Large Filing Separator Sheet

Case Number: 12-1857-EL-RDR

File Date: 6/29/2012

Section: 7

Number of Pages: 201

Description of Document: New Case

❑ No, already have them installed in all available windows – *skip to next series*

SGI f.. Have you purchased any additional switch gaskets since receiving the kit from Home Energy House Call?

❑ Yes ❑ No ❑ DK

If yes, **SGI g. For how many switches?** _____

6j. **weather stripping** ❑ Yes – *triggers follow up questions WS a-e.*
❑ No **Do you plan on using this item?** ❑ Yes – *triggers WS b-e.*
❑ No ❑ Maybe/DK

❑ DK

WS a.How many feet did you install?
❑ 1-5 ❑ 6-10 ❑ 11-17 ❑ DK

WS b. Did you have any weather stripping installed in your home before you received the kit from the Home Energy House Call program?

❑ Yes ❑ No ❑ DK

WS c. Were you planning on buying any weather stripping for your home before you received the kit from the Home Energy House Call program?

❑ Yes ❑ No ❑ Maybe ❑ DK

❑ No, already have them installed around all available doors – *skip to next series*

WS d. Have you purchased any additional weather stripping since receiving the kit from Home Energy House Call?

❑ Yes ❑ No ❑ DK

If yes, **WS e. For how many doors?**

_____

Audit recommendations:

If "Your home needs attic ducts insulated to R-19" was recommended:

Did you insulate your attic ducts as recommended in the Home Energy House Call Audit Report?

❑ Yes ❑ No ❑ DK

If yes, what did you do: _____

If "Your home needs attic ducts sealed" was recommended"
Did you seal your attic ducts as recommended in the Home Energy House Call Audit Report?

❑ Yes ❑ No ❑ DK

If yes, what did you do: _____

If "Your home needs attic insulation" was recommended:
Did you insulate your attic as recommended in the Home Energy House Call Audit Report?

❑ Yes ❑ No ❑ DK

If yes, what did you do: _____

If "your home needs basement wall insulation" was recommended:
Did you install basement wall insulation as recommended in the Home Energy House Call Audit Report?

❑ Yes ❑ No ❑ DK

If yes, what did you do: _____

If "Your home needs garage ducts insulated to R-19" was recommended:
Did you insulate your garage ducts as recommended in the Home Energy House Call Audit Report?

❑ Yes ❑ No ❑ DK

If yes, what did you do: _____

If "Your home needs garage ducts sealed" was recommended:
Did you seal your garage ducts as recommended in the Home Energy House Call Audit Report?

❑ Yes ❑ No ❑ DK

If yes, what did you do: _____

If "Your home needs insulation in the floor or around perimeter of the home" was recommended:
Did you insulate in the floor or around the perimeter of the home as recommended in the Home Energy House Call Audit Report?

❑ Yes ❑ No ❑ DK

If yes, what did you do: _____

If "your home needs wall insulation" was recommended:
Did you insulate your walls as recommended in the Home Energy House Call Audit Report?

❑ Yes ❑ No ❑ DK

If yes, what did you do: _____

Did you make any other changes to your home as a result of the Home Energy House Call Audit Report?

❑ Yes ❑ No ❑ DK

If yes, what did you do: _____

13. **Do you recall receiving the CFL magnet that was included in the kit?**

❑ Yes ❑ No ❑ DK

If yes, 13b. **Where is it?** _____

15a. **Have you visited Duke Energy's website to read the CFL safe handling tips?**

❑ Yes ❑ No ❑ DK

If yes, 15b. **Were you able to find the CFL safe handling tips on Duke Energy's web site?**

❑ Yes ❑ No ❑ DK

If yes, 15c. **Did what you read about CFL safe handling tips on Duke Energy's web site change your opinion of CFLs?**

❑ Yes ❑ No ❑ DK

If yes, 15d. **How?** _____

16. **Did you read the "DOE Energy Savers" Booklet?**

❑ Yes ❑ No ❑ No, but I will ❑ DK

***If yes,* Did you read and discuss the book with your family?**

❑ Yes ❑ No ❑ No, but I will ❑ DK

Have you taken any actions based on the advice in the booklet in the following areas?

Insulation/Air Leaks ❑ Yes ❑ No ❑ No, but I plan to ❑ DK
If yes, what did you do: _____

Heating and Cooling ❑ Yes ❑ No ❑ No, but I plan to ❑ DK
If yes, what did you do: _____

Heating and Cooling ❑ Yes ❑ No ❑ No, but I plan to ❑ DK
If yes, what did you do: _____

Water Heating ❑ Yes ❑ No ❑ No, but I plan to ❑ DK
If yes, what did you do: _____

Windows ❑ Yes ❑ No ❑ No, but I plan to ❑ DK
If yes, what did you do: _____

Lighting ❑ Yes ❑ No ❑ No, but I plan to ❑ DK
If yes, what did you do: _____

Appliances ❑ Yes ❑ No ❑ No, but I plan to ❑ DK
If yes, what did you do: _____

Home Office ❑ Yes ❑ No ❑ No, but I plan to ❑ DK
If yes, what did you do: _____

Home Electronics ❑ Yes ❑ No ❑ No, but I plan to ❑ DK
If yes, what did you do: _____

Driving/Car Maintenance ❑ Yes ❑ No ❑ No, but I plan to ❑ DK
If yes, what did you do: _____

Renewable Energy ❑ Yes ❑ No ❑ No, but I plan to ❑ DK
If yes, what did you do: _____

Spillover Questions

17. **Since you participated in the Home Energy House Call Program, have you purchased and installed any other type of energy efficiency equipment or made energy efficiency improvements in your home that were recommended by the audit report?**

1. ❑ Yes
2. ❑ No
3. ❑ Don't Know

18. **Did you order additional energy efficiency kits?**

1. ❑ Yes
2. ❑ No
3. ❑ Don't Know

If yes, 18a. **What did you do with the additional kits?**

_____
_____

19. **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: _____

20. **Was this improvement suggested by the home energy audit provided to you through the Home Energy House Call program?**

Type 1: _____ ❑ Yes ❑ No ❑ DK
Type 1: _____ ❑ Yes ❑ No ❑ DK
Type 1: _____ ❑ Yes ❑ No ❑ DK
Type 1: _____ ❑ Yes ❑ No ❑ DK

21. *For each type listed in 19 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.

22. **My experience with the Home Energy House Call Program in** <2006, 2007, 2008> **influenced my decision to install** <Type 1/Type 2/Type 3/Type 4> **on my own.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

23. **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 _____

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.

24. **The web site's form for getting the kit was easy to understand and complete.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

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

25. **Scheduling the home energy audit 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?**_____

_____

26. **The interactions and communications I had with the energy auditor 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?**_____

_____

27. **The energy auditor 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?**_____

_____

28. **The audit 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?**_____

_____

29. **The recommendations in the audit 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?**_____

_____

30. **The recommendations in the audit 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?**_____

_____

31. **The interactions and communications I had with Duke Energy staff was 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?**_____

_____

32. **The measures I installed from in the energy efficiency kit were of satisfactory quality.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

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

_____

33. **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?**_____

_____

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

Response: _____

_____

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

Response: _____

36. **What do you think can be done to increase people's interest in participating in the Home Energy House Call Program?**

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

37. **What do you like most about this program?**

Response: _____

38. **What do you like least about this program?**

Response: _____

Thank you, that completes our survey, but we are looking for residential customers to participate in a research study in which a Duke Energy representative will visit homes to look for additional ways in which Duke Energy can help to reduce their customers' energy bills. If you choose to participate, a Duke Energy representative will visit your home at your convenience in June. The appointment would take about 30 minutes. We will only use your data for internal purposes and your responses will be grouped with other households. This will help us to improve Duke Energy's Home Energy House Call program. As a thank you, you will receive a $50 Visa pre-paid check card that will be mailed within 8 weeks of your participation. Are you interested in participating?

1. ❑ Yes

2. ❑ No – **OK, thank you for your time and feedback today!** (*politely end call*)

If Yes: **A Duke Energy representative will be calling your home to schedule your appointment. After the home visit, you will receive a $50 Visa pre-paid check card that will be mailed within 8 weeks of your participation. Can you please provide the best phone number to reach you:**

1. ❑ Number on file
2. ❑ Different number: _____

OK, thank you for your time and feedback today! (*politely end call*)

Appendix B: Program Manager Interview Instrument

Name: _____

Title: _____

Position description and general responsibilities:

_____

_____

_____

We are conducting this interview to obtain your opinions about and experiences with the Home Energy House Call program. We'll talk about the Home Energy House Call Program and its objectives, your thoughts on improving the program, 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 Home Energy House Call's current objectives. How have these changed over time?

2. In your opinion, which objectives do you think are best being met or will be met?

3. Are there any program objectives that are not being addressed or not being addressed as well as possible 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?

4. Should the program objectives be changed in any way due to technology-based, market-based, or management based conditions? What objectives would you change? What program changes would you put into place as a result, and how would it affect the operations of the program?

Operational Efficiency

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?

6. Please review with us how the Home Energy House Call operates relative to your duties, that is, please walk us through the processes and procedures and key events that allow you do currently fulfill your duties.

7. Have any recent changes been made to your duties? If so, please tell us what changes were made and why they were made. What are the results of the change?

8. Describe the evolution of the Home Energy House Call Program. How has the program changed since it was it first started?

9. Do you have suggestions for improvements to the program that would increase participation rates or interest levels?

10. Do you have suggestions for improving or increasing energy impacts?

11. Do you have suggestion for the making the program operate more smoothly or effectively?

Program Design & Implementation

12. *(If not captured earlier)* Please explain how the interactions between the auditors, customers and Home Energy House Call's management team work. Do you think these interactions or means of communication should be changed in any way? If so, how and why?

13. Describe your quality control and tracking process.

14. Are key industry experts, trade professionals or peers used for assessing what the technologies or models should be included in the program? If so, how does this work?

15. Are key industry experts and trade professionals used in other advisory roles? If so how does this work and what kinds of support is obtained?

16. Describe Home Energy House Call's auditor program orientation training and development approach. Are auditors getting adequate program training and program information? What can be done that could help improve auditor effectiveness? Can we obtain training materials that are being used?

17. In your opinion, do the audits cover enough different kinds of energy efficient products or recommendations?

1. ❑ Yes 2. ❑ No 99. ❑ DK/NS

If no, 20b. What other products or equipment should be included? Why?

_____

_____

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

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

20. Overall, what about the Home Energy House Call program works well and why?

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

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

23. In what ways can these operations or operational efficiencies be improved?

24. In what ways can the program attract more participants?

25. How do you make sure that the best information and practices are being used in Home Energy House Call operations?

26. *(If not collected above)* What market information, research or market assessments are you using to determine the best target markets and program opportunities, market barriers, delivery mechanisms and program approach?

27. Are there any other issues or topics you think we should know about and discuss for this evaluation?

Appendix C: Estimated Statistical Model

This appendix presents the complete regression models use to determine the program effects. The models include the participation variables by state (Audit and kit), weather conditions (temperature and dew point), and indicator variables for each month in the model (in the form MMMYY).

Table C.1 Audit and Kit Savings

	kWh/Day
Audit, Ohio	-3.391 (-8.08)
Audit, NC	-1.761 (-3.74)
Audit, SC	-1.427 (-1.76)
Kit, Ohio	-2.520 (-6.02)
Kit, SC	-1.521 (-1.87)
Kit, NC	-0.989 (-2.09)
Temperature	0.0940 (1.66)
Dew Point	-0.0770 (-1.23)
Humidity	0.238 (8.50)
sept08	16.06 (11.07)
oct08	11.88 (5.05)
nov08	18.82 (6.47)
dec08	35.88 (10.84)
jan09	46.29 (16.50)
feb09	47.91 (15.12)
march09	38.12 (10.96)
april09	31.43 (8.65)
may09	30.38 (8.07)
june09	37.89 (9.89)
july09	50.57 (13.06)
aug09	50.14 (12.74)
sept09	44.92 (11.32)
oct09	33.29 (8.35)
nov09	30.87 (7.70)
dec09	41.68 (10.46)
jan10	55.88 (19.75)
feb10	52.60 (16.44)
march10	41.85 (12.05)
april10	34.46 (9.46)
may10	31.31 (8.29)
june10	44.60 (11.50)
july10	62.80 (15.92)
Observations	293,388

t statistics in parentheses

$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table C.2 Total Savings

	kWh/Day
Total, Ohio	-5.505*** (-23.61)
Total, NC	-2.420*** (-9.02)
Total, SC	-2.577*** (-6.09)
Temperature	0.0940*** (1.66)
Dew Point	-0.0762*** (-1.21)
Humidity	0.237*** (8.47)
sept08	16.03*** (11.05)
oct08	11.84*** (5.03)
nov08	18.77*** (6.45)
dec08	35.83*** (10.83)
jan09	46.28*** (16.50)
feb09	47.86*** (15.11)
march09	38.06*** (10.95)
april09	31.36*** (8.63)
may09	30.30*** (8.05)
june09	37.76*** (9.87)
july09	50.44*** (13.03)
aug09	49.99*** (12.70)
sept09	44.77*** (11.29)
oct09	33.13*** (8.31)
nov09	30.68*** (7.65)
dec09	41.48*** (10.41)
jan10	55.71*** (19.70)
feb10	52.38*** (16.38)
march10	41.58*** (11.97)
april10	34.15*** (9.38)
may10	30.93*** (8.19)
june10	44.18*** (11.39)
july10	62.35*** (15.81)
Observations	293,388

t statistics in parentheses
$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Final Report

Evaluation of the 2009-2010 Residential Smart $aver® HVAC Program in Ohio

Results of an Impact Evaluation

Prepared for
Duke Energy

139 East Fourth Street
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Table of Contents

Executive Summary

Key Findings and Recommendations

An overview of the key findings identified through this evaluation is presented in this section.

Significant Impact Evaluation Findings

Table 1 presents the gross unit kWh and kW savings per ton associated with the Residential Smart $aver program. These results are obtained based on a model which uses the results of the engineering analysis within a statistical billing data analysis (the SAE approach).

Table 1. Energy Savings Per Ton Associated with the Residential Smart $aver Program in Ohio

Measure	Gross Energy and Demand Savings Per Ton		
	kWh/ton	kW/ton	Therm/ton
AC_seer14	147	0.14	-4
AC_seer15	176	0.12	-4
AC_seer16	282	0.1	-6
AC_seer17	301	0.13	-6
Hp_seer14	940	0.11	0
Hp_seer15	829	0.17	0
Hp_seer16	1,221	0.18	0
Hp_seer17	539	0.19	0
Hp_seer18	1,327	0.19	0

Program participation by HVAC system type, size, SEER, and location were applied to the savings per ton estimates from Table 1 above to compute the program savings, as shown in Table 2. These results are consistent with current evaluation results in Ohio.[1]

Table 2. Summary of Program Savings by Measure

Measure	Participation Count	Gross Ex Post kWh Savings	Gross Ex Post kW Savings	Gross Ex Post kWh Savings per unit	Gross Ex Post kW Savings per unit
Air conditioner	5,604	3,398,450	1,955	606	0.349
Heat Pump	5,670	14,729,349	2,598	2,628	0.464

[1] For example, see DP&L's 2010 Evaluation, Measurement and Verification Report, March 15, 2011, page 70.

- The electronically commutated (EC) motors required by the program caused very little change in occupant behavior relative to supply fan usage. Large increases in supply fan operating hours after system installation were not observed. The proportion of fan systems operating continuously decreased slightly after system installation.
- The EC motors provided substantial savings in fan power consumption, on the order of 46%.
- Future monitoring should capture fan, compressor and strip heat energy to provide full unit heating and cooling data for model development and calibration.
- Engineering modeling revealed energy and demand savings that are not proportional to the difference in SEER. The SEER, which is based on a standardized laboratory test, is not a reliable predictor of annual energy consumption under the more realistic operating conditions included in the building energy simulation models. Higher SEER air conditioners and heat pumps typically rely on multiple compressors to improve part-load performance, but may not provide proportional improvements in full-load efficiency. The results seen in this evaluation are consistent with results in other states.
- The billing analysis indicates that the participants realized 55.1% and 108.5% of the savings estimated by the engineering analysis for air conditioners and heat pumps, respectively.
- Participating dealers should record the make and model number of the replaced air conditioner and provide an assessment of the condition of the unit as part of the rebate application process. These data will allow the evaluation team to improve the estimate of the early replacement baseline efficiency.

Recommendation

- Duke Energy may wish to consider conducting an economic impact evaluation of key Duke Energy programs, including the Smart $aver Program, as previous studies suggest that job related impacts of energy efficiency programs may be substantial. Previous studies conducted on the economic impacts associated with energy efficiency programs show impacts in four job creation categories. These include: 1) Jobs created by helping businesses become more profitable by lowering their cost of operations, making them more competitive; 2) Lowering the energy cost of living for customers that increases their disposable income, which in turn supports jobs driven by expenditures other than energy; 3) Dollars spent more locally on non-energy expenditures keeps more dollars in the state being re-spent through the local economy creating more in-state jobs; and 4) Greater spending within non-energy economic streams leads to increased manufacturing, distribution and sales that require additional jobs to support consumer demand. Evaluations that assess economic effects of programs allow policy makers to understand a fuller range of program impacts. These evaluations can be conducted using secondary data (research conducted by others and applied to the Duke Energy programs) or use primary research depending on the reliability needs associated with the study findings.

Description of Program

The Duke Energy Residential Smart $aver program provides rebates for installations of higher efficiency heating and cooling measures in new or existing homes. Qualified purchases by residential customers are eligible for rebates of $200 to the homeowner, and $100 to the HVAC contractor/dealer. Home builders who install qualified equipment are eligible for rebates of $300 that they may choose to pass on to the home buyers.

There are two types of measures for which rebates are available: central air conditioners (CAC) with electronically commutated fan motors (ECM)s, and heat pumps with ECMs. Duke Energy provides rebates for measures that have higher efficiency performance levels that are above current federal standards.

To participate, Duke Energy customers work directly with a participating HVAC contractor, select the eligible equipment, and provide their Duke Energy account number. The contractor completes the application for the rebate, providing the necessary AHRI certificates. Duke Energy has contracted with a third party, program administrator (Wisconsin Energy Conservation Corporation, WECC) who then processes the rebates and sends incentives to the customer and/or the contractor.

Program Participation

The evaluation covers participants in the program spanning 2009 through 2010, with post customer data through June 2011. Engineering estimates were prepared for each program participant. The billing analysis included a near census of participants, as shown below:

Program	Impact Type	Participation Count for 2009-2010
Residential Smart $aver – Ohio	Engineering	11,274
Residential Smart $aver – Ohio	Billing	10,774

Methodology

The impact evaluation used an engineering approach combined with a statistical billing analysis in a Statistically Adjusted Engineering (SAE) model framework. The engineering-based approach to estimating program savings consisted of the following steps:

1. Analysis of contractor surveys
2. Analysis of program participation tracking system data
3. Development and calibration of prototypical building energy simulation models
4. Simulation of measure energy savings
5. True-up of engineering estimates with billing data using a Statistically Adjusted Engineering (SAE) approach
6. Calculation of gross program energy and demand savings

The engineering estimates were then combined with a billing analysis by comparing the engineering estimates of savings for each participant as the participation variable. In this manner, the coefficient on the participation variable becomes the percentage of the engineering savings realized by participants (i.e., the realization rate). This is the SAE approach.

This approach differs from most of the other evaluations of similar programs in that it combines both an engineering and a billing analysis. Other evaluations have either used one or the other. Those evaluations that use only engineering analysis (even if they calibrated using billing data), ignore changes in customer HVAC usage associated with the installation of higher efficiency units and other behavior changes. Evaluations that depend only upon a billing analysis can only capture the early replacement of equipment – they cannot capture the natural replacement savings (i.e., the baseline is not the actual efficiency of the existing HVAC system, but the current HVAC efficiency standards).

The Residential Smart $aver HVAC program is designed as a time of replacement program. Incentives are offered to encourage customers to upgrade from a standard efficiency new air conditioner or heat pump to a higher efficiency new system when the existing system is at the end of its service life. This is commonly referred to a "normal replacement" scenario. The baseline efficiency assumed for the program is a SEER 13 minimally code-compliant air conditioner or heat pump. In some cases, the customer may be encouraged by the program to replace their existing air conditioner or heat pump before the existing system is at the end of its service life. This is commonly referred to as an "early replacement" scenario. Under an early replacement scenario, the existing HVAC system is the baseline, and the life cycle savings accrue using the existing system baseline for the remaining useful life of the existing system. Once the existing system reaches the end of its service life, the baseline reverts to the normal replacement baseline, and the life cycle savings accrue until the end of the service life of the new equipment. This is commonly referred to as the "dual baseline" approach, which is shown in the equation below:

$$\text{Life cycle kWh savings} = (kWh_{ER} - kWh_{EE}) \times RUL + (kWh_{NR} - kWh_{EE}) \times (EUL - RUL)$$

where:

kWh_{ER} = kWh consumption of the existing system
kWh_{EE} = kWh consumption of the efficient (rebated) system
kWh_{NR} = kWh consumption of a minimally code compliant system
RUL = remaining useful life of the existing system
EUL = effective useful life of the efficient (rebated) system

Under the normal replacement scenario, the savings are simply:

$$\text{Life cycle kWh savings} = (kWh_{NR} - kWh_{EE}) \times EUL$$

As discussed above, it is reasonable for the program to claim the savings associated with early replacement. These savings can only be claimed for the remaining life of the replaced unit, after which the claimed savings revert to the normal replacement level. However, it is extremely difficult and expensive to derive accurate estimates of the replaced unit's remaining life, so this evaluation takes the conservative approach, where all replacements were considered to be normal replacements.

To convert the early replacement savings estimate obtained from the billing analysis, the estimated realization rate (using engineering estimates with a 10 SEER early replacement baseline), was multiplied by the engineering-based loss in savings associated with going from a 10 SEER to a 13 SEER (the normal replacement baseline). This represents approximately a 70% reduction in savings.

Finally, during the initial phase of this evaluation, it was discovered that there was a marked difference between the engineering analysis and billing analysis in the preliminary results. This difference was a result of using different participant samples for the engineering and billing analyses. (Please see Appendix C: November 23, 2011 Memo to Duke Energy for more information.) This disparity warranted further investigation and analysis, which resulted in the same participation group used for both the billing and the engineering analysis, the final results of which are presented in this report.

Data collection methods, sample sizes, and sampling methodology

Engineering Estimates

Smart $aver program participation records for all participants covering the period through December, 2010 were obtained from Duke Energy.

Billing Analysis

The results from the billing analysis represent the entire population of participants with usable billing data, so no sample design was necessary.

Number of completes and sample disposition for each data collection effort

Engineering Estimates

Smart $aver program participation records for all participants covering the period through December, 2010 were obtained from Duke Energy.

Billing Analysis

Program tracking data was used to pull billing data from all participants in Ohio. The billing data was combined with information on participation date and in turn linked to weather data (temperature) to form the dataset used in the regression analysis.

Expected and achieved precision

Engineering Estimates

Not applicable. Census of participants used in the study.

Billing Analysis

All savings estimates from the billing analysis were statistically significant at the 95% confidence level.

Description of baseline assumptions, methods and data sources

Engineering Estimates

Baseline assumptions are incorporated into the prototypical simulation models derived from the residential building prototypes used in the California Database for Energy Efficiency Resources (DEER) study, with adjustments made for local building practices and climate. A detailed description can be seen in Table 3.

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

Engineering Estimates

DOE-2.2 simulations were used to estimate savings from all measures, air conditioners and heat pumps ranging from SEER 14 to SEER 18.

Billing Analysis

The billing analysis was used to true up the engineering estimates. The realization rate from the SAE model was used to adjust the engineering estimates of savings for air conditioners and heat pumps ranging from SEER 14 to SEER 18.

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

Engineering Estimates

Any potential for bias in the engineering estimates is minimized through the use of building energy simulation models, which are considered to be state of the art for building shell and HVAC system analysis. Seasonality in heating and cooling energy use, and the use of natural ventilation during mild weather in the cooling season is incorporated to reduce upward bias in the engineering estimates. The engineering models are informed by pre/post metered data on fan usage at a sample of sites, and trued up to the billing analysis described below.

Billing Analysis

The specification of the model used in the billing analysis was designed specifically to avoid the potential of omitted variable bias by including monthly variables that capture any non-program effects that affect energy usage. The model did not correct for self-selection bias because there is no reason to as long as the program remains voluntary.

Snapback and Persistence

The theoretical additional energy and capacity used by customers that may occur from implementing an energy efficiency product, often called "snapback" if it occurs, is by design already captured in the impact evaluation through the billing analysis approach. The billing analysis approach uses 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, are already accounted for in this evaluation method. This is contrasted to evaluations that primarily rely upon engineering calculations.

The billing data analysis, by using usage data from customers who participated as long as over two years ago, indicates that the impacts of the Smart $aver program are likely to persist for at least two years. However, the evaluation did not address how long these savings are likely to persist over time because the time span of the available data was not sufficient to address this issue. Both persistence and technical degradation are included in the calculation of each measure's effective useful life shown in Appendix B: DSMore Table.

Energy Impact Analysis and Findings

Program Tracking System Analysis

Smart $aver program participation records covering the period through December 2010 were obtained from Duke Energy. The data, delivered as an Excel spreadsheet, contained customer name and address, installing vendor contact information, system type and efficiency, unit make and model number, rebate amounts, and other information. These data were examined to identify the number and types of customers and HVAC systems in the program.

The distribution of equipment type listed in the program tracking database is shown in Figure 1.

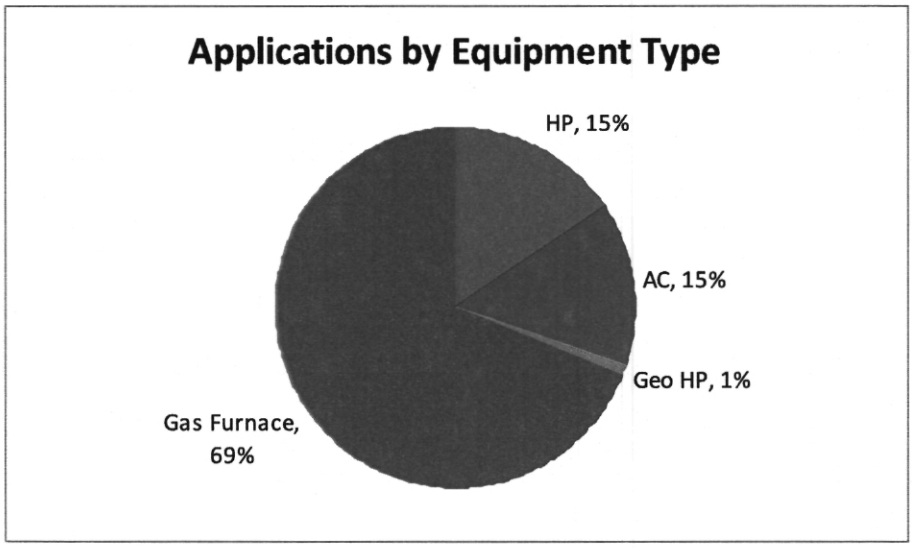

Figure 1. Applications by Equipment Type

Note, gas furnaces make up the majority of the applications listed in the program tracking database received from Duke Energy. Air conditioners and air source heat pump applications numbered about the same. A negligible number of geothermal heat pump applications were recorded. Air conditioners and some heat pumps were bundled with high efficiency furnaces, although they were recorded separately in the tracking database.

The frequency of rebated units and their efficiency is shown below.

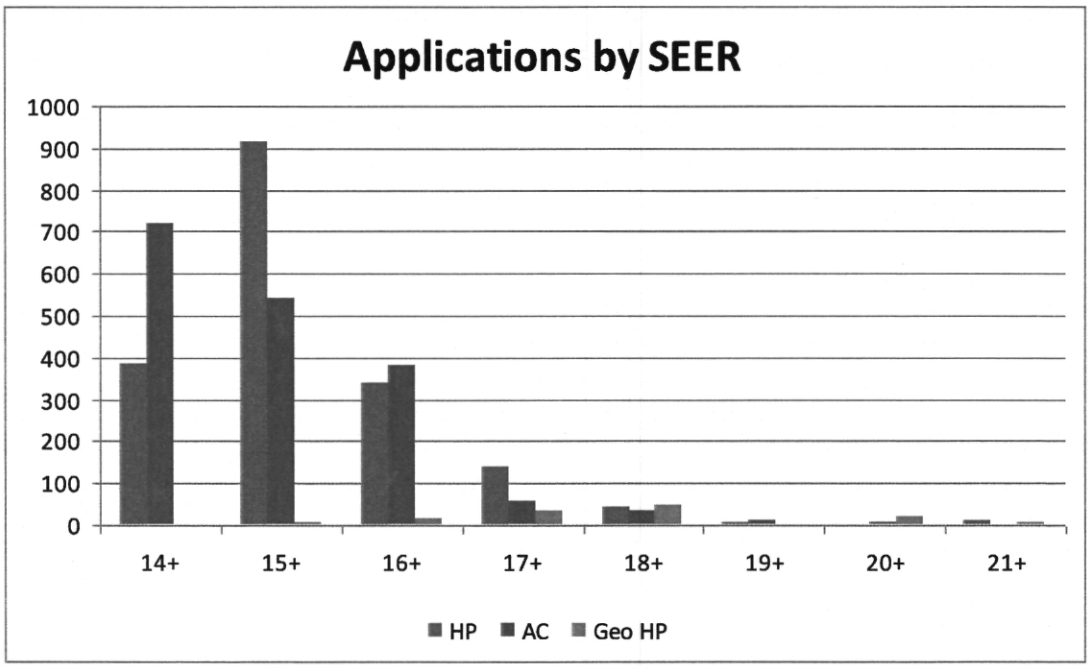

Figure 2. Heat Pump and Air Conditioner Applications by SEER[2]

Engineering-Based Analysis

The impact analysis for the Residential Smart $aver program is based on a combination of engineering estimates and billing data analysis. The engineering estimates are based on DOE-2.2 simulations of a set of prototypical residential buildings. The prototypical simulation models were derived from the residential building prototypes used in the California Database for Energy Efficiency Resources (DEER) study, with adjustments made for local building practices and climate. The prototype "model" in fact contains 4 separate residential buildings; 2 one-story and 2 two-story buildings. Each version of the 1 story and 2 story buildings are identical except for the orientation, which is shifted by 90 degrees. The selection of these 4 buildings is designed to give a reasonable average response of buildings of different design and orientation to the impact of energy efficiency measures. A sketch of the residential prototype buildings is shown in Figure 3.

[2] Note: Geothermal heat pumps are rated by EER

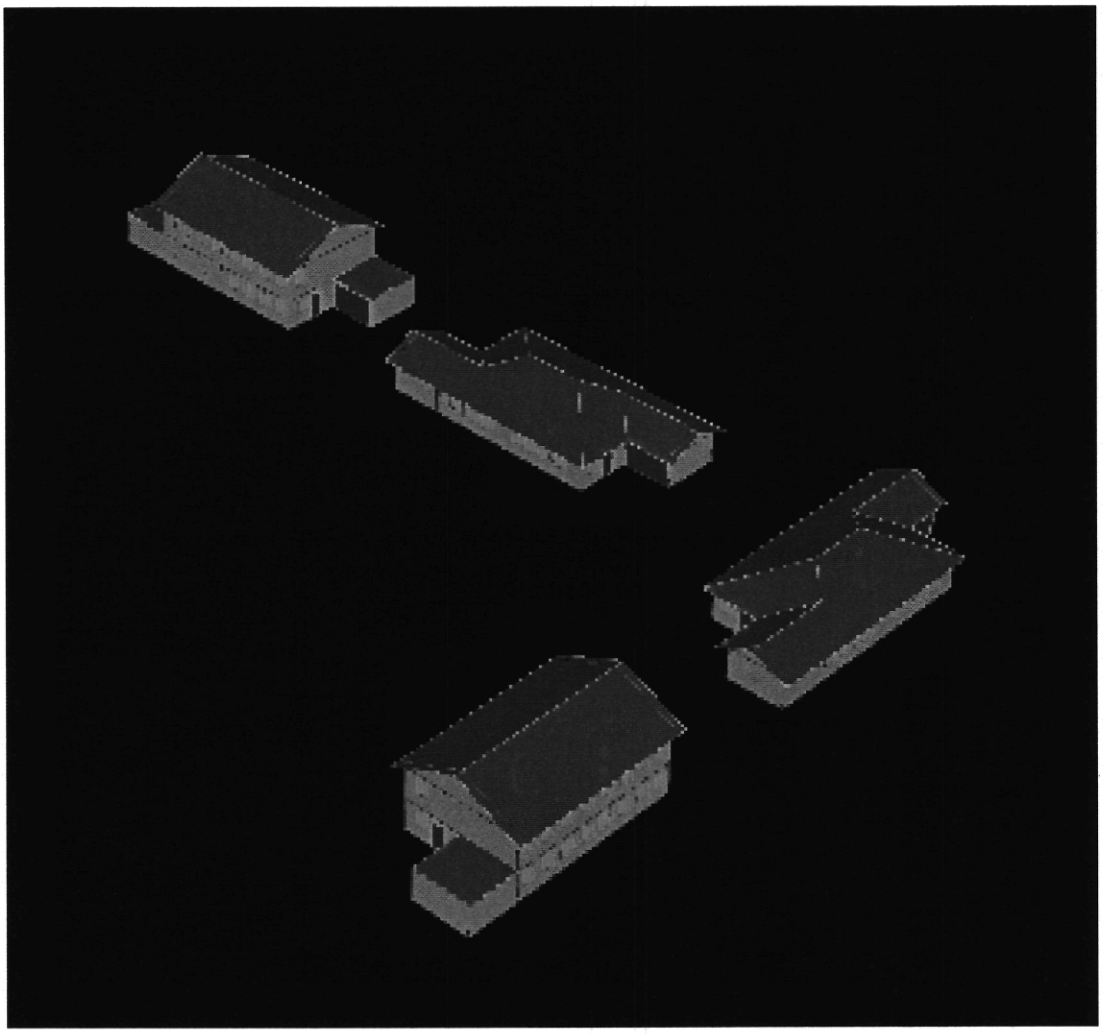

Figure 3. Computer Rendering of Residential Building Prototype Model

For this study, we added a basement to each building to create another set of 4 buildings, allowing us to simulate the impact of the energy efficiency measures on buildings with and without basements. Appliance saturation survey data collected in Indiana were used to refine the prototype models. An appliance saturation survey was not available for Ohio, so the Indiana data were used. These data were judged to be the best data available for the study. The general characteristics of the residential building prototype model are summarized in Table 3.

Table 3. Residential Building Prototype Description

Characteristic	Value
Vintage	Three vintages simulated: 1959 and older, 1960 – 1989, and 1990 and newer
Conditioned floor area	1 story house: 1465 SF (not including basement) 2 story house: 2930 SF (not including basement)
Wall construction and R-value	Wood frame with siding, R-value varies by system type and vintage
Roof construction and R-value	Wood frame with asphalt shingles, R-value varies by system type and vintage
Glazing type	Average of single and double pane; properties vary by system type and vintage
Lighting and appliance power density	0.51 W/SF average
HVAC system type	Packaged single zone AC or heat pump
HVAC system size	Based on peak load with 20% oversizing.
HVAC system efficiency	Baseline SEER = 13 for normal replacement; SEER = 10 for early replacement Furnace efficiency = 0.78 AFUE
Thermostat setpoints	Heating setpoint = 70, cooling setpoint =75. Night setback/setup of 5 degrees in runs with setback thermostats.
Duct location	Buildings without basement: Unconditioned attic Buildings with basement: basement
Duct surface area	Single story house: 390 SF supply, 72 SF return Two story house: 505 SF supply, 290 SF return
Duct leakage	20% total, evenly distributed between supply and return
Cooling season	Covington: April 29th – Oct 9th
Natural ventilation	Allowed during cooling season when cooling setpoint exceeded and outdoor temperature < 65°F. 3 air changes per hour

Several of the building characteristics were varied by vintage and HVAC system type to reflect the differences noted in the appliance saturation survey. These characteristics are described below.

Wall, Floor and Ceiling Insulation Levels

The appliance saturation survey contains questions about the presence of wall, floor and ceiling insulation. The penetration of wall, floor and ceiling insulation was tracked by building vintage and HVAC system type, and an average wall, floor and ceiling insulation level was established to represent the average insulation level in the population. In buildings with basements, the floor insulation levels shown below were applied to the basement walls. The assumed values for wall, floor and ceiling insulation and the assumed average R-value by vintage and HVAC system type is shown in Table 4 through Table 6.

Table 4. Insulation R-Value Assumptions by Vintage

Vintage	HVAC type	Assumed R-value of insulated wall	Average R-value of insulated and non-insulated walls
1959 and older	A/C w/ gas furnace	11	5.26

Vintage	HVAC type	Assumed R-value of insulated wall	Average R-value of insulated and non-insulated walls
	Heat pump	11	7.15
1960 - 1989	A/C w/ gas furnace	11	7.30
	Heat pump	11	8.54
1990 and newer	A/C w/ gas furnace	19	14.35
	Heat pump	19	16.05

Table 5. Ceiling Insulation R-Value Assumptions by Vintage and HVAC System Type

Vintage	HVAC type	Assumed R-value of insulated ceiling	Average R-value of insulated and non-insulated ceiling
1959 and older	A/C w/ gas furnace	19	14.71
	Heat pump	19	16.23
1960 - 1989	A/C w/ gas furnace	30	25.91
	Heat pump	30	25.48
1990 and newer	A/C w/ gas furnace	36	30.41
	Heat pump	36	34.09

Table 6. Floor Insulation R-Value Assumptions by Vintage and HVAC System Type

Vintage	HVAC type	Assumed R-value of insulated floor	Average R-value of insulated and non-insulated floor
1959 and older	A/C w/ gas furnace	11	2.19
	Heat pump	11	3.31
1960 - 1989	A/C w/ gas furnace	11	3.71
	Heat pump	11	4.03
1990 and newer	A/C w/ gas furnace	19	8.46
	Heat pump	19	5.91

Duct Insulation

The appliance survey asked a question about the presence of duct insulation. The fraction of the respondents that indicated the presence of duct insulation by building vintage and HVAC system type was used to establish baseline duct insulation levels. Note, the assumed R-value for insulated ductwork in the general population is R-4.9, corresponding to standard 1in. duct wrap or insulated flex duct.

Table 7. Duct Insulation R-Value Assumptions by Vintage and HVAC System Type

Vintage	HVAC type	Assumed R-value of insulated ducts
1959 and older	A/C w/ gas furnace	4.9
	Heat pump	4.9
1960 – 1989	A/C w/ gas furnace	4.9
	Heat pump	4.9
1990 and newer	A/C w/ gas furnace	4.9
	Heat pump	4.9

Windows

The appliance survey included questions about the presence of dual pane or storm windows, low-e windows and window film. The glazing U-value and solar heat gain coefficient (SHGC) assumptions for these systems are shown in Table 8. Note, the presence of window film was assumed to result in a 50% reduction in SHGC in the small number of buildings affected.

Table 8. Basic Glazing Property Assumptions

Property	Single	Double	Low e
U-value (Btu/hr-F-SF)	1.04	0.55	0.45
Solar heat gain coefficient	0.86	0.76	0.65

The penetration of dual pane, low-e and window film features by building vintage and HVAC system type were applied to the basic window properties to develop a set of glazing property assumptions, as shown in Table 9.

Table 9. Glazing Property Assumptions by Vintage and HVAC System Type

Vintage	HVAC type	U-value	SHGC
1959 and older	A/C w/ gas furnace	0.63	0.88
	Heat pump	0.66	0.89
1960 – 1989	A/C w/ gas furnace	0.62	0.87
	Heat pump	0.62	0.88
1990 and newer	A/C w/ gas furnace	0.65	0.87
	Heat pump	0.60	0.87

Model Calibration

The DOE-2 models were refined using monitored data supplied by Duke Energy on residential central air conditioners and heat pumps in Ohio and Indiana. Dent Elite Pro true electric power meters were installed on the furnace/air handler fans at a sample of sites. Time series measurements of fan power before and after the Residential Smart $aver system installations were made. The dataloggers were rotated from site to site, with some systems monitored during the heating season while other systems were monitored during the cooling season. Note, only the fan power was monitored; total unit power was not included in the monitoring activity. The purpose of the monitoring was to assess the fan power differences resulting from including an electronically-commutated (EC) motor as a program requirement. EC motors are much more efficient than standard motors, improving the SEER rating of an air conditioner or heat pump. The EC motor also allows for fan speed modulation, saving additional fan energy during part-load operation. Homeowners may elect to run their systems with continuous low speed fan operation regardless of heating or cooling needs to improve comfort and indoor air quality. Under this type of control, the energy savings from EC motor installation are reduced due to longer operating hours.

The monitored data were analyzed to determine the fan operation (continuous vs. cycling with call for heat/cool) and fan power per ton of cooling capacity in the pre and post installation case. The result of the monitored data analysis is shown in Table 10.

Table 10. Summary of Furnace Fan Motor Monitoring

Unit Monitored	Cycling Fan Fraction	Continuous Fan Fraction	Average Fan Power at Full Flow (W/cfm)
Existing	42%	58%	0.367
New	51%	49%	0.197

The existing units were more likely to operate with a continuous fan (58% of existing units vs. 49% of replacement units). While continuous fan operation is a feature of systems with EC motors, about half of the systems monitored used the feature.

The average fan power at full flow for the existing units was 0.365 W/cfm, while the average fan power at full flow for the replacement units was 0.197 W/cfm, representing a savings of 46% in full load fan power. Additional fan savings due to reduced speed operation were analyzed using the DOE-2.2 simulation models described in the next section.

The prototype model was simulated with a variety of efficiency measures to develop a series of savings estimates. The engineering analysis provided two sets of estimates. Separate estimates were generated for both normal replacement (replace on failure) and early replacement scenarios. Under the normal replacement scenario, air conditioning systems were simulated with a baseline SEER 13 air conditioner and with a series of high efficiency air conditioners ranging from SEER 14 to SEER 17. Heat pump systems were simulated with a baseline SEER 13 heat pump and with a series of high efficiency heat pumps ranging from SEER 14 to SEER 18. Under the early replacement scenario, the baseline unit efficiency was set at SEER 10, which is typical of units manufactured 20 years ago. The analysis required two sets of estimates. The early replacement baseline was used to compare the engineering analysis to the billing analysis. This comparison yielded an engineering adjustment factor. The adjustment factor was then applied to the engineering estimates developed under the normal replacement scenario. The adjusted, normal replacement engineering estimates were used to develop the final results.

The basic efficiency assumptions for each of the air conditioner and heat pump measures are shown in Table 11. These data were taken from an extensive study of residential air conditioners and heat pumps conducted for the California DEER update study.[3] Besides these basic efficiency parameters, an extensive set of performance curves were developed representing mean performance of production units in each SEER category. These performance curves describe unit efficiency as a function of outdoor temperature, part-load efficiency, and so on. Fan power data were taken directly from the metering study. These curves were also applied to air conditioner and heat pump measures in each SEER category.

[3] Itron, 2005. "2004-2005 Database for Energy Efficiency Resources (DEER) Update Study, Final Report," Itron, Inc., J.J. Hirsch and Associates, Synergy Consulting, and Quantum Consulting. December, 2005. Available at http://eega.cpuc.ca.gov/deer

Table 11. Baseline and Measure Performance Assumptions

Type	Efficiency	Fan Type	EER	Sensible Heat Ratio	Air flow (CFM/ton)	Heating COP
Air conditioner	SEER 10	Std 1-speed	9.3	0.74	396	
	SEER 13	Std 1-speed	11.1	0.75	376	
	SEER 14	EC motor	13.2	0.71	361	
	SEER 15	EC motor	12.7	0.7	320	
	SEER 16	EC motor	11.6	0.81	409	
	SEER 17	EC motor	12.3	0.8	422	
Heat pump	SEER 10	Std 1-speed	9.0	0.69	371	3.0
	SEER 13	Std 1-speed	11.1	0.73	337	3.28
	SEER 14	EC motor	12.2	0.73	352	3.52
	SEER 15	EC motor	12.7	0.81	436	3.74
	SEER 16	EC motor	12.1	0.78	400	3.48
	SEER 17	EC motor	12.5	0.81	430	3.26
	SEER 18	EC motor	13.0	0.78	404	3.18

This set of measures resulted in a simulation run matrix as follows:

Category	Number	Description
Building Vintage	3	1959 and older, 1960 – 1989, and 1990 and newer
Foundation type	2	With and without basement
HVAC systems	2	Air conditioner with gas furnace Standard heat pump with electric backup
Air conditioner efficiency levels	7	Base and 5 measures
Heat pump efficiency levels	8	Base and 6 measures
Furnace fan control	2	Continuous and intermittent
Tstat type	2	Setback and no setback

Evaluation Findings

The set of simulations described above were conducted for Covington, Kentucky, which is the closest weather data site to Cincinnati, Ohio. The results for each of the vintages were weighted according to the relative frequency of each vintage in the overall population. The simulated savings were normalized per ton of cooling capacity. A summary of the simulation results is shown in Table 12. Savings results are shown for each SEER class and air conditioner or heat pump type. Engineering estimates were provided using a normal replacement (SEER 13) baseline and an early replacement (SEER 10) baseline. The estimates for early replacement were prepared for consistency with the billing analysis, which observes the change in consumption as existing equipment is replaced with the efficient equipment.

Table 12. Normalized Measure Savings from Prototype Simulations for All Vintages[4]

Measure	Normal Replacement			Early Replacement[5]	
	kWh/ton	kW/ton	Therm/ton	kWh/ton	kW/ton
AC_seer14	288	0.14	-7	627	0.42
AC_seer15	343	0.12	-8	686	0.4
AC_seer16	405	0.1	-9	762	0.38
AC_seer17	431	0.13	-9	789	0.41
Hp_seer14	793	0.11	0	1333	0.34
Hp_seer15	699	0.17	0	1231	0.39
Hp_seer16	1051	0.18	0	1613	0.4
Hp_seer17	464	0.19	0	1031	0.41
Hp_seer18	1142	0.19	0	1706	0.42

The engineering analysis used detailed performance maps for air conditioners and heat pumps at each SEER level. The detailed performance maps were derived from engineering data published by the unit manufacturers, and were compiled by the California Database for Energy Efficiency Resources (DEER) project. The most recent version of the DEER performance maps were used for this evaluation[6]. The performance maps addressed unit full load efficiency and capacity over a range of outdoor and indoor temperature and humidity conditions and the effects of part-load operation on unit efficiency. The simulation models include the effect of duct leakage into return air systems on HVAC system performance, which in turn affects the temperature and humidity of the entering air conditions. The detailed simulation modeling formed the basis of the engineering estimates.

Note, the energy and peak demand savings derived from the simulations are not proportional to the difference in SEER. The SEER, which is based on a standardized laboratory test, is not a reliable predictor of annual energy consumption under the more realistic operating conditions included in the building energy simulation models. Peak demand savings across the SEER levels are due to different strategies used by manufacturers to achieve a particular SEER rating and the influence of those strategies on energy efficiency under peak conditions. For example, units using multiple compressors can have high SEER ratings, while having relatively poor efficiency under peak conditions. Heat pumps save energy for both heating and cooling, thus the overall annual energy savings are greater for heat pumps than air conditioners. Also, heat pumps have different performance characteristics than air conditioners, causing differences in the demand savings within each SEER class. Energy savings as a function of unit SEER are based on the performance of units under operating conditions representative of units in Ohio, especially when

[4] Normalized energy savings are a weighted average of the results for each of the building vintages.
[5] Billing analysis addressed electricity savings only, so no early replacement gas savings were estimated.
[6] See www.deeresources.com for DEER documentation. The HVAC performance maps are described in the Summary of Energy Analysis Changes in 2008 DEER versus 2005 DEER document, which is accessed from the DEER 2008 for 09-11 Planning/Reporting section under the DEER Database Contents heading.

considering the influence of warm moist air infiltration into the return air systems on system performance.

The savings per ton from the table above were applied to each participant in the program tracking system according to the installed cooling capacity (tons), location and the SEER of the rebated unit to create a customer specific estimate of savings. The customer specific estimates using the early replacement baseline (i.e., SEER 10) were then passed to billing analysis, as described in the next section. The resulting realization rate was then modified by the difference in the engineering-based savings associated with going from the early replacement baseline to the normal replacement baseline.

Billing Analysis

This section of the report presents the results of a billing analysis conducted over the participants in the Ohio Residential Smart $aver program. Billing data was obtained for all participants in the program between January, 2009 and March, 2011 that had accounts with Duke Energy (after processing, there were a total of 10,774 accounts from Ohio).[7] A panel model was used to determine program impacts, where the dependent variable was monthly electricity consumption from January 2009 to June 2011. Since engineering estimates were available for all these participants, a Statistically Adjusted Engineering (SAE) model was used for the analysis. The SAE model uses the customer-specific engineering savings estimate as the program variable, and the resulting estimated coefficient indicates the percentage of the engineering estimate realized on average by participants (i.e., the realization rate). The results of the billing analysis are presented in Table 13.[8]

Table 13. Estimated Ohio Residential Smart $aver Impacts: Billing Analysis

Program Component	Realization Rate	t-value
Air conditioners less than SEER 16	51.2%	8.02
Air conditioners SEER 16 and higher	69.8%	10.38
Heat Pumps less than SEER 16	118.6%	60.49
Heat Pumps SEER 16 and higher	116.2%	49.45

This table shows that the Residential Smart $aver program produced statistically significant savings for participants in Ohio. The realization rate indicates that the savings from this billing analysis is lower than the savings based upon the engineering analysis of air conditioners, and higher for heat pumps. This is often the case because the estimated realization rate captures several factors:

- Customer behavior. The engineering analysis assumes that there is no change in customer behavior with the installation of the new HVAC system. In practice, the addition of a new energy efficient system results in a decline in the cost of heating and cooling, so it is reasonable to assume that some customers will increase their heating/cooling.
- Actual home thermodynamics. The engineering analysis used a set of representative houses to develop the impact estimates. The billing analysis essentially captures the thermodynamics of specific to each house. Since some

[7] In order to maximize the use of the data, a single model was estimated over all states (Ohio, North Carolina, and South Carolina). Therefore, the actual sample size in the model also included 15,054 accounts from North Carolina and 3,213 from South Carolina, for a total sample size of 29,033 households.

[8] In order to insure an accurate separation between the pre and post participation periods, for each customer, the billing data for the period of time between the reported installation date (which may not accurately reflect when the new HVAC system installation was running) and the receipt of the rebate application was eliminated. In a vast majority of the cases this period was less than 2 months.

houses may vary significantly from the set of representative houses, their actual savings may therefore be significantly different as well.

- Status of pre-system. The billing analysis essentially compares the pre-installation usage to the post-installation usage. If some customer's pre-installation HVAC system was not functional, then the billing analysis will show an increase in electricity usage, and the overall estimated program savings will be lower than the case with functioning systems (which is the assumption in the engineering analysis).
- Actual baseline efficiency. The engineering analysis assumed that all customers had a fixed baseline efficiency. However, the billing analysis implicitly uses the actual efficiency of the customer's HVAC system, which may be higher or lower than the efficiency assumed in the engineering analysis.

