participate. The survey will take about 20 minutes and we are offering a \$100 gift card as compensation for your time.

Do you have some time today to discuss the CEI program?

1. Yes
2. No (reschedule for a better time)

Thank you for taking the time to speak with me today.

#### Current Energy Practices

First, I'd like to get an idea of your role at [COMPANY NAME] and get a sense of what your company does to manage its energy use.

1. Can you tell me what your title is and give a general overview of what you do at [COMPANY NAME]?
2. How do your job duties relate to energy use at your facility?
3. *[Do not ask if respondent said they are the energy manager in Q1 or Q2]* Do you have an energy manager at your facility?



4. How does your company manage energy consumption, including demand response and distributed generation? [probe for any certifications they may already have or are pursuing, such as ISO 50001 or DOE certifications]
5. What is the potential and interest level for energy-efficiency, demand response and distributed generation at your facility? [make sure they address each of the 3]
6. What types of training could be offered to the staff at your facility that can improve energy performance?
7. What are the barriers to participating in utility-offered training? (location, time, budget, etc.)?

## Program Awareness

Next, I'd like to talk about your awareness of the CEI program.

8. How did you first hear about the CEI program?
  1. Account Executive
  2. CEI Advisor
  3. CEI Advisor and Account Executive
  4. Co-worker
  5. Other
  1. *[IF 8=4 or 5]* As you were first learning about the program did you discuss it with anyone from [CEI ADVISOR FIRM] or your account executive from [UTILITY NAME]?
  2. *[IF 8=1]* As you were first learning about the program did you discuss it with anyone from [CEI ADVISOR FIRM]?
  3. *[IF 8=2]* As you were first learning about the program did you discuss it with your account executive from [UTILITY NAME]?
9. *[ASK ABOUT THE AE AND/OR THE CEI ADVISOR BASED ON RESPONSES TO THE QUESTIONS ABOVE]* Do you feel your account executive was well informed about the program and that they could clearly explain the details of the program? What about the person from [CEI ADVISOR FIRM]?
10. Is there anything that the [CEI ADVISOR/ACCOUNT EXECUTIVE] could have done better?
11. In general, did you feel like you had enough information about the program? If no, what else would you liked to have learned about the program?

## Participation Decisions and Market Barriers

12. Did you consider participating in the program? If so, how strongly were you considering participation?
13. Why did your company choose not to participate in the CEI program?
14. Was the decision not to participate solely yours or did other people from your company play a role in it?
15. What were upper management's attitudes and perceptions about CEI?
16. What about other staff?
17. In general, what do you think keeps large [SECTOR] companies from participating in the CEI program?

## Program Perception and Value

18. Thinking about what you know about the CEI program, what features did you think would be most valuable to your company?
19. Which features of the program would be the least valuable?
20. What do you like or dislike about the following features of the programs:
  1. Long term approach
  2. Time commitment
  3. Level of capital investment
  4. Need for numerous staff members to be involved
  5. Holistic approach
21. Would you be interested in attending workshops with other companies that are implementing CEI so you can discuss different strategies and experiences? Why or why not?
22. What do you think is the best way to promote this program to [SECTOR] companies like you?

## Future Participation

23. Before learning about the CEI program, had you participated in one of the [UTILITY'S] energy-efficiency programs before?

1. If yes, what program? When?
  2. If no, why not?
24. In the future, what types of utility sponsored energy-efficiency programs would be beneficial to you and your organization?
25. If [UTILITY] were to offer a training for energy managers how likely would you be to participate?
1. Not at all likely
  2. Not too likely
  3. Neutral (*do not read*)
  4. Somewhat likely
  5. Very likely
26. If [UTILITY] were to offer assistance with certifications, such as ISO 50001, how likely would you be to utilize this assistance?
1. Not at all likely
  2. Not too likely
  3. Neutral (*do not read*)
  4. Somewhat likely
  5. Very likely
27. In the future, how likely are you to participate in CEI? Why?
1. Not at all likely
  2. Not too likely
  3. Neutral (*do not read*)
  4. Somewhat likely
  5. Very likely
28. Are there any changes that could be made to the CEI program that would make you more likely to participate?
29. Do you have any additional suggestions for improving the program?