

PROGRAM AWARENESS AND PARTICIPATION

PA0 Are you aware that Ameren Illinois Utilities offers programs to help their business customers save energy?

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

PA1 Have you heard of Ameren Illinois Utilities' "Act on Energy" program?

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

[SKIP IF PA1 = 1]

PA2 The Act on Energy program offers incentives for energy efficient equipment upgrades and improvements including lighting, cooling, refrigeration, and motors. Have you heard of this program?

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

[IF PA2 = 2, 8, 9 SKIP TO MK2]

PA7 Have you ever participated in the Act on Energy program?

- 1 Yes [THANK AND TERMINATE]
- 2 No
- 8 (Don't know)
- 9 (Refused)

S0 How did you first hear about the Act on Energy program?

- 1. (Ameren Key Account Executive)
- 2. (Ameren Website)
- 3. (Workshop)
- 4. (Contractor/program ally)
- 5. (Billboards)
- 6. (Radio advertising)
- 7. (Newspaper)
- 8. (Email)
- 9. (Television)
- 10. (Friend/colleague/word of mouth)
- 11. (Bill insert)
- 12. (Chamber of Commerce Publication)
- 13. (Trade Show)
- 00. (Other, specify)
- 98. (Don't know)
- 99. (Refused)

- PA3 How would you rate your familiarity with the Act on Energy programs? Would you say you are..?
- 1 Very familiar
 - 2 Somewhat familiar
 - 3 Not very familiar
 - 4 Not at all familiar
 - 8 (Don't know)
 - 9 (Refused)

[IF PA3=3, 4, 8, 9 SKIP TO B4]

- PA4 What are your reasons for not participating in the program? [MULTIPLE CHOICE, UP TO 3]
- 1 (Incentives not high enough/not worth the effort)
 - 2 (Need more information/Lack of awareness of the program)
 - 3 (Measure not available)
 - 4 (Paperwork is too burdensome)
 - 5 (Program is too complicated/confusing)
 - 6 (Cost of equipment)
 - 7 (Program ran out of incentive money/oversubscribed)
 - 00 (Other, specify)
 - 98 (Don't know)
 - 99 (Refused)

- PA5 How likely are you to participate in the Act on Energy program in the future? Would you say you are...
- 1 Very likely
 - 2 Somewhat likely
 - 3 Not very likely
 - 4 Not at all likely
 - 8 (Don't know)
 - 9 (Refused)

[IF PA5 = 1, 2, 8, 9 SKIP TO B1a]

- PA5a Why are you not likely to participate in the program in the future? [MULTIPLE RESPONSE, UP TO 3]
- 1 (Incentives not high enough/not worth the effort)
 - 2 (Need more information/lack of awareness of the program)
 - 3 (Measure not available)
 - 4 (Paperwork is too burdensome)
 - 5 (Program is too complicated/confusing)
 - 6 (Cost of equipment)
 - 00 (Other, specify)
 - 98 (Don't know)
 - 99 (Refused)

- PA6 How could the Act on Energy program be improved to make it easier for companies to participate? [MULTIPLE RESPONSE, UP TO 4]
- 1 (Higher incentives)
 - 2 (More measures)
 - 3 (Greater publicity)
 - 4 (No recommendations)
 - 00 (Other, specify)
 - 98 (Don't know)
 - 99 (Refused)

BENEFITS AND BARRIERS

- B1a What do you see as the main benefits to participating in an energy efficiency program like the Act on Energy program? [MULTIPLE RESPONSE, UP TO 3]
- 1 (Energy Savings)
 - 2 (Good for the Environment)
 - 3 (Lower Maintenance Costs)
 - 4 (Better Quality/New Equipment)
 - 5 (Rebate/Incentive)
 - 00 (Other, Specify)
 - 98 (Don't know)
 - 99 (Refused)
- B4 What do you see as the main barriers to installing energy efficient equipment at your facility? [MULTIPLE RESPONSE, UP TO 3]
- 1 (Costs more/too much)
 - 2 (Isn't always available/not available)
 - 3 (Awareness/knowledge of options)
 - 4 (Can purchase used equipment)
 - 5 (Not always recommended by contractor/distributor)
 - 6 (Corporate approval)
 - 00 (Other, specify)
 - 98 (Don't know)
 - 99 (Refused)

MARKETING AND OUTREACH

- MK1 Do you recall seeing or receiving any marketing materials or other information about Ameren Illinois Utilities' Act on Energy program?
- 1 Yes
 - 2 No
 - 8 (Don't know)
 - 9 (Refused)

[IF MK1 = 2, 8, 9 SKIP TO MK2]

- MK1a What types of marketing materials do you remember? [MULTIPLE RESPONSE, UP TO 5]
- 1. (Television)
 - 2. (Newspaper)
 - 3. (Email)
 - 4. (Billboards)

- 5. (Radio advertising)
- 6. (Chamber of Commerce publication)
- 7. (Presentation/workshop)
- 8. (Bill insert)
- 9. (Brochure)
- 10. (ActOnEnergy website)
- 00. (Other, please specify)
- 98. (Don't know)
- 99. (Refused)

[IF MK1a = 98, 99 SKIP TO MK2]

MK1b How useful were the program's marketing materials in providing information about the program? Would you say they were..?

- 1 Very useful
- 2 Somewhat useful
- 3 Not very useful
- 4 Not at all useful
- 8 (Don't know)
- 9 (Refused)

[IF MK1b= 1,2,8,9 SKIP TO MK2]

MK1c What would have made the materials more useful to you? [MULTIPLE RESPONSE, UP TO 3]

- 1 (More detailed information)
- 2 (Where to get additional information)
- 3 (Information provided in a simpler and more straightforward way)
- 00 (Other, specify)
- 98 (Don't know)
- 99 (Refused)

MK2 In general, what is the best way of reaching companies like yours to provide information about energy efficiency opportunities like the Act on Energy program? [MULTIPLE RESPONSE, UP TO 3]

- 1 (Bill inserts)
- 2 (Flyers/ads/mailings)
- 3 (e-mail)
- 4 (Telephone)
- 5 (Key Account Executive)
- 6 (Webinars/roundtables/events)
- 7 (Through trade or professional associations)
- 8 (Trade allies/contractors)
- 00 (Other, specify)
- 98 (Don't know)
- 99 (Refused)

EQUIPMENT MODULE

- E2 Who makes decisions about the lighting installed in your space? (If necessary, does your firm, property management firm, or if you rent, your building owner make these decisions?)
- 1 My company makes the decisions
 - 2 Owner makes the decisions
 - 3 (Both company and owner)
 - 4 (Property management firm)
 - 5 (Franchise management)
 - 00 (Other, specify)
 - 98 (Don't know)
 - 99 (Refused)

[SET LDECISION = 1 IF (F2 = 1, 2) OR (F2=3 AND E2=1) OR (F2=3 AND E2=3), ELSE SET LDECISION = 0]

- E3 Who makes decisions about the cooling equipment installed in your space? Does your company make these decisions or is that done by the building owner or a property management firm on behalf of the owner?
- 1 My company makes the decisions
 - 2 Owner makes the decisions
 - 3 (Both company and owner)
 - 4 (Property management firm)
 - 5 (Franchise management)
 - 00 (Other, specify)
 - 98 (Don't know)
 - 99 (Refused)

[SET CDECISION = 1 IF (F2 = 1, 2) OR (F2=3 AND E3=1) OR (F2=3 AND E3=3), ELSE SET CDECISION = 0]

- E4 Does your company have any commercial refrigeration equipment other than standard vending machines or stand alone icemakers at this location?
- 1 Yes
 - 2 No
 - 8 (Don't know)
 - 9 (Refused)

[SET REFRIGERATION = 1 IF E4=1, ELSE SET REFRIGERATION = 0]

- E5 Does your company have any equipment with an electric motor such as a pump or fan for ventilation at this location?
- 1 Yes
 - 2 No
 - 8 (Don't know)
 - 9 (Refused)

[SET MOTORS = 1 IF E5=1, ELSE SET MOTORS = 0]

Lighting

[IF LDECISION=0 SKIP TO EC1]

EL1 Have you purchased, or contracted to install, any lighting equipment since June 2009?

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

[IF EL1=2,8,9 SKIP TO EL2]

EL1a Was the lighting equipment you purchased high efficiency?

- 1 Yes
- 2 No
- 3 (Some)
- 8 (Don't know)
- 9 (Refused)

[SET LSPILLMEAS=1 IF EL1A=1, ELSE SET LSPILLMEAS=0]

EL2 Do you plan to install any lighting equipment within the next 12 months?

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

[IF EL2 = 2, 8, 9 SKIP TO EC1]

EL2a Do you plan to install high efficiency lighting equipment within the next 12 months?

- 1 Yes
- 2 No
- 3 Maybe
- 8 (Don't know)
- 9 (Refused)

Cooling

[IF CDECISION=0 SKIP TO ER1]

EC1 Have you purchased, or contracted to install, any air conditioning equipment or chillers since June 2009?

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

[IF EC1=2,8,9 SKIP TO EC2]

EC1a Was the cooling equipment you purchased high efficiency?

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

[SET CSPILLMEAS=1 IF EC1A=1, ELSE SET CSPILLMEAS=0]

- EC2 Are you thinking of purchasing a new air conditioning unit or a chiller within the next 12 months?
- 1 Yes
 - 2 No
 - 8 (Don't know)
 - 9 (Refused)

[IF EC2 = 2, 8, 9 SKIP TO ER1]

- EC2a Do you plan to purchase high efficiency cooling equipment within the next 12 months?
- 1 Yes
 - 2 No
 - 3 Maybe
 - 8 (Don't know)
 - 9 (Refused)

Refrigeration

[IF REFRIGERATION=0 SKIP TO EM1]

- ER1 Have you purchased, or contracted to install, any refrigeration equipment since June 2009?
- 1 Yes
 - 2 No
 - 8 (Don't know)
 - 9 (Refused)

[IF ER1=2,8,9 SKIP TO ER2]

- ER1a Was the refrigeration equipment you purchased high efficiency?
- 1 Yes
 - 2 No
 - 8 (Don't know)
 - 9 (Refused)

[SET RSPILLMEAS=1 IF ER1A=1, ELSE SET RSPILLMEAS=0]

- ER2 Are you thinking of purchasing any new refrigeration equipment within the next 12 months?
- 1 Yes
 - 2 No
 - 8 (Don't know)
 - 9 (Refused)

[IF ER2 = 2, 8, 9 SKIP TO EM1]

- ER2a Do you plan to purchase high efficiency refrigeration equipment within the next 12 months?
- 1 Yes
 - 2 No
 - 3 Maybe
 - 8 (Don't know)
 - 9 (Refused)

Motors

[IF MOTORS=0 SKIP TO E6]

EM1 Have you purchased, or contracted to install, any motors since June 2009?

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

[IF EM1=2,8,9 SKIP TO EM2]

EM1a Were the motors you purchased high efficiency?

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

[SET MSPILLMEAS=1 IF EM1A=1, ELSE SET MSPILLMEAS=0]

EM2 Are you thinking of purchasing any new motors within the next 12 months?

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

[IF EM2 = 2, 8, 9 SKIP TO E6]

EM2a Do you plan to purchase high efficiency motors within the next 12 months?

- 1 Yes
- 2 No
- 3 Maybe
- 8 (Don't know)
- 9 (Refused)

[IF LDECISION=0 AND CDECISION=0 AND REFRIGERATION=0 AND MOTORS=0; THEN SKIP TO END]

E6 In general, when considering the purchase of new equipment, what sources do you consult for information and guidance on the purchase? [MULTIPLE RESPONSE; UP TO 5]

- 1 (Colleagues/Other employees in the company)
- 2 (Other personal/professional acquaintances)
- 3 (Contractor)
- 4 (Consultant)
- 5 (Equipment vendors/salespeople)
- 6 (Ameren/Ameren Key Account Executive)
- 7 (Magazines/journals)
- 8 (Trade Associations)
- 9 (Internet)
- 00 (Other, specify)
- 98 (Don't know)
- 99 (Refused)

PL1 Who is the most influential in specifying the type of equipment you install?

- 1. (me/respondent)
- 2. (contractor)

- 3. (engineer)
- 4. (architect)
- 5. (manufacturer)
- 6. (distributor)
- 7. (Owner)
- 00. (Other, specify)
- 98. (Don't know)
- 99. (Refused)

- E7 On a scale of 0 to 10 where 0 is “not at all important” and 10 is “very important,” how important are the following factors when purchasing new equipment for your facility? How important is... [SCALE 0-10; 98=Don't know, 99=Refused]
- a. initial purchase cost
 - b. operation and maintenance cost
 - c. energy efficiency
 - d. aesthetics/décor
 - e. availability

[SET TOTSPILLMEAS = LSPILLMEAS + CSPILLMEAS + RSPILLMEAS + MSPILLMEAS]

SPILLOVER MODULE

[SKIP TO END IF PA2=2,8,9 OR IF PA3=>3]

S1 (IF TOTALSPILL>1) On a scale of 0 to 10, where 0 means “no influence” and 10 means “greatly influenced,” how much did your knowledge of the Act On Energy Business program influence your decision to install each of the following types of high efficiency equipment on your own?

(IF TOTALSPILL=1) On a scale of 0 to 10, where 0 means “no influence” and 10 means “greatly influenced,” how much did your knowledge of the Act On Energy Business program influence your decision to install high efficiency [SPILLMEASTYPE] equipment on your own?

[SCALE 0-10; 98=Don't know, 99=Refused]

- a. [SKIP IF LSPILLMEAS=0] Lighting equipment
- b. [SKIP IF CSPILLMEAS=0] Cooling equipment
- c. [SKIP IF RSPILLMEAS=0] Refrigeration equipment
- d. [SKIP IF MSPILLMEAS=0] Motors

Lighting:

[SKIP TO CS4 IF LSPILLMEAS=0]

- LS4 What type of lighting equipment was installed OUTSIDE of the program? (Read list if necessary. After each response, prompt with: “Did you install any other energy efficient lighting equipment at your facility since June 2009?”) [MULTIPLE RESPONSE, UP TO 5]
- 1 (Linear fluorescent lights)
 - 2 (High-Intensity Discharge (HID) Fixtures)
 - 3 (Compact fluorescent lights (CFLs))

- 4 (Exit signs)
- 5 (Lighting controls)
- 00 (Other, specify)
- 98 (Don't know)
- 99 (Refused)

Cooling:

[SKIP TO RS4 IF CSPILLMEAS=0]

- CS4 What types of equipment were installed OUTSIDE of the program? (Read list if necessary. After each response, prompt with: "Did you install any other energy efficient cooling equipment at your facility since June 2009?") [MULTIPLE RESPONSE, UP TO 5]
- 1 (Split system air conditioners (two components: compressor is separate from the supply air fan))
 - 2 (Packaged air conditioning systems (one component, for example rooftop units or unitary equipment))
 - 3 (Package Terminal A/C (e.g., Hotel/Motel units))
 - 4 (Window/Wall Air-Conditioning Units)
 - 5 (Remote Condensing Unit)
 - 6 (Evaporative coolers/swamp coolers)
 - 7 (Water Chillers)
 - 8 (Evaporative Condenser)
 - 9 (Adjustable Speed Drives)
 - 10 (Energy Management System)
 - 11 (HVAC Controls: Bypass Timer)
 - 12 (HVAC Controls: Time Clock)
 - 13 (HVAC Controls: Set-Back Programmable Thermostat)
 - 14 (Heat Pump Units)
 - 00 (Other, specify) (RECORD MULTIPLE "OTHER" RESPONSES HERE, IF NECESSARY)
 - 98 (Don't know)
 - 99 (Refused)

Refrigeration

[SKIP TO MS4 IF RSPILLMEAS=0]

- RS4 What types of refrigeration measures were installed OUTSIDE of the program? (Read list if necessary. After each response, prompt with: "Did you install any other energy efficient refrigeration equipment at your facility since June 2009") [MULTIPLE RESPONSE, UP TO 5]
- 1 (Night covers for display cases)
 - 2 (Strip curtains)
 - 3 (Glass doors on vertical open display cases)
 - 4 (Reach in display cases, with doors)
 - 5 (Main door cooler/freezer door gaskets)
 - 6 (Auto closers for coolers/freezers)
 - 7 (Anti-sweat heat controllers)
 - 8 (Insulate bare suction pipes)
 - 9 (Multiplex compressor systems)
 - 10 (Condensers)
 - 11 (Floating head pressure controllers)

- 12 (Evaporative fan coolers)
- 13 (Vending machine controllers)
- 00 (Other, specify)
- 98 (Don't know)
- 99 (Refused)

Motors:

[SKIP TO END IF MSPILLMEAS=0]

MS4 What types of applications were these motors installed in OUTSIDE of the program? (Read list if necessary. After each response, prompt with: "Did you install any other energy efficient motors at this facility since June 2009?") [MULTIPLE RESPONSE, UP TO 5]

- 1 (Pumping)
- 2 (Fans/Blowers)
- 3 (Compressed Air)
- 4 (Materials handling (conveyor belts))
- 5 (Ventilation/HVAC)
- 6 (Boiler fans)
- 7 (Production process machinery)
- 00 (Other, specify)
- 98 (Don't know)
- 99 (Refused)

[END] This concludes our survey. Thank you very much for your participation!

AMEREN ILLINOIS UTILITIES ACT ON ENERGY BUSINESS PROGRAM

PARTICIPANT SURVEY – STANDARD PROJECTS

FINAL

06/28/10

INTRODUCTION

[READ IF CONTACT=1]

Hello, this is _____ from Opinion Dynamics calling on behalf of Ameren Illinois Utilities. This is not a sales call. May I please speak with <PROGRAM CONTACT>?

Our records show that <COMPANY> purchased <ENDUSE>, which was/were <installed in “INSTALL DATE” OR recently installed> and received an incentive of <INCENTIVE AMOUNT> from Ameren Illinois Utilities. We are calling to do a follow-up study about your firm’s participation in this program, which is called the Act On Energy Business Program. I was told you’re the person most knowledgeable about this project. Is this correct? [IF NOT, ASK TO BE TRANSFERRED TO MOST KNOWLEDGABLE PERSON OR RECORD NAME & NUMBER.]

This survey will take about 25 minutes. Is now a good time? [If no, schedule call-back]

[READ IF CONTACT=0]

Hello, this is _____ from Opinion Dynamics calling on behalf of Ameren Illinois Utilities. I would like to speak with the person most knowledgeable about recent changes in cooling, lighting, or other energy-related equipment for your firm at this location.

[IF NEEDED] Our records show that <COMPANY> purchased <ENDUSE>, which was <installed in “INSTALL DATE” OR recently installed> and received an incentive of <INCENTIVE AMOUNT> from Ameren Illinois Utilities. We are calling to do a follow-up study about your firm’s participation in this program, which is called the Act On Energy Business Program. I was told you’re the person most knowledgeable about this project. Is that correct? [IF NOT, ASK TO BE TRANSFERRED TO MOST KNOWLEDGABLE PERSON OR RECORD NAME & NUMBER.]