The remainder of this section discusses the procedure used in the billing analysis.

For this analysis, data are available both across households (i.e., cross-sectional) and over time (i.e., time-series). With this type of data, known as "panel" data, it becomes possible to control, simultaneously, for differences across households as well as differences across periods in time through the use of a "fixed-effects" panel model specification. The fixed-effect refers to the model specification aspect that differences across homes that do not vary over the estimation period (such as square footage, heating system, etc.) can be explained, in large part, by customer-specific intercept terms that capture the net change in consumption due to the program, controlling for other factors that do change with time (e.g., the weather).

Because the consumption data in the panel model includes months before and after the installation of measures through the program, the period of program participation (or the participation window) may be defined specifically for each customer. This feature of the panel model allows for the pre-installation months of consumption to effectively act as controls for post-participation months. In addition, this model specification, unlike annual pre/post-participation models such as annual change models, does not require a full year of post-participation data. Effectively, the participant becomes their own control group, thus eliminating the need for a non-participant group.

The fixed effects model can be viewed as a type of differencing model in which all characteristics of the home, which (1) are independent of time and (2) determine the level of energy consumption, are captured within the customer-specific constant terms. In other words, differences in customer characteristics that cause variation in the level of energy consumption, such as building size and structure, are captured by constant terms representing each unique household.

Algebraically, the fixed-effect panel data model is described as follows:

$$y_{it} = \alpha_i + \beta x_{it} + \varepsilon_{it},$$

where:

y_{it} = energy consumption for home i during month t

α_I = constant term for site *i*
β = vector of coefficients
x = vector of variables that represent factors causing changes in energy consumption for home *i* during month *t* (i.e., weather and participation)
ε = error term for home *i* during month *t*.

With this specification, the only information necessary for estimation is those factors that vary month to month for each customer, and that will affect energy use, which effectively are weather conditions and program participation. Other non-measurable factors can be captured through the use of monthly indicator variables (e.g., to capture the effect of potentially seasonal energy loads).

The effect of the Residential Smart $aver program is captured by including a variable which is equal to zero for the months prior to participation, and the engineering estimate (on a monthly basis) for all months after the household participated in the program. The coefficient on this variable is the realization rate, and indicates the relationship between the engineering estimate and the billing data estimate (if the estimate is greater than one, the billing data indicates a higher savings than the engineering estimate. If the coefficient is less than one, then the billing data indicates a smaller savings than the engineering models). In order to account for differences in billing days, the usage was normalized by days in the billing cycle. The estimated model is presented in Table 14.[9]

Table 14. Estimated Savings Model – dependent variable is (daily kWh usage), January 2009 through June 2011 (savings are negative).

Independent Variable	Coefficient (percentage / 100)	t-value
Ohio – AC Eng. Est.	-0.55	-11.89
Ohio – HP Eng. Est.	-1.09	-69.24
Carolina – AC Eng. Est.	-0.67	-40.12
Carolina – HP Eng. Est.	-0.56	-38.80
Sample Size	725,874 observations (29,033 homes)	
R-Squared	73%	

The complete estimate model, showing the weather and time factors, is presented in Appendix A: Estimated Statistical Model.

The billing analysis represents a pre/post comparison of energy consumption, using the existing air conditioner or heat pump as the "pre" equipment.

The realization rate from the billing analysis (based upon the early replacement engineering estimates) was applied to the ratio of the savings associated with the early replacement to normal replacement engineering estimates, to give an estimate of the normal replacement energy

[9] As stated previously, a single model was estimated over participants in all states. Thus, this table presents the impacts for the Ohio in addition to the impacts for the Carolinas.

savings. Since the billing analysis did not address demand savings, the engineering estimates of peak demand were not adjusted. The final billing analysis adjusted gross energy and demand savings per ton estimates are shown in Table 15.

Table 15. Adjusted Gross Energy and Demand Savings Per Ton

Measure	Gross Energy and Demand Savings Per Ton		
	kWh/ton	kW/ton	Therm/ton
AC_seer14	147	0.14	-4
AC_seer15	176	0.12	-4
AC_seer16	282	0.10	-6
AC_seer17	301	0.13	-6
Hp_seer14	940	0.11	0
Hp_seer15	829	0.17	0
Hp_seer16	1,221	0.18	0
Hp_seer17	539	0.19	0
Hp_seer18	1,327	0.19	0

Program participation by HVAC system type, size, and SEER were applied to the savings per ton estimates from Table 15 above to compute the program savings, as shown in Table 16.

Table 16. Summary of Program Savings by Measure

Measure	Participation Count	Gross Ex Post kWh Savings	Gross Ex Post kW Savings	Gross Ex Post kWh Savings per unit	Gross Ex Post kW Savings per unit
Air conditioner	5,604	3,398,450	1,955	606	0.349
Heat Pump	5,670	14,729,349	2,598	2,628	0.464

The kW savings estimated for the program are summer peak demand savings at the customer meter. Estimates of utility coincident peak savings were not included in the study. Coincidence factors are applied to the customer peak savings in the DSMore cost effectiveness tool to estimate coincident peak savings.

Net-to-Gross Analysis for Impact Estimates

The evaluation examined the extent to which customers would have taken the same actions without the Duke Energy incentive and the degree to which the program participation impacted the adoption of additional energy efficient measures. This analysis assessed the degree of the influence of the program and the program's rebate on the customer's decision to buy, and used self-reports of 54 surveyed program participants to estimate freeridership.

Participants were asked how important the program rebate was to their decision to purchase a more energy efficient model. The results are shown in Figure 4. One participant (1.9%) indicated that the rebate was the primary reason and five participants (9.3%) regarded the rebate as unimportant or minor in their consideration. Fifteen participants (27.3%) regarded the rebate as important, and thirty-three participants (61.1%) said that the rebate was one of the reasons, but not the most important.

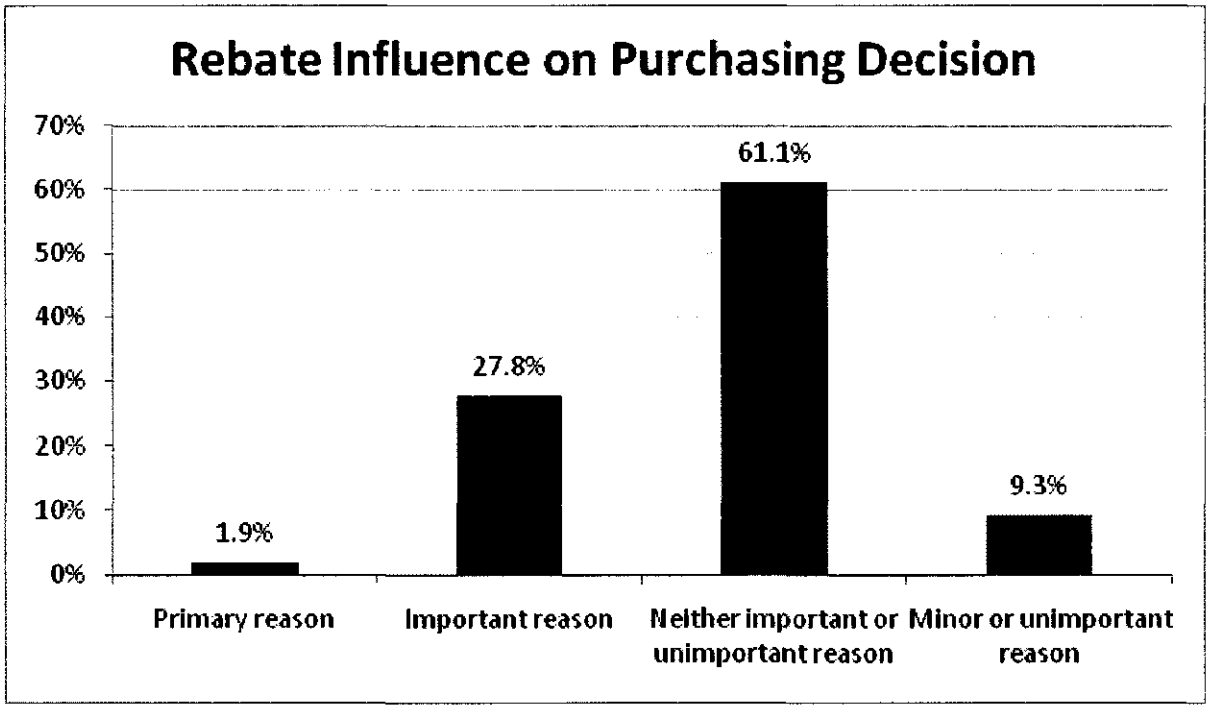

Figure 4. Rebate Influence on Purchasing Decision (n=54)

Surveyed participants were asked if the rebate had not been available whether they would have purchased the same measure or an equally energy efficient one. Customers were also asked about the timeline associated with their purchase to determine if the change would have been made, but at a later time. In addition, only two out of 54 surveyed participants indicated that they would have delayed the purchase of equipment without the program. One participant thought the delay would be three to four months and the other thought he or she would have waited six months to purchase new equipment.

Survey participants were read the following statement in order to rate the amount of influence the rebate had on their purchasing decision: "I would like to ask how important the program incentive was in your decision to buy the more energy efficient model. Would you say the incentive was…"

Possible responses were weighted for free ridership and included the following:

- The primary reason (no free ridership)

- An important reason (20 percent free ridership)
- Neither an important or unimportant reason (40 percent free ridership)
- An unimportant reason (80 percent free ridership)
- Not a reason at all (100 percent free ridership)

The free ridership multiplier from each rating is then multiplied by the percentage of respondents who chose that rating. The sum of the products of the percentages and multipliers is the unadjusted free ridership percentage.

The unadjusted free ridership percentage is calculated using Table 17. The overall free ridership is calculated to be 37.4 percent with a net to gross ratio of 62.6 percent (100 percent minus 37.4 percent.)

Table 17. Free Ridership Percentages

Amount of Rebate Influence	Free Ridership Multiplier	Number of Respondents	Percent of Respondents	Adjusted Free Ridership Ratio
Primary reason	0 percent	1	1.9%	0 %
Important reason	20 percent	15	27.8%	5.6%
Neither Important or Unimportant reason	40 percent	33	61.1%	24.4%
Unimportant reason	80 percent	5	9.3%	7.4%
Not a reason	**100 percent**	**0**	**0%**	**0%**
Sum			**100%**	**37.4%**

In a previous study of this program (TecMarket Works 2008) we estimated free ridership using a different approach. In the previous study we interviewed dealers and contractors and asked them to make estimates of their customer's free rider condition. That finding was almost identical (37.2% in 2008 versus the current study's 37.4%). Because these two different approaches that were conducted at different times yet for the same program provide almost identical findings, we are not adjusting the current study's free ridership score down to reflect the decision bias described in the evaluation literature. The fact that the two scores are essentially identical supports the findings of both studies.

Spillover

The participant survey asked customers if they had taken additional actions to save energy beyond the equipment discounted as a result of the Duke Energy program. Fourteen (25%) participants indicated that they had taken additional actions beyond those covered by the program. However, TecMarket Works is not crediting any additional savings to the program as a result of these actions because the customers did not understand that the Duke Energy program was responsible for the reduced price of the program-covered incentive, and because the participating dealers do not push additional products or behavior changes as a result of the Duke Energy program. This finding may change if future interviews with the participating dealers and surveys with customers identify that Duke Energy has in some way caused all or a portion of those actions to occur. This conclusion is supported by the majority of the interviewed dealers who indicated that their customers were not aware of the Duke Energy program at the time of the customer's decision to purchase.

Net to Gross Ratio

The net to gross ratio for this program is set at 0.626 and includes a downward adjustment in gross savings equal to 37.4% of the gross savings. There is no adjustment for spillover savings for this program until such time as the program can be found to be a cause of additional actions being taken by program participants. As a result, the final net-to-gross ratio for the program is set at 0.626.

Appendix A: Estimated Statistical Model

This appendix show the complete model estimated for the billing analysis. The model includes indicators for each month (the YYYYMM variable), temperature, and the participation variables.

kwhyear	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
hp_oh_eng	-1.085192	.0156737	-69.24	0.000	-1.115912	-1.054473
ac_oh_eng	-.5513968	.0463747	-11.89	0.000	-.6422897	-.4605038
hp_cl_eng	-.5602956	.0139649	-40.12	0.000	-.5876664	-.5329248
ac_cl_eng	-.6728898	.0173447	-38.80	0.000	-.7068849	-.6388947
tme#c.atemp						
200901	-913.7671	6.085213	-150.16	0.000	-925.6939	-901.8403
200902	-343.6916	7.26964	-47.28	0.000	-357.9399	-329.4434
200903	-390.8604	12.29096	-31.80	0.000	-414.9503	-366.7706
200904	-271.3217	14.12966	-19.20	0.000	-299.0154	-243.6281
200905	38.25065	13.30942	2.87	0.004	12.16461	64.33668
200906	541.3495	14.65064	36.95	0.000	512.6347	570.0643
200907	-226.1684	15.70453	-14.40	0.000	-256.9488	-195.3881
200908	291.9479	12.93154	22.58	0.000	266.6025	317.2933
200909	422.4782	12.54466	33.68	0.000	397.8911	447.0653
200910	72.02099	8.661937	8.31	0.000	55.04387	88.9981
200911	-182.7167	12.81394	-14.26	0.000	-207.8316	-157.6018
200912	-384.9971	8.653933	-44.49	0.000	-401.9586	-368.0357
201001	-1207.315	9.643819	-125.19	0.000	-1226.216	-1188.413
201002	-236.4453	9.281978	-25.47	0.000	-254.6377	-218.2529
201003	-523.1728	8.899549	-58.79	0.000	-540.6156	-505.73
201004	-272.333	12.62213	-21.58	0.000	-297.072	-247.5941
201005	241.5872	13.89349	17.39	0.000	214.3565	268.818
201006	643.2156	15.28561	42.08	0.000	613.2563	673.1749
201007	632.6885	19.8788	31.83	0.000	593.7267	671.6503
201008	550.5609	20.72206	26.57	0.000	509.9463	591.1755
201009	499.6086	14.61731	34.18	0.000	470.9591	528.258
201010	296.6883	10.38808	28.56	0.000	276.328	317.0486
201011	-179.2051	10.95534	-16.36	0.000	-200.6772	-157.733
201012	-565.9388	8.366704	-67.64	0.000	-582.3373	-549.5403
201101	-673.5651	13.65525	-49.33	0.000	-700.3289	-646.8012
201102	-780.1368	9.999165	-78.02	0.000	-799.7348	-760.5388
201103	-580.2816	11.67736	-49.69	0.000	-603.1689	-557.3944
201104	-296.3959	13.40752	-22.11	0.000	-322.6742	-270.1176
201105	168.4322	16.95744	9.93	0.000	135.1961	201.6682
201106	623.2664	14.92664	41.76	0.000	594.0107	652.5221
tme						
200902	-25705.23	346.5428	-74.18	0.000	-26384.44	-25026.01
200903	-24840.03	588.0499	-42.24	0.000	-25992.59	-23687.47
200904	-32458.36	768.8295	-42.22	0.000	-33965.24	-30951.48
200905	-49999.84	862.4094	-57.98	0.000	-51690.13	-48309.54
200906	-82434.03	1051.236	-78.42	0.000	-84494.41	-80373.64
200907	-22183.3	1180.341	-18.79	0.000	-24496.73	-19869.87
200908	-61815.77	988.7357	-62.52	0.000	-63753.66	-59877.88
200909	-73287.39	933.2411	-78.53	0.000	-75116.51	-71458.26
200910	-51609.09	588.1439	-87.75	0.000	-52761.83	-50456.35
200911	-37437.37	722.1384	-51.84	0.000	-38852.73	-36022
200912	-25245.57	451.6399	-55.90	0.000	-26130.77	-24360.37
201001	9588.784	396.5249	24.18	0.000	8811.608	10365.96
201002	-27710.61	397.4397	-69.72	0.000	-28489.58	-26931.64
201003	-18321.73	432.9353	-42.32	0.000	-19170.26	-17473.19
201004	-31497	750.2375	-41.98	0.000	-32967.44	-30026.56
201005	-62780.79	909.432	-69.03	0.000	-64563.24	-60998.33

201006	-90085.7	1140.603	-78.98	0.000	-92321.24	-87850.15
201007	-88609.74	1575	-56.26	0.000	-91696.69	-85522.79
201008	-82419.24	1669.476	-49.37	0.000	-85691.36	-79147.12
201009	-79675.89	1129.434	-70.55	0.000	-81889.54	-77462.23
201010	-66272.66	731.0191	-90.66	0.000	-67705.43	-64839.88
201011	-36859.49	650.8755	-56.63	0.000	-38135.18	-35583.79
201012	-16006.69	426.1167	-37.56	0.000	-16841.87	-15171.52
201101	-11038.53	516.6781	-21.36	0.000	-12051.2	-10025.86
201102	-7096.302	447.7675	-15.85	0.000	-7973.912	-6218.693
201103	-15183.09	612.8344	-24.78	0.000	-16384.22	-13981.95
201104	-29628.96	765.9756	-38.68	0.000	-31130.25	-28127.67
201105	-57977.34	1106.54	-52.40	0.000	-60146.13	-55808.56
201106	-88967.22	1113.216	-79.92	0.000	-91149.09	-86785.36
_cons	61532.85	243.7272	252.47	0.000	61055.15	62010.54

Appendix B: DSMore Table

Per Measure Impacts Summary for Smart Saver Ohio

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)
Air Conditioner		Ohio	606	0.349	N/A	unit	37.40%	379	0.218	N/A	no	18
Heat Pump		Ohio	2,628	0.464	N/A	unit	37.40%	1,645	0.290	N/A	no	18
Program wide			**1,623**	**0.407**	**NA**	**unit**	**37.40%**	**1,016**	**0.255**	**NA**		

Notes: Coincidence factors to be applied in DSMore using the residential HVAC load shape in the DSMore library.

Appendix C: November 23, 2011 Memo to Duke Energy

In using both engineering and billing analysis approaches for this evaluation, it was discovered that there was a marked difference between the engineering analysis and billing analysis in the preliminary results. This difference was due a result of using different participant samples for the engineering and billing analyses, as described in the memo below.

TecMarket Business Center
165 Netherwood Road
2nd Floor, Suite A
Oregon, WI 53575

Memorandum

To: Ashlie Ossege, Duke Energy
From: Michael Ozog, Integral Analytics
Date: November 23, 2011
Subject: Status of Residential Smart Saver impact evaluation

This memo reviews the status of the impact evaluation of the residential Smart Saver program. The impact evaluation consists of both engineering and a billing data analyses. The engineering analysis consists of DOE-2 simulations of prototypical residential buildings combined with pre/post monitoring of HVAC system fans at a sample of participant sites. The DOE-2 simulations provide unit energy savings estimates (kWh/ton and kW/ton) for central air conditioners and heat pumps at various efficiency levels. Since the program requires electronically commutated (EC) motors on the supply fans of the rebated equipment, pre/post monitoring of HVAC system fans was used to improve the simulation models by observing how participants used this feature in their new systems. The billing analysis uses pre- and post-participation data of participants within a regression model to estimate program impacts.

Both the billing data and engineering analysis were initially completed in September. However, when the results were compared, there was a marked difference between the results from the engineering analysis and the billing analysis. To investigate this difference, the engineering estimates were combined into the regression model in a statistically adjusted engineering (SAE) framework. While constructing the SAE model, it was noted that the samples used for the engineering analysis did not match the sample used in the billing data analysis, with the engineering analysis having significantly fewer participants than the billing analysis.

Therefore, a new extract of the participation data for Smart Saver was conducted in order to insure that both samples were consistent and the SAE model could be run with the full set of program participants. Once this task was completed, new engineering and billing data analyses were conducted. This procedure was, naturally, time consuming, and was not completed until mid-November. The results are currently being reviewed internally and will be available once the internal review is completed.

2009 Program Year

Row	Program Name	Measure Name	kWh	kW	Participants	kWh Savings	Total MWh	Ossege Attachment / Supplemental Info	Additional Ossege Attachment / Supplemental
1	Smart Saver® for Nonresidential Customers	1.5 Horse Power High Efficiency Pumps	378	0.1	2	757	0.2	Ossege Attachment Q-15	
2	Smart Saver® for Nonresidential Customers	10 Horse Power High Efficiency Pumps	2526	0.7	2	5052	1.4	Ossege Attachment Q-15	
3	Smart Saver® for Nonresidential Customers	125-250 Horse Power Motors - Incentives per participant	2604	0.7	1	2604	0.7	Ossege Attachment Q-15	
4	Smart Saver® for Nonresidential Customers	15 Horse Power High Efficiency Pumps	3788	1.0	2	7576	2.1	Ossege Attachment Q-15	
5	Smart Saver® for Nonresidential Customers	1-5 Horse Power Motors - Incentives per participant	121	0.0	5	605	0.2	Ossege Attachment Q-15	
6	Smart Saver® for Nonresidential Customers	2 High Bay 6L T-5 High Output replacing 1000W HID	1562	0.4	114	178013	44.4	Ossege Attachment Q-15	
7	Smart Saver® for Nonresidential Customers	2 High Bay Fluorescent 8LF32T8 - Replacing 1000W HID	2151	0.5	61	131218	32.7	Ossege Attachment Q-15	
8	Smart Saver® for Nonresidential Customers	20 Horse Power High Efficiency Pumps	5051	1.4	2	10101	2.8	Ossege Attachment Q-15	
9	Smart Saver® for Nonresidential Customers	25-100 Horse Power Motors - Incentives per participant	1132	0.3	20	22647	6.2	Ossege Attachment Q-15	
10	Smart Saver® for Nonresidential Customers	7.5-20 Horse Power Motors - Incentives per participant	437	0.1	20	8750	2.4	Ossege Attachment Q-15	
11	Smart Saver® for Nonresidential Customers	AC 135,000 - 240,000	2543	0.9	28	71217	25.7	Ossege Attachment Q-12	
12	Smart Saver® for Nonresidential Customers	AC 240,000 - 760,000	1667	0.6	50	83368	30.1	Ossege Attachment Q-12	
13	Smart Saver® for Nonresidential Customers	AC 65,000 - 135,000	718	0.3	32	22969	8.3	Ossege Attachment Q-12	
14	Smart Saver® for Nonresidential Customers	AC greater than 760,000	6399	2.3	11	70384	25.4	Ossege Attachment Q-12	
15	Smart Saver® for Nonresidential Customers	AC less than 65,000 1 Ph	348	0.1	13	4530	1.6	Ossege Attachment Q-12	
16	Smart Saver® for Nonresidential Customers	AC less than 65,000 3 Ph	261	0.1	4	1044	0.4	Ossege Attachment Q-12	
17	Smart Saver® for Nonresidential Customers	BONUS Air Cooled Chiller Tun Up	25784	9.3	16	412539	148.9	Ossege Attachment Q-13	
18	Smart Saver® for Nonresidential Customers	BONUS High Bay 2L T-5 High Output	1257	0.1	2	2515	0.3	Ossege Attachment Q-9	
19	Smart Saver® for Nonresidential Customers	BONUS High Bay 3L T-5 High Output	481	0.1	148	71255	17.8	Ossege Attachment Q-15	
20	Smart Saver® for Nonresidential Customers	BONUS High Bay 4L T-5 High Output	1060	0.2	2511	2662771	466.7	Ossege Attachment Q-9	
21	Smart Saver® for Nonresidential Customers	BONUS High Bay 6L T-5 High Output	331	0.1	863	286042	66.8	Ossege Attachment Q-9	
22	Smart Saver® for Nonresidential Customers	BONUS High Bay 8L T-5 High Output	2807	0.5	492	1381217	269.5	Ossege Attachment Q-12	
23	Smart Saver® for Nonresidential Customers	BONUS High Bay Fluorescent 3 Lamp (F32 Watt T8)	366	0.1	165	60323	15.1	Ossege Attachment Q-20	
24	Smart Saver® for Nonresidential Customers	BONUS High Bay Fluorescent 4 Lamp (F32 Watt T8)	883	0.1	2676	2363611	353.6	Ossege Attachment Q-9	
25	Smart Saver® for Nonresidential Customers	BONUS High Bay Fluorescent 6 Lamp (F32 Watt T8)	1296	0.2	5035	6523708	1071.0	Ossege Attachment Q-9	
26	Smart Saver® for Nonresidential Customers	BONUS High Bay Fluorescent 8 Lamp (F32 Watt T8)	1144	0.1	578	661419	79.5	Ossege Attachment Q-9	
27	Smart Saver® for Nonresidential Customers	BONUS High Performance Low Watt T8 4ft 1 lamp, replacing standard T8	31	0.0	218	6729	1.8	Ossege Attachment Q-20	
28	Smart Saver® for Nonresidential Customers	BONUS High Performance Low Watt T8 4ft 2 lamp, replacing standard T8	51	0.0	5834	300296	82.3	Ossege Attachment Q-20	
29	Smart Saver® for Nonresidential Customers	BONUS High Performance Low Watt T8 4ft 3 lamp, replacing standard T8	67	0.0	178	11910	3.3	Ossege Attachment Q-20	
30	Smart Saver® for Nonresidential Customers	BONUS High Performance Low Watt T8 4ft 4 lamp, replacing standard T8	99	0.0	342	33888	9.3	Ossege Attachment Q-20	
31	Smart Saver® for Nonresidential Customers	BONUS High Performance T8 4ft 1 lamp, replacing T12-HPT8	68	0.0	6	409	0.1	Ossege Attachment Q-20	
32	Smart Saver® for Nonresidential Customers	BONUS High Performance T-8 4ft 2 lamp replacing T-12 8ft 1 lamp	72	0.0	88	6343	1.7	Ossege Attachment Q-20	
33	Smart Saver® for Nonresidential Customers	BONUS High Performance T-8 4ft 2 lamp replacing T-12 High Output 8ft 1 lamp	187	0.1	851	158797	43.5	Ossege Attachment Q-20	
34	Smart Saver® for Nonresidential Customers	BONUS High Performance T8 4ft 2 lamp, replacing T12-HPT8	87	0.0	230	20123	5.5	Ossege Attachment Q-20	
35	Smart Saver® for Nonresidential Customers	BONUS High Performance T8 4ft 3 lamp, replacing T12-HPT8	156	0.0	91	14168	3.9	Ossege Attachment Q-20	
36	Smart Saver® for Nonresidential Customers	BONUS High Performance T-8 4ft 4 lamp replacing T-12 8ft 2 lamp	53	0.0	156	8234	2.3	Ossege Attachment Q-20	
37	Smart Saver® for Nonresidential Customers	BONUS High Performance T-8 4ft 4 lamp replacing T-12 High Output 8ft 2 lamp	314	0.1	60	18836	5.2	Ossege Attachment Q-20	
38	Smart Saver® for Nonresidential Customers	BONUS High Performance T8 4ft 4 lamp, replacing standard T8	55	0.0	20	1107	0.3	Ossege Attachment Q-20	
39	Smart Saver® for Nonresidential Customers	BONUS High Performance T8 4ft 4 lamp, replacing T12-HPT8	181	0.0	232	42090	11.5	Ossege Attachment Q-20	
40	Smart Saver® for Nonresidential Customers	BONUS Low Watt T8 lamps replacing standard 32 Watt T-8's	17	0.0	5802	97157	26.7	Ossege Attachment Q-15	
41	Smart Saver® for Nonresidential Customers	BONUS Occupancy Sensors over 500 Watts	1063	0.3	2296	2440347	666.0	Ossege Attachment Q-9	
42	Smart Saver® for Nonresidential Customers	BONUS Occupancy Sensors under 500 Watts	425	0.1	3095	1316468	365.8	Ossege Attachment Q-9	
43	Smart Saver® for Nonresidential Customers	BONUS Pulse Start Metal Halide (retrofit only)	460	0.1	1	460	0.1	Ossege Attachment Q-15	
44	Smart Saver® for Nonresidential Customers	BONUS Refrigeration System Tune Up	8745	1.5	23	201134	33.8	Impacts provided by Morgan Marketing Partners from industry data (Wisconsin Focus on Energy).	
45	Smart Saver® for Nonresidential Customers	BONUS T-5 2 Lamp with Electronic Ballast (replacing T-12 fixture	48	0.0	27	1286	0.4	Ossege Attachment Q-15	
46	Smart Saver® for Nonresidential Customers	BONUS T-5 High Output 4 Lamp with Electronic Ballast (replacing T-12 fixture	197	0.0	54	10622	1.0	Ossege Attachment Q-9	
47	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 10 Horse Power Pumps	30503	0.1	8	244021	0.5	Ossege Attachment Q-12	
48	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 15 Horse Power Pumps	45756	0.1	14	640583	1.2	Ossege Attachment Q-12	
49	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 20 Horse Power Pumps	61007	0.1	3	183020	0.4	Ossege Attachment Q-12	
50	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 25 Horse Power Pumps	76259	0.1	5	381293	0.7	Ossege Attachment Q-12	
51	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 30 Horse Power Pumps	91511	0.2	7	640574	1.2	Ossege Attachment Q-12	
52	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 40 Horse Power - Process Pumping	46408	9.6	2	92816	19.5	Ossege Attachment Q-20	
53	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 40 Horse Power Pumps	122015	0.2	3	366044	0.7	Ossege Attachment Q-12	
54	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 5 Horse Power Pumps	15252	0.0	3	45756	0.1	Ossege Attachment Q-12	
55	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 50 Horse Power Pumps	152517	0.3	4	610069	1.2	Ossege Attachment Q-12	
56	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 7.5 Horse Power Pumps	22877	0.0	82	1875887	3.6	Ossege Attachment Q-12	
57	Smart Saver® for Nonresidential Customers	BONUS Water Cooled Chiller Tune Up	64459	23.3	10	644592	232.6	Ossege Attachment Q-13	
58	Smart Saver® for Nonresidential Customers	Compact Fluorescent Fixture	605	0.1	2184	1322299	173.6	Ossege Attachment Q-9	
59	Smart Saver® for Nonresidential Customers	Compact Fluorescent Screw in	194	0.0	12824	2488887	509.8	Ossege Attachment Q-9	
60	Smart Saver® for Nonresidential Customers	Energy Star Window AC over 14,000 Btu hr	199	0.1	22	4372	1.6	Ossege Attachment Q-11	
61	Smart Saver® for Nonresidential Customers	Fryer	1053	0.2	1	1053	0.2	Ossege Attachment Q-20	
62	Smart Saver® for Nonresidential Customers	High Bay 2L T-5 High Output	1257	0.1	36	45263	5.3	Ossege Attachment Q-9	
63	Smart Saver® for Nonresidential Customers	High Bay 3L T-5 High Output	481	0.1	70	33702	8.4	Ossege Attachment Q-15	
64	Smart Saver® for Nonresidential Customers	High Bay 4L T-5 High Output	1060	0.2	1730	1834565	321.5	Ossege Attachment Q-9	

65	Smart Saver® for Nonresidential Customers	High Bay 6L T-5 High Output	331	0.1	1321	437846	102.2	Ossege Attachment Q-9	
66	Smart Saver® for Nonresidential Customers	High Bay 8L T-5 High Output	2807	0.5	591	1659144	323.7	Ossege Attachment Q-12	
67	Smart Saver® for Nonresidential Customers	High Bay Fluorescent 4 Lamp (F32 Watt T8)	883	0.1	820	724275	108.4	Ossege Attachment Q-9	
68	Smart Saver® for Nonresidential Customers	High Bay Fluorescent 6 Lamp (F32 Watt T8)	1296	0.2	2965	3841667	630.7	Ossege Attachment Q-9	
69	Smart Saver® for Nonresidential Customers	High Bay Fluorescent 8 Lamp (F32 Watt T8)	1144	0.1	369	422256	50.7	Ossege Attachment Q-9	
70	Smart Saver® for Nonresidential Customers	High Performance Low Watt T8 4ft 1 lamp, replacing standard T8	31	0.0	319	9847	2.7	Ossege Attachment Q-20	
71	Smart Saver® for Nonresidential Customers	High Performance Low Watt T8 4ft 2 lamp, replacing standard T8	51	0.0	2368	121889	33.4	Ossege Attachment Q-20	
72	Smart Saver® for Nonresidential Customers	High Performance Low Watt T8 4ft 3 lamp, replacing standard T8	67	0.0	3850	257596	70.5	Ossege Attachment Q-20	
73	Smart Saver® for Nonresidential Customers	High Performance Low Watt T8 4ft 4 lamp, replacing standard T8	99	0.0	1884	186682	51.2	Ossege Attachment Q-20	
74	Smart Saver® for Nonresidential Customers	High Performance T-8 4ft 2 lamp replacing T-12 High Output 8ft 1 lamp	187	0.1	298	55607	15.2	Ossege Attachment Q-20	
75	Smart Saver® for Nonresidential Customers	High Performance T8 4ft 2 lamp, replacing standard T8	33	0.0	58	1939	0.5	Ossege Attachment Q-20	
76	Smart Saver® for Nonresidential Customers	High Performance T8 4ft 2 lamp, replacing T12-HPT8	87	0.0	1	87	0.0	Ossege Attachment Q-20	
77	Smart Saver® for Nonresidential Customers	High Performance T8 4ft 3 lamp, replacing standard T8	37	0.0	15	559	0.1	Ossege Attachment Q-20	
78	Smart Saver® for Nonresidential Customers	High Performance T-8 4ft 4 lamp replacing T-12 8ft 2 lamp	53	0.0	67	3537	1.0	Ossege Attachment Q-20	
79	Smart Saver® for Nonresidential Customers	High Performance T-8 4ft 4 lamp replacing T-12 High Output 8ft 2 lamp	314	0.1	125	39242	10.7	Ossege Attachment Q-20	
80	Smart Saver® for Nonresidential Customers	High Performance T8 4ft 4 lamp, replacing standard T8	55	0.0	40	2213	0.6	Ossege Attachment Q-20	
81	Smart Saver® for Nonresidential Customers	High Performance T8 4ft 4 lamp, replacing T12-HPT8	181	0.0	50	9071	2.5	Ossege Attachment Q-20	
82	Smart Saver® for Nonresidential Customers	Holding Cabinet Full Size Insulated	5659	1.0	3	16976	3.1	Ossege Attachment Q-20	
83	Smart Saver® for Nonresidential Customers	Holding Cabinet Half Size Insulated	1917	0.3	3	5750	1.0	Ossege Attachment Q-20	
84	Residential Energy Assessments	Home Energy House Call	856	0.1	4214	3606395	536.8	Ossege Attachment Q-5	Ossege Attachment Q-7
85	Smart Saver® for Nonresidential Customers	HP less than 65,000 1 Ph	614	0.1	46	28250	6.0	Ossege Attachment Q-12	
86	Smart Saver® for Nonresidential Customers	HP less than 65,000 3 Ph	349	0.1	53	18496	4.0	Ossege Attachment Q-12	
87	Smart Saver® for Nonresidential Customers	Icemaker (500 to 1000 lbs_day)	2890	0.3	3	8669	1.0	Ossege Attachment Q-15	
88	Smart Saver® for Nonresidential Customers	Icemaker (Greater Than 1000 lbs_day)	6484	0.7	4	25938	3.0	Ossege Attachment Q-15	
89	Energy Efficiency Education Program for Schools	K-12 Education Program- CFL Distribution (2009)	433	0.0	898	388785	39.9	Ossege Attachment Q-7	
90	Energy Efficiency Education Program for Schools	K-12 Education Program- Curriculum	243	0.0	1781	432957	76.8	Ossege Attachment Q-4	Ossege Attachment Q-23
91	Smart Saver® for Nonresidential Customers	LED Exit Signs Electronic Fixtures (Retrofit Only)	159	0.0	659	105009	21.9	Ossege Attachment Q-9	
92	Smart Saver® for Nonresidential Customers	Light Tube	387	0.1	3	1162	0.3	Ossege Attachment Q-10	
93	Low Income Services	Low Income Weatherization- Refrigerator Replacement	1264	0.2	57	72021	9.9	Ossege Attachment Q-8	
94	Smart Saver® for Nonresidential Customers	Low Watt T8 lamps replacing standard 32 Watt T-8's	17	0.0	6761	113216	31.2	Ossege Attachment Q-15	
95	Smart Saver® for Nonresidential Customers	Night covers for displays	26	0.0	166	4291	0.7	Ossege Attachment Q-12	
96	Smart Saver® for Nonresidential Customers	Occupancy Sensors over 500 Watts	1063	0.3	435	462348	126.2	Ossege Attachment Q-9	
97	Smart Saver® for Nonresidential Customers	Occupancy Sensors under 500 Watts	425	0.1	714	303702	84.4	Ossege Attachment Q-9	
98	Residential Energy Assessments	Online Audit	433	0.0	1910	826927	84.9	Ossege Attachment Q-7	
99	Residential Energy Assessments	Personalized Energy Report	433	0.0	5009	2168626	222.6	Ossege Attachment Q-7	
100	Smart Saver® for Nonresidential Customers	Plug Load Occupancy Sensors Document Stations	861	0.1	8	6886	0.8	Ossege Attachment Q-15	
101	Smart Saver® for Nonresidential Customers	Pulse Start Metal Halide (retrofit only)	460	0.1	29	13352	3.6	Ossege Attachment Q-15	
102	Smart Saver® for Nonresidential Customers	SAW Central Lighting Controls	12331	3.4	4	49325	13.5	Ossege Attachment Q-9	
103	Smart Saver® for Nonresidential Customers	SAW Chilled Air EE Cooled Chillers	37175	13.4	5	185876	67.1	Impacts provided by Morgan Marketing Partners.	
104	Smart Saver® for Nonresidential Customers	SAW Chilled Water EE Cooled Chillers 150 - 300 tor	49022	17.7	1	49022	17.7	Impacts provided by Morgan Marketing Partners.	
105	Smart Saver® for Nonresidential Customers	SAW Chilled Water EE Cooled Chillers greater than 300 tor	177617	64.1	2	355234	128.2	Impacts provided by Morgan Marketing Partners.	
106	Smart Saver® for Nonresidential Customers	SAW Custom	274842	34.2	1	274842	34.2	N/A	
107	Smart Saver® for Nonresidential Customers	SAW Custom	1379930	195.9	1	1379930	195.9	N/A	
108	Smart Saver® for Nonresidential Customers	SAW Custom	657	0.1	5932	3895696	446.2	N/A	
109	Smart Saver® for Nonresidential Customers	SAW Custom	15973	10.6	1	15973	10.6	N/A	
110	Smart Saver® for Nonresidential Customers	SAW Custom	11771	24.7	1	11771	24.7	N/A	
111	Smart Saver® for Nonresidential Customers	SAW Custom	17860	11.9	1	17860	11.9	N/A	
112	Smart Saver® for Nonresidential Customers	SAW Custom	14868	9.9	1	14868	9.9	N/A	
113	Smart Saver® for Nonresidential Customers	SAW Custom	19796	56.1	1	19796	56.1	N/A	
114	Smart Saver® for Nonresidential Customers	SAW Custom	21797	64.6	1	21797	64.6	N/A	
115	Smart Saver® for Nonresidential Customers	SAW Custom	15158	11.6	1	15158	11.6	N/A	
116	Smart Saver® for Nonresidential Customers	SAW Custom	18628	46.2	1	18628	46.2	N/A	
117	Smart Saver® for Nonresidential Customers	SAW Custom	174935	46.6	1	174935	46.6	N/A	
118	Smart Saver® for Nonresidential Customers	SAW Custom	205345	23.5	1	205345	23.5	N/A	
119	Smart Saver® for Nonresidential Customers	SAW Custom	6473	0.9	1	6473	0.9	N/A	
120	Smart Saver® for Nonresidential Customers	SAW Custom	41011	3.6	82	3362881	297.8	N/A	
121	Smart Saver® for Nonresidential Customers	SAW Custom	16039	1.8	56	898159	102.4	N/A	
122	Smart Saver® for Nonresidential Customers	SAW Custom	33196	0.0	2	66391	0.0	N/A	
123	Smart Saver® for Nonresidential Customers	SAW Occupancy Sensors over 500 Watts	1065	0.3	146	155553	42.6	Ossege Attachment Q-9	
124	Smart Saver® for Nonresidential Customers	SAW Occupancy Sensors under 500 Watts	426	0.1	2968	1263664	345.5	Ossege Attachment Q-9	
125	Residential Energy Assessments	SAW Online Audit w_EE kit	158	0.0	131	20640	3.7	Ossege Attachment Q-6	
126	Smart Saver® for Nonresidential Customers	SAW Switching Controls Multilevel Lighting	9669	1.6	1	9669	1.6	Ossege Attachment Q-3	
127	Smart Saver® for Nonresidential Customers	Setback Programmable Thermostat	1224	0.2	537	657100	110.5	Ossege Attachment Q-9	
128	Smart Saver® for Residential Customers	Smart Saver - Central Air Conditioner	1063	0.2	1845	1960317	398.3	Ossege Attachment Q-26	
129	Smart Saver® for Residential Customers	Smart Saver - Heat Pump	2598	0.4	2228	5787688	930.0	Ossege Attachment Q-26	
130	Smart Saver® for Residential Customers	Smart Saver - Residential Compact Fluorescent Light Promo	72	0.0	156851	11318000	1161.5	Ossege Attachment Q-7	
131	Smart Saver® for Nonresidential Customers	Solid Door Reach-in Freezer (21 to 48 cu ft) Avg 3C	544	0.1	2	1088	0.1	Ossege Attachment Q-15	

Row	Program Name	Measure Name	kWh	Coincident kW	Participation	Total kWh	Total kW	Ossege Attachment / Subattachment	Additional Ossege Attachment / Subattachment
132	Smart Saver® for Nonresidential Customers	Solid Door Reach-in Refrig (Greater Than 48cu ft) Avg 63	1459	0.2	1	1459	0.2	Ossege Attachment Q-15	
133	Smart Saver® for Nonresidential Customers	Solid Door Reach-in Refrig (Less Than 20 cu ft) Avg 12	970	0.1	1	970	0.1	Ossege Attachment Q-15	
134	Smart Saver® for Nonresidential Customers	Steamer	13938	2.7	1	13938	2.7	Ossege Attachment Q-12	
135	Smart Saver® for Nonresidential Customers	T-5 1 Lamp with Electronic Ballast (replacing T-12 fixture)	51	0.0	9	463	0.1	Ossege Attachment Q-25	
136	Smart Saver® for Nonresidential Customers	T-5 2 Lamp with Electronic Ballast (replacing T-12 fixture)	48	0.0	138	6571	1.8	Ossege Attachment Q-15	
137	Smart Saver® for Nonresidential Customers	T-5 4 Lamp with Electronic Ballast (replacing T-12 fixture)	64	0.0	106	6804	2.3	Ossege Attachment Q-9	
138	Smart Saver® for Nonresidential Customers	T-5 High Output 4 Lamp with Electronic Ballast (replacing T-12 fixture)	197	0.0	30	5901	0.5	Ossege Attachment Q-9	
139	Smart Saver® for Nonresidential Customers	T-8 2ft 2 lamp	46	0.0	258	11940	2.2	Ossege Attachment Q-9	
140	Smart Saver® for Nonresidential Customers	T-8 2ft 3 lamp	86	0.0	13	1120	0.2	Ossege Attachment Q-25	
141	Smart Saver® for Nonresidential Customers	T-8 2ft 4 lamp	95	0.0	12	1142	0.2	Ossege Attachment Q-25	
142	Smart Saver® for Nonresidential Customers	T-8 3ft 1 lamp	48	0.0	18	856	0.2	Ossege Attachment Q-25	
143	Smart Saver® for Nonresidential Customers	T-8 3ft 2 lamp	44	0.0	23	1006	0.2	Ossege Attachment Q-25	
144	Smart Saver® for Nonresidential Customers	T-8 4ft 1 lamp	60	0.0	437	26411	5.2	Ossege Attachment Q-25	
145	Smart Saver® for Nonresidential Customers	T-8 4ft 2 lamp	81	0.0	5760	466216	86.6	Ossege Attachment Q-9	
146	Smart Saver® for Nonresidential Customers	T-8 4ft 3 lamp	94	0.0	3898	365518	104.7	Ossege Attachment Q-9	
147	Smart Saver® for Nonresidential Customers	T-8 4ft 4 lamp	215	0.0	6954	1492710	231.6	Ossege Attachment Q-9	
148	Smart Saver® for Nonresidential Customers	T-8 8ft 2 lamp	125	0.0	856	106734	14.7	Ossege Attachment Q-9	
149	Smart Saver® for Nonresidential Customers	T-8 High Output 8 ft 2 Lamp	216	0.0	59	12746	2.5	Ossege Attachment Q-25	
150	Smart Saver® for Nonresidential Customers	Thermal Storage	0	155.8	1	0	155.8	Ossege Attachment Q-12	
151	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 10 Horse Power - Process Pumping	11485	2.4	11	126330	26.6	Ossege Attachment Q-20	
152	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 10 Horse Power Pumps	30503	0.1	1	30503	0.1	Ossege Attachment Q-12	
153	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 15 Horse Power - Process Pumping	17403	3.7	24	417670	87.9	Ossege Attachment Q-20	
154	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 15 Horse Power Pumps	45756	0.1	1	45756	0.1	Ossege Attachment Q-12	
155	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 2 Horse Power Pumps	6100	0.0	4	24401	0.0	Ossege Attachment Q-12	
156	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 20 Horse Power - Process Pumping	23204	4.9	12	278447	58.6	Ossege Attachment Q-20	
157	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 20 Horse Power Pumps	61007	0.1	4	244026	0.5	Ossege Attachment Q-12	
158	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 25 Horse Power - Process Pumping	29005	6.1	5	145024	30.5	Ossege Attachment Q-20	
159	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 25 Horse Power Pumps	76259	0.1	1	76259	0.1	Ossege Attachment Q-12	
160	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 3 Horse Power Pumps	9152	0.0	3	27455	0.1	Ossege Attachment Q-12	
161	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 30 Horse Power - Process Pumping	34806	7.3	2	69612	14.7	Ossege Attachment Q-20	
162	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 30 Horse Power Pumps	91511	0.2	1	91511	0.2	Ossege Attachment Q-12	
163	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 40 Horse Power - Process Pumping	46408	9.8	7	324854	68.4	Ossege Attachment Q-20	
164	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 5 Horse Power - Process Pumping	5742	1.2	1	5742	1.2	Ossege Attachment Q-20	
165	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 50 Horse Power Pumps	152517	0.3	1	152517	0.3	Ossege Attachment Q-12	
166	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 7.5 Horse Power - Process Pumping	8701	1.8	5	43504	9.2	Ossege Attachment Q-20	
167	Smart Saver® for Nonresidential Customers	Water-Cooled cent Chiller 150 - 300 ton 0.63 kW_ton with 0.45 kW_ton IPLV	32656	11.8	3	97967	35.4	Ossege Attachment Q-2	
168	Smart Saver® for Nonresidential Customers	Water-Cooled cent Chiller greater than 300 ton 0.58 kW_ton with 0.41 kW_ton IPLV	134161	48.4	3	402482	145.2	Ossege Attachment Q-2	
169	Smart Saver® for Nonresidential Customers	Window Film	13	0.0	58531	748611	125.9	Ossege Attachment Q-10	
170	Total					85,663,509	13,702.4		

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Row	Program Name	Measure Name	kWh	Coincident kW	Participation	Total kWh	Total kW	Ossege Attachment / Subattachment	Additional Ossege Attachment / Subattachment
1	Smart Saver® for Nonresidential Customers	125-250 Horse Power Motors - Incentives per participant	2604	0.7	1	2604	0.7	Ossege Attachment Q-15	
2	Smart Saver® for Nonresidential Customers	15 Horse Power High Efficiency Pumps	3788	1.0	3	11365	3.1	Ossege Attachment Q-15	
3	Smart Saver® for Nonresidential Customers	1-5 Horse Power Motors - Incentives per participant	121	0.0	14	1693	0.5	Ossege Attachment Q-15	
4	Smart Saver® for Nonresidential Customers	2 High Bay 6L T-5 High Output replacing 1000W HID	1562	0.4	59	92130	23.0	Ossege Attachment Q-15	
5	Smart Saver® for Nonresidential Customers	25-100 Horse Power Motors - Incentives per participant	1132	0.3	22	24912	6.8	Ossege Attachment Q-15	
6	Smart Saver® for Nonresidential Customers	3 Horse Power High Efficiency Pumps	758	0.2	4	3032	0.8	Ossege Attachment Q-15	
7	Smart Saver® for Nonresidential Customers	715-20 Horse Power Motors - Incentives per participant	437	0.1	12	5250	1.4	Ossege Attachment Q-15	
8	Smart Saver® for Nonresidential Customers	AC 135,000 - 240,000	2543	0.9	53	134803	48.6	Ossege Attachment Q-12	Ossege Attachment Q-16
9	Smart Saver® for Nonresidential Customers	AC 240,000 - 760,000	1667	0.6	14	23343	8.4	Ossege Attachment Q-12	Ossege Attachment Q-16
10	Smart Saver® for Nonresidential Customers	AC 65,000 - 135,000	718	0.3	64	45937	16.6	Ossege Attachment Q-12	Ossege Attachment Q-16
11	Smart Saver® for Nonresidential Customers	AC greater than 760,000	6399	2.3	7	44790	16.2	Ossege Attachment Q-12	Ossege Attachment Q-16
12	Smart Saver® for Nonresidential Customers	AC less than 65,000 1 Ph	348	0.1	53	18468	6.7	Ossege Attachment Q-12	Ossege Attachment Q-16
13	Smart Saver® for Nonresidential Customers	AC less than 65,000 3 Ph	261	0.1	12	3131	1.1	Ossege Attachment Q-12	Ossege Attachment Q-16
14	Low Income Services	Agency Assistance Portal	866	0.1	3690	3195141	327.9	Ossege Attachment Q-7	
15	Smart Saver® for Nonresidential Customers	Air Cooled Chiller Tune Up	25784	9.3	12	309404	111.6	Ossege Attachment Q-13	
16	Smart Saver® for Nonresidential Customers	Air-Cooled Screw Chiller COP = 2.86, IPLV = 4.33	82933	29.9	1	82933	29.9	Ossege Attachment Q-13	
17	Smart Saver® for Nonresidential Customers	Air-Cooled Screw Chiller COP = 3108, IPLV = 318C	55624	20.1	1	55624	20.1	Ossege Attachment Q-2	Ossege Attachment Q-16
18	Smart Saver® for Nonresidential Customers	Air-Cooled Screw Chiller COP = 3108, IPLV = 410C	65795	23.7	9	592151	213.7	Ossege Attachment Q-2	Ossege Attachment Q-16
19	Smart Saver® for Nonresidential Customers	Anti-sweat Heater Controls	1766	0.3	128	226097	38.0	Ossege Attachment Q-12	Ossege Attachment Q-16
20	Smart Saver® for Nonresidential Customers	Barrel Wraps (Inj Mold & Extruders)	54	0.0	18	972	0.2	Ossege Attachment Q-15	
21	Smart Saver® for Nonresidential Customers	BONUS 2 High Bay 6L T-5 High Output replacing 1000W HID	1562	0.4	77	120237	30.0	Ossege Attachment Q-15	
22	Smart Saver® for Nonresidential Customers	BONUS 2 High Bay Fluorescent 8LF32T8 - Replacing 1000W HID	2151	0.5	143	307611	76.8	Ossege Attachment Q-15	

