LARGE FILING SEPARATOR SHEET

CASE NUMBER 12-1857-EL-RDR

FILE DATE 6/29/2012

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(12 pm – 5 pm)									
Evening (5 pm – 10 pm)									
Night (10 pm – 6 am)									

26. What is your thermostat setting on a hot *summer weekend* (Saturday or Sunday) when you are using the air conditioner

	< 65	65 to 68	69 to 72	73 to 75	73 to 75	76 to 78	>78	OFF	Do not have a thermostat that controls the air conditioner
Morning (6 am – 12 pm)									
Afternoon (12 pm – 5 pm)									
Evening (5 pm – 10 pm)									
Night (10 pm – 6 am)									

27. **Do you have a programmable thermostat?**
   a. Yes
   b. No

YOUR HOUSEHOLD

The following questions are about your household. Please keep in mind that all information you provide will be kept strictly confidential and will not be released to anyone. This information will be combined with information provided by other households and will be used for statistical purposes only.

28. **How many people live in this home?**
   a. 1
   b. 2
   c. 3
   d. 4
   e. 5
   f. 6
   g. 7
   h. 8 or more

29. **How many persons are usually home on a weekday afternoon?**

a. 0
b. 1
c. 2
d. 3
e. 4
f. 5
g. 6
h. 7
i. 8 or more

30. **What is the fuel used in your primary heating system?** *(Mark all that apply)*
    a. Electricity
    b. Natural Gas
    c. Oil
    d. Propane
    e. Other

31. **Which of the following best describes your home's primary heating system?**
    a. None
    b. Central forced air furnace
    c. Electric Baseboard
    d. Heat Pump
    e. Geothermal Heat Pump
    f. Other

32. **If you have a central furnace system, how old is the primary system?**
    a. 0-4 years
    b. 5-9 years
    c. 10-14 years
    d. 15-19 years
    e. 19 years
    f. Don't know
    g. Do not have

33. **What is the fuel used by your water heater?** ***(Mark all that apply)***
    a. Electricity
    b. Natural Gas
    c. Oil
    d. Propane
    e. Other

34. **How old is your water heater?**
    a. 0-4 years
    b. 5-9 years
    c. 10-14 years
    d. 15-19 years

e. > 19 years
f. Don't know

Optional - the following questions are for classification purposes only and will not be used for any other purpose than to help Duke Energy continue to improve service.

35. **What is your age group?**
    a. 18-34
    b. 35-49
    c. 50-59
    d. 60-64
    e. 65-74
    f. Over 74

36. **Please indicate your annual household income.**
    a. Under $15,000
    b. $15,000-$29,999
    c. $30,000-$49,999
    d. $50,000-$74,999
    e. $75,000-$100,000
    f. Over $100,000

Those are all of the questions I have for you. Thank you for participating.

Appendix B: Energy Solutions @ Home Phone Audit But No In-home Audit Participant Survey Instrument

The questions below require mostly short, scaled replies from the interviewee, and not all questions will be asked of all participants. This interview should take approximately 10 to 15 minutes.

Energy Solutions at Home Program

Phone Audit Participant Survey

Use five attempts at different times of the day and different days before dropping from contact list. Call times are from 10:00 a.m. to 8:00 p.m. EST or 9-7 CST Monday through Saturday. No calls on Sunday. (Sample size N =?)

SURVEY

Introduction

Note: Only read words in bold type.

Hello, my name is _____. I am calling on behalf of Duke Energy to conduct a customer survey about the Energy Solutions at Home Program. May I speak with _____ please?

If person talking, proceed. If person is called to the phone reintroduce.
If not home, ask when would be a good time to call and schedule the call-back:

Call back 1:	Date: _____,	Time: _____	❑AM or ❑PM
Call back 2:	Date: _____,	Time: _____	❑AM or ❑PM
Call back 3:	Date: _____,	Time: _____	❑AM or ❑PM
Call back 4:	Date: _____,	Time: _____	❑AM or ❑PM
Call back 5:	Date: _____,	Time: _____	❑AM or ❑PM

❑ Contact dropped after fifth attempt.

We are conducting this survey to obtain your opinions about the Energy Solutions at Home Program. Duke Energy's records indicate that you participated in the Energy Solutions at Home Program. We are not selling anything. The survey will take about 10 minutes and your answers will be confidential, and will help us to make improvements to the program to better serve others. May we begin the survey?

Note: If this is not a good time, ask if there is a better time to schedule a callback.

1. **Do you recall participating in the Energy Solutions at Home Program?**

   a. Yes - *Skip to Q2.*
   b. No
   c. DK/NS

   This program was provided through Duke Energy. In this program, you registered to receive a home energy assessment for $90. In return, the assessors provided you with custom energy-saving recommendations for you and your home, as well as suggestions for major upgrades that were eligible for Duke Energy's incentive programs. These incentives included rebates as well as assistance with project construction.

   Do you remember participating in this program?

   a Yes - *Go to Q2.*
   b. No
   c. DK/NS

If No or DK/NS terminate interview and go to next participant.

2. **Our records indicate that you participated in a phone assessment, but chose not schedule a home assessment, is this correct?**
   a. Yes
   b. No – *ask question 2a.*

   2a. **Did you complete an on-site home audit?**
   Yes – *start new survey with home audit protocol*
   No – *continue survey*

3. **How did you first learn of the Energy Solutions at Home program?**
   a. Mailer/brochure
   b. Other Duke Energy program -- **Which one?** _____
   c. Duke Energy Web Site
   d. Friend
   e. Relative
   f. Other: _____

4. **Please think back to the time when you were deciding to participate in the Energy Solutions at Home program. What factors motivated you to**

participate? (*do not read list, place a "1" next to the response that matches best)*

a. The assessment
b. The program incentives
c. The technical assistance from the assessor
d. Coordination with contractor
e. Coordination with lending institution
f. Recommendation of someone else (*Probe*: **Who?**_____)
g. Wanted to reduce energy costs
h. The information provided by the Program
i. Past experience with this program
j. Because of past experience with another Duke Energy program
k. Recommendation from other utility program
   i. (*Probe*: **What program?** _____)
l. Recommendation of family/friend/neighbor
m. Other (SPECIFY) _____
n. Don't know/don't remember/not sure (DK/NS)

If multiple responses: 2.a. **Were there any other reasons?** *(number responses above in the order they are provided - Repeat until 'no' response.)*

Duke Energy has not heard from you since your phone assessment and would like to ask you a few follow-up questions. Your answers will be grouped with others so please be candid and honest in your answers. Do you have a few minutes?

5. **What was your reason for not scheduling an appointment with our Energy Experts for a comprehensive energy assessment of your home?**

   a) Not a good time for me
   b) Felt Initial assessment would be too time-consuming
   c) Initial cost was too expensive
   d) Not interested in saving energy
   e) Feel I already do enough to save energy in my house
   f) Feel I am already knowledgeable about ways to save energy
   g) Don't believe the projected savings are accurate
   h) I like my home the way it is
   i) Felt that the over-the-phone assessment gave me enough to do at this time
   j) ❑Was not aware that there were further steps to the program

5b. Was there any other reason?
a. Yes **What were the other reasons?**
_____
b. No

IF THESE ARE NOT SPECIFICALLY STATED IN 5 OR 5B:

6. **Was the timing of the offering an issue for you?**

   a. Yes
   b. No *(skip to 7)*

   6a. Why do you say that? _____

7. **The energy assessment cost $50 and could later be applied to the cost of program-approved improvements. Do you think $50 for a home energy assessment was too expensive?**
   a. Yes
   b. No *(skip to 8)*

   In this assessment, a skilled energy inspector comes to your home and inspects it for any opportunities to reduce your energy consumption and provide you with a report listing suggestions for you. They then can provide contacts with contractors in order to make the home more energy efficient. ..

   7a. What price should Duke Energy charge for this service?

   a. _____
   b. Don't Know (*skip to 8*)

   7b. If it were priced at this level, would you be interested in having an energy assessment? Again, we are not promoting or selling, we are only interested in customer opinions.
   a. Yes
   b. No
   c. Don't Know

8. **Did you understand what Duke Energy was offering?**
   a. Yes --- *Skip to 9*
   b. No
   c. Don't Know/Not Sure

   8a. Was there anything specific about the program's offering that you didn't understand?

   _____

9. **After you completed the over-the-phone assessment, did you call or email Duke Energy with any additional questions about the program?**

   a. Yes
   b. No ---- *Skip to 10*

   9b. Did they answer your questions adequately?
   a. Yes
   b. No

10. **What effect, if any, did the phone audit have on your decision not to schedule a home audit. Was it...**

    a. **Very influential**
    b. **Influential**
    c. **Not very influential**
    d. **Of no influence at all**

Measure Questions

If <Insulation / AC / furnace / caulking and sealing / heat pump> was recommended:

11. **Did you install the** <measure> **as recommended in the Energy Solutions at Home Assessment Report?**

    a. Yes –*ask question 11a*
    b. No – *ask question 11b*
    c. DK

    If yes, **11a. What did you do?** _____
    ask about next measure if measures are exhausted skip to question 12

    If no, **11b. Do you have plans to install <measure>?**
    a. Yes – *go to question 11c*
    b. No – *skip to question 11d*
    c. DK – *skip to question 11d*

    11c. When do you plan to install this measure?
    a. Within the next 6 months
    b. Within the next year
    c. Within the next two years
    d. Within the next three years
    e. After three years
    f. Don't Know

11d. Can you tell me why you have decided to delay or skip installation ?

a. Don't believe it will improve comfort
b. Don't believe it will save energy
c. Don't believe it will reduce bills
d. Installing other measures first
e. Cannot afford it at this time
f. Other : _____

Repeat question 11 until all measures are exhausted

12. **Did you receive a rebate through the Energy Solutions as Home program for this installation?**
    a) Yes
    b) No – skip to question 15
    c) DK – skip to question 15

13. **Did you find the level of the rebate satisfactory?**
    a) Yes
    b) No
    c) DK

    14. *If no to question 13* **What amount would you consider a satisfactory rebate for this installation?** _____

15. **Did you receive a rebate from any other Duke Energy incentive programs for this installation?**
    a) Yes
    b) No – *skip to question 16*
    c) DK/NS – *skip to question 16*

    If yes, **15a. From which program?**
    a) Res Smart Saver
    b) Home Energy House Call
    c) Smart Saver CFL
    d) Other: _____
    e) Don't Know

16. **Before receiving the Energy Solutions at Home phone assessment, what was your level of interest in this installation?**
    a) None
    b) Already been thinking about doing it
    c) Already collecting information about this type of project
    d) Already begun to get product information and price estimates
    e) Already made a firm decision to install

f) Already negotiated with a supplier to install the project

If c or d above, **16a. Would you have focused as much attention to the energy efficiency aspects of the project if you would have done it on your own without the phone assessment?**

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

Repeat for all measures installed...

Spillover Questions

17. **Since you participated in the Energy Solutions at Home Program, have you purchased and installed any other type of energy efficiency equipment or made energy efficiency improvements in your home that were not recommended by the assessment report?**
    a) Yes
    b) No
    c) Don't Know
    If Yes, **What did you do?**

    _____
    _____

18. **What type and quantity of high efficiency equipment did you install on your own?** *Probe to get exact type and quantity and location*

Type 1: _____	Quantity 1: _____	Location 1: _____
Type 2: _____	Quantity 2: _____	Location 2: _____
Type 3: _____	Quantity 3: _____	Location 3: _____
Type 4: _____	Quantity 4: _____	Location 4: _____

19. *For each type listed in 18 above,*
    How do you know that this equipment is high efficiency? For example, was it Energy Star rated?

    Type 1: _____
    Type 2: _____
    Type 3: _____
    Type 4: _____

I'm going to read a statement about this equipment that you purchased on your own. On a scale from 1-10, with 0 indicating that you strongly disagree, and 10 indicating that you strongly agree, please rate the following statement.

20. **My experience with the Energy Solutions at Home Program in <month/year> influenced my decision to install <Type 1/Type 2/Type 3/Type 4> on my own.**

Type 1:	1	2	3	4	5	6	7	8	9	10	Don't Know
Type 2:	1	2	3	4	5	6	7	8	9	10	Don't Know
Type 3:	1	2	3	4	5	6	7	8	9	10	Don't Know
Type 4:	1	2	3	4	5	6	7	8	9	10	Don't Know

21. **What other actions, if any, have you taken in your home to save energy and reduce utility bills at least in part as a result of what you learned in this program?**

Response 1: _____
Response 2: _____
Response 3: _____
Response 4: _____

22. **Do you feel that you have already explored all possibilities for improving the energy saving and comfort level of your home?**
    a) Yes --- *Skip to 23*
    b) No
    c) Don't Know

    If no or don't know,
    22a. What types of things do you think are left to be done (again, we are not selling anything).
    Type 1: _____
    Type 2: _____
    Type 3: _____
    Type 4: _____

23. **Generally speaking, how important are environmental issues to you? Would you say they are…**

    a. **Very Important**
    b. **Important**
    c. **Neither Important nor Not Important**

d. **Not Important**
e. **Not at all Important**

24. **What do you think is the most pressing environmental issues today?**

_____

25. **Generally speaking, how important is decreasing your monthly energy bill to you? Would you say it is…**

a. **Very Important**
b. **Important**
c. **Neither Important Nor Not Important**
d. **Not Important, or**
e. **Not At All Important**

26. **How important is maintaining the comfort level of your home to you? Would you say it is…**

a. **Very Important**
b. **Important**
c. **Neither Important Nor Not Important**
d. **Not Important, or**
e. **Not At All Important**

27. **What additional services would you like the program to provide that it does not now provide?**
Response: _____
_____

28. **Are there any other things that you would like to see changed about the program?**
Response: _____

29. **What do you think can be done to increase people's interest in participating in the Energy Solutions at Home Program?**
Response 1: _____
Response 2: _____
Response 3: _____
Response 4: _____

30. **What do you like most about this program?**
Response: _____

31. **What do you like least about this program?**
Response: _____

Now I am going to ask you some general satisfaction statements. On a scale from 1-10, with 1 indicating that you strongly disagree, and 10 indicating that you strongly agree, please rate the following statements.

32. **Scheduling the over-the-phone energy assessment was easy to do.**

1 2 3 4 5 6 7 8 9 10 Don't Know

If 7 or less, **How could this be improved?**

_____

33. **The interactions and communications I had with the over-the-phone energy assessor were satisfactory.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know ❑ Not Applicable (no interaction)

If 7 or less, **How could this be improved?**

_____

34. **The over-the-phone energy assessor was helpful and knowledgeable.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know ❑ Not Applicable (no interaction)

If 7 or less, **How could this be improved?**

_____

35. **Scheduling the home energy assessment was easy to do**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know ❑ Not Applicable (no interaction)

36. **The interactions and communications I had with Duke Energy staff were satisfactory.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know ❑ Not Applicable (no interaction)

If 7 or less, **How could this be improved?**

_____

37. **The over-the-phone assessment report was easy to read and understand.**

1 2 3 4 5 6 7 8 9 10 Don't Know

If 7 or less, **How could this be improved?**

_____

38. **The recommendations in the over-the-phone assessment report provided new ideas that I was not previously considering.**

1 2 3 4 5 6 7 8 9 10 Don't Know

If 7 or less, **How could this be improved?**

_____

39. **The recommendations in the over-the-phone assessment report increased the likelihood that I would take recommended actions.**

1 2 3 4 5 6 7 8 9 10 Don't Know

If 7 or less, **How could this be improved?**

_____

40. **Overall I am satisfied with the program.**

1 2 3 4 5 6 7 8 9 10 Don't Know

If 7 or less, **How could this be improved?**

_____

41. **Have you ever participated in any of Duke Energy's other energy efficiency programs? These are programs that provide energy audits of your home, or offer purchase rebates to buy the more energy efficient equipment when you make updates to your home.**

a. Yes
b. No - *skip to household/demographic questions - q45*
c. Don't Know/Not Sure - *read the list of programs, ask again*

41a. In which of the Duke Energy programs did you participate?
a. Smart Saver CFL, which offers coupons for CFLs
b. Smart Saver
c. Low Income program
d. Home Energy House Call
e. K12, aka "Get Energy Smart" or NEED
f. Personalized Energy Report
g. Other _____

42. **Using a 1-10 scale with 1 meaning completely dissatisfied and 10 meaning completely satisfied, how would you rate your overall satisfaction with the** <above> **program(s)?**
1 2 3 4 5 6 7 8 9 10 Don't Know

Repeat for all programs.

43. **Using the same 1-10 scale, overall, how satisfied are you with Duke Energy and its programs and services?**
1 2 3 4 5 6 7 8 9 10 Don't Know

44. **What can Duke Energy do to increase your interest in the Energy Solutions at Home service?**

_____

Housing Characteristics

45. **In what type of building do you live?**
a. Single-family detached building
b. Mobile Home/Manufactured home
c. Condominium
d. Duplex/two-family
e. Multi-family building (3 or more units)
f. Townhouse

46. **What year was your residence built?**
a. 1959 and before
b. 1960-1979
c. 1980-1989
d. 1990-1997
e. 1998-2000
f. 2001-2007
g. 2008-present

h. Don't Know

47. **About how many square feet of living space are in your home?**
(Do not include garages or other unheated areas)
Note: A 10 foot by 12 foot room is 120 square feet

a. Less than 500
b. 500 – 999
c. 1000 – 1499
d. 1500 – 1999
e. 2000 – 2499
f. 2500 – 2999
g. 3000 – 3499
h. 3500 – 3999
i. 4000 or more
j. Don't know

48. **What type of fuel do you use for indoor cooking?**

a. Electricity
b. Natural Gas
c. Oil
d. Propane
e. Other

49. **What type of fuel do you use for clothes drying?**

a. Electricity
b. Natural Gas
c. Oil
d. Propane
e. Other
f. No clothes dryer

Air Conditioning

This next set of questions asks about how you cool your home. Please mark the response that best answers each question.

50. **Do you use one or more of the following to cool your home?**
(Mark all that apply)

a. None, do not cool the home=
b. Heat pump for cooling
c. Central air conditioning
d. Through the wall or window air conditioning unit
e. Geothermal Heat pump

51. **How many rooms in your home (excluding bathrooms, but including finished basements) are cooled?**
   a. None
   b. 1-3
   c. 4
   d. 5
   e. 6
   f. 7
   g. 8
   h. 9
   i. 10 or more

52. **How old is your cooling system?**
   a. 0-4 years
   b. 5-9 years
   c. 10-14 years
   d. 15-19 years
   e. 19 years
   f. Don't know

53. **How many window-unit or "through the wall" air conditioner(s) do you use?**
   a. None
   b. 1
   c. 2
   d. 3
   e. 4
   f. 5
   g. 6
   h. 7
   i. 8 or more

54. **What is your thermostat setting on a hot *summer weekday* (Monday through Friday) when you are using the air conditioner**

	< 65	65 to 68	69 to 72	73 to 75	73 to 75	76 to 78	>78	OFF	Do not have a thermostat that controls the air conditioner
Morning (6 am – 12 pm)									
Afternoon (12 pm – 5 pm)									
Evening (5 pm – 10 pm)									
Night (10 pm – 6 am)									

55. **What is your thermostat setting on a hot *summer weekend* (Saturday or Sunday) when you are using the air conditioner**

	< 65	65 to 68	69 to 72	73 to 75	73 to 75	76 to 78	>78	OFF	Do not have a thermostat that controls the air conditioner
Morning (6 am – 12 pm)									
Afternoon (12 pm – 5 pm)									
Evening (5 pm – 10 pm)									
Night (10 pm – 6 am)									

56. **Do you have a programmable thermostat?**
    a. Yes
    b. No

Your Household

The following questions are about your household. Please keep in mind that all information you provide will be kept strictly confidential and will not be released to anyone. This information will be combined with information provided by other households and will be used for statistical purposes only.

57. How many people live in this home?
    a. 1
    b. 2
    c. 3
    d. 4
    e. 5
    f. 6
    g. 7
    h. 8 or more

58. How many persons are usually home on a weekday afternoon?
    a. 0
    b. 1
    c. 2
    d. 3

e. 4
f. 5
g. 6
h. 7
i. 8 or more

59. What is the fuel used in your primary heating system? *(Mark all that apply)*
a. Electricity
b. Natural Gas
c. Oil
d. Propane
e. Other

60. Which of the following best describes your home's primary heating system?
a. None
b. Central forced air furnace
c. Electric Baseboard
d. Heat Pump
e. Geothermal Heat Pump
f. Other

61. If you have a central furnace system, how old is the primary system?
a. 0-4 years
b. 5-9 years
c. 10-14 years
d. 15-19 years
e. 19 years
f. Don't know
g. Do not have

62. What is the fuel used by your water heater? ***(Mark all that apply)***
a. Electricity
b. Natural Gas
c. Oil
d. Propane
e. Other

63. How old is your water heater?
a. 0-4 years
b. 5-9 years
c. 10-14 years
d. 15-19 years
e. > 19 years
f. Don't know

Optional - the following questions are for classification purposes only and will not be used for any other purpose than to help Duke Energy continue to improve service.

64. What is your age group?
a. 18-34
b. 35-49
c. 50-59
d. 60-64
e. 65-74
f. Over 74

65. Please indicate your annual household income.
a. Under $15,000
b. $15,000-$29,999
c. $30,000-$49,999
d. $50,000-$74,999
e. $75,000-$100,000
f. Over $100,000

Those are all of the questions I have for you. Thank you for participating.

Appendix C: Energy Solutions @ Home In-Home Audit But No Installation Participant Survey Instrument

The questions below require mostly short, scaled replies from the interviewee, and not all questions will be asked of all participants. This interview should take approximately 10 to 15 minutes.

Energy Solutions at Home Program

Participant Survey

If Energy Solutions at Home participant, then contact for survey. Use five attempts at different times of the day and different days before dropping from contact list. Call times are from 10:00 a.m. to 8:00 p.m. EST or 9-7 CST Monday through Saturday. No calls on Sunday. (Sample size N =?)

SURVEY

Introduction

Note: Only read words in bold type.

Hello, my name is _____. I am calling on behalf of Duke Energy to conduct a customer survey about the Energy Solutions at Home Program. May I speak with _____ please?

If person talking, proceed. If person is called to the phone reintroduce.
If not home, ask when would be a good time to call and schedule the call-back:

Call back 1:	Date: _____,	Time: _____	❑AM or ❑PM
Call back 2:	Date: _____,	Time: _____	❑AM or ❑PM
Call back 3:	Date: _____,	Time: _____	❑AM or ❑PM
Call back 4:	Date: _____,	Time: _____	❑AM or ❑PM
Call back 5:	Date: _____,	Time: _____	❑AM or ❑PM

❑ Contact dropped after fifth attempt.

We are conducting this survey to obtain your opinions about the Energy Solutions at Home Program. Duke Energy's records indicate that you participated in the Energy Solutions at Home Program. We are not selling anything. The survey will take about 10 minutes and your answers will be confidential, and will help us to

make improvements to the program to better serve others. May we begin the survey?

Note: If this is not a good time, ask if there is a better time to schedule a callback.

1. **Do you recall participating in the Energy Solutions at Home Program?**

   a. Yes, *begin* → *Skip to Q2.*
   b. No,
   c. DK/NS

   This program was provided through Duke Energy. In this program, you registered to receive a home energy assessment for $90. In return, the assessors provided you with custom energy-saving recommendations for you and your home, as well as suggestions for major upgrades that were eligible for Duke Energy's incentive programs. These incentives included rebates as well as assistance with project financing.

   Do you remember participating in this program?

   a. Yes, *begin* → *Go to Q2.*
   b. No,
   c. DK/NS

If No or DK/NS terminate interview and go to next participant.

2. **How did you first learn of the Energy Solutions at Home program?**
   a. Mailer/brochure
   b. Other Duke Energy program - **Which one?** _____
   c. Duke Energy Web Site
   d. Friend
   e. Relative
   f. Other

3. **Please think back to the time when you were deciding to participate in the Energy Solutions at Home program. What factors motivated you to participate?** (*do not read list, place a "1" next to the response that matches best)*

   a. ____ The assessment
   b. ____ The program incentives
   c. ____ The technical assistance from the assessor

d. ____ coordination with contractor
e. ____ coordination with lending institution
f. ____ Recommendation of someone else (*Probe*: **Who?**_____)
g. ____ Wanted to reduce energy costs
h. ____ The information provided by the Program
i. ____ Past experience with this program
j. ____ Because of past experience with another Duke Energy program
k. ____ Recommendation from other utility program
(*Probe*: **What program?** _____)
l. ____ Recommendation of family/friend/neighbor
m. ____ Other (SPECIFY) _____
n. ____ Don't know/don't remember/not sure (DK/NS)

If multiple responses: 3.a. **Were there any other reasons?** *(number responses above in the order they are provided - Repeat until 'no' response.)*

4. **Prior to participating in Energy Solutions at Home, had you participated in any other Duke Energy rebate or incentive programs** (*check all that apply*)?

a) Yes
b) No

If yes, 4a: **Which programs?**
a) Res Smart Saver
b) Non-res Smart Saver
c) Home Energy House Call
d) K-12
e) Power Manager
f) Low Income
g) CFLs (coupons or IVR, web, BRC)
h) Personalized Energy Report
i) Other : _____
j) Don't Know

Program Free-Ridership Questions

5. **Before you heard about the Energy Solutions at Home from Duke Energy, had you already been considering getting a home energy assessment?**

   a) Yes
   b) No
   c) Don't Know

6. **If the assessment from Duke Energy's Energy Solutions at Home Program had not been available, would you still have:**

   6a. **Purchased a home assessment from someone else?**

   a. Yes
   b. No – *skip to question 7*
   c. Don't Know – *skip to question 7*

   If yes, 6b. **Assessments from private suppliers typically cost from $150 to $300 dollars compared to the $50 charged by Duke Energy.**

   What do you think you would have had to pay for the assessment if you would not have obtained it from Duke Energy?