This survey will take about 25 minutes. Is now a good time? [If no, schedule call-back]

SCREENING QUESTIONS

- A1. Just to confirm, between June 1, 2009 and May 31, 2010 did <COMPANY> participate in Ameren Illinois Utilities’ Act On Energy Business Program at <ADDRESS>? (IF NEEDED: This is a program where your business received an incentive for installing one or more energy-efficient products covered under the program.)

- 1 (Yes, participated as described)
- 2 (Yes, participated but at another location)
- 3 (NO, did NOT participate in program)
- 00 (Other, specify)
- 98 (Don't know)
- 99 (Refused)

[SKIP A2 IF A1=1,2]

A2. Is it possible that someone else dealt with the energy-efficient product installation?

- 1 (Yes, someone else dealt with it)
- 2 (No)
- 00 (Other, specify)
- 98 (Don't know)
- 99 (Refused)

[IF A2=1, ask to be transferred to that person. If not available, thank and terminate. If available, go back to A1]

[IF A1=3,98,99 or A2=2,00,98,99: Thank and terminate. Record dispo as "Could not confirm participation".]

Before we begin, I want to emphasize that this survey will only be about the <END USE> you installed through the Act On Energy Business Program at <ADDRESS>.

A3. I'd like to confirm some information in Ameren Illinois Utilities' database. Our records show that you implemented the following <ENDUSE> projects through the Act On Energy Business Program. Is this correct?

[ASK A3a IF MEASD1 <> BLANK]

a <MEASD1>

- 1 (Yes)
- 2 (No, did not install)
- 8 (Don't know)
- 9 (Refused)

[ASK A3b IF MEASD2 <> BLANK]

b <MEASD2>

- 1 (Yes)
- 2 (No, did not install)
- 8 (Don't know)
- 9 (Refused)

[ASK A3c IF MEASD3 <> BLANK]

c <MEASD3>

- 1 (Yes)
- 2 (No, did not install)
- 8 (Don't know)
- 9 (Refused)

CREATE VARIABLES MEAS1, MEAS2, MEAS3.

SET MEAS1=1 IF (A3a = 1 OR 2; ELSE SET MEAS1=0)

SET MEAS2=1 IF (A3b = 1 OR 2; ELSE SET MEAS2=0)

SET MEAS3=1 IF (A3c =1 OR 2; ELSE SET MEAS3=0)

[IF MEAS1=0 AND MEAS2=0 AND MEAS3=0 then thank and terminate. Record dispo as "Could not confirm measures".]

LIGHTING MODULE [ASK IF LIGHT=1, ELSE SKIP TO COOLING MODULE]

PL1 Who was the most influential in specifying the details of the <ENDUSE> project you completed through the Act On Energy Business program?

1. (me/respondent)
2. (contractor)
3. (engineer)
4. (architect)
5. (manufacturer)
6. (distributor)
7. (Owner)
8. (Electrician)
9. (Supplier)
10. (Ameren Illinois Utilities representative/program staff)
11. (Program Ally)
00. (Other, specify)
98. (Don't know)
99. (Refused)

PL2 And who identified the opportunity for the Ameren Illinois Utilities incentive?

1. (me/respondent)
2. (contractor)
3. (engineer)
4. (architect)
5. (manufacturer)
6. (distributor)
7. (Ameren Key Account Executive)
8. (owner/developer)
9. (project manager)
10. (Supplier)
11. (Ameren Illinois Utilities representative/program staff)
00. (Other, specify)
98. (Don't know)
99. (Refused)

Measure Loop

[Loop 1: ASK IF MEAS1=1. Loop 2: ASK IF MEAS2=1. Loop 3: ASK IF MEAS3=1.]

[For Loop 2, replace "1" at the end of read-ins with "2"; for Loop 3, replace "1" with "3".]

The following questions are about the <lamps you removed OR "MEASD" you installed> through the Act On Energy Business Program.

L0 When did you <remove the lamps OR install the MEASD1> (IF NECESSARY, PROBE FOR BEST GUESS)

- a Month [Precodes for Jan through Dec., DK, REF]
- b Year [Precodes for 2009 and 2010, DK, REF]

DELAMPING [ASK IF MEASURE1 = LINEAR, ELSE SKIP TO L6]

- L1 Did any of your new fixtures have fewer bulbs per fixture than your old fixtures (i.e., did you delamp)? (If needed: delamping occurs when you replace your T12 fixtures with T8s and reduce the number of lamps per fixture.)
- 1 Yes
 - 2 No
 - 8 (Don't know)
 - 9 (Refused)

[ASK IF L1=1, ELSE GO TO L6]

- L2 How many lamps per fixture were installed prior to delamping?
- 1 (1 lamp)
 - 2 (2 lamps)
 - 3 (3 lamps)
 - 4 (4 lamps)
 - 00 (Other, specify)
 - 98 (Don't know)
 - 99 (Refused)

- L3 How many lamps per fixture are installed now?
- 1 (1 lamp)
 - 2 (2 lamps)
 - 3 (3 lamps)
 - 4 (4 lamps)
 - 00 (Other, specify)
 - 98 (Don't know)
 - 99 (Refused)

- L4 After you delamped, did you install additional lighting fixtures in that same space at a later time to increase the amount of lighting?
- 1 Yes
 - 2 No
 - 8 (Don't know)
 - 9 (Refused)

[ASK IF L4=1, ELSE GO TO L6a]

- L5 How many of these additional fixtures did you install? [NUMERIC OPEN END, 1 TO 3000; 98=Don't know, 99=Refused]

BULBS INTO STORAGE [ASK IF <MEASURE1>=CFL, ELSE SKIP TO L7]

- L6 Was any of the lighting equipment for which you received an incentive placed into storage or installed at another facility?

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

[SKIP L6a AND L6b IF L6<>1]

L6a What percentage of the CFLs for which you received an incentive were placed in storage? [NUMERIC OPEN END, 0 TO 100; 998=Don't know, 999=Refused]

L6b And what percentage were installed at another facility? [NUMERIC OPEN END, 0 TO 100; 998=Don't know, 999=Refused]

REMOVED EQUIPMENT

[IF MEASURE1 = Occupancy Sensor, SKIP TO OS1]

[IF MEASURE1 = EXIT SIGNS, SKIP TO EX1]

[READ IF MEASD1<>"lamps removed"] I'd like to ask you a few questions about the equipment that was removed and replaced when you installed the <MEASD1>...

L7 What type of lighting was removed [READ IF MEASD1<>"lamps removed": and replaced when you installed <MEASD1>] through the Act On Energy Business program? (READ LIST) [MULTIPLE RESPONSE, UP TO 3]

- 1 Linear fluorescent lights
- 2 High-Intensity Discharge (HID) Fixtures
- 3 Compact fluorescent lights
- 4 Incandescent bulbs
- 5 Halogen lights
- 6 (Did not replace anything - new equipment)
- 00 (Other, specify)
- 98 (Don't know)
- 99 (Refused)

[ASK L7a IF L7=1]

L7a What type of linear fluorescent lights were removed? (READ LIST) [MULTIPLE RESPONSE, UP TO 3]

- 1 High performance T8 (1" diameter bulbs)
- 2 T8 fluorescent fixtures (1" diameter bulbs)
- 3 T10 fluorescent fixtures
- 4 T12 Fixtures (1.5" diameter bulbs)
- 5 T5 Fixtures (5/8" diameter)
- 00 (Other, specify)
- 98 (Don't know)
- 99 (Refused)

[ASK L7b IF L7a=4]

L7b What types of ballasts were in use on the linear fluorescent fixtures you removed?

- 1 Electronic Ballast
- 2 Magnetic Ballast
- 00 (Other, specify)
- 98 (Don't know)
- 99 (Refused)

[ASK L7c IF L7=2]

L7c What type of HID lamps were removed? (READ LIST) [MULTIPLE RESPONSE, UP TO 3]

- 1 High pressure sodium
- 2 Metal Halide
- 3 Mercury Vapor
- 4 Incandescent
- 00 (Other, specify)
- 98 (Don't know)
- 99 (Refused)

[ASK L7d IF L7=3]

L7d What type of compact fluorescent lights were removed? (READ LIST) [MULTIPLE RESPONSE, UP TO 3]

- 1 Screw-in Modular
- 2 Hardwire
- 00 (Other, specify)
- 98 (Don't know)
- 99 (Refused)

[ASK IF L7=1,2,3,4,5, OTHERWISE SKIP TO OS1]

L8 Was the removed lighting equipment controlled?

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

[ASK L8a IF L8=1]

L8a What type of lighting controls were in use on the removed equipment? (READ LIST)

- 1 Time Clock
- 2 Occupancy Sensor
- 3 Bypass/Delay Timers
- 4 Photocell
- 5 Manual switches
- 6 Building management system
- 00 (Other, specify)
- 98 (Don't know)
- 99 (Refused)

OCCUPANCY SENSORS [ASK IF MEASURE1 = Occupancy Sensor; ELSE GO TO EX1]

- OS1 Roughly what percentage of your lights now have occupancy controls on them? [NUMERIC OPEN END; 0 TO 100; 998=Don't know, 999=Refused]
- OS2 Before Occupancy Sensors were installed, about how many hours per day were the lights in operation? [NUMERIC OPEN END; 0 TO 24; 98=Don't know, 99=Refused]
- OS3 After controls were installed, about how many hours per day were the lights in operation? [NUMERIC OPEN END; 0 TO 24; 98=Don't know, 99=Refused]

EXIT SIGNS [ASK IF MEASURE1 = Exit Signs; ELSE GO TO NEXT LIGHTING LOOP]

- EX1 What type of exit signs were removed? (READ LIST) [MULTIPLE RESPONSE, UP TO 3]
- 1 Incandescent exit signs
 - 2 Compact fluorescent exit signs
 - 3 LED exit signs
 - 00 (Other, specify)
 - 98 (Don't know)
 - 99 (Refused)

[End of Measure Loop; GO TO NEXT LIGHTING MEASURE]

[ASK NET-TO-GROSS MODULE, THEN RETURN]

SPILLOVER – LIGHTING

Thank you for discussing the new lighting equipment that you installed through the Act On Energy Business program. Next, I would like to discuss any lighting equipment you might have installed OUTSIDE of the program ...

- LS1 Since June 2009 have you purchased and installed any energy efficient lighting equipment WITHOUT an incentive from the Act On Energy Business program or another utility program... [1=Yes, 2=No, 8=Don't know, 9=Refused]
- a. at this facility
 - b. at another facility owned by your company

[IF LS1a=2,8,9 AND LS1b=2,8,9, THEN SKIP TO HOURS OF USE – LIGHTING MODULE]

[ASK LS1c IF LS1b=1]

- LS1c You said you installed equipment at another facility owned by your company. Can you please give me the address? (If more than one, record "multiple") [OPEN END]
- LS2 On a scale of 0 to 10, where 0 means "no influence" and 10 means "greatly influenced," how much did your experience with the Act On Energy Business program influence your decision to

install high efficiency lighting equipment on your own? [SCALE 0-10; 98=Don't know, 99=Refused]

LS3 Why did you purchase this lighting equipment without the financial assistance available through the Act On Energy Business program? [MULTIPLE RESPONSE, UP TO 3]

- 1 (Takes too long to get approval)
- 2 (No time to participate, needed equipment immediately)
- 3 (The equipment did not qualify)
- 4 (The amount of the incentive wasn't large enough)
- 5 (Did not know the program was available)
- 6 (There was no program available)
- 7 (Had reached the maximum incentive amount)
- 00 (Other, specify)
- 98 (Don't know)
- 99 (Refused)

[ASK LS3a IF LS3=3, ELSE SKIP TO LS4]

LS3a Why didn't the equipment qualify? [OPEN END]

[ASK IF LS2=8,9,10 and LS3 <> 3, ELSE GO TO LH1A]

LS4 What type of lighting equipment was installed without an incentive? Did you install... [MULTIPLE RESPONSE, UP TO 5]

- 1 Linear fluorescent lights
- 2 High-Intensity Discharge (HID) Fixtures
- 3 Compact fluorescent lights (CFLs)
- 4 Exit signs
- 5 Lighting controls
- 00 (Other, specify)
- 98 (Don't know)
- 99 (Refused)

HOURS OF USE – LIGHTING

Now we'd like to talk about the hours that your lighting equipment is in operation.

LH1a Are you typically open every day, Monday through Friday?

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

[ASK LH1b IF LH1a=2]

LH1b How many days are you CLOSED Monday through Friday?

- 1 One
- 2 Two
- 3 Three
- 4 Four

- 5 Five
- 8 (Don't know)
- 9 (Refused)

[IF LH1b=5, SKIP TO LH4]

- LH2 At what time do your indoor lights currently turn on during weekdays (Monday - Friday)? (Enter 2400 for 24-hour operation, enter 0 for never on)
- LH2a Enter hours and minutes, e.g., 0530 for 5:30
- LH2b 1. AM
2. PM

[SKIP LH3 IF LH2=24hr or never]

- LH3 At what time do your indoor lights currently turn off during weekdays (Monday - Friday)? (Enter 2400 for 24-hour operation, enter 0 for never on)
- LH3a Enter hours and minutes, e.g., 0530 for 5:30
- LH3b 1. AM
2. PM

- LH4 Does the lighting equipment operate on a different schedule on weekends (Saturday and Sunday)?
- 1 Yes
2 No
8 (Don't know)
9 (Refused)

[ASK IF LH4=1, ELSE SKIP TO LH9]

- LH5 On Saturdays, at what time does the indoor lighting equipment turn on? (Enter 2400 for 24-hour operation, enter 0 for never on)
- LH5a Enter hours and minutes, e.g., 0530 for 5:30
- LH5b 1. AM
2. PM

[SKIP LH6 IF LH5=24hr or never]

- LH6 And when does the indoor lighting equipment turn off on Saturdays? (Enter 2400 for 24-hour operation, enter 0 for never on)
- LH6a Enter hours and minutes, e.g., 0530 for 5:30
- LH6b 1. AM
2. PM

- LH7 And on Sundays, at what time does the indoor lighting equipment turn on? (Enter 2400 for 24-hour operation, enter 0 for never on)
- LH7a Enter hours and minutes, e.g., 0530 for 5:30
- LH7b 1. AM
2. PM

[SKIP LH8 IF LH7=24hr or never]

- LH8 And when does the indoor lighting equipment turn off on Sundays? (Enter 2400 for 24-hour operation, enter 0 for never on)

- LH8a Enter hours and minutes, e.g., 0530 for 5:30
 LH8b 1. AM
 2. PM

[ASK LH9aa and LH9bb if <MEASD> <> “Dimming system controls” or “Occupancy sensors”]

LH9aa Roughly what percentage of your lights have occupancy controls on them? [NUMERIC OPEN END; 0 TO 100; 998=Don’t know, 999=Refused]

[SKIP LH9bb if LH9aa=0]

LH9bb I know it is hard to know for certain, but about how many hours a day do you think the occupancy sensors turn off lights that otherwise would be on? [NUMERIC OPEN END; 0.0 TO 24.0; 998=Don’t know, 999=Refused]

[ASK LH9a IF LH9aa=0]

LH9a During hours when your business is OPEN, approximately what percentage of the indoor lights are kept on? [NUMERIC OPEN END, 0 TO 100; 998=DON’T KNOW, 999=REFUSED]

[ASK LH9c IF LH9aa>0]

LH9c Now, disregard the occupancy sensors at your facility, which can turn off some of your lights. During hours when your business is OPEN, approximately what percentage of the indoor lights are kept on? [NUMERIC OPEN END, 0 TO 100; 998=DON’T KNOW, 999=REFUSED]

[SKIP LH9b IF LH1a=1 AND LH2a = 2400 AND LH4 = 2]

LH9b During hours when your business is CLOSED, approximately what percentage of the indoor lights are kept on? [NUMERIC OPEN END, 0 to 100; 998=Don’t know, 999=Refused]

LH10a Are there any months during the year when the operating schedule for the indoor lighting differs significantly from what you just described?

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

[ASK LH10b-e IF LH10a=1; ELSE SKIP TO PROCESS MODULE]

LH10b How many hours per day does the indoor lighting typically operate during the periods with different operating schedules?
 [NUMERIC OPEN END, 0 TO 24; 98=DON’T KNOW, 99=REFUSED]

LH10c And how many days per week?
 [NUMERIC OPEN END, 0 TO 7; 8=DON’T KNOW, 9=REFUSED]

LH10d How many months per year does the equipment run on the alternative schedule? [NUMERIC OPEN END, 0 TO 12; 98=DON’T KNOW, 99=REFUSED]

LH10e During hours when your business is OPEN on the alternative schedule, approximately what percentage of the indoor lighting is kept on? [NUMERIC OPEN END, 0 TO 100; 998=DON’T KNOW, 999=REFUSED]

[SKIP LH10f IF LH10b = 24]

LH10f During hours when your business is CLOSED on the alternative schedule, approximately what percentage of the indoor lights are kept on? [NUMERIC OPEN END, 0 to 100; 998=Don't know, 999=Refused]

COOLING MODULE [ASK IF COOLING=1, ELSE SKIP TO REFRIGERATION MODULE]

PC1 Who was the most influential in specifying the <ENDUSE> you installed through the Act On Energy Business program?

1. (me/respondent)
2. (contractor)
3. (engineer)
4. (architect)
5. (manufacturer)
6. (distributor)
7. (Owner)
8. (Ameren Illinois Utilities representative/program staff)
9. (Program Ally)
00. (Other, specify)
98. (Don't know)
99. (Refused)

PC2 And who identified the opportunity for the Ameren Illinois Utilities incentive?

1. (me/respondent)
2. (contractor)
3. (engineer)
4. (architect)
5. (manufacturer)
6. (distributor)
7. (Ameren Key Account Executive)
8. (owner/developer)
9. (project manager)
10. (Ameren Illinois Utilities representative/program staff)
00. (Other, specify)
98. (Don't know)
99. (Refused)

Measure Loop

[Loop 1: ASK IF MEAS1=1. Loop 2: ASK IF MEAS2=1. Loop 3: ASK IF MEAS3=1.]

[For Loop 2, replace "1" at the end of read-ins with "2"; for Loop 3, replace "1" with "3".]

The following questions are about the <MEASD1> you installed through the Act On Energy Business Program.