Row	Program Name	Measure Name	kWh	Coincident kW	Participation	Total kwh	Total kw	Ossege Attachment / Subattachment	Additional Ossege Attachment / Subattachment
23	Smart Saver® for Nonresidential Customers	BONUS 42W 8 Lamp High Bay Compact Fluorescent	371	0.1	46	17055	4.3	Ossege Attachment Q-15	
24	Smart Saver® for Nonresidential Customers	BONUS Air Cooled Chiller Tun Up	25784	9.3	22	567241	204.7	Ossege Attachment Q-13	
25	Smart Saver® for Nonresidential Customers	BONUS High Bay 2L T-5 High Output	1257	0.1	162	203683	24.0	Ossege Attachment Q-9	
26	Smart Saver® for Nonresidential Customers	BONUS High Bay 3L T-5 High Output	481	0.1	190	91476	22.8	Ossege Attachment Q-15	
27	Smart Saver® for Nonresidential Customers	BONUS High Bay 4L T-5 High Output	1060	0.2	2845	3016959	528.8	Ossege Attachment Q-9	
28	Smart Saver® for Nonresidential Customers	BONUS High Bay 6L T-5 High Output	331	0.1	2073	687096	160.3	Ossege Attachment Q-9	
29	Smart Saver® for Nonresidential Customers	BONUS High Bay 8L T-5 High Output	2807	0.5	738	2071825	404.2	Ossege Attachment Q-12	
30	Smart Saver® for Nonresidential Customers	BONUS High Bay Fluorescent 3 Lamp (F32 Watt T8)	366	0.1	165	60323	15.1	Ossege Attachment Q-20	
31	Smart Saver® for Nonresidential Customers	BONUS High Bay Fluorescent 4 Lamp (F32 Watt T8)	883	0.1	1063	938908	140.5	Ossege Attachment Q-9	
32	Smart Saver® for Nonresidential Customers	BONUS High Bay Fluorescent 6 Lamp (F32 Watt T8)	1296	0.2	13117	16995327	2790.2	Ossege Attachment Q-9	
33	Smart Saver® for Nonresidential Customers	BONUS High Bay Fluorescent 8 Lamp (F32 Watt T8)	1144	0.1	426	487482	58.6	Ossege Attachment Q-9	
34	Smart Saver® for Nonresidential Customers	BONUS High Performance Low Watt T8 4ft 1 lamp, replacing standard T8	31	0.0	94	2902	0.8	Ossege Attachment Q-20	
35	Smart Saver® for Nonresidential Customers	BONUS High Performance Low Watt T8 4ft 2 lamp, replacing standard T8	51	0.0	5536	284957	78.1	Ossege Attachment Q-20	
36	Smart Saver® for Nonresidential Customers	BONUS High Performance Low Watt T8 4ft 3 lamp, replacing standard T8	67	0.0	1068	71458	19.6	Ossege Attachment Q-20	
37	Smart Saver® for Nonresidential Customers	BONUS High Performance Low Watt T8 4ft 4 lamp, replacing standard T8	99	0.0	1310	129805	35.6	Ossege Attachment Q-20	
38	Smart Saver® for Nonresidential Customers	BONUS High Performance T8 4ft 1 lamp, replacing standard T8	21	0.0	276	5687	1.6	Ossege Attachment Q-20	
39	Smart Saver® for Nonresidential Customers	BONUS High Performance T8 4ft 1 lamp, replacing T12-HPT8	68	0.0	181	12344	3.4	Ossege Attachment Q-20	
40	Smart Saver® for Nonresidential Customers	BONUS High Performance T-8 4ft 2 lamp replacing T-12 8ft 1 lamp	72	0.0	56	4036	1.1	Ossege Attachment Q-20	
41	Smart Saver® for Nonresidential Customers	BONUS High Performance T-8 4ft 2 lamp replacing T-12 High Output 8ft 1 lamp	187	0.1	1349	251724	69.0	Ossege Attachment Q-20	
42	Smart Saver® for Nonresidential Customers	BONUS High Performance T8 4ft 2 lamp, replacing standard T8	33	0.0	412	13775	3.4	Ossege Attachment Q-20	
43	Smart Saver® for Nonresidential Customers	BONUS High Performance T8 4ft 2 lamp, replacing T12-HPT8	87	0.0	1478	129311	35.4	Ossege Attachment Q-20	
44	Smart Saver® for Nonresidential Customers	BONUS High Performance T8 4ft 3 lamp, replacing standard T8	37	0.0	83	3095	0.8	Ossege Attachment Q-20	
45	Smart Saver® for Nonresidential Customers	BONUS High Performance T8 4ft 3 lamp, replacing T12-HPT8	156	0.0	611	95131	26.1	Ossege Attachment Q-20	
46	Smart Saver® for Nonresidential Customers	BONUS High Performance T-8 4ft 4 lamp replacing T-12 8ft 2 lamp	53	0.0	319	16838	4.6	Ossege Attachment Q-20	
47	Smart Saver® for Nonresidential Customers	BONUS High Performance T-8 4ft 4 lamp replacing T-12 High Output 8ft 2 lamp	314	0.1	1551	486914	133.3	Ossege Attachment Q-20	
48	Smart Saver® for Nonresidential Customers	BONUS High Performance T8 4ft 4 lamp, replacing standard T8	55	0.0	883	48858	13.4	Ossege Attachment Q-20	
49	Smart Saver® for Nonresidential Customers	BONUS High Performance T8 4ft 4 lamp, replacing T12-HPT8	181	0.0	1827	331460	90.8	Ossege Attachment Q-20	
50	Smart Saver® for Nonresidential Customers	BONUS Low Watt T8 lamps replacing standard 32 Watt T-8's	17	0.0	26719	447423	123.2	Ossege Attachment Q-15	
51	Smart Saver® for Nonresidential Customers	BONUS Occupancy Sensors over 500 Watts	1063	0.3	5274	5605571	1529.8	Ossege Attachment Q-9	
52	Smart Saver® for Nonresidential Customers	BONUS Occupancy Sensors under 500 Watts	425	0.1	10623	4518527	1255.4	Ossege Attachment Q-9	
53	Smart Saver® for Nonresidential Customers	BONUS Pulse Start Metal Halide (retrofit only)	460	0.1	7	3223	0.9	Ossege Attachment Q-15	
54	Smart Saver® for Nonresidential Customers	BONUS Refrigeration System Tune Up	8745	1.5	91	795792	133.8	Impacts provided by Morgan Marketing Partners from Industry data (Wisconsin Focus on Energy).	
55	Smart Saver® for Nonresidential Customers	BONUS T-5 2 Lamp with Electronic Ballast (replacing T-12 fixture	48	0.0	123	5857	1.6	Ossege Attachment Q-15	
56	Smart Saver® for Nonresidential Customers	BONUS T-5 3 Lamp with Electronic Ballast (replacing T-12 fixture	107	0.0	11	1175	0.3	Ossege Attachment Q-11	Ossege Attachment Q-15
57	Smart Saver® for Nonresidential Customers	BONUS T-5 4 Lamp with Electronic Ballast (replacing T-12 fixture	64	0.0	71	4557	1.5	Ossege Attachment Q-9	
58	Smart Saver® for Nonresidential Customers	BONUS T-5 High Output 2 Lamp with Electronic Ballast (replacing T-12 fixture	177	0.0	50	8872	0.9	Ossege Attachment Q-9	
59	Smart Saver® for Nonresidential Customers	BONUS T-5 High Output 4 Lamp with Electronic Ballast (replacing T-12 fixture	197	0.0	59	11606	1.1	Ossege Attachment Q-9	
60	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 10 Horse Power Pumps	30503	0.1	29	884577	1.7	Ossege Attachment Q-12	Ossege Attachment Q-16
61	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 15 Horse Power Pumps	45756	0.1	49	2242041	4.3	Ossege Attachment Q-12	Ossege Attachment Q-16
62	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 2 Horse Power Pumps	6100	0.0	4	24401	0.0	Ossege Attachment Q-12	Ossege Attachment Q-16
63	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 20 Horse Power Pumps	61007	0.1	11	671073	1.3	Ossege Attachment Q-12	Ossege Attachment Q-16
64	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 25 Horse Power Pumps	76259	0.1	13	991362	1.9	Ossege Attachment Q-12	Ossege Attachment Q-16
65	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 3 Horse Power Pumps	9152	0.0	3	27455	0.1	Ossege Attachment Q-12	Ossege Attachment Q-16
66	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 30 Horse Power - Process Pumping	34806	7.3	3	104417	22.0	Ossege Attachment Q-20	
67	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 30 Horse Power Pumps	91511	0.2	17	1555680	3.0	Ossege Attachment Q-12	Ossege Attachment Q-16
68	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 40 Horse Power Pumps	122015	0.2	8	976116	1.9	Ossege Attachment Q-12	Ossege Attachment Q-16
69	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 5 Horse Power Pumps	15252	0.0	7	106764	0.2	Ossege Attachment Q-12	Ossege Attachment Q-16
70	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 50 Horse Power - Process Pumping	58010	12.2	1	58010	12.2	Ossege Attachment Q-20	
71	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 50 Horse Power Pumps	152517	0.3	11	1677689	3.2	Ossege Attachment Q-12	Ossege Attachment Q-16
72	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 715 Horse Power Pumps	22877	0.0	47	1075204	2.1	Ossege Attachment Q-12	Ossege Attachment Q-16
73	Smart Saver® for Nonresidential Customers	BONUS Water Cooled Chiller Tune Up	64459	23.3	3	193378	69.8	Ossege Attachment Q-13	
74	Smart Saver® for Nonresidential Customers	CFL12PKMIXBC_22	2329	0.6	4150	9666124	2356.6	Ossege Attachment Q-9	
75	Smart Saver® for Nonresidential Customers	Combination Oven (90 lbs_hr)	19762	4.5	1	19762	4.5	Ossege Attachment Q-20	
76	Smart Saver® for Nonresidential Customers	Compact Fluorescent Fixture	605	0.1	996	603027	79.2	Ossege Attachment Q-9	
77	Smart Saver® for Nonresidential Customers	Compact Fluorescent Screw In	194	0.0	16539	3209896	657.4	Ossege Attachment Q-9	
78	Smart Saver® for Nonresidential Customers	Convection Oven	2426	0.6	1	2426	0.6	Ossege Attachment Q-20	
79	Smart Saver® for Nonresidential Customers	ENERGY STAR Commercial Solid Door Refrigerators less than 15ft3 - va	289	0.0	2	579	0.1	Ossege Attachment Q-19	
80	Smart Saver® for Nonresidential Customers	ENERGY STAR Commercial Solid Door Refrigerators 15 to 30 ft3 - va	504	0.1	2	1009	0.1	Ossege Attachment Q-19	
81	Smart Saver® for Nonresidential Customers	Fryer	1053	0.2	1	1053	0.2	Ossege Attachment Q-20	
82	Smart Saver® for Nonresidential Customers	High Bay 3L T-5 High Output	481	0.1	209	100623	25.1	Ossege Attachment Q-15	
83	Smart Saver® for Nonresidential Customers	High Bay 4L T-5 High Output	1060	0.2	206	218451	38.3	Ossege Attachment Q-9	
84	Smart Saver® for Nonresidential Customers	High Bay 6L T-5 High Output	331	0.1	682	226049	52.8	Ossege Attachment Q-9	
85	Smart Saver® for Nonresidential Customers	High Bay Fluorescent 3 Lamp (F32 Watt T8)	366	0.1	28	10237	2.6	Ossege Attachment Q-20	
86	Smart Saver® for Nonresidential Customers	High Bay Fluorescent 4 Lamp (F32 Watt T8)	883	0.1	318	280877	42.0	Ossege Attachment Q-9	
87	Smart Saver® for Nonresidential Customers	High Bay Fluorescent 6 Lamp (F32 Watt T8)	1296	0.2	3733	4836743	794.1	Ossege Attachment Q-9	

Row	Program Name	Measure Name	kWh	Coincident kW	Participation	Total kwh	Total kw	Ossege Attachment # Sub-Attachment	Additional Ossege Attachment # / Sub-Attachment
88	Smart Saver® for Nonresidential Customers	High Bay Fluorescent 8 Lamp (F32 Watt T8)	1144	0.1	324	370761	44.6	Ossege Attachment Q-9	
89	Smart Saver® for Nonresidential Customers	High Performance Low Watt T8 4ft 1 lamp, replacing standard T8	31	0.0	244	7532	2.1	Ossege Attachment Q-20	
90	Smart Saver® for Nonresidential Customers	High Performance Low Watt T8 4ft 2 lamp, replacing standard T8	51	0.0	1110	57135	15.7	Ossege Attachment Q-20	
91	Smart Saver® for Nonresidential Customers	High Performance Low Watt T8 4ft 3 lamp, replacing standard T8	67	0.0	267	17864	4.9	Ossege Attachment Q-20	
92	Smart Saver® for Nonresidential Customers	High Performance Low Watt T8 4ft 4 lamp, replacing standard T8	99	0.0	27	2675	0.7	Ossege Attachment Q-20	
93	Smart Saver® for Nonresidential Customers	High Performance T8 4ft 1 lamp, replacing standard T8	21	0.0	113	2328	0.6	Ossege Attachment Q-20	
94	Smart Saver® for Nonresidential Customers	High Performance T8 4ft 1 lamp, replacing T12-HPT8	68	0.0	115	7843	2.1	Ossege Attachment Q-20	
95	Smart Saver® for Nonresidential Customers	High Performance T-8 4ft 2 lamp replacing T-12 8ft 1 lamp	72	0.0	163	11749	3.2	Ossege Attachment Q-20	
96	Smart Saver® for Nonresidential Customers	High Performance T-8 4ft 2 lamp replacing T-12 High Output 8ft 1 lamp	187	0.1	254	47396	13.0	Ossege Attachment Q-20	
97	Smart Saver® for Nonresidential Customers	High Performance T8 4ft 2 lamp, replacing standard T8	33	0.0	1327	44367	11.0	Ossege Attachment Q-20	
98	Smart Saver® for Nonresidential Customers	High Performance T8 4ft 2 lamp, replacing T12-HPT8	87	0.0	630	55119	15.1	Ossege Attachment Q-20	
99	Smart Saver® for Nonresidential Customers	High Performance T8 4ft 3 lamp, replacing T12-HPT8	156	0.0	294	45775	12.5	Ossege Attachment Q-20	
100	Smart Saver® for Nonresidential Customers	High Performance T-8 4ft 4 lamp replacing T-12 8ft 2 lamp	53	0.0	362	19108	5.2	Ossege Attachment Q-20	
101	Smart Saver® for Nonresidential Customers	High Performance T-8 4ft 4 lamp replacing T-12 High Output 8ft 2 lamp	314	0.1	171	53683	14.7	Ossege Attachment Q-20	
102	Smart Saver® for Nonresidential Customers	High Performance T8 4ft 4 lamp, replacing standard T8	55	0.0	72	3984	1.1	Ossege Attachment Q-20	
103	Smart Saver® for Nonresidential Customers	High Performance T8 4ft 4 lamp, replacing T12-HPT8	181	0.0	647	117381	32.1	Ossege Attachment Q-20	
104	Smart Saver® for Nonresidential Customers	Holding Cabinet Full Size Insulated	5659	1.0	2	11317	2.1	Ossege Attachment Q-20	
105	Smart Saver® for Nonresidential Customers	Holding Cabinet Half Size Insulated	1917	0.3	3	5750	1.0	Ossege Attachment Q-20	
106	Home Energy Comparison Report	Home Energy Comparison Report - Pilot	320	0.1	105822	2821209	500.4	Original impacts for pilot based on industry information of 2% savings of average annual customer usage of 13,000 kWh.	
107	Residential Energy Assessments	Home Energy House Call	856	0.1	4212	3604684	536.5	Ossege Attachment Q-5	Ossege Attachment Q-7
108	Smart Saver® for Nonresidential Customers	HP 135,000 - 240,000	3101	0.7	1	3101	0.7	Ossege Attachment Q-12	Ossege Attachment Q-16
109	Smart Saver® for Nonresidential Customers	HP 65,000 - 135,000	1332	0.3	6	7994	1.7	Ossege Attachment Q-12	Ossege Attachment Q-16
110	Smart Saver® for Nonresidential Customers	HP greater than 240,000	4711	1.0	1	4711	1.0	Ossege Attachment Q-12	Ossege Attachment Q-16
111	Smart Saver® for Nonresidential Customers	HP less than 65,000 1 Ph	614	0.1	9	5527	1.2	Ossege Attachment Q-12	Ossege Attachment Q-16
112	Smart Saver® for Nonresidential Customers	Icemaker (100 to 500 lbs_day)	1772	0.2	5	8858	1.0	Ossege Attachment Q-15	
113	Smart Saver® for Nonresidential Customers	Icemaker (500 to 1000 lbs_day)	2890	0.3	1	2890	0.3	Ossege Attachment Q-15	
114	Smart Saver® for Nonresidential Customers	Icemaker (Greater Than 1000 lbs_day)	6484	0.7	7	45391	5.2	Ossege Attachment Q-15	
115	Energy Efficiency Education Program for Schools	K-12 Education Program- CFL Distribution (2010)	433	0.0	243	105206	10.8	Ossege Attachment Q-7	
116	Energy Efficiency Education Program for Schools	K-12 Education Program- Curriculum	243	0.0	3920	952943	169.0	Ossege Attachment Q-4	Ossege Attachment Q-23
117	Smart Saver® for Nonresidential Customers	LED Auto Traffic Signals	294	0.1	2069	608975	188.9	Ossege Attachment Q-9	
118	Smart Saver® for Nonresidential Customers	LED Case lighting	461	0.1	536	246880	28.2	Ossege Attachment Q-17	
119	Smart Saver® for Nonresidential Customers	LED Exit Signs Electronic Fixtures (Retrofit Only)	159	0.0	1487	236948	49.5	Ossege Attachment Q-9	
120	Smart Saver® for Nonresidential Customers	LED Pedestrian Signals	161	0.0	430	69017	20.3	Ossege Attachment Q-9	
121	Low Income Services	Low Income Weatherization- Refrigerator Replacement	1264	0.2	70	88447	12.1	Ossege Attachment Q-8	
122	Smart Saver® for Nonresidential Customers	Low Watt T8 lamps replacing standard 32 Watt T-8's	17	0.0	38136	638606	175.8	Ossege Attachment Q-15	
123	Smart Saver® for Nonresidential Customers	Night covers for displays	26	0.0	1079	27891	4.7	Ossege Attachment Q-12	Ossege Attachment Q-16
124	Smart Saver® for Nonresidential Customers	Occupancy Sensors over 500 Watts	1063	0.3	601	638784	174.3	Ossege Attachment Q-9	
125	Smart Saver® for Nonresidential Customers	Occupancy Sensors under 500 Watts	425	0.1	2355	1001707	278.3	Ossege Attachment Q-9	
126	Residential Energy Assessments	Online Audit	433	0.0	1435	621277	63.8	Ossege Attachment Q-7	
127	Smart Saver® for Nonresidential Customers	Packaged Terminal AC	26	0.0	8	207	0.1	Ossege Attachment Q-12	Ossege Attachment Q-16
128	Residential Energy Assessments	Personalized Energy Report	433	0.0	3970	1718795	176.4	Ossege Attachment Q-7	
129	Smart Saver® for Nonresidential Customers	Plug Load Occupancy Sensors Document Stations	861	0.1	17	14633	1.7	Ossege Attachment Q-15	
130	Smart Saver® for Residential Customers	Property Manager 13WCFL	42	0.0	9106	385767	36.8	Ossege Attachment Q-18	
131	Smart Saver® for Nonresidential Customers	Pulse Start Metal Halide (retrofit only)	460	0.1	10	4604	1.3	Ossege Attachment Q-15	
132	Smart Saver® for Residential Customers	RCFL Opt-In Free CFLs	72	0.0	2627448	189590487	19456.7	Ossege Attachment Q-7	
133	Residential Energy Assessments	Residential Retrofit Pilot	5049	1.0	7	35345	7.2	Ossege Attachment Q-24	Ossege Attachment Q-3
134	Smart Saver® for Nonresidential Customers	SAW Chilled Air EE Cooled Chillers	37175	13.4	3	111525	40.2	Ossege Attachment Q-27	
135	Smart Saver® for Nonresidential Customers	SAW Custom	145947	23.3	1	145947	23.3	N/A	
136	Smart Saver® for Nonresidential Customers	SAW Custom	27924	0.0	4	111694	0.0	N/A	
137	Smart Saver® for Nonresidential Customers	SAW Custom	10851	3.3	1	10851	3.3	N/A	
138	Smart Saver® for Nonresidential Customers	SAW Custom	498218	34.3	1	498218	34.3	N/A	
139	Smart Saver® for Nonresidential Customers	SAW Custom	622524	0.0	1	622524	0.0	N/A	
140	Smart Saver® for Nonresidential Customers	SAW Custom	0	65.5	1	0	65.5	N/A	
141	Smart Saver® for Nonresidential Customers	SAW Custom	177947	55.9	1	177947	55.9	N/A	
142	Smart Saver® for Nonresidential Customers	SAW Custom	114267	35.9	1	114267	35.9	N/A	
143	Smart Saver® for Nonresidential Customers	SAW Custom	732	0.1	24	17570	2.0	N/A	
144	Smart Saver® for Nonresidential Customers	SAW Custom	657	0.1	3870	2541528	291.1	N/A	
145	Smart Saver® for Nonresidential Customers	SAW Custom	4283	1.1	42	179899	44.8	N/A	
146	Smart Saver® for Nonresidential Customers	SAW Custom	159014	19.0	1	159014	19.0	N/A	
147	Smart Saver® for Nonresidential Customers	SAW Custom	238184	27.1	1	238184	27.1	N/A	
148	Smart Saver® for Nonresidential Customers	SAW Custom	120609	27.3	2	241217	54.7	N/A	
149	Smart Saver® for Nonresidential Customers	SAW Custom	383838	61.6	1	383838	61.6	N/A	
150	Smart Saver® for Nonresidential Customers	SAW Custom	461380	60.6	1	461380	60.6	N/A	
151	Smart Saver® for Nonresidential Customers	SAW Custom	18511	4.9	1	18511	4.9	N/A	
152	Smart Saver® for Nonresidential Customers	SAW Custom	20437	5.5	1	20437	5.5	N/A	

Row	Program Name	Measure Name	kWh	Coincident kW	Participating Stores	Total kWh	Total kW	Ossege Attachment / Substantiation	Additional Ossege Attachment / Substantiation
153	Smart Saver® for Nonresidential Customers	SAW Custom	22722	7.6	1	22722	7.6	N/A	
154	Smart Saver® for Nonresidential Customers	SAW Custom	14385	4.1	1	14385	4.1	N/A	
155	Smart Saver® for Nonresidential Customers	SAW Custom	18797	5.0	1	18797	5.0	N/A	
156	Smart Saver® for Nonresidential Customers	SAW Custom	12063	3.5	1	12063	3.5	N/A	
157	Smart Saver® for Nonresidential Customers	SAW Custom	16618	4.4	1	16618	4.4	N/A	
158	Smart Saver® for Nonresidential Customers	SAW Custom	29692	7.9	1	29692	7.9	N/A	
159	Smart Saver® for Nonresidential Customers	SAW Custom	13520	3.6	1	13520	3.6	N/A	
160	Smart Saver® for Nonresidential Customers	SAW Custom	12905	3.4	1	12905	3.4	N/A	
161	Smart Saver® for Nonresidential Customers	SAW Custom	8097	0.9	35	283388	32.4	N/A	
162	Smart Saver® for Nonresidential Customers	SAW Custom	1992	0.2	299	595521	68.1	N/A	
163	Smart Saver® for Nonresidential Customers	SAW Custom	3090	0.4	85	262692	30.0	N/A	
164	Smart Saver® for Nonresidential Customers	SAW Custom	1682	0.2	13	21861	2.5	N/A	
165	Smart Saver® for Nonresidential Customers	SAW Custom	107	0.0	12909	1378548	0.0	N/A	
166	Smart Saver® for Nonresidential Customers	SAW Custom	9445	0.0	1	9445	0.0	N/A	
167	Smart Saver® for Nonresidential Customers	SAW Custom	10076	0.0	1	10076	0.0	N/A	
168	Smart Saver® for Nonresidential Customers	SAW Custom	12309	0.0	1	12309	0.0	N/A	
169	Smart Saver® for Nonresidential Customers	SAW Custom	214889	32.9	1	214889	32.9	N/A	
170	Smart Saver® for Nonresidential Customers	SAW Custom	21475	2.4	1	21475	2.4	N/A	
171	Smart Saver® for Nonresidential Customers	SAW Custom	64416	6.7	1	64416	6.7	N/A	
172	Smart Saver® for Nonresidential Customers	Setback Programmable Thermostat	1224	0.2	296	362201	60.9	Ossege Attachment Q-9	
173	Smart Saver® for Residential Customers	Smart Saver - Central Air Conditioner	1063	0.2	3288	3493508	709.8	Ossege Attachment Q-1	Ossege Attachment Q-26
174	Smart Saver® for Residential Customers	Smart Saver - Heat Pump	2598	0.4	3243	8424360	1353.7	Ossege Attachment Q-1	Ossege Attachment Q-26
175	Smart Saver® for Residential Customers	Smart Saver - Residential Compact Fluorescent Light Promo	72	0.0	22312	1609982	165.2	Ossege Attachment Q-7	
176	Smart Saver® for Nonresidential Customers	Solid Door Reach-in Freezer (21 to 48 cu ft) Avg 3C	544	0.1	3	1633	0.2	Ossege Attachment Q-15	
177	Smart Saver® for Nonresidential Customers	Solid Door Reach-in Freezer (Greater Than 48cu ft) Avg 63	519	0.1	1	519	0.1	Ossege Attachment Q-15	
178	Smart Saver® for Nonresidential Customers	Solid Door Reach-in Refrig (21 to 48 cu ft) Avg 3C	1146	0.1	12	13756	1.6	Ossege Attachment Q-15	
179	Smart Saver® for Nonresidential Customers	Solid Door Reach-in Refrig (Greater Than 48cu ft) Avg 63	1459	0.2	1	1459	0.2	Ossege Attachment Q-15	
180	Smart Saver® for Nonresidential Customers	Solid Door Reach-in Refrig (Less Than 20 cu ft) Avg 12	970	0.1	3	2910	0.3	Ossege Attachment Q-15	
181	Smart Saver® for Nonresidential Customers	Steamer	13938	2.7	2	27877	5.5	Ossege Attachment Q-12	
182	Smart Saver® for Nonresidential Customers	T-5 1 Lamp with Electronic Ballast (replacing T-12 fixture)	51	0.0	84	4323	0.5	Ossege Attachment Q-25	
183	Smart Saver® for Nonresidential Customers	T-5 2 Lamp with Electronic Ballast (replacing T-12 fixture)	48	0.0	6	286	0.1	Ossege Attachment Q-15	
184	Smart Saver® for Nonresidential Customers	T-5 3 Lamp with Electronic Ballast (replacing T-12 fixture)	107	0.0	32	3418	0.9	Ossege Attachment Q-15	
185	Smart Saver® for Nonresidential Customers	T-5 High Output 2 Lamp with Electronic Ballast (replacing T-12 fixture)	177	0.0	8	1420	0.1	Ossege Attachment Q-9	
186	Smart Saver® for Nonresidential Customers	T-5 High Output 4 Lamp with Electronic Ballast (replacing T-12 fixture)	197	0.0	64	12590	1.2	Ossege Attachment Q-9	
187	Smart Saver® for Nonresidential Customers	T-8 2ft 1 lamp	32	0.0	26	836	0.2	Ossege Attachment Q-25	
188	Smart Saver® for Nonresidential Customers	T-8 2ft 2 lamp	46	0.0	736	34061	6.3	Ossege Attachment Q-9	
189	Smart Saver® for Nonresidential Customers	T-8 2ft 3 lamp	86	0.0	35	3015	0.6	Ossege Attachment Q-25	
190	Smart Saver® for Nonresidential Customers	T-8 2ft 4 lamp	95	0.0	105	9992	1.9	Ossege Attachment Q-25	
191	Smart Saver® for Nonresidential Customers	T-8 3ft 1 lamp	48	0.0	46	2189	0.4	Ossege Attachment Q-25	
192	Smart Saver® for Nonresidential Customers	T-8 4ft 1 lamp	60	0.0	345	20851	4.1	Ossege Attachment Q-25	
193	Smart Saver® for Nonresidential Customers	T-8 4ft 2 lamp	81	0.0	6060	490498	91.1	Ossege Attachment Q-9	
194	Smart Saver® for Nonresidential Customers	T-8 4ft 3 lamp	94	0.0	1355	127059	36.4	Ossege Attachment Q-9	
195	Smart Saver® for Nonresidential Customers	T-8 4ft 4 lamp	215	0.0	6954	1492710	231.6	Ossege Attachment Q-9	
196	Smart Saver® for Nonresidential Customers	T-8 8ft 2 lamp	125	0.0	1537	191647	26.4	Ossege Attachment Q-9	
197	Smart Saver® for Nonresidential Customers	T-8 High Output 8 ft 1 Lamp	99	0.0	7	694	0.2	Ossege Attachment Q-15	
198	Smart Saver® for Nonresidential Customers	T-8 High Output 8 ft 2 Lamp	216	0.0	4	864	0.2	Ossege Attachment Q-25	
199	Smart Saver® for Nonresidential Customers	Thermal Storage Irg C&I	0	155.8	2	0	311.6	Ossege Attachment Q-12	
200	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 10 Horse Power Pumps	30503	0.1	5	152513	0.3	Ossege Attachment Q-12	Ossege Attachment Q-16
201	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 15 Horse Power Pumps	45756	0.1	3	137268	0.3	Ossege Attachment Q-12	Ossege Attachment Q-16
202	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 2 Horse Power Pumps	6100	0.0	1	6100	0.0	Ossege Attachment Q-12	Ossege Attachment Q-16
203	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 20 Horse Power Pumps	61007	0.1	24	1464159	2.8	Ossege Attachment Q-12	Ossege Attachment Q-16
204	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 25 Horse Power Pumps	76259	0.1	5	381293	0.7	Ossege Attachment Q-12	Ossege Attachment Q-16
205	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 3 Horse Power Pumps	9152	0.0	1	9152	0.0	Ossege Attachment Q-12	Ossege Attachment Q-16
206	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 30 Horse Power Pumps	91511	0.2	4	366042	0.7	Ossege Attachment Q-12	Ossege Attachment Q-16
207	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 40 Horse Power Pumps	122015	0.2	4	488058	0.9	Ossege Attachment Q-12	Ossege Attachment Q-16
208	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 5 Horse Power Pumps	15252	0.0	1	15252	0.0	Ossege Attachment Q-12	Ossege Attachment Q-16
209	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 50 Horse Power Pumps	152517	0.3	1	152517	0.3	Ossege Attachment Q-12	Ossege Attachment Q-16
210	Smart Saver® for Nonresidential Customers	Variable Frequency Drive 7I5 Horse Power Pumps	22877	0.0	3	68630	0.1	Ossege Attachment Q-12	Ossege Attachment Q-16
211	Smart Saver® for Nonresidential Customers	Vending Equipment Controller	859	0.2	77	66129	18.2	Ossege Attachment Q-10	Ossege Attachment Q-15
212	Smart Saver® for Nonresidential Customers	Water Cooled Chiller Tune Up	64459	23.3	15	966888	348.9	Ossege Attachment Q-13	
213	Smart Saver® for Nonresidential Customers	Water-Cooled cent Chiller 150 - 300 ton 0157 kW_ton with 014 kW_ton IPL\	52242	18.9	1	52242	18.9	Ossege Attachment Q-2	Ossege Attachment Q-16
214	Smart Saver® for Nonresidential Customers	Water-Cooled cent Chiller greater than 300 ton 0152 kW_ton with 0131 kW_ton IPL\	259957	93.8	1	259957	93.8	Ossege Attachment Q-2	Ossege Attachment Q-16
215	Smart Saver® for Nonresidential Customers	Water-Cooled cent Chiller greater than 300 ton 0152 kW_ton with 0137 kW_ton IPL\	211887	76.5	1	211887	76.5	Ossege Attachment Q-2	Ossege Attachment Q-16
216	Smart Saver® for Nonresidential Customers	Water-Cooled cent Chiller greater than 300 ton 0158 kW_ton with 0135 kW_ton IPL\	187591	67.7	2	375182	135.4	Ossege Attachment Q-2	Ossege Attachment Q-16
217	Smart Saver® for Nonresidential Customers	Water-Cooled cent Chiller greater than 300 ton 0158 kW_ton with 0141 kW_ton IPL\	134161	48.4	1	134161	48.4	Ossege Attachment Q-2	Ossege Attachment Q-16
218	Smart Saver® for Nonresidential Customers	Water-Cooled cent Chiller greater than 300 ton 0158 kW_ton with 0147 kW_ton IPL\	81876	29.5	1	81876	29.5	Ossege Attachment Q-2	Ossege Attachment Q-16
219	Smart Saver® for Nonresidential Customers	Water-cooled screw chiller less than 150 ton 0171 kW_ton with 0153 kW_ton IPL\	17333	6.3	1	17333	6.3	Ossege Attachment Q-2	Ossege Attachment Q-16

Row	Program Name	Measure Name	kWh	Coincident kW	Participation	Total kwh	Total kw	Ossege Attachment / Subattachment	Additional Ossege Attachment / Subattachment
220	Smart Saver® for Nonresidential Customers	Window Film	13	0.0	96079	1228849	206.6	Ossege Attachment Q-10	
221	Total					309,907,597	40,207.7		

2011 Program Year

Row	Program Name	Measure Name	kWh	Coincident kW	Participation	Total kwh	Total kw	Ossege Attachment / Subattachment	Additional Ossege Attachment / Subattachment
1	Smart Saver® for Nonresidential Customers	1.5 Horse Power High Efficiency Pumps	378	0.1	2	757	0.2	Ossege Attachment Q-15	
2	Smart Saver® for Nonresidential Customers	10 Horse Power High Efficiency Pumps	2526	0.7	1	2526	0.7	Ossege Attachment Q-15	
3	Smart Saver® for Nonresidential Customers	15 Horse Power High Efficiency Pumps	3788	1.0	1	3788	1.0	Ossege Attachment Q-15	
4	Smart Saver® for Nonresidential Customers	1-5 Horse Power Motors - Incentives per participant	121	0.0	4	484	0.1	Ossege Attachment Q-15	
5	Smart Saver® for Nonresidential Customers	2 High Bay 6L T-5 High Output replacing 1000W HID	1702	0.3	15	25535	5.2	Ossege Attachment Q-19	
6	Smart Saver® for Nonresidential Customers	20 Horse Power High Efficiency Pumps	5051	1.4	1	5051	1.4	Ossege Attachment Q-15	
7	Smart Saver® for Nonresidential Customers	25-100 Horse Power Motors - Incentives per participant	1132	0.3	12	13588	3.7	Ossege Attachment Q-15	
8	Smart Saver® for Nonresidential Customers	5 Horse Power High Efficiency Pumps	1262	0.3	1	1262	0.3	Ossege Attachment Q-15	
9	Smart Saver® for Nonresidential Customers	7.5 Horse Power High Efficiency Pumps	1894	0.5	1	1894	0.5	Ossege Attachment Q-15	
10	Smart Saver® for Nonresidential Customers	7.5-20 Horse Power Motors - Incentives per participant	437	0.1	15	6562	1.8	Ossege Attachment Q-15	
11	Smart Saver® for Nonresidential Customers	AC 135,000 - 240,000 per tor	112	0.0	970	108190	39.0	Ossege Attachment Q-14	
12	Smart Saver® for Nonresidential Customers	AC 240,000 - 760,000 per tor	58	0.0	1003	58667	21.2	Ossege Attachment Q-14	
13	Smart Saver® for Nonresidential Customers	AC 65,000 - 135,000 per ton	63	0.0	773	48640	17.6	Ossege Attachment Q-14	
14	Smart Saver® for Nonresidential Customers	AC greater than 760,000 per ton	86	0.0	90	7769	2.8	Ossege Attachment Q-14	
15	Smart Saver® for Nonresidential Customers	AC less than 65,000 1 Ph per ton	61	0.0	18	1100	0.4	Ossege Attachment Q-14	
16	Smart Saver® for Nonresidential Customers	AC less than 65,000 3 Ph per ton	46	0.0	233	10663	3.8	Ossege Attachment Q-14	
17	Low Income Services	Agency Assistance Portal	682	0.1	1529	1042454	102.7	Ossege Attachment H	
18	Smart Saver® for Nonresidential Customers	Air Cooled Chiller Tune Up per ton	129	0.0	10574	1363183	491.9	Ossege Attachment Q-13	
19	Smart Saver® for Nonresidential Customers	Air-Cooled Screw Chiller COP = 2.86, IPLV = 3.48 per tor	174	0.1	1660	289325	104.4	Ossege Attachment Q-13	
20	Smart Saver® for Nonresidential Customers	Air-Cooled Screw Chiller COP = 2.86, IPLV = 3.97 per tor	229	0.1	577	132130	47.7	Ossege Attachment Q-13	
21	Smart Saver® for Nonresidential Customers	Air-Cooled Screw Chiller COP = 2.86, IPLV = 4.33 per tor	415	0.1	711	294828	106.4	Ossege Attachment Q-13	
22	Smart Saver® for Nonresidential Customers	Air-Cooled Screw Chiller COP = 3.08, IPLV = 4.00 per tor	377	0.1	190	71704	25.9	Ossege Attachment Q-14	
23	Smart Saver® for Nonresidential Customers	Beverage Reach-In Controller	717	0.0	35	25097	1.4	Ossege Attachment Q-19	
24	Smart Saver® for Nonresidential Customers	BONUS 2 High Bay 6L T-5 High Output replacing 1000W HID	1702	0.3	18	30642	6.3	Ossege Attachment Q-19	
25	Smart Saver® for Nonresidential Customers	BONUS 2 High Bay Fluorescent 8LF32T8 - Replacing 1000W HID	2344	0.5	44	103148	21.1	Ossege Attachment Q-19	
26	Smart Saver® for Nonresidential Customers	BONUS High Bay 2L T-5 High Output	413	0.1	141	58183	10.9	Ossege Attachment B	
27	Smart Saver® for Nonresidential Customers	BONUS High Bay 3L T-5 High Output	481	0.1	135	64906	12.2	Ossege Attachment B	
28	Smart Saver® for Nonresidential Customers	BONUS High Bay 4L T-5 High Output	945	0.2	1915	1809380	340.0	Ossege Attachment B	
29	Smart Saver® for Nonresidential Customers	BONUS High Bay 6L T-5 High Output	401	0.1	1537	616439	115.0	Ossege Attachment B	
30	Smart Saver® for Nonresidential Customers	BONUS High Bay 8L T-5 High Output	2808	0.5	94	263907	49.5	Ossege Attachment B	
31	Smart Saver® for Nonresidential Customers	BONUS High Bay T8 4ft Fluorescent 4 Lamp (F32 Watt T8)	659	0.1	1593	1050515	196.8	Ossege Attachment B	
32	Smart Saver® for Nonresidential Customers	BONUS High Bay T8 4ft Fluorescent 6 Lamp (F32 Watt T8)	1030	0.2	9547	9830389	1844.3	Ossege Attachment B	
33	Smart Saver® for Nonresidential Customers	BONUS High Bay T8 4ft Fluorescent 8 Lamp (F32 Watt T8)	695	0.1	300	208637	39.2	Ossege Attachment B	
34	Smart Saver® for Nonresidential Customers	BONUS High Performance Low Watt T8 4ft 1 lamp, replacing standard TE	35	0.0	217	7521	1.5	Ossege Attachment Q-19	
35	Smart Saver® for Nonresidential Customers	BONUS High Performance Low Watt T8 4ft 2 lamp, replacing standard TE	49	0.0	11437	557948	113.5	Ossege Attachment Q-19	
36	Smart Saver® for Nonresidential Customers	BONUS High Performance Low Watt T8 4ft 3 lamp, replacing standard TE	82	0.0	2394	196710	40.4	Ossege Attachment Q-19	
37	Smart Saver® for Nonresidential Customers	BONUS High Performance Low Watt T8 4ft 4 lamp, replacing standard TE	87	0.0	3278	286175	58.6	Ossege Attachment Q-19	
38	Smart Saver® for Nonresidential Customers	BONUS High Performance T8 4ft 1 lamp, replacing standard TE	26	0.0	11	282	0.1	Ossege Attachment Q-19	
39	Smart Saver® for Nonresidential Customers	BONUS High Performance T8 4ft 1 lamp, replacing T12-HPTE	83	0.0	17	1419	0.3	Ossege Attachment Q-19	
40	Smart Saver® for Nonresidential Customers	BONUS High Performance T8 4ft 2 lamp, replacing standard TE	41	0.0	1455	59755	11.6	Ossege Attachment Q-19	
41	Smart Saver® for Nonresidential Customers	BONUS High Performance T8 4ft 2 lamp, replacing T12 High Output 8ft 1 lamp	230	0.0	271	62275	12.6	Ossege Attachment Q-19	
42	Smart Saver® for Nonresidential Customers	BONUS High Performance T8 4ft 2 lamp, replacing T12-HPTE	108	0.0	2714	294125	106.3	Ossege Attachment Q-19	
43	Smart Saver® for Nonresidential Customers	BONUS High Performance T8 4ft 3 lamp, replacing standard TE	46	0.0	120	5544	1.1	Ossege Attachment Q-19	
44	Smart Saver® for Nonresidential Customers	BONUS High Performance T8 4ft 3 lamp, replacing T12-HPTE	191	0.0	1576	301479	61.7	Ossege Attachment Q-19	
45	Smart Saver® for Nonresidential Customers	BONUS High Performance T8 4ft 4 lamp, replacing standard TE	69	0.0	187	12963	2.6	Ossege Attachment Q-19	
46	Smart Saver® for Nonresidential Customers	BONUS High Performance T8 4ft 4 lamp, replacing T12 High Output 8ft 2 lamp	388	0.1	1497	580423	118.9	Ossege Attachment Q-19	
47	Smart Saver® for Nonresidential Customers	BONUS High Performance T8 4ft 4 lamp, replacing T12-HPTE	225	0.0	1815	407770	83.1	Ossege Attachment Q-19	
48	Smart Saver® for Nonresidential Customers	BONUS Low Watt T8 lamps 2-4ft, replacing standard 32 Watt TE	19	0.0	93451	1799739	371.1	Ossege Attachment Q-19	
49	Smart Saver® for Nonresidential Customers	BONUS Occupancy Sensors over 500 Watts	1313	0.3	1975	2593872	529.3	Ossege Attachment Q-19	
50	Smart Saver® for Nonresidential Customers	BONUS Occupancy Sensors under 500 Watts	525	0.1	10093	5300314	1102.1	Ossege Attachment Q-19	
51	Smart Saver® for Nonresidential Customers	BONUS PC Network Energy Management	215	0.0	800	171879	30.9	Impacts provided by Morgan Marketing Partners from industry data (Wisconsin Focus on Energy).	
52	Smart Saver® for Nonresidential Customers	BONUS Pulse Start Metal Halide (retrofit only)	461	0.1	82	37777	10.6	Ossege Attachment Q-19	
53	Smart Saver® for Nonresidential Customers	BONUS Refrigeration System Tune Up	8745	1.5	2	17490	2.9	Impacts provided by Morgan Marketing Partners from Industry data (Wisconsin Focus on Energy).	
54	Smart Saver® for Nonresidential Customers	BONUS T-5 4 ft 4 Lamp with Electronic Ballast (replacing T-12 fixture	117	0.0	16	1869	0.4	Ossege Attachment Q-19	
55	Smart Saver® for Nonresidential Customers	BONUS T-5 High Output 2 Lamp with Electronic Ballast (replacing T-12 fixture	92	0.0	36	3328	0.7	Ossege Attachment Q-19	
56	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 10 Horse Power - Process Pumping	11485	2.4	7	80392	16.9	Ossege Attachment Q-20	
57	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 15 Horse Power - Process Pumping	17403	3.7	5	87015	18.3	Ossege Attachment Q-20	

Row	Program Name	Measure Name	kWh	Coincident Factor	Participation	Total kWh	kW/Unit	Ossege Attachment / SubAttachment	Additional Ossege Attachment / SubAttachment
58	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 15 Horse Power Pumps	45756	0.1	4	183024	0.4	Ossege Attachment Q-12	
59	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 20 Horse Power Pumps	61007	0.1	5	305033	0.6	Ossege Attachment Q-12	
60	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 25 Horse Power Pumps	76259	0.1	4	305034	0.6	Ossege Attachment Q-12	
61	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 3 Horse Power Pumps	9152	0.0	2	18303	0.0	Ossege Attachment Q-12	
62	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 30 Horse Power - Process Pumping	34806	7.3	2	69612	14.7	Ossege Attachment Q-20	
63	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 30 Horse Power Pumps	91511	0.2	13	1189638	2.3	Ossege Attachment Q-12	
64	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 5 Horse Power - Process Pumping	5742	1.2	8	45938	9.7	Ossege Attachment Q-12	
65	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 5 Horse Power Pumps	15252	0.0	1	15252	0.0	Ossege Attachment Q-12	
66	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 50 Horse Power - Process Pumping	58010	12.2	2	116019	24.4	Ossege Attachment Q-20	
67	Smart Saver® for Nonresidential Customers	BONUS Variable Frequency Drive 7.5 Horse Power Pumps	22877	0.0	1	22877	0.0	Ossege Attachment Q-12	
68	Smart Saver® for Nonresidential Customers	CFL Reflector Flood	263	0.1	24	6316	1.3	Ossege Attachment Q-19	
69	Smart Saver® for Nonresidential Customers	CFL Screw high wattage	452	0.1	201	90833	18.5	Ossege Attachment Q-19	
70	Smart Saver® for Nonresidential Customers	CFL12PK_MIXBC_22	2511	0.0	168	421850	0.0	Ossege Attachment Q-9	
71	Smart Saver® for Nonresidential Customers	Compact Fluorescent Fixture	362	0.1	589	213242	43.6	Ossege Attachment Q-19	
72	Smart Saver® for Nonresidential Customers	Compact Fluorescent Screw In	211	0.0	12256	2580436	525.6	Ossege Attachment Q-19	
73	Smart Saver® for Nonresidential Customers	Delamping T12 4ft to T-8	190	0.0	18	3420	0.7	Ossege Attachment Q-19	
74	Smart Saver® for Nonresidential Customers	ENERGY STAR Commercial Solid Door Freezers 15 to 30 ft3 - var	931	0.1	2	1862	0.2	Ossege Attachment Q-19	
75	Smart Saver® for Nonresidential Customers	ENERGY STAR Commercial Solid Door Freezers 30 to 50ft3 - var	1852	0.2	1	1852	0.2	Ossege Attachment Q-19	
76	Smart Saver® for Nonresidential Customers	ENERGY STAR Commercial Solid Door Freezers less than 15ft3 - var	638	0.1	1	638	0.1	Ossege Attachment Q-19	
77	Smart Saver® for Nonresidential Customers	ENERGY STAR Commercial Solid Door Refrigerators 15 to 30 ft3 - var	464	0.0	3	1391	0.1	Ossege Attachment Q-19	
78	Smart Saver® for Nonresidential Customers	ENERGY STAR Commercial Solid Door Refrigerators 30 to 50ft3 - var	846	0.1	2	1692	0.2	Ossege Attachment Q-19	
79	Smart Saver® for Nonresidential Customers	ENERGY STAR Commercial Solid Door Refrigerators less than 15ft3 - var	289	0.0	1	289	0.0	Ossege Attachment Q-19	
80	Smart Saver® for Nonresidential Customers	ENERGY STAR Commercial Solid Door Refrigerators more than 50ft3 - var	1214	0.1	3	3642	0.3	Ossege Attachment Q-19	
81	Smart Saver® for Nonresidential Customers	Energy Star Room AC over 14,000 Btu hr	170	0.1	2	339	0.2	Ossege Attachment Q-19	
82	Smart Saver® for Nonresidential Customers	Exterior HID replacement above 175W to 250W HID retrofit	444	0.0	197	87445	0.0	Ossege Attachment Q-19	
83	Smart Saver® for Nonresidential Customers	Exterior HID replacement above 250W to 400W HID retrofit	760	0.0	141	107216	0.0	Ossege Attachment Q-19	
84	Smart Saver® for Nonresidential Customers	Exterior HID replacement above 400W HID retrofit	1368	0.0	16	21883	0.0	Ossege Attachment Q-19	
85	Smart Saver® for Nonresidential Customers	Exterior HID replacement to 175W HID retrofit	300	0.0	24	7195	0.0	Ossege Attachment Q-19	
86	Smart Saver® for Nonresidential Customers	Fryer	1250	0.2	1	1250	0.2	Ossege Attachment Q-19	
87	Smart Saver® for Nonresidential Customers	Garage HID replacement above 175W to 250W HID retrofit	1011	0.1	70	70791	8.1	Ossege Attachment Q-19	
88	Smart Saver® for Nonresidential Customers	Garage HID replacement above 250W to 400W HID retrofit	1738	0.2	11	19121	2.2	Ossege Attachment Q-19	
89	Smart Saver® for Nonresidential Customers	Garage HID replacement to 175W HID retrofit	686	0.1	224	153614	17.6	Ossege Attachment Q-19	
90	Smart Saver® for Nonresidential Customers	High Bay 4L T-5 High Output	945	0.2	325	307075	57.7	Ossege Attachment B	
91	Smart Saver® for Nonresidential Customers	High Bay 6L T-5 High Output	401	0.1	467	187298	34.9	Ossege Attachment B	
92	Smart Saver® for Nonresidential Customers	High Bay 8L T-5 High Output	2808	0.5	20	56150	10.5	Ossege Attachment B	
93	Smart Saver® for Nonresidential Customers	High Bay T8 4ft Fluorescent 4 Lamp (F32 Watt T8)	659	0.1	237	156291	29.3	Ossege Attachment B	
94	Smart Saver® for Nonresidential Customers	High Bay T8 4ft Fluorescent 6 Lamp (F32 Watt T8)	1030	0.2	1195	1230472	230.9	Ossege Attachment B	
95	Smart Saver® for Nonresidential Customers	High Efficiency Commercial Electric Water Heater 4.5 kW EF 0.93	410	0.1	1	410	0.1	Ossege Attachment Q-19	
96	Smart Saver® for Nonresidential Customers	High Performance Low Watt T8 4ft 1 lamp, replacing standard T8	35	0.0	156	5407	1.1	Ossege Attachment Q-19	
97	Smart Saver® for Nonresidential Customers	High Performance Low Watt T8 4ft 2 lamp, replacing standard T8	49	0.0	3759	183381	37.3	Ossege Attachment Q-19	
98	Smart Saver® for Nonresidential Customers	High Performance Low Watt T8 4ft 3 lamp, replacing standard T8	82	0.0	2019	165897	34.1	Ossege Attachment Q-19	
99	Smart Saver® for Nonresidential Customers	High Performance Low Watt T8 4ft 4 lamp, replacing standard T8	87	0.0	2356	205683	42.1	Ossege Attachment Q-19	
100	Smart Saver® for Nonresidential Customers	High Performance T8 4ft 1 lamp, replacing T12-HPT8	83	0.0	1	83	0.0	Ossege Attachment Q-19	
101	Smart Saver® for Nonresidential Customers	High Performance T8 4ft 2 lamp, replacing standard T8	41	0.0	113	4641	0.9	Ossege Attachment Q-19	
102	Smart Saver® for Nonresidential Customers	High Performance T8 4ft 2 lamp, replacing T12 8ft 1 lamp	89	0.0	337	29851	6.0	Ossege Attachment Q-19	
103	Smart Saver® for Nonresidential Customers	High Performance T8 4ft 2 lamp, replacing T12 High Output 8ft 1 lamp	230	0.0	50	11490	2.3	Ossege Attachment Q-19	
104	Smart Saver® for Nonresidential Customers	High Performance T8 4ft 2 lamp, replacing T12-HPT8	108	0.0	194	21024	7.6	Ossege Attachment Q-19	
105	Smart Saver® for Nonresidential Customers	High Performance T8 4ft 3 lamp, replacing T12-HPT8	191	0.0	249	47632	9.8	Ossege Attachment Q-19	
106	Smart Saver® for Nonresidential Customers	High Performance T8 4ft 4 lamp, replacing standard T8	69	0.0	51	3535	0.7	Ossege Attachment Q-19	
107	Smart Saver® for Nonresidential Customers	High Performance T8 4ft 4 lamp, replacing T12 8ft 2 lamp	64	0.0	267	17137	3.4	Ossege Attachment Q-19	
108	Smart Saver® for Nonresidential Customers	High Performance T8 4ft 4 lamp, replacing T12 High Output 8ft 2 lamp	388	0.1	261	101196	20.7	Ossege Attachment Q-19	
109	Smart Saver® for Nonresidential Customers	Holding Cabinet Full Size Insulated	5630	0.9	4	22522	3.5	Ossege Attachment Q-19	
110	Smart Saver® for Nonresidential Customers	Holding Cabinet Half Size Insulated	1924	0.3	1	1924	0.3	Ossege Attachment Q-19	
111	Home Energy Comparison Report	Home Energy Comparison Report	279	0.0	139208	419126	74.3	Original impacts for pilot based on Industry Information of 2% savings of average annual customer usage of 13,000 kWh.	
112	Home Energy Comparison Report	Home Energy Comparison Report - Commercialized	235	0.0	661188	12963477	2299.3	Ossege Attachment M	
113	Residential Energy Assessments	Home Energy House Call - Energy Efficiency Starter KIT	821	0.1	4014	3295307	320.8	Ossege Attachment Q-5; see also accompanying document (OH HEHC Workpaper.pdf)	Ossege Attachment H
114	Smart Saver® for Nonresidential Customers	HP 135,000 - 240,000 per ton	152	0.0	14	2124	0.5	Ossege Attachment Q-14	
115	Smart Saver® for Nonresidential Customers	HP 65,000 - 135,000 per ton	127	0.0	6	763	0.2	Ossege Attachment Q-14	
116	Smart Saver® for Nonresidential Customers	HP less than 65,000 1 Ph per ton	119	0.0	20	2385	0.5	Ossege Attachment Q-14	
117	Smart Saver® for Nonresidential Customers	HP less than 65,000 3 Ph per ton	65	0.0	5	327	0.1	Ossege Attachment Q-14	
118	Smart Saver® for Nonresidential Customers	Icemaker (100 to 500 lbs_day)	642	0.1	1	642	0.1	Ossege Attachment Q-19	