   $ _____

   6c. **Would you have purchased the assessment within the next year, the next two years, the next three years or after three years?**

   a) Within the next year
   b) Within the next two years
   c) Within the next three years
   d) After three years
   e) Don't Know

7. **Were you aware that the $50 home audit fee may be applied to the installation cost of program-approved upgrades?**
   a) Yes
   b) No
   c) DK

SATISFACTION QUESTIONS

Now I am going to ask you some general satisfaction statements. On a scale from 1-10, with 1 indicating that you strongly disagree, and 10 indicating that you strongly agree, please rate the following statements.

8. **Scheduling the over-the-phone energy assessment was easy to do.**

   1 2 3 4 5 6 7 8 9 10

   ❑ Don't Know

   If 7 or less, **How could this be improved?**

   _____

9. **The interactions and communications I had with the over-the-phone energy assessor were satisfactory.**

   1 2 3 4 5 6 7 8 9 10

   ❑ Don't Know ❑ Not Applicable (no interaction)

   If 7 or less, **How could this be improved?**

   _____

10. **The over-the-phone energy assessor was helpful and knowledgeable.**

    1 2 3 4 5 6 7 8 9 10

    ❑ Don't Know ❑ Not Applicable (no interaction)

    If 7 or less, **How could this be improved?**

    _____

11. **Scheduling the home energy assessment was easy to do**

    1 2 3 4 5 6 7 8 9 10

    ❑ Don't Know ❑ Not Applicable (no interaction)

12. **The interactions and communications I had with the home energy assessor were satisfactory.**

    1 2 3 4 5 6 7 8 9 10

    ❑ Don't Know ❑ Not Applicable (no interaction)

    If 7 or less, **How could this be improved?**

    _____

13. **The home energy assessor was helpful and knowledgeable.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know ❑ Not Applicable (no interaction)

If 7 or less, **How could this be improved?**

_____

14. **The interactions and communications I had with Duke Energy staff were satisfactory.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know ❑ Not Applicable (no interaction)

If 7 or less, **How could this be improved?**

_____

15. **The assessment report was easy to read and understand.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved?**

_____

16. **The recommendations in the assessment report provided new ideas that I was not previously considering.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved?**

_____

17. **The recommendations in the assessment report increased the likelihood that I would take recommended actions.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved?**

_____

18. **The coordination offered between Duke Energy and a contractor increased the likelihood that I would take recommended actions.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved?**

_____

19. **The rebate offered by Duke Energy above and beyond the federal stimulus rebate increased the likelihood that I would take recommended actions.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved?**

_____

20. **Overall I am satisfied with the program.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved?**

_____

Measure Questions

21. *If <Insulation/AC/furnace/caulking and sealing/heat pump> was recommended:*
Did you install any measures as recommended in the Energy Solutions at Home Assessment Report?
    a) Yes – *have them list measures installed, skip to 22.*
        i. Measure 1:_____
        ii. Measure 2:_____
        iii. Measure 3:_____
        iv. Measure 4:_____

    b) No – *ask question 21 a & b.*
    c) DK

21a. *For any measures not installed,* **Do you have plans to install <measure> within the next**
    a. Six months
    b. Year
    c. 2 years
    d. 3 year
    e. More than 3 years
    f. Don't know

21b. For any measures not installed **Can you tell me why you have decided to delay or skip installation for this measure?**
    a. Don't believe it will improve comfort
    b. Don't believe it will save energy
    c. Don't believe it will reduce bills
    d. Installing other measures first
    e. Cannot afford it at this time
    f. Other : _____

22. *For all installed measures from question 21,*
Did you use any Energy Solutions at Home-specific services such as contractor coordination, financial coordination, or rebates to help complete this installation?
    a) Yes
    b) No
    c) Don't Know

23. **Did you use any other Duke Energy programs, such as Smart Saver or Home Energy House Call to help complete this installation?**
    a) Yes -- **Which one?** _____
    b) No -- *skip to Spillover Questions q36*
    c) Don't know -- *skip to Spillover Questions q36*

If they used ESAH services ask questions 24 to 35.

24. **Did you use a contractor coordinated with Duke Energy for the installation?**
    a) Yes – *skip to question 26*
    b) No
    c) Not sure

25. *If no to 24.,* **Why did you choose not to use a contractor coordinated with Duke Energy (check all that apply)?**
    a) Did it themselves
    b) Preferred the quality of another contractor
    c) Preferred the price of another contractor
    d) Felt there was too much paperwork involved
    e) Switched to a different program (which one?)
    f) Other: _____

On a 1-to-10 scale please rate your satisfaction with your contractor in the following areas:

25a. Communication

1 2 3 4 5 6 7 8 9 10 ❑ Don't Know

If 7 or less, **How could this be improved?**

_____

25b. Services offered

1 2 3 4 5 6 7 8 9 10 ❑ Don't Know

If 7 or less, **How could this be improved?**

_____

25 c. Pricing

1 2 3 4 5 6 7 8 9 10 ❑ Don't Know

If 7 or less, **How could this be improved?**

_____

25 d. Quality of work

1 2 3 4 5 6 7 8 9 10 ❑ Don't Know

If 7 or less, **How could this be improved?**

_____

25 e. Overall satisfaction

1 2 3 4 5 6 7 8 9 10 ❑ Don't Know

If 7 or less, **How could this be improved?**

_____

26. **Did you receive a rebate for this installation from the Duke Energy 'Energy Solutions at Home' program, excluding the federal stimulus rebate?**
    a) Yes
    b) No
    c) DK/NS

27. **Did you find the rebate amount from Energy Solutions at Home was satisfactory?**
    a) Yes -- *skip to question 28*
    b) No
    c) DK/NS

    27a.. **What amount would you consider a satisfactory rebate for this installation?** _____

28. **Did you receive a rebate from any other Duke Energy incentive programs for this installation?**
    a) Yes
    b) No
    c) DK/NS

    If yes, **28a. From which program?**
    a) Res Smart Saver
    b) Home Energy House Call
    c) Smart Saver CFL
    d) Other: _____
    e) Don't Know

29. **Before receiving the Energy Solutions at Home assessment, what was your level of interest in this installation?**

    a. None
    b. Already been thinking about doing it
    c. Already collecting information about this type of project
    d. Already begun to get product information and price estimates
    e. Already made a firm decision to install
    f. Already negotiated with a supplier to install the project

On a 1-to-10 scale, with a 1 meaning that it had no influence and a 10 meaning it was very influential in your decision to perform the installation please rate the influence of each of the following factors on your decision to perform the installation:

30. **The home assessment and the report**

1 2 3 4 5 6 7 8 9 10 ❑ Don't Know

31. **Duke Energy coordination with the contractor**

1 2 3 4 5 6 7 8 9 10 ❑ Don't Know

32. **The Duke Energy incentive amount**

1 2 3 4 5 6 7 8 9 10 ❑ Don't Know

33. **If the home assessment wasn't available through the Energy Solutions at Home Program, which of the following statements are you in most agreement:**

a) I would not have undertaken the project
b) I may not have undertaken the project
c) I would have undertaken the project but at a later time – *ask question 33a*
d) I would have undertaken the project at the same time – *ask question 33a*
e) I am not sure what I would have done.

33 a. *If c or d above*, **Would you have focused as much attention to the energy efficiency aspects of the project if you would have done it on your own without the assessment?**

a. Yes
b. No
c. Don't know

34. **If Duke Energy coordination with the contractor wasn't available through the Energy Solutions at Home Program, which of the following statements are you in most agreement:**

a) **I would not have undertaken the project**
b) **I may not have undertaken the project**
c) **I would have undertaken the project but at a later time**
d) **I would have undertaken the project at the same time**
e) **I am not sure what I would have done.**

35. **If the Duke Energy financial incentive wasn't available through the Energy Solutions at Home Program, which of the following statements are you in most agreement:**

a) **I would not have undertaken the project**

b) **I may not have undertaken the project**
c) **I would have undertaken the project but at a later time**
d) **I would have undertaken the project at the same time**
e) **I am not sure what I would have done.**

Spillover Questions

36. Since you participated in the Energy Solutions at Home Program, have you purchased and installed any other type of energy efficiency equipment or made energy efficiency improvements in your home that were not recommended by the assessment report?

a. Yes
b. No
c. Don't Know

37. What type and quantity of high efficiency equipment did you install on your own?
PROBE TO GET EXACT TYPE AND QUANTITY AND LOCATION

Type 1: :_____ Quantity 1: _____ Location 1:_____
Type 2: :_____ Quantity 2: _____ Location 2:_____
Type 3: :_____ Quantity 3: _____ Location 3:_____
Type 4: :_____ Quantity 4: _____ Location 4:_____

38. *For each type listed in 37 above,* **How do you know that this equipment is high efficiency? For example, was it Energy Star rated?**

Type 1: _____
Type 2: _____
Type 3: _____
Type 4: _____

I'm going to read a statement about this equipment that you purchased on your own. On a scale from 1-10, with 0 indicating that you strongly disagree, and 10 indicating that you strongly agree, please rate the following statement.

39. My experience with the Energy Solutions at Home Program in <month/year> **influenced my decision to install** <Type 1/Type 2/Type 3/Type 4> **on my own.**

Type 1:	1	2	3	4	5	6	7	8	9	10	Don't Know
Type 2:	1	2	3	4	5	6	7	8	9	10	Don't Know
Type 3:	1	2	3	4	5	6	7	8	9	10	Don't Know
Type 4:	1	2	3	4	5	6	7	8	9	10	Don't Know

40. What other actions, if any, have you taken in your home to save energy and reduce utility bills at least in part as a result of what you learned in this program?

Response 1: _____
Response 2: _____
Response 3: _____
Response 4: _____

41. What additional services would you like the program to provide that it does not now provide?

Response: _____

42. Are there any other things that you would like to see changed about the program?

Response: _____

43. What do you think can be done to increase people's interest in participating in the Energy Solutions at Home Program?

Response 1: _____
Response 2: _____
Response 3: _____
Response 4: _____

44. What do you like most about this program?

Response: _____

45. What do you like least about this program?
Response: _____

That is the end of our survey, thank you for your time and feedback today! (*politely end call*)

Appendix D: Energy Solutions @ Installation Participant Survey Instrument

The questions below require mostly short, scaled replies from the interviewee, and not all questions will be asked of all participants. This interview should take approximately 10 to 15 minutes.

Energy Solutions at Home Program

Participant Survey

Contact Module
SURVEY INTRODUCTION

If Energy Solutions at Home participant, then contact for survey. Use five attempts at different times of the day and different days before dropping from contact list. Call times are from 10:00 a.m. to 8:00 p.m. EST or 9-7 CST Monday through Saturday. No calls on Sunday. (Sample size N =?)

SURVEY

Introduction

Note: Only read words in bold type.

Hello, my name is _____. I am calling on behalf of Duke Energy to conduct a customer survey about the Energy Solutions at Home Program. May I speak with _____ please?

If person talking, proceed. If person is called to the phone reintroduce.
If not home, ask when would be a good time to call and schedule the call-back:

Call back 1:	Date: _____,	Time: _____	❑AM or ❑PM
Call back 2:	Date: _____,	Time: _____	❑AM or ❑PM
Call back 3:	Date: _____,	Time: _____	❑AM or ❑PM
Call back 4:	Date: _____,	Time: _____	❑AM or ❑PM
Call back 5:	Date: _____,	Time: _____	❑AM or ❑PM

❑ Contact dropped after fifth attempt.

We are conducting this survey to obtain your opinions about the Energy Solutions at Home Program. Duke Energy's records indicate that you participated in the Energy Solutions at Home Program. We are not selling anything. The survey will take about 10 minutes and your answers will be confidential, and will help us to

make improvements to the program to better serve others. May we begin the survey?

Note: If this is not a good time, ask if there is a better time to schedule a callback.

1. **Do you recall participating in the Energy Solutions at Home Program?**

   a. Yes, *begin* → *Skip to Q2.*
   b. No,
   c. DK/NS

   This program was provided through Duke Energy. In this program, you registered to receive a home energy assessment for $90. In return, the assessors provided you with custom energy-saving recommendations for you and your home, as well as suggestions for major upgrades that were eligible for Duke Energy's incentive programs. These incentives included rebates as well as assistance with project financing.

   Do you remember participating in this program?

   a. Yes, *begin* → *Go to Q2.*
   b. No,
   c. DK/NS

   If No or DK/NS terminate interview and go to next participant.

2. **How did you first learn of the Energy Solutions at Home program?**
   a. Mailer/brochure
   b. Other Duke Energy program **(which one?)**
   c. Duke Energy Web Site
   d. Friend
   e. Relative
   f. Other

3. **Please think back to the time when you were deciding to participate in the Energy Solutions at Home program. What factors motivated you to participate?** *(do not read list, place a "1" next to the response that matches best)*

   a. ____ The entire group of services rolled together as a single service
   b. ___The home assessment
   c. ____ The program's financial incentives
   d. ____ The technical assistance from the assessor

e. ____ coordination with contractor
f. ____ coordination with lending institution
g. ____ Recommendation of someone else (*Probe*: **Who?**_____)
h. ____ Wanted to reduce energy costs
i. ____ The information provided by the Program
j. ____ Past experience with this program
k. ____ Because of past experience with another Duke Energy program
l. ____ Recommendation from other utility program
(*Probe*: **What program?** _____)
m. ____ Recommendation of family/friend/neighbor
n. ____ Other (SPECIFY) _____
o. ____ Don't know/don't remember/not sure (DK/NS)

If multiple responses: 3.a. **Were there any other reasons?** *(number responses above in the order they are provided - Repeat until 'no' response.)*

Program Free-Ridership Questions

4. **Before you heard about the Energy Solutions at Home from Duke Energy, had you already been considering getting a home energy assessment?**

   a. Yes
   b. No
   c. Don't Know

5. **If the assessment from Duke Energy's Energy Solutions at Home Program had not been available, would you still have:**

   5a. **Purchased a home assessment from someone else?**

   a. Yes
   b. No – *skip to question 6*
   c. Don't Know – *skip to question 6*

   If yes, **Assessments from private suppliers typically cost from $150 to $300 dollars compared to the $90 charged by Duke Energy.**
   What do you think you would have had to pay for the assessment if you would not have obtained it from Duke Energy?

   $ _____

   5b. **Would you have purchased the assessment within the next year, the next two years, the next three years or after three years?**

   a. Within the next year
   b. Within the next two years
   c. Within the next three years
   d. After three years
   e. Don't Know

SATISFACTION QUESTIONS

Now I am going to ask you some general satisfaction statements. On a scale from 1-10, with 1 indicating that you strongly disagree, and 10 indicating that you strongly agree, please rate the following statements.

6. **Scheduling the over-the-phone energy assessment was easy to do.**

   1 2 3 4 5 6 7 8 9 10

   ❑ Don't Know

   If 7 or less, **How could this be improved?**_____

7. **The interactions and communications I had with the over-the-phone energy assessor were satisfactory.**

   1 2 3 4 5 6 7 8 9 10

   ❑ Don't Know ❑ Not Applicable (no interaction)

   If 7 or less, **How could this be improved?**_____

8. **The over-the-phone energy assessor was helpful and knowledgeable.**

   1 2 3 4 5 6 7 8 9 10

   ❑ Don't Know ❑ Not Applicable (no interaction)

   If 7 or less, **How could this be improved?**_____

9. **Scheduling the home energy assessment was easy to do**

   1 2 3 4 5 6 7 8 9 10

   ❑ Don't Know ❑ Not Applicable (no interaction)

10. **The interactions and communications I had with the home energy assessor were satisfactory.**

    1 2 3 4 5 6 7 8 9 10

    ❑ Don't Know ❑ Not Applicable (no interaction)

If 7 or less, **How could this be improved?**_____

_____

11. **The home energy assessor was helpful and knowledgeable.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know ❑ Not Applicable (no interaction)

If 7 or less, **How could this be improved?**_____

_____

12. **The interactions and communications I had with Duke Energy staff were satisfactory.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know ❑ Not Applicable (no interaction)

If 7 or less, **How could this be improved?**_____

_____

13. **The assessment report was easy to read and understand.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved?**_____

_____

14. **The recommendations in the assessment report provided new ideas that I was not previously considering.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved?**_____

_____

15. **The recommendations in the assessment report increased the likelihood that I would take recommended actions.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved?**_____

16. **The coordination offered between Duke Energy and a contractor increased the likelihood that I would take recommended actions.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved?**_____

17. **The rebate offered by Duke Energy above and beyond the federal stimulus rebate increased the likelihood that I would take recommended actions.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved?**_____

18. **Overall I am satisfied with the program.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved?**_____

Measure Questions

19. If <Insulation/AC/furnace/caulking and sealing/heat pump> was recommended:
Did you install the <measure> as recommended in the Energy Solutions at Home Assessment Report?
a. Yes
What did you do? _____
b. No
c. DK

19a. If yes to q19. **For this measure, we have <contractor name> listed as the contractor who performed the installation. Is this correct**?
a. Yes – skip to 20
b. No – skip to 20
c. Not sure – skip to 20

If no to question 19,
19b. **Do you have plans to install <measure> within the next**
a. Six months
b. Year
c. 2 years or more
d. Never

If no to question 19,
19c. **Can you tell me why you have decided to delay or skip installation?**
a. Don't believe it will improve comfort
b. Don't believe it will save energy
c. Don't believe it will reduce bills
d. Installing other measures first
e. Cannot afford it at this time
f. Other (what?)

20. **On a 1-to-10 scale please rate your satisfaction with your contractor in the following areas:**

20a. Communication
1 2 3 4 5 6 7 8 9 10
❑ Don't Know

If 7 or less, **How could this be improved ?** _____

20b. Services offered

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved ?** _____

20c. Pricing

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved ?** _____

20d. Quality of work

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved ?** _____

20 e. Overall satisfaction

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved ?** _____

21. **Our records indicate that your rebate from Duke Energy, excluding the federal stimulus rebate, was <amount>. Is this correct?**
    a. Yes
    b. No – skip to question 23
    c. DK/NS – skip to question 23

22. **Did you find this rebate amount was satisfactory?**
    a. Yes -- skip to question 23
    b. No -- ask question 22a.
    c. DK/NS – ask question 22a.

22 a. If no, **what amount would you consider a satisfactory rebate for this installation?** _____

23. **Before receiving the Energy Solutions at Home assessment, what was your level of interest in this installation?**
    a. None
    b. Already been thinking about doing it
    c. Already collecting information about this type of project
    d. Already begun to get product information and price estimates
    e. Already made a firm decision to install
    f. Already negotiated with a supplier to install the project

On a 1-to-10 scale, with a 1 meaning that it had no influence and a 10 meaning it was very influential in your decision to perform the installation please rate the influence of each of the following factors on your decision to perform the installation:

24. **The level of influence of the home assessment and the report**
    1 2 3 4 5 6 7 8 9 10
    ❑ Don't Know

25. **The influence of the Duke Energy coordination with the contractor**
    1 2 3 4 5 6 7 8 9 10
    ❑ Don't Know

26. **Duke Energy coordination with the lending institution**
    1 2 3 4 5 6 7 8 9 10
    ❑ Don't Know

27. **The influence of the Duke Energy incentive amount**
    1 2 3 4 5 6 7 8 9 10
    ❑ Don't Know

For the next few questions, please indicate your likelihood of installing this measure if the following program service had NOT been available from Duke Energy.

28. **The home assessment**
    a) Would not have undertaken the project
    b) May not have undertaken the project
    c) Would have undertaken the project but at a later time – *ask question 28a*
    d) Would have undertaken he project at the same time – *ask question 28a*
    e) Not sure what I would have done.

28 a. If c or d above, **If the program was not available to you, would you have focused as much attention to the energy efficiency aspects of the project**

a) Yes
b) No
c) Not sure don't know

29. **If the Duke Energy coordination with the installation contractor was not a part of the Duke Program, would you...**
    a) not have undertaken the project
    b) probably not have undertaken the project
    c) have undertaken the project but at a later time
    d) have undertaken he project at the same time.
    e) Not sure what I would have done.

30. **What about if the Duke Energy financial incentive was not available, would you**
    a) not have undertaken the project
    b) probably not have undertaken the project
    c) have undertaken the project but at a later time
    d) have undertaken he project at the same time.
    e) Not sure what I would have done.

Repeat for all measures installed...

Spillover Questions

31. **Since you participated in the Energy Solutions at Home Program, have you purchased and installed any other type of energy efficiency equipment or made energy efficiency improvements in your home that were not recommended by the assessment report?**

a) Yes
b) No
c) Don't Know

_____
_____

32. **What type and quantity of high efficiency equipment did you install on your own?** *PROBE TO GET EXACT TYPE AND QUANTITY AND LOCATION*

Type 1: _____ Quantity 1: _____ Location 1: _____
Type 2: _____ Quantity 2: _____ Location 2: _____
Type 3: _____ Quantity 3: _____ Location 3: _____
Type 4: _____ Quantity 4: _____ Location 4: _____

33. *For each type listed in 32 above,* **How do you know that this equipment is high efficiency? For example, was it Energy Star rated?**

Type 1: _____
Type 2: _____
Type 3: _____
Type 4: _____

I'm going to read a statement about this equipment that you purchased on your own. On a scale from 1-10, with 0 indicating that you strongly disagree, and 10 indicating that you strongly agree, please rate the following statement.

34. **My experience with the Energy Solutions at Home Program in** <month/year> **influenced my decision to install** <Type 1/Type 2/Type 3/Type 4> **on my own.**

Type 1:	1	2	3	4	5	6	7	8	9	10	Don't Know
Type 2:	1	2	3	4	5	6	7	8	9	10	Don't Know
Type 3:	1	2	3	4	5	6	7	8	9	10	Don't Know
Type 4:	1	2	3	4	5	6	7	8	9	10	Don't Know

35. **What other actions, if any, have you taken in your home to save energy and reduce utility bills at least in part as a result of what you learned in this program?**
Response:1 _____
Response:2 _____
Response:3 _____
Response:4 _____

36. **What additional services would you like the program to provide that it does not now provide?**

Response: _____
_____

37. Are **there any other things that you would like to see changed about the program?**
Response: _____

38. **What do you think can be done to increase people's interest in participating in the Energy Solutions at Home Program?**

Response:1 _____
Response:2 _____
Response:3 _____
Response:4 _____

39. **What do you like most about this program?**
Response: _____

40. **What do you like least about this program?**
Response: _____

That is the end of our survey, thank you for your time and feedback today!
(*politely end call*)

Process and Energy Impact Evaluation of Duke Energy's Ohio Non-Residential Energy Assessment Program

Final Report

Prepared for
Duke Energy
139 East Fourth Street
Cincinnati, OH 45201

November 15, 2011

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Executive Summary

Key Findings and Recommendations

The key findings and recommendations identified through this evaluation are presented below.