C0 When did you install the <MEASD1> (IF NECESSARY, PROBE FOR BEST GUESS)

- a Month [Precodes for Jan through Dec.; DK, REF]
- b Year [Precodes for 2009 and 2010; DK, REF]

REMOVED EQUIPMENT

- C1 What type of cooling equipment was REMOVED AND REPLACED when you installed <MEASD1> through the Act On Energy Business Program? (DO NOT READ LIST) [MULTIPLE RESPONSE, UP TO 3]
- 1 (Split system air conditioners (two components: compressor is separate from the supply air fan))
 - 2 (Packaged air conditioning systems (one component, for example rooftop units or unitary equipment))
 - 3 (Package Terminal A/C (e.g., Hotel/Motel units))
 - 4 (Window/Wall Air-Conditioning Units)
 - 5 (Remote Condensing Unit)
 - 6 (Evaporative coolers/swamp coolers)
 - 7 (Water Chillers)
 - 8 (Evaporative Condenser)
 - 9 (Adjustable Speed Drives)
 - 10 (Energy Management System)
 - 11 (HVAC Controls: Bypass Timer)
 - 12 (HVAC Controls: Time Clock)
 - 13 (HVAC Controls: Set-Back Programmable Thermostat)
 - 14 (Heat Pump Units)
 - 15 (NOTHING, EQUIPMENT ADDED NOT REPLACED)
 - 16 (Air Source Heat Pump Units)
 - 17 (Air Cooled Chiller)
 - 00 (Other, specify)
 - 98 (Don't know)
 - 99 (Refused)

[SKIP C2 AND C3 IF C1=15,98,99]

- C2 How would you describe the condition of the equipment that was removed? Was it...
- 1 Inoperable/broken
 - 2 Poor condition
 - 3 Fair condition
 - 4 Good condition
 - 8 (Don't know)
 - 9 (Refused)

- C3 How old was the equipment that was removed? Was it...
- 1 Less than 5 years old
 - 2 Between 5 and 10 years old
 - 3 11 to 20 years old
 - 4 More than 20 years old
 - 8 (Don't know)
 - 9 (Refused)

[End of Measure Loop; GO TO NEXT COOLING MEASURE]

[ASK NET-TO-GROSS MODULE, THEN RETURN]

SPILLOVER – COOLING

Thank you for discussing the new cooling equipment that you installed through the Act On Energy Business Program. Next, I would like to discuss any cooling equipment you might have installed OUTSIDE the Act On Energy Business Program ...

- CS1 Since June 2009 have you purchased and installed any energy efficient cooling equipment WITHOUT an incentive from the Act On Energy Business program or another utility program... [1=Yes, 2=No, 8=Don't know, 9=Refused]
- at this facility
 - at another facility owned by your company

[IF CS1a=2,8,9 AND CS1b=2,8,9, THEN SKIP TO HOURS OF USE – COOLING MODULE]

[ASK IF CS1b=1]

- CS1c You said you installed equipment at another facility owned by your company. Can you please give me the address? (If more than one, record "multiple") [OPEN END]
- CS2 On a scale of 0 to 10, where 0 means "no influence" and 10 means "greatly influenced," how much did your experience with the Act On Energy Business program influence your decision to install different types of high efficiency cooling equipment on your own? [SCALE 0-10; 98=Don't know, 99=Refused]
- CS3 Why did you purchase this cooling equipment without the financial assistance available through the Act On Energy Business program? [MULTIPLE RESPONSE, UP TO 3]
- (Takes too long to get approval)
 - (No time to participate, needed equipment immediately)
 - (The equipment did not qualify)
 - (The amount of the incentive wasn't large enough)
 - (Did not know the program was available)
 - (There was no program available)
 - (Had reached the maximum incentive amount)
 - 00 (Other, specify)
 - 98 (Don't know)
 - 99 (Refused)

[ASK CS3a IF CS3=3, ELSE SKIP TO CS4]

- CS3a Why didn't the equipment qualify for the program? [OPEN END]

[ASK IF CS2=8, 9,10 AND CS3 <>3, ELSE SKIP TO CH1A]

- CS4 What types of equipment were installed as part of the cooling retrofit? (DO NOT READ LIST. After each response, prompt with: "Did you install any other energy efficient cooling equipment at your facility since June 2009?") [MULTIPLE RESPONSE, UP TO 5]
- (Split system air conditioners (two components: compressor is separate from the supply air fan))
 - (Packaged air conditioning systems (one component, for example rooftop units or unitary equipment))

- 3 (Package Terminal A/C (e.g., Hotel/Motel units))
- 4 (Window/Wall Air-Conditioning Units)
- 5 (Remote Condensing Unit)
- 6 (Evaporative coolers/swamp coolers)
- 7 (Water Chillers)
- 8 (Evaporative Condenser)
- 9 (Adjustable Speed Drives)
- 10 (Energy Management System)
- 11 (HVAC Controls: Bypass Timer)
- 12 (HVAC Controls: Time Clock)
- 13 (HVAC Controls: Set-Back Programmable Thermostat)
- 14 (Heat Pump Units)
- 15 (Air Source Heat Pump Units)
- 16 (Air Cooled Chiller)
- 00 (Other, specify) (RECORD MULTIPLE "OTHER" RESPONSES HERE, IF NECESSARY)
- 98 (Don't know)
- 99 (Refused)

HOURS OF USE – COOLING

Now we'd like to talk about the hours that your cooling system is in operation.

CH1a Are you typically open every day, Monday through Friday?

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

[ASK CH1b IF CH1a=2]

CH1b How many days are you CLOSED Monday through Friday?

- 1 One
- 2 Two
- 3 Three
- 4 Four
- 5 Five
- 8 (Don't know)
- 9 (Refused)

[IF CH1b=5, SKIP TO CH4]

CH2 At what time does your cooling system currently turn on during weekdays (Monday - Friday)?
(Enter 2400 for 24-hour operation, enter 0 for never on)

CH2a Enter hours and minutes, e.g., 0530 for 5:30

- CH2b 1. AM
- 2. PM

[SKIP CH3 IF CH2=24hr or never]

CH3 At what time does your cooling system currently turn off during weekdays (Monday - Friday)?
(Enter 2400 for 24-hour operation, enter 0 for never on)

CH3a Enter hours and minutes, e.g., 0530 for 5:30

- CH3b 1. AM
2. PM

CH4 Does the cooling system operate on a different schedule on weekends (Saturday and Sunday)?

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

[ASK IF CH4=1, ELSE SKIP TO PROCESS MODULE]

CH5 On Saturdays, at what time does the cooling system turn on? (Enter 2400 for 24-hour operation, enter 0 for never on)

CH5a Enter hours and minutes, e.g., 0530 for 5:30

- CH5b 1. AM
2. PM

[SKIP CH6 IF CH5=24hr or never]

CH6 And when does the cooling system turn off on Saturdays? (Enter 2400 for 24-hour operation, enter 0 for never on)

CH6a Enter hours and minutes, e.g., 0530 for 5:30

- CH6b 1. AM
2. PM

CH7 And on Sundays, at what time does the cooling system turn on? (Enter 2400 for 24-hour operation, enter 0 for never on)

CH7a Enter hours and minutes, e.g., 0530 for 5:30

- CH7b 1. AM
2. PM

[SKIP CH8 IF CH7=24hr or never]

CH8 And when does the cooling system turn off on Sundays? (Enter 2400 for 24-hour operation, enter 0 for never on)

CH8a Enter hours and minutes, e.g., 0530 for 5:30

- CH8b 1. AM
2. PM

REFRIGERATION MODULE [ASK IF REFRIG=1, ELSE TO GO MOTORS MODULE]

PR1 Who was the most influential in specifying the <ENDUSE> you installed through the Act On Energy Business program?

1. (me/respondent)
2. (contractor)
3. (engineer)
4. (architect)
5. (manufacturer)
6. (distributor)
7. (Owner)
8. (Ameren Illinois Utilities representative/program staff)
9. (Program Ally)
00. (Other, specify)
98. (Don't know)
99. (Refused)

PR2 And who identified the opportunity for the Ameren Illinois Utilities incentive?

1. (me/respondent)
2. (contractor)
3. (engineer)
4. (architect)
5. (manufacturer)
6. (distributor)
7. (Ameren Key Account Executive)
8. (owner/developer)
9. (project manager)
10. (Ameren Illinois Utilities representative/program staff)
00. (Other, specify)
98. (Don't know)
99. (Refused)

Measure Loop

[Loop 1: ASK IF MEAS1=1. Loop 2: ASK IF MEAS2=1. Loop 3: ASK IF MEAS3=1.]

[For Loop 2, replace "1" at the end of read-ins with "2"; for Loop 3, replace "1" with "3".]

The following questions are about the <MEASD1> you installed through the Act On Energy Business Program.

R0 When did you install the <MEASD1> (IF NECESSARY, PROBE FOR BEST GUESS)

- a Month [Precodes for Jan through Dec.]
- b Year [Precodes for 2009 and 2010]

REMOVED EQUIPMENT

R1 What type of refrigeration equipment was removed when you installed the <MEASD1> through the Act On Energy Business Program? [MULTIPLE RESPONSE, UP TO 3]

- 1 (Old Strip curtains)
- 2 (Older Main door cooler/freezer door gaskets)
- 3 (Older Anti-sweat heat controllers)
- 4 (Same Equipment, just newer)
- 5 (Older Display cases without doors)
- 6 (NONE - Not a replacement)
- 7 (Standard efficiency evaporator fan motors)
- 8 (Older evaporator fan controls)
- 9 (Older ice makers)
- 10 (Older vending machine)
- 11 (Older beverage machine controls)
- 12 (Older snack machine controls)
- 13 (Standard efficiency vending machine)
- 00 (Other, specify)
- 98 (Don't know)
- 99 (Refused)

[SKIP R2 AND R3 IF R1=6,98,99]

R2 How would you describe the condition of refrigeration equipment that was removed? Was it...

- 1 Inoperable (broken)
- 2 Poor condition
- 3 Fair condition
- 4 Good condition
- 8 (Don't know)
- 9 (Refused)

R3 Approximately how old was the refrigeration equipment that was removed? Was it...

- 1 Less than 5 years old
- 2 Between 5 and 10 years old
- 3 11 to 20 years old
- 4 more than 20 years old
- 8 (Don't know)
- 9 (Refused)

[ASK R4a and R4b IF MEASD1="Anti-Sweat Heater Controls"]

R4a Thinking about the previous system you had in place to reduce condensation on your refrigeration doors, was it on all the time or did you control the number of hours that it operated?

- 1 On all the time
- 2 Controlled the hours of operation
- 00 (Other, specify)
- 96 (Didn't have a previous system)
- 98 (Don't Know)
- 99 (Refused)

[ASK R4b IF R4a=2]

R4b How many hours per day was the previous system on? [NUMERIC OPEN END, 0 TO 24; 98=Don't know, 99=Refused]

[ASK R5a and R5b IF MEASD1="Vending Machine Controller"]

R5a Before you installed the vending machine controller, did you have a timeclock or other type of controller installed to turn the machine on and off?

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

[ASK R5b IF R5a=1]

R5b What did you have installed on the machine? [OPEN END]

[ASK R6a, b, c, d, e IF MEASD1="Strip Curtains"]

R6a On what equipment did you install strip curtains? (Prompt if necessary) [MULTIPLE RESPONSE]

- 1 (Walk-in Refrigerator/Cooler)
- 2 (Walk-in Freezer)
- 3 (Both Cooler and Freezer)
- 00 (Other, specify)
- 98 (Don't know)
- 99 (Refused)

R6b What is the temperature setting of the equipment on which you installed the new strip curtains? An approximation would be fine. [NUMERIC OPEN END, 0 to 60 (DEGREES F); 98=Don't know, 99=Refused]

[ASK R6c IF R6b=98]

R6c Would you say the temperature is...

- 1 Low (0 - 10 degrees F)
- 2 Medium (30 - 40 degrees F)
- 00 (Other, specify)
- 98 (Don't know)
- 99 (Refused)

R6d What is the height, in feet, of your new strip curtain? An approximation would be fine. [NUMERIC OPEN END, 0 to 90; 98=Don't know, 99=Refused]

R6e What is the width in feet of your Strip Curtain? An approximation would be fine. [NUMERIC OPEN END, 0 to 90; 98=Don't know, 99=Refused]

[ASK R7a, b IF MEASD1="Ice Maker"]

R7a How many pounds of ice does this ice maker produce in a day? [NUMERIC OPEN END, 0 to 90; 98=Don't know, 99=Refused]

R7b. How many days a year do you actively use ice from the ice maker? [NUMERIC OPEN END, 0 to 90; 98=Don't know, 99=Refused]

[ASK R8a, b IF MEASD1="Door Closer"]

R8a Thinking back to before you had an automatic door closer on your walk-in freezer, how often would you say the freezer door was left at least partially open?

1. Never
2. Under 1 hour a day
3. Between 2 and 4 hours a day
4. Over 4 hours a day
8. (Don't Know)
9. (Refused)

R8b. Did you have strip curtains on the freezer door area before you installed the automatic door closer?

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

[End of Measure Loop; GO TO NEXT REFRIGERATION MEASURE]

[ASK NET-TO-GROSS MODULE, THEN RETURN]

SPILLOVER – REFRIGERATION

Thank you for discussing the new refrigeration equipment that you installed through the Act On Energy Business Program. Next, I would like to discuss any refrigeration equipment you might have installed OUTSIDE the Act On Energy Business Program. This would include not only any other refrigeration equipment but also night covers, condensers, or evaporative fan coolers.

RS1 Since June 2009, have you purchased and installed any energy efficient refrigeration equipment WITHOUT an incentive from the Act On Energy Business program or another utility program...

[1=Yes, 2=No, 8=Don't know, 9=Refused]

- a. at this facility
- b. at another facility owned by your company

[IF RS1a=2,8,9 AND RS1b=2,8,9, THEN SKIP TO PROCESS MODULE]

[ASK RS1c IF RS1b=1]

RS1c You said you installed energy efficient refrigeration equipment at another facility owned by your company. Can you please give me the address? (If more than one, record "multiple") [OPEN END]

RS2 On a scale of 0 to 10, where 0 means "no influence" and 10 means "greatly influenced," how much did your experience with the Act On Energy Business program influence your decision to

install different types of high efficiency equipment on your own? [SCALE 0-10; 98=Don't know, 99=Refused]

RS3 Why did you purchase this refrigeration equipment without the financial assistance available through the Act On Energy Business Program? [MULTIPLE RESPONSE; UP TO 3]]

- 1 (Takes too long to get approval)
- 2 (No time to participate, needed equipment immediately)
- 3 (The equipment did not qualify)
- 4 (The amount of the incentive wasn't important enough)
- 5 (Did not know the program was available)
- 6 (There was no program available)
- 7 (Had reached the maximum incentive amount)
- 00 (Other, specify)
- 98 (Don't know)
- 99 (Refused)

[ASK RS3a IF RS3=3, ELSE SKIP TO RS4]

RS3a Why didn't the equipment qualify? [OPEN END]

[ASK IF RS2=8,9,10 and RS3 <> 3, ELSE GO TO PROCESS MODULE]

RS4 What types of refrigeration measures were installed OUTSIDE of the program? (DO NOT READ LIST. After each response, prompt with: "Did you install any other energy efficient refrigeration equipment at your facility since June 2009?") [MULTIPLE RESPONSE, UP TO 5]

- 1 (Night covers for display cases)
- 2 (Strip curtains)
- 3 (Glass doors on vertical open display cases)
- 4 (Reach in display cases, with doors)
- 5 (Main door cooler/freezer door gaskets)
- 6 (Auto closers for coolers/freezers)
- 7 (Anti-sweat heat controllers)
- 8 (Insulate bare suction pipes)
- 9 (Multiplex compressor systems)
- 10 (Condensers)
- 11 (Floating head pressure controllers)
- 12 (Evaporative fan coolers)
- 13 (Vending machine controllers)
- 14 (EC motor for WALK-IN cooler/freezer)
- 15 (EC motor for REACH-IN cooler/freezer)
- 16 (ENERGY STAR vending machine)
- 00 (Other, specify)
- 98 (Don't know)
- 99 (Refused)

MOTORS MODULE [ASK IF MOTORS=1]

PM1 Who was the most influential in specifying the <ENDUSE> you installed through the Act On Energy Business program?

1. (me/respondent)
2. (contractor)
3. (engineer)
4. (architect)
5. (manufacturer)
6. (distributor)
7. (Owner)
8. (Ameren Illinois Utilities representative/program staff)
9. (Program Ally)
00. (Other, specify)
98. (Don't know)
99. (Refused)

PM2 And who identified the opportunity for the Ameren Illinois Utilities incentive?

1. (me/respondent)
2. (contractor)
3. (engineer)
4. (architect)
5. (manufacturer)
6. (distributor)
7. (Ameren Key Account Executive)
8. (owner/developer)
9. (project manager)
10. (Ameren Illinois Utilities representative/program staff)
00. (Other, specify)
98. (Don't know)
99. (Refused)

Measure Loop

[Note to programmer: The Act On Energy sample has no participant with more than one measure. Only need one loop.]

The following questions are about the <MEASD1> you installed through the Act On Energy Business Program.

M0 When did you install the <MEASD1> (IF NECESSARY, PROBE FOR BEST GUESS)

- a Month [Precodes for Jan through Dec.]
- b Year [Precodes for 2009 and 2010]

M1 Are the new motors used to... (READ LIST)

- 1 Drive a newly installed piece of equipment
- 2 Replace a failed motor
- 3 Replace a functioning motor

- 4 Serve as a spare
- 00 Or for some other reason (Specify)
- 98 (Don't Know)
- 99 (Refused)

M1a Are the new motors controlled by a variable frequency drive (VFD)?

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

M2a In the past month, how many hours per day did this equipment typically operate? [NUMERIC OPEN END, 0 to 24; 98=Don't know, 99=Refused]

M2b And how many days per week? [NUMERIC OPEN END, 0 to 7; 8=Don't know, 9=Refused]

M2c Are there any months during the year when the operating schedule for this equipment differs significantly from what you just described?

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

[ASK IF M2c=1; ELSE SKIP TO M3]

M2d How many hours per day does the equipment typically operate during the periods with different operating schedules? [NUMERIC OPEN END, 0 to 24; 98=Don't know, 99=Refused]

M2e And how many days per week? [NUMERIC OPEN END, 0 to 7; 8=Don't know, 9=Refused]

M2f How many months per year does the equipment run on the alternative schedule? [NUMERIC OPEN END, 0 to 12; 98=Don't know, 99=Refused]

REPLACED EQUIPMENT [ASK IF M1=2,3, ELSE SKIP TO NTG MODULE]

I'd like to ask you a few questions about the equipment that was removed when you installed the new <MEASD1>.

M3a Were the motors you removed...

(IF NEEDED: "In this survey we use the term "NEMA Premium motors" to refer to very high efficiency motors that meet specific performance criteria developed by the National Electrical Manufacturers Association. We use the term "EPAct Motors" to refer to motors that meet current federal minimum efficiency standards contained in the Energy Policy Act; new motors installed in Illinois after 1997 must be, at a minimum, EPAct motors. Finally, we use the term "Standard Efficiency Motors" to refer to typically older motors that do not meet the current Federal standards.)