Row	Program Name	Measure Name	kWh	kW	Quantity	Total kWh	Total kW	Source Attachment/ Calculation Sheet	Additional Source Attachment / Sub-Attachment
119	Smart Saver® for Nonresidential Customers	Icemaker (Greater Than 1000 lbs_day)	1377	0.1	2	2754	0.3	Ossege Attachment Q-19	
121	Energy Efficiency Education Program for Schools	K-12 Education Program- Curriculum	243	0.0	2836	689425	122.3	Ossege Attachment Q-4; see also accompanying document	
122	Smart Saver® for Nonresidential Customers	LED Auto Traffic Signals	297	0.1	753	223993	68.8	Ossege Attachment Q-19	
123	Smart Saver® for Nonresidential Customers	LED Case lighting	490	0.0	800	391804	33.2	Ossege Attachment Q-19	
124	Smart Saver® for Nonresidential Customers	LED Downlight	258	0.1	997	257273	52.5	Ossege Attachment Q-19	
125	Smart Saver® for Nonresidential Customers	LED Exit Signs Electronic Fixtures (Retrofit Only)	246	0.0	1544	379682	51.4	Ossege Attachment Q-19	
126	Smart Saver® for Nonresidential Customers	LED Lamps	234	0.0	2244	524322	106.9	Ossege Attachment Q-19	
127	Smart Saver® for Nonresidential Customers	LED Pedestrian Signals	162	0.0	402	65242	19.0	Ossege Attachment Q-19	
128	Low Income Services	Low Income Weatherization- Refrigerator Replacement	1264	0.2	27	34115	4.7	Ossege Attachment Q-8	
129	Smart Saver® for Nonresidential Customers	Low Watt T8 lamps 2-4ft, replacing standard 32 Watt T8	19	0.0	48664	937202	193.2	Ossege Attachment Q-19	
130	Smart Saver® for Nonresidential Customers	LW HPT8 4ft 1 lamp, Replace T12	87	0.0	87	7595	1.6	Ossege Attachment Q-19	
131	Smart Saver® for Nonresidential Customers	LW HPT8 4ft 2 lamp, Replace T12	112	0.0	3044	339996	69.5	Ossege Attachment Q-19	
132	Smart Saver® for Nonresidential Customers	LW HPT8 4ft 3 lamp, Replace T12	209	0.0	2470	516879	105.4	Ossege Attachment Q-19	
133	Smart Saver® for Nonresidential Customers	LW HPT8 4ft 4 lamp, Replace T12	243	0.0	1873	454477	93.0	Ossege Attachment Q-19	
134	Smart Saver® for Nonresidential Customers	Occupancy Sensors over 500 Watts	1313	0.3	351	460987	94.1	Ossege Attachment Q-19	
135	Smart Saver® for Nonresidential Customers	Occupancy Sensors under 500 Watts	525	0.1	1490	782470	162.7	Ossege Attachment Q-19	
136	Residential Energy Assessments	Online Audit	341	0.0	2	682	0.1	Ossege Attachment H	
137	Smart Saver® for Nonresidential Customers	Packaged Terminal AC	32	0.0	85	2678	1.0	Ossege Attachment Q-14	
138	Residential Energy Assessments	Personalized Energy Report	341	0.0	5047	1720492	169.5	Ossege Attachment H	
139	Smart Saver® for Residential Customers	Property Manager 13WCFL	42	0.0	3633	154353	14.7	Ossege Attachment Q-18	
140	Smart Saver® for Nonresidential Customers	Pulse Start Metal Halide 320W retrofit only	452	0.1	116	52421	10.7	Ossege Attachment Q-19	
141	Smart Saver® for Residential Customers	RCFL Opt-In Free CFLs	57	0.0	1932452	109793572	10814.1	Ossege Attachment H	
142	Residential Energy Assessments	Residential Retrofit Pilot	5049	1.0	7	35345	7.2	Ossege Attachment Q-24	
143	Smart Saver® for Nonresidential Customers	SAW Custom	26	0.0	866	22726	0.0	N/A	
144	Smart Saver® for Nonresidential Customers	SAW Custom	9509	0.6	3	28526	1.7	N/A	
145	Smart Saver® for Nonresidential Customers	SAW Custom	111203	14.7	1	111203	14.7	N/A	
146	Smart Saver® for Nonresidential Customers	SAW Custom	424	0.0	43	18224	0.0	N/A	
147	Smart Saver® for Nonresidential Customers	SAW Custom	2967	0.0	95	281836	0.0	N/A	
148	Smart Saver® for Nonresidential Customers	SAW Custom	244780	0.0	1	244780	0.0	N/A	
149	Smart Saver® for Nonresidential Customers	SAW Custom	514824	86.6	1	514824	86.6	N/A	
150	Smart Saver® for Nonresidential Customers	SAW Custom	47571	12.5	1	47571	12.5	N/A	
151	Smart Saver® for Nonresidential Customers	SAW Custom	1186	0.1	79	93684	10.7	N/A	
152	Smart Saver® for Nonresidential Customers	SAW Custom	539680	90.8	1	539680	90.8	N/A	
153	Smart Saver® for Nonresidential Customers	SAW Custom	139856	23.5	1	139856	23.5	N/A	
154	Smart Saver® for Nonresidential Customers	SAW Custom	769243	83.7	1	769243	83.7	N/A	
155	Smart Saver® for Nonresidential Customers	SAW Custom	123801	2.1	1	123801	2.1	N/A	
156	Smart Saver® for Nonresidential Customers	SAW Custom	628	0.2	70	43956	16.5	N/A	
157	Smart Saver® for Nonresidential Customers	SAW Custom	17817	5.7	1	17817	5.7	N/A	
158	Smart Saver® for Nonresidential Customers	SAW Custom	19125	4.3	1	19125	4.3	N/A	
159	Smart Saver® for Nonresidential Customers	SAW Custom	44097	13.0	1	44097	13.0	N/A	
160	Smart Saver® for Nonresidential Customers	SAW Custom	58453	18.7	1	58453	18.7	N/A	
161	Smart Saver® for Nonresidential Customers	SAW Custom	166309	47.0	1	166309	47.0	N/A	
162	Smart Saver® for Nonresidential Customers	SAW Custom	24498	6.9	1	24498	6.9	N/A	
163	Smart Saver® for Nonresidential Customers	SAW Custom	11172	3.4	1	11172	3.4	N/A	
164	Smart Saver® for Nonresidential Customers	SAW Custom	37102	11.8	1	37102	11.8	N/A	
165	Smart Saver® for Nonresidential Customers	SAW Custom	24332	5.8	1	24332	5.8	N/A	
166	Smart Saver® for Nonresidential Customers	SAW Custom	20998	10.7	1	20998	10.7	N/A	
167	Smart Saver® for Nonresidential Customers	SAW Custom	12569	0.0	1	12569	0.0	N/A	
168	Smart Saver® for Nonresidential Customers	SAW Custom	12748	0.0	1	12748	0.0	N/A	
169	Smart Saver® for Nonresidential Customers	SAW Custom	85857	54.8	1	85857	54.8	N/A	
170	Smart Saver® for Nonresidential Customers	SAW Custom	39325	0.0	1	39325	0.0	N/A	
171	Smart Saver® for Nonresidential Customers	SAW Custom	48002	0.0	1	48002	0.0	N/A	
172	Smart Saver® for Nonresidential Customers	SAW Custom	62356	34.4	1	62356	34.4	N/A	
173	Smart Saver® for Nonresidential Customers	SAW Custom	45615	7.7	1	45615	7.7	N/A	
174	Smart Saver® for Nonresidential Customers	SAW Custom	17494	2.9	1	17494	2.9	N/A	
175	Smart Saver® for Nonresidential Customers	SAW Custom	41923	0.0	1	41923	0.0	N/A	
176	Smart Saver® for Nonresidential Customers	SAW Custom	16824	2.8	1	16824	2.8	N/A	
177	Smart Saver® for Nonresidential Customers	SAW Custom	35849	6.0	1	35849	6.0	N/A	
178	Smart Saver® for Nonresidential Customers	SAW Custom	251	0.0	266	66651	0.0	N/A	
179	Smart Saver® for Nonresidential Customers	SAW Custom	649	0.1	710	461076	52.6	N/A	
180	Smart Saver® for Nonresidential Customers	SAW Custom	294	0.0	16	4706	0.0	N/A	
181	Smart Saver® for Nonresidential Customers	SAW Custom	762	0.1	15	11435	1.3	N/A	
182	Smart Saver® for Nonresidential Customers	SAW Custom	349	0.0	8	2789	0.0	N/A	
183	Smart Saver® for Nonresidential Customers	SAW Custom	904	0.1	157	141852	16.2	N/A	
184	Smart Saver® for Nonresidential Customers	SAW Custom	960	0.1	46	44159	5.0	N/A	
185	Smart Saver® for Nonresidential Customers	SAW Custom	856	0.1	24	20555	2.3	N/A	
186	Smart Saver® for Nonresidential Customers	SAW Custom	429	0.0	53	22711	0.0	N/A	

Row	Program Name	Measure Name	MWh	Coincident kW	# Installations	Total kwh	Total kw	Change Attachment / Subattachment	Additional Change Attachment / Subattachment
187	Smart Saver® for Nonresidential Customers	SAW Custom	596	0.0	12	7147	0.0	N/A	
188	Smart Saver® for Nonresidential Customers	SAW Custom	922	0.0	2	1845	0.0	N/A	
189	Smart Saver® for Nonresidential Customers	SAW Custom	422623	3.3	1	422623	3.3	N/A	
190	Smart Saver® for Nonresidential Customers	SAW Custom	1045	0.1	17	17760	2.0	N/A	
191	Smart Saver® for Nonresidential Customers	SAW Custom	1092	0.1	39	42578	4.9	N/A	
192	Smart Saver® for Nonresidential Customers	SAW Custom	791	0.1	122	96451	11.0	N/A	
193	Smart Saver® for Nonresidential Customers	SAW Custom	838	0.1	55	46070	5.3	N/A	
194	Smart Saver® for Nonresidential Customers	SAW Custom	791	0.1	122	96451	11.0	N/A	
195	Smart Saver® for Nonresidential Customers	SAW Custom	838	0.1	81	67849	7.7	N/A	
196	Smart Saver® for Nonresidential Customers	SAW Custom	66464	11.2	1	66464	11.2	N/A	
197	Smart Saver® for Nonresidential Customers	SAW Custom	59160	9.9	1	59160	9.9	N/A	
198	Smart Saver® for Nonresidential Customers	SAW Custom	19845	3.3	1	19845	3.3	N/A	
199	Smart Saver® for Nonresidential Customers	SAW Custom	866	0.0	76	65851	0.0	N/A	
200	Smart Saver® for Nonresidential Customers	SAW Custom	152039	0.0	1	152039	0.0	N/A	
201	Smart Saver® for Nonresidential Customers	SAW Custom	27819	0.0	1	27819	0.0	N/A	
202	Smart Saver® for Nonresidential Customers	SAW Custom	4683	0.0	12	56200	0.0	N/A	
203	Smart Saver® for Nonresidential Customers	SAW Custom	169	0.0	1	169	0.0	N/A	
204	Smart Saver® for Nonresidential Customers	SAW Custom	866	0.0	2	1732	0.0	N/A	
205	Smart Saver® for Nonresidential Customers	SAW Custom	1119	0.0	59	66042	0.0	N/A	
206	Smart Saver® for Nonresidential Customers	SAW Custom	1685	0.0	6	10113	0.0	N/A	
207	Smart Saver® for Nonresidential Customers	SAW Custom	349	0.1	40	13951	3.6	N/A	
208	Smart Saver® for Nonresidential Customers	SAW Custom	377	0.1	570	214732	49.0	N/A	
209	Smart Saver® for Nonresidential Customers	SAW Custom	506016	74.0	1	506016	74.0	N/A	
210	Smart Saver® for Nonresidential Customers	SAW Custom	214633	24.5	1	214633	24.5	N/A	
211	Smart Saver® for Nonresidential Customers	SAW Custom	116813	38.5	1	116813	38.5	N/A	
212	Smart Saver® for Nonresidential Customers	SAW Custom	9814	0.0	1	9814	0.0	N/A	
213	Smart Saver® for Nonresidential Customers	SAW Custom	796	0.3	16	12735	4.2	N/A	
214	Smart Saver® for Nonresidential Customers	SAW Custom	97563	32.9	1	97563	32.9	N/A	
215	Smart Saver® for Nonresidential Customers	SAW Custom	21332	0.0	1	21332	0.0	N/A	
216	Smart Saver® for Nonresidential Customers	SAW Custom	776	0.3	30	23293	7.9	N/A	
217	Smart Saver® for Nonresidential Customers	SAW Custom	370514	122.0	1	370514	122.0	N/A	
218	Smart Saver® for Nonresidential Customers	SAW Custom	72566	0.0	1	72566	0.0	N/A	
219	Smart Saver® for Nonresidential Customers	SAW Custom	796	0.3	106	84369	27.8	N/A	
220	Smart Saver® for Nonresidential Customers	SAW Custom	297634	100.5	1	297634	100.5	N/A	
221	Smart Saver® for Nonresidential Customers	SAW Custom	63666	0.0	1	63666	0.0	N/A	
222	Smart Saver® for Nonresidential Customers	SAW Custom	776	0.3	54	41927	14.2	N/A	
223	Smart Saver® for Nonresidential Customers	SAW Custom	544	0.0	10	5443	0.0	N/A	
224	Smart Saver® for Nonresidential Customers	SAW Custom	1083	0.0	4	4332	0.0	N/A	
225	Smart Saver® for Nonresidential Customers	SAW Custom	163825	54.0	1	163825	54.0	N/A	
226	Smart Saver® for Nonresidential Customers	SAW Custom	58613	0.0	1	58613	0.0	N/A	
227	Smart Saver® for Nonresidential Customers	SAW Custom	796	0.3	30	23878	7.9	N/A	
228	Smart Saver® for Nonresidential Customers	SAW Custom	27191	4.3	1	27191	4.3	N/A	
229	Smart Saver® for Nonresidential Customers	SAW Custom	132655	44.8	1	132655	44.8	N/A	
230	Smart Saver® for Nonresidential Customers	SAW Custom	24675	0.0	1	24675	0.0	N/A	
231	Smart Saver® for Nonresidential Customers	SAW Custom	776	0.3	1	776	0.3	N/A	
232	Smart Saver® for Nonresidential Customers	SAW Custom	21686	2.2	1	21686	2.2	N/A	
233	Smart Saver® for Nonresidential Customers	SAW Custom	151468	51.1	1	151468	51.1	N/A	
234	Smart Saver® for Nonresidential Customers	SAW Custom	27925	0.0	1	27925	0.0	N/A	
235	Smart Saver® for Nonresidential Customers	SAW Custom	776	0.3	35	27175	9.2	N/A	
236	Smart Saver® for Nonresidential Customers	SAW Custom	108128	36.5	1	108128	36.5	N/A	
237	Smart Saver® for Nonresidential Customers	SAW Custom	20814	0.0	1	20814	0.0	N/A	
238	Smart Saver® for Nonresidential Customers	SAW Custom	776	0.3	20	15529	5.2	N/A	
239	Smart Saver® for Nonresidential Customers	SAW Custom	26034	4.3	1	26034	4.3	N/A	
240	Smart Saver® for Nonresidential Customers	SAW Custom	4696	0.5	126	591722	67.7	N/A	
241	Smart Saver® for Nonresidential Customers	SAW Custom	843	0.0	96	80950	0.0	N/A	
242	Smart Saver® for Nonresidential Customers	SAW Custom	531	0.2	43	22852	7.9	N/A	
243	Smart Saver® for Nonresidential Customers	SAW Custom	776356	130.6	1	776356	130.6	N/A	
244	Smart Saver® for Nonresidential Customers	SAW Custom	338161	51.8	1	338161	51.8	N/A	
245	Smart Saver® for Nonresidential Customers	SAW Custom	48	0.0	708	33861	9.1	N/A	
246	Smart Saver® for Nonresidential Customers	SAW Custom	212	0.0	2408	509405	82.8	N/A	
247	Smart Saver® for Nonresidential Customers	SAW Custom	233688	0.0	1	233688	0.0	N/A	
248	Smart Saver® for Nonresidential Customers	SAW Custom	6109	0.0	1	6109	0.0	N/A	
249	Smart Saver® for Nonresidential Customers	SAW Custom	340240	23.9	1	340240	23.9	N/A	
250	Smart Saver® for Nonresidential Customers	SAW Custom	308674	0.0	1	308674	0.0	N/A	
251	Smart Saver® for Nonresidential Customers	SAW Custom	583662	66.7	1	583662	66.7	N/A	
252	Smart Saver® for Nonresidential Customers	SAW Custom	204489	10.3	1	204489	10.3	N/A	
253	Smart Saver® for Nonresidential Customers	SAW Custom	114900	17.9	1	114900	17.9	N/A	

Row	Program Name	Measure Name	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
254	Smart Saver® for Nonresidential Customers	SAW Custom	171	0.0	436	74756	14.5	N/A	
255	Smart Saver® for Nonresidential Customers	SAW Custom	210	0.0	334	70199	13.6	N/A	
256	Smart Saver® for Nonresidential Customers	SAW Custom	263	0.0	12	3153	0.4	N/A	
257	Smart Saver® for Nonresidential Customers	SAW Custom	479	0.1	15	7187	1.0	N/A	
258	Smart Saver® for Nonresidential Customers	SAW Custom	487	0.1	10	4866	0.7	N/A	
259	Smart Saver® for Nonresidential Customers	SAW Custom	584	0.1	13	7586	0.9	N/A	
260	Smart Saver® for Nonresidential Customers	SAW Custom	254	0.0	14	3549	0.5	N/A	
261	Smart Saver® for Nonresidential Customers	SAW Custom	462	0.1	12	5547	0.8	N/A	
262	Smart Saver® for Nonresidential Customers	SAW Custom	377	0.1	11	4144	0.6	N/A	
263	Smart Saver® for Nonresidential Customers	SAW Custom	320	0.0	15	4800	0.5	N/A	
264	Smart Saver® for Nonresidential Customers	SAW Custom	321	0.1	5	1605	0.3	N/A	
265	Smart Saver® for Nonresidential Customers	SAW Custom	452	0.1	13	5873	0.7	N/A	
266	Smart Saver® for Nonresidential Customers	SAW Custom	240	0.0	15	3602	0.5	N/A	
267	Smart Saver® for Nonresidential Customers	SAW Custom	381	0.1	13	4948	0.7	N/A	
268	Smart Saver® for Nonresidential Customers	SAW Custom	267	0.0	59	15744	2.2	N/A	
269	Smart Saver® for Nonresidential Customers	SAW Custom	438	0.1	26	11386	1.7	N/A	
270	Smart Saver® for Nonresidential Customers	SAW Custom	254	0.0	30	7605	1.1	N/A	
271	Smart Saver® for Nonresidential Customers	SAW Custom	462	0.1	14	6472	0.9	N/A	
272	Smart Saver® for Nonresidential Customers	SAW Custom	254	0.0	44	11154	1.6	N/A	
273	Smart Saver® for Nonresidential Customers	SAW Custom	320	0.0	29	9280	1.1	N/A	
274	Smart Saver® for Nonresidential Customers	SAW Custom	584	0.1	41	23924	2.7	N/A	
275	Smart Saver® for Nonresidential Customers	SAW Custom	487	0.1	27	13138	1.8	N/A	
276	Smart Saver® for Nonresidential Customers	SAW Custom	1145296	166.5	1	1145296	166.5	N/A	
277	Smart Saver® for Nonresidential Customers	SAW Custom	66	0.0	132	8660	0.0	N/A	
278	Smart Saver® for Nonresidential Customers	SAW Custom	86	0.0	5838	502162	0.0	N/A	
279	Smart Saver® for Nonresidential Customers	SAW Custom	44	0.0	748	32715	0.0	N/A	
280	Smart Saver® for Nonresidential Customers	SAW Custom	286	0.1	17	4856	1.0	N/A	
281	Smart Saver® for Nonresidential Customers	SAW Custom	276903	5.8	1	276903	5.8	N/A	
282	Smart Saver® for Nonresidential Customers	SAW Custom	177597	0.0	1	177597	0.0	N/A	
283	Smart Saver® for Nonresidential Customers	SAW Custom	109721	-9.3	1	109721	-9.3	N/A	
284	Smart Saver® for Nonresidential Customers	SAW Custom	167998	19.2	1	167998	19.2	N/A	
285	Smart Saver® for Nonresidential Customers	SAW Custom	9412	1.1	8	75293	8.6	N/A	
286	Smart Saver® for Nonresidential Customers	SAW Custom	934	0.0	27	25217	0.0	N/A	
287	Smart Saver® for Nonresidential Customers	SAW Custom	1186632	219.4	1	1186632	219.4	N/A	
288	Smart Saver® for Nonresidential Customers	SAW Custom	4753	0.5	248	1178714	134.5	N/A	
289	Smart Saver® for Nonresidential Customers	SAW Custom	270950	12.0	1	270950	12.0	N/A	
290	Smart Saver® for Nonresidential Customers	SAW Custom	46817	8.0	1	46817	8.0	N/A	
291	Smart Saver® for Nonresidential Customers	SAW Custom	72517	0.0	1	72517	0.0	N/A	
292	Smart Saver® for Nonresidential Customers	SAW Custom	142264	19.9	1	142264	19.9	N/A	
293	Smart Saver® for Nonresidential Customers	SAW Custom	57632	9.2	1	57632	9.2	N/A	
294	Smart Saver® for Nonresidential Customers	SAW Custom	183751	1.1	1	183751	1.1	N/A	
295	Smart Saver® for Nonresidential Customers	SAW Custom	1176	0.1	11	12941	1.5	N/A	
296	Smart Saver® for Nonresidential Customers	SAW Custom	85961	9.8	1	85961	9.8	N/A	
297	Smart Saver® for Nonresidential Customers	SAW Custom	14925	0.0	1	14925	0.0	N/A	
298	Smart Saver® for Nonresidential Customers	SAW Custom	65991	0.0	1	65991	0.0	N/A	
299	Smart Saver® for Nonresidential Customers	SAW Custom	1496	0.0	1	1496	0.0	N/A	
300	Smart Saver® for Nonresidential Customers	SAW Custom	60927	0.0	1	60927	0.0	N/A	
301	Smart Saver® for Nonresidential Customers	SAW Custom	97698	0.0	1	97698	0.0	N/A	
302	Smart Saver® for Nonresidential Customers	SAW Custom	338191	0.0	1	338191	0.0	N/A	
303	Smart Saver® for Nonresidential Customers	SAW Custom	106885	0.0	1	106885	0.0	N/A	
304	Smart Saver® for Nonresidential Customers	SAW Custom	83416	0.0	1	83416	0.0	N/A	
305	Smart Saver® for Nonresidential Customers	SAW Custom	173615	32.0	1	173615	32.0	N/A	
306	Smart Saver® for Nonresidential Customers	SAW Custom	243976	45.0	1	243976	45.0	N/A	
307	Smart Saver® for Nonresidential Customers	SAW Custom	250874	46.3	1	250874	46.3	N/A	
308	Smart Saver® for Nonresidential Customers	SAW Custom	259158	47.8	1	259158	47.8	N/A	
309	Smart Saver® for Nonresidential Customers	SAW Custom	257649	47.5	1	257649	47.5	N/A	
310	Smart Saver® for Nonresidential Customers	SAW Custom	255517	47.1	1	255517	47.1	N/A	
311	Smart Saver® for Nonresidential Customers	SAW Custom	208233	38.4	1	208233	38.4	N/A	
312	Smart Saver® for Nonresidential Customers	SAW Custom	214869	39.6	1	214869	39.6	N/A	
313	Smart Saver® for Nonresidential Customers	SAW Custom	197737	24.0	1	197737	24.0	N/A	
314	Smart Saver® for Nonresidential Customers	SAW Custom	114	0.0	16	1831	0.7	N/A	
315	Smart Saver® for Nonresidential Customers	SAW Custom	170	0.1	65	11050	4.3	N/A	
316	Smart Saver® for Nonresidential Customers	SAW Custom	117	0.0	2	235	0.0	N/A	
317	Smart Saver® for Nonresidential Customers	SAW Custom	495	0.0	20	9897	0.0	N/A	
318	Smart Saver® for Nonresidential Customers	SAW Custom	1286	0.0	7	8999	0.0	N/A	
319	Smart Saver® for Nonresidential Customers	SAW Custom	997	0.3	400	398799	109.6	N/A	
320	Smart Saver® for Nonresidential Customers	SAW Custom	3484	0.6	60	209031	34.4	N/A	

Row	Program Name	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
321	Smart Saver® for Nonresidential Customers	SAW Custom	0	5371.6	1	0	5371.6	N/A	
322	Smart Saver® for Nonresidential Customers	SAW Custom	6334	0.0	1	6334	0.0	N/A	
323	Smart Saver® for Nonresidential Customers	SAW Custom	1660	0.3	15	24899	3.8	N/A	
324	Smart Saver® for Nonresidential Customers	SAW Custom	1942	0.3	10	19425	3.0	N/A	
325	Smart Saver® for Nonresidential Customers	SAW Custom	20414	3.1	1	20414	3.1	N/A	
326	Smart Saver® for Nonresidential Customers	SAW Custom	2017	0.4	1	2017	0.4	N/A	
327	Smart Saver® for Nonresidential Customers	SAW Custom	1996	0.4	1	1996	0.4	N/A	
328	Smart Saver® for Nonresidential Customers	SAW Custom	1462	0.3	1	1462	0.3	N/A	
329	Smart Saver® for Nonresidential Customers	SAW Custom	1094	0.2	1	1094	0.2	N/A	
330	Smart Saver® for Nonresidential Customers	SAW Custom	1419	0.3	1	1419	0.3	N/A	
331	Smart Saver® for Nonresidential Customers	SAW Custom	1953	0.4	1	1953	0.4	N/A	
332	Smart Saver® for Nonresidential Customers	SAW Custom	739	0.1	1	739	0.1	N/A	
333	Smart Saver® for Nonresidential Customers	SAW Custom	3882	0.4	1	3882	0.4	N/A	
334	Smart Saver® for Nonresidential Customers	SAW Custom	1308	0.1	1	1308	0.1	N/A	
335	Smart Saver® for Nonresidential Customers	SAW Custom	2994	0.5	1	2994	0.5	N/A	
336	Smart Saver® for Nonresidential Customers	SAW Custom	2701	0.3	1	2701	0.3	N/A	
337	Smart Saver® for Nonresidential Customers	SAW Custom	4562	0.5	1	4562	0.5	N/A	
338	Smart Saver® for Nonresidential Customers	SAW Custom	2012	0.4	1	2012	0.4	N/A	
339	Smart Saver® for Nonresidential Customers	SAW Custom	2787	0.5	1	2787	0.5	N/A	
340	Smart Saver® for Nonresidential Customers	SAW Custom	2764	0.5	1	2764	0.5	N/A	
341	Smart Saver® for Nonresidential Customers	SAW Custom	2998	0.5	1	2998	0.5	N/A	
342	Smart Saver® for Nonresidential Customers	SAW Custom	2781	0.5	1	2781	0.5	N/A	
343	Smart Saver® for Nonresidential Customers	SAW Custom	4620	0.5	1	4620	0.5	N/A	
344	Smart Saver® for Nonresidential Customers	SAW Custom	3260	0.4	1	3260	0.4	N/A	
345	Smart Saver® for Nonresidential Customers	SAW Custom	4488	0.5	1	4488	0.5	N/A	
346	Smart Saver® for Nonresidential Customers	SAW Custom	2850	0.5	1	2850	0.5	N/A	
347	Smart Saver® for Nonresidential Customers	SAW Custom	3216	0.6	1	3216	0.6	N/A	
348	Smart Saver® for Nonresidential Customers	SAW Custom	2039	0.4	1	2039	0.4	N/A	
349	Smart Saver® for Nonresidential Customers	SAW Custom	2827	0.5	1	2827	0.5	N/A	
350	Smart Saver® for Nonresidential Customers	SAW Custom	1795	0.3	1	1795	0.3	N/A	
351	Smart Saver® for Nonresidential Customers	SAW Custom	1826	0.3	1	1826	0.3	N/A	
352	Smart Saver® for Nonresidential Customers	SAW Custom	4551	0.5	1	4551	0.5	N/A	
353	Smart Saver® for Nonresidential Customers	SAW Custom	2807	0.5	1	2807	0.5	N/A	
354	Smart Saver® for Nonresidential Customers	SAW Custom	2058	0.4	1	2058	0.4	N/A	
355	Smart Saver® for Nonresidential Customers	SAW Custom	3260	0.4	1	3260	0.4	N/A	
356	Smart Saver® for Nonresidential Customers	SAW Custom	2058	0.4	1	2058	0.4	N/A	
357	Smart Saver® for Nonresidential Customers	SAW Custom	2847	0.5	1	2847	0.5	N/A	
358	Smart Saver® for Nonresidential Customers	SAW Custom	2309	0.4	1	2309	0.4	N/A	
359	Smart Saver® for Nonresidential Customers	SAW Custom	1712	0.3	1	1712	0.3	N/A	
360	Smart Saver® for Nonresidential Customers	SAW Custom	2847	0.5	1	2847	0.5	N/A	
361	Smart Saver® for Nonresidential Customers	SAW Custom	1893	0.3	1	1893	0.3	N/A	
362	Smart Saver® for Nonresidential Customers	SAW Custom	2196	0.4	1	2196	0.4	N/A	
363	Smart Saver® for Nonresidential Customers	SAW Custom	2039	0.4	1	2039	0.4	N/A	
364	Smart Saver® for Nonresidential Customers	SAW Custom	2680	0.3	1	2680	0.3	N/A	
365	Smart Saver® for Nonresidential Customers	SAW Custom	4077	0.5	1	4077	0.5	N/A	
366	Smart Saver® for Nonresidential Customers	SAW Custom	2487	0.5	1	2487	0.5	N/A	
367	Smart Saver® for Nonresidential Customers	SAW Custom	2362	0.4	1	2362	0.4	N/A	
368	Smart Saver® for Nonresidential Customers	SAW Custom	2504	0.5	1	2504	0.5	N/A	
369	Smart Saver® for Nonresidential Customers	SAW Custom	3839	0.4	1	3839	0.4	N/A	
370	Smart Saver® for Nonresidential Customers	SAW Custom	2932	0.5	1	2932	0.5	N/A	
371	Smart Saver® for Nonresidential Customers	SAW Custom	1232	0.2	1	1232	0.2	N/A	
372	Smart Saver® for Nonresidential Customers	SAW Custom	1917	0.3	1	1917	0.3	N/A	
373	Smart Saver® for Nonresidential Customers	SAW Custom	2893	0.5	1	2893	0.5	N/A	
374	Smart Saver® for Nonresidential Customers	SAW Custom	1109	0.2	1	1109	0.2	N/A	
375	Smart Saver® for Nonresidential Customers	SAW Custom	574	0.1	1	574	0.1	N/A	
376	Smart Saver® for Nonresidential Customers	SAW Custom	2183	0.4	1	2183	0.4	N/A	
377	Smart Saver® for Nonresidential Customers	SAW Custom	544965	217.0	1	544965	217.0	N/A	
378	Smart Saver® for Nonresidential Customers	SAW Custom	1215	0.0	28	34018	0.0	N/A	
379	Smart Saver® for Nonresidential Customers	SAW Custom	313206	43.1	1	313206	43.1	N/A	
380	Smart Saver® for Nonresidential Customers	Setback Programmable Thermostat	1245	0.2	292	363440	61.1	Ossege Attachment Q-14	
381	Smart Saver® for Residential Customers	Smart Saver - Central Air Conditioner	1063	0.2	2597	2759319	560.7	Ossege Attachment Q-1	Ossege Attachment Q-26
382	Smart Saver® for Residential Customers	Smart Saver - Heat Pump	2598	0.4	2204	5725343	920.0	Ossege Attachment Q-1	Ossege Attachment Q-26
383	Smart Saver® for Nonresidential Customers	Steamer_5 pan	14813	2.8	2	29626	5.7	Ossege Attachment Q-19	
384	Smart Saver® for Nonresidential Customers	T-5 4 ft 1 Lamp with Electronic Ballast (replacing T-12 fixture)	58	0.0	50	2913	0.6	Ossege Attachment Q-19	
385	Smart Saver® for Nonresidential Customers	T-5 4 ft 2 Lamp with Electronic Ballast (replacing T-12 fixture)	58	0.0	1655	95619	19.7	Ossege Attachment Q-19	
386	Smart Saver® for Nonresidential Customers	T-5 4 ft 3 Lamp with Electronic Ballast (replacing T-12 fixture)	131	0.0	34	4452	0.9	Ossege Attachment Q-19	
387	Smart Saver® for Nonresidential Customers	T-5 High Output 1 Lamp with Electronic Ballast (replacing T-12 fixture)	73	0.0	8	585	0.1	Ossege Attachment Q-19	

	Program Name	Measure Name							
388	Smart Saver® for Nonresidential Customers	T-5 High Output 2 Lamp with Electronic Ballast (replacing T-12 fixture	92	0.0	271	25050	5.1	Ossege Attachment Q-19	
389	Smart Saver® for Nonresidential Customers	T-5 High Output 3 Lamp with Electronic Ballast (replacing T-12 fixture	122	0.0	109	13294	2.7	Ossege Attachment Q-19	
390	Smart Saver® for Nonresidential Customers	T-5 High Output 4 Lamp with Electronic Ballast (replacing T-12 fixture	253	0.1	109	27568	5.6	Ossege Attachment Q-19	
391	Smart Saver® for Nonresidential Customers	T-8 2ft 1 lamp	49	0.0	125	6098	1.2	Ossege Attachment Q-19	
392	Smart Saver® for Nonresidential Customers	T-8 2ft 2 lamp	117	0.0	1097	128160	26.1	Ossege Attachment Q-19	
393	Smart Saver® for Nonresidential Customers	T-8 2ft 3 lamp	58	0.0	208	12017	2.5	Ossege Attachment Q-19	
394	Smart Saver® for Nonresidential Customers	T-8 2ft 4 lamp	229	0.0	105	23995	4.9	Ossege Attachment Q-19	
395	Smart Saver® for Nonresidential Customers	T-8 3ft 1 lamp	103	0.0	164	16843	3.4	Ossege Attachment Q-19	
396	Smart Saver® for Nonresidential Customers	T-8 3ft 2 lamp	171	0.0	180	30734	6.3	Ossege Attachment Q-19	
397	Smart Saver® for Nonresidential Customers	T-8 3ft 4 lamp	359	0.1	1	359	0.1	Ossege Attachment Q-19	
398	Smart Saver® for Nonresidential Customers	T-8 4ft 1 lamp	59	0.0	681	40214	8.1	Ossege Attachment Q-19	
399	Smart Saver® for Nonresidential Customers	T-8 4ft 2 lamp	63	0.0	11158	701944	144.0	Ossege Attachment Q-19	
400	Smart Saver® for Nonresidential Customers	T-8 4ft 3 lamp	126	0.0	1973	248241	50.9	Ossege Attachment Q-19	
401	Smart Saver® for Nonresidential Customers	T-8 4ft 4 lamp	155	0.0	6055	940613	192.3	Ossege Attachment Q-19	
402	Smart Saver® for Nonresidential Customers	T-8 8ft 1 lamp	82	0.0	15	1233	0.3	Ossege Attachment Q-19	
403	Smart Saver® for Nonresidential Customers	T-8 8ft 2 lamp	68	0.0	735	50012	10.2	Ossege Attachment Q-19	
404	Smart Saver® for Nonresidential Customers	T-8 High Output 8 ft 2 Lamp	229	0.0	199	45476	9.3	Ossege Attachment Q-19	
405	Smart Saver® for Nonresidential Customers	Thermal Storage	0	155.8	2	0	311.6	Ossege Attachment Q-12	
406	Smart Saver® for Nonresidential Customers	Vending Equipment Controller	857	0.0	62	53151	0.0	Ossege Attachment Q-19	
407	Smart Saver® for Nonresidential Customers	VFD HVAC Fan	1335	0.2	1652	2205622	370.9	Ossege Attachment Q-14	
408	Smart Saver® for Nonresidential Customers	VFD HVAC Pump	3804	0.6	215	817772	137.5	Ossege Attachment Q-14	
409	Smart Saver® for Nonresidential Customers	VFD Process Pump 1-50 HP	1025	0.2	135	138344	29.4	Ossege Attachment Q-19	
410	Smart Saver® for Nonresidential Customers	VSD Air Compressors	674	0.2	60	40441	9.7	Ossege Attachment Q-19	
411	Smart Saver® for Nonresidential Customers	Water Cooled Chiller Tune Up per ton	64	0.0	40170	2589326	934.4	Ossege Attachment Q-13	
412	Smart Saver® for Nonresidential Customers	Water-Cooled cent Chiller greater than 300 ton 0.58 kW_ton with 0.35 kW_ton IPLV per tor	188	0.1	1588	298905	107.9	Ossege Attachment Q-14	
413	Smart Saver® for Nonresidential Customers	Water-Cooled Centrifugal Chiller less than 150 ton 0.63 kW_ton with 0.38 kW_ton IPLV per tor	359	0.1	240	86224	31.1	Ossege Attachment Q-14	
414	Smart Saver® for Nonresidential Customers	Water-cooled screw chiller less than 150 ton 0.71 kW_ton with 0.53 kW_ton IPLV per tor	258	0.1	163	42071	15.2	Ossege Attachment Q-14	
415	Smart Saver® for Nonresidential Customers	Water-cooled screw chiller less than 150 ton 0.79 kW_ton with 0.55 kW_ton IPLV per tor	163	0.1	262	42636	15.4	Ossege Attachment Q-14	
416	Smart Saver® for Nonresidential Customers	Window Film	4	0.0	39809	175022	29.4	Ossege Attachment Q-14	
	Total					215,236,542	35,189.5		

Appendix C

Final Report

An Evaluation of the Smart Saver Program in Ohio

Results of a Process and Impact Evaluation

September 29, 2008

Prepared for

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Executive Summary

About This Report

This report presents the results of a process and impact evaluation of Duke Energy's Smart Saver Program as it is operated in Ohio. The Smart Saver Program provides incentives to customers to upgrade to an energy efficient heat pump or air conditioner in existing homes. The program saves energy by helping customers obtain efficient heating and air conditioning units that out-perform older or less efficient furnaces and air conditioning. The study focuses on participants from program year 2007 to the present (November 2007 through May 2008).

The first section of this report provides the results from the process evaluation. This effort employed in-depth interviews with program design, planning and implementation staff, in-depth interviews with partnering contractors, and 100 surveys of program participants.

The second section provides findings from the impact evaluation efforts. The impact evaluation employed a tracking system review, review of monitored data on HVAC unit fan power supplied by Duke Energy, a set of contractor interviews and building energy simulation modeling of typical residential buildings to estimate the program savings.

Summary of Findings

An overview of the key findings identified through this evaluation is presented in this section.

Significant Process Evaluation Findings

- Contractors, builders and participants are all very happy with the program, in contrast to the last evaluation of the Smart Saver program performed in 2007 (which was done for Indiana in which many contractors were not happy with the technologies and communication and with the lack of field representatives). This program does not appear to have any significant operational issues.
- The length of time between the application submittal and the receipt of the rebate is an average of 6.6 days, with a median of 4 days. Generally, the rebates are delivered in a timely manner. However, there were a few complaints about the length of time it took to receive the rebate – with some contractors reporting a wait of more than three months.
- The ARI web site (the web site that contractors must use to obtain equipment information to complete the rebate forms) and paperwork is a minor issue reported by the respondents. The web site does not always respond, resulting in delays in completing the paperwork. Also, the ARI documentation is viewed as unnecessary by some of the contractors because they believe this is something that could be more easily done by program staff.
- There is a notable amount of spillover associated with the Smart Saver program in Ohio (see table below). Twenty-seven percent (27%) of the 5,015 Ohio customers who participated in the program since 2007 reported that the program was at least partially responsible for causing them to take additional actions. These additional actions are estimated to provide these customers with approximately 178 kW of net

energy savings. In addition, almost 600,000 spillover kilowatt hours and over 4,000 spillover therms are saved annually over the lifetime of the measures.

Spillover Impacts	kW	kWh	Therms
Gross	355.413	1,141,942	10,195
Net	178.062	572,113	5,108

Significant Impact Findings

The gross and net energy and demand savings estimated by this evaluation are summarized in Table 1 below. These savings estimates were calculated for the program as operated during the evaluation period, with a SEER 13 baseline for normal replacement units and a SEER 10 baseline for early replacement units. Baseline furnace efficiency was 0.78 AFUE.

Table 1. Evaluation Unit Energy and Demand Savings Estimates

Measure	Covington		
	kWh/ton	kW/ton	Therm/ton
Gas_seer14	356	0.181	62
Gas_seer15	431	0.215	60
Gas_seer16	584	0.315	55
Gas_seer17	637	0.330	55
Hp_seer14	1077	0.133	0
Hp_seer15	1087	0.200	0
Hp_seer16	1473	0.318	0
Hp_seer17	1539	0.266	0
Hp_seer18	1591	0.323	0
Dfhp_seer14	683	0.133	30
Dfhp_seer15	909	0.200	23
Dfhp_seer16	1231	0.318	25
Dfhp_seer17	1317	0.266	24
Dfhp_seer18	1359	0.323	25
All AC	408	0.208	61
All Heat pumps	1106	0.192	6
Measure	**kWh/kSF**	**kW/kSF**	**Therm/kSF**
Hi effic gas furnace	0	0.000	98
Gas furnace plus ECM	356	0.042	91

Program free ridership was estimated at 37.2%. The total gross and net energy savings for the program[1] are shown in Table 2 below.

Table 2. Duke Energy Smart Saver Program Planning Unit Savings Estimates

	kWh	kW	Therm
Gross program savings	3,315,148	933	1,019,463
Net program savings	2,081,913	586	640,223

Recommendations

1. Move to an electronic application submission. This was cited by contractors in the previous evaluation and in this current one. Online submission will make it easier and faster for the contractors to complete the application process. This approach should be established with a confirmation protocol allowing the contactors to know that their application was submitted, providing them with a tracking number and an e-mail confirmation for reference tracking. Currently, many applications are faxed to Duke. The contractors report having to wait for the rebate check to arrive before they know if the application was received and approved for payment.
2. With the move to an on-line application process, eliminate or reduce the documentation required to complete the ARI documentation requirement if feasible to do so. If the application is submitted this check can be part of the on-line automated effort.

[1] The program total savings are based on 675 air conditioner applications, 673 heat pump applications, and 3,667 high efficiency gas furnace applications. Each of the air conditioners and 160 of the heat pumps were bundled with a high efficiency furnace; the remaining furnace applications were stand-alone.

Introduction

This report presents the results of a process and impact evaluation of the Smart Saver Program. To conduct the process evaluation we interviewed program managers, product vendors/dealers/contractors/distributors, and program participants.

Program Description

Smart Saver® promotes the use of high-efficiency heat pumps, air-conditioning systems and Gas furnaces. The Smart Saver Program is available to Duke Energy residential customers in Ohio. The program offers customers an incentive to purchase an energy efficient HVAC system for new and existing homes.

Evaluation Methodology

Process Evaluation

The process evaluation included an offsite interview with the Duke Energy program manager. This interview focused on the design, planning, and implementation of the program and a review of the goals and objectives associated with the program. Interviews were conducted with:

1. Dan Welklin, Duke Energy Program Manager

The interview was conducted in July of 2008, and followed a formal evaluation interview protocol. This protocol is provided in Appendix A of this report and allows the reader to see the range and scope of the questions addressed during the process interviews.

We also interviewed seven out of a possible 27 builders and ten of the 145 partnering dealers for which we were provided contact data and also had more than 3 projects. The builders and contractors were randomly selected for interviews.

Figure 1 below shows how the number of Smart Saver projects is dominated by a small number of these partnering dealers. These partners processed a total of 4,006 installations during the period of time covered by this evaluation (November 2007 through May 2008).

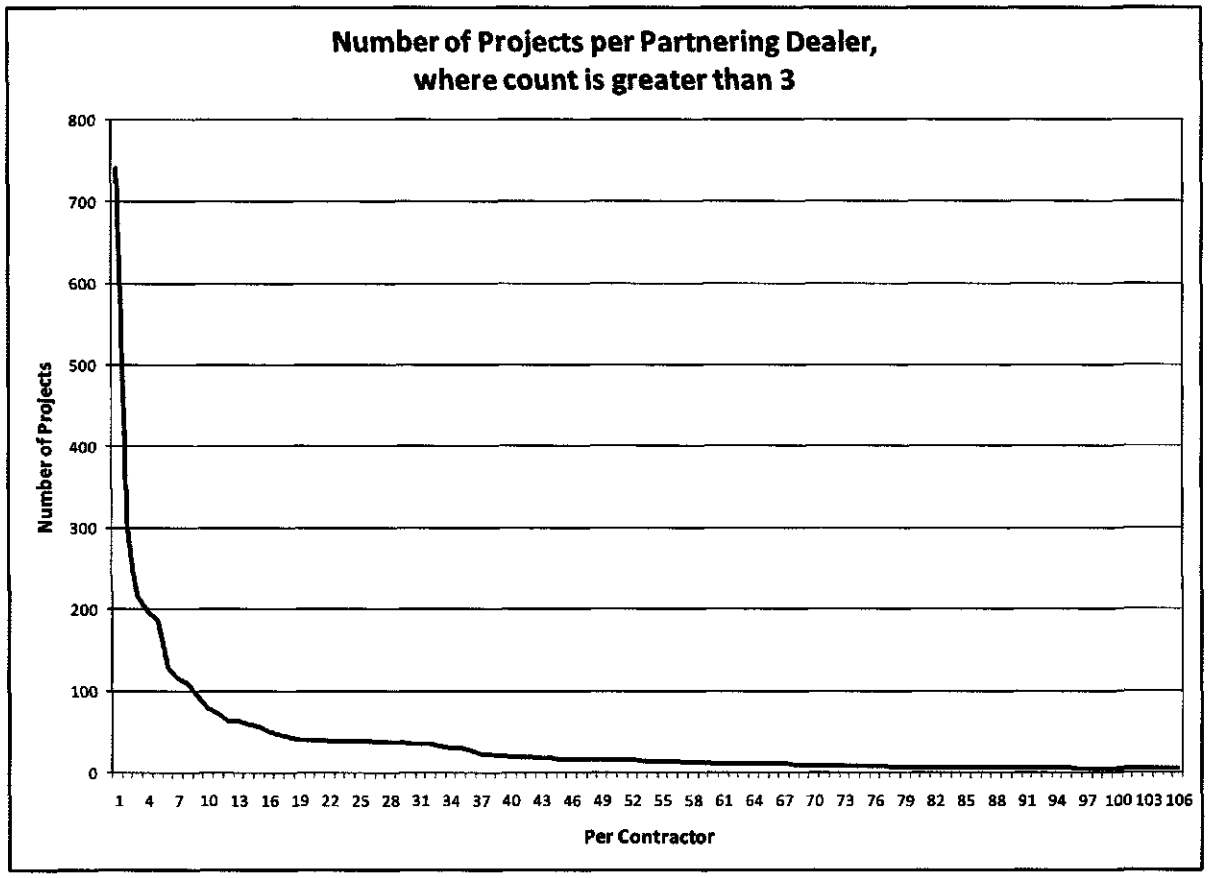

Figure 1. Number of Projects per Smart Saver Partnering Dealer

Gross Energy Impact Analysis

The impact evaluation used program participation records and the results of the interviews with program contractors to identify the range of equipment used and the installation decisions that would have been made without the program. During the interviews we asked questions about early-replacement and replace-on-failure decisions, estimates of remaining life of early replacement units and if they are installing additional measures such as duct insulation and sealing, and programmable thermostats. DOE-2 simulations of typical residential buildings were used to develop the energy savings estimates. A sample of participants had metering installed on the HVAC system fans by Duke Energy. These data were used to inform the construction of the DOE-2 models.