Program Operations: Recommendations

1. RECOMMENDATION: The Non-Residential Energy Assessments Program (EAP) should work with the Account Managers to develop clear criteria for identifying prospective participants for the Smart $aver® program based upon segmentation of past Smart $aver® participants. An analysis of what projects and measures were of interest to past Smart $aver® participants in each industry sector would allow Account Managers to make suggestions of similar projects to prospective participants in the same sector. This would allow the budget for the EAP to be directed to those customers who are more likely to take action. (See "Relationship Building" on Page 14)
2. RECOMMENDATION: Track the conversion rate (i.e. percentage of EAP participants who adopt EAP recommendations through subsequent Smart $aver® projects) and identify those Account Managers who are more successful at actively converting EAP participants into Smart Saver® participants. These Account Managers may have developed successful strategies that could be shared with other Account Managers to help them increase Duke Energy's overall conversion rates from EAP to Smart $aver®. (See "Tracking Recommendation Adoptions" on Page 17)
3. RECOMMENDATION: Duke Energy or their evaluation contractors should survey customers who receive both phone and on-site assessments to determine how much additional perceived value is provided by the on-site assessment, and where this additional value comes from. This would allow Duke Energy to identify customer's needs and wants from the on-site assessment report. Duke Energy or their evaluation contractors should also compare the relative cost effectiveness of the phone assessment compared with the on-line web assessment. If the on-line assessment is not perceived as valuable and does not drive customers to participation, Duke Energy should consider discontinuing the web-based assessment (but still offer online input of assessment data for a telephone assessment). However, care should be taken in this effort as different customers may want different services, and each of these delivery approaches may define a market sub-segment that may or may not participate in the program if their assessment choices are limited compared to their expectations. The study should also examine the relative success of each approach in driving customers to participate in other Duke Energy programs, as well as identifying additional benefits to the customer not captured by the other programs (low-cost no-cost savings, customer loyalty, satisfaction, etc.) (See "Relationship Building" on Page 14)
4. RECOMMENDATION: Conduct a service needs survey to determine what customers expect from assessment reports in terms of short term versus long term recommendations and in terms of electric-only versus more comprehensive sustainability recommendations. While the primary objective is to help customers identify projects that can be implemented under the Smart $aver® program, the overall credibility of energy efficiency-related recommendations may be enhanced by including recommendations that

present a more comprehensive approach to reducing operating costs. Depending upon the survey results, Duke Energy may also elect to begin offering a "zero net energy with existing buildings" or other high savings assessments (not just cost effective for Duke Energy) for those customers who are motivated to achieve deep energy savings. This would help maintain Duke Energy's standing as the customers' primary partner in meeting all their energy needs, including sustainable energy. (See "Assessments" on Page 15)

5. RECOMMENDATION: Assess if it is possible to develop set of segment-specific recommendations that are targeted to the specific needs of different market segments to the degree that the segments can be used to target high-priority customers more likely to take segment-specific actions. If there are identifiable segment-specific actions that are specific to a segment, this can allow Duke Energy to show customers that their needs are understood, and that the assessment report's recommendations are customized especially for them. Duke Energy can begin to develop these targeted recommendations by first asking Account Managers to identify a few key market sectors that they believe has the greatest untapped potential for energy savings. Duke Energy can survey the Smart $aver® participants and non-participants within those sectors to determine their needs, wants, barriers to participation, and how well the Smart $aver® program addresses those. If Duke Energy has not already done so, we recommend that Duke Energy also conduct market characterization studies for those sectors to see what the mid- to long-term trends are for that market, and also to aid in their conversations with the customers about the projects with longer paybacks. Information from the surveys and any market characterization studies can also be used to build case studies that will help other customers understand the process and benefits of participating in Smart $aver®.(See "Demonstrating Program Value" on Page 17)
6. RECOMMENDATION: Duke Energy should conduct some contingency analyses of the recommendations adoption data to determine whether adopting low-cost no-cost recommendations affect the adoption of Smart $aver®-eligible measures. In a parallel study, Duke Energy should investigate whether there are any corollary benefits to including low-cost no-cost recommendations. For example, excluding low-cost no-cost recommendations may inadvertently emphasize the greater expense of the Smart $aver®-eligible measures, and thus increase the perceived first-cost barriers to becoming more energy efficient. (See "Tracking Recommendation Adoptions" on Page 17)
7. RECOMMENDATION: EAP should use the program's follow up activities to obtain immediate feedback on the usefulness of the assessment reports. This may allow a better leveraging of resources. Additionally, if Account Managers are conducting the follow up feedback, the program's Smart $aver® objectives and services can be kept at the forefront of customer interactions. (See "Quality Control" on Page 15)
8. RECOMMENDATION: Develop the program website so that it is easy to find on the web, has a clear presentation of the services offered and the service approach, and an easy to use web-based enrollment process. (See "Past Evaluation Recommendations" on Page 16)
9. RECOMMENDATION: Design the assessment to formally provide low-cost and no-cost recommendations to customers and incorporate estimates of the impact of these actions,

when implemented into the tally of energy saved credited to Duke Energy (and other utilities) as a result of the program. The low-cost and no-cost savings may not be eligible for cost recovery, but it is important to document the full value of the EAP, whether officially credited or not. This will allow Duke Energy to make decisions with a more comprehensive knowledge of how each energy efficiency program interacts with the other programs in Duke Energy's energy efficiency portfolio. (See "Past Evaluation Recommendations Relationship Building" on Page 16)

Implementation Rates: Key Findings

1. **Many Recommendations are Accepted and Used:** Eight participants, four receiving off-site assessments and four receiving an on-site assessment, were provided with a total of 47 recommendations:
   - The overall implementation rate for all recommended measures was 38%.
   - 32% of the recommendations were rejected by the customer and will not be implemented.
   (See "Implementation Rates" on Page 19)

2. **Participants Take Action Rapidly:** Of the recommendations that were implemented prior to the evaluation contact, 65% were completed within six months of receiving the report. 12% were completed immediately upon receipt of the recommendation or within the next 30 days. (See "Timing of Actions" on Page 22)

3. **Economy and Corporate Conditions Slow Measure Installations:** Corporate economic conditions and the firm's current financial status together represent the most common reasons provided for a recommended measure not being implemented. These two reasons are similar in that they deal with the firm's financial condition within the economies in which they operate. As a result, measures with long payback periods and/or excessive upfront capital costs become the measures cited most often as those that cannot be implemented. (See "Effect of Current Economy on Energy Efficient Actions" on Page 26)

Program Satisfaction: Key Findings

1. **Satisfaction Scores are High:** Participants gave high satisfaction scores for three program aspects: "Responsiveness of Duke Energy staff," "Length of time to receive assessment report" and "Report meets expectations," received satisfaction ratings of 9.2 or higher on a ten point scale. Overall satisfaction within nine other categories was also scored well with average scores higher than eight on a ten-point scale. (See "Program Satisfaction" on Page 23)

2. **Scheduling and practicality of report are concerns:** Two participants noted that they found it difficult to schedule their assessment and gave scores that lowered the "Ease of Scheduling" rating below an eight. Four of eight participants rated the overall practicality

of the report at less than eight. However, all participants did implement at least one report recommendation.

Engineering Impact Estimates: Key Findings

There were a total of 20 customers in Ohio that received an energy assessment. Attempts were made to contact all customers for a follow-up phone interview. Eight were able to be contacted, but only six of the 20 verified that they implemented energy saving recommendations from their Non-Residential Energy Assessment report. The energy saving measures taken by these six customers as a result of the program provide gross annual savings of 786,451 kWh, 209,649 MMBtu, and reduce peak load by 58.7 kW. A breakdown of the savings by customer can be seen in Table 1. A detailed analysis is presented in the Engineering-Based Impact Analysis section on page 30.

Table 1: Program Savings Estimate Breakdown by Customer

Customer	kWh	kW	MMBtu
Customer One	227,358	21.5	-632
Customer Two	101,740	4.7	-285
Customer Three	57,213	7.5	-160
Customer Four*	297,849	17.1	-430
Customer Five	74,998	4.7	0
Customer Six	27,293	3.3	211,156
TOTAL	**786,451**	**58.7**	**209,649**

* Customer Four implemented a compressed air system repair and maintenance program as recommended to them in their energy assessment report. Subsequent to implementing this program, this customer purchased and received a rebate for a new variable speed compressor with controller. This rebate was received through the Smart $aver® Custom program and the unit's purchase is considered to have been precipitated by the customer's participation in the Energy Assessment program. In consideration of the new, more efficient compressor, the energy savings factor (ESF) for this customer's repair and maintenance program has been lowered.

Table 2 shows all of the measures that contribute to program savings and the number of customers that implemented them. The table also details gross savings as well as per unit savings broken down by measure.

Table 2. Summary of Program Savings by Measure

Measure	Participation Count	Ex Ante Per unit kWh impact	Ex Ante Per unit kW impact	Gross Ex Ante kWh Savings	Gross Ex Ante kW Savings
Metal Halide to T5 and Occupancy Sensors	1	1,438	0.14	225,746	21.46
Vending machine motion sensor	1	1,612	0.00	1,612	0.00
Incandescent to CFL	2	507	0.03	102,320	6.03
Halogen to LED	1	365	0.02	14,580	0.67
T12 to T8	2	212	0.02	67,743	7.95
Occupancy Sensors	1	929	0.04	929	0.04
Metal Halide to T5	1	1,462	0.16	153,533	17.08

Compressed Air System Repair and Maintenance Program	1	176,602	0.00	176,602	0.00
Reduced Compressed Air Pressure	1	74,998	4.72	74,998	4.72
Na/Hg Vapor to T8	1	-8	0.00	-391	-0.13
Hg Vapor to T8 and Occupancy Sensors	1	53	0.04	1,066	0.89

Introduction and Purpose of Study

Summary Overview

This section presents a summary of the evaluation of the Non-Residential Energy Assessments Program, the evaluation objectives, and the researchable issues. This evaluation did not have a detailed evaluation plan.

Summary of the Evaluation

This report presents the results of a process and impact evaluation of the Ohio Non-Residential Energy Assessments Program (EAP).

Evaluation Objectives

The purpose of this evaluation is to provide feedback that can help the program provider consider changes to the program that can help achieve improvement in cost effective operations, help understand program impacts and obtain an understanding of customer related conditions and satisfaction.

Researchable Issues

In addition to the objectives noted above, there were a number of researchable issues for this evaluation. These were:

1. To determine which recommendations were implemented by the participant
2. The installation rate of recommendations that were low-cost/no-cost recommendations
3. The installation rate of recommendations that were incented through Duke Energy's Smart $aver Prescriptive (or Custom) Program.

Description of Program

The Energy Assessment Program provides informational and educational support and resources to non-residential customers to help identify energy savings opportunities. The program is marketed through phone and face-to-face contact with customers by Duke Energy representatives, the Duke-Energy.com web content and Duke Energy's Business Services Newsline.

The program is offered as an energy resource program marketing and participant attraction tool. Its primary purpose is to provide customers with energy efficiency recommendations that will convince them to enroll in Duke Energy's prescriptive or custom program offerings. The program is also a customer satisfaction support tool, designed to build the relationship between the customer and Duke Energy in a way that additional energy savings are acquired via the Duke Energy offerings as a result of a service that focuses on providing customers tailored information about efficiency opportunities for their facility.

The Ohio Non-Residential Energy Assessment Program is a well-designed program that is structured within the Duke Energy non-residential program portfolio. The performance of the program seems to be consistent with the objectives of the program in that participants are taking the recommended actions via participation in other programs and are very satisfied with the program and its services.

The program is not designed to focus on acquiring direct savings, thus its performance can only be measured in terms of how it affects the portfolio's ability to attract participants and acquire savings via other Duke Energy programs compared with the cost to operate the program as a marketing tool. As a result, the savings in this evaluation that are presented in two categories:

1. The savings that are part of the programmatic savings from Duke Energy's other non-residential programs are presented in this report but not counted as savings attributable to EAP.
2. The savings achieved as a result of participating in this program but not through participation in other Duke Energy programs are presented here and attributed to the Non-Residential Energy Assessments Program.

Program Participation

Program	Participation Count for 2010
Non-Residential Energy Assessments	20

Methodology

Overview of the Evaluation Approach

This evaluation was performed without an evaluation plan.

Study Methodology: Process

This section presents the methodologies used in both the process and impact evaluations for the Non-Residential Energy Assessments Program.

The evaluation was comprised of in-depth interviews with two program managers. These in-depth interviews provided a detailed investigation into program operations, goals, and suggestions for improvements and changes.

This study also implemented a participant survey with facility managers to identify the types of actions that are being taken as a result of the assessment provided through the program. The survey also included a limited number of satisfaction and program operations questions to help Duke Energy determine if the program is being implemented effectively from the perspective of the participants. This study focuses on participants from January to June of 2009. At the time of the evaluation, a total of 20 Ohio participants had received the assessment and had enough time to implement the recommended actions (at least 6 months). The evaluation focused the data collection efforts on interviewing these participants. A total of 8 participants were interviewed for this evaluation (40%).

There were three objectives to the participant survey:

1. **Process Evaluation Findings** – The in-depth interviews provided a detailed investigation into program operations, goals, and suggestions for improvements and changes.

2. **Review of Implementation Rates** – Those surveyed were asked if their company has installed or implemented each of the recommendations provided in the Energy Assessment Report. In addition, 1 or 2 follow-up questions are asked for each recommendation, depending on the response given.

3. **Review of Program Satisfaction** – We asked the responders about their satisfaction with the program, assessment staff, and the Energy Assessment Report.

The evaluation survey focused on the collection of implementation rates for the recommended measures and behaviors and their levels of satisfaction with the audit, communications, and the recommendations provided. (See Appendix C: Participant Survey Instrument.) The survey also assessed program process issues including the ease of signing up for the assessment, the convenience of scheduling the inspection, the quality and completeness of the inspection, the recommendations provided, knowledge of the auditor, and the assessment report itself. The findings from this evaluation are presented in the following sections of this document.

Study Methodology: Impact

Data were collected via phone interviews with site personnel familiar with the projects. All sites where interviewees indicated they implemented audit recommendations were studied – no sampling was done, so there was no sampling error. The phone survey resulted in eight completes out of a census of all 20 program participants resulting in a 40 percent completion rate. In total, 17 recommendations were taken, three of which were dropped due to insufficient data to complete the calculation. Program impacts were calculated from the remaining 14 measures. For the majority of the measures, calculations and baseline assumptions were taken from Ohio TRM. Methodology sources for non-TRM measures are listed in the "Use of TRM values and explanation if TRM values not used" section on page 12. No savings were assigned to customers that were not contacted or refused to be interviewed.

Data collection methods, sample sizes, and sampling methodology

Process

In-depth interviews with two program managers focusing on program operations, goals, and suggestions for improvements and changes.

Phone survey of program participant facility managers focusing on satisfaction and program operations. The phone survey resulted in eight completes out of a census of all 20 program participants resulting in a 40 percent completion rate.

Impact

Data were collected via phone interviews with site personnel familiar with the projects. Initial phone interviews identified sites where audit recommendations were implemented. Follow-up phone interviews were used to obtain project details. All sites where interviewees indicated they implemented audit recommendations were studied – no sampling was done.

Number of completes and sample disposition for each data collection effort

Process

The phone survey resulted in eight completes out of a census of all 20 program participants resulting in a 40 percent completion rate. All participants were contacted a maximum of five times or until the contact resulted in a completed survey or refusal to participate.

Impact

All sites were studied. Three of 17 measures were dropped due to insufficient information from the customer to complete the calculations.

Expected and achieved precision

All sites studied. No sampling error.

Description of baseline assumptions, methods and data sources

Baseline assumptions were taken from Ohio TRM for the majority of the measures. Baseline data sources for non-TRM measures are listed below:

1. High pressure sodium fixture wattage - CA SPC lighting table for fixture watts.
2. Mercury vapor fixture wattage - CA SPC lighting table for fixture watts.
3. Boiler stack economizer – Add-in measure. Baseline is boiler without economizer
4. Compressed air leak check/maintenance program – *Improving Compressed Air System Performance* from the DOE Compressed Air Challenge[1]
5. LED wattage – LED equivalency table from CA workpapers.

Description of measures and selection of methods by measure(s) or market(s)

The measures and TRM applicability are shown below. All customers are in the C&I market.

Customer	Measures	TRM
Customer 1	Lighting: Metal Halide to HO T8	yes
	Lighting: Metal Halide to T5 and Occupancy Sensors	yes
Customer 2	Lighting: Incandescent to CFL	yes
	Lighting: Halogen to LED	no
Customer 3	Lighting: Incandescent to CFL	yes
	Lighting: T12 to T8	yes
	Lighting: Occupancy Sensors	yes
Customer 4	Lighting: Metal Halide to T5	yes
	Compressed Air System Repair and Maintenance Program	no
Customer 5	Reduced Compressed Air Pressure	no
Customer 6	Lighting: T12 to T8	yes
	Lighting: Na/Hg Vapor to T8	no
	Lighting: Hg Vapor to T8 and Occupancy Sensors	no
	Economizer	no

Use of TRM values and explanation if TRM values not used

TRM used as applicable. Methodology source for non-TRM measures listed below:

Measures	
Lighting: Halogen to LED	Standard lighting calculations with baseline fixture watts defined above

[1] *Improving Compressed Air System Performance: A Sourcebook for Industry.* Prepared for the US Department of Energy by Lawrence Berkeley Laboratory and Resource Dyanmics.

Compressed Air System Repair and Maintenance Program	Calculation method specified in *Improving Compressed Air System Performance.*
Reduced Compressed Air Pressure	Calculation method specified in *Improving Compressed Air System Performance.*
Lighting: Na/Hg Vapor to T8	Standard lighting calculations with baseline fixture watts defined above
Lighting: Hg Vapor to T8 and Occupancy Sensors	Standard lighting calculations with baseline fixture watts defined above. TRM equation adapted to include combination of fixture upgrades and occupancy sensors
Boiler Economizer	Standard boiler consumption equation, with process hours defined by customer. Energy savings factors from MI workpapers.

Threats to validity, sources of bias and how those were addressed

Process

Results from the participant survey portion of this report should be viewed with the understanding that EAP's participant response rate of 40% indicates that the results are reliable within the program population. However, the fact that the participant population is so low (20) means these results may not reflect the overall market population.

The participant responses are self-reports and therefore may be affected by self-selection bias, false response bias or positive result bias. However, since the energy savings impacts from EAP are captured in other programs, bias adjustments were neither calculated nor applied in the presentation of survey data.

Impact

Census of participants attempted. Some customers refused to participate or did not respond. Some non-response bias likely, but no savings were assigned to customers that were not contacted or refused to be interviewed. Some measures were not calculated due to insufficient data, which will also bias the results downward. Engineering biases may exist, but TRM followed where possible. Sources of engineering methods and secondary data sources listed.

Evaluation Findings

Process Evaluation

Introduction

The Energy Assessment Program (EAP) has two objectives. First, it is designed to assist Commercial and Industrial customers in identifying energy efficiency projects for their facilities that would qualify for Duke Energy's Non-Residential Smart $aver® Program. The EAP is marketed through Duke Energy's Account Managers. Duke Energy shares the cost of the facility assessment with the customer. At the time of these interviews, the facility assessment cost $3,000 for a one day assessment and $600 for each additional day. If the customer chooses to undertake a Smart $aver® project after receiving the assessment report, Duke Energy then reimburses the customer's half of the assessment costs. Second, the EAP is provided as a customer service, to help build relationships between the customer and Duke Energy Account Managers.

Background

The current program was launched when the Non-Residential Smart $aver® program was started, and in the fall of 2010 changed its management structure, moving from one program manager to two: one dedicated to the Midwest including Ohio and one dedicated to the Carolinas. Both program managers work closely together so that the program offering is identical in both regions, and the internal control procedures and administrative help is provided by the same people for both regions. Both program managers were interviewed as a part of this process evaluation.

Relationship Building

Although the EAP is explained on Duke Energy's website, it is hard to find using typical subject search engines and the presentation of services and enrollment processes is difficult to navigate. This restricts program information availability and enrollment into the program. However, the EAP is mostly marketed through Duke Energy's large customer Account Managers. The Account Managers discuss with the customer their plans and help review how customers are managing their energy usage. If customers need help, they are told about the Energy Assessment Program and offered an energy assessment of their facility.

The program manager reports that the Account Managers see the EAP more as a relationship-building tool rather than a lead generation program that may eventually bring Duke Energy revenue through the Smart $aver® program. Program managers and business relationship managers have found the EAP to be very successful at building relationships with customers. However, that relationship objective sometimes overshadows the objective of increasing Smart $aver® participation and capturing the available savings. The Duke Energy program manager reports that Account Managers sometimes will offer the EAP on-site assessments as a "freebie", without qualifying the customer to see whether they may be good candidates for the Smart $aver® program. The other program manager agrees, saying that it is not clear that the Account Managers are identifying proper customers or effectively marketing the program to a wider group of customers who may want this service.

Assessments

Duke Energy's non-residential customers can participate in the Energy Assessment Program in three ways: Customers can look for the assessment tool on Duke Energy's website at any time, and this online assessment is available to customers of all sizes. For larger customers (> 500kW), Duke Energy also offers an off-site phone-based assessment, and an on-site assessment.
Duke Energy provides the online and off-site phone assessments at no cost to the customers. The on-site assessments are more expensive, and cost $3,000 for a one-day assessment, and $600 for each additional day. Duke Energy will pay half the cost of the on-site assessment if the customer has paid into the energy efficiency rider. All customers who want to participate in the on-site assessment must first participate in the off-site phone assessment.

During the off-site assessment, the customer is asked to provide information about their facilities. Duke Energy retrieves their facility's historical usage and rate comparison, and provides this information to an assessor. The assessors are contractors with different areas of expertise, and are assigned based upon the facility's characteristics. The assessor contacts the customer and provides an off-site report.

Assessors

There are three outside companies who conduct the assessments: Advanced Energy, Petra Engineering, and ThermalTech. Both Duke Energy program managers agree that these firms are doing a good job for Duke Energy and for their customers. One program manager reports, "*Most of my interactions have been with ThermalTech; I think they are doing an outstanding job. We had a meeting with a client and he was thrilled with the report.*"

Reports and Recommendations

The assessment reports are generated a couple of weeks after the assessments, but can take "a little" longer if the customer requests that the reports' findings and recommendations be delivered in person. Reports focus on energy efficiency measures, but one of the Duke Energy program managers suggests it should also include referrals to other Duke Energy programs such as PowerShare®, or include suggestions for on-site generation. The assessment reports do sometimes include water savings recommendations. The lack of a strong referral component within the program service and materials does not take advantage of the exposure to the customer that has already been captured by the program.

In 2010, the EAP provided five customers with on site assessments of their facilities.

Quality Control

The Energy Assessment Program does not generate revenue for Duke Energy so management of the program consists of managing expenses and managing the assessment contractors. Program managers also try to review the assessment reports to maintain quality control whenever they can, but they rely upon a different independent contractor to review the report and offer a second opinion on the recommendations. The program manager reports that the independent reviewer has generally been in agreement with the assessor's recommendations; occasionally the reviewer will ask whether the assessor has considered a particular recommendation, and the assessor would then explain why they made their particular decision.

Past Evaluation Recommendations

An early feedback mini process evaluation of Ohio's EAP was conducted early in 2010. Due to the program management change and the fact that the feedback report identified areas of improvement so recently, we do not expect that the recommendations could have been fully implemented. Because the Ohio program was identical to the Carolinas EAP, we will address those recommendations here as well.

Tracking: the Early Feedback study found that Duke Energy was in the midst of improving their customer tracking system for the then-new Energy Assessment Program. At the time of the interviews for this process evaluation, Duke Energy is using Salesforce.com to provide their customer relationship management (CRM) software. This CRM system is only available to Duke Energy employees, and allows the program managers to track a comprehensive set of customer data including: customer name, facility name, account name, location of facility, account owner, Account Manager, type of assessment requested, the assigned assessor, the status of the assessment, the dates of key events such as the date of the assessment and date of the report, and the status of the Account Manager follow up. The Duke Energy program manager reported that there are currently plans to integrate the assessment report's recommendations into "*opportunity records*" for each customer, to better track recommendations.

Low-cost and no-cost recommendations and actions with two-year paybacks: The Early Feedback report recommended that the EAP's reports include low-cost and no-cost recommendations, and actions that have a payback period of less than two years. At the time of this interview, the program management reports that the assessment reports do include these recommendations whenever they exist. One program manager reports that one of the assessors sort their recommendations by payback, according to a "proprietary algorithm".

Another program manager reiterates the concern pointed out in the Early Feedback report that the low-cost no-cost measures generally cannot be claimed by Duke Energy: "*There's a discontinuity of goals there between Duke Energy's investments to achieve impacts and the low-cost no-cost recommendations...if Duke Energy is helping customers uncover and realize [more energy savings], there should be a recovery mechanism for the low-cost no-cost measures.*"

There are no plans at this point to develop recovery mechanisms for these measures. This needs to be addressed, while the regulatory authorities in the Duke Energy states typically do not like to allow credit for recommendations that have less than a one-year payback. The Commissions have not to our knowledge excluded low-cost or no-cost measures from being credited to Duke Energy when the payback is greater than one year. As a result, Duke Energy is not now receiving credit for the energy savings generated via the no-cost or low cost recommendations. These should be incorporated into the program as a formal part of the program and savings estimates for these changes should be credited.

One program manager reports that they are finding that manufacturers have already implemented the low-cost and no-cost measures "*because they have been squeezed for so long*", while they report that the commercial building customers have just started to think about these types of measures. Duke Energy has also identified hospitals as a sector that has yet to implement low-cost and no-cost measures. The program manager reports that while they had not been tracking

the types of low-cost and no-cost recommendations, the current effort to review and document the assessment report recommendations should provide useful data on the number and types of low-cost no-cost recommendations that have been made and adopted when they have been included into the report and when follow-up tracking efforts have been completed.

Other recommendations made in the Early Feedback report were still being considered by Duke Energy at the time of the interviews, including the recommendation for Duke Energy to provide a package incentive that motivates customers to push for deeper savings for completing a group of actions.

Program Challenges

One of the program managers said "*Ultimately we want customers to take advantage of the Smart $aver® incentives, once they realize what advantages there are. We're not yet successful in linking the two.*" The other program manager concurs, "*We can have some improvement in the frequency with which we convert assessments to energy projects, and we have some momentum in that.*"

One program manager believes that a coordinated approach between the Account Managers, the vendors, and the EAP is key to getting more EAP participants converted to Smart $aver® participants. When asked, this program manager acknowledged that following up on the assessment reports is very important, but that Duke Energy was still gathering data on whether customers were being followed up consistently by the Account Managers.

To Be Improved

Demonstrating Program Value

Both program managers are interested in a better understanding of whether the customer perceives value in the existing program. One program manager reports that Account Managers have indicated that customers desire more details, but it is not clear what kind of details are desired. The program manager is currently exploring this, "*We're stepping in to it, working with a client to identify the specific need.*"

Both program managers also agree that their objective is to be able to demonstrate that the program is profitable for Duke Energy as well as the customer.

The program managers believe that the EAP has significant value as a relationship-building service for large nonresidential customers. They report that while they do not yet have quantitative metric of the EAP's effectiveness, the fact that customers keep requesting energy assessments in the absence of a significant marketing effort is an indicator of its value. "Customers will often request an onsite assessment, saying '*I understand the costs and am willing to pay*'".