- 1 NEMA Premium motors
- 2 EPAct motors
- 3 standard efficiency motors

- 8 (Don't Know)
- 9 (Refused)

M3b Had the motors you removed been rewound?

- 1 Yes
- 2 No
- 8 (Don't Know)
- 9 (Refused)

[ASK IF M3b=1 ELSE SKIP TO MC3]

M3b1 How many times have the motors been rewound? [NUMERIC OPEN END, 1 TO 97; 98=Don't know, 99=Refused]

M3c How would you describe the condition of the motors that were removed when you installed the new <MEASD1>? Were they...

- 1 Inoperable (broken)
- 2 Poor condition
- 3 Fair condition
- 4 Good condition
- 8 (Don't Know)
- 9 (Refused)

M3d How old were the motors that were removed and replaced? Would you say...

- 1 Less than 5 years old
- 2 Between 5 and 10 years old
- 3 11 to 20 years old
- 4 more than 20 years old
- 8 (Don't Know)
- 9 (Refused)

[End of Measure Loop; GO TO NEXT MOTORS MEASURE]

[ASK NET-TO-GROSS MODULE, THEN RETURN]

SPILLOVER – MOTORS

Thank you for discussing the new motors that you installed through the Act On Energy Business Program. Next, I would like to discuss any motors you might have installed OUTSIDE the Act On Energy Business Program...

MS1 Since June 2009, have you purchased and installed any energy efficient motors WITHOUT an incentive from the Act On Energy Business program or another utility program... [1=Yes, 2=No, 8=Don't know, 9=Refused]

- a. at this facility
- b. at another facility owned by your company

[IF MS1a=2,8,9 AND MS1b=2,8,9, THEN SKIP TO PROCESS MODULE]

[ASK MS1c IF MS1b=1]

MS1c You said you installed energy efficient motors at another facility owned by your company. Can you please give me the address? (If more than one, record "multiple") [OPEN END]

[ASK MS2 IF MS1a=1 OR MS1b=1]

MS2 On a scale of 0 to 10, where 0 means "no influence" and 10 means "greatly influenced," how much did your experience with the Act On Energy Business program influence your decision to install these high efficiency motors on your own? [SCALE 0-10; 98=Don't know, 99=Refused]

MS3 Why did you purchase this equipment without the financial assistance available through the Act On Energy Business Program? [MULTIPLE RESPONSE; UP TO 3]

- 1 (Takes too long to get approval)
- 2 (No time to participate, needed equipment immediately)
- 3 (The equipment did not qualify)
- 4 (The amount of the incentive wasn't important enough)
- 5 (Did not know the program was available)
- 6 (There was no program available)
- 7 (Had reached the maximum incentive amount)
- 00 (Other, specify)
- 98 (Don't know)
- 99 (Refused)

[ASK MS3a IF MS3=3, ELSE SKIP TO MS4]

MS3a Why didn't the equipment qualify? [OPEN END]

[ASK IF MS2=8,9,10 and MS3 <> 3, ELSE GO TO PROCESS MODULE]

MS4 What types of applications were these motors installed in? (DO NOT READ LIST. After each response, prompt with: "Did you install any other energy efficient motors at this facility since June 2009?") [MULTIPLE RESPONSE, UP TO 5]

- 1 Pumping
- 2 Fans/Blowers
- 3 Compressed Air
- 4 Materials handling (conveyor belts)
- 5 Ventilation/HVAC
- 6 Boiler fans
- 7 Production process machinery
- 8 Variable Frequency Drives (VFDs)
- 00 Other, specify
- 98 (Don't know)
- 99 (Refused)

PROCESS MODULE

I'd now like to ask you a few general questions about your participation in the Act On Energy Business program.

Program Processes and Satisfaction

- S0 How did you first hear about the Act On Energy Business program?
1. (Ameren Key Account Executive)
 2. (Ameren Website)
 3. (Workshop)
 4. (BLANK)
 5. (Billboards)
 6. (Radio advertising)
 7. (Newspaper)
 8. (Email)
 9. (Television)
 10. (Friend/colleague/word of mouth)
 11. (Bill insert)
 12. (Chamber of Commerce Publication)
 13. (Vendor)
 14. (Distributor)
 15. (Consultant)
 16. (Supplier)
 17. (Engineer)
 18. (Residential market materials)
 19. (Sales representative)
 20. (Electrician)
 21. (Professional group)
 22. (Webinar)
 23. (Speaker/Presentation at an event)
 24. (Newsletter)
 25. (In-person meeting with Ameren Illinois Utilities representative)
 26. (Contractor)
 27. (Program Ally)
 00. (Other, specify)
 98. (Don't know)
 99. (Refused)

S1a Did YOU fill out the application forms for the project? (either the initial or the final program application).

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

[ASK S1b IF S1a=1 ELSE SKIP TO S1e]

S1b Did the application forms clearly explain the program requirements and how to participate?

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

S1c How would you rate the application process? Please use a scale of 0 to 10 where 0 is "very difficult" and 10 is "very easy". [SCALE 0-10; 98=Don't know, 99=Refused]

[ASK S1d IF S1c<4]

S1d Why did you rate it that way? [OPEN END]

1. (Required me to research on lighting)
2. (Harder compared to other state's programs)
3. (Difficult to understand)
4. (Long process)
00. (Other, specify)
98. (Don't know)
99. (Refused)

[ASK S1e IF S1a=2]

S1e Who filled out the application forms for the project?

1. (Someone else at the facility)
2. (Someone else at the company)
3. (Program ally)
4. (Contractor)
5. (Consultant)
6. (Engineer)
7. (Supplier/distributors/vendor)
00. (Other, specify)
98. (Don't know)
99. (Refused)

[SKIP S3 IF S1e=3 OR S0=27]

S3 Are you familiar with the term Act On Energy Business program ALLY?

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

9. (Refused)

S4a Did you use a contractor for your <ENDUSE> project?

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

[ASK S4b IF S4a=1]

S4b Was the contractor you used affiliated with the Act On Energy Business program? (If needed: Was the contractor REGISTERED with the Act On Energy Business program?)

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

[ASK S5 IF S4a=1 ELSE SKIP TO S7]

S5 How would you rate the contractor's ability to meet your needs in terms of implementing your project? Please use a scale from 0 to 10, where 0 is "not at all able to meet needs" and 10 is "completely able to meet needs"? [SCALE 0-10; 98=Don't know, 99=Refused]

S6a Would you recommend the contractor you worked with to other people or companies?

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

[ASK S6b IF S6a=2]

S6b Why not? [OPEN END]

00. [Record VERBATIM]
98. (Don't know)
99. (Refused)

S7 When implementing an energy efficiency project, how important is it to you that the contractor is affiliated with the Act On Energy Business program? Please use a scale from 0 to 10, where 0 is "not at all important" and 10 is "very important"? [SCALE 0-10; 98=Don't know, 99=Refused]

S8 During the course of your participation in the program, did you place any calls to the Act On Energy Business Call Center?

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

[ASK S8a IF S8=1]

S8a On a scale of 0 to 10, where 0 is “very dissatisfied” and 10 is “very satisfied”, how would you rate your satisfaction with the Call Center’s ability to answer your questions? [SCALE 0-10; 96=not applicable, 98=Don’t know, 99= Refused]

[ASK S8b IF S8a<4]

S8b Why did you rate it that way?

1. (Provided inconsistent information)
2. (Didn’t understand the question)
3. (Hard to reach the right person/person with the answer)
00. (Other, specify)
98. (Don’t know)
99. (Refused)

S9a Did you ask any questions of your Act On Energy technical reviewer while participating in the program? (If needed: This is a program staff person you would have spoken or e-mailed with to clarify any issues that came up during the review of your application. Technical reviewers are SAIC or GDS employees, who are Act On Energy Business program partners.)

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

[ASK S9b IF S9a=1]

S9b Approximately how long did it take for your questions to be answered?

1. (Within the same day)
2. (1-2 business days)
3. (3-5 business days)
4. (1 -2 weeks)
5. (More than 2 week)
8. (Don’t know)
9. (Refused)

S11 On a scale of 0 to 10, where 0 is very dissatisfied and 10 is very satisfied, how would you rate your satisfaction with... [SCALE 0-10; 96=not applicable, 98=Don’t know, 99=Refused]

- a. the incentive amount
- b. the program’s technical review staff
- c. the measures offered by the program (If needed: this is the equipment that is eligible for an incentive under the program)
- d. the Act On Energy Business program overall
- e. Ameren Illinois Utilities

[ASK S12a IF S11a<4]

S12a. You indicated some dissatisfaction with the incentive amount, why did you rate it this way?

[MULTIPLE RESPONSE, UP TO 3]

1. (Better rebates in other states)
2. (Too small)
3. (Equipment didn't qualify)
00. (Other, specify)
98. (Don't know)
99. (Refused)

[ASK S12b IF S11b<4]

S12b. You indicated some dissatisfaction with the program's technical review staff, why did you rate it this way? [MULTIPLE RESPONSE, UP TO 3]

1. (Provided inconsistent information)
2. (Didn't understand the question)
3. (Hard to reach the right person/person with the answer)
00. (Other, specify)
98. (Don't know)
99. (Refused)

[ASK S12c IF S11c<4]

S12c. You indicated some dissatisfaction with the measures offered by the program, why did you rate it this way? [OPEN END; 98=Don't know, 99=Refused]

[ASK S12d IF S11d<4]

S12d. You indicated some dissatisfaction with the Act On Energy Business program overall, why did you rate it this way? [OPEN END; 98=Don't know, 99=Refused]

[ASK S12e IF S11e<4]

S12e. You indicated some dissatisfaction with Ameren Illinois Utilities, why did you rate it this way?

[MULTIPLE RESPONSE, UP TO 3]

1. (Rates are too high)
2. (Took too long to get Incentive)
3. (Poor customer service)
4. (Poor power supply/service)
00. (Other, specify)
98. (Don't know)
99. (Refused)

S10a Did you experience any problems during the participation process? (IF NEEDED: (Other than what we have already talked about)

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

[ASK S10b IF QS10a=1]

S10b What problems did you experience? [MULTIPLE RESPONSE, UP TO 3]

1. (Phone calls not returned)
2. (Process takes too long)
3. (Low incentives/rebates)
00. (Other- specify)
8. (Don't know)
9. (Refused)

Marketing and Outreach

MK1 Do you recall seeing or receiving any marketing materials or other information for the Act On Energy Business program?

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

[ASK MK1a IF MK1=1, ELSE SKIP TO MK2]

MK1a What types of materials do you remember? [MULTIPLE RESPONSE, UP TO 5]

1. (Television)
2. (Newspaper)
3. (Email)
4. (Billboards)
5. (Radio advertising)
6. (Chamber of Commerce publication)
7. (Presentation/workshop)
8. (Bill insert)
9. (Brochure)
10. (ActOnEnergy website)
11. (Other mailing)
00. (Other, please specify)
98. (Don't know)
99. (Refused)

MK1b How useful were these materials in providing information about the program? Would you say they were...

1. Very useful
2. Somewhat useful
3. Not very useful
4. Not at all useful
8. (Don't know)

9. (Refused)

[ASK MK1c IF MK1b=3,4]

MK1c What would have made the materials more useful to you? [MULTIPLE RESPONSE, UP TO 3]

1. (More detailed information)
2. (Where to get additional information)
00. (Other, specify)
98. (Don't know)
99. (Refused)

MK1d Next, I'd like to ask you about how frequently you've heard about this program. Thinking about the past year, how often would you say you've seen, read or heard about the Act On Energy Business program?

- 1 Very frequently
- 2 Somewhat frequently
- 3 Only Occasionally
- 4 Rarely
- 5 Never
8. (Don't know)
9. (Refused)

MK2 What is the best way of reaching companies like yours to provide information about energy efficiency opportunities? [MULTIPLE RESPONSE, UP TO 3]

1. (Bill inserts)
2. (Flyers/ads/mailings)
3. (e-mail)
4. (Telephone)
5. (Key Account Executive)
6. (Webinars/roundtables/events)
7. (Through trade or professional associations)
8. (Program allies/contractors)
9. (Luncheons)
10. (Ameren reps)
00. (Other, specify)
98. (Don't know)
99. (Refused)

Benefits and Barriers

B1a What do you see as the main benefits to participating in the Act On Energy Business Program? [MULTIPLE RESPONSE, UP TO 3]

1. (Energy Savings)

- 2. (Good for the Environment)
- 3. (Lower Maintenance Costs)
- 4. (Better Quality/New Equipment)
- 5. (Rebate/Incentive)
- 00. (Other, Specify)
- 98. (Don't know)
- 99. (Refused)

B1b What do you see as the drawbacks to participating in the program? [MULTIPLE RESPONSE, UP TO 3]

- 1. (Paperwork too burdensome)
- 2. (Incentives not high enough/not worth the effort)
- 3. (Program is too complicated)
- 4. (Cost of equipment)
- 5. (No drawbacks)
- 6. (Financing rebates through monthly bill)
- 7. (Disposing of old equipment)
- 00. (Other, specify)
- 98. (Don't know)
- 99. (Refused)

B2 What do you think are the reasons companies like yours do not participate in this program? [MULTIPLE RESPONSE, UP TO 3]

- 1. (Lack of awareness of the program)
- 2. (Financial reasons)
- 3. (None)
- 4. (Not aware of savings/don't realize the savings)
- 5. (Time consuming application process)
- 6. (No time)
- 7. (Cumbersome paperwork)
- 8. (No need to replace equipment)
- 9. (Amount of payback)
- 00. (Other, specify)
- 98. (Don't know)
- 99. (Refused)

B3 Was the scope of your project limited by the program's incentive cap?

- 1. Yes
- 2. No
- 00. (Other, specify)
- 98. (Don't know)
- 99. (Refused)

Feedback and Recommendations

R1 Do you plan to participate in the program again in the future?

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

R2 How could the Act On Energy Business Program be improved? [MULTIPLE RESPONSE, UP TO 4]

1. (Higher incentives)
2. (More measures)
3. (Greater publicity)
4. (Advance payment)
5. (Key Account Executives provide more information)
6. (Relax partner guidelines)
7. (Add commercial cooking measures)
8. (More incentives)
96. (No recommendations)
00. (Other, specify)
98. (Don't know)
99. (Refused)

Firmographics

I only have a few general questions left.

F1a What is your company's business type? (PROBE, IF NECESSARY; IF MANUFACTURING, PROBE IF IT IS LIGHT INDUSTRY OR HEAVY INDUSTRY)

1. (BLANK)
2. (Grocery)
3. (Medical)
4. (Hotel/Motel)
5. (BLANK)
6. (Office)
7. (Restaurant)
8. (Retail/Service)
9. (Warehouse/Distribution)
10. (Community/recreational center)
11. (Non-profit organization)
12. (Agriculture)
13. (Gas station/convenience store)
14. (Light industry)
15. (Heavy industry)
16. (K-12 School)
17. (College/university)
00. (Other, specify)
98. (Don't know)
99. (Refused)

F1b And is the business type of the facility in which the <ENDUSE> was installed in the same sector?

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

[ASK F1c IF F1b=2]

F1c What is the business type of the facility? (PROBE, IF NECESSARY – CLASS MANUFACTURING AS EITHER LIGHT OR HEAVY INDUSTRY)

1. (BLANK)
2. (Grocery)
3. (Medical)
4. (Hotel/Motel)
5. (BLANK)
6. (Office)
7. (Restaurant)
8. (Retail/Service)
9. (Warehouse/Distribution)
10. (Community/recreational center)
11. (Non-profit organization)
12. (Agriculture)
13. (Gas station/convenience store)
14. (Light industry)
15. (Heavy industry)
16. (K-12 School)
17. (College/university)
00. (Other, specify)
98. (Don't know)
99. (Refused)

F2 Which of the following best describes the ownership of this facility?

1. My company owns and occupies this facility
2. My company owns this facility but it is rented to someone else
3. My company rents this facility
8. (Don't know)
9. (Refused)

F3 Does your company pay the electric bill?

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

F4a How old is this facility? [NUMERIC OPEN END, 0 TO 150; 998=Don't know, 999=Refused]

[ASK F4b IF F4a=998]

F4b Do you know the approximate age? Would you say it is...

1. Less than 2 years
2. 2-4 years
3. 5-9 years
4. 10-19 years
5. 20-29 years
6. 30 years or more years
8. (Don't know)
9. (Refused)

F5a How many employees, full plus part-time, are employed at this facility? [NUMERIC OPEN END, 0 TO 2000; 9998=Don't know, 9999=Refused]

[ASK F5b IF F5a=9998]

F5b Do you know the approximate number of employees? 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
8. (Don't know)
9. (Refused)

F6 Which of the following best describes your facility? This facility is...

1. my company's only location
2. one of several locations owned by my company
3. the headquarters location of a company with several locations
8. (Don't know)
9. (Refused)

[SKIP F7 IF F2=2]

F7 In comparison to other companies in your industry, would you describe your company as...

1. A small company
2. A medium-sized company
3. A large company
4. (Not applicable)
8. (Don't know)
9. (Refused)

PY2 NET-TO-GROSS MODULE

Variables for the net-to-gross module:

<NTG> (B=Basic rigor level, S= Standard rigor level. All questions here are asked if the standard rigor level is designated. Basic rigor level is designated through skip patterns.

<UTILITY> (ComEd or Ameren Illinois Utilities)

<PROGRAM> (Name of energy efficiency program)

<ENDUSE> (Type of measure installed, at the end use level; from program tracking dataset; values: lighting equipment, cooling equipment, refrigeration equipment, motors)

<VEND1> (Contractor who installed new equipment, from program tracking dataset)

<TECH_ASSIST> (If participant conducted Feasibility Study, Audit, or received Technical Assistance

through the program; from program tracking database)

<ACCT_REP> (Name of account representative, from program tracking database or program files if present)

<OTHERPTS> (Variable to be calculated based on responses. Equals 1- minus response to N3p.)

<FINCRIT1> (Variable to be calculated based on responses. Equals 1 if payback period WITHOUT incentive is shorter than company requirement. See instructions below.)

<FINCRIT2> (Variable to be calculated based on responses. Equals 1 if payback period WITH incentive is shorter than company requirement. See instructions below.)

<MSAME> (For prescriptive/standard survey only: Equals 1 if same customer had more than one project of the same measure type; from program tracking database)

<NSAME> (For prescriptive/standard survey only: Number of additional projects of the same measure type implemented by the same customer; from program tracking database)

VENDOR INFORMATION [ASK IF NTG=S, ELSE SKIP TO V4]

I would like to get some information on the VENDORS that may have helped you with the implementation of this equipment.

V1 Did you work with a contractor or vendor that helped you with the choice of this equipment?