The impact evaluation of gross energy savings consisted of the following steps:

1. Analysis of Contractor Surveys
2. Analysis of program participation tracking system data
3. Development and calibration of prototypical building energy simulation models
4. Simulation of measure energy savings
5. Calculation of gross program energy and demand savings

The contractor surveys were used to establish remaining life on early replacement units and identify additional non-program measures commonly included by Smart Saver contractors. Appliance saturation survey data supplied by Duke Energy from a study in Indiana was used to refine the prototypical building energy simulation models, as described in the Indiana Smart Saver evaluation (TecMarket Works, 2007). The survey data provided information on the buildings, such as type, size and age of the home, types of heating and cooling system installed, use of thermostats, efficiency features, and so on. These data were used to establish residential market segments based on building vintage and HVAC system type, and establish building characteristics appropriate for each of these segments.

The tracking system review identified the types, sizes and efficiencies of air conditioners and heat pumps installed under the program, thus focusing the scope of the engineering analysis. A set of residential prototypical building models were developed using the DOE-2.2 building energy simulation program for three building vintages. The prototypes were based on the models used in the California Database for Energy Efficiency Resources (DEER) study, with appropriate modifications to adapt these models to local design practices and climate. Energy savings estimates were developed from the prototype models and applied to the HVAC program tracking system to estimate program savings.

Section I: Process Interview Results

The seven Smart Saver partnering builders and ten contractors were interviewed in July and August of 2008. All of the interviews were conducted with a sales manager within the firm or an equivalent representative. Each of the respondents indicated that they are the individual within their company who has the most experience and is the most acquainted with the program. The interview protocol used during these interviews can be found in Appendix B.

The interviews were written to cover various aspects of the program, such as program operations, aspects of contractors' involvement, incentive levels applied, covered technologies, and program effects from the contractors' perspectives. The results of the process interviews are report by the response categories presented below.

Program Operations

According to the Program Manager the program started as a labor-intensive initiative to increase high efficiency unit sales and to move customers away from the lower efficient equipment. According to the manager, Duke spent a significant amount of management resources making sure the rebated equipment was properly installed, and that dealers were trained on the program's operations. Additional resources were spent inspecting installed units to make sure they were properly installed. However, over the last few years the program has been scaled back in other states so that it is operating as a rebate program for qualifying units and ECMs in Ohio. By eliminating the technical training the program has become less complicated.

The Smart Saver program has recently changed from being managed by Duke Energy staff to being operated by a service vendor, but has always been operated by this vendor in Ohio. According to the Program Manager this change has made the program operate more smoothly and effectively. To help assure program success a number of quality control checks have been placed into operations, including:

- Every paper application is double checked to assure accuracy and content.
- The contractors use the ARI on-line manual to make sure the indoor unit matches the outdoor unit and thereby qualify for the rebate.
- A field inspection is performed to confirm compliance (5% is the requirement, but vendors almost always do more). The inspections are specifically targeted to include 5% of many subsets including, geography, program measures, heating dealer participation.
- The inspection summary reports are checked by Duke Energy to make sure the percentage requirement is being managed for many subsets in the market including geography, program measures and heating dealer participation.

Materials

We asked the contractors if they had enough program materials such as brochures, applications, and program documentation to effectively sell the program to their customers. All interviewed

contractors indicated that they had the materials that they needed on hand and felt that they could obtain more when needed.

Problems That Have Come Up

Many of the questions asked of the contractors involved focused on their opinions on the operations of the program. The interviews with the contractors indicate that they are in agreement based on the dramatically reduced number of complaints about the program operations from past evaluations.

Most of the contractors said that their experiences with the program were free of any significant problems and that they were pleased with their interactions with the program. However, a few contractors expressed the following concerns:

- "Occasionally a customer complains that they haven't received the rebate in a 'timely manner,' in which case I look into it with Duke and help get them their rebate."
- "I think the only issues are some periodic time delays associated with the rebates and some contractors have been reluctant to participate because of the amount of paperwork associated with the rebate process. Also, some HVAC contractors that I know do not yet know about the program."
- "No real problems, but the ARI web site has changed a few times so we have to keep up with it. There is no advance notice of a change, so it can catch us by surprise."
- "The ARI web site won't always come up. This delays the process and we have to return to it rather than move on to other work."
- "I have had a couple of faxed incentive forms lost in transmission which delayed the rebate process. I had one that only received half of his incentive and we had to reprocess the forms to obtain the other half. I had one application in which the address got mixed up with another customer. This took 3 months for the client to receive his rebate. He was very upset with this."

When we asked contractors about the level of customer complaints, contractors reported that other than the above reported complaints there have been very few or no other customer complaints.

Wait Time for Incentive

The length of time that passes from when the application forms are submitted, to the arrival of the rebate check are described as reasonable by all of the contractors. The stated average length of time to wait for a rebate check varied from 2 to 6 weeks.

The data provided by Duke Energy allowed us to confirm the number of days between application submittal and the date the rebate check was sent out. The minimum period was 2 days with a maximum of 100 days. The average period was 6.6 days with a median of 4 days.

However, contractors perceive that the average wait for the incentive check is between 2 to 6 weeks.

What About Smart Saver Works Well

Each interviewed contractor was asked what they think works well about the program. This question was then followed with a question about what changes should be made to the progam. The contractors responded to the question of what works well about the program with a variety of responses. The responses include:

- "It saves both parties money and improves energy efficiency / consumption."
- "I think the simple fact that it saves people money is what makes it effective."
- "It helps people save money, and I don't think that will ever stop working."
- "The customer is getting a bonus and they are benefiting in energy savings."
- "The incentive attracts customer and contractor attention to buy qualifying equipment, trying to save energy, and it helps customers make decisions."
- "It helps save both money and energy."
- "Some people won't spend the extra money on the higher efficiency equipment on their own, but the rebate helps offset the costs."
- "After the job is finished the paper work is very easy to fill out."
- "It saves both builders and homeowners money, and it also saves energy."
- "I am pleased with the whole process. It's a systematic process and once you do it one or two times you have it down and there are not a bunch of crazy calculation variables involved that can muddy the waters."

These contractors indicate that the program gives them another selling point for the energy efficient equipment option, providing them an advantage to their ability to make a sale. Likewise several reported that the program is easy to fill out.

Some contractors see the program as a way to encourage customers to upgrade their heating and cooling equipment to a higher efficiency level. These contractors noted that the rebates do provide incentives to buy the better product and that this incentive often drives the customer's decision process and makes the program work well.

What Should Change About Smart Saver

The most frequent response to the question regarding what should be changed about the program was the single word "nothing". The contractors seem to be happy with the program. However, four of the contractors did offer suggestions for changes. One suggested that more technology

options should be offered, but wasn't sure if this was possible, another thought that the rebates should be larger, or that a discounted residential electric rate should be offered. Another indicated that it would be helpful to have a confirmation system in place so that the contractors know that the rebates are being processed. The comments received include:

- "Offer more equipment options, if possible."
- "Larger rebates or a different residential rate for those who use the energy saving equipment."
- "Have a convenient confirmation process put into place so the contractors know that the incentive forms have been received and are going to be processed."

Communications with Duke Energy Staff

Duke Energy distributes promotional materials to contractors and to customers to inform them about the program. The vendors are typically the customer's point of contact and answer questions about the rebates and the equipment eligible. All of the vendors have access to a field representative to help them answer questions. If the field representative cannot handle a question, it is sent up to the Program Manager who then calls to the customer or vendor to provide an answer. Field representatives are also responsible for seeking out vendors that are not currently participating in the program and encouraging them to become program partners.

The contractors are satisfied with the level of communications between themselves and Duke Energy. In fact, all but one of the contractors said that communication with Duke Energy staff was fine; the other indicated that the level of communication was acceptable. The contractor suggesting that improvement in communications was needed suggested the following:

- "Improve the ability for us to reach a person with our questions instead of leaving a message."

One contractor mentioned a specific employee to praise her attention to their questions and needs:

- "Yes, Paula Madjeski has always been available to me and has always taken the time to answer all of my questions and follow up on any issues that I have faced."

How Contractors Make Customers Aware of Smart Saver

Most of the contractors tell their customers about the program during normal sales communications. They explain the energy savings, and tell their customers about the incentives if they choose the more energy efficient option for their heating and cooling needs. Responses to the question regarding how their customers learn about the program include:

- "I explain the program to them."
- "I inform them of their options available through the program."

- "I will explain it to them during the sales call."
- "They tend to learn about it via word-of-mouth."
- "When we go out on a job estimate we advise them of the program and rebate."
- "We inform them that they have the option to have a higher efficiency unit at a slightly greater cost."
- "The program is offered when we are called out for a job estimate. We then give them the "good, better, best" estimates."
- "We tell each and every customer about it when doing an estimate."
- "Every quote we give to a customer mentions the incentive if they pick the right equipment."
- "I tell them about it. I also tell all of my clients about the Power Manager Program and how that benefits them and the rest of the world as well."

Getting Contractors Involved in Smart Saver

During the interviews we also talked to the contractors about how they got started in the program, why they participate, and what Duke Energy can do to attract more contractors to become a partner in Smart Saver.

How The Contractors Participate in Smart Saver

The contractors we spoke with had years of experience with the program, ranging from 1 year to (reportedly) over 20 years (in Indiana). Three contractors with whom we spoke said that they had been with the program since its inception.

When we asked the contractors to tell us how they participate in Smart Saver, we obtained the basic information on their operations as a partner in the program. Most of the contractors mentioned that they fill out the paperwork and submit the forms for their customers. The following responses were provided.

- "We're a small company that participates in the program in an attempt to diversify our services and offer our customers more options. If the customer expresses interest in a high efficiency unit, we inform them of the rebate."
- "I am a builder that participates in the program. I inform my customers that if they are interested in a higher efficiency unit, that equipment is available and there is a cash-back program if they go to the more efficient equipment."
- "I just handle the paperwork and ensure that the customer gets the rebate."

- "I stay updated from the web site. I use a laptop on my presentation and log on to the Duke web site."
- "We build homes with high efficiency units included as standard equipment.
- "We tell customers about the rebate and explain which equipment qualifies for the rebate and we fill out the paper work and send it in for them when the job is complete."
- "I did not know the program had a name. We include high efficiency furnaces in every one of our homes as standard, so we do not introduce the rebate program to the homebuyer. We keep the money to help offset the cost."
- "I tell the customers about the program and I make sure the customer's applications are filled out and I send them to Duke."
- "After we identify what equipment is going into their house, I let them know they are eligible for a Duke Energy rebate. I ask them for their account number and fill in the blanks on the application."
- "We build our homes with high efficiency equipment as the standard, therefore we do not give our customers an option and do not inform them of the program; we simply inform them that their homes are built with high efficiency equipment."
- "All customers are advised of the program as an encouragement to purchase our high efficiency items and qualify for the rebate. I get the orders for the equipment and our office processes and faxes in applications."
- "I sell the majority of the products for our company and our technicians will sell the rest. I process and receive all of the incentives. I introduce our product the same way to everyone and as I am explaining things I will ask if the client is a Duke customer for gas and electric and inform them of the rebate program. I process all of the rebates for all of our clients and I receive our incentives."

Why Contractors Participate

Why contractors participate varies from the basics (increased sales/profit) to the altruistic (doing the right thing for their customers). Most of them like to offer their customers the option of a more energy efficient means of heating and cooling their homes, whether it is for their comfort, long-term cost savings, the environment, or for simply providing good customer service. Contractors reported that they participate for the following reasons:

- "To offer more options to the customers and to promote high efficiency equipment."
- "To obtain the incentive for our customers and for ourselves. I believe in it professionally; to at least provide the customer with the energy efficient options."
- "To obtain the incentive and to satisfy our customers."

- "We are the leader in Heat pump installations and energy savings programs; we want to stay that way."
- "We do it for the rebates: they help sell the higher efficiency equipment, and it helps our customers."
- "To obtain the incentive and to provide the higher efficiency for customer."
- "Because it is good for our sales and helps us out."
- "We do it for the rebates and to sell efficient equipment. I became knowledgeable only through my heat company."
- "To build the best quality home at an affordable price. Part of that quality and affordability is directly related to how the homes retain heat/cool air, and at what price. We believe in this professionally and I believe in it personally. We need to do our part to help reduce our dependence upon energy sources."
- "We believe every homebuilder should do their part to build more energy efficient homes. We have committed to building 100% Energy Star rated homes. This is something we believe in professionally and believe it is a great service to our customers."
- "Helps customers save money and obtain the rebate from Duke."
- "We want to build good quality homes, and we figure that includes the heating and cooling system. Also, it shows our customers that we care about their well-being, the environment, and want to provide them with the best possible service."
- "We do it because it is lucrative for us and it is a good selling tool."
- I like the incentives and so do my clients so it only makes sense to benefit from the equipment that I am already promoting. I believe it is a wise business move as it can and does give our company an advantage when selling the high efficiency products. It offsets the price of the equipment, which is getting more and more expensive. It does help people decide to choose a higher efficiency product in many cases when they may be on the fence. It shows that we care that they can save money now on the investment end and in the long run of utility consumption, and it shows that Duke also cares about saving energy.

How To Get More Contractors to Participate

We asked the contractors what Duke Energy can do to increase the number of contractors that partner with the Smart Saver program. Three indicated that increasing the incentives would help. The other responses varied as noted below:

- "Offer a larger incentive, or maybe bonuses for certain numbers of high efficiency units sold."

- "Offer a greater incentive or market the program more effectively or something."
- "Offer more incentives or inform contractors better."
- "The dealers that stay up on our industry wants and needs are already enrolled."
- "Make them more aware of it; I'm not sure how many know about it. I heard of it at a heating association meeting and jumped on board, I think most would like to be on it."
- "Advertise more/ hold informational sessions. I didn't know about the program until one of our HVAC contractors told us about a rebate. Even then I didn't know the program had a name."
- "Place ads in newspapers and TV."
- "Simplify the paper work."
- "If they don't get it already then only a hammer to the head will make an impression."

Program Technologies and Incentives

According to the program managers, the program utilizes the expertise of a diverse group of professionals in choosing the technologies covered by the program: energy experts, consultants, load analysis experts, dealers, builders and customers, and past experience. Then the program conducts cost effectiveness tests on the technologies to determine if the savings in energy are great enough to offset the program's costs. These approaches allow Duke Energy to identify and select the technologies for the program, and which can reliably provide cost effective energy resources.

Technologies and Equipment Covered

We also talked to the contractors about the technologies offered in the program, and the incentives that are provided. The technologies covered under Smart Saver are supported by everyone we spoke with, with a few suggestions for additional technologies for consideration. The program seems to keep up with technological advancements and keeps the most efficient equipment in the program. Some of the contactors provided recommendations to consider other technologies.

- "Maybe programs for in-ground water sprinklers?"
- "It would be very helpful if Duke was to combine an insulation recommendation with the program for homes that need it, or provide helpful hints to go along with energy savings. All energy saving methods should be combined together in the same program (heat pumps, insulation, furnace, etc)."

- "Maybe some sort of incentive for building homes with high efficiency windows or some other construction approach?"

- "EnergyStar homes. When a home receives an EnergyStar label I think the homeowner should get an automatic rebate on their total energy bill every month (5% or something like that). This would practically ensure that consumer demand for EnergyStar rated homes would skyrocket."

- "Include high efficiency water heaters in the program"

- "Include ductless split air conditioners"

Incentive Levels

The incentive levels are set at the right level from the perspective of most of the contractors. However, one had an incentive comment that was targeted at specific technology of the program, believing that the incentive should be higher for geothermal heat pumps since they are more expensive and are more energy efficient than some of the other technologies included. The contractors provided the following additional responses to the incentive question.

- "Yes, they encourage the customers that are on the fence to choose the higher efficiency units."

- "It has swung a few people over as far as deciding which type of furnace to buy and that it isn't just a sales gimmick."

- "Yes, they are appropriate. They could certainly be better, but if someone is sort of in between, it can sway them over to the more efficient unit."

- "They could be larger, but that is always the case. I think they are appropriate."

- "Yes they help. Higher efficient customers want to save all they can."

- "They should get a larger rebate or a lower rate."

- "When given the choice, in about 50% of the time the homeowner will go with the higher efficiency equipment for the rebate."

- "More money back is always nice, but I can't say that the incentive attracts too many people because I have little to do with it."

- "Geothermal rebate should be more than gas furnaces since the cost is much greater to install a geothermal unit than it is to install a gas furnace and they are more energy efficient."

- "Yes they are helpful, although they could be more; it may further encourage the use of high efficiency equipment."

- "Yes. It often convinces a customer to buy the upgrade, as that cost is offset by looking forward to the incentive check."

- "It certainly helps them make the choice to go with the high efficiency equipment, but I promote the high efficiency equipment to begin with so it is mostly a bonus for my clients."

- "If the goal of the incentive is to attract more people to choose energy efficient units, then no. I do not think the incentive attracts those who would otherwise not buy one. However, if someone is already thinking about it, it may help sway him or her one way or another, but it is not enough to make someone change their mind about what they want."

Technologies that Should Not Be Included

None of the contractors indicated that any of the technologies covered should be removed from the program's offerings.

Smart Saver's Effects on Contractors

How the Program Changes Business

Overall, the contractors report that the program has not significantly changed their business or the line of products they offer. However, some report that it allows them to offer more options to their customers and it allows them to sell the higher efficiency products. It also helps achieve higher levels of customer satisfaction. The comments received from the interviewed contractors include responses that indicate that the program is moving the higher efficiency lines and other comments suggest that there are minimal impacts on the contactor's business:

- "The rebates help sell the higher efficiency equipment, as well as helping out the customer."

- "It's given us more lucrative sales by convincing a customer to buy a higher efficiency model."

- It's too hard to quantify so I am not sure if sales have increased due to this program. But I can say that it does help people upgrade to a variable speed blower air handler teamed with a higher SEER heat pump to get the rebate and save in the long run while being more comfortable.

- "It's hard to say, but as I alluded to earlier, I believe word of mouth has helped us attract more customers to the higher efficiency units."

- "It has added to our marketing and advertising programs by focusing on the higher efficiency lines."

- "It's hard to say, but giving people options helps them make good choices."

- "No it has not changed the lines we sell but we sell more of the high efficiency lines."

- "Not that I can tell, I think we sell more of the high efficiency units with the program."
- "I am not sure or at least not to my knowledge."
- "No, the program does not persuade a lot of people to buy."
- "Not particularly. We were already building EnergyStar rated homes, and already installing 92% gas furnaces standard in our homes. It is nice to have the rebate to help offset the overall price of the home and be price competitive in the market."

Contractor's Suggestions for Streamlining Participation Process

Contractors provided two suggestions for streamlining the process. Two contractors said that the ARI form could be eliminated from the process, and the other comment came from a contractor who suggested that the program applications be available via an online process and have a confirmation process so that they don't have to wonder if the fax was received and processed.

The program manager indicated in the past that Duke Energy was working on a confirmation process, and is forecasting that it will be incorporated into the program. The online application process should help reduce the turn-around time for rebates as well. An online process can be structured to reduce errors associated with models and efficiency levels. The comment received from the contractors regarding program changes include:

- "If the incentive form process could be done electronically it could make it easier to track. Faxing the information is cumbersome. I have to trust that the fax arrived and was processed and approved, and it takes weeks before I can figure out if one got lost along the way. I have no way of checking. Maybe some kind of confirmation process could be performed to inform the contractor that the faxed incentive form was received.
- "It could be streamlined by not having to send in the ARI certificate."
- "ARI copies to Duke could be done away with."

Program Results

We asked the contractors about the benefits of their participation in the program to their business and to their customers, and how the program has altered their business by changing what equipment they offer. None of the contractors have made significant changes to their marketing strategies because of the program beyond offering more options to their customers. They feel that simply telling the customer about the program, the rebate and the increased efficiency is enough to sell the rebated equipment. The contractors all offer the same equipment, but push the more efficient equipment when there are customer or dealer incentives to do so. Their goal is to obtain the best equipment for their customers at the best price. The incentives mean that they can push the energy efficient units at a reduced price allowing more customers to obtain the efficient equipment. These findings are consistent with the program theory to increase market penetration via rebates and incentives.

Benefits to the Contractors

The contractors like participating in the program for a variety of reasons. They like the incentives, the satisfaction knowing they are providing their customers with the best options for savings and comfort, and the high levels of customer satisfaction with the contractors. Contractors reported the following benefits:

- "We get a portion of the rebate."
- "We have more satisfied happy customers and extra money."
- "As the business owner, I know it's helping us. I do the reports and studies and the money that Duke is paying for it is quite a bit of pocket money for me and the customer gets better equipment."
- "I hope the equipment is good and pays off in the long run, the rebate I was able to turn over in the construction of the property was a benefit to me."
- "The program gives us extra cash and helps our customers."
- "The rebate is the primary benefit to us."
- "Our customers are more satisfied with their choice and we save some money."
- "Monetary incentive is the benefit we obtain"
- I make a living on 100% commission so the more I sell the more I have to feed my children and their mother. If I sell higher efficiency items my price tag goes up so I get a raise and my kids get fatter. I also receive the company incentives as a bonus because the owner of my company likes it when I am happy and the happier I am the easier it is to sell high efficiency. And the customer gets a better product so it is win-win.

Benefits to the Customer

The most common benefit to the customer cited by the contractors was that the customers are able to save energy and money when they purchase the rebated equipment. A few of them also mention that the equipment is quieter than the lower efficiency models. The following responses were provided by the contractors when asked about the customer benefits of the program:

- "They save money on their energy bills."
- "They save money over the life of the product."
- "They save money by getting this equipment."
- "Some are very energy conscious and like to know they are doing something to help save energy."

- "It's more eco-friendly and quiet."
- "Cash and the efficient unit saves them money."
- "They're saving money and are more comfortable."
- "They are quieter than other units."
- "Getting a good line of equipment and a price reduction in monthly usage that results in lower monthly bills. It's also nice to know that a big company is willing to give back to its customers and help them."
- "They save money and reduce their energy consumption."
- "Some people are very environmentally conscious, and higher efficiency is better for the environment."
- "They get a lower electric bills."
- "They save money over the life of the unit."
- "They are quieter and obviously use less energy."
- "They start saving faster on their investment and they will save much more over the long run and they will also have the benefit of greater comfort."
- "Comfort, quieter operation, indoor air quality, savings, helping the environment and status."

All of the contractors indicated that there have been no problems with the equipment offered through the program, and that customer satisfaction with the equipment is high.

Program's Influence on Business Practices

We asked the contractors if their business would change if the Smart Saver program were no longer offered. We posed the question to the builders: "*If Smart Saver were discontinued, would you still offer the energy efficient options? If yes, how would you structure pricing differently to make up for the program loss?*" None of them said they would change their offerings, though many added that they would increase their prices to cover the loss of the incentive.

- "Yes, I would just have the price of the home increase proportionately."
- "I think so; I imagine we would just price the homes proportionally more than we currently do."
- "Yes we would still offer the same equipment, and we wouldn't change the pricing structure."

- "Our pricing would not change – it didn't change when we started the program."
- "I think we would offer the same lines, but we may install more less-efficient units as well and price the homes accordingly."
- "We would increase the price of the home by the amount of the rebate."
- "We wouldn't mention Duke Energy or the rebates."
- "I'm not sure, but I don't see any reason not to offer the same line."
- "I play fair and I have never changed pricing due to the program so my pricing structure would remain the same."

We also asked the contractors what percent of their customers are aware of the program and the incentive beforehand. The contractors reported between 5% and 50% of their customers were aware of the program and that about 60% took advantage of the rebate.

Table 3. Customer Awareness of Duke Energy's Smart Saver Program

	Percent		
	Mean Percent	**Range**	**Weighted Mean Percent[2]**
What percent of the customers are already aware of the program before you present it to them?	23.5%	5% - 50%	11.7%
What percent of the customers take advantage of the program after you present it and explain it to them?	59.4%	30% - 99%	55.0%
What percent of your customers end up going to a more efficient product than they would have on their own?	61.7%	25% - 100%	50.0%

Continuing Need for The Program

We asked the contractors if they thought that the program was still needed. All of the interviewed contractors said yes, for the following reasons:

- "Yes, people need incentives to buy the more efficient lines."
- "Yes, it is a good idea and people can gain from it."

[2] Weighted to account for the number of units rebated through the program.

- "Yes, customers are interested in the higher efficiency units."
- "Yes, it encourages builders to put high efficiency units in new homes; hopefully it will become required for all new homes to have high efficiency units so we are not consuming so much."
- "Yes, plenty of people are still totally unaware of the concept of energy conservation."
- "Yes, it encourages builders to provide options rather than just lowest cost to them."
- "Not everyone wants to buy something more expensive, so I think the incentive can swing people over to buy the better product."
- "It's very customer friendly, and makes a friendly atmosphere between Duke and the homeowners. I don't believe it affects total sales a whole lot, but it makes a friendly atmosphere."
- "Yes, it is a good program and promotes energy conservation."
- "Yes. Not enough builders are committed to building with high efficiency equipment and not enough builders are committed to building EnergyStar rated homes. If consumers increase their demand for such homes then builders will start…but builders must be incentivized or they will stay on the cheap side."
- "Yes, it gives the customer the added incentive to purchase the high efficiency items."
- "Sure, like I said before, if we can up-sell another 20 to 30% that is good for me and the consumers."
- "Absolutely, because people love to get money back from Duke. It gives them a great sense of "finally getting something back" from a huge entity that takes a large part of their household income every year. When I ask a client if they have Duke gas and electric they respond with a sigh and a roll of their eyes and when I tell them about the rebate that they are "entitled" to they smile. That is just good business for Duke."
- "I think it shows people that energy providers, in this case Duke Energy, are trying to conserve energy and make energy more affordable to their customers."

Recommended Changes to Smart Saver Program

At the end of the interview we asked the contractors if they had any final suggestions for improving the program or comments to provide to Duke Energy that were not already discussed during the interview. Only one contractor had a comment:

- "Feel free to raise the incentive amounts paid to customers and contractors at any time."

Section II: Energy Impact Analysis and Findings

Overview of Impact Evaluation Approach

The impact evaluation used an engineering-based approach to estimate program savings. The impact evaluation effort consisted of the following steps:

1. Analysis of Contractor Surveys
2. Analysis of program participation tracking system data
3. Development and calibration of prototypical building energy simulation models
4. Simulation of measure energy savings
5. Calculation of gross program energy and demand savings

Contractor Survey Analysis

A special contractor survey was conducted with random sample of 20 contractors in Indiana and Ohio. One of the purposes of the contractor survey was to assess the relative fraction of normal replacement vs. early retirement installations and to estimate the remaining life on early replacement units. Individual contractor responses were weighted according to the number of systems installed under the program. The results of the weighted survey responses are shown in Table 4 below:

Table 4. Contractor Responses to Early and Normal Replacement Questions

Question	Average response
What fraction of the units you replaced were replaced before the end of its useful life?	21.9%
What is the average number of years of useful life remaining on the replaced units?	2.9 years

According to the contractors surveyed, about 22% of the units replaced were early replacement. However, the amount of remaining life on those units was fairly low; on the order of 3 years. Even though the early replacement systems had a few more years of service left in them, the majority of the units replaced were either worn out or near the end of their service life.

Another objective of the contractor survey was to assess the bundling of other efficiency improvements directly related to the system replacement but not covered under the program. The survey probed the bundling of setback thermostats, improved duct insulation and duct leakage sealing with the Smart Saver system installation. The results of the survey are shown in Table 5 below:

Table 5. Contractor Responses to Measure Bundling Questions

Question	Average response
What fraction of the units you replaced were bundled with the following measures?	
Setback thermostat	35.6%

Duct insulation	6.5%
Duct leakage sealing	0.6%
When duct insulation is added, what is the insulation R-value?	2.5

According to the contractors, about 36% of the units on average were installed with a setback thermostat. Duct insulation and duct leakage sealing were rarely included. When duct insulation was included, the R-value averaged R-2.5[3]. Contractors reported sealing ductwork on less than 1% of the systems on average, only one contractor reported using an instrumented[4] duct leakage sealing approach. Thus, the effectiveness of the duct leakage sealing, when applied, is unknown.

Program Tracking System Analysis

Smart Saver program participation records covering the period through June, 2008 were obtained from Duke Energy. The data, delivered as a Microsoft Access database, contained customer name and address, installing vendor contact information, system type and efficiency, unit make and model number, rebate amounts, and so on. These data were examined to identify the number and types of customers and HVAC systems that participated in the program.

The distribution of equipment type listed in the program tracking database is shown in Figure 2

[3] The Smart Saver program does have a duct insulation upgrade requirement, but their website recommends upgrading duct insulation to R-19.
[4] One contractor reported using the Carrier Aeroseal approach, which measures duct leakage before and after sealing the system, thus verifying the effectiveness of the duct leakage sealing activity.

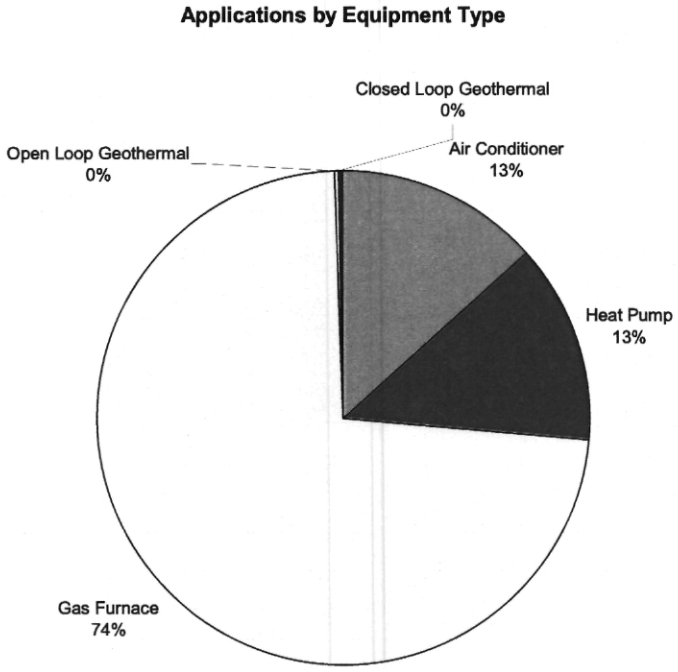

Figure 2. Applications by Equipment Type

Note, gas furnaces make up the majority of the applications listed in the program tracking database received from Duke Energy. Air conditioners and air source heat pump applications numbered about the same. A negligible number of geothermal heat pump applications were recorded. Air conditioners and some heat pumps were bundled with high efficiency furnaces, although they were recorded separately in the tracking database.

Prototypical Building Model Development

The impact analysis for the Smart Saver program is based on DOE-2.2 simulations of a set of prototypical residential buildings. The prototypical simulation models were derived from the residential building prototypes used in the California Database for Energy Efficiency Resources (DEER) study, with adjustments make for local building practices and climate. The prototype "model" in fact contains 4 separate residential buildings; 2 one-story and 2 two-story buildings. The each version of the 1 story and 2 story buildings are identical except for the orientation, which is shifted by 90 degrees. The selection of these 4 buildings is designed to give a reasonable average response of buildings of different design and orientation to the impact of energy efficiency measures. A sketch of the residential prototype buildings is shown in Figure 3.

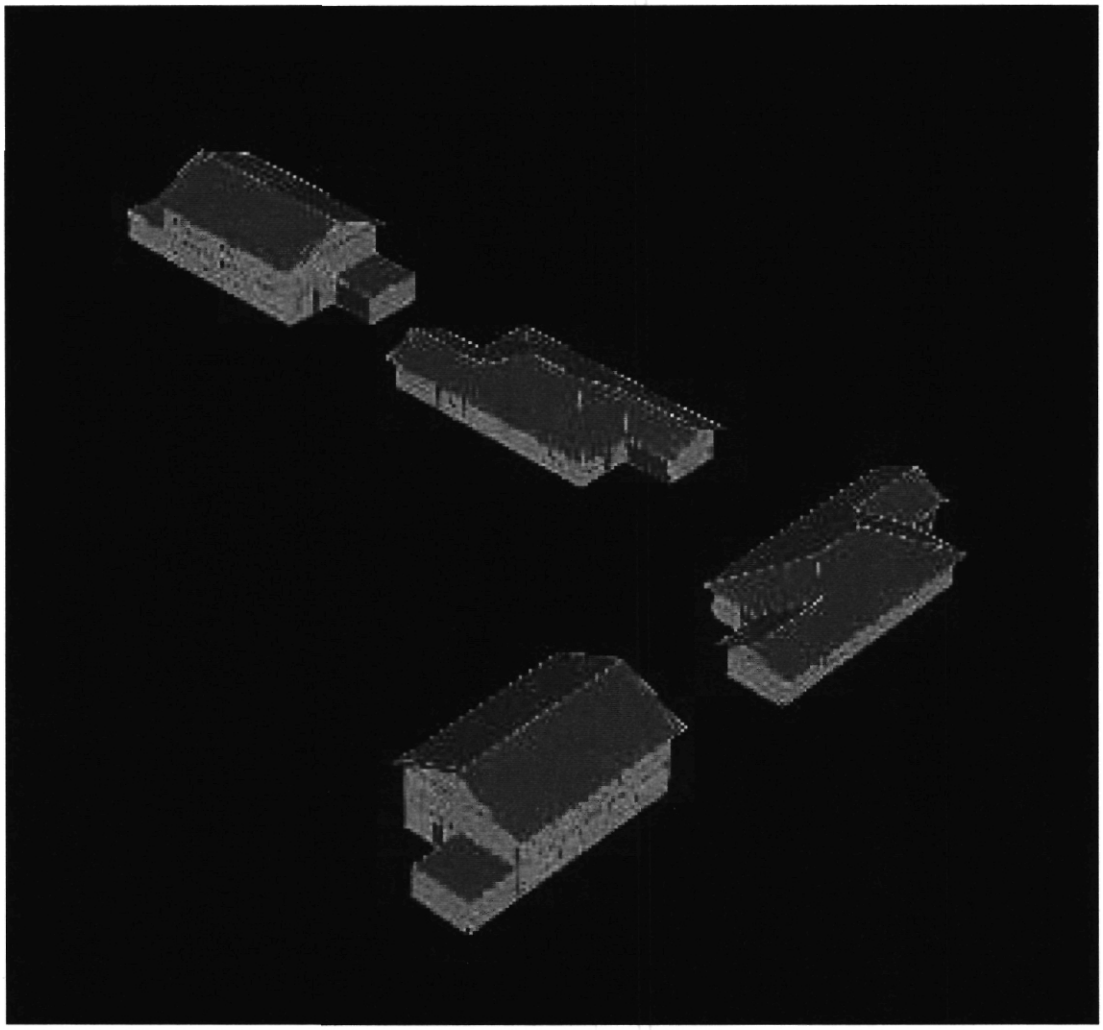

Figure 3. Computer Rendering of Residential Building Prototype Model

For this study, we added a basement to each building to create another set of 4 buildings, allowing us to simulate the impact of the energy efficiency measures on buildings with and without basements. Appliance saturation survey data collected in Indiana were used to refine the prototype models. An appliance saturation survey was not available for Ohio, so the Indiana data were used. These data were judged to be the best data available for the study. The general characteristics of the residential building prototype model are summarized in Table 6.

Table 6. Residential Building Prototype Description

Characteristic	Value
Vintage	Three vintages simulated – 1959 and older, 1960 – 1989, and 1990 and newer
Conditioned floor area	1 story house: 1465 SF (not including basement) 2 story house: 2930 SF (not including basement)
Wall construction and R-value	Wood frame with siding, R-value varies by system type and vintage
Roof construction and R-value	Wood frame with asphalt shingles, R-value varies by system type and vintage
Glazing type	Average of single and double pane; properties vary by system type and vintage
Lighting and appliance power density	0.51 W/SF average
HVAC system type	Packaged single zone AC or heat pump
HVAC system size	Based on peak load with 20% oversizing. Average 700 SF/ton
HVAC system efficiency	Baseline SEER = 13 for normal replacement; SEER = 10 for early replacement Furnace efficiency = 0.78 AFUE
Thermostat setpoints	Heating setpoint = 70, cooling setpoint =75. Night setback/setup of 5 degrees in runs with setback thermostats.
Duct location	Buildings without basement: attic Buildings with basement: basement
Duct surface area	Single story house: 390 SF supply, 72 SF return Two story house: 505 SF supply, 290 SF return
Duct insulation	Varies by system type and vintage
Duct leakage	20% total, evenly distributed between supply and return
Cooling season	Covington: April 29th – Oct 9th
Natural ventilation	Allowed during cooling season when cooling setpoint exceeded and outdoor temperature < 65°F. 3 air changes per hour

Several of the building characteristics were varied by vintage and HVAC system type to reflect the differences noted in the appliance saturation survey. These characteristics are described below:

Wall, Floor and Ceiling Insulation Levels

The appliance saturation survey contains questions about the presence of wall, floor and ceiling insulation. The penetration of wall, floor and ceiling insulation was tracked by building vintage and HVAC system type, and an average wall, floor and ceiling insulation level was established to represent the average insulation level in the population. In buildings with basements, the floor insulation levels shown below were applied to the basement walls. The assumed values for wall, floor and ceiling insulation and the assumed average R-value by vintage and HVAC system type is shown in Table 7 through Table 9.

Table 7. Wall Insulation R-Value Assumptions by Vintage and HVAC System Type

Vintage	HVAC type	Assumed R-value of insulated wall	Average R-value of insulated and non-insulated walls
1959 and older	A/C w/ gas furnace	11	5.26
	Heat pump	11	7.15
1960 - 1989	A/C w/ gas furnace	11	7.30
	Heat pump	11	8.54
1990 and newer	A/C w/ gas furnace	19	14.35
	Heat pump	19	16.05

Table 8. Ceiling Insulation R-Value Assumptions by Vintage and HVAC System Type

Vintage	HVAC type	Assumed R-value of insulated ceiling	Average R-value of insulated and non-insulated ceiling
1959 and older	A/C w/ gas furnace	19	14.71
	Heat pump	19	16.23
1960 - 1989	A/C w/ gas furnace	30	25.91
	Heat pump	30	25.48
1990 and newer	A/C w/ gas furnace	36	30.41
	Heat pump	36	34.09

Table 9. Floor Insulation R-Value Assumptions by Vintage and HVAC System Type

Vintage	HVAC type	Assumed R-value of insulated floor	Average R-value of insulated and non-insulated floor
1959 and older	A/C w/ gas furnace	11	2.19
	Heat pump	11	3.31
1960 - 1989	A/C w/ gas furnace	11	3.71
	Heat pump	11	4.03
1990 and newer	A/C w/ gas furnace	19	8.46
	Heat pump	19	5.91

Duct Insulation

The appliance survey asked a question about the presence of duct insulation. The fraction of the respondents that indicated the presence of duct insulation by building vintage and HVAC system type was used to establish baseline duct insulation levels. Note, the assumed R-value for insulated ductwork in the general population is R-4.9, corresponding to standard 1in. duct wrap or insulated flex duct.

Table 10. Duct Insulation R-Value Assumptions by Vintage and HVAC System Type

Vintage	HVAC type	Assumed R-value of insulated ducts
1959 and older	A/C w/ gas furnace	4.9
	Heat pump	4.9
1960 - 1989	A/C w/ gas furnace	4.9
	Heat pump	4.9
1990 and newer	A/C w/ gas furnace	4.9
	Heat pump	4.9

Windows

The appliance survey included questions about the presence of dual pane or storm windows, low-e windows and window film. The glazing U-value and solar heat gain coefficient (SHGC) assumptions for these systems are shown in Table 11. Note, the presence of window film was assumed to result in a 50% reduction in SHGC in the small number of buildings affected.

Table 11. Basic Glazing Property Assumptions

Property	Single	Double	Low e
U-value (Btu/hr-F-SF)	1.04	0.55	0.45
Solar heat gain coefficient	0.86	0.76	0.65

The penetration of dual pane, low-e and window film features by building vintage and HVAC system type were applied to the basic window properties to develop a set of glazing property assumptions, as shown in Table 12.

Table 12. Glazing Property Assumptions by Vintage and HVAC System Type

Vintage	HVAC type	U-value	SHGC
1959 and older	A/C w/ gas furnace	0.63	0.88
	Heat pump	0.66	0.89
1960 - 1989	A/C w/ gas furnace	0.62	0.87
	Heat pump	0.62	0.88
1990 and newer	A/C w/ gas furnace	0.65	0.87
	Heat pump	0.60	0.87

Model Calibration

The DOE-2 models were refined using monitored data supplied by Duke Energy. Dent Elite Pro true electric power meters were installed on the furnace/air handler fans at a sample of sites. Time series measurements of fan power before and after the Smart Saver system installation were made. The data loggers were rotated from site to site, with some systems monitored during the heating season while other systems monitored during the cooling season. Note, only the fan power was monitored; total unit power was not included in the monitoring activity. The purpose of the monitoring was to assess the fan power differences resulting from including an electronically-commutated (EC) motor as a program requirement. EC motors are much more efficient than standard motors, improving the SEER rating of an air conditioner or heat pump. The EC motor also allows for fan speed modulation, saving additional fan energy during part-

load operation. Homeowners may elect to run their systems with continuous low speed fan operation regardless of heating or cooling needs to improve comfort and indoor air quality. Under this type of control, the energy savings from EC motor installation are reduced due to longer operating hours.

The monitored data were analyzed to determine the fan operation (continuous vs. cycling with call for heat/cool) and fan power per ton of cooling capacity in the pre and post installation case. The results of the monitored data analysis are shown in Table 13.

Table 13. Summary of Furnace Fan Motor Monitoring

Unit Monitored	Cycling Fan Fraction	Continuous Fan Fraction	Average Fan Power at Full Flow (kW/ton)
Existing (Pre)	0.66	0.33	0.155
Replacement (Post)	0.59	0.41	0.095

The existing units were only slightly less likely to operate with a continuous fan (33% of existing units vs. 41% of replacement units). While continuous fan operation is a feature of systems with EC motors, only 41% of the systems monitored used the feature.

The average fan power at full flow for the existing units was 0.155 kW/ton, while the average fan power at full flow for the replacement units was 0.095 kW/ton, representing a savings of 38% in full load fan power. Additional fan savings due to reduced speed operation were analyzed using the DOE-2 simulation models described in the next section.

Measure Savings Analysis

The prototype model was simulated with a variety of efficiency measures to develop a series of savings estimates. Air conditioning systems were simulated with a baseline SEER 13 air conditioner and with a series of high efficiency air conditioners ranging from SEER 14 to SEER 17. Heat pump systems were simulated with a baseline SEER 13 heat pump and with a series of high efficiency heat pumps ranging from SEER 14 to SEER 18. Standard heat pumps were simulated with electric resistance backup, while dual fuel heat pumps were simulated with a gas furnace backup.

The basic efficiency assumptions for each of the air conditioner and heat pump measures are shown in Table 14. These data were taken from an extensive study of residential air conditioners and heat pumps conducted for the California DEER update study.[5] Besides these basic efficiency parameters, an extensive set of performance curves were developed representing mean performance of production units in each SEER category. These performance curves describe unit efficiency as a function of outdoor temperature, part-load efficiency, and so on. Fan power data were taken directly from the metering study. These curves were also applied to air conditioner and heat pump measures in each SEER category.

[5] Itron, 2005. "2004-2005 Database for Energy Efficiency Resources (DEER) Update Study, Final Report," Itron, Inc., J.J. Hirsch and Associates, Synergy Consulting, and Quantum Consulting. December, 2005. Available at http://eega.cpuc.ca.gov/deer

Table 14. Baseline and Measure Performance Assumptions

Type	Efficiency	Fan Type	EER	Sensible Heat Ratio	Air flow (CFM/ton)	Heating COP
Air conditioner	SEER 10	Std 1-speed	9.2	0.67	362	
	SEER 13	Std 1-speed	11.1	0.75	376	
	SEER 14	EC motor	12.2	0.78	395	
	SEER 15	EC motor	12.7	0.7	319	
	SEER 16	EC motor	11.6	0.81	409	
	SEER 17	EC motor	12.3	0.8	422	
Heat pump	SEER 10	Std 1-speed	9.0	0.75	416	3.1
	SEER 13	Std 1-speed	11.1	0.725	337	3.28
	SEER 14	EC motor	12.2	0.73	352	3.52
	SEER 15	EC motor	12.7	0.81	436	3.74
	SEER 16	EC motor	12.1	0.78	400	3.48
	SEER 17	EC motor	12.5	0.81	430	3.26
	SEER 18	EC motor	12.9	0.8	428	3.66

This set of measures resulted in a simulation run matrix as follows:

Category	Number	Description
Building Vintage	3	1959 and older, 1960 – 1989, and 1990 and newer
Foundation type	2	With and without basement
HVAC systems	3	Air conditioner with gas furnace Standard heat pump with electric backup Dual fuel heat pump
Air conditioner efficiency levels	7	Base and 5 measures
Standard heat pump efficiency levels	8	Base and 6 measures
Dual fuel heat pump efficiency levels	8	Base and 6 measures
Furnace fan control	2	Continuous and intermittent
Tstat type	2	Setback and no setback

The set of simulations described above were conducted for Covington, Kentucky, which is the closest weather data site to Cincinnati, Ohio. The results for each of the vintages were weighted according to the relative frequency of each vintage in the overall population. The simulated savings were normalized per ton of cooling capacity for cooling systems and per 1000 square feet of heated floor space for furnaces only. A summary of the simulation results is shown in Table 15. Savings results are shown for each SEER class and air conditioner or heat pump type. A single value for air conditioners and heat pumps was calculated using the relative participation weights for units in each SEER class. Air source and dual fuel heat pumps were combined into a single category representing all heat pumps. Furnace savings were broken out for high AFUE furnaces and combined high AFUE with electronically commutated motors (ECM).

Table 15. Normalized Measure Savings from Prototype Simulations for All Vintages

Measure	Covington

	kWh/ton	kW/ton	Therm/ton
Gas_seer14	356	0.181	62
Gas_seer15	431	0.215	60
Gas_seer16	584	0.315	55
Gas_seer17	637	0.330	55
Hp_seer14	1077	0.133	0
Hp_seer15	1087	0.200	0
Hp_seer16	1473	0.318	0
Hp_seer17	1539	0.266	0
Hp_seer18	1591	0.323	0
Dfhp_seer14	683	0.133	30
Dfhp_seer15	909	0.200	23
Dfhp_seer16	1231	0.318	25
Dfhp_seer17	1317	0.266	24
Dfhp_seer18	1359	0.323	25
All AC	408	0.208	61
All Heat pumps	1106	0.192	6
Measure	**kWh/kSF**	**kW/kSF**	**Therm/kSF**
Hi effic gas furnace	0	0.000	98
Gas furnace plus ECM	356	0.042	91

Note, the peak demand savings are not proportional to the difference in SEER, due to different strategies used by manufacturers to achieve a particular SEER rating and the influence of those strategies on energy efficiency under peak conditions. For example, units using multiple compressors can have high SEER ratings, while having relatively poor efficiency under peak conditions. Heat pumps save energy for both heating and cooling, thus the overall annual energy savings are greater for heat pumps than air conditioners. Also, heat pumps have different performance characteristics than air conditioners, causing differences in the demand savings within each SEER class.

Program Energy and Demand Savings

Gross and Net Energy and Demand Savings

The gross unit energy and demand savings estimates described in the previous section were applied to the program tracking system. The HVAC unit make and model data were used to determine the unit nominal cooling capacity. The unit type and SEER designations were used to assign the appropriate gross savings by SEER category. The savings were totaled across the participants listed the program tracking system. The net to gross ratio of 0.628 previously described was applied to the gross savings, resulting in estimates of gross and net energy and demand savings as shown in Table 16.

The program total savings are based on 675 air conditioner applications, 673 heat pump applications, and 3,667 high efficiency gas furnace applications. Each of the air conditioners and 160 of the heat pumps were bundled with a high efficiency furnace; the remaining furnace applications were stand-alone.