Tracking Recommendation Adoptions and Program Overlap

Duke Energy analyzed program records to determine whether the EAP recommendations were adopted by the participants. It is easier to track adoption if customers participate in the Non-

Residential Smart $aver® Custom program because there are fewer participants and applications must be preapproved by Duke Energy. In contrast, the Non-Residential Smart $aver® Prescriptive program participants are more numerous and do not need to obtain project preapproval from Duke Energy. In order to track adoption, Duke Energy compiled all the 2010 EAP reports and determined whether there was a correlation between the EAP recommendations and the customers' installations, as measured by the Non-Residential Smart $aver® Prescriptive rebates that were given. One such correlation was found; see Customer Four in the Engineering-Based Impact Analysis section on page 32.
The program management recognizes that customer adoption of recommendations is one of the best metrics of whether the EAP provides a useful service or not, along with the value of the savings achieved.

Duke Energy is also conducting pilot tests of a "*white glove*" assessment program that offers a $30,000 in-depth assessment and provides additional services such as obtaining contractor quotes for the customer, providing calculations to prove that the financial case is sound, and filling out applications. Only a few qualified customers have been offered this pilot program but the program managers report that the preliminary response has been good. "*It's a test case but it's working very well.*" This pilot program is still in the development stages.

Program Successes

The program managers agree that the program works smoothly and cite the program's smooth and successful operations as one of the program successes. One program manager reports, "*I have a lot of good interactions with our vendor, and the account reps are very involved...I think it's a coordinated effort to stay in front of the customer.*"

Results from Participant Interviews

The following parts of this evaluation present the results of the interviews with 8 participants.

Implementation Rates

In general, TecMarket Works found no significant differences in implementation or satisfaction rates between those participants who received on-site evaluations and those who did not. TecMarket Works completed eight interviews from the 20 facilities that participated in the Energy Assessment Program in Ohio. These eight facilities were provided with a total of 47 program-generated recommendations. Figure 1 presents the status of the recommendations provided for these 8 facilities.

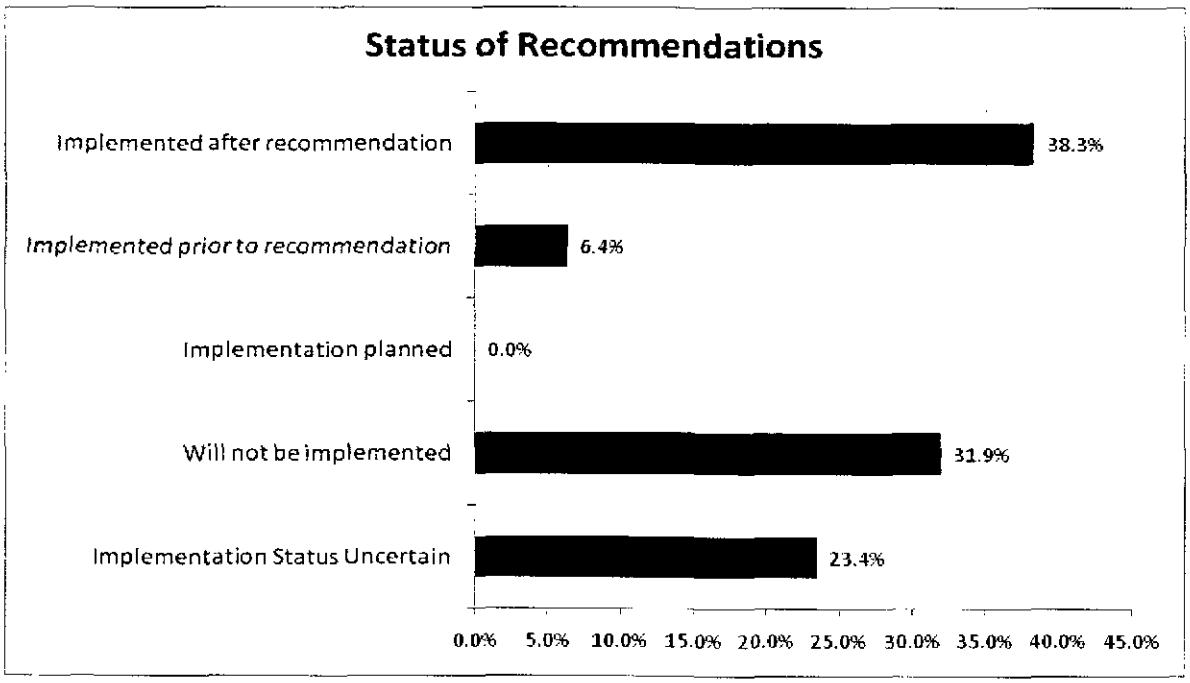

Figure 1. Status of Recommendations

The overall implementation rate for recommended measures is 38.3%, with 18 out of 47 recommendations implemented.

Recommendations That Will Not Be Installed and Why

There were 15 recommendations (31.9%) that will not be implemented that were provided to the eight facility representatives interviewed. These recommendations are provided in the table below. In three cases, the respondent declined to give a reason. The reasons for not installing the measure or making the improvements were subjectively divided into three summary categories: *Technical, Economic, or Other*. Eight (53.3%) of the reasons are categorized as Economic reasons for non-implementation, and three (20%) were classified as "Other" reasons. None of the reasons for certain non-implementation were classified as "Technical."

Table 3. Reasons Recommendations Will Not Be Installed

Recommendation	Reason for Not Implementing, If Provided	Economic, Technical, or Other
Utilize high efficiency heat pumps	Building is fairly new. Heat pumps are already high efficiency	Other
Investigate production activity during 2nd shift ramp-up	Conflicts with production needs	Economic
Centralized Energy Management for Lighting	Not provided	
Computer energy management	Switched from desktop computers to tablets. Employees take them home.	Other
HVAC Optimization	Cost. Payback greater than 3 years.	Economic
Compressed air system optimization	Facility is production driven, improvements are not a priority.	Economic
High efficiency motors (replace <30HP)	Cost	Economic
Put hot water circulation pump on a timer	Eliminated large hot water tank.	Other
HVAC economizer and control strategy	Cost	Economic
High Efficiency Motors for elevators	Not cost effective.	Economic
Energy Management System (EMS)	Too costly.	Economic
Chiller Tower VFD (variable frequency drive)	Too costly.	Economic
Demand Control practices	Not provided.	
Solar Panels for Hot Water	Not provided.	
Energy Management System (EMS)	Not provided.	

We asked if there was anything the program or Duke Energy could do to help the participant decide to take the program-provided recommendations. All of the responses were variations of "no," indicating that the participants could not provide indications for what the program could do to overcome resistance to implementing the recommended energy efficient action.

Recommendations That Are Under Consideration and Why

There were 11 recommendations categorized as "installation uncertain" by the respondents, indicating that they were not sure if they would take the action. These recommendations are provided in the table below. The reasons provided were likewise subjectively divided into three summary categories: *Technical, Economic, or Other*.

Table 4. Recommendations under Consideration

Recommendation	Reason for Not Implementing, If Provided	Economic, Technical, or Other
Utilize energy Management System	Not provided.	
Use 28 watt T8 lamps instead of 32W T8's	May replace with 28w as 32w burn out	Other
Utilize Energy Profiler Online (EPO)	Would like more information about EPO	Technical
Destratification fans	ROI not sufficient	Economic
Heat Recovery / Process Heat evaluation	Disrupted process during trial. Put on back burner	Technical
Lighting Occupancy sensors	Not provided	
Elevator high efficiency Motors	Not provided	
Glycol coolers	ROI not sufficient	Economic

Obtain Energy Star Certification	Not provided	
Daylighting	Overlooked, will reconsider	Other
Replace metal halide lamps with lower wattage	Not provided	

Again, we asked if there was anything the program or Duke Energy could do to help the participant decide to take appropriate recommendations. The responses for this group were identical to the responses for the recommendations that will not be installed. They all responded by indicating that they could not think of what the program could do to cause them to implement the recommendations. Essentially, customers consider the matter in their hands once the recommendation has been received.

Figure 2 summarizes the reasons for not implementing the recommendation or for the uncertainty over implementing the recommendation. The reasons are based in corporate economic conditions in almost half of the cases, and were least likely to be linked to technical barriers. Half of the reasons for not implementing a measure fall into the "Other" category. These primarily include lack of time to take the action or lack of a perceived need to make the change, even if there are savings.

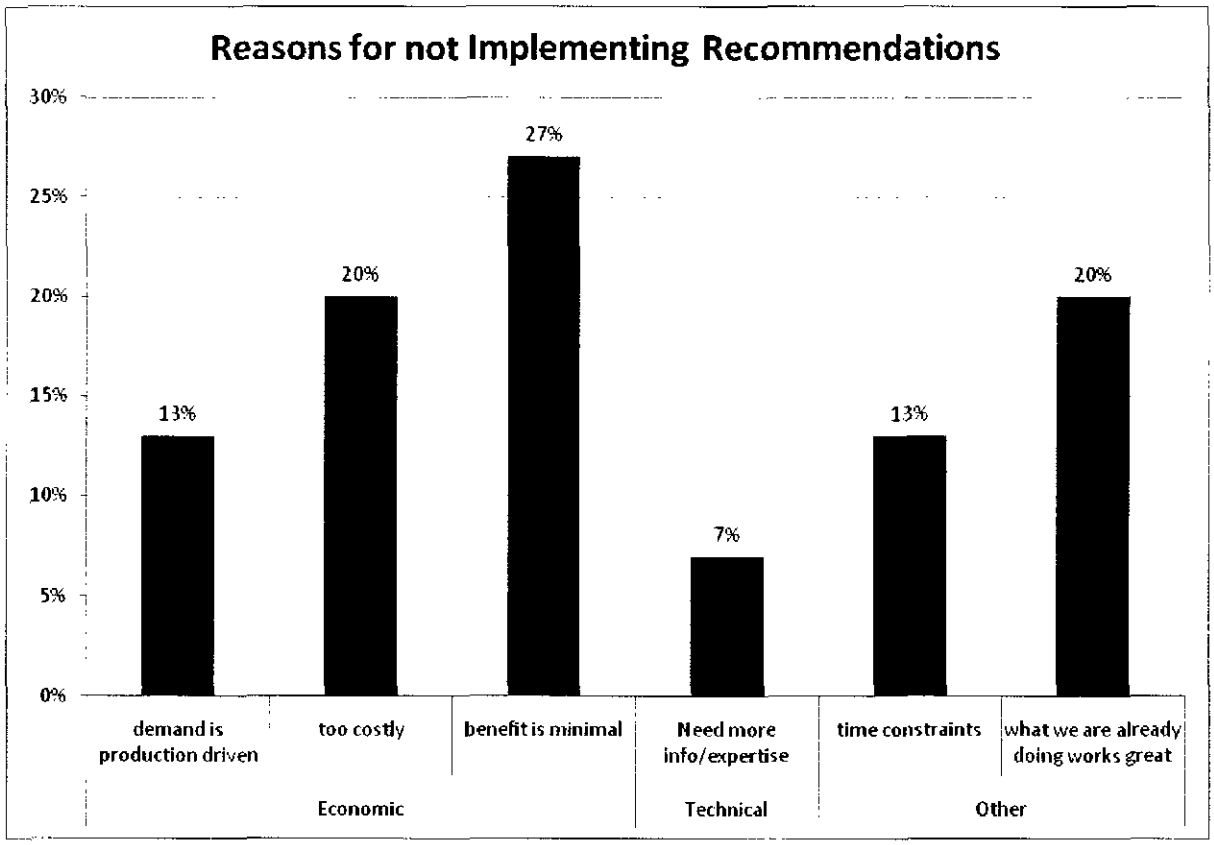

Figure 2. Reasons for Not Implementing Recommendations: recommendations that will not be done and recommendations that are under consideration

Timing of Actions

For each recommended action taken, we asked the responder how many months had passed between the time they received the report and the time when the action was taken. Seventeen of the 18 respondents were able to answer this question. The question was open-ended, allowing the respondent to provide an answer specific to their conditions. These respondents provided answers that grouped into five distinct periods of time: one month or less, six months, ten months, 12 months and 18 months. The percentage of each response is provided below in Figure 3.

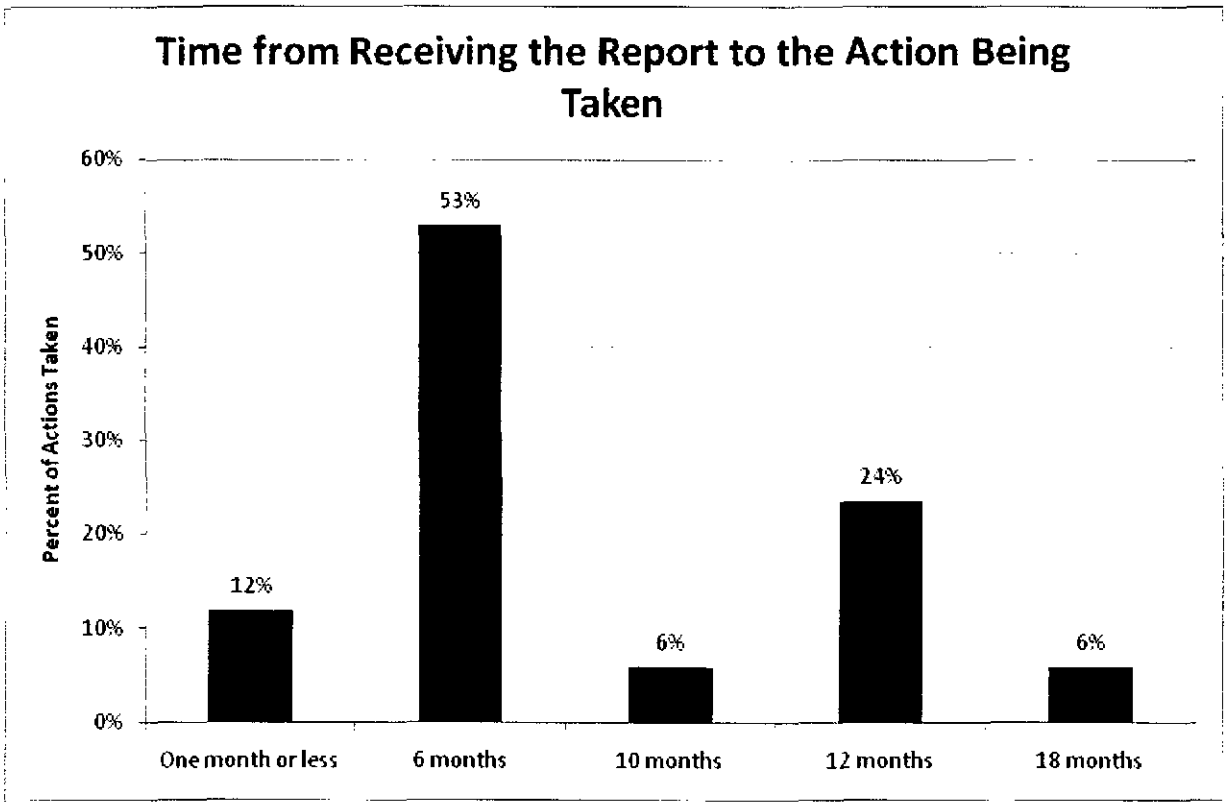

Figure 3. Months from Receiving the Report to the Action Being Taken

Figure 3 shows that 12% of the installed recommendations are installed almost immediately and that 65% are installed within six months of the facilities receiving the report. However, 30% of these participants required a year or more to implement the recommendations with another 6% requiring almost a year (10 months).

Table 5 below shows each recommendation taken and the number of months between the participant receiving the report recommendations and implementation of those actions.

Table 5. Individual Recommendations Implemented

	Measure	Months
1	T12 to T8 lighting retrofit	18
2	Lighting Occupancy sensors	12

3	Improve building envelope	12
4	Occupancy sensors and metal halide to T5 conversion	12
5	Incandescent to CFLs conversion	12
6	Demand control strategy	10
7	Motion sensors for vending machines	6
8	Incandescent to CFL conversion	6
9	Lighting Conversion	6
10	Compressed air system maintenance program	6
11	Compressed air, electric distribution, and space conditioning systems	6
12	Power factor correction	6
13	Lighting Conversion	6
14	Natural gas usage reduction study / boiler optimization	6
15	Compressed air system repair and maintenance program	5
16	Lighting conversion	1
17	Reduce compressed air pressure	1
18	Install programmable thermostats	NA

Program Satisfaction

Respondents were asked to rate various aspects of the program on a scale of one to ten, with one meaning they were very dissatisfied and ten meaning they were very satisfied. If a respondent provided a satisfaction score of seven or lower, they were asked how that aspect of the program could be improved.

The average satisfaction response across the eight respondents is presented in Table 6. The ability to answer each satisfaction question varied from participant to participant, therefore the sample size for each question varied from n=4 to n=8.

Table 6. Participant Satisfaction

Criteria	Satisfaction Rating	Range	N	Percent of ratings greater than 7
Responsiveness of Duke Energy staff	9.4	8-10	5	100%
Length of time to receive assessment report	9.3	8-10	6	100%
Report meets expectations	9.2	7-10	6	83%
Knowledge of energy specialists	9.0	8-10	7	100%
Ease of requesting assessment	8.9		7	86%
Review and discussion of the recommendations	8.9	7-10	7	71%
Comprehensiveness and completeness of assessment report	8.9	7-10	7	86%
Quality of inspection	8.7	7-10	6	67%
Completeness of inspection	8.5	7-10	4	50%
Clarity and ease of understanding assessment report	8.3	6-10	7	71%
Convenience of scheduling inspection	7.6	5-10	5	60%
Practicality of the recommendations provided	7.0	2-10	8	50%

Overall satisfaction with the assessment and report was high with scores higher than eight on all but two aspects of the program. The program's lowest marks come from the "Practicality of

Recommendations" and "Convenience of scheduling inspection" categories. One survey respondent who gave the inspection scheduling a rating of 7 stated that the inspection was "hard to arrange" and another respondent who gave the inspection scheduling a rating of 5 stated that the inspection "took a while to get scheduled."

While overall the ratings are high, the following are all the reasons given for lower ratings in the "Practicality/usefulness of Recommendations" category:

- "Many are not very practical"
- "Our building is new and we have already switched to CFLs."
- "Demand control practices are impractical for us."
- "We would like more return-on-investment information about the recommendations."

It should also be noted that while respondents gave practicality the lowest satisfaction marks of the categories, all respondents indicated that they had implemented at least one of the recommendations regardless of their rating of overall practicality. That is, each respondent found at least one program recommendation to be practical enough to implement.

Perception of Realized Savings

Participants who indicated that they had installed a recommended measure were then asked follow-up questions regarding whether they felt they were achieving the savings estimated in the report. Participants were then asked to provide an estimate of the cost of implementation and whether that cost was more or less than they had expected.

Five respondents answered the question for 10 of the installed measures. For seven of the measures, survey participants responded with a "yes" they had achieved the estimated savings and one responded with a "probably". Two respondents also stated that they were "unsure" about the savings of two of the measures installed.

Participants were also asked if the cost to implement the recommended measures was more, less, or in line with their expectations. Four surveyed respondents indicated that the cost for seven measures was in line with their expectations.

One respondent also indicated that four of the installed measures cost less than expected, and two other respondents indicated that their installation costs for four measures was in line with their expectations. No respondents stated that costs were more than expected. The measures with cost and saving expectations are listed in Table 7 below. The high level of met expectations suggests that participants are receiving accurate information from the assessment regarding implementation costs and savings estimates in several categories (lighting, building envelope, compressed air system maintenance).

Table 7. Measure Costs and Savings Compared to Expectations

Measure	Cost	Achieved Estimated Savings?
Motion sensors for vending machines	As expected	Yes
Lighting Occupancy sensors	Less than expected	Yes

T12 to T8 lighting retrofit	Less than expected	Yes
Improve building envelope	Less than expected	Yes
Occupancy sensors and metal halide to T5 conversion	As expected	"Probably"
Compressed air system repair and maintenance program	As expected	Yes
Lighting conversion	As expected	Yes
Incandescents to CFL conversion	Less than expected	Yes
Demand control strategy	NA	Unsure
Convert incandescents to CFLs	NA	Unsure
Lighting Conversion	NA	NA
Compressed air system maintenance program	NA	NA
Power factor correction	NA	NA
Lighting Conversion	NA	NA
Natural gas usage reduction study / boiler optimization	NA	NA
Reduce compressed air pressure	NA	NA
Install programmable thermostats	NA	NA

Additional Comments about the Program

The concluding questions had participants identify attributes of the program that they did and did not like. The most frequently mentioned positive was that the information and recommendations that the program provided. The most frequently mentioned negative aspects were a difficulty with scheduling the on-site assessment and the impracticality of some of the recommendations. Lastly, participants were asked if they could change one thing about the program, to identify what change they would make. Two respondents would like to see more time and energy spent during the on-site assessment, and one respondent would like to see scheduling for the visit improve. The responses can be seen in the lists below.

What Participants Liked Most About the Program

- "Assurance that staff was doing a good job."
- "Overall ease of participating."
- "The report confirmed actions that we were already taking, and added information and insight."
- "It was free. Some of the recommendations were useful and saved money."
- "Technical verification of energy saving measures."

What Participants Liked Least about the Program

- "Many recommendations were not practical."
- "Inconvenience of setting up the inspection."
- "Took awhile to get everybody scheduled."
- "Would have liked more info to understand how to apply recommendations to very large old facility."

What Participants Would Like To See Changed

- "More hands-on on-site inspection."

- "Easier scheduling."
- "More on-site time, more details of motor management."

Effect of Current Economy on Energy Efficient Actions

Survey participants were asked if their company was more or less likely to investigate and implement energy saving measures given the current state of the economy. Two of four total respondents to this question indicated that their company would spend more investigating energy efficient measures if the economy improved. One respondent indicated his or her company would spend the same amount and one respondent was unsure of company spending. No respondents indicated that their company would spend less.

Participant Program Referrals

Finally, participants were asked if they had referred the Non-Residential Energy Assessment program to other companies. Out of the four total respondents to this question, two indicated that they had recommended the program to others and two indicated that they had not. One respondent indicated that he had referred the program to 5 to 10 business owners and building operators, and one respondent indicated he had recommended the program to other facilities within his own company.

Market Analysis

Because all savings acquired through EAP are captured in other programs, there was no net to gross analysis conducted in this report. EAP is not designed to focus on acquiring direct savings, and its performance can only be measured in terms of how it affects the portfolio's ability to attract participants and acquire savings via other Duke Energy programs compared with the cost to operate the program as a marketing tool.

Participants were asked if the current state of the economy affected their likelihood to investigate and implement energy saving measures. Two participants (25%) indicated that an improvement in the economy would positively affect their allocation of capital to energy saving improvements. One participant indicated that the state of the economy would have no effect on energy saving activities. One participant was unsure of the economy's impact, and four participants declined to answer the question.

Conclusions and Recommendations for Program Changes

Program Operations: Recommendations

1. RECOMMENDATION: The Non-Residential Energy Assessments Program (EAP) should work with the Account Managers to develop clear criteria for identifying prospective participants for the Smart $aver® program based upon segmentation of past Smart $aver® participants. An analysis of what projects and measures were of interest to past Smart $aver® participants in each industry sector would allow Account Managers to make suggestions of similar projects to prospective participants in the same sector. This would allow the budget for the EAP to be directed to those customers who are more likely to take action.
2. RECOMMENDATION: Track the conversion rate (i.e. percentage of EAP participants who adopt EAP recommendations through subsequent Smart $aver® projects) and identify those Account Managers who are more successful at actively converting EAP participants into Smart Saver® participants. These Account Managers may have developed successful strategies that could be shared with other Account Managers to help them increase Duke Energy's overall conversion rates from EAP to Smart $aver®.
3. RECOMMENDATION: Duke Energy or their evaluation contractors should survey customers who receive both phone and on-site assessments to determine how much additional perceived value is provided by the on-site assessment, and where this additional value comes from. This would allow Duke Energy to identify customer's needs and wants from the on-site assessment report. Duke Energy or their evaluation contractors should also compare the relative cost effectiveness of the phone assessment compared with the on-line web assessment. If the on-line assessment is not perceived as valuable and does not drive customers to participation, Duke Energy should consider discontinuing the web-based assessment (but still offer online input of assessment data for a telephone assessment). However, care should be taken in this effort as different customers may want different services, and each of these delivery approaches may define a market sub-segment that may or may not participate in the program if their assessment choices are limited compared to their expectations. The study should also examine the relative success of each approach in driving customers to participate in other Duke Energy programs, as well as identifying additional benefits to the customer not captured by the other programs (low-cost no-cost savings, customer loyalty, satisfaction, etc.)
4. RECOMMENDATION: Conduct a service needs survey to determine what customers expect from assessment reports in terms of short term versus long term recommendations and in terms of electric-only versus more comprehensive sustainability recommendations. While the primary objective is to help customers identify projects that can be implemented under the Smart $aver® program, the overall credibility of energy efficiency-related recommendations may be enhanced by including recommendations that present a more comprehensive approach to reducing operating costs. Depending upon the survey results, Duke Energy may also elect to begin offering a "zero net energy with existing buildings" or other high savings assessments (not just cost effective for Duke

Energy) for those customers who are motivated to achieve deep energy savings. This would help maintain Duke Energy's standing as the customers' primary partner in meeting all their energy needs, including sustainable energy.