- 1 Yes
- 2 No
- 8 (Don't Know)
- 9 (Refused)

[SKIP IF V1=2,8,9]

V3 Did you also use a DESIGN or CONSULTING Engineer?

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

[SKIP TO N1 IF KAE=0]

V4 Did your key account executive assist you with the project that you implemented through the <PROGRAM>?

- 1 (Yes)
- 2 (No, don't have a key account executive)
- 3 (No, have a key account executive but they weren't involved)
- 8 (Don't know)
- 9 (Refused)

[SKIP V5 IF V4=2,3 OR <ACCT_REP> NOT BLANK]

V5 We do not have the name of your key account executive at <UTILITY>. Can you give me his or her name? [OPEN END; 98=Don't know; 99=Refused]

NET-TO-GROSS BATTERY

I'd now like to ask a few questions about the <ENDUSE> you installed through the program.

N1 When did you first learn about <UTILITY>'s Program? Was it BEFORE or AFTER you first began to THINK about implementing this measure? (NOTE TO INTERVIEWER: "this measure" refers to the specific energy efficient equipment installed through the program.)

- 1 Before
- 2 After
- 8 (Don't know)
- 9 (Refused)

[ASK IF N1=2, 8, 9, ELSE SKIP TO N3]

N2 Did you learn about <UTILITY>'s Program BEFORE or AFTER you DECIDED to implement the measure that was installed? (NOTE TO INTERVIEWER: "the measure" refers to the specific energy efficient equipment installed through the program.)

- 1 Before
- 2 After
- 8 (Don't know)
- 9 (Refused)

N3 Next, I'm going to ask you to rate the importance of the program as well as other factors that might have influenced your decision to implement this measure. Think of the degree of importance as being shown on a scale with equally spaced units from 0 to 10, where 0 means not at all important and 10 means extremely important. Now using this scale please rate the importance of each of the following in your decision to implement the measure at this time. [FOR N3a-n, RECORD 0 to 10; 96=Not Applicable; 98=Don't Know; 99=Refused]

(If needed: How important in your DECISION to implement the project was...)

[SKIP N3a IF NTG=B]

N3a. The age or condition of the old equipment

N3b. Availability of the PROGRAM incentive

N3bb. [ASK IF N3b=8,9,10] Why do you give it this rating? [OPEN END; 98=Don't know; 99=Refused]

[SKIP TO N3f IF NTG=B]

[ASK IF <TECH_ASSIST>=1, ELSE SKIP TO N3d]

N3c. "Information provided through the Feasibility study/Audit/Technical assistance you received from <UTILITY>?"

[SKIP N3cc IF NTG=B]

N3cc. [ASK IF N3c=8,9,10] Why do you give it this rating? [OPEN END; 98=Don't know; 99=Refused]

[ASK N3d IF V1=1]

N3d. Recommendation from an equipment vendor or contractor that helped you with the choice of the equipment.

N3e. Previous experience with this this type of equipment?

N3f. Recommendation from an <UTILITY> program staff person? [IF NECESSARY: This would be someone from Ameren Illinois Utilities that is affiliated specifically with the Act On Energy Business program and not someone from the utility that might ordinarily contact you about your account.]

[SKIP N3ff IF NTG=B]

ff. [ASK IF N3f=8,9,10] Why do you give it this rating?

N3h. Information from <PROGRAM> or <UTILITY> marketing materials?

[SKIP N3hh IF NTG=B]

N3hh. [ASK IF N3h=8,9,10] Why do you give it this rating?

[SKIP TO N3k IF NTG=B]

[ASK N3i IF V3=1]

N3i. A recommendation from a design or consulting engineer.

N3j. Standard practice in your business/industry

[SKIP N3k IF KAE=0 OR V4>1]

N3k. Endorsement or recommendation by a key account executive of <UTILITY>

[SKIP N3kk IF NTG=B]

N3kk. [ASK IF N3k=8,9,10] Why do you say that?

[SKIP TO N3n IF NTG=B]

N3l. Corporate policy or guidelines

N3m. Payback on the investment

N3n. Were there any other factors we haven't discussed that were influential in your decision to install this MEASURE?

1 (Nothing else influential)

00 [Record verbatim]

98 (Don't Know)

99 (Refused)

[ASK N3nn IF N3n=00]

N3nn. Using the same zero to 10 scale, how would you rate the influence of this factor? [RECORD 0 to 10; 98=Don't Know; 99=Refused]

Thinking about this differently, I would like you to compare the importance of the PROGRAM with the importance of other factors in implementing the <ENDUSE> project.

[SKIP TO N3p IF NTG=B]

[READ IF (N3A, N3D, N3E, N3I, N3J, N3L, N3M, OR N3NN)=8,9,10; ELSE SKIP TO N3p]

You just told me that the following other factors were important:

[READ IN ONLY ITEMS WHERE THEY GAVE A RATING OF 8 or higher]

- (N3A) Age or condition of old equipment,
- (N3D) Equipment Vendor recommendation
- (N3E) Previous experience with this measure
- (N3I) Recommendation from a design or consulting engineer
- (N3J) Standard practice in your business/industry
- (N3L) Corporate policy or guidelines
- (N3M) Payback on investment
- (N3N) Other factor

N3p If you were given a TOTAL of 100 points that reflect the importance in your decision to implement the <ENDUSE>, and you had to divide those 100 points between: 1) the program and 2) other factors, how many points would you give to the importance of the PROGRAM?
Points given to program: [RECORD 0 to 100; 998=Don't Know; 999=Refused]

[CALCULATE VARIABLE "OTHERPTS" AS: 100 MINUS N3p RESPONSE; IF N3p=998,999, SET OTHERPTS=BLANK]

N3o And how many points would you give to other factors? [RECORD 0 to 100; 998=Don't Know; 999=Refused]

[The response should be <OTHERPTS> because both numbers should equal 100. If response is not <OTHERPTS> ask INC1]

INC1 "The last question asked you to divide a TOTAL of 100 points between the program and other factors. You just noted that you would give <N4 RESPONSE> points to the program. Does that mean you would give <OTHERPTS> points to other factors?

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

[IF INC1=2, go back to N3p]

CONSISTENCY CHECK ON PROGRAM IMPORTANCE SCORE

[SKIP TO N5 IF N3p=998,999 OR IF N3p<80 OR IF (N3p>=80 AND ANY ONE OF (N3b, N3c, N3f, N3h, AND N3k)>3)]

N4 You just gave <N3p RESPONSE> points to the importance of the program, I would interpret that to mean that the program was quite important to your decision to install this equipment. Earlier, when I asked about the importance of individual elements of the program I recorded some answers that would imply that they were not that important to you. Just to make sure I have recorded this properly, I have a couple questions to ask you.

N4a When asked about THE AVAILABILITY OF THE PROGRAM INCENTIVE, you gave a rating of ...<N3B RESPONSE> ... out of ten, indicating that the program incentive was not that important to you. Can you tell me why the incentive was not that important?

00 [Record VERBATIM]

98 (Don't know)

99 (Refused)

[SKIP IF NTG=B OR <TECH_ASSIST>=0]

N4b When I asked you about THE INFORMATION PROVIDED THROUGH THE FEASIBILITY STUDY/AUDIT/TECHNICAL ASSISTANCE, you gave a rating of ...<N3C RESPONSE> ... out of ten, indicating that the information provided was not that important to you. Can you tell me why the information provided was not that important?

00 [Record VERBATIM]

98 (Don't know)

99 (Refused)

N4c When I asked you about THE RECOMMENDATION FROM AN <UTILITY> PROGRAM STAFF PERSON, you gave a rating of ...<N3F RESPONSE> ... out of ten, indicating that the information provided was not that important to you. Can you tell me why the information provided was not that important?

00 [Record VERBATIM]

98 (Don't know)

99 (Refused)

N4d When asked about THE INFORMATION from the <PROGRAM> or <UTILITY> MARKETING MATERIALS, you gave a rating of ...<N3H RESPONSE> ... out of ten, indicating that this information from the program or utility marketing materials was not that important to you. Can you tell me why this information was not that important?

00 [Record VERBATIM]

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

[SKIP N4e IF V4>1 or N3k=96,98,99]

N4e When asked about THE ENDORSEMENT or RECOMMENDATION by YOUR KEY ACCOUNT EXECUTIVE, you gave a rating of <N3K RESPONSE> ... out of ten, indicating that this Account Representative endorsement was not that important to you. Can you tell me why this endorsement was not that important?

- 00 [Record VERBATIM]
- 98 (Don't know)
- 99 (Refused)

Now I would like you to think about the action you would have taken with regard to the installation of this equipment if the utility program had not been available.

N5 Using a likelihood scale from 0 to 10, where 0 is “Not at all likely” and 10 is “Extremely likely”, if the utility program had not been available, what is the likelihood that you would have installed exactly the same equipment? [RECORD 0 to 10; 98=Don't know; 99=Refused]

CONSISTENCY CHECKS

[ASK IF N3b>7 AND N5>7, ELSE SKIP TO N6]

N5a When you answered ...<N3B RESPONSE> ... for the question about the influence of the incentive, I would interpret that to mean that the incentive was quite important to your decision to install. Then, when you answered <N5 RESPONSE> for how likely you would be to install the same equipment without the incentive, it sounds like the incentive was not very important in your installation decision.

I want to check to see if I am misunderstanding your answers or if the questions may have been unclear. Will you explain the role the incentive played in your decision to install this efficient equipment?

- 00 [Record VERBATIM]
- 98 (Don't know)
- 99 (Refused)

N5b Would you like for me to change your score on the importance of the incentive that you gave a rating of <N3B RESPONSE> or change your rating on the likelihood you would install the same equipment without the incentive which you gave a rating of <N5 RESPONSE> and/or we can change both if you wish?

- 1 (Change importance of incentive rating)
- 2 (Change likelihood to install the same equipment rating)
- 3 (Change both)
- 4 (No, don't change)

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

[ASK IF N5b=1,3]

N5c How important was... availability of the PROGRAM incentive? (IF NEEDED: in your DECISION to implement the project) [Scale of 0 to 10, where 0 means not at all important and 10 means extremely important; 98=Don't know, 99=Refused]

[ASK IF N5b=2,3]

N5d If the utility program had not been available, what is the likelihood that you would have installed exactly the same equipment? [Scale of 0 to 10, where 0 means "Not at all likely" and 10 means "Extremely likely"; 98=Don't know, 99=Refused]

[ASK IF N3j>7, ELSE SKIP TO N7]

N6 In an earlier question, you rated the importance of STANDARD PRACTICE in your industry very highly in your decision making. Could you please rate the importance of the PROGRAM, relative to this standard industry practice, in influencing your decision to install this measure. Would you say the program was much more important, somewhat more important, equally important, somewhat less important, or much less important than the standard practice or policy?

- 1 Much more important
- 2 Somewhat more important
- 3 Equally important
- 4 Somewhat less important
- 5 Much less important
- 8 (Don't know)
- 9 (Refused)

[ASK IF N5>0, ELSE SKIP TO N8]

N7 You indicated earlier that there was a <N5 RESPONSE> in 10 likelihood that you would have installed the same equipment if the program had not been available. Without the program, when do you think you would have installed this equipment? Would you say...

- 1 At the same time
- 2 Earlier
- 3 Later
- 4 (Never)
- 8 (Don't know)
- 9 (Refused)

[ASK N7a IF N7=3]

N7a. How much later would you have installed this equipment? Would you say...

- 1 Within 6 months?
- 2 6 months to 1 year later

- 3 1 - 2 years later
- 4 2 - 3 years later?
- 5 3 - 4 years later?
- 6 4 or more years later
- 8 (Don't know)
- 9 (Refused)

[ASK N7b IF N7a=6, ELSE SKIP TO N8]

N7b. Why do you think it would have been 4 or more years later?

- 00 [Record VERBATIM]
- 98 (Don't know)
- 99 (Refused)

PAYBACK BATTERY [ASK IF N3m>5 ELSE SKIP TO N11]

I'd like to find out more about the payback criteria your company uses for its investments.

N8 What financial calculations does your company make before proceeding with installation of a MEASURE like this one?

- 00 [Record VERBATIM]
- 98 (Don't know)
- 99 (Refused)

N9 What is the payback cut-off point your company uses (in months) before deciding to proceed with an investment? Would you say...

- 1 0 to 6 months
- 2 7 months to 1 year
- 3 more than 1 year up to 2 years
- 4 more than 2 years up to 3 years
- 5 more than 3 years up to 5 years
- 6 Over 5 years
- 8 (Don't know)
- 9 (Refused)

N10a What was the estimated payback period for the new <ENDUSE>, in months, WITH the incentive from the <PROGRAM>?

- 00 [NUMERIC OPEN END, UP TO 240]
- 998 (Don't know)
- 999 (Refused)

N10b And what was the estimated payback period for the <ENDUSE>, in months, WITHOUT the incentive from <PROGRAM>?

- 00 [NUMERIC OPEN END, UP TO 240]
- 998 (Don't know)
- 999 (Refused)

[CREATE VARIABLE FINCRIT1. SET FINCRIT1 = BLANK IF: N9=8,9 OR N10b=998,999. SET FINCRIT1 = 1 IF: (N9=1 AND N10b<7) OR (N9=2 AND N10b<13) OR (N9=3 AND N10b<25) OR (N9=4 AND N10b<37) OR (N9=5 AND N10b<61) OR (N9=6). ELSE, SET FINCRIT1 = 0.]

[ASK IF FINCRIT1=1, ELSE SKIP TO N10d]

N10c Even without the incentive, the <ENDUSE> project met your company's financial criteria. Would you have gone ahead with it even without the incentive?

- 1 Yes
- 2 No
- 3 (Maybe)
- 8 (Don't know)
- 9 (Refused)

[CREATE VARIABLE FINCRIT2. SET FINCRIT2 = BLANK IF: N9=8,9 OR N10a=998,999. SET FINCRIT2 = 1 IF: (N9=1 AND N10a<7) OR (N9=2 AND N10a<13) OR (N9=3 AND N10a<25) OR (N9=4 AND N10a<37) OR (N9=5 AND N10a<61) OR (N9=6). ELSE, SET FINCRIT2 = 0.

[ASK IF FINCRIT2=1 AND FINCRIT1=0 AND N3b<5, ELSE SKIP TO N10e]

N10d The incentive seemed to make the difference between meeting your financial criteria and not meeting them, but you are saying that the incentive didn't have much effect on your decision, why is that?

- 00 [Record VERBATIM]
- 98 (Don't know)
- 99 (Refused)

[ASK IF FINCRIT2=0 AND N3b>7, ELSE SKIP TO N11]

N10e. The incentive didn't cause this <ENDUSE> project to meet your company's financial criteria, but you said that the incentive had an impact on the decision to install the <ENDUSE>. Why did it have an impact?

- 00 [Record VERBATIM]
- 98 (Don't know)
- 99 (Refused)

CORPORATE POLICY BATTERY [ASK IF N3i>5, ELSE SKIP TO N18]

N11 Does your organization have a corporate environmental policy to reduce environmental emissions or energy use? Some examples would be to "buy green" or use sustainable approaches to business investments.

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

[ASK IF N11=1, ELSE SKIP TO N18]

N12 What specific corporate policy influenced your decision to adopt or install the <ENDUSE> through the <PROGRAM>?

- 00 [RECORD VERBATIM]
- 98 (Don't know)
- 99 (Refused)

N13 Had that policy caused you to adopt energy efficient <ENDUSE> at this facility before participating in the <PROGRAM>?

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

N14 Had that policy caused you to adopt energy efficient <ENDUSE> at other facilities before participating in the <PROGRAM>?

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

[ASK IF N13=1 OR N14=1, ELSE SKIP TO N17]

N15 Did you receive an incentive for a previous installation of <ENDUSE>?

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

[ASK IF N15=1, ELSE SKIP TO N17]

N16 To the best of your ability, please describe.... [Record VERBATIM; 98=Don't know; 99=Refused]

- a. the amount of incentive received
- b. the approximate timing
- c. the name of the program that provided the incentive

[ASK IF N13=1 OR N14=1, ELSE SKIP TO N18]

N17 If I understand you correctly, you said that your company's corporate policy has caused you to install energy efficient <ENDUSE> previously at this and/or other facilities. I want to make sure I

fully understand how this corporate policy influenced your decision versus the <PROGRAM>.

Can you please clarify that?

- 00 [Record VERBATIM]
- 98 (Don't know)
- 99 (Refused)

STANDARD PRACTICE BATTERY [ASK IF N3]>5, ELSE SKIP TO N23]

N18 Approximately, how long has use of energy efficient <ENDUSE> been standard practice in your industry?

- M [00 Record Number of Months; 98=Don't know, 99=Refused]
- Y [00 Record Number of Years; 98=Don't know, 99=Refused]

N19 Does your company ever deviate from the standard practice?

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

[ASK IF N19=1]

N19a Please describe the conditions under which your company deviates from this standard practice.

- 00 [Record VERBATIM]
- 98 (Don't know)
- 99 (Refused)

N20 How did this standard practice influence your decision to install the <ENDUSE> through the <PROGRAM>?

- 00 [Record VERBATIM]
- 98 (Don't know)
- 99 (Refused)

N20a Could you please rate the importance of the <PROGRAM>, versus this standard industry practice in influencing your decision to install the <ENDUSE>. Would you say the <PROGRAM> was...

- 1 Much more important
- 2 Somewhat more important
- 3 Equally important
- 4 Somewhat less important
- 5 Much less important
- 8 (Don't know)
- 9 (Refused)

N21 What industry group or trade organization do you look to to establish standard practice for your industry?

00 [Record VERBATIM]

98 (Don't know)

99 (Refused)

N22 How do you and other firms in your industry receive information on updates in standard practice?

00 [Record VERBATIM]

98 (Don't know)

99 (Refused)

OTHER INFLUENCES BATTERY [ASK IF N3nn>5, ELSE SKIP TO N26]

N23 Who provided the most assistance in the design or specification of the <ENDUSE> you installed through the <PROGRAM>? (If necessary, probe from the list below.)

1 (Designer)

2 (Consultant)

3 (Equipment distributor)

4 (Installer)

5 (<UTILITY> Key Account Executive)

6 (<PROGRAM> staff)

00 (Other, specify)

98 (Don't know)

99 (Refused)

[SKIP N24 IF N23=98,99]

N24 Please describe the type of assistance that they provided.

00 [Record VERBATIM]

98 (Don't know)

99 (Refused)

[ASK N26 IF MSAME=1]

Our records show that your company also received an incentive from <UTILITY> for <NSAME> other <ENDUSE> project(s).

N26 Was it a single decision to complete all of those <ENDUSE> projects for which you received an incentive from <UTILITY> or did each project go through its own decision process?