Table 16. Program Gross and Net Savings Estimates

	kWh	kW	Therm
Gross program savings	3,315,148	933	1,019,463
Net program savings	2,081,913	586	640,223

Energy and Demand Effective Useful Lifetime

The effective useful lifetime of all the measures installed through the Smart Saver program is 15 years according to the program design documentation, so energy and demand savings remain strong throughout the next 15 years. Kilowatt demand reduction will remain steady at 586 kW, although some units may fail before 15 years, so some drop off can be expected (though not displayed in Figure 4. Kilowatt hour and therm savings figures follow.
Figure 4

Figure 4. Lifetime kW Impact of the Smart Saver Program Participants

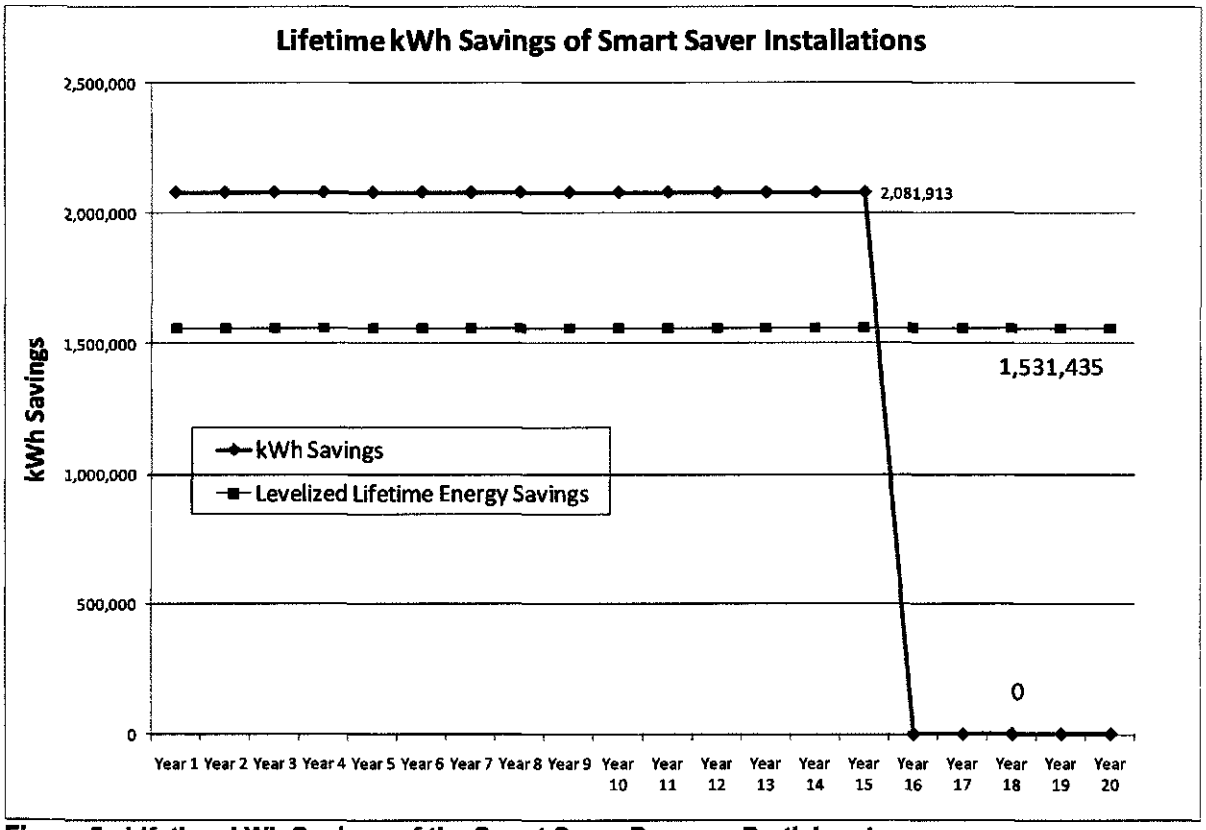

Figure 5. Lifetime kWh Savings of the Smart Saver Program Participants

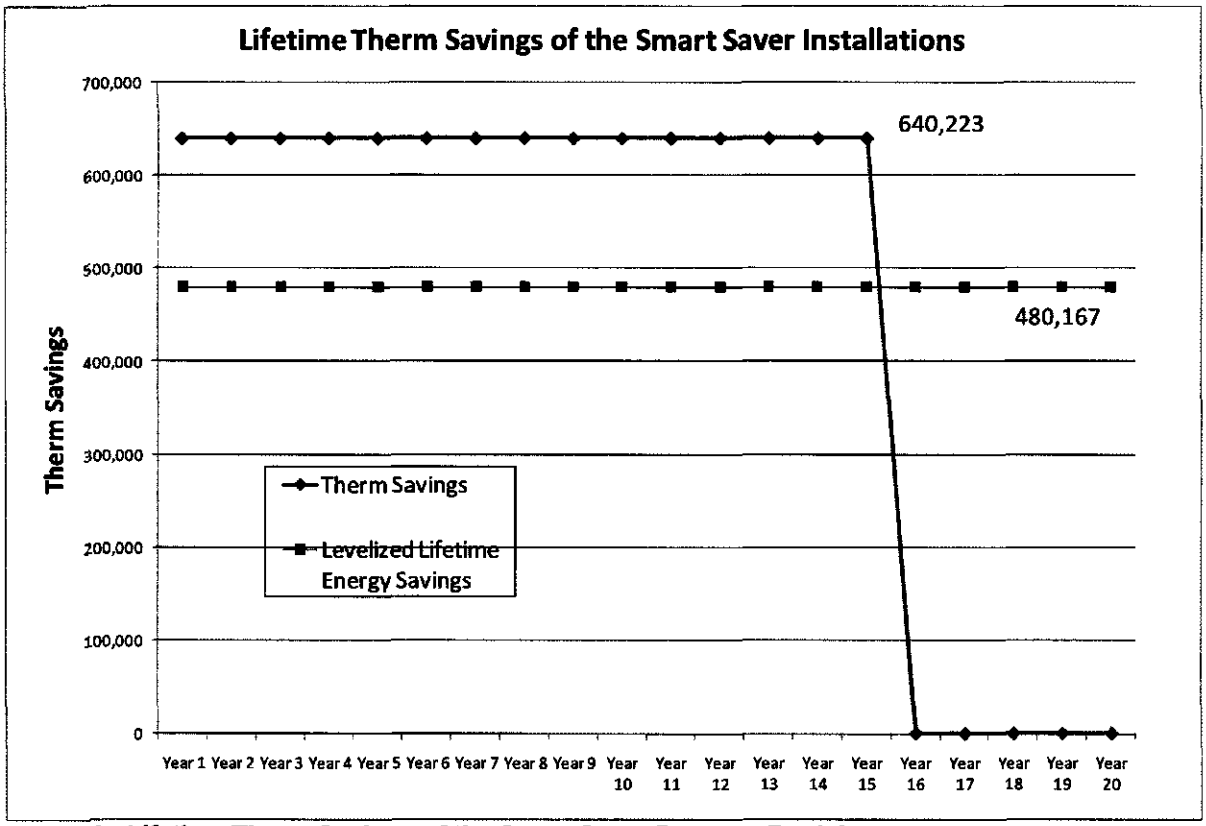

Figure 6. Lifetime Therm Savings of the Smart Saver Program Participants

Section 3: Participant Survey Results

This section presents the results of the participant telephone survey that was conducted with 100 randomly selected participants of the Smart Saver program in Ohio.

Selected Participants: Rebated Items and Purchasing Information

The appliance that was rebated for the selected participants is presented in Table 1 below. Most (64%) of the sample installed a new gas furnace through the Smart Saver program.

Table 17. Rebated Appliances of Selected Participants

Rebated Appliance Purchased			
Heat Pump	Air Conditioner	Geothermal Heat Pump	Gas Furnace
16	19	1	64

Their motivating factors are presented in Table 18 below. The most common responses was that the old equipment didn't work (n=43) or that it wasn't working properly (n=29), meaning that 72% of the participants purchased the new equipment as a "replace on failure" purchase. They did not replace the equipment just to move to a higher efficiency unit. Only 18 indicated that their motivating factor was to reduce energy costs.

Table 18. Motivating Factors for Purchasing High Efficiency Equipment

Motivating Factors for Purchasing High Efficiency Equipment N=100, multiple responses allowed	
Old Equipment Didn't Work	43%
Old Equipment Worked Poorly	29%
Wanted to Reduce Energy Costs	18%
Other	14%
Program's Incentive	4%
Recommendation of Someone Else	3%
Recommendation from Dealer/Retailer/Contractor/Builder	1%
Information Provided by the Program	1%
Recommendation from other Utility Program	1%

In many (44) cases, the replaced appliance was between 20 and 30 years old. One person said that the appliance they replaced was less than 5 years old. However, the appliance was not working properly.

Of the 18 surveyed that indicated that they wanted to reduce energy costs, all but two replaced items that were still in working condition. Six appliances were in "fair condition", three were in "good condition", and four were in "poor condition".

Of all respondents, 50% said that the replaced appliance was not working. The working condition of the replaced appliances that were working are shown in Figure 8. Only 12 units were in good working condition, while most of them (n=22) were in poor working condition.

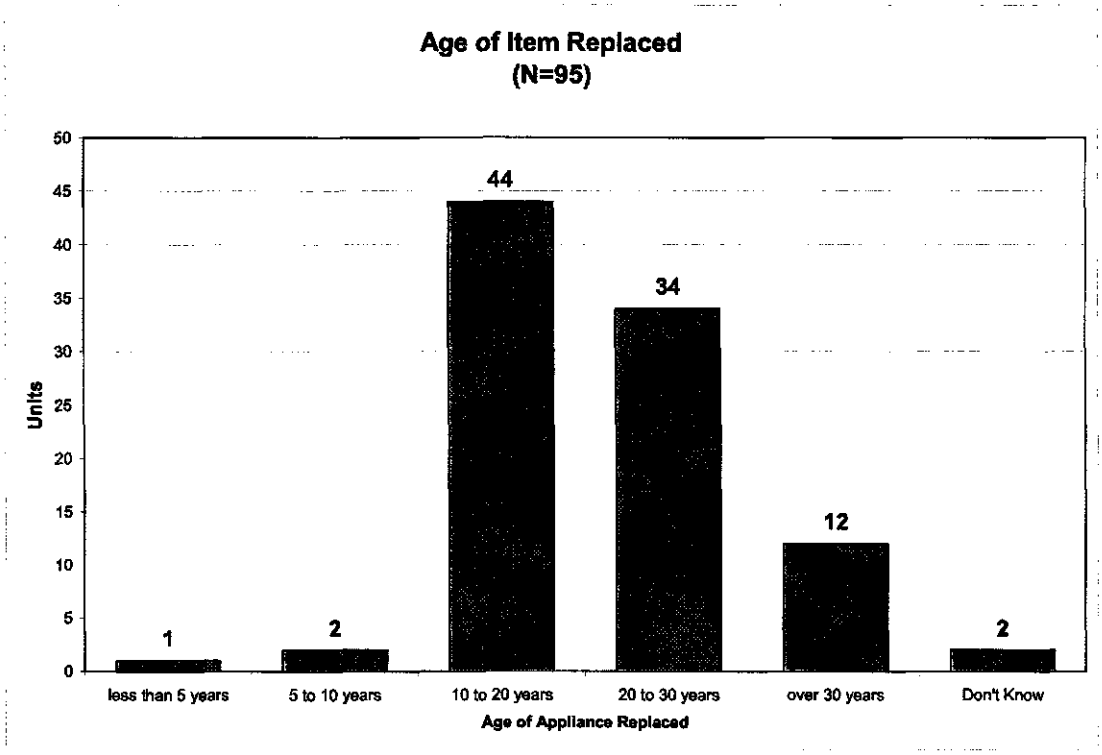

Figure 7. Age of Appliance Replaced

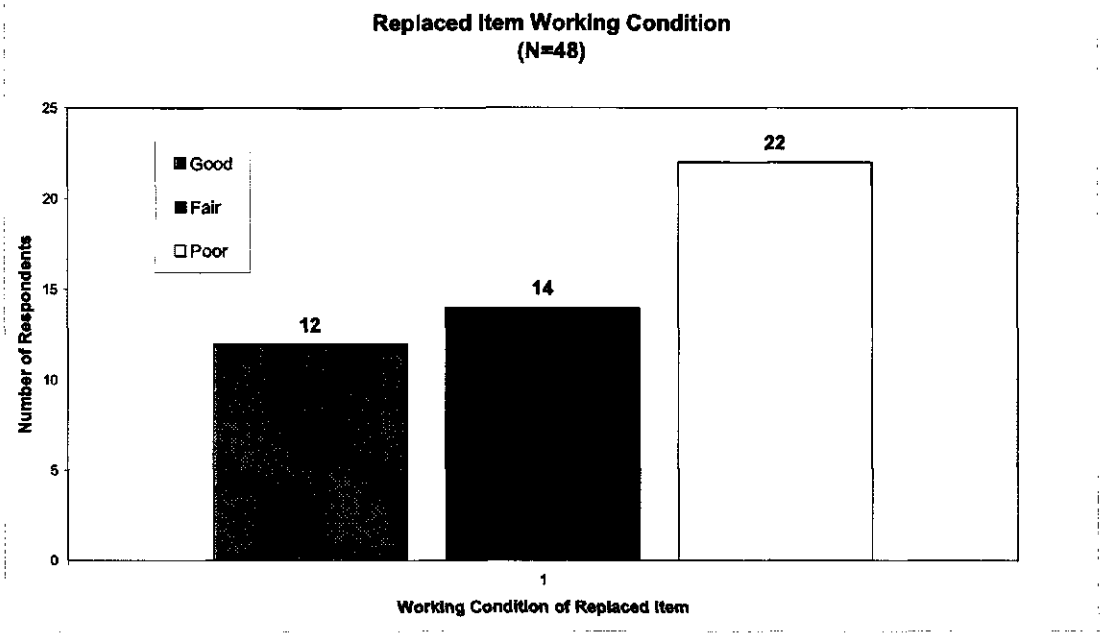

Figure 8. Replaced Item Working Condition

Participant Satisfaction

Overall, participant satisfaction with the Smart Saver program is high, with no program components getting a mean score below 8 on a 10-point scale. The lowest score was for the number of options in program-covered units and efficiency options with an 8 on a 10-point scale. However, the highest score of 9.4 is for the performance of the new high efficiency unit.

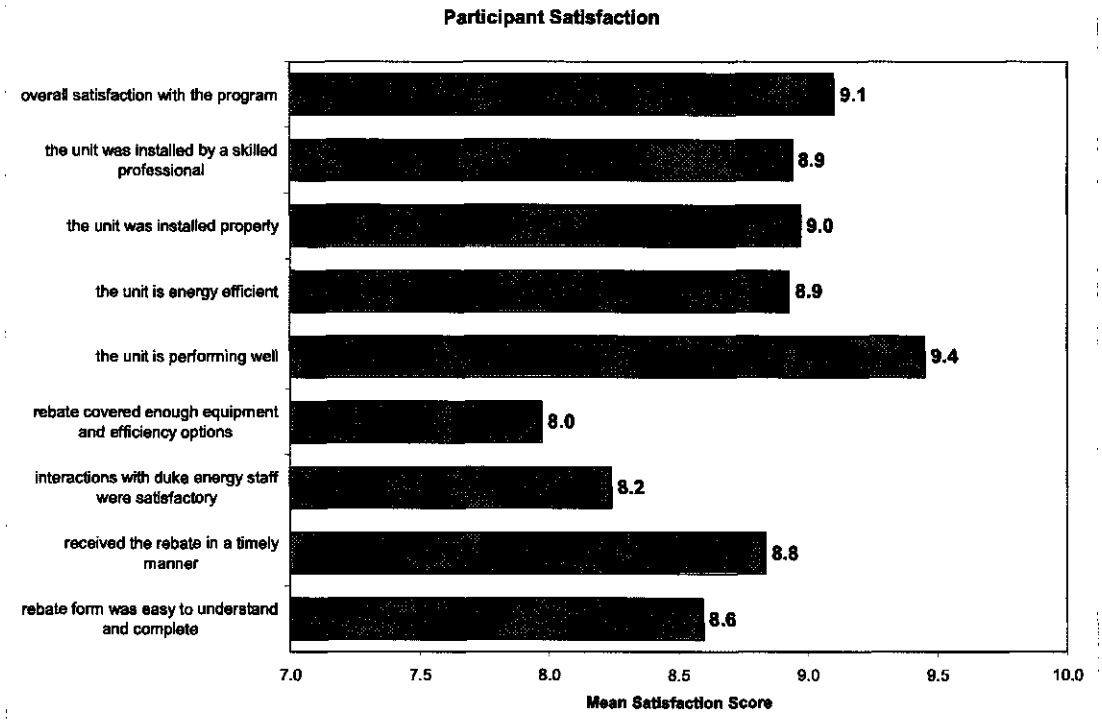

Figure 9. Participant Satisfaction with the Smart Saver Program

If surveyed participants gave a score below 8, we asked them how the program component could be improved. The responses are bulleted below:

Issues with Ease of Rebate Completion Form:

- It was somewhat time consuming
- It was difficult to acquire some of the needed information
- Some questions were applicable only to the dealers, making it tough for consumers to fill out

Issues with Rebate Timeliness:

- Took too long (4x)
- Was initially forgotten
- Had to call the vendor to send me the rebate
- Still haven't received it

Issues with Interactions with Duke Energy Staff:

- They don't understand buying gas from different places
- They need to respond more quickly
- I wasn't aware of the program before talking to the vendor
- The communication concerning the program was ok, but overall our communication is less than desirable.

Issues regarding Rebate Coverage:

- Offer a larger rebate or more options (5x)
- Variable speed vs. Non-variable speed DC Motor is too restrictive
- Didn't know it was taxable

Issues regarding Unit Efficiency:

- Expecting to see more savings over old unit
- Lack of evidence in the bill
- First few months even more expensive than old unit
- Not efficient enough to get credit on taxes

Issues regarding Unit Installation:

- Required a trip back to adjust something (3x)
- It was installed on New Year's Eve and a few things were forgotten
- Unit was missing a valve and not functioning properly
- Improper installation
- Took two months to properly wire thermostat
- Didn't check lines properly and caused a gas leak

Issues regarding Unit Installer/s:

- Improper installation (2x)

Issues hindering Overall Satisfaction:

- Would like a larger rebate (4x)

Additional Services Desired:

- Would like a larger rebate (16x)
- Offer rebates on a wider array of energy saving products (9x)
- Information regarding disposal of CFLs

- Lower rates (5x)
- An assessment of how much is actual being saved using certain products compared to less efficient models
- Lower rates for people who use less energy during peak times
- Faster delivery
- More information
- Incentives to convert to CFLs
- Get rid of automated operator on customer service line

Desired Changes to the Program:

- Larger rebate
- Change qualifications to match variable speed blower
- More publicity

Measures to Increase Participation:

- Increase rebate
- Allow contractors to advertise it
- Fliers in bills
- Inform retailers
- More advertising
- Calculate exact savings per household
- Give customers a percentage of their savings
- Add rebates for household appliances

What people liked most about the Program:

- The rebate
- Ease of participation
- Timeliness
- That it exists
- Helps vendors sell units
- Decrease in energy bills
- Brings attention to high efficiency units
- New/more features on appliances

What people liked least about the Program:

- The rebate could have been larger
- Lack of information
- The filters the new furnace requires
- Had to prod Duke to receive the rebate
- Lack of publicity
- Not enough options

- Paperwork
- Not enough vendors are involved
- Time it took to receive the rebate

In reviewing the above comments it is important to keep in mind that the vast majority of participants are very satisfied with the program. The comments noted above are those of people who indicated satisfaction at 8 or lower for a specific condition.

Section 4: Freeridership and Spillover

This section explores freeridership and spillover in the Smart Saver program. To estimate freeridership, we spoke with contractors, builders, and 100 randomly selected participants. Spillover estimates are based on the randomly selected participants' responses. In order to calculate freeridership and spillover and apply the estimates to the energy savings, there is a need to consider other factors such as self-selection and false response bias. These biases are discussed below, followed by the freeridership and spillover estimates.

Self-Selection and False Response Bias

There are substantial risks associated with relying on self-reported behavioral changes, because the foundation of the savings estimates are based solely on the participant's responses, with no means within the evaluation budget to verify that the respondent has installed the measures and are using them effectively or to document past installation or building/construction records.

There are two main sources of bias with these types of surveys that directly impact the conclusions drawn from the responses. These sources of bias are Self-Selection Bias and False Response Bias. There is also an issue regarding the accuracy of the baseline energy use conditions used by the evaluation contractor to estimate savings in that many of these conditions need to be based on assumptions about the participant population, rather than on measurements. These three conditions significantly impact the evaluation contractor's ability to provide accurate estimates of energy impact. These issues are discussed in more detail in the following paragraphs.

Self-Selection Bias

For this evaluation, we are using the self selection bias value of 29.9% on spillover estimates and 10% for adjusting freeridership estimates. This spillover value was estimated during a previous evaluation and is considered applicable for the Smart Saver spillover estimate as well. However, to guard against over estimating savings for the program's covered measures we use a more conservative 10% for adjusting freeriders impacts.

Self-Selection Bias

The participant survey effort contacted 182 participants. Of these 82 refused to participate in the survey and 100 completed the survey. This provides a response rate of 55%, a fairly high number for a participant survey. This number indicates that 45% of participants elected not to participate in the survey. These people self-select themselves not to participate in the survey because, for any number of reasons, they are less interested in the subject matter of the contact. That is, they have a bias against the subject of the contact more than those who completed the survey. In this case the respondents are more interested in the subject that those who did not participate and are more likely to have taken the action on their own, than people who are less interested in the subject. As a result we estimate the self-selection to be in the neighborhood of ¼ to ½ the non-response level. In order to not over-estimate savings we are setting the self-selection bias at ¼ off the non-response rate, or about 10%.

False Response Bias

False Response Bias is a problem with many self-reporting surveys. The participants respond not with the truth, but with the socially acceptable answer. In short, for any number of reasons they do not convey the entire story about the reasons for taking an action. In the case of this program, where the smarter or more self-serving choice is to go with the product that saves money, the bias tends to under-estimate the program as the cause of the action taken. That is, they indicate that they would have taken the action without the program, not necessarily because they would have, but because to report that they would not have made the wise choice without the program makes them appear to be illogical or non-self-serving. In short, it makes them appear to be not very smart. In the field of survey research, questions that make respondents appear to be illogical need to be adjusted for false response bias, often called social acceptance bias. False response bias can typically be as large as 50% or as low as 10%. To guard against over estimating program savings we elected to use a 20% bias adjustment and stay on the lower end of the scale.

Freeridership

We asked the contractors to estimate the level of freeriders. The responses we obtained all centered around a mean score of between 30-35% freeridership for the Smart Saver program. That is, the contractors indicated that about 30% to 35% of their sales are to people who would have purchased the more efficient line without the program rebates with 65% to 70% of sales going to people who have been convinced to move-up to the more efficient line.

The 100 sampled participants indicated a higher level of freeridership. Participant responses indicated that about 58.2 percent of sales would have been made without the program. However, this response is not adjusted for survey self selection or for false response bias. Adjusting the survey responses to account for these two biases suggests that the freeridership value is about 42%. This adjustment includes a 10% self selection bias to account for people more interested in energy efficiency to self-select themselves to take the survey and a 20% false response bias.

To arrive at a final freerider estimate we applied the average contactor assessment freerider rate of 32.5%, plus the participant response rate adjusted for self-selection bias (10%) and false response bias of 20% and averaged these two numbers. As a result the final freerider rate is estimated at (32.5 + (58.2 x .9 x .8))/2 or 37.2%. That is, about 37.2% of gross program savings would have been captured by the participants without the program. This estimate represents a reasonable estimate of the net effects adjustment for the estimated gross program savings without conducting on-site verification visits, conducting in-depth interviews with program participants or examining pre-program building and sales records of the participating contactors.

The method used to calculate unadjusted freeridership from survey responses is presented in the table below. Questions are listed in the table in the order they were asked. The first three questions were leading questions to get the participant to think about when they purchased the appliance. The following questions and their responses provided the information to estimate freeridership.

Question	Responses

At the time that you first heard about the Smart Saver Rebate from Duke Energy, had you...?	Already been thinking about purchasing a new item	Already begun collecting information about item	Already decided to buy item	Don't Know
Freeridership -->	no effect			
Just to be sure I understand, did you already have specific plans to install a high-efficiency <rebated item> before you heard about Duke's program or their rebate?	Yes	No		Don't Know
Freeridership -->	no effect			
Did you have to make any changes to your existing plans in order to receive this rebate through the Smart Saver Program?	Yes	No		Don't Know
Freeridership -->	no effect			
If the rebate from Duke Energy's Smart Saver Program had not been available, would you still have:	Purchased a new	Purchased the same efficiency of	Purchased the <rebated item> at the same time that you did?	Purchased the <rebated item> earlier than you did, or later? How much <earlier/later>?
Freeridership -->	no = not a FR; yes - move on	no = not a FR; yes - move on	no: 50%; yes: 100%	25% if earlier, FR if later
If the rebate from the Smart Saver Program had not been available, would you have done anything else differently?	Yes	No		Don't Know
Freeridership -->	no effect			
On a 0 to 10 scale, with 0 being not at all likely and 10 being very likely, how likely is it that you would have bought a less efficient <rebated item> if you had not received any rebate from the program?	Scale of 1 to 10			
Freeridership -->	adjust FR down by factor: 1=10% decrease, 2=20% decrease, etc.			

If I had not had any assistance from the program, I would have paid the additional <$200-$600> to buy the <rebated item> on my own?	On a scale of 0 to 10, where 0 is strongly disagree and 10 is strongly agree, how much do you agree with this statement?
Freeridership -->	adjust FR up by factor: 1, 2, 3 = not a freerider; 4-7 = 50%; 7 = 70%, 10 = 100% freerider
The rebate from the Duke Energy Smart Saver Program was a critical factor in my decision to purchase the high efficiency/energy efficient product.	On a scale of 0 to 10, where 0 is strongly disagree and 10 is strongly agree, how much do you agree with this statement?
Freeridership -->	adjust FR down by factor: 1, 2, 3 = no change; 4-5 = 10%; 6-8=25%, 9-10 = 50% decrease freerider
I would have bought a <rebated item> within [a year/2 years] of when I did even without the rebate from the Duke Energy Smart Saver Program.	On a scale of 0 to 10, where 0 is strongly disagree and 10 is strongly agree, how much do you agree with this statement?
Freeridership -->	no effect
The rebate from the Duke Energy Smart Saver Program was not necessary to cause me to purchase the higher efficiency product when I bought my new <rebated item>.	On a scale of 0 to 10, where 0 is strongly disagree and 10 is strongly agree, how much do you agree with this statement?
Freeridership -->	adjust FR up by factor: 1, 2, 3 = not a freerider; 4-7 = 50%; 7 = 70%, 10 = 100% freerider

Using these responses, freeridership is estimated at 58%. However, when the bias adjustments are applied, the value drops to 37.2%, which matches with the estimates provided by the contractors and builders. This is the freeridership level that is applied to the energy savings estimates.

Spillover

The contractors we talked to did not report that sales to their customers spill over into additional sales. However, of the 100 randomly selected participants that completed the survey, 27 of them indicated that as a result of their participation in the Smart Saver program, they installed 34 additional energy efficient measures in their homes. Table 19 through Table 21 present the reported measures installed and the gross and net energy impacts associated with these measures in a typical home. A summary of impacts is presented in Table 22. Gross spillover impacts have been reduced by the 29.9% false response bias and the 20% self-reporting bias, both discussed above. Again, these are additional measures that the participants indicated they had taken because of, at least in part, their participation in the program. That is, the program influenced their energy efficiency-related behaviors beyond the rebated item. These savings are not direct program savings, but can be thought of as additional benefits of the program beyond those counted by the program. We are not suggesting that these savings be counted toward the program, but report these impacts as potential added savings influenced by the program.

The most common measure installed is the CFL. Eleven out of 100 participants reported installing CFLs in their home as a result of the influence of the Smart Saver program. These 11 participants reported an average of 13 bulbs installed that were influenced by the program. Five of the 100 surveyed participants that installed a high efficiency furnace through the Smart Saver program also installed new high efficiency air conditioners, resulting in high spillover impacts from these 5 participants. The new refrigerators and new water heaters also provided for energy impact spillover from the Smart Saver program.

Table 19. Program Spillover: Installed Items and kW Impacts

Measure	# of participants installing	Gross kW Impact Per Install	Net kW Impact for 100 Surveyed	Gross kW Impact for population N=5,015	Net kW Impact for Population N=5,015
CFLs (mean of 13 bulbs)	11	0.066	0.364	36.409	18.241
new AC	5	0.902	2.260	226.177	113.314
New water heater	5	0.158	0.396	39.619	19.849
Showerhead	3	0.039	0.059	5.868	2.940
new refrigerator	2	0.210	0.210	21.063	10.553
New doors	2	0.005	0.005	0.502	0.251
new furnace	1	0	0.000	0.000	0.000
insulated garage door	1	0.031	0.016	1.555	0.779
insulated attic	1	0.196	0.098	9.829	4.925
new windows	1	0.206	0.103	10.331	5.176
Faucet aerators	1	0.001	0.001	0.050	0.025
New washer	1	0.080	0.040	4.012	2.010
TOTAL	27		3.551	355.413	178.062

Table 20. Program Spillover: Installed Items and kWh Savings

Measure	# of participants installing	Gross kWh Savings Per Install	Net kWh Savings for 100 Surveyed	Gross kWh Savings for population	Net kWh Savings for Population

				N=5,015	N=5,015
CFLs (mean of 13 bulbs)	11	759	4,183	418,702	209,770
new AC	5	1,361	3,409	341,271	170,977
New water heater	5	531	1,330	133,148	66,707
Showerhead	3	334	534	53,410	26,758
new refrigerator	2	1,509	1,512	151,353	75,828
New doors	2	18	18	1,805	905
new furnace	1		0	0	0
insulated garage door	1	77	39	3,862	1,935
insulated attic	1	346	173	17,352	8,693
new windows	1	227	114	11,384	5,703
Faucet aerators	1	1	0	27	13
New washer	1	192	96	9,629	4,824
TOTAL	27		11,408	1,141,942	572,113

Table 21. Program Spillover: Installed Items and Therm Savings

Measure	# of participants installing	Gross Therm Savings Per Install	Net Therm Savings for 100 Surveyed	Gross Therm Savings for population N=5,015	Net Therm Savings for Population N=5,015
CFLs (mean of 13 bulbs)	11	-1.1	-6	-607	-304
new AC	5	0	0	0	0
New water heater	5	25.9	65	6,494	3,254
Showerhead	3	17.3	26	2,603	1,304
new refrigerator	2	-1.9	-2	-191	-95
New doors	2	0.4	0	40	20
new furnace	1	16.3	16	1,635	819
insulated garage door	1	1.4	1	70	35
insulated attic	1	5.3	3	266	133
new windows	1	-6.9	-3	-346	-173
Faucet aerators	1	1.9	1	95	48
New washer	1	2.7	1	135	68
TOTAL	27		102	10,195	5,108

Table 22. Summary of Spillover Impacts

Impact	kW	Annual kWh	Annual Therms
Gross	355.413	1,141,942	10,195
Net	178.062	572,113	5,108

Effective Useful Life of Spillover Impacts

The measures listed in the tables above vary in their effective useful lifetime. The table below shows the effective useful lifetimes in years that were used in calculating overall spillover impacts. Graphic displays of the impacts over the next 20 years are below.

Measure	Effective Useful Lifetime (years)
CFLs (mean of 13 bulbs)	5
new AC	15
New water heater	15
Showerhead	10
new refrigerator	12
New doors	20
new furnace	20
insulated garage door	20
insulated attic	20
new windows	20
Faucet aerators	10
New washer	12

The kilowatt impacts of the spillover measures remain high and steady for the next 15 years, with a drop from about 75 kW to just over 10 kW for the last 5 years.

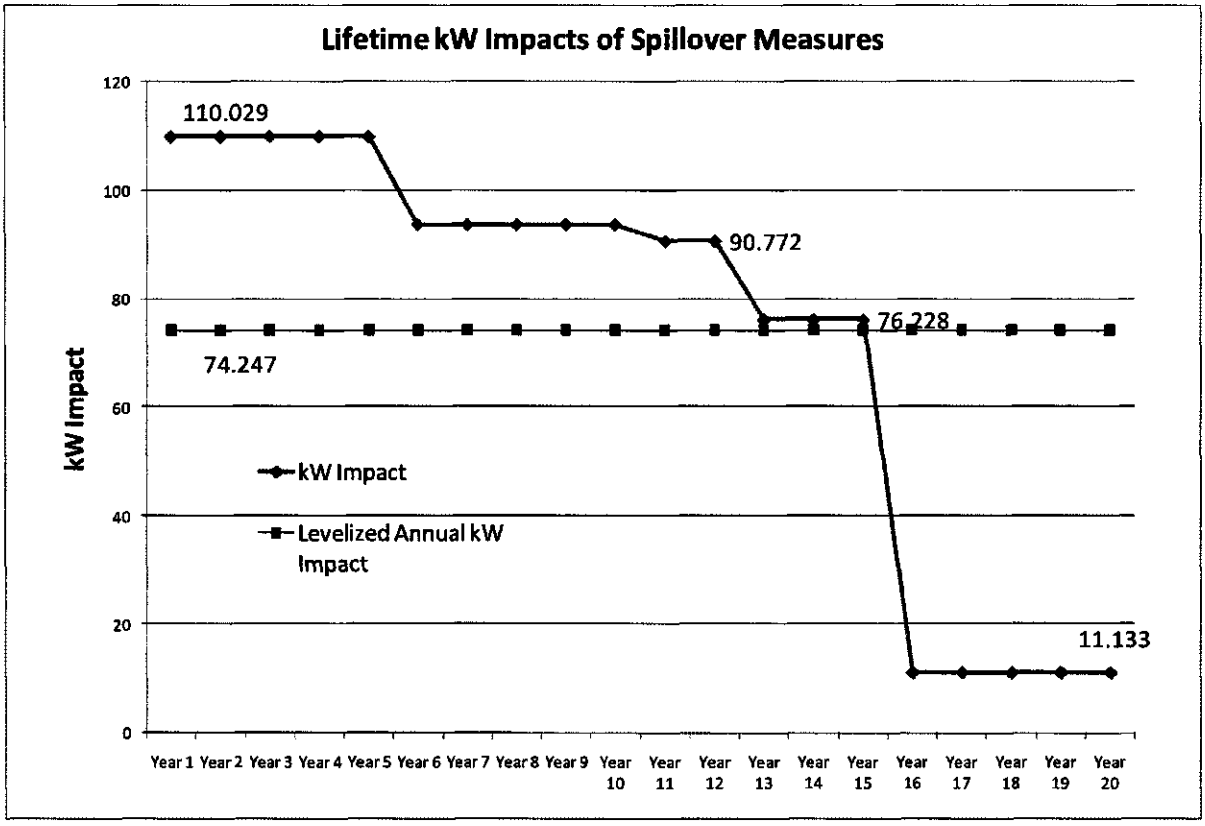

Figure 10. Effective Useful Life of Spillover Measures and their kW Impacts

The kilowatt hour savings stagger down in different years, but remain high at over 17,000 kWh in the final years (years 15-20). Over the course of the 20 years, the total savings is 6,194,327 kilowatt hours, or 1,235 kWhs per participant over the 20 years.

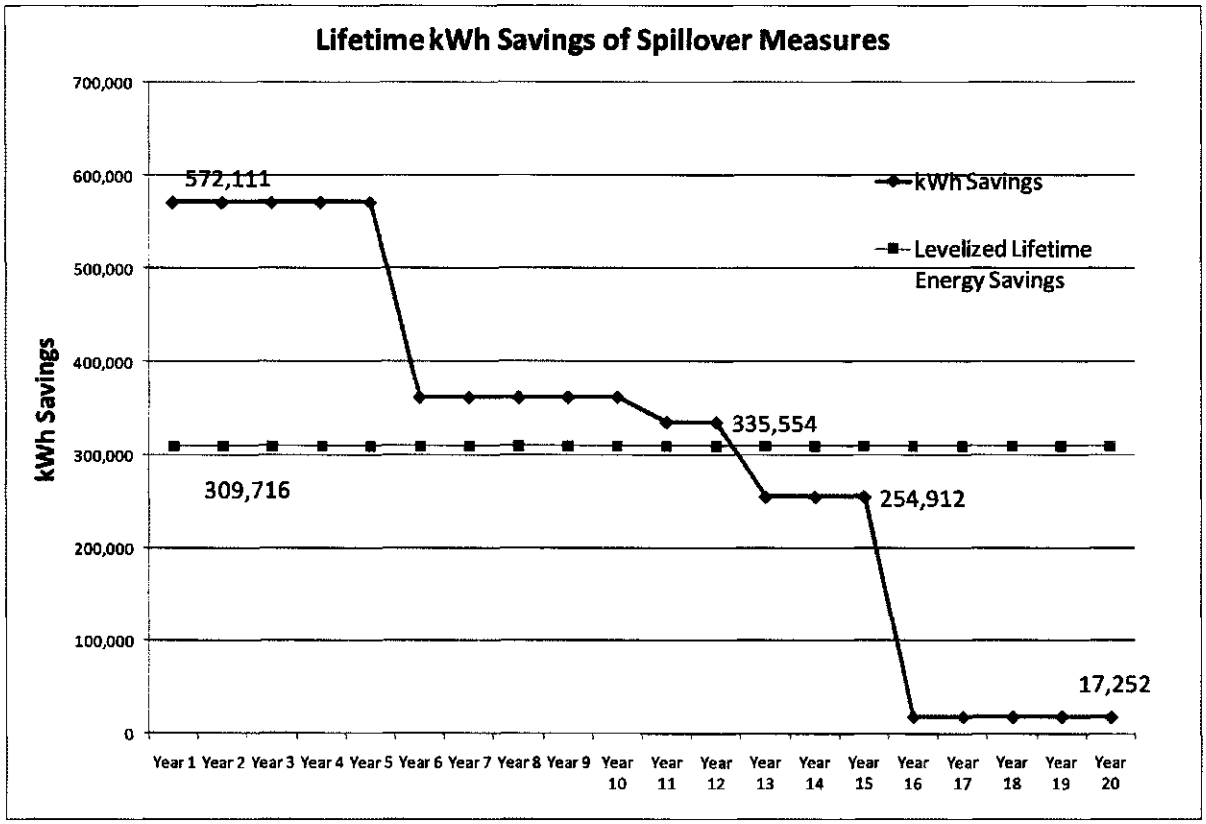

Figure 11. Effective Useful Life of Spillover Measures and their kWh Savings

The figure below presents the therm savings that can be expected over the next 20 years based on the effective useful life of the installed spillover measures. For the first five years, annual spillover savings are 5,115 therms for the 5,015 participants of the Smart Saver program. By year six, the savings increase slightly because the negative effect on natural gas usage caused as the gas impacts from CFLs use drops out of the equation, and in years eleven through twenty, annual therms drop down to about 4,500 therms per year. The total therm savings over the next twenty years for these 5,015 participants is 77,381 therms, a mean of 15.4 therms per participant over the 20 years. If the program causes the participant to permanently move to CFL use, the savings will continue. This savings would be market transformation savings and are not counted in this evaluation. As a result, these savings are less than what can actually be expected.

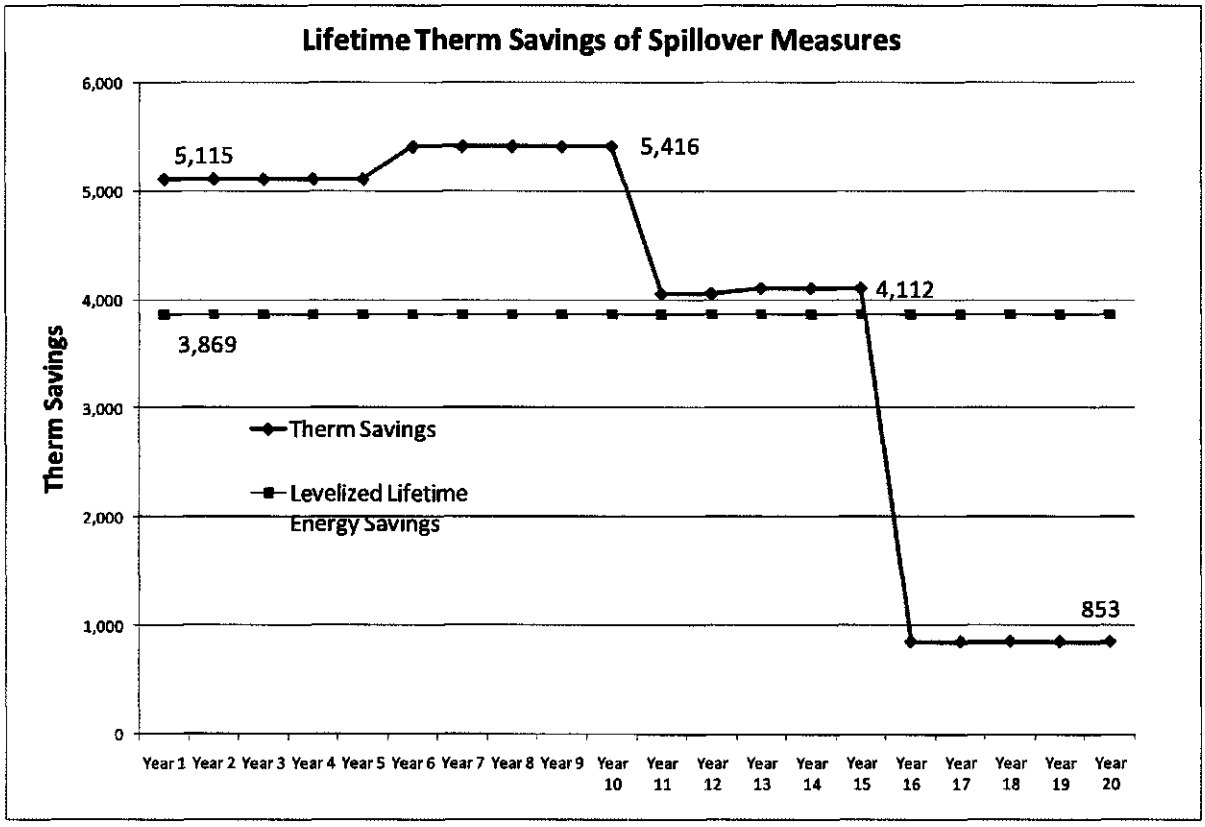

Figure 12. Effective Useful Life of Spillover Measures and their Therm Savings

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 Smart Saver and Summer Saver programs, which I will refer to as one program, the Smart Saver program. We'll talk about the Smart Saver Program and its objectives, your thoughts on improving the program, 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 Smart Saver Program's current objectives. How have these changed over time?

2. In your opinion, which objectives do you think are best being met or will be met?

3. Are there any program objectives that are not being addressed or not being addressed as well as possible 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?

4. Should the program objectives be changed in any way due to technology-based, market-based, or management based conditions? What objectives would you change? What program changes would you put into place as a result, and how would it affect the operations of the program?

Operational Efficiency

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?

6. Please review with us how the Smart Saver operates relative to your duties, that is, please walk us through the processes and procedures and key events that allow you do currently fulfill your duties.

7. Have any recent changes been made to your duties? If so, please tell us what changes were made and why they were made. What are the results of the change?

8. Describe the evolution of the Smart Saver Program. How has the program changed since it was it first started?

9. Do you have suggestions for improvements to the program that would increase participation rates or interest levels?

10. Do you have suggestions for improving or increasing energy impacts?

11. Do you have suggestion for the making the program operate more smoothly or effectively?

Program Design & Implementation

12. *(If not captured earlier)* Please explain how the interactions between the contractors, customers, and Summer Saver's management team work. Do you think these interactions or means of communication should be changed in any way? If so, how and why?

13. How do you determine which heat pumps and air conditioners are included in the program? How do you determine what efficiency levels should be placed in the program for heat pumps and central AC units? What should be changed about this selection process? Do you think this would result in more contractors and/or customers participating in the program?

14. Describe your quality control and tracking process.

15. Are key industry experts, trade professionals or peers used for assessing what the technologies or models should be included in the program? If so, how does this work?

16. Are key industry experts and trade professionals used in other advisory roles? If so how does this work and what kinds of support is obtained?

17. Describe Smart Saver's contractor program orientation training and development approach. Are contractors getting adequate program training and program information? What can be done that could help improve contractor effectiveness? Can we obtain training materials that are being used?

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

1. ❑ Yes 2. ❑ No 99. ❑ DK/NS

If no, 20b. What other products or equipment should be included and why?

---

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. Overall, what about the Smart Saver program works well and why?

22. What doesn't work well and why? Do you think this discourages participation or contractor interests?

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

24. In what ways can these operations or operational efficiencies be improved?

25. In what ways can the program attract more participants?

26. How do you make sure that the best information and practices are being used in Smart Saver operations?

27. *(If not collected above)* What market information, research or market assessments are you using to determine the best target markets and program opportunities, market barriers, delivery mechanisms and program approach?

28. If you had a magic wand, what one thing would you change and why?

29. Are their any other issues or topics you think we should know about and discuss for this evaluation?

Appendix B: Contractor Interview Instrument

Name: _____

Title: _____

Position description and general responsibilities:

_____

_____

_____

We are conducting this interview to obtain your opinions about and experiences with the Smart and Summer Saver programs, which I will refer to as one program, the Smart Saver program. We'll talk about your understanding of the Smart Saver Program and its objectives, your thoughts on improving the program, and the technologies the program covers. The interview will take about an hour to complete. May we begin?

Understanding the Program

We would like to ask you about your understanding of the Smart Saver program. We would like to start by first asking you to…

3. Please review for me how you are involved in the program and the steps you take in the participation process. Walk me though the typical steps you take to help a customer become eligible for this program and what you do to receive or help the customer receive the program incentive.

4. What kinds of problems or issues have come up in the Smart Saver program?

5. Have you heard of any customer complaints that are in any way associated with this program? Have callbacks increased due to the program technologies?

Program Design and Design Assistance

4. Do you feel that the proper technologies and equipment are being covered through the program?

5. Are the incentive levels appropriate? How do they impact the choice by the customers of the higher efficient equipment?

6. Are there other technologies or energy efficient systems that you think should be included in the program?

7. Are there components that are now included that you feel should not be included? What are they and why should they not be included?

8. Are the new changes going into effect in January going to significantly impact the program or your activity within the program? How?

Reasons for Participation in the Program

We would like to better understand why contractors become partners in the Smart Saver Program.

9. How long have you been a partner in the Smart Saver Program?

10. What are your primary reasons for participating in the program? Why do you continue to be a partner?.... *If prompts are needed...* Is this a wise business move for you, is it something you believe in professionally, is it that it provides a service to your customers, or other reasons?

11. Has this program made a difference in your business? How?

12. How do you think Duke can get more contractors to participate in this program?

Program Participation Experiences

The next few questions ask about the process for submitting participation forms and obtaining the incentive payments.

13. Do you think the process could be streamlined in any way? How?

14. How long does it take between the time that you apply for your incentive, to the time that you and your customer receive the payments? Is this a reasonable amount of time? What should it be? Why?

15. Do you have the right amount of materials such as forms, information sheets, brochures or marketing materials that you need to effectively show and sell your Smart Saver heat pumps and air conditioners? What else do you need?

16. Overall, what about the Smart Saver Program do you think works well and why?

17. What changes would you suggest to improve the program?

18. Do you feel that communications between you and Duke's Smart Saver program staff is adequate? How might this be improved?

19. What benefits do you receive as a result of participating in Duke's Smart Saver Program or from selling Smart Saver items?

20. What do you think are the primary benefits to the people who buy an Smart Saver points, or are their other benefits that are important to a potential customer?

Market Impacts and Effects

21. How do you make customers aware of the Program?

22. Are customers more satisfied with this equipment? Why or why not?

23. Do you have fewer calls or more calls to correct problems with the Smart Saver appliances?

24. Do you market or sell the Smart Saver equipment differently than your other equipment? How?

25. Other than the energy efficient heat pumps and air conditioners, has the program influenced you to carry other energy efficient equipment that is not rebated through the program?

    a. *If yes*, what do you now carry?

    b. *If yes,* About how many of these units did you install/sell in the last year?

Heat Pump Questions

26. Has the program influenced your decision to market or sell more high efficiency heat pumps than you would have without the program?

    a. *If yes,* To what extent?

27. Of those Energy Efficient heat pumps that were rebated through the program, what percent of those customers do you think would have still gone with an energy efficient model if the Duke rebate were not available?

28. What percent of these customers do you think were in some way influenced by the rebate Duke offered?

29. What percent of your total high efficiency heat pump sales were rebated through the Duke program last year?

Central Air Conditioner Questions

30. Has the program influenced your decision to market or sell more high efficiency air conditioners than you would have without the program?

    a. *If yes,* To what extent?

31. Of those Energy Efficient central AC units that were rebated through the program, what percent of those customers do you think would have still gone with an energy efficient model if the Duke rebate were not available?

32. What percent of these customers do you think were in some way influenced by the rebate Duke offered?

33. What percent of your total high efficiency central AC sales were rebated through the Duke program last year?

We would like to know what your practices were before you became a partner in the program, and what you would offer your customers without the program.

39. There are no plans to terminate the program, but we would like to know how the program effects contractors. If the program were to be discontinued, would you still offer the same energy efficient equipment options?

40. If the program were not offered, how would you structure pricing differently to make up for the program loss?

41. In your opinion is the Smart Saver program still needed? Why?

Recommended Changes from the Participating Contractors

37. Are there any other changes that you would recommend to Duke Energy for their Program not already discussed?

38. If you had a magic wand to make any changes you wanted to these programs, what changes would you make to this program?

Appendix C: Participant Survey

Smart Saver Program

Participant Survey

Contact Module
SURVEY INTRODUCTION

If Smart Saver participant, then contact for survey. Use seven 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 =150-200)

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 Smart Saver 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
Call back 6:	Date: _____,	Time: _____ ❑AM or ❑PM
Call back 7:	Date: _____,	Time: _____ ❑AM or ❑PM

❑ Contact dropped after seventh attempt.

We are conducting this survey to obtain your opinions about the Smart Saver Program. We are not selling anything. The survey will take about 5-10 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 Smart Saver Program?**

1. ❑ Yes, *begin* → *Skip to Q3.*
2. ❑ No,
99. ❑ DK/NS

This program was provided through Duke Energy. In this program, you purchased a new energy efficient central air conditioner, heat pump, or furnace and received a rebate of $200 to $600 from Duke Energy's Smart Saver Program.

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.

2. **What was the rebated appliance that you purchased?**

1. ❑ Heat Pump
2. ❑ Air Conditioner
3. ❑ Geothermal Heat Pump
4. ❑ Gas Furnace
   If 4, **Was it a 90% AFUE or greater natural gas furnace combined with a new, qualifying AC or heat pump?**

1. ❑ Yes 2. ❑ No

3. **Please think back to the time when you were deciding to buy the energy saving** <rebated item>**, perhaps recalling things that occurred in your household shortly before and after your purchase. What factors motivated you to purchase energy saving** <rebated item>? *(do not read list, place a "1" next to the response that matches best)*

1. ____ Old equipment didn't work
2. ____ Old equipment working poorly
3. ____ The program's incentive
4. ____ The program's technical assistance
5. ____ Recommendation of someone else (*Probe*: **Who?**_____)
6. ____ Wanted to reduce energy costs
7. ____ The information provided by the Program

8. ____ Past experience with this program
9. ____ Because of past experience with another Duke Energy program
10. ____ Recommendation from friend/neighbor
11. ____ Recommendation from other utility program
    i. (*Probe*: **What program?** _____)
12. ____ Recommendation of dealer/retailer/contractor/builder
13. ____ Advertisement in newspaper (*Probe:* **For what program?** _____)
14. ____ Radio advertisement (*Probe:* **For what program?** _____)
15. ____ Other (SPECIFY) _____
16. ____ 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.)*

5. **Did you get this** <rebated item> **to replace an existing** <rebated item>**?**

1. ❑ Yes – *skip to question 8*
2. ❑ No
3. ❑ DK/NS – *skip to question 11*

6. **Is this** <rebated item> **the first you have ever had in your current home?**

1. ❑ Yes – *skip to question 11*
2. ❑ No
3. ❑ DK/NS – *skip to question 11*

7. **Did you get this** <rebated item> **because you wanted to add another/more** <rebated item> **to your home?**

1. ❑ Yes
2. ❑ No
3. ❑ Don't Know – *skip to question 11*

8. **About how old was the** <rebated item> **you replaced?**

1. ❑ Less than 5 years old
2. ❑ 5 to less than 10 years old
3. ❑ 10 to less than 20 years old
4. ❑ 20 years to less than 30 years old

5. ❑ 30 or more years old
99. ❑ Don't Know

9. **Was the old** <rebated item> **working or not working?**

1. ❑ Yes, working
2. ❑ No, not working – *skip to question 11*
3. ❑ Don't Know

10. **Was the old** <rebated item> **in good, fair, or poor working condition?**

1. ❑ Good
2. ❑ Fair
3. ❑ Poor
4. ❑ Don't Know

Free-Ridership Questions

11. **At the time that you first heard about the Smart Saver Rebate from Duke Energy, had you…?**

1. ❑ **Already been thinking about purchasing a new** <rebated item>
2. ❑ **Already begun collecting information about** <rebated item> **or**
3. ❑ **Already decided to buy the** <rebated item>**?**
4. ❑ Don't Know

12. Just to confirm, you understand that Duke Energy pays a rebate to customers who purchase <rebated item> before they hear about Duke's program or the rebate?

1. ❑ Yes
2. ❑ No – *skip to question 14*
3. ❑ Don't Know – *skip to question 14*

13. **Did you have to make any changes to your existing plans in order to receive this rebate through the Smart Saver Program?**

1. ❑ Yes
2. ❑ No
3. ❑ Don't Know

14. **If the rebate from Duke Energy's Smart Saver Program had not been available, would you still have:**

14a. **Purchased a new** <rebated item>**?**

1. ❑ Yes
2. ❑ No – *skip to question 16*
3. ❑ Don't Know – *skip to question 16*

14b. **Purchased the same efficiency of** <rebated item>?