5. RECOMMENDATION: Assess if it is possible to develop set of segment-specific recommendations that are targeted to the specific needs of different market segments to the degree that the segments can be used to target high-priority customers more likely to take segment-specific actions. If there are identifiable segment-specific actions that are specific to a segment, this can allow Duke Energy to show customers that their needs are understood, and that the assessment report's recommendations are customized especially for them. Duke Energy can begin to develop these targeted recommendations by first asking Account Managers to identify a few key market sectors that they believe has the greatest untapped potential for energy savings. Duke Energy can survey the Smart $aver® participants and non-participants within those sectors to determine their needs, wants, barriers to participation, and how well the Smart $aver® program addresses those. If Duke Energy has not already done so, we recommend that Duke Energy also conduct market characterization studies for those sectors to see what the mid- to long-term trends are for that market, and also to aid in their conversations with the customers about the projects with longer paybacks. Information from the surveys and any market characterization studies can also be used to build case studies that will help other customers understand the process and benefits of participating in Smart $aver®.
6. RECOMMENDATION: Duke Energy should conduct some contingency analyses of the recommendations adoption data to determine whether adopting low-cost no-cost recommendations affect the adoption of Smart $aver®-eligible measures. In a parallel study, Duke Energy should investigate whether there are any corollary benefits to including low-cost no-cost recommendations. For example, excluding low-cost no-cost recommendations may inadvertently emphasize the greater expense of the Smart $aver®-eligible measures, and thus increase the perceived first-cost barriers to becoming more energy efficient.
7. RECOMMENDATION: EAP should use the program's follow up activities to obtain immediate feedback on the usefulness of the assessment reports. This may allow a better leveraging of resources. Additionally, if Account Managers are conducting the follow up feedback, the program's Smart $aver® objectives and services can be kept at the forefront of customer interactions.
8. RECOMMENDATION: Develop the program website so that it is easy to find on the web, has a clear presentation of the services offered and the service approach, and an easy to use web-based enrollment process.
9. RECOMMENDATION: Design the assessment to formally provide low-cost and no-cost recommendations to customers and incorporate estimates of the impact of these actions, when implemented into the tally of energy saved credited to Duke Energy (and other utilities) as a result of the program. The low-cost and no-cost savings may not be eligible for cost recovery, but it is important to document the full value of the EAP, whether officially credited or not. This will allow Duke Energy to make decisions with a more comprehensive knowledge of how each energy efficiency program interacts with the other programs in Duke Energy's energy efficiency portfolio.

Implementation Rates: Key Findings

4. **Many Recommendations are Accepted and Used:** Eight participants, four receiving off-site assessments and four receiving an on-site assessment, were provided with a total of 47 recommendations:
   - The overall implementation rate for all recommended measures was 38%.
   - 32% of the recommendations were rejected by the customer and will not be implemented.
     (See "Implementation Rates" on Page 19)

5. **Participants Take Action Rapidly:** Of the recommendations that were implemented prior to the evaluation contact, 65% were completed within six months of receiving the report. 12% were completed immediately upon receipt of the recommendation or within the next 30 days. (See "Timing of Actions" on Page 22)

6. **Economy and Corporate Conditions Slow Measure Installations:** Corporate economic conditions and the firm's current financial status together represent the most common reasons provided for a recommended measure not being implemented. These two reasons are similar in that they deal with the firm's financial condition within the economies in which they operate. As a result, measures with long payback periods and/or excessive upfront capital costs become the measures cited most often as those that cannot be implemented. (See "Effect of Current Economy on Energy Efficient Actions" on Page 26)

Program Satisfaction: Key Findings

3. **Satisfaction Scores are High:** Participants gave high satisfaction scores for three program aspects: "Responsiveness of Duke Energy staff," "Length of time to receive assessment report" and "Report meets expectations," received satisfaction ratings of 9.2 or higher on a ten point scale. Overall satisfaction within nine other categories was also scored well with average scores higher than eight on a ten-point scale. (See "Program Satisfaction" on Page 23)

4. **Scheduling and practicality of report are concerns:** Two participants noted that they found it difficult to schedule their assessment and gave scores that lowered the "Ease of Scheduling" rating below an eight. Four of eight participants rated the overall practicality of the report at less than eight. However, all participants did implement at least one report recommendation.

Engineering-Based Impact Analysis

There were a total of 20 customers in Ohio that received an energy assessment. Attempts were made to contact all customers for a follow-up phone interview. Eight were able to be contacted, but only six of the 20 verified that they implemented energy saving recommendations from their Non-Residential Energy Assessment report. The energy saving measures taken by these six customers as a result of the program provide gross annual savings of 818,736 kWh, 209,649 MMBtu, and reduce peak load by 58.7 kW. A breakdown of the savings by customer can be seen in Table 8.

Table 8: Program Savings Estimate Breakdown by Customer

Customer	kWh	kW	MMBtu
Customer One	227,358	21.5	-632
Customer Two	101,740	4.7	-285
Customer Three	57,213	7.5	-160
Customer Four*	297,849	17.1	-430
Customer Five	74,998	4.7	0
Customer Six	27,293	3.3	211,156
TOTAL	786,451	58.7	209,649

* Customer Four implemented a compressed air system repair and maintenance program as recommended to them in their energy assessment report. Subsequent to implementing this program, this customer purchased and received a rebate for a new variable speed compressor with controller. This rebate was received through the Smart $aver® Custom program and the unit's purchase is considered to have been precipitated by the customer's participation in the Energy Assessment program. In consideration of the new, more efficient compressor, the energy savings factor (ESF) for this customer's repair and maintenance program has been lowered.

All savings calculations were made using equations from the Ohio TRM (unless otherwise noted in the section "Use of TRM values and explanation if TRM values not used" on page 12), which are presented alongside each customer's energy savings in the individual customer sections. Savings adjustment factors used include:

WHFe = 0.095

WHFe is the lighting-HVAC interaction factor for energy. This factor represents the reduced electric space cooling requirements due to the reduction of waste heat rejected by the efficient lighting.

WHFd = 0.2

WHFd is the lighting-HVAC waste heat factor for demand. This factor represents the reduced electric space cooling requirements due to the reduction of waste heat rejected by the efficient lighting.

IFMMBtu = -.0028

IFMMBtu is the lighting-HVAC interaction factor for gas heating impacts. This factor represents the increased gas space heating requirements due to the reduction of waste heat rejected by the efficient lighting.

CF = Varies

CF is the summer peak coincidence factor and is dependent on building type.

ESF = Varies

ESF is the energy savings factor. This factor represents the additional savings percentage achieved and is dependent on the measure and installation types.

Customer One

This project involved a lighting retrofit and vending machine motion sensors installed in an office building with annual operating hours of 8,760. For the lighting retrofit, 157 215-Watt metal halide lamps were replaced with 93-Watt CFLs. One refrigerated vending machine was fitted with a motion sensor. These measures provide gross annual savings of 227,358 kWh and reduce the peak load by 21.5 kW. A breakdown of the savings by measure can be seen in Table 9.

Table 9: Customer One Savings Estimate Breakdown by Measure

Customer One	kWh	kW	MMBtu
Lighting retrofit + sensors	225,746	21.5	-632
Vending machine motion sensor	1,612	0.0	0
TOTAL	**227,358**	**21.5**	**-632**

Lighting with occupancy sensors:

ΔkWh = [WATTSbase – WATTSee * (1-ESF)] * HOURS * (1 + WHFe) / 1000
ΔkW = [WATTSbase – WATTSee * (1-ESF)] * CF * (1 + WHFd) / 1000
ΔMMBtu = ΔkWh * IFMMBtu

Vending machine motion sensor:

ΔkWh = WATTSbase / 1000 * HOURS * ESF

Customer Two

This project involved two separate lighting retrofits installed in condominiums with annual operating hours of 8,760. For the first lighting retrofit, 150 incandescent bulbs averaging 87.5-Watts were replaced with CFLs averaging 26.9-Watts. For the second, 40 50-Watt halogen bulbs were replaced with 12-Watt LEDs. These measures provide gross annual savings of 101,740 kWh and reduce peak load by 4.7 kW. A breakdown of the savings by measure can be seen in Table 10.

Table 10: Customer Two Savings Estimate Breakdown by Measure

Customer Two	kWh	kW	MMBtu
Lighting retrofit (CFLs)	87,160	4.0	-244
Lighting retrofit (LEDs)	14,580	0.7	-41
TOTAL	**101,740**	**4.7**	**-285**

Lighting:

ΔkWh = (WATTSbase – WATTSee) * HOURS * (1 + WHFe) / 1000
ΔkW = (WATTSbase – WATTSee) * CF * (1 + WHFd) / 1000
ΔMMBtu = ΔkWh * IFMMBtu

Customer Three

This project involved two separate lighting retrofits as well as occupancy sensors installed in a school with annual operating hours of 4,160. For the first lighting retrofit, 244 96-Watt T12 lamps were replaced with 59-Watt T8s. For the second, 52 90-Watt incandescent bulbs were replaced with 26-Watt CFLs. Occupancy sensors were hooked up to 22 fixtures with a total

controlled wattage of 680-Watts. These measures provide gross annual savings of 57,213 kWh and reduce peak load by 7.5 kW. A breakdown of the savings by measure can be seen in Table 11.

Table 11: Customer Three Savings Estimate Breakdown by Measure

Customer Three	kWh	kW	MMBtu
Lighting retrofit (CFLs)	15,160	2.0	-42
Lighting retrofit (T8s)	41,124	5.4	-115
Occupancy sensors	929	0.04	-3
TOTAL	**57,213**	**7.5**	**-160**

Lighting:

ΔkWh = (WATTSbase – WATTSee) * HOURS * (1 + WHFe) / 1000
ΔkW = (WATTSbase – WATTSee) * CF * (1 + WHFd) / 1000
ΔMMBtu = ΔkWh * IFMMBtu

Occupancy sensors:

ΔkWh = kWcontrolled * HOURS * (1 + WHFe) * ESF
ΔkW = kWcontrolled * (1 + WHFd) * ESF * CF
ΔMMBtu = ΔkWh * IFMMBtu

Customer Four

This project involved a lighting retrofit and the adoption of a compressed air system repair and maintenance program implemented in a light industrial building with annual operating hours of 7,488. For the lighting retrofit, 140 400-Watt metal halide lamps were replaced with 105 355-Watt T5s. The company has three single stage screw type air compressors totaling 525hp and averaging 1120cfm. These measures provide gross annual savings of 297,849 kWh and reduce peak load by 17.1 kW. A breakdown of the savings by measure can be seen in Table 12.

Following a comparison of NREA and Smart $aver® participants, it was discovered that this customer received a rebate through the Smart $aver® program for the adoption of a measure related to a recommendation in their energy assessment. Savings achieved through the implementation of the repair and maintenance program has been adjusted to account for the purchase of a new compressor through the Smart $aver® Custom program. The energy savings factor (ESF) was reduced to address the savings calculation's dependence on compressor efficiency.

Table 12: Customer Four Savings Estimate Breakdown by Measure

Customer Four	kWh	kW	MMBtu
Lighting retrofit (T5s)	**153,533**	**17.1**	**-430**
Maintenance program	**144,316**	**0.0**	**0**
TOTAL	**297,849**	**17.1**	**-430**

Lighting:

ΔkWh = (WATTSbase – WATTSee) * HOURS * (1 + WHFe) / 1000
ΔkW = (WATTSbase – WATTSee) * CF * (1 + WHFd) / 1000
ΔMMBtu = ΔkWh * IFMMBtu

Compressed air system repair and maintenance program:

ΔkWh = cfm * kW/cfm * ESF * HOURS

Customer Five

This project involved just one measure, a reduction of compressed air pressure. This was implemented in a light industrial building with annual operating hours of 6,032. Air pressure was lowered from 110 to 95 psi on two 100hp compressors. This measure provides gross annual savings of 74,998 kWh and reduces peak load by 4.7 kW.

Reduced compressed air pressure:

ΔkWh = BHP * 0.746 / ηmotor x HOURS x ESF
ΔkW = ΔkWh / HOURS * CF

Customer Six

This project involved three separate lighting retrofits across multiple buildings and the installation of a stack economizer for a steam boiler. For the first lighting retrofit, 75 96-Watt T12 lamps were replaced with 59-Watt T8s in an industrial building. For the second, 50 223-Watt high pressure sodium and mercury vapor lamps were replaced with 226-Watt T8s in a warehouse. The third lighting retrofit was for a different warehouse. Occupancy sensors were added and 20 205-Watt mercury vapor fixtures were replaced with 226-Watt T8s. The stack economizer was installed on a 200hp steam boiler. The boiler runs 24 hours a day five days a week in warm weather and 24 hours a day seven days a week in cold weather. These measures combine to provide gross annual savings of 27,293 kWh, 211,156 MMBtu, and reduce peak load by 3.3 kW. A breakdown of the savings by measure can be seen in Table 13.

Table 13: Customer Six Savings Estimate Breakdown by Measure

Customer Six	kWh	kW	MMBtu
Lighting retrofit (T12-T8)	26,618	2.5	-75
Lighting retrofit (Na/Hg-T8)	-391	-0.1	1
Lighting retrofit with sensors	1,066	0.9	-3
Economizer	0	0.0	211,232
TOTAL	**27,293**	**3.3**	**211,156**

Lighting:

ΔkWh = (WATTSbase – WATTSee) * HOURS * (1 + WHFe) / 1000
ΔkW = (WATTSbase – WATTSee) * CF * (1 + WHFd) / 1000
ΔMMBtu = ΔkWh * IFMMBtu

Lighting with occupancy sensors:

ΔkWh = [WATTSbase – WATTSee * (1-ESF)] * HOURS * (1 + WHFe) / 1000
ΔkW = [WATTSbase – WATTSee * (1-ESF)] * CF * (1 + WHFd) / 1000
ΔMMBtu = ΔkWh * IFMMBtu

Stack Economizer:

ΔMMBtu = HP x kBtuh/HP / 10 x FLH x ESF

Appendix A: Required Savings Tables

The required table showing measure-level participation counts and savings for each program is below. **Also include tables showing calculations done to achieve Adjusted Gross Savings for each program.**

Required tables will include the following (see Excel file for details):

1. Participation counts and ex ante savings estimates at the measure level for each program
2. Gross savings calculations at the measure level for each program.
    - At a minimum, *Gross Verified Savings* must be reported.
    - If additional adjustments are made, *Adjusted Gross Savings* can be reported using Option A, B, C only.

Measure	Participation Count	Verified Per unit kWh impact	Verified Per unit kWh impact	Gross Verified kWh Savings	Gross Verified kW Savings
Metal Halide to T5 and Occupancy Sensors	1	1,438	0.14	225,746	21.46
Vending machine motion sensor	1	1,612	0.00	1,612	0.00
Incandescent to CFL	2	507	0.03	102,320	6.03
Halogen to LED	1	365	0.02	14,580	0.67
T12 to T8	2	212	0.02	67,743	7.95
Occupancy Sensors	1	929	0.04	929	0.04
Metal Halide to T5	1	1,462	0.16	153,533	17.08
Compressed Air System Repair and Maintenance Program	1	176,602	0.00	176,602	0.00
Reduced Compressed Air Pressure	1	74,998	4.72	74,998	4.72
Na/Hg Vapor to T8	1	-8	0.00	-391	-0.13
Hg Vapor to T8 and Occupancy Sensors	1	53	0.04	1,066	0.89

Appendix B: Management Interview Instrument

Name: _____

Title: _____

Position description and general responsibilities:

_____

_____

_____

We are conducting this interview to obtain your opinions about and experiences with the Facility Assessment Program. We'll talk about the Program and its objectives, your thoughts on improving the program and its participation rates, and the technologies the program covers. The interview will take about an hour to complete. May we begin?

Program Objectives

1. In your own words, please describe the Facility Assessment Program's objectives.

2. In your opinion, which objectives do you think are being met or will be met? How do you think the program's objectives have changed over time?

3. Are there any program objectives that are not being addressed or that you think should have more attention focused on them? If yes, which ones? How should these objectives be addressed? What should be changed? Do you think these changes will increase program participation?

4. Should the program objectives be changed in any way because of market conditions, other external or internal program influences, or any other conditions that have developed since the program objectives were devised? What changes would you put into place, and how would it affect the objectives?

5. Please describe your role and scope of responsibility in detail. What is it that you are responsible for as it relates to this program? When did you take on this role? *If a recent change in management*...Do you feel that Duke Energy gave you enough time to adequately prepare to manage this program? Did you get all the support that you needed to manage this program?
6. Do you think the incentives application process offered through the Facility Assessment program is easy to understand and complete?

7. Which recommendations have been implemented? Why, and why have other measures not been adopted?

8. What kinds of marketing, outreach and customer contact approaches do you use to make your customers aware of the program and its options? Are there any changes to the program marketing that you think would increase participation?

9. How do you inform trade allies and contractors about the program? How effective has this been in getting participation from the contractors?

10. Are there any changes to the marketing that could possibly increase participation in the program?

Overall Facility Assessment Management

11. Describe the use of any advisors, technical groups or organizations that have in the past or are currently helping you think through the program's approach or methods. How often do you use these resources? What do you use them for?

12. Overall, what about the Facility Assessment Program works well and why?

13. What doesn't work well and why? Do you think this discourages participation?

14. Can you identify any market or operational barriers that impede a more efficient program operation?

15. If you could change any part of the program what would you change and why?

Program Design & Implementation

16. What market information, research or market assessments are you using to determine the best target markets or market segments to focus on?

17. What market information, research or market assessments are you using to identify market barriers, and develop more effective delivery mechanisms?

18. How do you manage and monitor or evaluate contractor involvement or performance? What is the quality control and tracking process? What do you do if contractor performance is exemplary or below expectations?

23. In your opinion, did the incentives cover enough different kinds of energy efficient products and recommendations?

1. ❑ Yes 2. ❑ No 99. ❑ DK/NS

If no, 22b. What should be included?

_____

_____

24. In what ways can the Facility Assessment Program's operations be improved?

25. Do you have any suggestions for how program participation can be increased?

Appendix C: Participant Survey Instrument

Hello, my name is <*name*> with TecMarket Works and I am calling in regard to the assessment that was provided to your facility through Duke Energy in <*Month Year*>. From that assessment, you were provided with a report that listed energy saving opportunities for your facility to pursue. The purpose of this call is to find out if you or your company have implemented any of the energy savings opportunities that were recommended in the report and to ask you a few questions about your satisfaction with the program's services. This call will only take about 5 or 10 minutes. Is now a good time?

In that report there were <#> energy and cost saving opportunities recommended. There were: <*list*>.

For each (some, if over 4 recommendations) **of these recommendations we would like to know…**

1. **If you have already taken the action,**
2. **If you have decided to take the action, but have not yet done so,**
3. **If you have decided not to take the action,**
   Or,
4. **If you are not sure if you are going to take the action**
5. **Already doing the action before the assessment was done.**

1. **Let's start with <*action1*>. For <*action1*> please tell me…**

   1. **If you have already taken the action,**
   2. **If you have decided to take the action, but have not yet done so,**
   3. **If you have decided not to take the action,**
      Or,
   4. **If you are not sure if you are going to take the action.**
   5. **Already taking the action prior to the assessment.**
   6. **Don't remember that recommendation**

Follow-up questions to Q1

If Q1 = a above…

2. **If you recall, about how many months after the assessment did you take this action?**
3. **Do you feel you are achieving the savings estimated in the report?**
4. **What were the costs associated with implementation?**
   a. **Was this more or less than what you had expected?**

If Q1 = b above…

5. **What are the reasons why your business has not yet taken this action?**

If Q1 = c above…

6. What are the main reasons that you have decided not to take this action?

If Q1 = d above…

7. What are some of the reasons why you are not sure if you are going to take this action?

If Q1 = b,c, or d above.

8. Is there anything that you think the program can do to help you decide to implement this action or to make taking this action an easier or faster process?

Read each of the energy saving recommendations and ask the above questions for each of the top 4 recommendations.

If time is an issue for participant, or if there are a more recommendations, ask the questions above for the top four energy savings recommendations, then ask about the remaining actions as a group…. For example:

9. I am now going to read the rest of the recommendations contained in the report. Please tell me which of these actions you have already taken, and which of these you plan to take within the next year or two.

Read remaining recommendations and ask which they have taken and which they are currently planning on taking within the next year or two.

Recommendation 5	_Have taken	_Plan to take in the next year or two
Recommendation 6	_Have taken	_Plan to take in the next year or two
.		
.		
Recommendation 14	_Have taken	_Plan to take in the next year or two
Recommendation 15	_Have taken	_Plan to take in the next year or two

I would now like to ask you about your level of satisfaction with the assessment service and the interaction with the assessment staff. I will read a series of statements. Please rate your satisfaction with each item on a scale from 1 to 10 with 1 meaning that you were not satisfied at all and 10 meaning that you were extremely satisfied.

10. How satisfied are you with...

	Score
a. The ease of signing up for the assessment?	
b. The convenience of scheduling the inspection?	
c. The completeness of the inspection.	
d. The quality of the inspection.	
e. The review and discussion of the recommendations	
f. The knowledge of the energy specialists who conducted the inspection and explained your assessment report.	
g. The length of time it took to receive the assessment report	
h. The clarity and ease of understanding the assessment report	
i. The comprehensiveness and completeness of the assessment report	
j. The practicality/usefulness of the recommendations provided	
k. The report meeting your expectations	
l. The responsiveness of Duke Energy staff	

If customer scores a 7 or less for any of these, ask

11. What would you like to see changed about ...?

Ask this as you go, so that if we get a 7 or lower score, we ask about changes to that item at the same time, then go on to the next item.

12. What did you like most about this program?

13. What did you like least about this program?

14. If you could change one thing about the program, what would it be?

15. Given the current state of the economy, is your company more or less likely to investigate and implement energy saving measures?

16. Have you recommended this program to others?

a. *If yes,* **How many companies did you refer to this program?**

i. Who or what company did you refer to this program?

We have completed the survey. Thank you for your time. Are there any questions comments you have for me or that you would like for me to convey to Duke Energy?

Appendix D: Responses to Installation Questions

The following pages consist of a table that lists each of the recommendations and the outcome of that recommendation for each of the eight facilities for which we were able to complete an interview.

The facilities are listed in no particular order.

Facility #	On/Off Site	# of Recom-mendations	Measure	Installed	Months	Note	What Duke Can Do
EA-00031	Off	8	Utilize Energy Management System	No		Unsure of future status	
EA-00031	Off	8	Centralized Energy Management for Lighting	No			
EA-00031	Off	8	Occupancy sensors and metal halide to T5 conversion	Yes	12		
EA-00031	Off	8	Elevator high efficiency motors	No		Unsure of future status	
EA-00031	Off	8	Motion Sensors for Vending Machines	Yes	6		
EA-00031	Off	8	Obtain Energy Star Certification	No		Unsure of future status	
EA-00031	Off	8	Chiller Tower VFD	No			
EA-00031	Off	8	Solar Panels for Hot Water	No			
EA-00052	Off	5	Utilize High Efficiency Heat Pumps	No		Building is new.	
EA-00052	Off	5	Use 28 watt T8 lamps instead of 32W T8's	No		May replace 32W with 28W as they burn out	
EA-00052	Off	5	Convert to CFLs	Yes	12		
EA-00052	Off	5	Lighting Occupancy Sensors	No		Unsure of future status	
EA-00052	Off	5	Elevator high efficiency motors	No		Not deemed cost effective	
EA-00179	On	9	Convert to CFLs	Yes	6		
EA-00179	On	9	Computer Energy Management	No		Had already adopted alternative strategy	
EA-00179	On	9	Utilize Energy Profiler Online	No		Unsure of future status	Provide more information on EPO
EA-00179	On	9	Put hot water circulation pump on a timer	No		Eliminated large hot water tank	
EA-00179	On	9	Lighting Occupancy sensors	Yes	12		
EA-00179	On	9	Daylighting	No		Overlooked, will reconsider	
EA-00179	On	9	Replace metal halide lamps with lower wattage	No		Unsure of future status	
EA-00179	On	9	T12 to T8 lighting retrofit	Yes	18		
EA-00179	On	9	Improve building envelope	Yes	12		
EA-00063	On	7	Lighting upgrades	Yes	2	Had already begun prior to assessment	

EA-00063	On	7	HVAC Optimization	No		ROI greater than three years	
EA-00063	On	7	Compressed air system evaluation and maintenance	Yes		Already completed before received report	
EA-00063	On	7	Heat Recovery / Process Heat evaluation	No		Disrupted process during trial. Put on back burner.	
EA-00063	On	7	Energy Management System	No		Deemed too costly	
EA-00063	On	7	High Efficiency Motor replacement	Yes		Already ongoing as part of regular replacement	
EA-00063	On	7	Demand Control Strategy	No		Not possible due to production schedule	
EA-00084	Off	4	Demand Control Strategy	Yes	10		
EA-00084	Off	4	Compressed air system optimization	No		Would interfere with production	
EA-00084	Off	4	High efficiency motors	No		Deemed too costly	
EA-00084	Off	4	HVAC economizer and control strategy	No		Deemed too costly	
EA-00304	Off	3	Investigate production activity during 2nd shift ramp-up	No		Interferes with production	
EA-00304	Off	3	Compressed air system repair and maintenance program	Yes	5		
EA-00304	Off	3	Lighting conversion	Yes	1		
EA-00266	Off	5	Reduce compressed air pressure	Yes	1		
EA-00266	Off	5	Lighting conversion	Yes	6		
EA-00266	Off	5	Install destratification fans	No		Not deemed cost effective	
EA-00266	Off	5	Install glycol coolers	No		Not deemed cost effective	
EA-00266	Off	5	Install programmable thermostats	Yes	6		
EA-00293	On	5	Compressed air, electric distribution, and space conditioning systems	Yes	6		
EA-00293	On	5	Compressed air system maintenance program	Yes	1		
EA-00293	On	5	Power factor correction	Yes	6		
EA-00293	On	5	Lighting conversion	Yes	6		

EA-00293	On	5	Natural gas usage reduction study / boiler optimization	Yes	6		

Final Report

Evaluation of the Non-Residential Smart $aver® Custom Program in Ohio

Results of a Process Evaluation

Prepared for
Duke Energy

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Executive Summary

Key Findings and Recommendations

The key findings and recommendations identified through this evaluation are presented below.