1 (Single Decision)

2 (Each project went through its own decision process)

00 (Other, specify)

98 (Don't know)

99 (Refused)

[ASK N27 IF FSAME=1 ELSE SKIP TO SPILLOVER MODULE]

Our records show that <COMPANY> also received an incentive from <UTILITY> for a <FDESC> project at < ADDRESS >.

N27 Was the decision making process for the <FDESC> project the same as for the <ENDUSE> project we have been talking about?

- 1 (Same decision making process)
- 2 (Different decision making process)
- 00 (Other, specify)
- 98 (Don't know)
- 99 (Refused)



AMEREN ACTION ENERGY
RETRO-COMMISSIONING PROGRAM:
VERIFICATION AND DUE DILIGENCE

Final

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1. INTRODUCTION

This memo provides the results of Task 3 – Verification and Due Diligence – for the Retro-commissioning Program, which was not included in last year’s QA/QC assessment given its pilot status. Under this task, we explored the quality assurance and verification activities currently carried out by program and implementation staff. We compared these activities to industry best practices¹ for similar C&I programs to determine:

1. If any key quality assurance and verification activities that should take place are currently not being implemented.
2. If any of the current quality assurance and verification activities are biased (i.e., incorrect sampling that may inadvertently skew results, purposeful sampling that is not defensible, etc.).
3. If any of the current quality assurance and verification activities are overly time-consuming and might be simplified or dropped.

This assessment primarily relied on in-depth interviews with program and implementation staff and documentation of current program processes, where available.

The remainder of this memo includes a summary of key quality assurance and verification activities currently conducted by Ameren Illinois Utilities’ C&I Retro-commissioning Program and recommendations for improvement; an overview of data collection activities carried out for this task; and detailed findings on current quality assurance and verification activities.

¹ See the Best Practices Self Benchmarking Tool developed for the Energy Efficiency Best Practices Project: <http://www.eebestpractices.com/benchmarking.asp>.

2. SUMMARY AND RECOMMENDATIONS

C&I Retro-commissioning Program

Overall, Ameren Illinois Utilities' (Ameren or AIU) quality control and verification procedures for the C&I Retro-commissioning Program are sufficient to ensure quality projects. However, in general, compared to other C&I programs in the Act On Energy Business portfolio, the number of quality assurance activities in place is low. We suggest that Ameren first formally document the existing sampling methodology used for post inspections of RSP work, and second, consider expanding the number of these inspections to ensure that projects are completed as expected.

Table 1 summarizes the quality assurance and verification activities currently carried out by the C&I Retro-commissioning Program. It also presents recommended changes to current procedures.

Table 1: Summary of Quality Assurance Activities in Place and Recommendations

QA Activities in Place	Recommended Change
<ul style="list-style-type: none">• Eligibility checks	<ul style="list-style-type: none">• None
<ul style="list-style-type: none">• Engineering review	<ul style="list-style-type: none">• None
<ul style="list-style-type: none">• Verification survey (RSP)	<ul style="list-style-type: none">• None
<ul style="list-style-type: none">• On-site survey/Post inspection (AIU Staff)	<ul style="list-style-type: none">• Document current on-site survey inspection guidelines• Consider expanding the scope of current post inspection activities to cover more than 10% of completed projects
<ul style="list-style-type: none">• Screening of Participating RSPs	<ul style="list-style-type: none">• None

3. DATA COLLECTION

Data for this task was primarily gathered through depth interviews with David Gibson, the deputy program manager from SAIC, on May 19, 2010. The Application Processing Checklist and Custom and Standard Revised Technical Review Process contained within the Technical Review Manual were also reviewed as part of this task given similarities in the administration of the programs.

We used the Self Benchmarking spreadsheet found under the Best Practices in Energy Efficiency Programs (<http://www.eebestpractices.com/benchmarking.asp>) to determine specifically what types of information to collect.

4. DETAILED FINDINGS

C&I Retro-commissioning Program

Eligibility Checks

Upon receipt of the initial application, customer eligibility is checked by entering the account number provided on the application into the AIB database where it is cross-referenced against Ameren's customer information. Ameren customer information is imported into AIB for this purpose. An application cannot be entered into AIB and labeled as a project until the account number is verified. Once the account number is deemed valid and the customer verified as eligible, project information is entered into AIB, and the application review process begins.

Assessment: Ameren's procedures for the verification of customer eligibility are successful in ensuring only eligible customers participate in the program. No changes are needed in this area.

Pre-Approval

Pre-approval is required for all retro-commissioning projects before the survey phase begins. However, given the nature of retro-commissioning, the program carries out a number of steps at the beginning of a project that feed into the pre-approval process. For example, there is typically a kick-off meeting between the Ameren program staff, the designated Retro-commissioning Service Provider (RSP) and the participating customer. Often the meeting occurs at the customer site and allows the group to talk about the project and address any questions the customer may have about their participation. The customer or RSP will then submit an initial application identifying the total survey cost, and the pre-approval process begins.

The pre-approval application review, conducted by program staff, is designed to check that the project is eligible, based on the program criteria, and that the survey scope is reasonable. Typically, Ameren utilizes two, SAIC reviewers for the pre-approval stage. The primary reviewer is responsible for reviewing the project's pre-approval application and making a recommendation to grant or deny the application. A secondary reviewer also examines the application as well as the primary reviewer's recommendation. The approval of this secondary reviewer is required before the project can be pre-approved.

Once an application has gone through the technical review process it is sent to the SAIC program manager and the administrative assistant with a recommendation that they issue the pre-approval letter, which establishes the incentive levels and minimum energy savings requirements determined by the reviewers. The letter is then created and reviewed by the program manager. The program attempts to ensure high data quality by limiting the number of people with responsibility for data entry. The majority of project information and dates in AIB are entered by the program's administrative assistant. This individual also has the responsibility for making all modifications to AIB except when a technical reviewer needs to update project information to aid in the review process. The primary and secondary

reviewers enter data regarding the project, and the secondary reviewer checks the primary reviewer's entries for accuracy.

A formal pre-inspection is not required or necessary for this program given that the first activity conducted is a thorough retro-commissioning survey by the RSP, the results from which are then discussed with the customer and Ameren staff before the scope of the project is finalized. In addition, the RSP and program staff may conduct a walkthrough of the facility before the project starts to identify potential retro-commissioning measures. This walkthrough takes place before the formal retro-commissioning survey.

Assessment: The program has sufficient pre-approval procedures to ensure a thorough review and verification of planned project activities. The program's technical review procedures ensure that the program's requirements are met before work commences, and the review by two staff members also helps to minimize errors in the process.

Final Approval

Upon completion of the project, two surveys are performed: a verification survey conducted by the RSP and an on-site survey conducted by SAIC program staff. The verification survey occurs for all sites and consists of a spot check and instrumented survey to ensure that the appropriate measures have been installed. The instrumented survey involves RSP use of equipment such as leak detectors, where applicable, to verify the changes made as a part of the project. If it is determined that the measures were not installed or if the installation was not consistent with generally accepted engineering practices, the customer may be required to make changes to remedy any discrepancies. Assuming a satisfactory verification survey, the RSP submits the appropriate paperwork to Ameren for review and approval of payment.

As with the pre-approval process, Ameren draws upon two SAIC reviewers for final approval. The primary reviewer is responsible for the main review of the verification survey and additional final documentation. A secondary reviewer examines the application to ensure that all of the requirements have been met. The approval of the secondary reviewer is required before the project can be approved for payment.

Additionally, following the verification survey, program staff performs an on-site survey for 10% of completed projects.² This survey is not an instrumented survey like the verification survey, but a physical observation survey to verify that the proper measures were installed. The presence of installed measures is compared to the invoices and purchase orders kept by the customer per program requirements.

Assessment: The verification survey performed by the RSPs is effective in ensuring a review and verification of agreed-upon project activities, although the process could be enhanced with the addition of mandatory post metering. In addition, while there is theoretically a chance of error or fraud on the part RSPs, who have a responsibility for both conducting the work and ensuring it was done properly, the on-site survey conducted by program staff is a reasonable approach to identifying any such issues and correcting them. However, a higher percentage of projects than the current 10% should be inspected by Ameren staff to ensure that all RSP verification work is done properly and there is a robust independent verification

² At this time, it is unclear how the program determines which projects to inspect.

process. While the screening and training of RSPs is an important and valuable step in reducing the chance of fraud, additional independent verification could help catch any errors in the project work.

The on-site survey exists to verify the RSP's inspection. While a more detailed inspection with instrumentation could be performed by program staff, it is not necessary given the screening and training provided to RSPs. However, in order to enhance this process, Ameren should document the on-site survey process so that it is clear to internal audiences whether projects are randomly selected for the visits or some criteria is used to determine which projects receive an on-site survey. Given that RSPs conduct the initial verification, the evaluation team would suggest that random selection is likely more effective in preventing fraud.

A. APPENDIX: QUALITY CONTROL AND VERIFICATION BEST PRACTICES

Program Design and Structure

1. Base quality control on program's relationship with vendors, number of vendors involved, types of measures, project volume, variability of project size
 - The quality control procedures are based on relationships with a limited number of retro-commissioning service providers (RSPs) involved in the program and the requirement that they receive training from the program.

2. Assure quality of product through independent testing procedures
 - While this issue was not explored through in-depth interviews, it does appear that the program relies on independent sources in establishing product quality. For example, Ameren reserves the right to deny applications for projects utilizing measures that have not been approved by recognized independent public authorities, such as Underwriter's Laboratory (UL).

3. Use measure product specification in program requirements & guidelines
 - The incentive application forms contain tables with facility eligibility requirements and measures to be included in the retro-commissioning audit.

4. Use inspections & the verification function as a training tool for the market, especially for market transformation programs
 - The program has procedures for inspections and verification, but it is unclear whether the program has used these processes to provide training to program participants to reinforce the benefits and optimal use of program measures.

5. Implement a contractor screening/certification/training process
 - RSPs participating in the program were screened by program staff as part of a formal RFP process to ensure that they meet the technical requirements of the program. Once selected, RSPs are also required to participate in quarterly training.

6. Develop inspection and verification procedures during the program design phase
 - The programs' inspection and verification procedures were created during program

development and design.

7. Consider administrative cost in designing the verification strategy

- Given that the program does not inspect all completed projects, administrative cost is an inherent component of the post-inspection strategy. However, the evaluation team is not yet aware of the criteria used to select projects for verification.

Sampling

8. Require pre-inspections for large or uncertain impact projects

- While a formal pre-inspection is not required, to date all participants have had a facility walkthrough and are required to provide an outline of planned measures in their application. In addition, the retro-commissioning study performed as the first step in program participation generally serves the same role as a formal pre-inspection.

9. Conduct/Require in-program measurement/impact evaluation (or post-project inspections and commissioning) for the very largest projects or those with uncertain impacts

- The program uses engineering review, as well as onsite inspections (verification survey) to assess the impact of all projects.
- The program staff also conducts inspections of 10% of completed projects, although it is unclear how these projects are selected.

10. Build in statistical features to the sampling protocol to allow a reduction in the number of required inspections based on observed performance & demonstrated quality of work. Use a “good” random sample.

- It is unclear the extent to which Ameren is using statistical features in the selection of projects for non-RSP post-inspection.

11. Always inspect the first job submitted by a new vendor

- It is not clear whether Ameren has implemented this practice. However, the screening process for admitting RSPs into the program allows another level of quality assurance and control in terms of the services provided.

12. Obtain a good sample of vendor and measure types

- It is unclear the extent to which Ameren has established inspection criteria that provide a good sample of vendor and measure types. It is likely that this happening by default given the small number of active RSPs and relative uniformity of measures implemented.

Inspection Procedures

13. Ensure inspectors have plenty of hands-on-construction practice

- Inspections are performed by both the RSP and utility program staff that have experience in retro-commissioning. While the formal training of these individuals was not assessed as part of this evaluation, technical reviewers have extensive engineering experience and knowledge of the measures incentivized through the program.

14. Conduct an independent audit or pre-installation inspections

- The program often includes a facility walkthrough prior to the formal retro-commissioning study, which serves as an independent audit of facility performance.

15. Conduct on-site post-installation inspections

- Inspections are performed by both the RSP and program staff.

16. Govern post-inspection levels by cost-effectiveness considerations and results from an initial set of inspections early in the implementation process

- Cost-effectiveness is an inherent aspect of the current post-inspection protocols, as described in the Sampling section above.

17. For de-lamping projects, use light level requirements and pre- and post-light level readings to ensure quality

- This topic is not applicable to the retro-commissioning program.

Final Application Review

18. Verify accuracy of rebates, coupons, invoices to ensure the reporting system is recording actual product installations by target market

- Customers are required, as part of the program terms and conditions, to submit

copies of all invoices or other reasonable documentation of the costs associated with implementing the eligible projects.

- As part of the application review process, technical reviewers compare invoices and purchase orders to the application information to confirm that the claimed measures were actually installed at the specified time.

Evaluation

19. Assess customer satisfaction with the product through evaluation

- While the current evaluation effort will not gauge customer satisfaction with the program's processes, this information was indirectly gathered through interviews with RSPs and program staff that have worked closely with participating customers.

20. Tie staff performance to independently verified results

- This topic was not covered in the depth interview.



***Note: Our Ameren Illinois PY2 analysis used information in this appendix. The information in the appendix may have subsequently been updated.**

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Lighting

Most lighting measures presented in these work papers use the same methodology. The following provides the assumptions and methods used for calculating energy savings.

Baseline and retrofit equipment assumptions, i.e. wattages, are specific to the measure. Most lighting retrofits assume an early replacement of existing technologies where the baseline represents the equipment removed.

Savings are calculated by building type, since building types typically define the operating hours and other parameters that define the energy savings. These workpapers base the energy savings methodology on the California 2005 DEER Study¹ assumptions. The DEER database is a tool that was jointly developed by the California Public Utilities Commission (CPUC) and the California Energy Commission with support and input from the Investor-Owned Utilities and other interested stakeholders. Since DEER disaggregates building types to a higher level of detail than the ComEd Smart Ideas Program, a building-type mapping was performed. This mapping defines the group of DEER building types that are averaged to result in the ComEd building type factors used for calculating lighting savings. The following table shows the mapping results.

¹ 2005 Database for Energy Efficiency Resources (DEER) Update Study Final Report - Residential and Commercial Non-Weather Sensitive Measures

Table 1: DEER and Smart Ideas Building Types

DEER	Smart Ideas Program
Education - Primary School	K-12 School
Education - Secondary School	
Education - Community College	College/University
Education - University	
Grocery	Grocery
Health/Medical - Hospital	Medical
Health/Medical - Nursing Home	
Lodging - Hotel	Hotel/Motel
Lodging - Motel	
Lodging - Guest Room	
Manufacturing - Light Industrial	Light Industry
Office - Large	Office
Office - Small	
Restaurant - Sit-Down	Restaurant
Restaurant - Fast-Food	
Retail - 3-Story Large	Retail/Service
Retail - Single-Story Large	
Retail - Small	
Storage - Conditioned	Warehouse
Storage - Unconditioned	
Warehouse - Refrigerated	

Annual energy savings and the peak coincident demand savings were calculated using the equations below:

$$\text{Non-coincident kW reduction} = \text{kW of existing equipment} - \text{kW of replacement equipment}$$

Energy savings are based on the difference between baseline and efficient equipment connected wattage and annual operating hours, according to the following formula:

$$\text{kWh Reduction} = (\text{kW of existing equipment} - \text{kW of replacement equipment}) * (\text{Annual operating hours}) * (\text{Energy Interactive Effects})$$

Coincident demand savings are calculated by applying the coincidence factor and the demand interactive effect, according to the following formula:

$$\text{Coincident kW savings} = \text{non-coincident kW savings} * \text{Coincidence Factor} * \text{Demand interactive effect}$$

Interactive factors account for savings that the measures achieve through avoided air conditioning load because of reduced internal heat gains from energy-efficient lighting. The interactive effects do not apply to exterior lighting.

The annual operation hours, the coincidence factors, and the interactive effect factors are all derived from DEER figures. Since the Smart Ideas Program building types do not match DEER's exactly, as described, the DEER building types were mapped by combining and averaging similar building types. These figures apply to all lighting measures. The following tables list DEER values. Compact fluorescent lamps (CFLs), LED lighting (unless otherwise noted), and integrated ballast ceramic metal halides have CFL lighting operating hours. Other lighting has different operating hours as shown below.

Table 2: Interactive Effects by Building Type from DEER

DEER Market Sector	Demand Interactive Effects	Energy Interactive Effects
Education - Primary School	1.23	1.15
Education - Secondary School	1.23	1.15
Education - Community College	1.22	1.15
Education - University	1.22	1.15
Grocery	1.25	1.13
Medical - Hospital	1.26	1.18
Medical - Clinic	1.26	1.18
Lodging Hotel	1.14	1.14
Lodging Motel	1.14	1.14
Lodging - Guest Rooms	1.14	1.14
Manufacturing - Light Industrial	1.08	1.04
Office- Large	1.25	1.17
Office-Small	1.25	1.17
Restaurant - Sit-Down	1.26	1.15
Restaurant - Fast-Food	1.26	1.15
Retail – 3-Story Large	1.19	1.11
Retail - Single-Story Large	1.19	1.11
Retail - Small	1.19	1.11
Storage Conditioned	1.09	1.06
Storage Unconditioned	1.09	1.06
Warehouse	1.09	1.06
Average = Miscellaneous	1.19	1.13

Table 3: Coincident Diversity Factors from DEER

DEER Market Sector	Coincident Diversity Factors
Education - Primary School	0.42
Education - Secondary School	0.42
Education - Community College	0.68
Education - University	0.68
Grocery	0.81
Medical - Hospital	0.74
Medical - Clinic	0.74
Lodging Hotel	0.67
Lodging Motel	0.67
Lodging - Guest Rooms	0.67
Manufacturing - Light Industrial	0.99
Office- Large	0.81
Office-Small	0.81
Restaurant - Sit-Down	0.68
Restaurant - Fast-Food	0.68
Retail - 3-Story Large	0.88
Retail - Single-Story Large	0.88
Retail - Small	0.88
Storage Conditioned	0.84
Storage Unconditioned	0.84
Warehouse	0.84
Average = Miscellaneous	0.74

Table 4: Annual Operating Hours from DEER

DEER Market Sector	CFL Annual Operating Hours	Other Lighting Annual Operating Hours
Education - Primary School	1,440	1,440
Education - Secondary School	2,305	2,305
Education - Community College	3,792	3,792
Education - University	3,073	3,073
Grocery	5,824	5,824
Medical - Hospital	8,736	8,736
Medical - Clinic*	4,212	4,212
Lodging Hotel	8,736	8,736
Lodging Motel	8,736	8,736
Lodging - Guest Rooms	1,145	NA
Manufacturing - Light Industrial*	4,290	4,290
Office- Large	2,739	2,808
Office-Small	2,492	2,808
Restaurant - Sit-Down	3,444	4,368
Restaurant - Fast-Food	6,188	6,188
Retail - 3-Story Large	4,259	4,259
Retail – Single-Story Large	4,368	4,368
Retail – Small	3,724	4,004
Storage Conditioned	2,860	2,860
Storage Unconditioned	2,860	2,860
Warehouse	2,600	2,600
Average = Miscellaneous	4,380	4,242

* Not from DEER

Table 5 below provides the above data mapped to ComEd building types. The miscellaneous category is an average of the building types.