1. ❑ Yes
2. ❑ No
3. ❑ Don't Know

14c. **Purchased the** <rebated item> **at the same time that you did?**

1. ❑ Yes – *skip to question 15*
2. ❑ No
3. ❑ Don't Know – *skip to question 15*

14d. **Purchased the** <rebated item> **earlier than you did, or later?**

1. ❑ Earlier
2. ❑ Same Time
3. ❑ Later
4. ❑ Don't Know – *skip to question 15*

14e. **How much <earlier/later>?**

1. _____ years and/or _____months
2. ❑ Don't Know

15. If the rebate from the Smart Saver Program had not been available, would you have done anything else differently?

1. ❑ Yes
2. ❑ No
3. ❑ Don't Know

15a. **What would you have done differently?**

_____

_____

16. On a 0 to 10 scale, with 0 being not at all likely and 10 being very likely, how likely is it that you would have bought a less efficient <rebated item> **if you had not received any rebate from the program?**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

I'm going to read several statements about how you came to choose your <rebated item>. **On a scale of 0 to 10, where 0 is strongly disagree and 10 is strongly agree, how much do you agree with this statement?**

17. **If I had not had any assistance from the program, I would have paid the additional** <$200-$600> **to buy the** <rebated item> **on my own?**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

18. **The rebate from the Duke Energy Smart Saver Program was a critical factor in my decision to purchase the high efficiency/energy efficient product.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

19. **I would have bought a** <rebated item> **within** [a year/2 years] **of when I did even without the rebate from the Duke Energy Smart Saver Program.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

20. **The rebate from the Duke Energy Smart Saver Program was not necessary to cause me to purchase the higher efficiency product when I bought my new** <rebated item>.

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

Consistency Check & Resolution

21 will be asked only for those respondents who have a clear inconsistency between responses (i.e., all but one of the questions are at one end of the spectrum for free ridership while one question is at the other spectrum.) An algorithm will be provided after pretesting. The question responses that will be used to trigger 21 are:

- 14a (only for efficiency enhancement measures)

- 14b (only for incremental efficiency measures)
- 16
- 18
- 19
- 20

21. **Let me make sure I understand you. Earlier, you said <inconsistency prompted by excel function>, but that differs from some of your other responses. Please tell me in your own words what influence, if any, the program had on your decision to purchase and install the** <rebated item> **at the time you did?**

_____
_____
_____
_____

Based on response, correct any above entries.

Spillover Questions

22. **Since you participated in the Smart Saver Program, have you purchased and installed any other type of high efficiency equipment or made energy efficiency improvements in your home or at any other locations?**

1. ❑ Yes, only at this home
2. ❑ Yes, only at other locations
3. ❑ Yes, at both home and other locations
4. ❑ No
5. ❑ Don't Know

23. **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: _____

24. *For each type listed in 23 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.

25a. **My experience with the Smart Saver Program in** <2006, 2007, 2008> **influenced my decision to install** <item type 1> **on my own.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

25b. **My experience with the Smart Saver Program in** <2006, 2007, 2008> **influenced my decision to install** <item type 2> **on my own.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

25c. **My experience with the Smart Saver Program in** <2006, 2007, 2008> **influenced my decision to install** <item type 3> **on my own.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

25d. **My experience with the Smart Saver Program in** <2006, 2007, 2008> **influenced my decision to install** <item type 4> **on my own.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

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

Response:1 _____

Response:2 _____

Response:3 _____

Response:4 _____

Now I am going to ask you some general satisfaction statements. On a scale from 1-10, with 0 indicating that you strongly disagree, and 10 indicating that you strongly agree, please rate the following statements.

27. **The program's rebate form was easy to understand and complete.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

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

_____

28. **I received the rebate in a timely manner.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

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

_____

29. **The interactions and communications I had with Duke Energy staff was 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?**_____

_____

30. **The program rebates covered enough equipment and efficiency options.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

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

_____

31. **The** <rebated item> **has been performing well.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

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

_____

32. **The** <rebated item> **is energy efficient.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

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

_____

33. **The** <rebated item> **was installed properly.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

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

_____

34. **The** <rebated item> **was installed by a skilled and experienced installer.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

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

_____

35. **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?**_____

_____

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 Smart Saver 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: _____

1	4	6	7	8	12	From database - ignore			
			Impacts per Measure						
Non Residential Programs/Measures	Incremental Measure Customer Cost	Customer Incentive Per Unit	Annual kWh Impact	kW Impact	Measure Life	Incremental Measure Cost per unit	Typical size	kWh/unit	kW/unit
Water-Cooled cent Chiller > 300 ton 0.46 kW/ton with 0.28 kW/ton IPLV	$130,188		309,105	121.7	20	$130.19	1000	309	0.122
Water-Cooled cent Chiller > 300 ton 0.46 kW/ton with 0.33 kW/ton IPLV	$118,255		269,498	117.7	20	$118.26	1000	269	0.118
Water-Cooled cent Chiller > 300 ton 0.46 kW/ton with 0.35 kW/ton IPLV	$112,831		249,177	115.6	20	$112.83	1000	249	0.116
Water-Cooled cent Chiller > 300 ton 0.46 kW/ton with 0.37 kW/ton IPLV	$107,407		230,754	113.8	20	$107.41	1000	231	0.114
Water-Cooled cent Chiller > 300 ton 0.46 kW/ton with 0.44 kW/ton IPLV	$92,220		170,006	107.7	20	$92.22	1000	170	0.108
Water-Cooled cent Chiller > 300 ton 0.52 kW/ton with 0.31 kW/ton IPLV	$88,825		241,974	69.6	20	$88.82	1000	242	0.070
Water-Cooled cent Chiller > 300 ton 0.52 kW/ton with 0.37 kW/ton IPLV	$75,400		197,229	65.2	20	$75.40	1000	197	0.065
Water-Cooled cent Chiller > 300 ton 0.52 kW/ton with 0.39 kW/ton IPLV	$69,298		174,311	62.8	20	$69.30	1000	174	0.063
Water-Cooled cent Chiller > 300 ton 0.52 kW/ton with 0.42 kW/ton IPLV	$63,196		153,493	60.8	20	$63.20	1000	153	0.061
Water-Cooled cent Chiller > 300 ton 0.52 kW/ton with 0.49 kW/ton IPLV	$46,110		84,973	53.8	20	$46.11	1000	85	0.054
Water-Cooled cent Chiller > 300 ton 0.58 kW/ton with 0.35 kW/ton IPLV	$47,461		174,614	17.4	20	$47.46	1000	175	0.017
Water-Cooled cent Chiller > 300 ton 0.58 kW/ton with 0.41 kW/ton IPLV	$32,545		124,880	12.5	20	$32.54	1000	125	0.013
Water-Cooled cent Chiller > 300 ton 0.58 kW/ton with 0.44 kW/ton IPLV	$25,765		99,360	10.0	20	$25.76	1000	99	0.010
Water-Cooled cent Chiller > 300 ton 0.58 kW/ton with 0.47 kW/ton IPLV	$18,984		76,212	7.6	20	$18.98	1000	76	0.008
Water-Cooled cent Chiller 150 - 300 ton 0.51 kW/ton with 0.3 kW/ton IPLV	$37,227		76,881	30.6	20	$161.85	230	334	0.133
Water-Cooled cent Chiller 150 - 300 ton 0.51 kW/ton with 0.36 kW/ton IPLV	$34,326		66,863	29.6	20	$149.24	230	291	0.129
Water-Cooled cent Chiller 150 - 300 ton 0.51 kW/ton with 0.39 kW/ton IPLV	$33,007		61,723	29.1	20	$143.51	230	268	0.126
Water-Cooled cent Chiller 150 - 300 ton 0.51 kW/ton with 0.41 kW/ton IPLV	$31,689		57,060	28.6	20	$137.78	230	248	0.124
Water-Cooled cent Chiller 150 - 300 ton 0.51 kW/ton with 0.48 kW/ton IPLV	$28,260		42,730	27.2	20	$122.87	230	186	0.118
Water-Cooled cent Chiller 150 - 300 ton 0.57 kW/ton with 0.34 kW/ton IPLV	$24,217		59,941	17.4	20	$105.29	230	261	0.076
Water-Cooled cent Chiller 150 - 300 ton 0.57 kW/ton with 0.4 kW/ton IPLV	$20,954		48,628	16.3	20	$91.10	230	211	0.071
Water-Cooled cent Chiller 150 - 300 ton 0.57 kW/ton with 0.43 kW/ton IPLV	$19,470		42,821	15.7	20	$84.65	230	186	0.068
Water-Cooled cent Chiller 150 - 300 ton 0.57 kW/ton with 0.46 kW/ton IPLV	$17,987		37,555	15.2	20	$78.20	230	163	0.066
Water-Cooled cent Chiller 150 - 300 ton 0.57 kW/ton with 0.54 kW/ton IPLV	$14,130		21,370	13.6	20	$61.44	230	93	0.059
Water-Cooled cent Chiller 150 - 300 ton 0.63 kW/ton with 0.38 kW/ton IPLV	$11,208		43,068	4.2	20	$48.73	230	187	0.018
Water-Cooled cent Chiller 150 - 300 ton 0.63 kW/ton with 0.45 kW/ton IPLV	$7,582		30,397	3.0	20	$32.96	230	132	0.013
Water-Cooled cent Chiller 150 - 300 ton 0.63 kW/ton with 0.48 kW/ton IPLV	$5,933		23,918	2.4	20	$25.80	230	104	0.010
Water-Cooled cent Chiller 150 - 300 ton 0.63 kW/ton with 0.51 kW/ton IPLV	$4,285		18,042	1.8	20	$18.63	230	78	0.008
Water-Cooled Centrifugal Chiller < 150 ton 0.56 kW/ton with 0.34 kW/ton IPLV	$16,242		30,214	11.9	20	$203.03	80	378	0.148
Water-Cooled Centrifugal Chiller < 150 ton 0.56 kW/ton with 0.4 kW/ton IPLV	$15,314		26,332	11.5	20	$191.42	80	329	0.144
Water-Cooled Centrifugal Chiller < 150 ton 0.56 kW/ton with 0.43 kW/ton IPLV	$14,892		24,340	11.3	20	$186.15	80	304	0.141
Water-Cooled Centrifugal Chiller < 150 ton 0.56 kW/ton with 0.46 kW/ton IPLV	$14,470		22,532	11.1	20	$180.87	80	282	0.139
Water-Cooled Centrifugal Chiller < 150 ton 0.56 kW/ton with 0.53 kW/ton IPLV	$13,288		16,582	10.5	20	$166.10	80	207	0.132
Water-Cooled Centrifugal Chiller < 150 ton 0.63 kW/ton with 0.38 kW/ton IPLV	$9,968		23,691	6.8	20	$124.60	80	296	0.085
Water-Cooled Centrifugal Chiller < 150 ton 0.63 kW/ton with 0.45 kW/ton IPLV	$8,923		19,289	6.4	20	$111.54	80	241	0.080
Water-Cooled Centrifugal Chiller < 150 ton 0.63 kW/ton with 0.48 kW/ton IPLV	$8,448		17,037	6.1	20	$105.60	80	213	0.077
Water-Cooled Centrifugal Chiller < 150 ton 0.63 kW/ton with 0.51 kW/ton IPLV	$7,974		14,997	5.9	20	$99.67	80	187	0.074
Water-Cooled Centrifugal Chiller < 150 ton 0.63 kW/ton with 0.6 kW/ton IPLV	$6,644		8,278	5.3	20	$83.05	80	103	0.066
Water-Cooled Centrifugal Chiller < 150 ton 0.7 kW/ton with 0.42 kW/ton IPLV	$3,693		17,169	1.7	20	$46.16	80	215	0.021
Water-Cooled Centrifugal Chiller < 150 ton 0.7 kW/ton with 0.5 kW/ton IPLV	$2,532		12,263	1.2	20	$31.65	80	153	0.015
Water-Cooled Centrifugal Chiller < 150 ton 0.7 kW/ton with 0.53 kW/ton IPLV	$2,005		9,748	1.0	20	$25.06	80	122	0.012
Water-Cooled Centrifugal Chiller < 150 ton 0.7 kW/ton with 0.57 kW/ton IPLV	$1,477		7,480	0.7	20	$18.46	80	94	0.009
Water-cooled screw chiller < 150 ton 0.63 kW/ton with 0.38 kW/ton IPLV	$15,519		30,363	14.5	20	$193.99	80	380	0.182
Water-cooled screw chiller < 150 ton 0.63 kW/ton with 0.41 kW/ton IPLV	$14,378		28,384	14.2	20	$179.73	80	355	0.177
Water-cooled screw chiller < 150 ton 0.63 kW/ton with 0.44 kW/ton IPLV	$13,237		26,044	13.8	20	$165.46	80	326	0.172
Water-cooled screw chiller < 150 ton 0.63 kW/ton with 0.47 kW/ton IPLV	$12,096		23,515	13.3	20	$151.20	80	294	0.166
Water-cooled screw chiller < 150 ton 0.63 kW/ton with 0.5 kW/ton IPLV	$11,183		21,692	13.0	20	$139.78	80	271	0.162
Water-cooled screw chiller < 150 ton 0.63 kW/ton with 0.56 kW/ton IPLV	$8,900		16,507	12.2	20	$111.25	80	206	0.152
Water-cooled screw chiller < 150 ton 0.71 kW/ton with 0.43 kW/ton IPLV	$11,897		23,841	8.7	20	$148.71	80	298	0.109
Water-cooled screw chiller < 150 ton 0.71 kW/ton with 0.46 kW/ton IPLV	$10,613		21,613	8.4	20	$132.66	80	270	0.104
Water-cooled screw chiller < 150 ton 0.71 kW/ton with 0.5 kW/ton IPLV	$9,329		18,979	7.9	20	$116.61	80	237	0.098
Water-cooled screw chiller < 150 ton 0.71 kW/ton with 0.53 kW/ton IPLV	$8,045		16,134	7.4	20	$100.56	80	202	0.092
Water-cooled screw chiller < 150 ton 0.71 kW/ton with 0.56 kW/ton IPLV	$7,018		14,081	7.0	20	$87.72	80	176	0.088
Water-cooled screw chiller < 150 ton 0.71 kW/ton with 0.63 kW/ton IPLV	$4,450		8,245	6.1	20	$55.63	80	103	0.076
Water-cooled screw chiller < 150 ton 0.79 kW/ton with 0.47 kW/ton IPLV	$8,274		17,337	3.0	20	$103.43	80	217	0.037
Water-cooled screw chiller < 150 ton 0.79 kW/ton with 0.51 kW/ton IPLV	$6,847		14,862	2.5	20	$85.59	80	186	0.031

Water-cooled screw chiller < 150 ton 0.79 kW/ton with 0.55 kW/ton IPLV	$5,421	11,935	2.0	20	$67.76	80	149	0.025
Water-cooled screw chiller < 150 ton 0.79 kW/ton with 0.59 kW/ton IPLV	$3,994	8,804	1.4	20	$49.93	80	110	0.018
Water-cooled screw chiller < 150 ton 0.79 kW/ton with 0.62 kW/ton IPLV	$2,853	6,487	1.0	20	$35.66	80	81	0.013
Water-cooled screw chiller > 300 ton 0.51 kW/ton with 0.31 kW/ton IPLV	$114,051	307,254	146.8	20	$114.05	1000	307	0.147
Water-cooled screw chiller > 300 ton 0.51 kW/ton with 0.33 kW/ton IPLV	$104,020	287,230	143.2	20	$104.02	1000	287	0.143
Water-cooled screw chiller > 300 ton 0.51 kW/ton with 0.36 kW/ton IPLV	$93,990	263,533	139.0	20	$93.99	1000	264	0.139
Water-cooled screw chiller > 300 ton 0.51 kW/ton with 0.38 kW/ton IPLV	$83,959	237,931	134.4	20	$83.96	1000	238	0.134
Water-cooled screw chiller > 300 ton 0.51 kW/ton with 0.4 kW/ton IPLV	$75,934	219,483	131.2	20	$75.93	1000	219	0.131
Water-cooled screw chiller > 300 ton 0.51 kW/ton with 0.46 kW/ton IPLV	$55,873	167,035	123.1	20	$55.87	1000	167	0.123
Water-cooled screw chiller > 300 ton 0.58 kW/ton with 0.35 kW/ton IPLV	$93,387	241,208	88.4	20	$93.39	1000	241	0.088
Water-cooled screw chiller > 300 ton 0.58 kW/ton with 0.37 kW/ton IPLV	$82,102	218,694	84.3	20	$82.10	1000	219	0.084
Water-cooled screw chiller > 300 ton 0.58 kW/ton with 0.4 kW/ton IPLV	$70,818	192,065	79.6	20	$70.82	1000	192	0.080
Water-cooled screw chiller > 300 ton 0.58 kW/ton with 0.43 kW/ton IPLV	$59,533	163,302	74.5	20	$59.53	1000	163	0.074
Water-cooled screw chiller > 300 ton 0.58 kW/ton with 0.45 kW/ton IPLV	$50,506	142,534	70.8	20	$50.51	1000	143	0.071
Water-cooled screw chiller > 300 ton 0.58 kW/ton with 0.51 kW/ton IPLV	$27,936	83,544	61.6	20	$27.94	1000	84	0.062
Water-cooled screw chiller > 300 ton 0.64 kW/ton with 0.38 kW/ton IPLV	$72,723	175,171	29.8	20	$72.72	1000	175	0.030
Water-cooled screw chiller > 300 ton 0.64 kW/ton with 0.42 kW/ton IPLV	$60,184	150,168	25.4	20	$60.18	1000	150	0.025
Water-cooled screw chiller > 300 ton 0.64 kW/ton with 0.45 kW/ton IPLV	$47,646	120,578	20.1	20	$47.65	1000	121	0.020
Water-cooled screw chiller > 300 ton 0.64 kW/ton with 0.48 kW/ton IPLV	$35,108	88,606	14.4	20	$35.11	1000	89	0.014
Water-cooled screw chiller > 300 ton 0.64 kW/ton with 0.51 kW/ton IPLV	$25,077	65,562	10.3	20	$25.08	1000	66	0.010
Water-cooled screw chiller 150 - 300 ton 0.57 kW/ton with 0.34 kW/ton IPLV	$34,363	79,310	37.9	20	$149.41	230	345	0.165
Water-cooled screw chiller 150 - 300 ton 0.57 kW/ton with 0.37 kW/ton IPLV	$31,592	74,144	37.0	20	$137.36	230	322	0.161
Water-cooled screw chiller 150 - 300 ton 0.57 kW/ton with 0.4 kW/ton IPLV	$28,821	68,033	35.9	20	$125.31	230	296	0.156
Water-cooled screw chiller 150 - 300 ton 0.57 kW/ton with 0.43 kW/ton IPLV	$26,049	61,428	34.7	20	$113.26	230	267	0.151
Water-cooled screw chiller 150 - 300 ton 0.57 kW/ton with 0.45 kW/ton IPLV	$23,832	56,666	33.9	20	$103.62	230	246	0.147
Water-cooled screw chiller 150 - 300 ton 0.57 kW/ton with 0.51 kW/ton IPLV	$18,289	43,130	31.8	20	$79.52	230	188	0.138
Water-cooled screw chiller 150 - 300 ton 0.65 kW/ton with 0.39 kW/ton IPLV	$27,228	62,268	22.8	20	$118.38	230	271	0.099
Water-cooled screw chiller 150 - 300 ton 0.65 kW/ton with 0.42 kW/ton IPLV	$24,110	56,456	21.8	20	$104.83	230	245	0.095
Water-cooled screw chiller 150 - 300 ton 0.65 kW/ton with 0.45 kW/ton IPLV	$20,992	49,581	20.6	20	$91.27	230	216	0.089
Water-cooled screw chiller 150 - 300 ton 0.65 kW/ton with 0.48 kW/ton IPLV	$17,875	42,149	19.2	20	$77.72	230	183	0.084
Water-cooled screw chiller 150 - 300 ton 0.65 kW/ton with 0.51 kW/ton IPLV	$15,380	36,795	18.3	20	$66.87	230	160	0.079
Water-cooled screw chiller 150 - 300 ton 0.65 kW/ton with 0.57 kW/ton IPLV	$9,145	21,562	15.9	20	$39.76	230	94	0.069
Water-cooled screw chiller 150 - 300 ton 0.72 kW/ton with 0.43 kW/ton IPLV	$20,093	45,246	7.7	20	$87.36	230	197	0.034
Water-cooled screw chiller 150 - 300 ton 0.72 kW/ton with 0.47 kW/ton IPLV	$16,628	38,791	6.5	20	$72.30	230	169	0.028
Water-cooled screw chiller 150 - 300 ton 0.72 kW/ton with 0.5 kW/ton IPLV	$13,184	31,143	5.2	20	$57.24	230	135	0.023
Water-cooled screw chiller 150 - 300 ton 0.72 kW/ton with 0.54 kW/ton IPLV	$9,700	22,893	3.7	20	$42.17	230	100	0.016
Water-cooled screw chiller 150 - 300 ton 0.72 kW/ton with 0.57 kW/ton IPLV	$6,928	16,932	2.6	20	$30.12	230	74	0.012
Air-Cooled Recip Chiller COP = 2.8, IPLV = 3.41	$9,011	24,690	3.9	20	$45.06	200	123	0.019
Air-Cooled Recip Chiller COP = 2.8, IPLV = 3.89	$18,406	50,499	8.2	20	$92.03	200	252	0.041
Air-Cooled Recip Chiller COP = 2.8, IPLV = 4.24	$23,916	62,646	9.5	20	$119.58	200	313	0.048
Air-Cooled Recip Chiller COP = 3.08, IPLV = 3.36	$11,497	27,434	20.1	20	$57.48	200	137	0.101
Air-Cooled Recip Chiller COP = 3.08, IPLV = 3.76	$19,717	49,912	23.6	20	$98.58	200	250	0.118
Air-Cooled Recip Chiller COP = 3.08, IPLV = 4.28	$28,106	73,408	27.6	20	$140.53	200	367	0.138
Air-Cooled Recip Chiller COP = 3.08, IPLV = 4.67	$33,172	84,465	28.8	20	$165.86	200	422	0.144
Air-Cooled Recip Chiller COP = 3.36, IPLV = 3.66	$20,845	50,583	37.1	20	$104.23	200	253	0.186
Air-Cooled Recip Chiller COP = 3.36, IPLV = 4.10	$28,458	71,192	40.3	20	$142.29	200	356	0.201
Air-Cooled Recip Chiller COP = 3.36, IPLV = 4.67	$36,187	92,736	43.9	20	$180.94	200	464	0.220
Air-Cooled Recip Chiller COP = 3.36, IPLV = 5.09	$40,774	102,875	45.0	20	$203.87	200	514	0.225
Air-Cooled Screw Chiller COP = 2.8, IPLV = 3.46	$10,112	26,648	4.4	20	$50.56	200	133	0.022
Air-Cooled Screw Chiller COP = 2.8, IPLV = 3.64	$13,823	37,047	8.1	20	$69.11	200	185	0.040
Air-Cooled Screw Chiller COP = 2.8, IPLV = 4.75	$30,491	72,343	12.1	20	$152.45	200	362	0.060
Air-Cooled Screw Chiller COP = 3.08, IPLV = 3.36	$11,715	27,516	20.2	20	$58.57	200	138	0.101
Air-Cooled Screw Chiller COP = 3.08, IPLV = 3.80	$20,662	51,776	24.2	20	$103.31	200	259	0.121
Air-Cooled Screw Chiller COP = 3.08, IPLV = 4.00	$24,078	61,243	27.5	20	$120.39	200	306	0.138
Air-Cooled Screw Chiller COP = 3.08, IPLV = 5.22	$39,248	93,375	31.2	20	$196.24	200	467	0.156
Air-Cooled Screw Chiller COP = 3.36, IPLV = 3.66	$21,245	50,733	37.2	20	$106.23	200	254	0.186
Air-Cooled Screw Chiller COP = 3.36, IPLV = 4.15	$29,621	72,978	40.9	20	$148.10	200	365	0.204
Air-Cooled Screw Chiller COP = 3.36, IPLV = 4.42	$33,442	81,658	43.9	20	$167.21	200	408	0.220
Air-Cooled Screw Chiller COP = 3.36, IPLV = 5.69	$46,553	111,120	47.2	20	$232.76	200	556	0.236

FILE

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BEFORE

THE PUBLIC UTILITIES COMMISSION OF OHIO

PUCO

In the Matter of the Application for Recovery of Costs, Lost Margin, and Performance Incentive Associated with the Implementation of Electric Residential Demand Side Management Programs by The Cincinnati Gas & Electric Company	)	Case No. 06-91-EL-UNC *
In the Matter of the Application for Recovery of Costs, Lost Margin, and Performance Incentive Associated with the Implementation of Electric Non-Residential Demand Side Management Programs by The Cincinnati Gas & Electric Company	)	Case No. 06-92-EL-UNC
In the Matter of the Application for Recovery of Costs, Lost Margin, and Performance Incentive Associated with the Implementation of Natural Gas Demand Side Management Programs by The Cincinnati Gas & Electric Company	)	Case No. 06-93-GA-UNC

THE CINCINNATI GAS & ELECTRIC COMPANY'S APPLICATION TO ESTABLISH DEMAND SIDE MANAGEMENT PROGRAMS FOR RESIDENTIAL AND NON-RESIDENTIAL CONSUMERS

Now comes The Cincinnati Gas & Electric Company (CG&E) with the consensus of the Cinergy/Community Energy Partnership (CCEP), the Ohio Consumers' Counsel (OCC), the Cincinnati Public Schools (Schools), and in consultation with the Public Utilities Commission of Ohio (Commission) Staff (Staff) to file this application to implement a set of demand side management (DSM) programs through 2010 for residential and small/medium size business consumers and to propose implementation of DSM Cost

Recovery Riders applicable to residential electric and gas sales as well as for non-residential electric sales. CG&E, with the consensus of the CCEP, OCC, and Schools, (together the interested stakeholders) applies for recovery of costs, lost margins, and shared savings associated with the proposed set of residential and non-residential DSM programs.

The Applicant is CG&E of 139 East Fourth St., Cincinnati, Ohio 45202. The CCEP Collaborative members are: Myra Boggs with Working in Neighborhoods, Nina Creech with People Working Cooperatively, Christine Ritchie with Home Ownership Center of Greater Cincinnati, Gary Tabor with Adams/Brown Counties Economic Opportunities, Inc., Dave Scharfenberger with Communities United for Action, Jim Tenhundfeld with Cincinnati/Hamilton County Community Action Agency, Tonya Goins with the Public Utilities Commission of Ohio, Wilson Gonzalez with the Office of the Consumers' Counsel, Michael Gilkerson with Cincinnati Public Schools and Tim Lenahan with the Ohio Department of Development.

This application is divided into seven sections with seven appendices. Section I provides background information, definitions, and acronyms. Section II contains the process used to select programs and measures. Section III discusses the cost-effectiveness methodology. Section IV provides descriptions of each program as well as the cost-effectiveness results. Section V contains the plan for program evaluation. Section VI discusses the recovery mechanism. And, Section VII details the calculation of the DSM riders.

The first two appendices (A and B) provide detailed information on the calculations of costs, lost margins, and shared savings for the residential and non-residential programs. Appendices C and D contain detailed descriptions of the operation of the DSM Riders.

Appendix E provides the calculation of the DSM Riders. The last two appendices (F and G) contain the DSM Riders.

I. INTRODUCTION

A. Background

CG&E with the support and involvement of the CCEP, has been active in the implementation of energy efficiency programs for many years. In 1992 the Commission ordered CG&E in Case No. 91-410-EL-AIR to form a Collaborative to provide energy efficiency programs to help reduce the electrical demand of consumers. Later that year, CG&E formed its first Energy Collaborative made up of members of the community, companies, community groups, and community service agencies that deal with energy issues. This effort was directed at all consumers from residential to large industrial consumers. Many quality programs were developed and implemented during the period of 1992 through 1996 that helped consumers save energy.

On December 19, 1996, the PUCO issued its order in Case No. 95-103-EL-FOR that recognized that the fundamental assumption that validates Demand Side Management (DSM), namely the inherent cost sharing linkage among all consumers of a utility, is broken in an open access, consumer choice environment. The key provisions of the order directed the Ohio Collaborative (re-formed as the Cinergy/Community Energy Partnership) to "...focus on (residential) programs, such as weatherization, which benefit low-income consumers and reduce Percentage of Income Payment Program (PIPP) costs, thereby benefiting all consumers..." In January of 1997, the Cinergy Energy Collaborative dissolved and formed the CCEP and narrowed its focus and programs to better reflect the directive from the Commission. The CCEP established a charter as

follows:

> "The purpose of the Cinergy/Community Energy Partnership is to give Cinergy/CG&E guidance and make recommendations on cost-effective programs that will benefit all residential consumers, especially low income, and help the community become more energy efficient."

The CCEP Board is comprised of up to ten directors. The Chair is a representative from Cinergy. The other members are a composite of individuals from community service organizations that focus on energy issues, other community service agencies, and individuals representing consumers as a whole. In addition to the board members, there are three ex-officio members. These individuals are from the Staff, the Ohio Department of Development Energy Bureau, and the OCC. Cinergy staff and consultants support the CCEP Board activities and planning while Cinergy staff and Cinergy sub-contractors implement the programs.

In Case No. 03-93-EL-ATA, CG&E recommended that DSM programs once again be implemented in its service area. As mentioned above, in the late 1990's, it became apparent to many that DSM programs in an Integrated Resource Planning (IRP) process were no longer reasonable. The driving principle to this conclusion was the realization that the utility, could no longer be assured that the costs of the incentives provided to consumers would be re-captured through the benefits of deferrals in the construction of new generation since, in a restructured environment, the utility could no longer be assured it would be providing generation service to the consumer. Thus, incentives paid to install more energy efficient equipment might never reap the benefits for the entity paying the incentives. In an IRP structure, incentive-based DSM made no sense.

CG&E has come to recognize that a new approach can be employed which justifies the implementation of DSM programs by the utility, from a societal point of view. In the past, a critical component to DSM program cost-effectiveness was the utility's avoided costs. Now, under deregulation, a forecast of market prices can be used as an alternative to, or proxy for, utility avoided costs. Any DSM program can be considered cost-effective if the cost of implementation can be offset by savings relative to forward projected market prices.

With this filing CG&E is proposing to offer energy efficiency measures within DSM programs to all consumers, regardless of their generation supplier, through the year 2010. CG&E, with the support of the Interested Stakeholders, is requesting approval to implement the proposed set of programs through 2010. Improving overall energy efficiency in the economy is extremely important from an environmental as well as global competition perspective. Larger users of energy already have a significant incentive to improve their energy efficiency. These are the most likely consumers to have in-house engineering expertise and the financial capability to make efficiency improvements.

According to discussions with the National Association of Energy Services Companies, larger users are targeted by energy service companies offering new sophisticated methods to improve energy efficiency. CG&E does not intend to develop and offer DSM programs for large energy users since the needs of those users can be effectively met in the market place. Instead, it is the remaining market of residential and small/medium size business users for which CG&E sees the need to offer DSM programs. Those users tend to be overlooked by energy service companies because the

level of individual savings is small. However, collectively, the savings can be significant, making this an important effort. These smaller consumers also have the most market barriers hindering action including lack of information, expertise, training, and capital. CG&E, working with the Interested Stakeholders, has developed a wide-ranging set of DSM programs to address these market barriers for all consumers in its targeted consumer classes. With this application, CG&E is seeking funding of the programs through two trackers. The tracker charge will apply to only those consumer classes receiving benefits, regardless of their electric supplier.

In the Commission's Order in Case No. 03-93-EL-ATA, a DSM Rider for residential electric DSM programs was approved with a zero charge. With this application, CG&E, with the support of the Interested Stakeholders, is proposing specific charges for residential electric consumers, the establishment of a non-residential electric component for the approved DSM Rider, and. the establishment of a Gas DSM Rider and program for residential gas consumers.

B. Definitions

For the purposes of this Application, the following terms have been defined:

1) **"DSM Revenue Requirements"** shall mean the revenue requirements associated with all Program Costs, Administrative Costs, Lost Revenues (less fuel savings), and the Shared Savings Incentive.
2) **"Collaborative"** shall mean the CCEP Collaborative.
3) **"Program Costs"** shall mean the costs incurred for planning, developing, implementing, monitoring and evaluating the DSM programs that have been approved by the Collaborative.

4) **"Administrative Costs"** shall mean the costs incurred by or on behalf of the collaborative process and that are approved by the Collaborative, including, but not limited to, incremental costs for consultants, employees and administrative expenses.

5) **"Lost Revenues"** shall mean the amount of net revenue due to lost sales due to installed DSM programs. Lost revenues will be calculated using estimates approved by the Commission which may include engineering estimates[1] of the level of decreased sales for each program. The level of net revenue due to lost sales will be the product of the actual level or the level calculated by multiplying the average lost sales per unit of DSM by the number of installed units, multiplied by the incremental charge, less the fuel costs reflected in the applicable market price or rate. Following any retail rate case, lost revenue recovery would cease on any lost revenues subsequently reflected in rates.

6) **"Shareholder Incentive"** shall mean a percentage share of the net benefits attributable to DSM programs provided as an incentive to pursue such programs. The Shareholder Incentive or Shared Savings will be a percentage of the net resource savings generated by DSM measure installation during each twelve-month period. The percentage will be based upon the level of load savings achieved relative to the goal for the program at or below the projected level of spending for that level of load savings. Net resource savings is defined as program benefits less utility program costs. Benefits will be calculated on the basis of the present value of avoided costs over the expected life of the

[1] Engineering estimates, estimates based on generally accepted engineering calculations, will be used when there are no data on savings available from impact studies.

implemented DSM programs.

7) **"DSM Cost Recovery Mechanism"** shall mean the methodology used to reconcile differences between the amounts of revenue actually collected through the mechanism and the amount of revenues estimated to be collected. For program and administrative costs, a balance adjustment amount will be determined by calculating the amount collected and the actual costs during the same twelve-month period. For revenues attributable to lost sales, the balance adjustment will be determined by calculating the revenues from lost sales based upon the difference between the actual installed units of the DSM measures and the projected units. If engineering estimates or estimates taken from studies outside the Cinergy service area have been used as the basis for the calculation of Lost Revenues, during the first balancing period at which sufficient actual impact data is available, an adjustment for the difference between the original estimate and the actual impact data shall be made retroactive to the program start date, and shall be included in the balancing adjustment for the following year. After impact data from the first impact evaluation study has been employed in a reconciliation, differences between actual impact data collected in a given year and the actual impact data used in a prior year shall be used only to affect future cost recovery, and shall not be applied retroactively to the program start date. For the Shareholder Incentive, the balance adjustment amount will be calculated by determining the incentive amount based on actual installed DSM measures and the projected incentive amount. Adjustments to the cost-effectiveness calculations arising from completion of the first impact

studies will be applied retroactively to the program start date. The results of future impact studies will be applied up to the timing of the prior impact study. All of these adjustments will reflect any differences between actual and projected sales volumes. Any over- or under-recovery, with interest applied at the rate equal to the average of the three-month commercial paper rate for the immediately preceding twelve-month period, will be divided by kWh or MCF sales for a subsequent twelve-month period, as a portion of the DSM balance adjustment to the DSM Cost Recovery Mechanism. Any over- or under-recovery of a previous balance adjustment amount will also be included in the application of the DSM balance adjustment.

8) **"Voucher"** shall mean the credit receipt the consumer receives from a social service agency. The voucher can be used by the consumer as a partial payment toward the utility bill.

C. Acronyms

ACCA	**Air Conditioning Contractors of America**
AFUE	**Annual Fuel Utilization Efficiency**
ARI	**Air Conditioning and Refrigeration Institute**
CCEP	**Cinergy Community Energy Partnership**
CG&E	**The Cincinnati Gas & Electric Company**
DSM	**Demand Side Management**
ECM	**Electronically Commutated Motors**
HEHC	**Home Energy House Call**
HVAC	**Heating, Ventilation, and Air Conditioning**

IRP	**Integrated Resource Plan**
NATE	**North American Technician Excellence**
NEED	**National Energy Education Development**
PER	**Personalized Energy Report Pilot**
PIPP	**Percentage of Income Payment Program**
PV	**Photovoltaic**
RSES	**Refrigeration Service Engineers Society**
SEER	**Seasonal Energy Efficiency Ratio**

II. PROCESS OF PROGRAM SELECTION

The DSM programs being submitted for approval to the Commission were developed by CG&E with the Interested Stakeholders through a two step process. The first step was development of proposed programs by CG&E. Similar programs are currently implemented in Cinergy's Indiana and Kentucky service territories. If implemented in Ohio, these programs benefit from the shared administration, experience and development already invested by Cinergy, thus keeping costs down for all consumers. The Interested Stakeholders have reviewed and approved these programs.

The second step was the solicitation of new program ideas from the members of the CCEP Board. These ideas were then refined and reviewed by Cinergy staff, applying the cost effectiveness analysis (described in section III) used for all programs. Those programs deemed cost effective were then reviewed by the CCEP Board and considered for inclusion in the overall DSM process. Approved programs included within this filing are:

RESIDENTIAL PROGRAMS

- Home Energy House Call
- AC Check Pilot
- Smart Saver/Summer Saver
- Power Manager
- Energy Star Products
- Energy Efficiency Website
- Ohio Energy Project
- Appliance Turn-In
- Personalized Energy Report
- Pre-Paid Billing Services

COMMERCIAL PROGRAMS

- Commercial & Industrial (C&I) Prescriptive Incentive Program
    - School Incentive Program
- Photovoltaic Schools Demonstration/Education Program

RESEARCH

- House Call Plus Research Program

III. COST-EFFECTIVENESS SCREENING METHODOLOGY

A. General

CG&E believes it is in the best interest of its consumers to provide incentives that promote the installation and implementation of energy efficiency measures and technologies in a cost effective manner. Over time, new technologies are designed that

warrant attention within the context of utility provided DSM programs.

In addition to the economic and technological reasons for offering DSM programs in CG&E's territory, there are also market reasons for expanded utility involvement. First, as mentioned previously, only the largest companies are being served by the Energy Services market providers. Second, for residential and smaller commercial/industrial consumers, the energy efficiency market has many existing barriers to the adoption of efficient technology. These vary by technology and market but include: higher incremental costs for high efficiency equipment, lack of consumer education, lack of contractor/trade ally training, lack of equipment supply at time of replacement, fear of change, and societal costs not being reflected in prices. While it was hoped that during the general advance of restructuring, more free market players would move the market towards greater energy efficiency, this is only happening for the largest consumers. Consequently, CG&E believes that the utility needs to continue to play a role in promoting and encouraging energy efficiency. The utility has an existing relationship with the consumer and is viewed by most consumers as their main source of energy information. Contractors, retailers, trade allies, and other players in the market also interact with the utility and its consumers. As such, the utility is in a unique position to integrate consumer and trade ally needs for information, education, services, market stimulation, and financial assistance through technology incentives to help remove market barriers and speed the adoption of more efficient technologies.

CG&E recognizes that implementation of energy efficiency measures within DSM programs can reduce the long-run supply costs of power for consumers and looming carbon mitigation costs. As a result, the Company believes it is important to

continue the work of cost-effectively increasing consumers' energy efficiency.

In addition, the cost of energy is expected to increase due to the cost of additional capacity required to meet a growing consumer demand and due to the cost of environmental compliance associated with the reduction of sulfur dioxide (SO_2), nitrogen oxide (NO_x), and mercury (Hg) emissions. This argues for an even more aggressive DSM program that targets not just reductions in kW summer peak demand (peak reduction programs), but also reductions in kWhs throughout the year (conservation programs).

B. Methodology

CG&E carefully evaluates the cost-effectiveness of DSM measures when making decisions about inclusion in DSM programs. The net present value of the financial stream of costs vs. benefits is assessed, *i.e.*, the costs to implement the measures are valued against the savings or avoided costs. The resultant benefit/cost ratios, or tests, provide a summary of the measure's cost-effectiveness relative to the benefits of its projected load impacts.

The main criteria CG&E uses for screening DSM measures are the Utility Cost Test (UCT), the Total Resource Cost Test (TRC), and the Ratepayer Impact Test (RIM). A Participant Test is also reviewed to make sure the program makes sense for the individual consumer. The UCT compares utility benefits to utility costs and does not consider other benefits such as participant savings or societal impacts. This test compares the cost (to the utility) to implement the measures with the savings or avoided costs (to the utility) resulting from the change in magnitude and/or the pattern of electricity consumption caused by implementation of the program. Avoided costs are

considered in the evaluation of cost-effectiveness based on the projected market price of power including the projected cost of environmental compliance. With the expected increase in the cost of compliance for controlling SO_2, NO_x, and Hg emissions, the benefits of conservation have increased. The cost-effectiveness analyses also incorporate avoided transmission and distribution costs, load (line) losses, and avoided ancillary services.[2]

The TRC test compares the total benefits to the utility and to participants relative to the costs to the utility to implement the program and the costs to the participant. The benefits to the utility are the same as those computed under the UCT test. The RIM test, or non-participants test, indicates if market prices and rates increase or decrease over the long-run as a result of implementing the program.

In addition to the standard tests, CG&E conducted additional cost-effectiveness studies that incorporate a more complete analysis of the range of expected values across alternate load and weather impacts. The cost-effectiveness that could occur under these alternate weather and market price conditions provides a more robust view of the cost-effectiveness of a measure or program. CG&E performed simulation analyses of the value of the energy impacts using more than thirty years of historical weather data. Under extreme weather conditions (and hence extreme market price and avoided cost conditions), the expected value of test results can increase. Under these conditions, DSM programs yield more value (*i.e.*, option value), since the value of the energy saved is also increasing. While the probability of such events may be small, the value of such events can be significant. The option valuation method provides insights regarding the extent to

[2] Ancillary services include OATT Schedules 1, 2, 3, 5, 6, 8 and OATT Schedule 7 split between peak and off-peak months.

which a particular DSM program provides a hedge against potential increases in market prices and/or market price volatility.

The costs associated with implementing new measures in DSM programs include incentives offered to consumers to encourage participation and vendor delivery and installation costs (if applicable). The costs to market the program (including direct mail and/or channel fees) and the expenses for program administration are not directly included in the calculation of the UCT due to the difficulty of allocating them to the individual measures. Rather, measures are considered cost-effective as long as the UCT is more than 30% above 1.0 in order to allow for the additional program costs.

Previously, CG&E used EPRI's DSManager program for assessing DSM program cost-effectiveness; however, CG&E now uses a more comprehensive and convenient Excel-based analysis to replace DSManager because: 1) EPRI no longer supports DSManager; 2) computing power has increased to the point where PCs can now handle complex DSM evaluations more easily; 3) spreadsheet analyses allow for a more transparent review of input assumptions and key sensitivities, which serves to enhance the overall quality of the evaluation and subsequent decisions; and 4) CG&E's current approach allows for the assessment of weather normal load impacts, option valuation, and the future possibility of valuing avoided locational commodity costs on the electrical system (*e.g.*, constrained interconnections, highly loaded feeders).

C. Program/Measure Screening

CG&E is proposing that the following DSM programs be implemented.

RESIDENTIAL PROGRAMS

- Home Energy House Call

- AC Check Pilot
- Smart Saver/Summer Saver
- Power Manager
- Energy Star Products
- Energy Efficiency Website
- Ohio Energy Project
- Appliance Turn-In
- Personalized Energy Report
- Pre-Paid Billing Services

COMMERCIAL / INDUSTRIAL PROGRAMS

- C&I Prescriptive Incentive Program
    - School Incentive Program
- Photovoltaic Schools Demonstration/Education Program

RESEARCH

- House Call Plus Research Program

Detailed descriptions and information on each program are provided in the following section. The test results for each new measure and program in this DSM filing are provided on page 1 of Attachment A for the residential programs and pages 1a and 1b in Attachment B for the commercial and industrial programs. These results utilize the projected market cost of power including the projected cost of environmental compliance. All the programs pass the UCT and TRC cost-effectiveness tests. CG&E also evaluated a photovoltaic incentive program. This program provided for the installation of a demonstration photovoltaic system in a few schools. While this program is not cost

effective, it is being recommended for implementation as a demonstration and educational project.

The following programs are the initial programs identified by the CCEP Collaborative. As part of the ongoing CCEP annual planning process, the CCEP Collaborative will review and make recommendations for revisions and improvements to the existing 5 year program plan and adjust programs and technology funding levels based on the performance of the programs, market conditions, and consumer demand. The Company and the CCEP Collaborative will seek approval from the PUCO for those adjustments requiring funding level changes outside authorized levels or the addition or elimination of programs. Commission approval will not be sought for adjustments to existing programs due to new technologies as long as the programs continue to pass cost effectiveness tests.

IV. Program Descriptions

RESIDENTIAL PROGRAMS:

1. Home Energy House Call

The Home Energy House Call program (HEHC) is an in-home energy analysis that helps consumers determine the most cost-effective steps they can take in their home to save energy. The analysis looks at potential efficiency improvements from insulation to equipment replacement. Data taken from the analysis is run through a computer model to make recommendations and disaggregate the energy bill into usage categories. The results are mailed to the participant. This program will be jointly implemented with the Cinergy PSI and ULH&P territory to reduce administrative costs and leverage promotion.

Target Market: Owner occupied single-family homes and condominiums throughout the CG&E territory.

Technology Categories: The HEHC analysis looks at shell measures, air sealing, lighting, heating and cooling equipment, and appliance use in the home.

Market Barriers: The HEHC analysis addresses the need for quality information on energy efficiency options within a home. Consumers can get information by measure from other sources, but no other source within the market provides a full analysis of all

measures. This independent view adds credibility to the information and allows non-biased analysis.

Components of Delivery:
Incentives: The audit is free to the consumer. No incentives are provided for measures installed, however, participants get a free low cost measure kit at the time of the audit to begin their energy savings immediately. The kit includes 2 CFL bulbs, low flow showerhead, 2 aerators, motion sensor night light and outlet gaskets.

Education/Training: HEHC is an education program in participant's homes providing information on ways consumers can save and make improvements.

Marketing: The primary method of participant recruitment is through direct mail to CG&E consumers by zip code areas. Other information is provided through bill stuffers, and call center referrals.

Market Support: Consumers who wish to implement the recommendations from the HEHC analysis utilize the existing contractors and market providers within the area.

Delivery Organizations: The program is delivered through GoodCents Solutions, a national energy services provider, who was chosen through a competitive bid process.

Quality Control/Monitoring: Consumers are asked to complete a written survey about their HEHC analysis experience and the information provided. CG&E also does in-field review with the field auditors and phone interviews of a participant sample.

Budget: Total Budget request for the program is outlined in Appendix A. Year 2006 request is $850,000.

Expected Participation: 3250 homes in 2006

Savings per Participant: 998 kWh 0.31 kW

Cost Effectiveness: Cost effectiveness results are UCT 4.89; TRC 4.89; RIM 0.98

2. AC Check – Test Program

Air conditioners are a large user of electricity during CG&E's summer peak season and, as such, their use and operation can negatively impact the CG&E system if they are running improperly. To address this, CG&E is testing during the 2006 summer season, a central air conditioning tune up and recharge program to increase efficiency of units. Using the Check Me! program developed in California, CG&E will work with contractors to test the savings available from these maintenance improvements.

Target Market: Consumers who have central air conditioning in owner-occupied single-family or mobile homes.

Technology Categories: The Check Me! program looks at air flow and refrigerant charge to optimize unit operation. CG&E tested this program on low-income homes and found 10% to 15% savings from these improvements.

Market Barriers: Consumers, as well as many contractors, do not maintain and test their air conditioning equipment to insure proper and efficient operation. This lack of knowledge and motivation to test the units causes many systems to be under- or over-charged with refrigerant or not have proper airflow. This increases the consumer's energy use and energy bill. It also causes an unnecessary increase in load on the CG&E system at peak. Direct assistance is required to make appropriate equipment improvements.

Components of Delivery:
Incentives: CG&E pays a $100 incentive for the unit testing which is typically 1/3 of the cost.

Education/Training: CG&E provides the training through Proctor Engineering to the technicians at the participating companies.

Marketing: This will be marketed through the participating contracts in the pilot program.

Market Support: Proctor Engineering, the developers of Check Me!, and another yet to be determined local engineering firm will provide technical support.

Delivery Organizations: Yet to be determined HVAC contractors will provide the infield services for the pilot. Proctor Engineering provides the software, training, tracking and technical support.

Quality Control/Monitoring: Quality control and monitoring occurs through the Proctor tracking system as well as through field monitoring by CG&E or a subcontractor.

Other Standards for Participation: Proctor Engineering establishes adjustment guidelines. If a unit is replaced, efficiency of the existing unit will be SEER 13.

Budget: Total Budget request for the program is outlined in Appendix A. Year 2006 request is $32,500.

Expected Participation: The test will consist of 250 units for the first year and double each year if successful.

Savings per Participant: 394 kWh 0.35 kW

Cost Effectiveness: Cost effectiveness results are UCT 3.75; TRC 16.26; RIM 1.08

3. Smart $aver®/Summer Saver (includes gas furnaces)

The Smart $aver®/Summer Saver program provides market incentives and market support to consumers, heating contractors and new home builders to promote the use of high efficiency heat pumps with electronically commutated motors (ECM), high efficiency gas furnaces with and without ECM motors, and high efficiency Energy Star central air conditioners. Monetary incentives and technical support to trade ally sales personnel stimulate demand for the high efficient equipment options. This program will be jointly implemented with the Cinergy PSI territory to reduce administrative costs and leverage promotion.

Target Market: In the residential new home market, builders and new homeowners are targeted. In the existing home market we target heating contractors and CG&E consumers who purchase new heating systems or cooling systems for their homes.

Technology Categories Included: SEER 14 or higher heat pumps with ECM motors, SEER 14 or higher central air conditioners including devices that increase efficiency on these two items; thermal expansion valves, fan delay relay switches, new higher efficiency refrigerants and new compressor technologies. Gas furnaces with efficiencies at or above 90% AFUE with and without ECM motors. Incentives vary based on inclusion of the ECM motor. Technology levels may change over time in response to changes in technology, market acceptance and upgrades to national or state efficiency codes.

Market Barriers Addressed: There are several barriers addressed through the program, but the most common is the higher price of high efficiency HVAC systems. We address this with incentives to the builder or consumer to mitigate the additional expense. However, the most important way to address the higher price is to educate all builders, HVAC personnel and consumers about the payback for purchasing a high efficiency system. The second barrier is builder and heating contractor participation. Through education, in-field sales support and incentives to builders and HVAC sales personnel, more high efficiency systems are promoted to consumers because the sales person is more knowledgeable and they understand the benefits to the consumer. Additional support is provided through manufacturer relationships that help coordinate promotions for the same high efficiency technologies. The Smart $aver®/Summer Saver program also works in coordination with the national Energy Star initiatives which label high efficiency equipment for easy market recognition and score homes higher if they have high efficiency heating and/or cooling equipment.