Significant Process Evaluation Findings

Duke Energy's Smart $aver® Custom program is playing an important role in helping non-residential customers to implement projects using measures not in the Smart $aver® Prescriptive program. The program is also being marketed very well, through a network of dealers and distributors, as well as through Duke Energy's account managers. While all customers appreciate that Duke Energy offers a Custom program, they are only moderately satisfied with the program. Two areas where customers express less satisfaction are in the application's difficulty and in the time for application review. (See section titled "Satisfaction Ratings" on page 13.) Duke Energy's Smart $aver® Custom program managers are well aware of the challenges facing their program, and have already taken steps to address them. Smaller customers find that the application is difficult if the applicant does not have a technical or engineering background. Duke Energy's program managers report that the time to review larger project applications is only marginally greater than the time to review smaller project applications. They also report that while the program's overall success depends critically on those larger projects, they are expending the majority of their resources on reviewing the smaller applications. As it is right now, the Smart $aver® Custom program may have reached a point of equilibrium, with the difficulty of the application process serving to reduce the number of applications from the smaller projects. (See section titled "Feedback on Application Process" on page 14.)

Recommendations

1. Duke Energy should decide what size projects (in terms of energy savings) the Custom program should target. Duke Energy program managers have expressed a greater need to encourage larger projects, in order to increase program effectiveness. Duke Energy may determine that it is not cost prohibitive to provide technical support for all the "onesie, twosie" projects. Whether or not Duke Energy decides to support projects of all sizes, making an explicit decision one way or the other may allow Duke Energy to allocate their resources and outreach more efficiently. (See section titled "Feedback on Application Process" on page 14.)
2. If Duke Energy decides to continue to encourage customers with smaller projects to apply, Duke Energy should find a way to provide technical support to qualified unassigned customers who are filling out their own applications. Alternately, Duke Energy may also want to consider temporarily assigning those customers to a Duke Energy representative, or temporarily requesting technical assistance from WECC to meet those unassigned customers' needs. This would allow those smaller customers to receive the assistance they say they need. (See section titled "Feedback on Application Process" on page 14.)
3. Duke Energy should also consider managing all customers' expectations for the amount of work involved in filling out an application, and perhaps provide data on what types of projects had been approved in the past. This may allow customers to make more

informed choices on whether it is worthwhile for them to undertake the work of applying. (See section titled "Feedback on Application Process" on page 14.)

Introduction and Purpose of Study

Summary Overview

This process evaluation of the Smart $aver® Custom program was conducted through in-depth interviews with the Duke Energy program manager for the Ohio program and the Duke Energy program manager for the Carolinas program. Short interviews were also conducted with 11 Duke Energy nonresidential customers and 10 vendors who had submitted applications for the Custom program. The Smart $aver® Custom program is offered in all five states in Duke Energy service territory. This evaluation focuses on the Smart $aver® Custom program being offered in Ohio

Summary of the Evaluation

This report presents the results of a process and impact evaluation of the Ohio Non-Residential Smart $aver® Custom Program.

Researchable Issues

In addition to the objectives noted above, there were a number of researchable issues for this evaluation. These were:

1. To determine which measures were implemented by the participant, and the timing and reasons for implementation.
2. Participant satisfaction with the program application, communications, and rebates
3. To determine the level of freeridership and spillover associated with the program.

Description of Program

The Duke Energy Smart $aver® Custom program is intended to supplement the Smart $aver® program, which provides Prescriptive rebates on pre-selected measures. Customers who want to install measures not on the Smart $aver® Prescriptive list are provided the opportunity to apply for a rebate through the Custom program. One Duke Energy manager states, "*We lead with the Prescriptive program.*"

The Custom program is tightly coordinated with the Smart $aver® Prescriptive program: the program managers of both programs meet regularly, and any change to the Smart $aver® Prescriptive program is also made to the Custom program. One Duke Energy program manager reports that when the Custom program starts seeing repeated applications for the same measure, they begin considering that measure for inclusion in the Prescriptive program, in order to lower administrative costs.

Program Participation

Program	Participation Count for 2010
Non-Residential Smart $aver Custom	70

Methodology

Overview of the Evaluation Approach

This evaluation was performed without an evaluation plan.

Study Methodology: Process

This section presents the methodologies used in both the process and impact evaluations for the Non-Residential Smart $aver® Custom Program.

The evaluation was comprised of in-depth interviews with two program managers. These in-depth interviews provided a detailed investigation into program operations, goals, and suggestions for improvements and changes.

This study also implemented a participant survey with facility managers and with program vendors to identify the types of actions that are being taken as a result of the program. The survey also included a limited number of satisfaction and program operations questions to help Duke Energy determine if the program is being implemented effectively from the perspective of the participants. This study focuses on participants from late 2009 through 2010. A total of 11 customers and 10 vendors were interviewed for this evaluation.

The evaluation survey focused on the collection of implementation rates for the recommended measures and behaviors and their levels of satisfaction with the program, communications, and the rebates provided. The survey also assessed program process issues including the ease of signing up for the program, the program application process. The findings from this evaluation are presented in the following sections of this document.

Data collection methods, sample sizes, and sampling methodology

Process

Short interviews were conducted with 11 customers and 10 vendors. The sample was drawn from the pool of customers who had received notification in late 2009 through 2010 from Duke Energy about whether their applications were approved or denied. An average of 2.14 phone calls were made and 0.68 emails were sent to each of the 41 people in the sample, with an overall response rate of 46%. Across the sample, 8 respondents had their projects approved, completed and rebated; 6 had their applications denied, and 7 had their applications approved but Duke Energy did not know the status of their projects. See Table 2 for the sample disposition.

Number of completes and sample disposition for each data collection effort

Process

Short interviews were conducted with 11 customers and 10 vendors. In these 15-minute interviews, respondents were asked to provide feedback on their experiences with aspects of the Custom program as well as provide satisfaction ratings. Respondents were assured their answers would remain anonymous and were allowed to decline to answer any of the questions. The sample sizes are too small to allow responses to be considered statistically representative; as a

result, the responses should be considered indicative of the program but should not be generalized to all Custom program participants.

Table 1. Sample Disposition

Completed	19
Couldn't Remember Details	2
Declined	3
Left Company	6
Out of Business	1
Retired	1
No Response	6
No Show	3

Threats to validity, sources of bias and how those were addressed

Process

The sample sizes for the participant surveys are too small to allow responses to be considered statistically representative; as a result, the responses should be considered indicative of the program but should not be generalized to all Custom program participants.

Process Evaluation

Program Design and Implementation

Duke Energy implements the Smart $aver® Custom program with support from the Wisconsin Energy Conservation Corporation (WECC). The Duke Energy program managers' responsibilities include overall management of costs and revenue, and management of the third party vendors who help deliver the program.

WECC provides support for the Smart $aver® Custom program in a number of ways. WECC representatives act as "trade ally representatives" and have supported Duke Energy's Smart $aver® programs over several years in building a "trade ally network". Dealers, vendors and distributors of energy efficient equipment constitute Duke Energy's trade allies. Through the network supported by WECC these vendors can receive information about Duke Energy's Smart $aver® program eligibility, program benefits, and application requirements. In many cases, WECC representatives serve as the main source of information about Duke Energy's Smart $aver® program. WECC also provides technical staff who helps Duke Energy review the Custom applications.

Marketing

The Duke Energy program managers report that the Smart $aver® Custom program is not marketed as a separate program. "*We just market Smart $aver® incentives as a whole.*" The Custom program is designed for non-residential energy efficiency projects that propose to use measures not already approved in the Smart $aver® Prescriptive measures program.

Program information and forms are available on Duke Energy's website. However, the main channels for marketing for the program are through vendors and through Duke Energy account managers. For Duke Energy customers who have been assigned to an account manager, that account manager serves as the primary contact and provides assistance with Custom program applications. For mass market or unassigned customers, Duke Energy markets the Custom program through trade shows and through their network of trade allies and vendors. The trade ally network is cultivated by WECC. Unassigned customers can also call a toll free number operated by a third party vendor with questions about the Custom program. "*I see a lot of volume through our trade allies*," one Duke Energy program manager reports. A Duke Energy program manager also reports that the Custom program is also marketed through pilot programs, such as the Smart Building Advantage program, and the Energy Savings Master Plan programs. "*A lot of this is marketing internally, so our colleagues can market externally.*"

Applications

Applications can come in through the trade ally network, directly from the customer, or from the account manager on behalf of the customer. The Smart $aver® Custom application asks customers to provide information about their facility, information about the proposed project, equipment specification sheets, a calculation of energy savings from the project, and the payback period. The program manager reports that customers generally ask the equipment vendor to provide these calculations for them. The program manager acknowledges that this is not a simple process, "*It's only worthwhile for the large projects.*"

As part of the application process, customers are required to answer questions that would determine whether they were a "freerider". The term "freeriders" refer to customers who would install the measures whether or not any rebate was given. Customers need to obtain approval for the rebate prior to commencing any work on the project, including signing any purchase orders with their vendors. Those who began their projects prior to application approval are disqualified from the rebate because they are considered freeriders and therefore do not provide net energy savings for the program. This approach keeps the program cost effective and assures low freeridership.

Application Review

Once a Custom application is submitted, the Duke Energy program managers conduct a quick initial screening to determine if the application must be disqualified due to obvious reasons, such as missing information. The application then undergoes a technical review by in house staff, or is sent to WECC for review by their engineers. WECC makes sure the applications are complete, and contacts the customer if any information is missing or needs clarification. Duke Energy's program managers try to review as many applications as they can themselves. The technical reviewers determine the energy savings that can be expected from each project.

The turnaround time on the technical reviews had been one month, but recently increased to six weeks. At the time of these interviews, WECC had recently expanded their scope of work with Duke Energy to include conducting technical reviews for the Custom program. WECC was in the process of developing the additional capacity to process Duke Energy's applications in much shorter periods of time. One Duke Energy program manager acknowledges that some of the delay may be due to that: "*They've been building up their knowledge,*" but also believes that once WECC finishes staffing up, this timing problem will be resolved.

Duke Energy is aware of the complexity of the Custom application, "*We get the complaint all the time that the Custom application is too hard and too complicated. We have ideas on how to make it easier, but at the end of the day, the customer or vendor still needs to tell us about the project. We cannot take on the work of doing that for them.*" Because incentive decisions must be made based on the energy savings of each project, the application must provide the information needed to make cost effective energy efficiency supply decisions.

Incentive Calculation

The energy savings calculations are sent to Duke Energy's Market Analytics division, which determines how much revenue Duke Energy can earn on the project through "Save-a-Watt". This stage was taking two weeks, but the Duke Energy program manager is working to reduce the turnaround time to approximately one week. The Duke Energy program manager takes the revenue estimate and makes the final determination on what incentive amount is offered to the customer on their Smart $aver® Custom project. The customer then makes a decision whether or not to go forward with their proposed project, taking their other needs into consideration.

Results

Customer demand for the program is high. At the time of these interviews, the Duke Energy program managers report that they are ahead of program targets in Ohio. "*We have more requests than we can handle...*" One program manager reports that level of interest from customers recently had increased to the extent that it became another factor in the increased turnaround time for reviewing applications.

When asked what might have caused the increased level of interest, the Duke Energy program manager suggested it might simply be because "*Customers have started to hear about the program. Word gets out, customers say [I'll apply] when I get around to doing it. Even when they are aware of the program, takes a while to participate. [They may] want to wait until building is not occupied, etc.*"

Future Growth of the Custom Program

The program managers were asked about the possibility of future growth of the Custom program, in two ways: growth in terms of increased numbers of participants and growth in terms of types of technologies that are accepted.

When asked, one Duke Energy program manager was hesitant about what continued participant growth of the Custom program would entail. This program manager estimates, "*there are probably two or three incentives in each state that make up the vast majority of the overall revenue [from Custom] for Duke. [We usually get] a couple of projects that are so massive that they carry everything else. If those projects don't get done, we're not going to do well...We only need a handful of big projects, rather than a bunch of onesie and twosies.*" The program manager then suggested one approach that Duke Energy is considering, "*One way is to take the large project ideas and work with account managers to see if they have customers who may be interested.*"

The Duke Energy program manager also cites market conditions as a consideration in their decisions about growing the Custom program. "*We have more applications that we approve than get implemented; that's because of economics.*" The program manager estimates that at that point, there were 69 applications across Duke Energy's service territory that had had been approved, but Duke Energy has no indication from the customers about whether they are planning to implement the projects.

In terms of growth in types of technologies allowed, the other Duke Energy program manager believes that the Custom program currently covers most of the opportunities in electric energy savings, but that more opportunities might be available if gas and electric utilities were allowed to work together and current regulations were changed to allow fuel switching. "*Geothermal applications will not take off until we let the gas companies participate.*"

Customer and Vendor Interviews

Short interviews were conducted with 11 customers and 10 vendors. In these 15-minute interviews, respondents were asked to provide feedback on their experiences with aspects of the Custom program as well as provide satisfaction ratings. Respondents were assured their answers would remain anonymous and were allowed to decline to answer any of the questions. The sample sizes are too small to allow response to be considered statistically representative; as a result, the responses should be considered indicative of the program but should not be generalized to all Custom program participants. Survey instruments were used as guidelines for the interviews. These interviews are intended to gather some concrete examples of some of the issues that Smart $aver® Custom applicants have faced, and to allow the evaluation team to delve into issues more deeply than would be possible in a typical customer satisfaction survey.

Table 2. Sample Disposition

Completed	19
Couldn't Remember Details	2
Declined	3
Left Company	6
Out of Business	1
Retired	1
No Response	6
No Show	3

The sample was drawn from the pool of customers who had received notification in late 2009 through 2010 from Duke Energy about whether their applications were approved or denied. An average of 2.14 phone calls were made and 0.68 emails were sent to each of the 41 people in the sample, with an overall response rate of 46%. Across the sample, 8 respondents had their projects approved, completed and rebated; 6 had their applications denied, and 7 had their applications approved but Duke Energy did not know the status of their projects. See Table 2 for the sample disposition.

Table 3. Satisfaction with the Custom Program

	Satisfaction with Incentive	Ease of Filling Out Application	Satisfaction with Time to Review Application	Satisfaction with Technical Expertise of Duke Energy Staff	Satisfaction with Program Information Provided	Overall Satisfaction with Smart $aver® Custom
Mean Rating	7.00	6.63	7.37	7.88	7.73	7.70
Std Dev	2.86	2.25	2.78	1.81	1.67	2.25
N	15	13	16	9	14	16

Note: Ratings are on a scale of 0 to 10, with 10 being highest and 0 being lowest. Some ratings were not solicited from the respondent if they were not appropriate, for example if the customer did not fill out the application, or if no technical help was requested from Duke Energy.

Satisfaction Ratings

While not statistically representative, the satisfaction ratings may be used as an indication of trends among the customer and vendors. These ratings suggest that while there is moderate satisfaction with the Custom program overall, there may be less satisfaction with the incentive level, with the application process, and with the time it takes for Duke Energy to review the applications (all rated below 7.5). These trends in the satisfaction ratings are reflected in the interviewee's feedback, reported below.

Awareness of the Smart $aver® Custom Program

Respondents were asked how they first heard about the Custom program. The Smart $aver® program and the trade ally network were designed so the Duke Energy account managers would market to large customers, vendors would market to the mass market (including unassigned customers), and WECC would provide technical support for the vendors. Through the interviews, this was exactly what was found: Customers tended to report that they first heard about the Custom program from their vendor or a Duke Energy representative. Vendors tended to have first heard about the program from WECC. Duke Energy's website was mentioned only a couple of times by both customers and vendors as their first exposure to the Custom program. Customers also reported that they were able to get all the information they needed from their source. Vendors also reported that their source, WECC, was able to provide all the information they needed.

The relationship between the vendors and WECC seems to be an excellent one. Most vendors referred to their WECC representative by name, and highly praised WECC's support: *"Great support from Rob", "Rob knows this thing inside and out. Rob is indispensible so to speak", "Everybody in our area knows Rob.", "When you mention the rebate program, Rob's name comes up. He's the area expert." "I give WECC a 10+ [satisfaction rating out of 10 maximum]"*

Feedback on the Influence of the Rebate

Customers generally reported that the rebate was a major influence on their decision to do the project. One customer said the influence of the rebate was "*one of more important; if it had been offered by the other utility we would have thought about switching [to the other utility].*" One vendor offered that the rebate was "*extremely crucial; that was what the project hinged upon.*"

When asked what they would have done (or did) in the absence of a rebate, customers were evenly divided among those who said they would not have done the project, those said they would have had to use less expensive equipment, and those who would have scaled back or delayed the project. Likewise, most customers reported their primary reason for undertaking their projects was to lower energy costs. Two of them reported that their primary motivation was to replace aging (but still functional) equipment; one would have had to select cheaper equipment without the rebate, and the other would not have been able to do the project without the rebate. One customer reported he wanted to lower his peak demand use, because his energy

costs for the rest of the year were to be calculated off his peak usage. Only one customer reported that the Custom rebate would have only played a small part in the advancement of the project; that customer also had his application denied. These responses indicate that the freerider screen is working and assures that the program is the primary or one of the important drivers of the energy efficient changes being made. These responses also indicate that when the program is not a main reason for the change, that project is not approved, helping to maintain cost effectiveness, but at the price of lower levels of satisfaction especially from denied applications.

Feedback on Application Process

Technical content of applications. Customers and vendors had mixed reactions when asked if the application was easy to understand. There were two respondents who said it was easy if you knew what you were doing, or if you had a mechanical background. The others needed to engage with the technical review team to answer additional questions and the delays arising in the second or third rounds of questions were mentioned as difficulties with the application. One customer had difficulty because the application required information about the existing lights, but he didn't have the records due to the age of the building. Another customer reported the application contained an unclear question and that they couldn't find anyone to help them at Duke Energy. One customer suggested that Duke Energy could have a representative assist the businesses that were filling out the applications by themselves.

In contrast, vendors who were filling out the applications for customers also had questions, but most of them reported that they were answered by WECC.

Delays during the application approval process. Several respondents discussed issues related to the application approval time. One customer was dealing with a Duke Energy representative who went on leave and experienced "*five months of transferring. I was on a deadline. Got to a point where I couldn't get a hold of anyone. [Original rep's phone message said] call this number, but that [voice mailbox] was full.*" Two vendors mentioned that it took a long time and many phone calls to meet the Custom program's calculation requirements, particularly exacerbated by the fact that their clients were on a deadline. This is a problem of which Duke Energy program managers are well aware, and as discussed elsewhere in this report, the managers are currently working to shorten the approval process by working with third party vendors to provide more technical assistance.

The complexity of the application process does serve as a deterrence to some prospects. Two vendors mentioned that they have declined to submit applications. "*I'll ignore jobs that require the Custom rebate, I'm [just] selling the materials and don't charge for [submitting] the application; I need an answer on a rebate within a day.*" This vendor had already had a negative experience with a two month long delay after submitting the application. Another vendor reports, "*sometimes it's not worth it. I did a whole project for $9 cheaper a ballast [rather than doing the paperwork]. I don't usually [absorb the costs] I just don't say anything [about the rebate] sometimes.*"

While it may be discomfiting to some to hear that there are vendors who do not want to participate in the Custom program because the application process is too complicated or drawn out, this may act as a filter that helps Duke Energy better serve customers with larger projects

that have higher impact. Duke Energy program managers have already mentioned that there needs to be a balance between serving as many customers as possible and remaining cost effective as a program. As one vendor puts it, "*The process for Custom is tedious. You have got to really want to do it...it eliminates a lot of the smaller projects.*"

This is not to say that Duke Energy does not need to continue refine program operations and reduce the delays that affect customers. Rather, Duke Energy should find a way to manage customer expectations so that customers are aware the Custom program may not suitable for smaller projects. Customer and vendor interview responses suggest that vendors may currently be providing that filtering, in deciding not to mention rebates for certain projects. However, not every customer chooses to work with vendors, and it is that group of customers whose expectations may need to be addressed.

Rebate Checks

For those who completed their approved projects and received the rebate, there were no reports of problems associated with receiving the checks. One vendor praised the speed with which the checks were sent out. "*Their turnaround time is phenomenal.*"

Most Successful Aspect

When asked to state the most successful aspect of the Custom program, some respondents stated that the fact that Duke Energy provides the Custom program is valuable in itself. "*We're glad that Duke has been partnering with us and giving us something [to work with]*". "*I really like the Custom program. It enables you to kind of go outside the box.*", "*The fact that Custom exists: so that if you do something that's not Prescriptive you still get some incentive for doing it.*" Another customer reports the Custom rebate was a selling point for their management.

Top Priority for Improvement

When asked which area should have top priority for improvement, responses were varied, sometimes reflecting a lack of knowledge of program requirements. One customer wanted to be able to apply for a Custom rebate retroactively, after completing a project. Another customer wanted Duke Energy to streamline the application process so that customers could apply without having to have vendors sign off on the application. Another customer echoed that suggestion, saying when she had to involve vendors she felt obligated to compensate them, but she only had enough budget to install the fixtures with in-house staff. One customer who had extreme difficulty finding help when her original contact at Duke Energy went on leave wanted to be able to check the status of an application online. Several suggested that Duke Energy make it a top priority to find a way to reduce uncertainty about the amount of the rebate.

Increasing Participation

When asked if they had any suggestions on how Duke Energy could increase participation, six respondents suggested more marketing. They believe that a lot of people are not well informed about the benefits of the program. Two vendors suggested that Duke Energy could increase participation by "blessing" qualified vendors, citing the need to overcome customers' distrust because the incentives sounded too high: "*I don't think they actually believe the numbers*" and "*People know there are new lights and they saves energy, but they have no idea how much.*

People roll their eyes and walk away because it sounds too good to be true." One vendor mentioned that having Duke Energy account managers involved to provide customer rate information would be helpful.

Comparisons to Other Utilities

Vendors who worked with clients of other utilities did make some unsolicited comparisons. While they were appreciative that Duke Energy offers a Custom program, the most frequent comparison was that Duke Energy's program was harder to sell than those of other utilities because of the uncertainty involved in the amount of the rebate. Another common comparison was that other utilities had online application submission: "*Hand writing and printing and scanning [the application] is old school...a lot of other utilities have spreadsheets that you populate.*" Duke Energy program managers report that while applications cannot be submitted online, they are already developing spreadsheets for certain Custom measures including lighting, VFDs and compressors that allow fields to be autofilled with calculations once certain parameters are entered.

Overall, the vendors had no serious issues "*Very easy to work with Duke.*"

Program Improvements Under Way

Duke Energy's program managers report that they already have a worksheet-based application for Custom lighting projects and that they are currently developing a similar application for VFDs and air compressors. These templates have been completed and were being tested at the time of these interviews, with an anticipated release date at the end of January of 2011. The Custom program staff is also in the process of putting together some case studies, targeted to specific market segments.

The program managers are aware of customer dissatisfaction with the application response times and are working to reduce the time to one month. However, one program manager cautions, *"it's a careful balance. The market moves very fast, and we don't let it govern the quality of our review, but customer satisfaction would be diminished if they had to wait [longer]...I would say the quality of the review is high; I feel confident when M&V comes back, based on the information we've reviewed [to determine the level of incentives], it would be very cost effective."*

Market Analysis

Freeridership & Spillover – Manager Opinions

One Duke Energy program manager reports that there may be some freeridership in the Custom program, even though customers are prescreened for freeridership during the application stage. This low level of freeridership comes as a result of the other reasons customers have for undertaking their retrofit projects, and as a result of the algorithm used to quantify freeridership. To qualify for a program incentive, the customer's freeridership score is calculated based on a set of questions provided to Duke Energy by TecMarket Works. These questions are included in the program application forms. Each applicant is required to complete the freeridership question battery from which the scores are calculated. Typically the customer simply answers the

freeridership questions along with a set of other enrollment and project questions included on the application form. If a customer had issues with the questions or if a customer answered questions in a way that provided questionable results, TecMarket Works evaluation staff then conducted a telephone freeridership interview with the applicant and scored their responses to the questions during that interview. Very few applicants had issues with the freerider questions. Duke Energy program managers used the freeridership score to estimate the level of incentive provided and to test for net cost effectiveness of each project submitted. According to Duke Energy managers, they were able to accept small levels of freeridership for the Custom projects as long as the project was cost effective.

The Duke Energy program managers only occasionally hear of instances of spillover from the Custom program, such as an anecdote about a customer who started a lighting project and ended up installing more lights than planned. However, spillover is not formally assessed for the Custom program.

Freeridership Calculations

The freeridership score is based on applicant responses to a battery of freeridership questions. The freeridership battery of questions consists of four questions and focuses on the reason for the applicant's decision to implement their energy efficiency project. The scoring approach is a linear approach which allocates from zero percent to full freeridership (100%) scores based on the responses provided by the applicant to cause-and-effect questions. Applicants with scores too low to make custom projects cost effective are rejected by the program and incentives are not paid. This approach allows the pre-screening of projects so that only cost effective projects are funded. This approach pioneered by Duke Energy represents a "Best Practice" within United States for Custom programs because it helps assure that program funds are spent obtaining net new energy savings. Other approaches approve projects before the net savings are known, increasing the probability that program funds will be spent on projects that would have been implemented without the program's financial or informational assistance. The questions are presented below along with the scoring approach. The scoring approach *(in italics)* does not appear on the application form.