Industrial operating hours are assumed based on the following sources:

- DEER estimates hours to be 2,860.
- Efficiency Vermont Technical Reference User Manual’s (No. 2004-29) estimates 5,913 hours .
- the 2004-2005 PG&E workpapers assumed 6,650 hours for process industrial and 4,400 for assembly industrial.

DEER’s estimated hours are far lower than figures other sources have provide and so we have increased the DEER values by 50% or to 4,290 hours. This value is reasonable and on the



conservative side of the averages. We will use this conservative value until more data is available for the ComEd territory.

Similarly, we believe that the DEER storage and warehouse operating hours are low as well. Current ComEd data show that warehouses average 4859 in operating hours. This is the average operating hours recorded for 55 inspected warehouse projects where this information was available. DEER operating hours for conditioned, unconditioned storage areas, and warehouses range from only 2600-2860. ComEd program data suggests that operating hours are significantly higher. We believe that 4,859 is a better estimate of deemed operating hours since it derives from actual ComED customers.

DEER has set Medical-Hospital operating hours at 8,736. We have lowered this value for the purposes of calculating our average by using operating hours 50% above that of offices or 4,212 hours (Medical-Clinic operating hours). This is to account for areas in medical facilities that behave more like offices and do not operate around the clock. ComEd medical operating hours is the average of the DEER Hospital the revised clinic operating hours.

Hotel/Motel operating hours are the average of guest room hours and either hotel or motel operating hours since a facility can only be one or the other. ComEd hotel hours and motel hours are equivalent (average of 8,736 and 1,145).

Table 5: Mapped Lighting Factors

ComEd Building Types	CFL Annual Operating Hours	Other Lighting Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects
Office	2,616	2,808	1.25	0.81	1.17
School (K-12)	1,873	1,873	1.23	0.42	1.15
College/University	3,433	3,433	1.22	0.68	1.15
Retail/Service	4,117	4,210	1.19	0.88	1.11
Restaurant	4,816	5,278	1.26	0.68	1.15
Hotel/Motel	4,941	4,941	1.14	0.67	1.14
Medical	6,474	6,474	1.26	0.74	1.18
Grocery	5,824	5,824	1.25	0.81	1.13
Warehouse	4,859	4,859	1.09	0.84	1.06
Light Industry	4,290	4,290	1.08	0.99	1.04
Heavy Industry	4,290	4,290	1.08	0.99	1.04
Average =	4,321	4,389	1.19	0.77	1.12



Miscellaneous				
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Compact Fluorescent Fixtures, Hardwired	
Measure Description	New fixtures or modular retrofits with hardwired electronic ballasts qualify. The CFL ballast must be programmed start or programmed rapid start with a PF ≥ 90 and THD $\leq 20\%$.
Units	Per fixture
Base Case Description	Incandescent or HID lamps.
Measure Savings	Source: KEMA
Measure Incremental Cost	Source: KEMA
Effective Useful Life	Source: DEER 12 years

Hardwired CFL incentives apply only to complete new fixtures or modular (pin-based) retrofits with hardwired electronic ballasts. The CFL ballast must be programmed „start’ or programmed „rapid start’ with a PF ≥ 90 and THD ≤ 20 percent.

Measure Savings

Baseline and retrofit equipment assumptions are presented in the table below. Most lighting retrofits assume early replacement of existing technologies where the baseline represents the equipment removed. The following table shows the wattages used for the savings calculations.

Table 6: Baseline and Retrofit Wattages

Measure	Base Wattage	Retrofit Wattage	kW Reduction
29W or Less	100	28	0.072
29W or Less	125	27	0.098
29W or Less	110	27	0.083
29W or Less	100	26	0.074
29W or Less	75	26	0.049
29W or Less	100	25	0.075
29W or Less	75	25	0.05
29W or Less	100	23	0.077
29W or Less	75	20	0.055
29W or Less	75	19	0.056
29W or Less	75	18	0.057
29W or Less	60	18	0.042
29W or Less	60	16	0.044
29W or Less	60	15	0.045
29W or Less	60	14	0.046
29W or Less	60	13	0.047
29W or Less	40	13	0.027
29W or Less	40	9	0.031
30W or Greater	120	30	0.09
30W or Greater	120	40	0.08
30W or Greater	200	55	0.145
30W or Greater	200	65	0.135

Table 7: Wattage Reduction

Wattage Category	Average Wattage Reduction
≤29	57
≥30W	113

The following tables provide the measure savings using the above wattage reduction assumptions. The savings are provided by building type. The miscellaneous category is an average of the building types.

Since DEER building types differ from those used in the ComEd Smart Ideas Program, they are mapped to fit the program. Some savings values have been combined to fit program needs (see detailed description of the methodology in the Appendix introduction).



Table 8: Measure Savings for 29W or less

ComEd Building Types	Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects	Peak kW Savings	kWh Savings
Office	2,616	1.25	0.81	1.17	0.058	175
School (K-12)	1,873	1.23	0.42	1.15	0.029	123
College/University	3,433	1.22	0.68	1.15	0.047	225
Retail/Service	4,117	1.19	0.88	1.11	0.060	261
Restaurant	4,816	1.26	0.68	1.15	0.049	316
Hotel/Motel	4,941	1.14	0.67	1.14	0.044	322
Medical	6,474	1.26	0.74	1.18	0.053	436
Grocery	5,824	1.25	0.81	1.13	0.058	376
Warehouse	4,859	1.09	0.84	1.06	0.052	294
Light Industry	4,290	1.08	0.99	1.04	0.061	255
Heavy Industry	4,290	1.08	0.99	1.04	0.061	255
Average = Miscellaneous	4,321	1.19	0.77	1.12	0.052	276

Table 9: Measure Savings for ≥30W

ComEd Building Types	Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects	Peak kW Savings	kWh Savings
Office	2,616	1.25	0.81	1.17	0.114	344
School (K-12)	1,873	1.23	0.42	1.15	0.058	242
College/University	3,433	1.22	0.68	1.15	0.093	444
Retail/Service	4,117	1.19	0.88	1.11	0.118	514
Restaurant	4,816	1.26	0.68	1.15	0.096	623
Hotel/Motel	4,941	1.14	0.67	1.14	0.086	634
Medical	6,474	1.26	0.74	1.18	0.105	859
Grocery	5,824	1.25	0.81	1.13	0.114	740
Warehouse	4,859	1.09	0.84	1.06	0.103	579
Light Industry	4,290	1.08	0.99	1.04	0.120	502
Heavy Industry	4,290	1.08	0.99	1.04	0.120	502
Average = Miscellaneous	4,321	1.19	0.77	1.12	0.103	544

Measure Savings Analysis

Annual energy savings and the peak coincident demand savings were calculated using the equations below. The annual operation hours, the coincidence factors, and the interactive effect factors were all obtained from the DEER database.² However, DEER building types were mapped to fit that of the ComEd Program. Industrial and warehouse operating hours were increased based on experience.

$$\text{Non-coincident kW reduction} = \text{kW of existing equipment} - \text{kW of replacement equipment}$$

Energy savings are calculated by applying the annual operating hours and the energy interactive effect, according to the following formula:

$$\text{kWh Reduction} = \text{non-coincident kW savings} * \text{Annual operating hours} * \text{Energy interactive effect}$$

Coincident demand savings are calculated by applying the coincidence factor and the demand interactive effect, according to the following formula:

$$\text{Coincident kW savings} = \text{non-coincident kW savings} * \text{Coincidence Factor} * \text{Demand interactive effect}$$

Measure Life and Incremental Measure Cost

The table below provides the measure life and IMC documented for this measure as well as the source of the data.

Incremental cost is the cost difference between the energy-efficient equipment and the less efficient option. In this case, lighting measures, the IMC is equal to the full measure cost since the cost of the less efficient option, i.e., not conducting the retrofit, is \$0.

Table 10: Measure Life and Incremental Measure Cost

Wattage Category		Value	Source
All	Measure Life	12	ICF Portfolio Study
≤29	Incremental Measure Cost	\$95	KEMA
≥30W	Incremental Measure Cost	\$132	KEMA

² 2005 Database for Energy Efficiency Resources (DEER) Update Study Final Report - Residential and Commercial Non-Weather Sensitive Measures

Permanent Lamp Removal	
Measure Description	Incentives are paid for the permanent removal of existing 8' and 4' fluorescent lamps. Unused lamps, lamp holders, and ballasts must be permanently removed from the fixture. This measure is applicable when retrofitting from T12 lamps to T8 lamps or simply removing lamps from a T8 fixture. Removing lamps from a T12 fixture that is not being retrofitted with T8 lamps are not eligible for this incentive.
Units	Per lamp
Base Case Description	Various configurations of 8' or 4' fluorescent fixtures before removal of lamps.
Measure Savings	Source: KEMA
Measure Incremental Cost	Source: ICF Portfolio
Effective Useful Life	Source: DEER 11 years

Incentives are paid for the permanent removal of existing fluorescent lamps resulting in a net reduction of the number of foot-lamps. Customers are responsible for determining whether or not to use reflectors in combination with lamp removal in order to maintain adequate lighting levels. Unused lamps, lamp holders, and ballasts must be permanently removed from the fixture. This measure is applicable when retrofitting from T12 lamps to T8 lamps or simply removing lamps from a T8 fixture. Removing lamps from a T12 fixture that is not being retrofitted with T8 lamps are not eligible for this incentive. A Pre-approval Application is required for lamp removal projects in order for Com Ed to conduct a pre-retrofit inspection.

Measure Savings

Non-coincident demand saving is summarized by the following table:

Table 11: Wattage Reduction

Wattage Category	Average Wattage Reduction
8 Foot Lamp Removal	68
4 Foot Lamp Removal	35

Since DEER building types differ from those used in the ComEd Smart Ideas Program, they are mapped to fit program. Some savings values have been combined to fit program needs (see detailed description of the methodology in the introduction).



Table 12: Measure Savings for 8-Foot Lamp Removal

ComEd Building Types	Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects	8-foot Lamp Peak Savings (kW)	8-foot Savings (kWh)
Office	2,808	1.25	0.81	1.17	0.069	223.1
School (K-12)	1,873	1.23	0.42	1.15	0.035	146.2
College/University	3,433	1.22	0.68	1.15	0.056	268.0
Retail/Service	4,210	1.19	0.88	1.11	0.071	317.3
Restaurant	5,278	1.26	0.68	1.15	0.058	412.1
Hotel/Motel	4,941	1.14	0.67	1.14	0.052	382.4
Medical	6,474	1.26	0.74	1.18	0.063	518.7
Grocery	5,824	1.25	0.81	1.13	0.069	446.9
Warehouse	4,859	1.09	0.84	1.06	0.062	349.7
Light Industry	4,290	1.08	0.99	1.04	0.073	302.9
Heavy Industry	4,290	1.08	0.99	1.04	0.073	302.9
Average = Miscellaneous	4,389	1.19	0.77	1.12	0.062	333.7

Table 13: Measure Savings for 4-Foot Lamp Removal

ComEd Building Types	Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects	4-foot Lamp Peak Savings (kW)	4-foot Savings (kWh)
Office	2,808	1.25	0.81	1.17	0.035	115.2
School (K-12)	1,873	1.23	0.42	1.15	0.018	75.5
College/ University	3,433	1.22	0.68	1.15	0.029	138.4
Retail/Service	4,210	1.19	0.88	1.11	0.037	163.8
Restaurant	5,278	1.26	0.68	1.15	0.030	212.8
Hotel/Motel	4,941	1.14	0.67	1.14	0.027	197.4
Medical	6,474	1.26	0.74	1.18	0.033	267.8
Grocery	5,824	1.25	0.81	1.13	0.035	230.7
Warehouse	4,859	1.09	0.84	1.06	0.032	180.6
Light Industry	4,290	1.08	0.99	1.04	0.037	156.4
Heavy Industry	4,290	1.08	0.99	1.04	0.037	156.4
Average = Miscellaneous	4,389	1.19	0.77	1.12	0.032	172.3

Measure Savings Analysis

Annual energy savings and the peak coincident demand savings were calculated using the equations below. The annual operation hours, the coincidence factors, and the interactive effect factors were all obtained from the DEER database.³ However, DEER building types were mapped to fit that of ours. Industrial and warehouse operating hours were increase based on experience.

$$\text{Non-coincident kW reduction} = \text{kW of existing equipment} - \text{kW of replacement equipment}$$

Energy savings are calculated by applying the annual operating hours and the energy interactive effect, according to the following formula:

³ 2005 Database for Energy Efficiency Resources (DEER) Update Study Final Report - Residential and Commercial Non-Weather Sensitive Measures



$$\text{kWh Reduction} = \text{non-coincident kW savings} * \text{Annual operating hours} * \text{Energy interactive effect}$$

Coincident demand savings are calculated by applying the coincidence factor and the demand interactive effect, according to the following formula:

$$\text{Coincident kW savings} = \text{non-coincident kW savings} * \text{Coincidence Factor} * \text{Demand interactive effect}$$

Baseline assumptions are presented in the next table. Most lighting retrofits assume an early replacement of existing technologies where the baseline represents the equipment removed. The table shows the wattages used for the savings calculations. Weighted average savings values are used when determining deemed savings for each 8 foot or 4 foot lamp permanently removed.

Table 14: Wattages for Eight-foot Lamps

Baseline	Base Wattage	Lamp Removed Wattage	Weight Percentages
Two 8' T12 (60W/75W)	140	70	85%
Two 8' T8 (59W)	111	56	15%
Total Weighted Average		68	

Table 15: Wattages for Four-foot Lamps

Baseline	Base Wattage	Lamp Removed Wattage	Weight Percentages
Two 4' T8 (32W)	65	36	3%
Two 4' T12 (34W/40W)	72	36	8%
Three 4' T8 (32W)	92	31	7%
Three 4' T12 (34W/40W)	115	38	22%
Four 4' T8 (32W)	118	30	15%
Four 4' T12 (34W/40W)	144	36	45%
Total Weighted Average		35	

Measure Life and Incremental Measure Cost

The following table provides the measure life and incremental measure cost (IMC) documented for this measure as well as the source of the data.

Incremental cost is cost difference between the energy efficient equipment and the less efficient option. In this case the lighting measures, the IMC is equal to the full measure cost since the cost of the less efficient option, i.e., not conducting the retrofit, is \$0.

Table 16: Measure Life and Incremental Measure Cost

Wattage Category		Value	Source
All	Measure Life	11	DEER
8-Foot Lamp Removal	Incremental Measure Cost	\$25.91	ICF Portfolio Study
4-Foot Lamp Removal	Incremental Measure Cost	\$25.70	ICF Portfolio Study

High Performance and Reduced Wattage 4-foot T8 Lamps and Ballast	
Measure Description	This measure consists of replacing existing T12 4' lamps and magnetic ballasts with high performance 32W T8 lamps or reduced wattage 28W or 25W lamps and electronic ballasts. Both the lamp and ballast must meet the Consortium for Energy Efficiency (CEE) high performance or reduced wattage T8 specification (www.cee1.org) and summarized below.
Units	Per lamp
Base Case Description	T12 lamp and magnetic ballasts
Measure Savings	Source: KEMA
Measure Incremental Cost	Source: ICF Portfolio
Effective Useful Life	Source: DEER 11 years

This measure consists of replacing existing T12 lamps and magnetic ballasts with high-performance T8 lamps or reduced wattage (28 or 25W) T8 lamps and electronic ballasts. This measure is based on the Consortium for Energy Efficiency (CEE) high-performance T8 or reduced wattage specification (www.cee1.org) and is summarized below. A list of qualified lamps and ballasts can be found at: <http://www.cee1.org/com/com-lt/com-lt-main.php3>. Both the lamp and ballast must meet the specification to qualify for an incentive. The incentive is calculated based on the number of lamps installed. A manufacturer's specification sheet must accompany the application.

For reduced wattage 4-foot T8 lamps, the nominal wattage must be 28 W ($\geq 2,585$ Lumens) or 25 W ($\geq 2,400$ Lumens) to qualify. The mean system efficacy must be ≥ 90 MLPW, CRI ≥ 80 , and lumen maintenance at 94 percent. Other requirements can be found on the CEE website using the links above.

The table below provides the specification for high performance systems.

Table 17: High-Performance T8 Specifications

Performance Characteristics for Systems					
Mean system efficacy	≥ 90 Mean Lumens per Watt (MLPW) for Instant Start Ballasts				
	≥ 88 MLPW for Programmed Rapid Start Ballasts				
Performance Characteristics for Lamps					
Color Rendering Index (CRI)	≥ 80				
Minimum initial lamp lumens	≥ 3100 Lumens ⁴				
lamp life	≥ 24,000 hours				
Lumen maintenance or minimum mean lumens	≥ 90% or ≥ 2,900 Mean Lumens				
Performance Characteristics for Ballasts					
Ballast Efficacy Factor (BEF) BEF = (BF x 100) / Ballast Input Watts	Instant-Start Ballast (BEF)				
	Lamps	Low BF ≤ 0.85	Norm 0.85 < BF ≤ 1.0	High BF ≥ 1.01	
	1	> 3.08	> 3.11	NA	
	2	> 1.60	> 1.58	>1.55	
	3	≥ 1.04	≥ 1.05	≥ 1.04	
	4	≥ 0.79	≥ 0.80	≥ 0.77	
	Programmed Rapid Start Ballast (BEF)				
	1	≥ 2.84	≥ 2.84	NA	
	2	≥ 1.48	≥ 1.47	≥ 1.51	
	3	≥ 0.97	≥ 1.00	≥ 1.00	
	4	≥ 0.76	≥ 0.75	≥ 0.75	
	Ballast Frequency	20 to 33 kHz or ≥ 40 kHz			
	Power Factor	≥ 0.90			
Total Harmonic Distortion	≤ 20%				

Measure Savings

Since DEER building types differ from those used in the ComEd Smart Ideas Program, they are mapped to fit the program. Some savings values have been combined to fit program needs (see detailed description of the methodology in the introduction). The coincident kW and kWh savings are provided by building type in the following tables.

⁴ For lamps with temperature ≥4500K, 2,950 minimum initial lamp lumens are specified.