1. **Please indicate if the Duke Energy incentive is/was a factor in your choice to install the more energy efficient equipment instead of other equipment that may not have saved as much energy.**
    1. Incentive had an influence on the decision (*move to next question*)
    2. Incentive had no influence on the decision (*100% freerider*)

2. **If the Duke Energy incentive/program was a factor in your choice, please indicate how much of an influence the program incentive had on your energy efficient equipment choice. Please circle the number that best represents the influence the program has on your equipment choice.** (*allowed responses = 0 to 10*)

    0 = The Duke Energy program had no effect on our equipment choice (*100% freerider*).

    1 or 2 = The Duke Energy program may have a minor influence on our energy efficient equipment choice (*1=80% freerider; 2=70% freerider*)

3 or 4 = The Duke Energy program had a positive influence in our selection of energy efficiency equipment (*3=50% freerider; 4=40% freerider*)
5 or 6 = The Duke Energy program was one of the key reasons for the energy efficient equipment choice, but not the most important reason (*5=30% freerider 6=25% freerider*)
7 or 8 = The Duke Energy program was one of the most important reasons for the energy efficient equipment choice (*7=15% freerider 8= 10% freerider*)
9 or 10 = The Duke Energy program was the primary reasons for the energy efficient equipment choice (*9=5% freerider 10=0% freerider*)

3. **Do you think that you would have selected the same level of energy efficiency if the program information and technical assistance would not have been available to you?**
   A. No. We would make a somewhat different equipment selection of not do the same project (*decrease freerider score by 10% but not lower than 0%)*
   B. Not sure what we would do (*no change in score*)
   C. Yes. We would make exactly the same equipment choice (*increase freeridership score by 10% but no higher than 100%)*

4. **Do you think that you would have selected the same level of energy efficiency if the program's financial incentive would not have been available to you?**
   A. No. We would make a somewhat different equipment selection or not do the same project (*decrease freerider score by 25% but no lower than 0%)*
   B. Not sure what we would do (*no change in score*)
   C. Yes. We would make exactly the same equipment choice (*increase freerider score by 25% but no lower than 100%*)

In order to estimate program-wide freeridership the scores, the results of the scores for each incentivized (approved) application were tabulated by TecMarket Works and weighted by the percent of each project's ex ante energy savings compared to the total program-wide ex ante savings. This approach was taken because of the wide range of levels of energy savings among the Custom projects that prohibited the use of un-weighted (averaged mean) scores, and provides an average freeridership score that reflects the energy savings that are not counted as program-induced. The results of this assessment confirm that the pre-screening of applications with the use of net energy savings calculated incentives provides for very low levels of freeridership and a high level of net energy savings. The following table presents the results of the scoring process and presents both the un-weighted and the ex ante energy savings weighted freeridership scores.

State	Number of Applicants in Freerider Assessment	Mean Non-Energy Weighted Freeridership Score	Mean Ex Ante Energy Weighted Freeridership Score	Net-to-Gross Ratio
Ohio	82	13%	10%	0.9

Conclusions and Recommendations for Program Changes

The program managers seem well aware of the major issues that face their program: long turnaround times and the complexity of the Custom application process. They are actively working to address these issues. However, Duke Energy may need to make a business decision about whether they should overtly focus projects with higher impacts, and become more selective about which small projects are cost effective to support, and manage customer expectations so that only projects with larger impacts would likely apply. Conversely, if Duke Energy decides that all customers who pay the rider need to be served equally, then the unassigned customers who choose to fill out their own applications should be provided some technical assistance with the application or provided direction as to where they might obtain technical resources.

There is agreement among the interviewees that the Custom program has significant value. As one Duke Energy program manager says, "*There's no question that customers are coming up with interesting and unique projects that would never fit in the Prescriptive program. It's really important that we have the Custom program to offer them. There are really interesting projects that have very large impacts that are out there...that makes everyone happy.*"

Appendix A: Program Manager Interview Protocol

Name: _____

Title: _____

Position description and general responsibilities:

_____

_____

_____

We are conducting this interview to obtain your opinions about and experiences with the Commercial and Industrial Incentive Program. We'll talk about the Program and its objectives, your thoughts on improving the program and its participation rates, and the technologies the program covers. The interview will take about an hour to complete. May we begin?

Program Objectives

1. In your own words, please describe the Commercial and Industrial Incentive Program's objectives.

2. In your opinion, which objectives do you think are being met or will be met? How do you think the program's objectives have changed over time?

3. Are there any program objectives that are not being addressed or that you think should have more attention focused on them? If yes, which ones? How should these objectives be addressed? What should be changed? Do you think these changes will increase program participation?

4. Should the program objectives be changed in any way because of market conditions, other external or internal program influences, or any other conditions that have developed since the program objectives were devised? What changes would you put into place, and how would it affect the objectives?

5. Do you think the incentives application process offered through the C&I Incentive program is easy to understand and complete?

6. Do you think the incentives offered through the program are large enough to entice the C&I community to purchase the high efficiency items? Why or why not?

7. Do you think the incentives cover the right equipment? Do you think there is equipment that is currently incentivized that should not be, or equipment that is not covered that should be?

8. Which measures have been most used?

9. What kinds of marketing, outreach and customer contact approaches do you use to make your customers aware of the program and its options? Are there any changes to the program marketing that you think would increase participation?

10. How do you inform trade allies and contractors about the program? How effective has this been in getting participation from the contractors?

11. Are there any changes to the incentives or marketing that could possibly increase participation in the program?

12. Thinking about how your program enrolls participants, what do you think your level of freeridership is for this program? (*That is, what percent of the equipment rebated through the program would have been purchased and installed without the program's incentive?*)

13. What do you think the level of spillover is for this program? *(That is, what percent of the participants take similar actions in their business that are not rebated through the program?)*

Overall C&I Incentives Management

14. Describe the use of any advisors, technical groups or organizations that have in the past or are currently helping you think through the program's approach or methods. How often do you use these resources? What do you use them for?

15. Overall, what about the Commercial and Industrial Incentive Program works well and why?

16. What doesn't work well and why? Do you think this discourages participation?

17. Can you identify any market or operational barriers that impede a more efficient program operation?

18. If you had a magic wand and could change any part of the program what would you change and why?

Program Design & Implementation

19. What market information, research or market assessments are you using to determine the best target markets or market segments to focus on?

20. What market information, research or market assessments are you using to identify market barriers, and develop more effective delivery mechanisms?

21. How do you manage and monitor or evaluate contractor involvement or performance? What is the quality control and tracking process? What do you do if contractor performance is exemplary or below expectations?

23. In your opinion, did the incentives cover enough different kinds of energy efficient products?

1. ❑ Yes 2. ❑ No 99. ❑ DK/NS

If no, 23b. What other products or equipment should be included? Why?

_____

_____

24. In what ways can the Commercial and Industrial Incentive Program's operations be improved?

25. Do you have any suggestions for how program participation can be increased?

Appendix B: Participant Survey Instrument, Closed Won

Name: _____
Company: _____
Title: _____

Hello, my name is _____. I am calling on behalf of Duke Energy to conduct a customer satisfaction interview about the Smart $aver® Custom Program. May I speak with _____ please?

If person talking, proceed. If person is called to the phone reintroduce.
If not free to talk, ask when would be a good time to call and schedule the call-back:

Call back 1:	Date: _____,	Time: _____	❑AM or ❑PM
Call back 2:	Date: _____,	Time: _____	❑AM or ❑PM
Call back 3:	Date: _____,	Time: _____	❑AM or ❑PM
Call back 4:	Date: _____,	Time: _____	❑AM or ❑PM
Call back 5:	Date: _____,	Time: _____	❑AM or ❑PM

❑ Contact dropped after fifth attempt.

We need your help. Duke Energy has given us your name as someone who might be able to share some of your experiences with the Smart $aver® Custom Program. We are not selling anything. We would like to conduct a short interview that will take about 15-20 minutes and all your answers will be kept confidential. This information will enable Duke to make improvements to the program and the application process. Would you be able to help us?

Establishing Questions:

ES-0. **Would you please tell me what your company does, and what your role is in your company?** _____

ES-1. **Our records indicate that you participated in the Smart $aver® Custom Program in <date> and that you installed <technology> through the program and received an incentive for your purchase. Do you recall participating in this program?**

1. ❑ Yes, *begin* — *Skip to Q2.*
2. ❑ No,
99. ❑ DK/NS

1a. **This program was provided through Duke Energy. In this program, your company installed <technologies>. In exchange for purchasing the energy efficient option, Duke Energy provided your company with an incentive.**

Do you remember participating in this program?

1. ❑ Yes, *begin* → *Go to Q2.*
2. ❑ No,
99. ❑ DK/NS

If No or DK/NS terminate interview and go to next participant.

ES-3. **Please tell me what you remember about the project: How long did it take? Why did you decide to undertake the project at that time, rather than sooner or later?**_____

Information-Gathering Phase

INFO-1. **How did you become aware of the Smart $aver® Custom Program?**

a. ❑ Duke Energy sent me a brochure
b. ❑ A Duke Energy representative told me about it
c. ❑ Duke Energy website.
d. ❑ A contractor I was working with told me about the program
e. ❑ An equipment supplier
f. ❑ I saw an ad in _____
g. ❑ Other _____
h. ❑ DK/NS

INFO-2. **At the time you became aware of the program and considered taking advantage of the incentive, did you do any additional investigation to confirm the program's participation requirements and program benefits, or was the information you had enough for you to make a participation decision?**

a. ❑ The information received was adequate
b. ❑ Didn't need to confirm/ already knew about it
c. ❑ Went to the program or Duke Energy web site
d. ❑ Called or emailed a Duke Energy contact
e. ❑ Called or emailed a contractor
f. ❑ Called or emailed an equipment salesperson
g. ❑ Other: _____
h. ❑ DK/NS

If c, d, e, f, g:

INFO-3. **Were you able to get the information you needed about the program's participation requirements and benefits?** *Note: many may have only heard about this through their contractors and thus had minimal involvement, so this question may only apply to a few of them.*

1. ❑ Yes 2. ❑ No 99. ❑ DK/NS

INFO-4. **While you were deciding whether or not you wanted to participate, did you have additional questions that were not answered or did you need information that you were unable to obtain?**

1. ❑ Yes 2. ❑ No 99. ❑ DK/NS

INFO-4a. **What were they?**

_____

_____

Decision Making

DM-1. **What was the primary reason that you decided to purchase or upgrade your equipment?** (*check all that apply*) *(FR Survey = #7)*

1. ❑ Remodeling
2. ❑ Cost of repair or maintenance of old unit(s)
3. ❑ Parts availability
4. ❑ Reliability issues of old equipment
5. ❑ Equipment was near or past its projected life❑ Equipment failure
6. ❑ Poor performance of old equipment
7. ❑ Contractor recommendation
8. ❑ Energy or energy cost Savings
9. ❑ Environmental concerns
10. ❑ Got a good deal
11. ❑ Needed more modern, smarter equipment (energy manager systems integration or SmartGrid compatible)
12. ❑ Other: *list them*: _____

Please indicate if the *Duke Energy* incentive is/was a factor in your choice to install the more energy efficient equipment instead of other equipment that may not have saved as much energy.

A. Program assistance/incentive has an influence on our decision, or

B. Program assistance/incentive has no influence at all on our decision

If the *Duke Energy* incentive was a factor in your decision, please indicate how much of an influence

the program

incentive/service had on your energy efficient equipment choice. Please circle the number that best represents

the level of influence the program has on your equipment choice. *(Read 0 and read 10 to customer, only read intermediate ratings if customer asks for clarification)*

The Duke Energy program had no effect on our equipment choice	The Duke Energy program may have had a minor influence on our energy efficient equipment choice.		The Duke Energy program had a positive influence in our selection of the energy efficient equipment		The Duke Energy program was one of the key reasons for the energy efficient equipment choice, but not the most important reason		The Duke Energy program was one of the most important reasons for the energy efficiency equipment choice		The Duke Energy program was the primary reason for the energy efficient equipment choice	
0	1	2	3	4	5	6	7	8	9	10

3. Do you think that you would have or will select the same level of energy efficiency

the program <u>information and technical assistance</u> would not have been available to you?

A. No, we would make a somewhat different equipment selection or not do the same project

B. Not sure what we would do

C. Yes, we would make exactly the same equipment choice.

DM-2. **If Duke Energy did not offer an incentive for _____, what would you have installed?** *(FR = #1 and #3)*

a. ❑ I would not have installed anything at this time
b. ❑ I would have installed the same equipment but would have needed to wait longer

DM-3. **How much later do you think you might have waited to make the purchase without the incentive?**

i. Months ___
ii. Years ___
iii. Other: _____

c. ❑ I would have installed _____

DM-4a. **Why would you have chosen that particular piece of equipment?**

_____

DM-4b. **Do you remember whether it was more or less expensive than the equipment you eventually installed?** _____
DM-4c. **Do you remember whether it was of higher or lower efficiency than the equipment you eventually installed?**_____

(Repeat for every type of technology in the project)

DM-6. **Were there other reasons in addition to the incentive that you went with the higher efficiency choice instead of something less efficient?**

1. ❑ Yes 2. ❑ No 99. ❑ DK/NS

DM-6a. *If yes....* **What were the other reasons?**

_____

_____

Application Process

App-1. **Who filled out the program application forms for your company?** *(check all that apply).*

a. ❑ I did
b. ❑ Someone from my company did
c. ❑ The contractor
d. ❑ The salesperson
e. ❑ Someone from Duke Energy
f. ❑ Other: _____

App-2. **Who submitted the completed forms to Duke Energy?**

a. ❑ I did
b. ❑ Someone from my company did
c. ❑ The contractor
d. ❑ The salesperson
e. ❑ Someone from Duke Energy
f. ❑ Other: _____

If they filled it out.

App-2a. **On a scale of 1 to 10, please rate how easy it was for you to understand the application form. Please rate 10 for extremely easy and 1 for extremely difficult.** *(A zero would mean it was too difficult to fill out at all.)*

If they don't recall the application,

App-2b. **I've emailed you a copy of the application form to refresh your memory: Do you remember what part of it was difficult?**

_____

App-3. **Did you have any problems receiving the incentive or having the application approved?**

1. ❑ Yes 2. ❑ No 99. ❑ DK/NS

If yes, App-3a. **Please explain the problem and how it was resolved. Was it resolved to your satisfaction?**

_____

_____

Spillover – Channeling into Other Programs

Ch-1. **When firms have experience with energy efficiency programs or products they sometimes make similar decisions to continue the energy savings in other parts of their business. Has your firm taken advantage of any other Duke Energy's energy efficiency programs as a result of your participation in the Smart $aver® Custom program? If yes, what?**

1. 1. ❑ Yes 2. ❑ No 99. ❑ DK/NS

If yes,

Ch-1a. **What have you done? – get as much detail as possible.**_____

Ch-1b. **How much energy or money do you think you have saved as a result?**

Spillover - Electric

Sp-1. **As a result of your participation in Duke Energy's Smart $aver® Custom program, have you made any other electric energy efficiency improvements that do not qualify for any incentive or rebate?**

1. ❑ Yes 2. ❑ No 99. ❑ DK/NS

If yes,

Sp-1a. **What have you done?** – *get as much detail as possible.*

Sp-1b. **How much energy or money do you think you have saved as a result?**

If response provided above,

Sp-2. **Any others?**

1. ❑ Yes 2. ❑ No 99. ❑ DK/NS

If yes,

Sp-2a. **What have you done?** – *get as much detail as possible.*

Sp-2b. **How much energy or money do you think you have saved as a result?**

Improvements

Impr-1. **One of the objectives that the program would like to see over the next year is increased participation of businesses like yours. Can you think of things that the program can do to help increase participation or help increase interest from people like yourself?**

a. ❑ Increase general advertising
b. ❑ Increase advertising in trade media
c. ❑ Present the program in trade or associated meetings
d. ❑ Offer larger incentives
e. ❑ Offer incentives on other items/include other items
f. ❑ Have program staff call small C&I customers
g. ❑ Make the process more streamlined for customers
h. ❑ Make the process more streamlined for contractors
i. ❑ Other: _____

Impr-2. **At any time during your application process, did you need to contact Duke Energy to obtain information, or ask about progress on the application, or to obtain any other help, assistance or information?**

1. ❑ Yes 2. ❑ No 99. ❑ DK/NS

If yes, Impr 2-a. **Were your questions or needs effectively handled by the Duke Energy?**

1. ❑ Yes 2. ❑ No 99. ❑ DK/NS

Impr 2b. **How might this be improved?**

_____

_____

Impr-3. **Overall, what about the Smart $aver® Program works well and why?**

_____

_____

Impr-4. **What doesn't work well and why?**

_____

_____

Satisfaction

We would like to ask you a few questions about your satisfaction with the program. For these questions we would like you to rate your satisfaction using a 1 to 10 scale where a 1 means that you are very dissatisfied with the program and a 10 means that you are very satisfied.

How would you rate your satisfaction with:

Sat-1. **The incentive levels provided by the program**

1 2 3 4 5 6 7 8 9 10

If score is 8 or less ask: **What could have been done to make this better?**

_____

Sat-2. **The ease of filling out the participation and incentive forms**

1 2 3 4 5 6 7 8 9 10

If score is 8 or less ask: **What could have been done to make this better?**

_____

Sat-3. **The time it took for you to receive your incentive**

1 2 3 4 5 6 7 8 9 10

If score is 8 or less ask: **What could have been done to make this better?**

_____

Sat-4. **The number and kind of technologies covered in the program**

1 2 3 4 5 6 7 8 9 10

If score is 8 or less ask: **What could have been done to make this better?**

_____

Sat-5. **The technical expertise of Duke Energy staff**

1 2 3 4 5 6 7 8 9 10

If score is 8 or less ask: **What could have been done to make this better?**

_____

Sat 6. **The information you were provided explaining the program**

1 2 3 4 5 6 7 8 9 10

If score is 8 or less ask: **What could have been done to make this better?**

_____

Sat 7. **Considering all aspects of the program, how would you rate your overall satisfaction with the Smart $aver® Custom Program?**

1 2 3 4 5 6 7 8 9 10

Sat-7a. If score is 8 or less ask: **What could have been done to make your experience better, or have we already covered it?**

_____

Appendix C: Program Manager Interview Protocol

Name: _____
Company: _____
Title: _____

Hello, my name is _____. I am calling on behalf of Duke Energy. Duke Energy is currently evaluating how well their Smart $aver® Custom program is doing, and your name came up as someone who might be willing to share any ideas you have on how Duke might increase customer participation in the Smart $aver® Custom. Would you be willing to help? I would like do a short interview you that will take about 15 minutes. May I speak with _____ please?

If person talking, proceed. If person is called to the phone reintroduce.
If not free to talk, ask when would be a good time to call and schedule the call-back:

Call back 1:	Date: _____,	Time: _____	❑AM or ❑PM
Call back 2:	Date: _____,	Time: _____	❑AM or ❑PM
Call back 3:	Date: _____,	Time: _____	❑AM or ❑PM
Call back 4:	Date: _____,	Time: _____	❑AM or ❑PM
Call back 5:	Date: _____,	Time: _____	❑AM or ❑PM

❑ Contact dropped after fifth attempt.

Establishing Questions:

ES-0. **Would you please tell me what your company does, and what your role is in your company?** _____

ES-1. **Our records indicate that you submitted an application to the Smart $aver® Custom Program in <date> and that you either did not or were not able to participate in the program.**

Do you recall submitting the application for this program?

1. ❑ Yes, *begin* — *Skip to Q2.*
2. ❑ No,
99. ❑ DK/NS

1a. **This program was provided through Duke Energy. In this program, Duke Energy provides incentives for companies to install an energy efficient technologies.**

Do you remember submitting an application for this program?

1. ❑ Yes, *begin* → *Go to Q2.*

2. ❑ No,
99. ❑ DK/NS

If No or DK/NS terminate interview and go to next participant.

ES-3. **Please tell me what you remember about the intended project: Did you go ahead and do the project? Is it completed? How long did it take? Why did you decide to undertake the project at that time, rather than sooner or later?**_____

Information-Gathering Phase

INFO-1. **How did you become aware of the Smart $aver® Custom Program?**

i. ❑ Duke Energy sent me a brochure
j. ❑ A Duke Energy representative told me about it
k. ❑ Duke Energy website.
l. ❑ A contractor I was working with told me about the program
m. ❑ An equipment supplier
n. ❑ I saw an ad in _____
o. ❑ Other _____
p. ❑ DK/NS

INFO-2. **At the time you became aware of the program and considered taking advantage of the incentive, did you do any additional investigation to confirm the program's participation requirements and program benefits, or was the information you had enough for you to make a participation decision?**

i. ❑ The information received was adequate
j. ❑ Didn't need to confirm/ already knew about it
k. ❑ Went to the program or Duke Energy web site
l. ❑ Called or emailed a Duke Energy contact
m. ❑ Called or emailed a contractor
n. ❑ Called or emailed an equipment salesperson
o. ❑ Other: _____
p. ❑ DK/NS

If c, d, e, f, g:

INFO-3. **Were you able to get the information you needed about the program's participation requirements and benefits?** *Note: many may have only heard about this through their contractors and thus had minimal involvement, so this question may only apply to a few of them.*

1. ❑ Yes 2. ❑ No 99. ❑ DK/NS

INFO-4. **While you were deciding whether or not you wanted to participate, did you have additional questions that were not answered or did you need information that you were unable to obtain?**

1. ❑ Yes 2. ❑ No 99. ❑ DK/NS

INFO-4a. **What were they?**

_____

_____

Decision Making

DM-1. **What was the primary reason that you decided to purchase or upgrade your equipment?** *(check all that apply)*

13. ❑ Remodeling
14. ❑ Cost of repair or maintenance of old unit(s)
15. ❑ Parts availability
16. ❑ Reliability issues of old equipment
17. ❑ Equipment was near or past its projected life❑ Equipment failure
18. ❑ Poor performance of old equipment
19. ❑ Contractor recommendation
20. ❑ Energy or energy cost Savings
21. ❑ Environmental concerns
22. ❑ Got a good deal
23. ❑ Needed more modern, smarter equipment (energy manager systems integration or SmartGrid compatible)
24. ❑ Other: *list them*: _____

DM-1a. **Once you learned you were not able to participate in Smart $aver®, what did you decide to do?**

a. ❑ Installed anyway
b. ❑ Installed later
c. ❑ Delayed indefinitely
d. ❑ Cancelled Project

If DM-1a=Installed anyway,

DM-2a. **What did you have installed?** _____

Repeat the following questions for each measure installed:

DM-2b **Is this the same equipment on your Smart $aver® application?** Y/N_____

DM-2c *If not,* **how is it different?**_____

a. ❑ Price higher
b. ❑ Price lower
c. ❑ More efficient
d. ❑ Less efficient
e. ❑ Other _____

If DM-1a=Installed later.

DM-3a. **When did you install the equipment?** _____
DM-3b. **Why did you decide to install at that time rather than sooner?**
DM-3c. **What did you have installed?**

_____

Repeat the following questions for each measure installed:

DM-3d. **Is this the same equipment on your Smart $aver® application?** Y/N_____

DM-3e. *If not,* **how is it different?**_____

a. ❑ Price higher
b. ❑ Price lower
c. ❑ More efficient
d. ❑ Less efficient
e. ❑ Other _____

If DM-1a=Delayed indefinitely:

DM-4a. **When do you realistically expect the project to start?**

_____

DM-4b. **Why do you expect the project to start then, rather than sooner?**
DM-4c. **What do you plan to install?**

_____

Repeat the following questions for each measure installed:

DM-4d. **Is this the same equipment on your Smart $aver® application?** Y/N_____

DM-4e. *If not,* **how is it different?**_____

a. ❑ Price higher
b. ❑ Price lower
c. ❑ More efficient
d. ❑ Less efficient
e. ❑ Other _____

If DM-1a=Cancelled project.

DM-5a. **Can you please share with me the reasons you cancelled the project?**

_____

Skip DM-6 and DM-7, go to next section.

DM-6. **I would like to ask how important the project cost (or the cost of the initial capital outlay), was in your decision making. Would you say the *project cost* was…** *(read and check the best response).*

a. ❑ The primary deciding factor for selecting the equipment,
b. ❑ One of the more important deciding factors.
c. ❑ An important reason, but not more so than other reasons
d. ❑ One of the reasons, but it was a minor or unimportant reason, or
e. ❑ It was not a reason at all,
f. ❑ DK/NS.

DM-7. **I would like to ask how important the cost of energy (or the ongoing costs of energy usage), were in your decision making. Would you say the energy *cost* was…** *(read and check the best response).*

a. ❑ The primary deciding factor for selecting the equipment,
b. ❑ One of the more important deciding factors.
c. ❑ An important reason, but not more so than other reasons
d. ❑ One of the reasons, but it was a minor or unimportant reason, or
e. ❑ It was not a reason at all,
f. ❑ DK/NS.

_____

_____

Application Process

App-1. **Who filled out the program application forms for your company?** *(check all that apply).*

a. ❑ I did
b. ❑ Someone from my company did
c. ❑ The contractor
d. ❑ The salesperson
e. ❑ Someone from Duke Energy
f. ❑ Other: _____

App-2. **Who submitted the completed forms to Duke Energy?**

a. ❑ I did
b. ❑ Someone from my company did
c. ❑ The contractor
d. ❑ The salesperson
e. ❑ Someone from Duke Energy
f. ❑ Other: _____

If they filled it out.