Table 18: Measure Savings for High-Performance or Reduced Wattage 4-foot Lamp and Ballast (per lamp)

ComEd Building Types	Coincident Demand Savings (kW)	Energy Savings (kWh)
Office	0.013	41.4
School (K-12)	0.007	27.2
College/University	0.010	49.8
Retail/Service	0.013	58.9
Restaurant	0.011	76.5
Hotel/Motel	0.010	71.0
Medical	0.012	96.3
Grocery	0.013	83.0
Warehouse	0.012	65.0
Light Industry	0.013	56.3
Heavy Industry	0.013	56.3
Average = Miscellaneous	0.012	62.0

Measure Savings Analysis

Annual energy savings and the peak coincident demand savings were calculated using the equations below. The annual operation hours, the coincidence factors, and the interactive effect factors were all obtained from the DEER database and shown in the following table. However, DEER building types were mapped to fit that of ours.

Table 19: Factors used for Calculating Lighting Savings

ComEd Building Types	Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects
Office	2,808	1.25	0.81	1.17
School (K-12)	1,873	1.23	0.42	1.15
College/University	3,433	1.22	0.68	1.15
Retail/Service	4,210	1.19	0.88	1.11
Restaurant	5,278	1.26	0.68	1.15
Hotel/Motel	4,941	1.14	0.67	1.14
Medical	6,474	1.26	0.74	1.18
Grocery	5,824	1.25	0.81	1.13
Warehouse	4,859	1.09	0.84	1.06
Light Industry	4,290	1.08	0.99	1.04
Heavy Industry	4,290	1.08	0.99	1.04
Average = Miscellaneous	4,389	1.19	0.77	1.12

Non-coincident kW reduction = kW of existing equipment - kW of replacement equipment

Energy savings are calculated by applying the annual operating hours and the energy interactive effect, according to the following formula:

$$\text{kWh Reduction} = \text{non-coincident kW savings} * \text{Annual operating hours} * \text{Energy interactive effect}$$

Coincident demand savings are calculated by applying the coincidence factor and the demand interactive effect, according to the following formula:

$$\text{Coincident kW savings} = \text{non-coincident kW savings} * \text{Coincidence Factor} * \text{Demand interactive effect}$$

Baseline and retrofit equipment assumptions are presented in the table below.

Table 20: Baseline and Retrofit Wattages for High-Performance or Reduced Wattage Fixture Retrofits

	T8, 4-foot Configuration	Base Fixture Wattage	Retrofit Lamp Wattage	Retrofit Fixture Wattage	Demand Savings per fixture (kW)	Demand Savings per lamp (kW)	Weight Percentages
High	4-lamp	144	32	108	0.036	0.009	9%
	3-lamp	103	32	83	0.02	0.007	4%
	2-lamp	72	32	54	0.018	0.009	8%
	1-lamp	43	32	28	0.015	0.015	4%
Med	4-lamp	144	28	96	0.048	0.012	15%
	3-lamp	103	28	72	0.031	0.010	10%
	2-lamp	72	28	48	0.024	0.012	15%
	1-lamp	43	28	25	0.018	0.018	10%
Low	4-lamp	144	25	85	0.059	0.015	9%
	3-lamp	103	25	66	0.037	0.012	4%
	2-lamp	72	25	44	0.028	0.014	8%
	1-lamp	43	25	22	0.021	0.021	4%
	Weighted Average					0.0126	

Measure Life and Incremental Measure Cost

The table below provides the measure life and IMC documented for this measure as well as the source of the data. Incremental cost is cost difference between the energy-efficient equipment and the less efficient option. In this case the lighting measures, the IMC is equal to the full measure cost since cost of the less efficient option.

Table 21: Measure Life and Incremental Measure Cost

	Measure Category	Value	Source
Measure Life	Lamp and Ballast	11	DEER
Incremental Measure Cost	4 Foot Lamp and Ballast	\$16.50	ICF Portfolio Plan

Reduced Wattage 4-foot Lamp Only	
Measure Description	This measure consists of replacing existing standard T8 4' lamps and electronic ballasts with reduced wattage T8 lamps. The lamp must meet the Consortium for Energy Efficiency (CEE) reduced wattage T8 specification (www.cee1.org). The nominal wattage for 4 foot lamps must be 28W (≥2585 Lumens) or 25W (≥2400 Lumens) to qualify. The mean system efficacy must be ≥ 90 MLPW, CRI ≥ 80, and lumen maintenance at 94%. A manufacturer's specification sheet must accompany the application.
Units	Per lamp
Base Case Description	Standard T8 fixtures.
Measure Savings	Source: KEMA
Measure Incremental Cost	Source: ICF Portfolio
Effective Useful Life	Source: KEMA 3 years

Incentives are available for when replacing standard 32-Watt T8 lamps with reduced-wattage T8 lamps when an electronic ballast is already present. The lamps must be reduced wattage in accordance with the Consortium for Energy Efficiency (CEE) specification (www.cee1.org). Qualified products can be found at <http://www.cee1.org/com/com-lt/com-lt-main.php3>. The nominal wattage must be 28 W (≥2,585 Lumens) or 25 W (≥2,400 Lumens) to qualify. The mean system efficacy must be ≥ 90 MLPW, CRI ≥80, and lumen maintenance at 94 percent. A manufacturer's specification sheet must accompany the application.

Measure Savings

Since DEER building types differ from those used in the ComEd Smart Ideas Program, they are mapped to fit the program. Some savings values have been combined to fit program needs (see detailed description of the methodology in the introduction). The coincident kW and kWh savings are provided by building type in the following table.

Table 22: Measure Savings for Reduced-Wattage 4-foot Lamp Only

ComEd Building Types	Coincident Demand Savings (kW)	Energy Savings (kWh)
Office	0.006	19.3
School (K-12)	0.003	12.6
College/University	0.005	23.1
Retail/Service	0.006	27.4
Restaurant	0.005	35.6
Hotel/Motel	0.004	33.0
Medical	0.005	44.8
Grocery	0.006	38.6
Warehouse	0.005	30.2
Light Industry	0.006	26.2
Heavy Industry	0.006	26.2
Average = Miscellaneous	0.005	28.8

Measure Savings Analysis

Annual energy savings and the peak coincident demand savings were calculated using the equations below. The annual operation hours, the coincidence factors, and the interactive effect factors were all obtained from the DEER database and shown in the next table. However, DEER building types were mapped to fit that of the ComEd Program.



Table 23: Factors used for Calculating Lighting Savings

ComEd Building Types	Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects
Office	2,808	1.25	0.81	1.17
School (K-12)	1,873	1.23	0.42	1.15
College/University	3,433	1.22	0.68	1.15
Retail/Service	4,210	1.19	0.88	1.11
Restaurant	5,278	1.26	0.68	1.15
Hotel/Motel	4,941	1.14	0.67	1.14
Medical	6,474	1.26	0.74	1.18
Grocery	5,824	1.25	0.81	1.13
Warehouse	4,859	1.09	0.84	1.06
Light Industry	4,290	1.08	0.99	1.04
Heavy Industry	4,290	1.08	0.99	1.04
Average = Miscellaneous	4,389	1.19	0.77	1.12

Non-coincident kW reduction = kW of existing equipment - kW of replacement equipment

Energy savings are calculated by applying the annual operating hours and the energy interactive effect, according to the following formula:

$$\text{kWh Reduction} = \text{non-coincident kW savings} * \text{Annual operating hours} * \text{Energy interactive effect}$$

Coincident demand savings are calculated by applying the coincidence factor and the demand interactive effect, according to the following formula:

$$\text{Coincident kW savings} = \text{non-coincident kW savings} * \text{Coincidence Factor} * \text{Demand interactive effect}$$

Baseline and retrofit equipment assumptions are presented in the next table.

Table 24: Baseline and Retrofit Wattages for 4-foot T8 Lamp Only

T8 Configuration	Base Lamp Wattage	Base Fixture Wattage	Retrofit Lamp Wattage	Retrofit Fixture Wattage	Demand Savings per fixture (kW)	Demand Savings per lamp (kW)	Weight Percentages
4 ft, 4-lamp	32	112	28	96	0.016	0.004	18%
4 ft, 3-lamp	32	85	28	72	0.013	0.004	13%
4 ft, 2-lamp	32	58	28	48	0.01	0.005	15%
4 ft, 1-lamp	32	32	28	25	0.007	0.007	5%
4 ft, 4-lamp	32	112	25	85	0.027	0.007	18%
4 ft, 3-lamp	32	85	25	66	0.019	0.006	13%
4 ft, 2-lamp	32	58	25	44	0.014	0.007	15%
4 ft, 1-lamp	32	32	25	22	0.01	0.010	5%
Weighted Average						0.006	

Measure Life and Incremental Measure Cost

The following table provides the measure life and IMC documented for this measure as well as the source of the data. Incremental cost is the cost difference between the energy-efficient equipment and the less efficient option. In this case, lighting measures, the IMC is equal to the full measure cost for lamp and ballast retrofit and incremental for lamp only. The lamp and ballast retrofit is a change in technology.

Table 25: Measure Life and Incremental Measure Cost

	Measure Category	Value	Source
Measure Life	Lamp Only	3	KEMA
Incremental Measure Cost	4 Foot Lamp Only	\$2.10	ICF Portfolio Plan

Reduced Wattage 8-foot	
Measure Description	<p>This measure consists of replacing existing T12 8' lamps and magnetic ballasts with reduced wattage T8 lamps and electronic ballasts. Both the lamp and ballast must meet the Consortium for Energy Efficiency (CEE) high performance or reduced wattage T8 specification (www.cee1.org). Eight foot lamps must have a minimum MLPW of 90 and must have a nominal wattage of less than 57W. A manufacturer's specification sheet must accompany the application.</p> <p>High wattage T8 (59W) can be replaced with reduced wattage lamps without replacing the ballast. The lamps must also meet CEE standards for reduced wattage.</p>
Units	Per lamp
Base Case Description	T12 lamp and magnetic ballasts or high watt T8 fixtures (for reduced wattage lamp only replacements).
Measure Savings	Source: KEMA
Measure Incremental Cost	Source: ICF Portfolio
Effective Useful Life	Source: KEMA and DEER

This measure consists of replacing existing T12 lamps and magnetic ballasts with reduced wattage lamp and electronic ballast systems. The lamps and ballasts must meet the Consortium for Energy Efficiency (CEE) specification (www.cee1.org). Qualified lamps and ballast products can be found at <http://www.cee1.org/com/com-lt/com-lt-main.php3>. Incentives are also available for when replacing 59-Watt T8 lamps with reduced-wattage T8 lamps when an electronic ballast is already present. Eight-foot lamps must have a minimum MLPW of 90 and must have a nominal wattage of less than 57 W. A manufacturer's specification sheet must accompany the application.

Measure Savings

Since DEER building types differ from those used in the ComEd Smart Ideas Program, they are mapped to fit the program. Some savings values have been combined to fit program needs (see detailed description of the methodology in the introduction). The coincident kW and kWh savings are provided by building type in the following tables.

Table 26: Measure Savings for Reduced-Wattage 8-foot Lamp and Ballast

ComEd Building Types	Coincident Demand Savings (kW)	Energy Savings (kWh)
Office	0.013	41.1
School (K-12)	0.006	26.9
College/University	0.010	49.3
Retail/Service	0.013	58.4
Restaurant	0.011	75.9
Hotel/Motel	0.010	70.4
Medical	0.012	95.5
Grocery	0.013	82.3
Warehouse	0.011	64.4
Light Industry	0.013	55.8
Heavy Industry	0.013	55.8
Average = Miscellaneous	0.011	61.4

Table 27: Measure Savings for Reduced-Wattage 8-foot Lamp Only

ComEd Building Types	Coincident Demand Savings (kW)	Energy Savings (kWh)
Office	0.005	16.4
School (K-12)	0.003	10.8
College/University	0.004	19.7
Retail/Service	0.005	23.4
Restaurant	0.004	30.3
Hotel/Motel	0.004	28.2
Medical	0.005	38.2
Grocery	0.005	32.9
Warehouse	0.005	25.8
Light Industry	0.005	22.3
Heavy Industry	0.005	22.3
Average = Miscellaneous	0.005	24.6

Measure Savings Analysis

Annual energy savings and the peak coincident demand savings were calculated using the equations below. The annual operation hours, the coincidence factors, and the interactive effect



factors were all obtained from the DEER database and shown in the table below. However, DEER building types were mapped to fit that of the ComEd Program.

Table 28: Factors used for Calculating Lighting Savings

ComEd Building Types	Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects
Office	2,808	1.25	0.81	1.17
School (K-12)	1,873	1.23	0.42	1.15
College/University	3,433	1.22	0.68	1.15
Retail/Service	4,210	1.19	0.88	1.11
Restaurant	5,278	1.26	0.68	1.15
Hotel/Motel	4,941	1.14	0.67	1.14
Medical	6,474	1.26	0.74	1.18
Grocery	5,824	1.25	0.81	1.13
Warehouse	4,859	1.09	0.84	1.06
Light Industry	4,290	1.08	0.99	1.04
Heavy Industry	4,290	1.08	0.99	1.04
Average = Miscellaneous	4,389	1.19	0.77	1.12

Non-coincident kW reduction = kW of existing equipment - kW of replacement equipment

Energy savings are calculated by applying the annual operating hours and the energy interactive effect, according to the following formula:

$$\text{kWh Reduction} = \text{non-coincident kW savings} * \text{Annual operating hours} * \text{Energy interactive effect}$$

Coincident demand savings are calculated by applying the coincidence factor and the demand interactive effect, according to the following formula:

$$\text{Coincident kW savings} = \text{non-coincident kW savings} * \text{Coincidence Factor} * \text{Demand interactive effect}$$

Baseline and retrofit equipment assumptions are presented in the next table.



Table 29: Baseline and Retrofit Wattages for 8-foot

	Configuration	Base Lamp Wattage	Base Fixture Wattage	Retrofit Lamp Wattage	Retrofit Fixture Wattage	Demand Savings per fixture (kW)	Demand Savings per lamp (kW)	Weight Percentages
Lamp and Ballast	8ft, 2 lamp	60	132	57	102	0.016	0.008	50%
	8ft, 1-lamp	60	77	57	60	0.017	0.017	50%
	Weighted Average						0.013	
Lamp Only	8ft, 2 lamp	59	106	57	102	0.004	0.002	50%
	8ft, 1-lamp	59	68	57	60	0.008	0.008	50%
	Weighted Average						0.005	

Measure Life and Incremental Measure Cost

The following table provides the measure life and IMC documented for this measure as well as the source of the data. Incremental cost is the cost difference between the energy-efficient equipment and the less efficient option. In this case, lighting measures, the IMC is equal to the full measure cost for lamp and ballast retrofit and incremental for lamp only. The lamp and ballast retrofit is a change in technology.

Table 30: Measure Life and Incremental Measure Cost

	Measure Category	Value	Source
Measure Life	Lamp and Ballast	11	DEER
Measure Life	Lamp Only	3	KEMA
Incremental Measure Cost	8 Foot Lamp and Ballast	\$38.00	ICF Portfolio Plan
Incremental Measure Cost	8 Foot Lamp Only	\$5.50	ICF Portfolio Plan

2-foot & 3-foot T8 Lamps and Ballast	
Measure Description	This measure consists of replacing existing T12 2-foot and 3-foot lamps and magnetic ballasts with 17W, 2-foot, and 25W, 3-foot, T8 lamps and electronic ballasts.
Units	Per lamp
Base Case Description	T12 lamps and magnetic ballast
Measure Savings	Source: KEMA
Measure Incremental Cost	Source: PG& E 2006 Work papers
Effective Useful Life	Source: DEER 11 years

This measure consists of replacing existing T12 lamps and magnetic ballasts with T8 lamps and electronic ballasts. The lamp must have a color rendering index (CRI) ≥ 80 and the ballast must have a total harmonic distortion (THD) $\leq 32\%$ at full light output and power factor (PF) ≥ 0.90 . Ballasts must also be warranted against defect for 5 years. The incentive is calculated based on the number of lamps installed. A manufacturer's specification sheet must accompany the application.

Measure Savings

The coincident kW and kWh savings are provided by building type in the following table:

Table 31: Measure Savings for 2-foot and 3-foot Lamp and Ballast (per lamp)

ComEd Building Types	2-foot Lamp fixtures		3-foot Lamp fixtures	
	Coincident Demand Savings (kW)	Energy Savings (kWh)	Coincident Demand Savings (kW)	Energy Savings (kWh)
Office	0.011	34.5	0.014	46.5
School (K-12)	0.005	22.6	0.007	30.5
College/University	0.009	41.5	0.012	55.8
Retail/Service	0.011	49.1	0.015	66.1
Restaurant	0.009	63.7	0.012	85.9
Hotel/Motel	0.008	59.2	0.011	79.7
Medical	0.010	80.2	0.013	108.1
Grocery	0.011	69.1	0.014	93.1
Warehouse	0.010	54.1	0.013	72.9
Light Industry	0.011	46.9	0.015	63.1
Heavy Industry	0.011	46.9	0.015	63.1
Average = Miscellaneous	0.010	51.6	0.013	69.5

Measure Savings Analysis

Annual energy savings and the peak coincident demand savings were calculated using the equations below. The annual operation hours, the coincidence factors, and the interactive effect factors were all obtained from the DEER database and shown in the following table. Since DEER building types differ from those used in the ComEd Smart Ideas Program, they are mapped to fit the program. Some savings values have been combined to fit program needs (see detailed description of the methodology in the introduction).

Table 32: Factors used for Calculating Lighting Savings



ComEd Building Types	Annual Operating Hours	Demand Interactive Effects	Coincident Diversity Factors	Energy Interactive Effects
Office	2,808	1.25	0.81	1.17
School (K-12)	1,873	1.23	0.42	1.15
College/University	3,433	1.22	0.68	1.15
Retail/Service	4,210	1.19	0.88	1.11
Restaurant	5,278	1.26	0.68	1.15
Hotel/Motel	4,941	1.14	0.67	1.14
Medical	6,474	1.26	0.74	1.18
Grocery	5,824	1.25	0.81	1.13
Warehouse	4,859	1.09	0.84	1.06
Light Industry	4,290	1.08	0.99	1.04
Heavy Industry	4,290	1.08	0.99	1.04
Average = Miscellaneous	4,389	1.19	0.77	1.12

Non-coincident kW reduction = kW of existing equipment - kW of replacement equipment

Energy savings are calculated by applying the annual operating hours and the energy interactive effect, according to the following formula:

$$\text{kWh Reduction} = \text{non-coincident kW savings} * \text{Annual operating hours} * \text{Energy interactive effect}$$

Coincident demand savings are calculated by applying the coincidence factor and the demand interactive effect, according to the following formula:

$$\text{Coincident kW savings} = \text{non-coincident kW savings} * \text{Coincidence Factor} * \text{Demand interactive effect}$$

Baseline and retrofit equipment assumptions are presented in the tables below. The fixture wattages were collected from PG&E's Non-residential Retrofit Program standard fixture wattage table.