App-2a. **On a scale of 1 to 10, please rate how easy it was for you to understand the application form. Please rate 10 for extremely easy and 1 for extremely difficult.** *(A zero would mean it was too difficult to fill out at all.)*

If they don't recall the application,

App-2b. **I've emailed you a copy of the application form to refresh your memory: Do you remember what part of it was difficult?**

_____

App-3. **Did you have any problems receiving the incentive or having the application approved?**

1. ❑ Yes 2. ❑ No 99. ❑ DK/NS

If yes, App-3a. **Please explain the problem and how it was resolved. Was it resolved to your satisfaction?**

_____

_____

Spillover – Channeling into Other Programs

Ch-1. **When firms have experience with energy efficiency programs or products they sometimes make similar decisions to continue the energy savings in other parts of their business. Has your firm taken advantage of any other Duke Energy's energy efficiency**

programs as a result of your participation in the Smart $aver® Custom program? If yes, what?

2. 1. ❑ Yes 2. ❑ No 99. ❑ DK/NS

If yes,

Ch-1a. **What have you done?** – *get as much detail as possible.*_____

Ch-1b. **How much energy or money do you think you have saved as a result?**

Spillover - Electric

Sp-1. **As a result of your participation in Duke Energy's Smart $aver® Custom program, have you made any other electric energy efficiency improvements that do not qualify for any incentive or rebate?**

1. ❑ Yes 2. ❑ No 99. ❑ DK/NS

If yes,

Sp-1a. **What have you done?** – *get as much detail as possible.*

Sp-1b. **How much energy or money do you think you have saved as a result?**

If response provided above,

Sp-2. **Any others?**

1. ❑ Yes 2. ❑ No 99. ❑ DK/NS

If yes,

Sp-2a. **What have you done?** – *get as much detail as possible.*

Sp-2b. **How much energy or money do you think you have saved as a result?**

Improvements

Impr-1. **One of the objectives that the program would like to see over the next year is increased participation of businesses like yours. Can you think of things that the program can do to help increase participation or help increase interest from people like yourself?**

a. ❑ Increase general advertising
b. ❑ Increase advertising in trade media
c. ❑ Present the program in trade or associated meetings
d. ❑ Offer larger incentives
e. ❑ Offer incentives on other items/include other items
f. ❑ Have program staff call small C&I customers
g. ❑ Make the process more streamlined for customers

h. ❑ Make the process more streamlined for contractors
i. ❑ Other: _____

Impr-2. **At any time during your application process, did you need to contact Duke Energy to obtain information, or ask about progress on the application, or to obtain any other help, assistance or information?**

1. ❑ Yes 2. ❑ No 99. ❑ DK/NS

If yes, Impr 2-a. **Were your questions or needs effectively handled by the Duke Energy?**

1. ❑ Yes 2. ❑ No 99. ❑ DK/NS

Impr 2b. **How might this be improved?**

_____

_____

Impr-3. **Overall, what about the Smart $aver® Program works well and why?**

_____

_____

Impr-4. **What doesn't work well and why?**

_____

_____

Satisfaction
We would like to ask you a few questions about your satisfaction with the program's offerings. For these questions we would like you to rate your satisfaction using a 1 to 10 scale where a 1 means that you are very dissatisfied with the program and a 10 means that you are very satisfied.

How would you rate your satisfaction with:

Sat-1. **The incentive levels provided by the program**

1 2 3 4 5 6 7 8 9 10

If score is 8 or less ask: **What could have been done to make this better?**

_____

Sat-2. **The ease of filling out the participation and incentive forms**

1 2 3 4 5 6 7 8 9 10

If score is 8 or less ask: **What could have been done to make this better?**

_____

Sat-3. **The time it took for you to receive notice on whether the application was approved or declined.**

1 2 3 4 5 6 7 8 9 10

If score is 8 or less ask: **What could have been done to make this better?**

_____

Sat-4. **The number and kind of technologies covered in the program**

1 2 3 4 5 6 7 8 9 10

If score is 8 or less ask: **What could have been done to make this better?**

_____

Sat-5. **The technical expertise of Duke Energy staff**

1 2 3 4 5 6 7 8 9 10

If score is 8 or less ask: **What could have been done to make this better?**

_____

Sat 6. **The information you were provided explaining the program**

1 2 3 4 5 6 7 8 9 10

If score is 8 or less ask: **What could have been done to make this better?**

_____

Sat 7. **Considering all aspects of the program, how would you rate your overall satisfaction with the Smart $aver® Custom Program's application process?**

1 2 3 4 5 6 7 8 9 10

Sat-7a. If score is 8 or less ask: **What could have been done to make your application experience better, or have we already covered it?**

_____

Final Report

Evaluation of Duke Energy's Low Income Refrigerator Replacement Program In Ohio

An Impact Evaluation

Prepared for
Duke Energy
139 East Fourth Street
Cincinnati, OH 45201

December 20, 2011

Submitted by

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Executive Summary

Key Findings and Recommendations

The key findings and recommendations identified through this evaluation are presented below.

Impact Evaluation

1. Average annual consumption of old and new refrigerators was 1,576 kWh and 394 kWh respectively, an average savings of 1,182 kWh.
2. A total of 569[1] refrigerators were replaced for a total program savings of 672,671 kWh.
3. Only 6% of old refrigerators were replaced with a 15 cubic foot model.
4. Average cubic footage of old vs. new models was very close, 18.92 vs. 19.3 cubic feet.
5. In special cases, a refrigerator with a bad seal may be replaced at the discretion of the auditor even if the meter wattage is below the program requirement. There were four such exceptions made in Ohio. In descending order, these units consumed 1304 kWh, 1243 kWh, 475 kWh, and 471 kWh. These installations, especially the latter two, should be reviewed by Duke Energy to assure that protocols that provide energy savings are being followed by all auditors.
6. Units were replaced only after an inspection of the old unit and a participant-specific offer by the program to have it replaced. Most participants were made aware of the Refrigerator Replacement Program offerings only after they had applied for another low income program (such as the weatherization program) and were subsequently informed that they were eligible for the Refrigerator Replacement Program as well. Survey data indicates that participants were not considering replacing their units at the time of the program offering. Hence, program freeridership is set at zero percent.

Engineering Impact Estimates: Key Findings

Table 1. Summary of Program Savings by Measure

Measure	Participation Count	Verified Per unit kWh impact	Gross Verified kWh Impact	Gross Verified kW Savings	Verified Per unit kW Savings
Frigidaire: 15 cubic feet	29	1,132	32,836	5.1	0.175
Frigidaire: 18 cubic feet	230	1,211	278,482	43.0	0.187
Frigidaire: 21 cubic feet	253	1,164	294,481	45.3	0.179
Whirlpool: 15 cubic feet	5	1,093	5,465	0.8	0.169
Whirlpool: 18 cubic feet	24	1,180	28,329	4.4	0.182
Whirlpool: 21 cubic feet	28	1,181	33,078	5.1	0.182
TOTAL	**569**	**1,182 [1]**	**672,671**	**104**	**0.182[2]**

[1]total gross kwh impact divided by 569 participants

[2]total gross kW savings divided by 569 participants

[1] The number of participants for the impact evalution is based upon the base rates and stipulated agreement program, and from the Energy Efficiency Portfolio program.

Introduction and Purpose of Study

Summary Overview

This document presents the evaluation report for Duke Energy's Low Income Refrigerator Replacement Program as it was administered in Ohio.

Summary of the Evaluation

The evaluation was conducted by TecMarket Works and BuildingMetrics.

The impacts are based on engineering analysis of the data collected through the use of a power meter installed directly to refrigerators in customers' homes. This report is structured to provide energy impact estimations per unit as well as total program savings. The impact tables reporting total savings are based on the savings identified from the 569 participants that replaced a refrigerator. Note that these savings do not include spillover or market effects savings from taking the old refrigerator off the secondary market.

Evaluation Objectives

This evaluation's objective is to determine the savings achieved by Duke Energy's Low Income Refrigerator Replacement Program through the replacement of customers' old, inefficient refrigerators with newer, more efficient, Energy Star qualified refrigerators.

Researchable Issues

- In special cases, a refrigerator with a bad seal may be replaced at the discretion of the auditor even if the meter wattage is below the program requirement. There were four such exceptions made in Ohio. In descending order, these units consumed 1304 kWh, 1243 kWh, 475 kWh, and 471 kWh. These installations, especially the latter two, should be reviewed by Duke Energy to assure that the minimum energy-saving-focused protocols are being followed by all auditors. However, in view that there were only two units with already low levels of consumption, this is not a serious issue for the program as a whole.

Description of Program

The Low Income Refrigerator Replacement Program's purpose is to replace the old, inefficient refrigerators of Duke Energy's low income customers with newer, more efficient, Energy Star qualified refrigerators. To determine if an old refrigerator is inefficient enough to be eligible for replacement, all units were tested in the customers' homes using a power meter installed directly to the refrigerator. If a refrigerator is found to be eligible, it is replaced at no charge to the customer. Old units are removed at the time of the delivery of the new unit and are environmentally recycled. This assures that the old refrigerator does not continue to be used by the customer or get resold in the secondary market thus taking it permanently off the grid.

Program Participation

Engineering estimates are based on the data from all 569 participants that replaced a refrigerator through the Low Income Refrigerator Replacement Program from January 2010 through June 2011.

Program	Participation Count for 2010 through June 2011
Low Income Refrigerator Replacement	569

Methodology

Overview of the Evaluation Approach

This impact evaluation is based on engineering estimates using in-situ monitored data collected from customers' homes.

Study Methodology

Power meters were installed directly to the old refrigerators in the customers' homes. Impact estimations were calculated by subtracting the new refrigerator's energy consumption, provided by the manufacturer, from the energy consumed by the customer's existing refrigerator as measured by the power meter.

Data collection methods, sample sizes, and sampling methodology

Power meters were installed directly to the refrigerators in the customers' homes. Low income homes were targeted. There were 569 participants in Ohio. All participants' units were pre-metered.

Number of completes and sample disposition for each data collection effort

Data was collected from the power meters that were installed directly to the refrigerators in all 569 of the customers' homes.

Expected and achieved precision

Not applicable. A census of participants was used in the study.

Description of baseline assumptions, methods and data sources

The existing (replaced) refrigerator is the baseline. Baseline energy consumption is obtained from in-situ metering.

Description of measures and selection of methods by measure(s) or market(s)

The low income residential market was targeted. Six refrigerator models were available as replacements. They can be seen in the table below.

Brand	Model Number	Size (Cubic ft.)	Energy Usage (kWh)
Frigidaire	FFHT1513LW	15	355
Frigidaire	FFHT1826LW	18	383
Frigidaire	FFHT2126LW	21	408
Whirlpool	ET5WSEXVQ	15	354
Whirlpool	ET8WTEXVQ	18	388
Whirlpool	ET1FTEXVQ	21	416

Use of TRM values and explanation if TRM values not used

The TRM uses a dual baseline approach to calculate lifecycle savings. The remaining useful life of the existing unit is deemed to be eight years. As a result, savings for the first eight years

calculated against the existing unit. Savings for the remaining nine years of the 17 year effective useful life of the new refrigerator are calculated against a new baseline unit. In this case we are deeming the effective useful life to be eight years.

Demand reduction was estimated as a function of energy savings as outlined in the following formula taken from the TRM:

$$\Delta kW = (\Delta kWh/8760) * TAF * LSAF$$

Where TAF (Temperature Adjustment Factor) is deemed at 1.3 and LSAF (Load Shape Adjustment Factor) is deemed at 1.074 for an existing unit and 1.18 for a new unit.

Threats to validity, sources of bias and how those were addressed

The baseline energy consumption is based on in-situ monitoring over a two-hour period. The monitoring period was selected to obtain a number of operating cycles. In-situ monitoring accounts for the location and condition of the refrigerator in terms of refrigerant charge, door gaskets, and so on. The doors remained closed during the test. The two hour test results were extrapolated to annual kWh usage. There is a potential engineering bias in the in-situ testing and extrapolation procedure, but this is expected to underestimate baseline use relative to a longer-period in-situ test that includes door openings, food loading, and so on. As a result, the actual achieved savings may be larger than the evaluated savings.

Snapback and Persistence

Both persistence and technical degradation are included in the calculation of a refrigerator's effective useful life shown in Appendix C: DSMore Table.

The theoretical additional energy and capacity used by customers that may occur from implementing an energy efficiency product, often called "snapback" if it occurs, by design will be captured in the impact evaluation through the billing analysis approach (due to be completed in 2012 after sufficient time has passed since the new refrigerator was installed).

The billing analysis approach will use actual energy use between the pre and post condition compared to what would occur without the program (control). All market or program effects conditions, including snapback, will be accounted for with this evaluation method. Further, there is little to no literature or snapback analysis within the evaluation industry that has been able to identify a snapback condition. The so-called snapback that has recently been referenced in the press has been the impact of normal electric demand growth that shows up in all customers as new products, services, and technologies are acquired and used. However, as noted above, any snapback that does occur would be captured in the evaluation design because of the use of pre and post billing analysis.

Evaluation Findings

Impact Evaluation

There were 569 refrigerators replaced through the Low Income Refrigerator Replacement program in Ohio from January 2010 to June 2011. All units were tested in the customers' homes using a power meter installed directly to the refrigerator. The meters collected energy consumption data for a minimum of two hours, allowing enough time for the unit to stabilize and cycle. Two hours has been shown to be sufficient time to determine a poorly operating unit that needs to be replaced.[2,3] Three sizes and two brands of replacement units were available: 15, 18, or 21 cubic foot Frigidaire or Whirlpool Energy Star top-freezer models. In Ohio, 90% of replacements were Frigidaire and 10% were Whirlpool. Of the 569 units replaced, 6% were 15 cubic feet, 45% were 18 cubic feet, and 49% were 21 cubic feet. A breakdown of the individual numbers can be seen in Table 2.

In general, the size of the customer's existing refrigerator and that of the unit chosen to replace it are as close as possible while still being restricted to the three available sizes. The average size of a replacement unit is 19.3 cubic feet while the average size of the replaced units was 18.92 cubic feet. A detailed comparison of refrigerator sizes and their replacements can be seen in Table 3.

Table 2. Replacement Unit Size and Brand Prevalence

Size of new unit	Count Frigidaire	Count Whirlpool	TOTAL
15 cubic feet	29	5	34
18 cubic feet	230	24	254
21 cubic feet	253	28	281
TOTAL	512	57	**569**

Table 3. Average Replaced Unit Size by Size and Brand of Replacement

Size of new unit	Frigidaire	Whirlpool	AVERAGE
15 cubic feet	15.14	15.00	15.12
18 cubic feet	17.80	18.00	17.81
21 cubic feet	20.37	21.82	20.52
AVERAGE	18.88	19.30	**18.99**

The power meter installed on the unit calculates the annual kWh consumption based on the watts used over the period of the test. If the refrigerator was calculated by the meter to consume over 1,315 kWh per year, it is eligible to be replaced at no charge to the customer. If a unit shows abnormally high peak wattage during the test, 325 watts or higher, this indicates that it was in defrost mode. In this case, the kWh per year must equal 1,565 kWh or more to be replaced. In special cases, a refrigerator with a bad seal may be replaced at the discretion of the auditor even

[2] Mapp, Jim. "Selection of High Usage Refrigerators and Freezers," Wisconsin Energy Bureau. April 16, 1998.
[3] Mapp, J., R Morgan, and K Schroder (2001). *Low-Income Refrigerator Replacement – Selection Criteria for High Usage Refrigerator Replacement,* August 21 – 24, 2001, Salt Lake City. International Energy Program Evaluation Conference.

if the meter wattage is below the program requirement. There were four such exceptions made in Ohio. In descending order, these units consumed 1304 kWh, 1243 kWh, 475 kWh, and 471 kWh. These installations, especially the latter two, should be reviewed by Duke Energy to assure that the replacement protocols, which focus on making sure all units provide savings, are being followed by all auditors.

Table 4. Annual kWh Consumed by Replaced Refrigerators

Size Replaced	Quantity	Average kWh/yr
12 cubic feet	1	1,418
13 cubic feet	1	2,133
14 cubic feet	24	1,626
15 cubic feet	29	1,503
16 cubic feet	19	1,560
17 cubic feet	23	1,594
18 cubic feet	225	1,562
19 cubic feet	16	1,500
20 cubic feet	28	1,701
21 cubic feet	141	1,547
22 cubic feet	36	1,634
23 cubic feet	1	1,572
24 cubic feet	7	1,627
25 cubic feet	12	1,733
26 cubic feet	6	1,768
TOTAL/AVG.	569	1,576

From Table 4, the average annual kWh consumed by replaced units was 1,576 kWh compared to the average annual kWh used by the replacement units of 394 kWh. This provides an average annual savings of 1,182 kWh per unit and results in a total savings of 672,671kWh across the entire program in Ohio. Savings per unit ranged from a minimum of 55 kWh to a maximum of 3,110 kWh. The manufacturer provided energy guides associated with the replacement units can be seen in Appendix B: Energy Guides. A breakdown of the energy savings by unit size and brand can be seen in Table 5. Per-unit savings can be found in Table 6. Program kW reduction can be seem in Table 7 and Table 8.

Table 5. Total Program kWh Savings by Unit Size and Brand

New Refrigerator Size	Frigidaire	Whirlpool	TOTAL
15 cubic feet	32,836	5,465	38,301
18 cubic feet	278,482	28,329	306,811
21 cubic feet	294,481	33,078	327,559
TOTAL	605,799	66,872	**672,671**

Table 6. Per-Unit kWh Savings by Unit Size and Brand

New Refrigerator Size	Frigidaire	Whirlpool	TOTAL
15 cubic feet	1,132	1,093	1,127
18 cubic feet	1,211	1,180	1,208
21 cubic feet	1,164	1,181	1,166
Savings Per Unit	1,183	1,173	**1,182**

Table 7. Total Program kW Reduction by Unit Size and Brand

New Refrigerator Size	Frigidaire	Whirlpool	TOTAL
15 cubic feet	5.1	0.8	6
18 cubic feet	43.0	4.4	47
21 cubic feet	45.3	5.1	50
TOTAL	93	10	**104**

Table 8. Per-Unit kW Reduction by Unit Size and Brand

New Refrigerator Size	Frigidaire	Whirlpool	TOTAL
15 cubic feet	0.175	0.169	0.174
18 cubic feet	0.187	0.182	0.186
21 cubic feet	0.179	0.182	0.179
Reduction per unit	0.182	0.181	**0.182**

Appendix A: Required Savings Tables

The required table showing measure-level participation counts and savings for each program is below.

Measure	Participation Count	Verified Per unit kWh impact	Gross Verified kWh Impact	Gross Verified kW Savings	Verified Per unit kW Savings
Frigidaire: 15 cubic feet	29	1,132	32,836	5.1	0.175
Frigidaire: 18 cubic feet	230	1,211	278,482	43.0	0.187
Frigidaire: 21 cubic feet	253	1,164	294,481	45.3	0.179
Whirlpool: 15 cubic feet	5	1,093	5,465	0.8	0.169
Whirlpool: 18 cubic feet	24	1,180	28,329	4.4	0.182
Whirlpool: 21 cubic feet	28	1,181	33,078	5.1	0.182
TOTAL	**569**	**1,182** [1]	**672,671**	**104**	**0.182**[2]

[1]total gross kwh impact divided by 569 participants

Appendix B: Energy Guides

Frigidaire: 15 Cubic Feet

U.S. Government

Federal law prohibits removal of this label before consumer purchase.

ENERGYGUIDE

Refrigerator-Freezer
* Automatic Defrost
* Top-Mounted Freezer
* No Through-the-Door-Ice-Service

Electrolux
FFHT1513L*
Capacity: 14.8 Cubic Feet

Estimated Yearly Operating Cost

$38

$40 — $48

The estimated yearly operating cost of this model was not available at the time the range was published.

Cost Range of Similar Models

355 kWh

Estimated Yearly Electricity Use

Your cost will depend on your utility rates and use.

- Cost range based only on models of similar capacity with automatic defrost , top-mounted freezer , and no through-the-door-ice-service
- Estimated operating cost based on a 2007 national average electricity cost of 10.64 cents per kWh.
- For more information, visit www.ftc.gov/appliances.

PART NO. 242028519

ENERGY STAR

Frigidaire: 18 Cubic Feet

U.S. Government

Federal law prohibits removal of this label before consumer purchase.

ENERGYGUIDE

Refrigerator-Freezer
* Automatic Defrost
* Top-Mounted Freezer
* No Through-the-Door-Ice-Service

Electrolux
FFHT1826L*
Capacity: 18.2 Cubic Feet

Estimated Yearly Operating Cost

$41

$42 — $52

The estimated yearly operating cost of this model was not available at the time the range was published.

Cost Range of Similar Models

383 kWh

Estimated Yearly Electricity Use

Your cost will depend on your utility rates and use.

- Cost range based only on models of similar capacity with automatic defrost, top-mounted freezer, and no through-the-door-ice-service
- Estimated operating cost based on a 2007 national average electricity cost of 10.64 cents per kWh.
- For more information, visit www.ftc.gov/appliances.

PART NO. 242028537

ENERGY STAR

Frigidaire: 21 Cubic Feet

U.S. Government

Federal law prohibits removal of this label before consumer purchase.

ENERGYGUIDE

Refrigerator-Freezer
* Automatic Defrost
* Top-Mounted Freezer
* No Through-the-Door-Ice-Service

Electrolux
FFHT2126L*
Capacity: 20.5 Cubic Feet

Estimated Yearly Operating Cost

$43

$44 — $56

The estimated yearly operating cost of this model was not available at the time the range was published.

Cost Range of Similar Models

408 kWh

Estimated Yearly Electricity Use

Your cost will depend on your utility rates and use.

- Cost range based only on models of similar capacity with automatic defrost , top-mounted freezer , and no through-the-door-ice-service
- Estimated operating cost based on a 2007 national average electricity cost of 10.65 cents per kWh.
- For more information, visit www.ftc.gov/appliances.

PART NO. 242028524

ENERGY STAR

Whirlpool: 15 Cubic Feet

U.S. Government

Federal law prohibits removal of this label before consumer purchase.

ENERGYGUIDE

Refrigerator-Freezer
•Automatic Defrost
•Top Mounted Freezer
•Without Through-the-Door-Ice Service

Whirlpool Corporation
Model(s): ET5WSE*V*0*
Capacity: 14.6Cubic Feet

Estimated Yearly Operating Cost

$38

$40 — $48

Cost Range of Similar Models

The estimated yearly operating cost of this model was not available at the time the range was published.

354 kWh

Estimated Yearly Electricity Use

Your cost will depend on your utility rates and use.

- Cost range based only on models of similar capacity with automatic defrost, Top mounted freezer, and without through the door ice service.
- Estimated operating cost based on a 2007 national average electricity cost of 10.65 cents per kWh.
- For more information, visit www.ftc.gov/appliances. (P/N W10185762A)

ENERGY STAR

Frigidaire: 18 Cubic Feet

U.S. Government Federal law prohibits removal of this label before consumer purchase.

ENERGYGUIDE

Refrigerator-Freezer
- Automatic Defrost
- Top-Mounted Freezer
- Without Through-The-Door-Ice Service

Whirlpool Corporation
Model: ET8WTE*V*0*
Capacity: 18.3 Cubic Feet

Estimated Yearly Operating Cost

$41

$42 — $52

Cost Range of Similar Models

The estimated yearly operating cost of this model was not available at the time the range was published.

388 kWh

Estimated Yearly Electricity Use

Your cost will depend on your utility rates and use.

- Cost range based only on models of similar capacity with automatic defrost, top-mounted freezer, and without through-the-door ice.
- Estimated operating cost based on a 2007 national average electricity cost of 10.65 cents per kWh.
- For more information, visit www.ftc.gov/appliances. (P/N W10178118 Rev. A)

ENERGY STAR

Frigidaire: 21 Cubic Feet

U.S. Government

Federal law prohibits removal of this label before consumer purchase.

ENERGYGUIDE

Refrigerator-Freezer
- Automatic Defrost
- Top-Mounted Freezer
- Without Through-The-Door-Ice

Whirlpool Corporation
Model(s): ET1CHE*V*0*, ET1FTE*V*0*
Capacity: 21.0 Cubic Feet

Estimated Yearly Operating Cost

$44

$44 — $56

Cost Range of Similar Models

416 kWh

Estimated Yearly Electricity Use

Your cost will depend on your utility rates and use.

- Cost range based only on models of similar capacity with automatic defrost, top-mounted freezer, and without through-the-door ice.
- Estimated operating cost based on a 2007 national average electricity cost of 10.65 cents per kWh.
- For more information, visit www.ftc.gov/appliances. (P/N W10206565 Rev. A)

ENERGY STAR

Appendix C: DSMore Table

Impacts / Technology	Product code	State	EM&V gross savings (kWh/unit)	EM&V gross kW (customer peak/unit)	EM&V gross kW (coincident peak/unit)	Unit of measure	Combined spillover less freeridership adjustment	EM&V net savings (kWh/unit)	EM&V net kW (customer peak/unit)	EM&V net kW (coincident peak/unit)	EM&V load shape (yes/no)	EUL (whole number)
Refrigerator Replacement		OH	1,182	0.182	0.182	Refrigerator	0.00%	1,182	0.182	0.182	no	8
Program wide			**1,182**	**0.182**	**0.182**			**1,182**	**0.182**	**0.182**		