Components of Delivery:
Incentives: Incentives or "consumer rewards" are available to three parties: builders, heating dealers and consumers. Heating dealers are usually the party that completes the application for incentives, as they are most aware of the technical information needed to certify the efficiency of the HVAC system. Proposed incentives are:

- Gas Furnaces = $300

- Gas Furnaces with ECM motors = $550
- Central AC = $250
- Heat Pumps with ECM motors = $350

Incentives levels may change over time in response to market and price changes.

Education/Training: Training is provided to heating dealer technicians, sales personnel, and owners. Builders are provided with training through local and state homebuilder associations. Consumers are educated through pamphlets, bill stuffers, web sites, and primarily through the trade ally network.

Marketing: Marketing support includes advertising support, heating and cooling cost estimates, payback estimates, brochures, web site information, testing sites for technicians and technical support for all parties.

Market Support: Cinergy has developed a team of Account Managers to support all needs of the builders, heating dealers and consumers in its PSI territory and will utilize those experts to help jump-start the program. The team disseminates all program information, receives daily calls from builders, dealers and consumers, processes all applications and awards all incentives. In addition to the normal marketing support needed for this program, the residential DSM team also is considered an excellent resource for any energy related question about heating, cooling, home building, insulation and energy usage. It is this field support that allows this program to run as efficiently as it possibly can.

Program Delivery: CG&E will use its residential DSM team to implement this program. In the Cinergy PSI territory, the Cinergy team has 14 years experience with the Smart $aver® program and each of the account managers have 25 years or more experience in energy conservation and energy technologies. Those resources as well as new Ohio based resources will be trained and utilized to expand capabilities in Ohio.

Quality Control/Monitoring: Participating heating dealers must have a certified heat pump technician. Certification may be from RSES or NATE. Homes receiving incentives are randomly selected and inspected for compliance. The individual who is responsible for the proper equipment to be installed signs every application. The model numbers for every job are confirmed as high efficient models in the ARI standards.

Other Standards for Participation: Home listed on the application must be a single family home, condominium, or duplex. Dwellings not eligible are apartments, mobile homes, commercial or other non-residential buildings. New system listed on the application must serve the entire home or if there is more than one system, all systems must meet the SEER minimum requirement. Total system airflow must be adequate for the new system, according to ACCA's Manual D. A certified technician name is asked for on each application.

Budget: Total Budget request for the program is outlined in Appendix A. Year 2006

request is $2,711,800.

Expected Participation: For 2006, the expected participation is 100 Heat Pumps with ECM motors, 5000 Gas Furnaces, 500 Gas Furnaces with ECM motors, and 1000 Central Air Conditioners.

Savings per Participant:

- Gas Furnaces 451 therms
- Gas Furnaces with ECM motors 772 kWh 0.24 kW 451 therms
- Central AC 280 kWh 0.25 kW
- Heat Pumps with ECM motors 922 kWh 0.29 kW

Cost Effectiveness: Cost effectiveness results are:

Heat Pumps with ECM Motors UCT: 1.94, TRC: 1.74, RIM: 0.54
Gas Furnaces UCT: 8.31, TRC: 2.87, RIM: 0.77
Gas Furnaces with ECM Motors UCT: 5.52, TRC: 2.46, RIM: 0.77
Central Air Conditioners UCT: 1.80, TRC: 8.48, RIM: 0.85

4. Power Manager

The purpose of the Power Manager program is to reduce demand by controlling residential air conditioning usage during peak demand conditions in the summer months. The program is offered to residential consumers with central air conditioning. CG&E would attach a load control device to the consumer's compressor to enable CG&E to cycle the consumer's air conditioner off and on when the load on CG&E's system reaches peak levels. Consumers receive financial incentives for participating in this program based upon the cycling option selected. This program will be jointly implemented with the Cinergy PSI and ULH&P territories to reduce administrative costs and leverage promotion.

Target Market: Homes in the CG&E territory with central air conditioners.

Technology Categories: This program addresses central air conditioners and cycles those units during times of peak load via a paging system. There are two levels of cycling in which a consumer can opt for participation. These levels then determine the amount of cycle time the unit is off. Typical temperature increases within the home during the time of cycling is 1-2 degrees.

Market Barriers: Central air conditioners cause high demands on the CG&E system during the summer. The Power Manager program offers an opportunity to reduce that load with little impact on comfort. This program provides a way to show consumers the value of such load reduction and provides the utility with cost effective load reductions that save all consumers money.

Components of Delivery:
Incentives: Participants receive a one-time sign up incentive and then a Variable Daily Event Incentive for each day that the A/C system is cycled. For any given day, the Variable Daily Event Incentive is based on the kW Reduction selected by the consumer, the number of hours that the A/C system is cycled on any given day and the real time value of electric energy during the control event. If a consumer selects Option A, their air conditioner is cycled to achieve a 1 kW reduction in load. If a consumer selects Option B, the air conditioner is cycled to achieve a 1.5 kW load reduction. Incentives are provided at the time of installation: $25 for Option A and $35 for Option B. In addition, when a cycling event occurs, a Variable Daily Event Incentive based upon marginal costs is also provided.

Education/Training: CG&E provides education information to consumers on the program and ways to stay cool during the hot summer peak days.

Marketing: Direct mail is the primary method of recruitment for interested consumers.

Market Support: HVAC contractors have been notified about the program and the control equipment used.

Delivery Organizations: The program is delivered through GoodCents Solutions, a national energy services provider, who was chosen through a competitive bid process.

Quality Control/Monitoring: CG&E completes consumer follow up inquires and performs random field visits of the installations.

Budget: Total Budget request for the program is outlined in Appendix A. For the year 2006, the request is $960,533, rising to over $3,000,000 per year as the program ramps up.

Expected Participation: For 2006, the expected consumer participation is 2,000.

Savings per Participant: Option A 1.0 kW Option B 1.5 kW Average 1.38 kW

Cost Effectiveness: Cost effectiveness results are UCT 1.56; TRC 2.05 RIM 1.56

5. Energy Star Products

The Energy Star Products program provides market incentives and market support through retailers to build market share and usage of Energy Star products. Special incentives to buyers and in-store support stimulate demand for the products and make it easier for store participation. The program targets Residential consumers' purchase of specified technologies through retail stores and special sales events. The first year of the program focuses on compact fluorescent lamps (bulbs) and torchiere lamps. This program will be jointly implemented with the Cinergy/ULH&P territory to reduce administrative costs and leverage promotion.

Target Market: Residential consumers purchase of specified technologies through retail stores.

Technology Categories: The first year of the program will focus on compact fluorescent lamps (bulbs), and torchiere lamps.

Market Barriers: There are several barriers addressed through the program. The first is price. Purchase rewards are provided for consumers to lower first cost of the item and stimulate interest. The second barrier is retailer participation. Through retail education, in-field sales support (signs, ads, etc), and stimulated market demand retailers stock more product, provide special promotions and plan sales strategies around these Energy Star products. Additional support is provided through manufacturer relationships that often can reduce prices through special large-scale purchases. Coordination will occur with the national Energy Star initiatives such as "Change a Light, Change the World" promotion.

Components of Delivery:
Incentives: Incentives or "consumer rewards" will be available in two ways, through mail-in forms available from the retailer and through special in-store "Instant Reward" events that occur in-store at the time of purchase. Initial proposed incentive levels are:

- CFL's = $2 per bulb
- Torchiere lamps = $20 per lamp

Incentives may change based on market prices and response as well as manufacturer/distributor co-funding.

Education/Training: Training will be provided to sales staff of the retailers and sales aids provided.

Marketing: Marketing support will include point of purchase displays and materials, co-operative advertising, coupons, and special "instant sales events". Public relations materials will also be used.

Market Support: The key to this program that is different from past utility rebate programs is market support. "Circuit Riders" will visit each store at least every six months to provide materials, training and label product. This in-field support eliminates

many of the barriers that retailers have to promoting this program. Another portion of the market support is coordination with manufacturers on a national level. Working with the national and regional Energy Star efforts, CG&E will be able to leverage quantities and reduce prices in the marketplace.

Delivery Organizations: CG&E proposes to use the Wisconsin Energy Conservation Corporation ("WECC") to provide this service. Recognized as the national leader in this program and located in the region, CG&E can take advantage of WECC's current activity to control costs and leverage other activity in the mid-west.

Quality Control/Monitoring: Monitoring occurs through reward verification tracking and in-store assessments by the Circuit Riders.

Other Standards for Participation: Technologies must be listed as complying with Energy Star standards as posted on the Energy Star web site.

Budget: Total Budget request for the program is outlined in Appendix A. Year 2006 request is $2,008,640.

Expected Participation: Expected participation for 2006 is 500,000 CFL bulbs, and 1,800 Torchiere lamps.

Savings per Participant: CFL 66 kWh 0.02kW Torchieres 388 kWh 0.12 kW

Cost Effectiveness: Cost effectiveness results are
CFL's - UCT 12.55; TRC 12.55; RIM 1.04
Torchieres – UCT 7.38, TRC 5.26, RIM 0.98

6. Energy Efficiency Website

Energy Zone™ is CG&E's enhanced energy efficiency web site. It provides CG&E consumers the most advanced programs, tools, and measures available to manage their energy and achieve load impacts. The website features a multi-tiered design providing the consumer the opportunity to receive quick customized energy tips and, if they choose, the ability to complete an online audit and receive ten (10) self-install energy efficiency measures. The marketing of the Energy Efficiency Website is an initiative meant to diversify and increase the reach of CG&E's DSM programs.

Target Market: With over 70% of CG&E consumers having access to the Internet in either their homes or at work, the target market is comprised of those individuals who do not have the time or logistically cannot be available for the Home Energy House Call audit program.

Technology Categories: The Energy Efficiency Starter Kit provides the consumer with the following measures:

(1) 15w CFL Bulb

(1) 20w CFL Bulb

(1) 2.0 GPM Earth Showerhead

(1) Dual Setting Touch Flow Kitchen Aerator with Swivel

(1) 1.5 GPM Standard Faucet Aerator

(1) LimeLite Nite Light

(1) Package of Toilet Dye Tablets

(2) Switch/Outlet Draft Stoppers

(1) Energy Star Efficiency Guide

Market Barriers: The largest barrier to success of the program is making the consumer aware of the website. For those consumers interested in how they use energy and lowering their energy bill, the website contains the audit tool, an appliance calculator, efficient products e-catalog and a library of energy information. The challenge is to get them to visit the website, which will happen primarily through direct marketing to the end user and promotion through the Call Center Consumer Service Representative.

Components of Delivery:

Incentives: The Energy Efficiency Starter Kit is the incentive for the website program. The kit will be sent to every consumer who completes the Quick-e-Audit.

Education/Training: The Consumer Service Representative in the Call Center will receive training on the program.

Marketing: Marketing will be conducted through direct mail and Call Center Representatives.

Market Support: No additional support is needed.

Delivery Organizations: The CG&E DSM department will have oversight for the delivery of the program.

Quality Control/Monitoring: The tracking of consumer usage pre/post completing the Quick-e-Audit is important to determine the installation of measures.

Budget: Total Budget request for the program is outlined in Appendix A. Year 2006 request is $137,700.

Expected Participation: Target participation for 2006 is 6,000 people completing audits and receiving kits.

Savings per Participant: 205 kWh 0.06 kW

Cost Effectiveness: Cost effectiveness results are UCT 6.18; TRC 23.83; RIM 0.96

7. Ohio Energy Project (NEED)

The Ohio Energy Project, a part of the National Energy Education Development (NEED), was previously part of the Ohio Collaborative activities before deregulation. The CCEP Board would like to restart the support of this important education program for Ohio. NEED was launched in 1980 to promote student understanding of the scientific, economic, and environmental impacts of energy. The program is currently available in 36 states, the U.S. Virgin Islands, and Guam. The Ohio Energy Project (NEED) activities provide teachers and students in Ohio with the materials, skills and classes to promote energy education in the classroom. The program will also provide a limited number of energy efficiency "kits" that will allow students to directly install energy efficiency items in their homes as it relates to their curriculum. This allows learning and direct savings from the program. Cinergy also supports NEED activities in its Kentucky and Indiana territories.

Target Market: The Ohio Energy Project (OEP) targets schools, teachers and students in the CG&E territory.

Technology Categories: The OEP looks at all energy sources and efficiency technologies. The kits will provide low cost savings measures such as compact fluorescent bulbs, low flow shower heads, gasket covers and faucet aerators.

Market Barriers: Energy education of our future leaders and citizens is critical to long term positive attitudes towards energy efficiency. By educating students about energy, they can then take those concepts and practices to their home to start saving energy immediately as well as for the long term. This program provides the tools, materials and curriculum to complete that education for long term impacts.

Components of Delivery:
Incentives: Free curriculum materials and kits are provided to schools as well as teacher education courses on how to use the materials. There are no other direct incentives.

Education/Training: OEP educates not only the teachers, but utilizes a peer "student-to-student" approach to expand its use of the curriculum. OEP also ties the education requirements of the school system and their learning outcomes to the materials. This allows the teachers to incorporate energy education to their overall outcome goals.

Marketing: Schools and teachers will be recruited directly by the OEP staff and their education network.

Market Support: This program is supported by the national NEED program activities, the programs in Cinergy's KY and IN service territories, as well as Cinergy staff.

Delivery Organizations: The program is delivered through the Ohio Energy Project.

Quality Control/Monitoring: Teachers and students are asked to complete a survey of the measures they installed and the condition of the existing measures in their home. This information will be used to determine savings from the kits installed as part of the program. Teachers also provide feedback on the usefulness of the materials directly to OEP. Last control is an advisory group to OEP by a set of educators to help direct the program.

Budget: Total Budget request for the program is outlined in Appendix A. Year 2006 request is $165,000.

Expected Participation: There will be 1000 energy efficiency kits provided as part of the overall focus on energy conservation and efficiency program. Additionally OEP expects to train 800 teachers and 11,000 students per year.

Savings per Participant: 300 kWh 0.09 kW

Cost Effectiveness: Cost effectiveness results are UCT: 1.78; TRC: 19.54; RIM: 0.65.

8. Appliance Turn-In

Older vintage room air conditioners (room AC) can be one of the least efficient electrical appliances in the home. Often these old units are used when they are not functioning properly and as a result use electricity very inefficiently. To encourage consumers to dispose of their old room air conditioners and purchase efficient Energy Star models, the CCEP proposes a room AC turn-in program. Located at retailer locations during special promotions, participants would receive coupons towards more efficient units if they turn in an old unit. Units received will be recycled through a certified recycling agency.

Target Market: CG&E residential consumers with old room air conditioners.

Technology Categories: Room air conditioners that the participant can bring to a drop off point. Coupons will be provided towards Energy Star room air conditioners.

Market Barriers: Room AC units often are inefficient and ineffective without the user realizing it. The fan may continue to run while the compressor is not functioning properly. This causes a barrier due to lack of knowledge and lack of stimulation to change out that unit. This program provides both the education and stimulation to remove and replace the inefficient unit.

Components of Delivery:
Incentives: Incentives will be provided on two levels, first an incentive to turn in the old unit and the second an additional incentive to upgrade to an Energy Star room AC unit. The logic for the two-level incentive approach is to get units recycled even if the participant is not replacing the old unit, as they may be going to a central AC system. Participants would receive a $15 coupon to drop off their old unit good towards anything in the store, and another $35 coupon towards a new Energy Star room AC unit, both good at the sponsoring retailers' facility. This approach will mitigate free-rider costs and maximize the number of units recycled.

Education/Training: Education will occur through the promotion of the program as well as by the retailers' within the store.

Marketing: Marketing will be through co-op advertising with the retailers' for the special limited time events.

Market Support: CG&E will hire a subcontractor to coordinate and implement this program. Additional market support will be through Cinergy CG&E marketing and working with the national Energy Star program.

Delivery Organizations: A competitive bid process will be used to select a subcontractor to implement the program.

Quality Control/Monitoring: CG&E will monitor events by the subcontractor for compliance. Units received and recycled will also be tracked to determine impacts.

Budget: Total Budget request for the program is outlined in Appendix A. Year 2006 request is $105,000.

Expected Participation: The program expects to collect and recycle 1,000 room air conditioners annually.

Savings per Participant: 175 kWh 0.16 kW

Cost Effectiveness: Cost effectiveness results are UCT 1.67; TRC 3.19; RIM 0.78

9. Personalized Energy Report Pilot Program

The Personalized Energy Report (PER) will provide the CG&E consumer with a customized energy report aimed at helping them better manage their energy costs. With rising energy costs in all aspects of daily life, the consumer is searching for information they can use and ideas they can implement which will impact their monthly energy bill. The PER program also includes the *"Energy Efficiency Starter Kit"* which is nine easily installed measures which demonstrate how easy it is to move towards improved home energy efficiency.

Target Market: The program will target single family residential consumers in the CG&E market that have not received measures through the Home Energy House Call energy efficiency audit or a weatherization program within the last three years.

Technology Categories: Program targets the entire home from an energy usage standpoint. The consumer will be provided energy tips and information regarding how they use energy and what simple, low cost/no cost measures can be undertaken to lower their energy bill.

Market Barriers: Lack of consumer education on how they individually consume energy in their home and the steps which can be taken to lower energy bills are the major hurdles to overcome. This program is meant to educate the consumer and put at their disposal, information, customized tips and simple to install measures which can all lower their energy costs.

Components of Delivery:
Education/Instructions: Both the energy survey which is completed by the consumer and generates the personalized energy report and the report itself are excellent educational tools. They will stimulate the consumer to think about how they use energy and then will provide them with tools and information to lower their energy costs. Additionally, the instructions on how to install the energy measures will demonstrate to the consumer how easy it is to improve their efficiency.

Marketing: The PER program commences with a letter to the consumer, offering the Personalized Energy Report if they would return a short, 14 question survey about their home. The survey asks very simple questions such as age of home, number of occupants, types of fuel used to heat, cool and cook. Once returned, the survey is used to generate a customized energy report.

Delivery: The program is delivered completely through CG&E

Quality Control/Monitoring: CG&E will complete a follow-up survey with a sub segment of the consumers who received the offer and those who also responded to determine what drove their responses. Additionally, the survey to those consumers who

did receive a customized energy report will also include questions regarding installation of the measures found in the *"Energy Efficiency Starter Kit"*.

Materials:

Personalized energy report: The report will contain the following information:

- Month-to Month Comparisons of 2005 for electric and/or gas usage including the amount of the bill
- Predictions of consumer's usage based on 95th percentile weather conditions (extremely hot summer/extremely cold winter) and 5th percentile weather conditions (extremely mild summer/extremely mild winter). Also includes bill amounts based on 2006 tariffs.
- Trend chart showing usage of electric and/or gas by kWh/CF by month and amount of monthly bill
- Bill comparison of CG&E vs. the average national electric and/or gas rate
- A disaggregation of how the consumer uses electricity and/or gas
- Description of Budget Bill
- Customized energy tips

Customized tips will based upon the consumers specific answers to questions in the survey. As an example

- If the age of the home is over 30 years, plastic window kits would be a recommend measure
- If over 50% of the ducts are in the attic, adding duct insulation would also be a measure.

"Energy Efficiency Starter Kit": The kit will be sent to the consumer in conjunction with the personalized energy report. The kit contains the following items:

- 1 each 1.5 GPM showerheads
- 1 each Kitchen Swivel Aerator 1.5 GPM
- 1 each Bathroom Aerator 1.0 GPM
- 1 each Small Roll Teflon Tape
- 1 each 15 Watt CFL (Energy Star)
- 1 each 20 Watt CFL (Energy Star)
- 1 each 17' Roll of Closed Cell Foam Weatherstrip
- 1 each Combination Pack (6) Switch/Outlet Gasket Insulators
- Installation instructions for all measures

Budget: Total Budget request for the program is outlined in Appendix A. Year 2006 request is $ 1,077,736.

Expected Participation: The program expects to reach 52,800 consumers.

Savings per Participant: Cinergy is using a similar kit in the Home Energy House Call and NEED programs with great success. In those programs, the average participant is saving between 240 and 360 kwh and between 10 and 16 therms per year.

Cost Effectiveness: Cost effectiveness results are UCT 9.33; TRC 29.72; RIM 0.62

10. PRE-PAID BILLING SERVICES

Providing consumers with the option of paying for their electrical use prior to consumption not only allows consumers to control their bills, but promotes energy savings. Implemented by several utilities around the country, "Pre-Paid Billing Services" or pre-paid meters provides participants with the metering to understand their energy usage and has resulted in 10% to 20% energy savings. The CCEP is proposing to test this concept recruiting 100 consumers per year for the next four years and analyzing their energy savings compared to a control group.

Target Market: Owner occupied single-family homes throughout the CG&E territory.

Technology Categories: CG&E will utilize one of the pre-paid metering devices available on the market.

Market Barriers: Consumers cannot usually see the impacts from changing the operation of equipment or lifestyle habits with normal utility meters. A pre-paid meter system allows consumers to see those impacts on a real-time basis. This provides immediate feedback and enables consumers to realize that the steps they took to modify their behavior to be more efficient actually saved money. It also allows consumers to adjust their payments to the utility to better meet their personal schedules and cash flow.

Components of Delivery:
Incentives: There are no direct incentives provided to the consumer. Incentives are provided through the consumer's ability to control their utility costs, payment and usage.

Education/Training: Education materials will be developed that describe the use and benefits of the pre-paid billing service.

Marketing: The primary method of participant recruitment is through direct mail to CG&E consumers by zip code areas. Other information is provided through bill stuffers, and call center referrals.

Market Support: Participants will be supported by the CG&E staff and call center. The equipment contractor will provide technical support.

Delivery Organizations: A competitive bid process will be used to chose a subcontractor to implement the program.

Quality Control/Monitoring: CG&E will monitor the subcontractor through random inspections of sites and review of the billing systems. Consumer satisfaction surveys will be conducted. A full evaluation of the energy and bill paying impacts of this program will be conducted.

Budget: Total Budget request for the program is outlined in Appendix A. Year 2006 request is $287,000.

Expected Participation: CG&E will recruit 100 participants per year.

Savings per Participant: 10% of bill or 1565 kWh 0.49 kW

Cost Effectiveness: Cost effectiveness results are UCT 4.70; TRC 4.70; RIM 0.84

COMMERCIAL PROGRAMS

1. Commercial & Industrial Prescriptive Incentive Program

The Commercial & Industrial prescriptive incentive program provides incentives to commercial and industrial consumers to install high efficiency equipment in applications involving new construction, retrofit, and replacement of failed equipment. This program will be jointly implemented with the Cinergy PSI and ULH&P territories to reduce administrative costs and leverage promotion. The current PSI program has been in effect for many years and promotes limited prescriptive incentives for motor, lighting and cooling equipment types. This application expands the program to include additional technologies covering more applications and end uses. This will allow more consumers to participate and avoid lost opportunities for high efficiency equipment in the marketplace.

Target Market: All CG&E commercial or industrial consumers except those receiving service under Rate TS, Service at Transmission Voltage.

Technology Categories: The list of technologies includes refrigeration, variable frequency drives, pumps, controls, motors, lighting, and HVAC equipment. A full listing of technologies covered is provided in Appendix B.

Market Barriers: The small to medium sized commercial and industrial consumer can have significant energy consumption, yet is not frequently served by the Energy Services Market. These consumers lack knowledge and may not understand the benefits of high efficiency alternatives. They may feel that the payback period for energy efficient equipment is too long. CG&E's program provides financial incentives to help reduce this cost differential and improve return. It also provides market demand where the dealers and distributors, or market providers, will stock and provide these high efficient alternatives as they can see increased demand for the products. CG&E provides these market providers with additional information and support so that they better understand the best applications for these technologies.

Components of Delivery:
Incentives: Incentives are provided based on CG&E's cost effectiveness modeling but with a high-end limit of 50% of measure cost. This approach assures cost effectiveness over the life of the measure.

Education/Training: CG&E provides education and training to its market providers to understand the program and the appropriate applications for the technologies.

Marketing: Marketing to consumers and market providers is through mailings.

Market Support: Market support varies by technology. Most technologies included within the program are proven and in the marketplace, though not widely applied. CG&E will provide to market providers additional support and education on newer technologies

that have lesser acceptance.

Delivery Organizations: CG&E will use its current skilled DSM team to manage and implement the program. Additional outside technical assistance will be retained to analyze technical applications and provide consumer/market provider assistance as necessary.

Quality Control/Monitoring: To assure appropriate installation of equipment, applications for incentives will be reviewed and checked for accuracy and whether measures meet appropriate standards. Random field inspections will occur to assure installation.

Other Standards for Participation: Varies by technology.

Budget: Total Budget request for the program is outlined in Appendix B. Year 2006 request is $1,611,243.

Expected Participation: See Appendix B for details on expected application of technology.

Savings per Participant: As there are numerous technologies, those are listed individually in Appendix B.

Cost Effectiveness: Cost effectiveness results were developed by technology and are included in Appendix B, page 1.

School Incentive Program

Due to the special needs of schools and recognizing that saving energy costs in schools helps all taxpayers, CG&E and the CCEP are proposing that $500,000 be set aside as part of the Commercial and Industrial Prescriptive Incentive Program budget for school measures and support. The measures identified for the Commercial and Industrial Prescriptive Incentive Program in this application can help schools reduce their energy consumption. Additional measures will be identified as CG&E works with the schools to assess energy saving opportunities. If all of the funds are not used by the schools within the year, they will be made available to other applicable commercial and industrial consumers. Likewise, if funds applicable to the Commercial and Industrial Prescriptive Incentive Program are not used by other commercial and industrial consumers, those funds will be made available to the schools above the earmarked amount.

The School Incentive Program provides incentives to schools to install high efficiency equipment in applications involving new construction, retrofit, and replacement of failed equipment. This program will be jointly implemented with the proposed Commercial and Industrial Prescriptive Incentive Program.

Target Market: All school consumers of CG&E except any school that may receive service under Rate TS, Service at Transmission Voltage.

Technology Categories: The list of technologies includes refrigeration, variable frequency drives, pumps, controls, motors, lighting, and HVAC equipment. A full listing of technologies covered is provided in Appendix B.

Market Barriers: The small to medium sized school consumer can have significant energy consumption, yet is not frequently served by the Energy Services Market. These consumers lack knowledge and may not understand the benefits of high efficiency alternatives. They may feel that the payback period for energy efficient equipment is too long. CG&E's program provides financial incentives to help reduce this cost differential and improve return. It also provides market demand where the dealers and distributors or "market providers" will stock and provide these high efficient alternatives as they can see increased demand for the products. CG&E provides these market providers with additional information and support so that they better understand the best applications for these technologies.

Components of Delivery:

Incentives: Incentives are provided based on CG&E's cost effectiveness modeling but with a high-end limit of 50% of measure cost. This approach assures cost effectiveness over the life of the measure.

Education/Training: CG&E provides education and training to its market providers to understand the program and the appropriate applications for the technologies.

Marketing: Marketing to consumers and market providers is through mailings.

Market Support: Market support varies by technology. Most technologies included within the program are proven and in the marketplace, though not widely applied. CG&E will provide to market providers additional support and education on newer technologies that have lesser acceptance.

Delivery Organizations: CG&E will use its current skilled DSM team to manage and implement the program. Additional outside technical assistance will be retained to analyze technical applications and provide consumer/market provider assistance as necessary.

Quality Control/Monitoring: To assure appropriate installation of equipment, applications for incentives will be reviewed and checked for accuracy and whether measures meet appropriate standards. Random field inspections will occur to assure

installation.

Other Standards for Participation: Varies by technology.

Budget: Total Budget request for the program is outlined in Appendix B. Year 2006 request is $500,000.

Expected Participation: See Appendix B for details on expected application of technology.

Savings per Participant: As there are numerous technologies, those are listed individually in Appendix B.

Cost Effectiveness: Cost effectiveness results were developed by technology and are included in Appendix B.

2. Photovoltaic Schools Demonstration/Education Program

This program was designed to introduce Photovoltaics ("PV") into the mix of options under CG&E's DSM program. It seeks to create awareness of the technical achievements, environmental considerations, and public policy issues that have matured to make photovoltaics a viable option for meeting today's energy needs. The program also focuses on educating faculty and students in the Ohio public school system about the benefits of photovoltaics as a source of renewable energy, through the installation and use of three PV demonstration units. This program has been successfully implemented in the Cinergy PSI territory.

Target Market: Schools located in CG&E's territory interested in environmental energy generation.

Technology Categories Included: Renewable energy resources.

Market Barriers Addressed: The greatest barrier to greater entry into the commercial market is cost. Under this program, CG&E has reduced this to zero by assuming all cost for the acquisition, purchase, and installation of three demonstration units.

Components of Delivery:

Incentives: CG&E pays the expense of the PV purchase, installation, and basic monitoring.

Education/Training: This program advances the education of many parts of the market. It helps students, parents, teachers, and the school community, understand and work with PV as a potential resource. It also helps educate and build skills of contractors, electricians and other market providers for possible application in other locations. If the NEED program gets approval within this application, CG&E would tie curriculum development and participation in the NEED program with the PV application to leverage both activities.

Marketing: CG&E will work with the area school systems to choose the best locations for application. If too many applicants are available, CG&E will choose participants through a random selection process.

Delivery Organizations: Contractors will be chosen through an RFP process to provide the equipment and services. NEED will provide the education component of the PV program.

Quality Control/Monitoring: All installations must pass an inspection by CG&E engineers prior to being connected to the electric grid to ensure compatibility and safe operations. Each system becomes the property of the recipient. Meters and LED read-outs are placed at each location for monitoring solar panel output of the PV system. In addition, a data acquisition system and PC monitor each school's system and includes software suitable for a class curriculum.

Budget: Total Budget request for the program is outlined in Appendix B. Year 2006 request is $75,000.

Expected Participation: Three schools per year will have systems installed.

Savings per Participant: 1716 kWh 0.54 kW

Cost Effectiveness: Cost effectiveness will vary with installation but the program's primary purpose is educational. Test results are provided to inform the reader of the results. The Collaborative and CG&E understands that the program is not cost effective but believes the values of this small demonstration/test are worth the investment.

Cost effectiveness results are UCT 0.07; TRC 0.27; RIM 0.07

RESEARCH PROGRAM

House Call PLUS Research Program

Opportunity: With rising energy prices, there is an opportunity to increase savings in the residential market through more comprehensive building analysis and efficiency improvements. As shown through state programs in New York and California, a comprehensive audit program, utilizing diagnostic tools such as blower doors, infrared scanners and duct leakage tests, combined with a "one-stop" installation service can be effective at getting more measures installed cost effectively, thus increasing savings from 10% to 30%. However to provide this service, the market providers such as insulation contractors and energy consultants, must learn how to effectively apply the building science, and how to use and apply the tools. The CCEP sees this opportunity and wants to direct money towards research to better understand the current market capabilities and how this opportunity might effectively be implemented for consumers of CG&E.

Goal: The purpose of the market and applications research is to better understand the capabilities and skills of the contractors and market actors for providing the analysis services and comprehensive one-stop audit services for the Residential market.

Year 1 Research

Approach: There will be two aspects to the one year research project.

1. Assessment of the Market: This effort will include primary and secondary research to determine the skills and capabilities within the marketplace to provide services. The research will try to determine levels of technical expertise in building science, numbers of contractors who are NATE or BPI certified that can provide high level diagnostics, training needs and interest in the contractor community in this approach. In addition, the market assessment will try to determine the interest and understanding by homeowners in advanced diagnostics and comprehensive efficiency improvements to save not only energy, but to increase the comfort, safety and durability of their home.

2. Applications Research: To help determine actual costs for services, the research will include analysis and comprehensive energy improvements for a sample of 25 homes in the area. This will help CCEP understand the actual costs and feasibility of the service and to improve the program design for a future potential DSM program.

The outcome of this research would be used to help define and quantify the opportunity to impact the market for long term energy savings through development of a full scale program. Based on the findings of the research, training would also begin for market providers (audit consulting contractors) for future long term implementation. It is expected that 8-10 providers would receive the in-depth training. Where possible, training would be leveraged with the contractor training provided by the Ohio Office of Energy Efficiency.

Timeframe: Preparation and bidding for research firms – March – June 2006
Research implementation – July 2006 - March 2007
Assessment of results – March - June 2007
Market Provider training and equipment – March – September 2007

Budget Estimate Year 1:

- Market assessment = $80,000
- Cost of Audit = $500 per home x 25 homes = $12,500
- Incentive to Consumer = 25% of cost capped at $2000 (plus $500 Federal credit not included in budget) = $50,000
- Independent audit technical support and analysis of results = $25,000
- Administration = $15,000
- Misc. costs (equipment, materials, training, other) = $15,000
- Market provider training & equipment = $30,000
- TOTAL = $212,500

Year 2 Research

Based on a successful indication of market preparation from year 1 research, CCEP proposes to use the second year of the research to expand the number of homes and test consumer response to the service. It will also be used to monitor the consumption of the first 25 homes to determine energy impacts.

Approach: Year two of the research will focus on field implementation and consumer response. The number of homes served will be increased to 100 and the number of qualified contractors implementing will increase to a yet to be determined number. Incentive levels may be changed to see what the market response is to price differences.

The second aspect of the year two research will be to monitor the homes completed in the first year. These homes will have a bill analysis conducted against a control group to measure the level of impacts obtained. While it is a small sample, it should provide an indication of the level of load impacts. More reliable impact evaluations will be performed in the future.

Timeframe: Planning and program design July – August 2007
Implementation September – May 2008
Impact Study July – August 2008
Assessment of Market Response on 100 homes June – August 2008

Budget:

- Impact Evaluation $30,000
- Cost of Audit = $500 per home x 100 homes = $50,000
- Incentive to Consumer = 15% of cost capped at $1200 (plus $500 Federal credit not included in budget) expecting 75% of homes to complete work = $90,000

- Independent audit technical support and analysis of results = $50,000
- Administration = $15,000
- Misc. costs (equipment, materials, training, other) = $25,000
- Market provider training & equipment = $30,000
- TOTAL = $290,000

Savings per Participant:

- Electrically heated homes 4700 kWh 1.48 kW
- Gas heated homes 300 therms

Cost Effectiveness: Cost effectiveness results are outlined for each year assuming that 80% of the participants would be gas consumers and 20% would be electric. The modeling did not include the evaluation and research dollars needed to complete the research, just the direct home activities and costs. Modeling results are:
Gas UCT 2.47, TRC 5.31, RIM 0.60
Electric: UCT 3.31, TRC 7.13, RIM 0.64

V. Program Evaluation Plan

CG&E and the Interested Stakeholders believe that third party independent evaluation is critical to the long term success of cost-effective programs. Through the evaluation process, the CCEP continues to learn what programs have been most effective and how to improve existing programs over time. CG&E intends to direct this third party evaluation process for the Board and use standard process and impact evaluation protocols to accomplish these tasks. For the new programs, approximately $500,000 or 5% of each program budget has been earmarked to perform the evaluations. This is at the industry standard of 3-5% for evaluation costs. The following chart outlines the range of time for the evaluations to be completed but actual timing will be based on participation rates adequate to get valid results.

Program	Evaluation Type	Earliest Timeframe for Report	Latest Timeframe for Report
C&I Program	Process	Jan. 2008	Jan. 2009
	Impact	July 2008	July 2009
HEHC	Process	July 2007	July 2008
	Impact	July 2009	July 2010
Ohio Energy Project	Process & Impact	Jan 2009	Jan 2009
Smart Saver/Summer Saver	Process	March 2008	March 2008
	Impact	Jan. 2009	Jan. 2010
Power Manager	Impact	Annually	Annually
Energy Star Products	Process	Jan. 2008	Jan. 2009
	Impact	July 2008	July 2009
AC Check	Process	Feb. 2008	Nov. 2008
	Impact	Nov. 2008	Nov. 2008
Appliance Turn In	Process	Sept. 2008	Sept. 2008
	Impact	Dec. 2008	Dec. 2008
Energy Efficiency Website	Process	July 2008	July 2008
	Impact	July 2009	July 2010
Pre-Paid Billing Service	Process	Jan 2008	Jan 2008
	Impact	Jan 2008	Jan 2008

It is expected external consultants will be used to conduct the impact evaluation studies. Methods employed to measure the impacts may include loggers to capture appliance usage times, impact studies conducted in other regions, and/or pre-/post-usage on a weather normal basis with comparison to control groups.

Quality control (QC) and verification will be an ongoing part of CG&E's program administration. The programs will be implemented with a 5% QC/verification target for all installations and services. Additional consumer surveys will be used to assess satisfaction. If problems with a contractor are detected, that contractor's next three installations or projects will be verified. If the problems persist, that contractor will be eliminated from the program.

VI. Recovery Mechanism

CG&E is committed to finding the right set of DSM programs that can cost-effectively reduce energy consumption. However, implementing a set of aggressive DSM programs raises significant risk to the Company. Since the beginning of deregulation, there has been no allowance for recovery of costs or lost revenues (net of fuel) or any incentive to encourage energy efficiency, such as a shared savings incentive.

With most DSM programs, there are many beneficiaries, primarily the program participants and the utility's other consumers. Participants in the programs save in the near term through lower bills, while consumers save over the longer term since the DSM program helps to reduce the need for more expensive purchased power from the market or building new power plants. In addition, improvements in energy efficiency reduce the demand for natural gas which can affect the level of natural gas prices. Two other groups are also impacted by the DSM programs, the utility and its shareholders. From the utility's perspective, implementing DSM programs reduces both the near-term and long-term amount of energy sold. In the near-term, the reduction in kWh and ccf sold reduces the utility's recovery of the fixed costs of its operations. Recovery of lost revenues (net of fuel) helps to fill that gap in cost recovery. From the shareholder's perspective, implementing DSM programs defers the need for investment in new facilities. Utility shareholders expect to receive a return on their investment based upon the utility's investment in its plant and equipment. DSM programs reduce the amount of these investments over time, reducing the return to shareholders and thus creating a disincentive for shareholders to pursue DSM. By providing a return to the shareholders through a "shared savings" mechanism, shareholders are given an economic incentive to

invest in DSM.

For the Company to once again aggressively pursue the implementation of DSM programs to achieve reductions in energy usage, a process for compensation and incentives for the utility and its shareholders should again be incorporated into the regulatory process. The Commission's past regulations regarding DSM contemplate recovery of lost revenues and an incentive as a way to offset regulatory or financial bias against DSM. CG&E proposes that the DSM rider once again include recovery of lost revenues for the three years after a DSM measure is installed (unless a rate case occurs) and incorporate recovery of a shared savings DSM program incentive for electric and natural gas DSM program implementation. These changes to the DSM rider will compensate the utility and its shareholders for the economic loss of reduced consumption, while providing a structured incentive to pursue DSM.

The Company is proposing, in these proceedings, that a set of DSM programs be implemented that are expected to reduce energy usage by more than 1.2 billion kWh and 50 million ccf over the next five years. This is a substantial reduction in energy usage which will require a commensurately substantial investment on the part of CG&E. Without the recovery of lost revenues and a mechanism to allow a sharing of the efficiency savings generated by the programs, the Company cannot reasonably advocate such an expansion of its DSM programs. During the five-year program period, CG&E proposes to limit its recovery of lost revenues to three years from the date of each DSM measure installation. In addition, CG&E is forgoing recovery of lost revenues and a shared savings incentive for the Personalized Energy Report Pilot program for the first year of the program. Once an evaluation of the results of the program has been

completed, CG&E reserves the right to seek recovery of prospective lost revenues and a shared savings incentive should the program continue.

The "lost revenues" referred to above are revenues the Company would have received, absent the implementation of DSM programs. For example, when a consumer participates in one of the DSM programs, a set of energy reducing measures are installed in the consumer's home or business. We can calculate, through impact evaluation studies and engineering estimates, what energy and demand savings those measures will produce. We can also determine the amount of the contribution to fixed costs that CG&E would lose because of the installation of those measures. CG&E is simply seeking recovery of this lost contribution to fixed costs (*i.e.*, the "lost revenues"). Obviously, the lost revenue impact of one consumer will be small; however, over five years and assuming full participation, CG&E projects a significant level of lost revenues to the company. Of course, if a retail base rate case is processed and new rates are approved, this lost revenue issue would be mitigated since the rate case will true-up revenues based on actual experience in the test year. At that point, lost revenues stop accumulating on DSM measures implemented prior to the rate case, but accrue only as new measures are installed at the conclusion of the rate case test year.

Lost revenues are computed using the applicable marginal block rate net of fuel costs and other variable costs times the estimated kWh or ccf savings. Page 5 of Appendices A and B provide the estimated lost revenues associated with the proposed residential and C&I DSM programs. Over the five years, this would amount to over $ 50 million. The lost revenues are cumulative in nature, since the revenue lost in year one, is also lost each year thereafter. The values provided in the Appendices are estimates based

upon a projected level of participation by consumers. With implementation of the proposed DSM programs, lost revenues would be calculated using the projected energy savings and actual consumer participation. Additionally, CG&E will update its load impacts based on the results of post-installation impact evaluation studies, engineering impact assessment studies, and benchmarking against similar programs in other states. The results of these review and evaluation activities will be used to project future energy savings.

In order to put DSM on par with alternatives such as building or buying additional generating capacity and to provide an incentive to implement DSM programs, CG&E believes that a shared savings incentive for both electric and gas DSM programs is appropriate. CG&E's proposal is a significant expansion of its DSM programs, and CG&E is responsible for implementing the programs in a cost effective manner. CG&E believes that a shared incentive of 10% for electric DSM programs and 5% for gas DSM programs is appropriate to incentivize the Company to propose and fully implement the DSM programs. As previously stated, CG&E's proposal is consistent with the Commission's past recognition that shared savings incentives appropriately place DSM programs on a comparable level with other capacity alternatives.

Total savings are computed using the total value created by the program as provided on page 6 of Appendices A and B. This value is net of the costs of measures, incentives to consumers, marketing, impact evaluation, and administration. The savings are estimated by simply multiplying the number of participants expected for each measure times the UCT value and then subtracting the program costs. Page 7 of Attachments A and B summarize the calculation of the projected value or savings to

residential and commercial and industrial consumers, respectively.

CG&E proposes to recover ten percent of that savings, a sharing of the value created, as an incentive to aggressively pursue implementation of the electric DSM programs. The recovery of the shared savings incentive will step in according to the level of achievement as follows:

1. No incentive is earned for any program that does not meet 65% of the projected program impacts at its prorated budgeted cost level.
2. 3% of the savings is earned once a program meets 65% of the projected program impacts at its prorated budgeted cost level.
3. 5% of the savings is earned once a program meets 75% of the projected program impacts at its prorated budgeted cost level.
4. 7% of the savings is earned once a program meets 90% of the projected program impacts at its prorated budgeted cost level.
5. 10% of the savings is earned once a program meets 100% of the projected program impacts at the budgeted cost level.
6. 12% of the savings is earned once a program meets 105% of the projected program impacts at the budgeted cost level.

CG&E proposes to recover five percent of that savings, a sharing of the value created, as an incentive to aggressively pursue implementation of the gas DSM programs. The recovery of the shared savings incentive will step in according to the level of achievement as follows:

7. No incentive is earned for any program that does not meet 65% of the projected program impacts at its prorated budgeted cost level.
8. 1.5% of the savings is earned once a program meets 65% of the projected program impacts at its prorated budgeted cost level.
9. 2.5% of the savings is earned once a program meets 75% of the projected program impacts at its prorated budgeted cost level.
10. 3.5% of the savings is earned once a program meets 90% of the projected program impacts at its prorated budgeted cost level.
11. 5% of the savings is earned once a program meets 100% of the projected program impacts at the budgeted cost level.

12. 6% of the savings is earned once a program meets 105% of the projected program impacts at the budgeted cost level.

C. Cost Recovery

CG&E proposes to use DSM Riders to track actual recovery of DSM program costs, lost revenues, and shared savings. Appendices C and D provide detailed descriptions on the operation of the riders. The rider is calculated using CG&E's forecast of program costs, lost revenues, and shared savings. CG&E will annually reconcile the rider and flow back any differences between the budgeted and actual costs. In this way, CG&E's consumers are only charged for the actual DSM program costs, lost revenues, and shared savings.

CG&E proposes that program costs, lost revenues, and the shared savings incentive will be allocated and recovered based on consumer class, *i.e.*, residential consumers (Rates RS, ORH and TD) will be responsible for residential program costs; and applicable commercial and industrial consumers (Rates DM, DS, and DP) will be responsible for the commercial and industrial program costs.

CG&E is also including a provision in the DSM Rider for C&I consumers to obtain a reduction in their billing demand for calculation of demand charges upon a showing that one or more of the DSM measures included in this Application were implemented. This removes a disincentive to those C&I consumers billed under the demand ratchet provisions of Rates DS and DP to implement DSM measures that could reduce kW demand.

VII. Calculation of 2006 DSM Riders

A. Outline of DSM Activity

CG&E is planning to offer the following DSM programs in CG&E's service

territory in 2006.

RESIDENTIAL PROGRAMS

- Home Energy House Call
- AC Check Pilot
- Smart Saver/Summer Saver
- Power Manager
- Energy Star Products
- Energy Efficiency Website
- Ohio Energy Project
- Appliance Turn-In
- Personalized Energy Report
- Pre-Paid Billing Services

COMMERCIAL PROGRAMS

- C&I Prescriptive Incentive Program
    - School Incentive Program
- Photovoltaic Schools Demonstration/Education Program

RESEARCH

- House Call Plus Research Program

B. 2006 DSM Riders

The Company, in conjunction with the Interested Stakeholders, submits the proposed DSM Riders (Appendices F and G). These riders are intended to recover 2006 program costs and the associated lost revenues and shared savings. In subsequent years, the riders will also be used to reconcile any differences between actual and projected

costs, lost revenues, and shared savings. Pages 1 through 5 of Appendix E provide the current calculation of the riders and the format for future reconciliations. Appendix E, page 1 of 5, demonstrates how a current reconciliation of the DSM Revenue Requirement would be associated with a prior reconciliation. The true-up adjustment will be based upon the difference between the actual DSM revenue requirement and the revenues collected during the most recent period.

Attachment E, page 5 of 5 contains the calculation of the 2006 Residential DSM Rider rates. This calculation includes any reconciliation adjustments shown in Attachment E, page 1 of 5 and the DSM revenue requirement for 2006. The residential DSM revenue requirement for 2006 includes the costs associated with the proposed Residential DSM programs and the associated net lost revenues and shared savings (Attachment E, pages 2 and 3 of 5). Total revenue requirements are incorporated along with the projected electric and gas volumes (Attachment E, page 4 of 5) in the calculation of the Residential DSM Rider.

Attachment E, page 5 of 5 also contains the calculation of the 2006 C&I DSM Rider. The calculation includes any reconciliation adjustments calculated in Attachment E, page 1 of 5 and the DSM revenue requirement for 2005. The C&I DSM revenue requirement for 2006 includes the costs associated with the C&I DSM program (C&I High Efficiency Incentive) and the associated net lost revenues and shared savings (Attachment E, pages 2 and 3 of 5). Total revenue requirements are incorporated along with the projected electric volumes (Attachment E, page 4 of 5) in the calculation of the C&I DSM Rider.

The Company's proposed 2006 DSM Riders, shown as Attachments F and G, are

proposed to be effective with the first billing cycle in January 2006, is applicable to service provided under CG&E's electric service tariffs as follows:

Residential Electric Service provided under:

Rate RS, Residential Service, Sheet No. 30

Rate ORH, Optional Residential Service with Electric Space Heating, Sheet No. 33

Rate TD, Optional Time-of-Day Rate, Sheet No. 34

Non-Residential Electric Service provided under:

Rate DS, Service at Secondary Distribution Voltage, Sheet No. 40

Rate GS-FL, Optional Unmetered General Service Rate for Small Fixed Loads, Sheet No. 41-

Rate EH, Optional Rate for Electric Space Heating, Sheet No. 42

Rate DM, Secondary Distribution Service – Small, Sheet No. 43

Rate DP, Service at Primary Distribution Service, Sheet No. 44

Rate SFL-ADPL, Optional Unmetered Rate for Small Fixed Loads Attached Directly to Company's Power Lines, Sheet No. 46

Rate RTP, Real Time Pricing Program, Sheet No. 90

The gas DSM rider is applicable to service provided under the following residential gas service tariffs:

Rate RS, Residential Service, Sheet No. 30

Rate RFT, Residential Firm Transportation Service, Sheet No. 33

Calculation of the Residential Charge

The proposed residential charge per kWh for 2006 was calculated by dividing the sum of: 1) the reconciliation amount calculated in Attachment E, page 1 of 5, and 2) the DSM Revenue Requirement associated with the DSM programs projected for calendar year 2006, by the projected sales for calendar year 2006. DSM Program Costs for 2006 include the total implementation costs plus program rebates, lost revenues, and shared savings. The calculations in support of the residential recovery mechanism are provided in Attachment E, page 5 of 5.

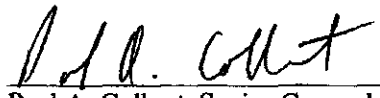
Calculation of the Non-Residential Charge

The proposed non-residential charge per kWh for 2006 was calculated by dividing the sum of: 1) the reconciliation amount calculated in Attachment E, page 1 of 5, and 2) the DSM Revenue Requirement associated with the DSM program projected for calendar year 2006, by the projected sales for calendar year 2006. DSM Program Cost for 2006 includes the total implementation costs plus program rebates, lost revenues and shared savings.

Allocation of the DSM Revenue Requirement

The DSM Cost Recovery Mechanism attributes the costs to be recovered to the respective class that benefits from the programs. The amounts associated with the reconciliation of the Rider are similarly allocated as demonstrated in Attachment D, page 2 of 5. The costs for the Power Manager program are fully allocated to the residential electric class, since this is the class directly benefiting from the implementation of the program. As required, qualifying industrial consumers are permitted to "opt-out" of participation in, and payment for, the DSM programs.

Respectfully submitted,



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CERTIFICATE OF SERVICE

I certify that a copy of the foregoing Application was sent by regular U.S. mail or overnight mail to all Interested Stakeholders listed below this 23rd day of January, 2006.

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APPENDIX A

Cost-Effectiveness of Proposed Residential DSM Programs

	UCT	Option Value UCT	TRC	RIM
Residential - New Programs/Measures				
Summer Saver (Air-conditioner)	1.80	1.55	8.48	0.85
Home Energy House Call	4.89	4.38	4.89	0.98
Ohio Energy Project (NEED)	1.78	1.61	19.54	0.65
Power Manager	1.56	1.81	2.05	1.56
Energy Star Products				
CFL's (Compact Fluorescent Lights)	12.55	11.26	12.55	1.04
Torchieres (Floor lamps)	7.38	6.62	5.26	0.98
Energy Efficiency Web Site (Electric Impacts)	6.18	5.55	23.83	0.96
Room AC Turn-In	1.67	1.44	3.19	0.78
AC Check - Pilot	3.75	3.23	16.26	1.08
Smart Saver Heat Pump with ECM	1.94	1.74	1.54	0.74
Personalized Energy Report Pilot Program	10.19	9.23	32.43	0.90
Pre-Paid Meter - Pilot	4.70	4.27	4.70	0.84
Energy Star Products - Gas Furnace /ECM (Elec Impacts)	5.52	5.08	2.46	0.77
House Call Plus - Research (Elec Heated Homes)	3.23	2.89	6.94	0.86
House Call Plus - Research (Gas Heated Homes)	2.54	2.33	5.48	0.70
Energy Star Products - Gas Furnace	8.31	7.68	2.87	0.77
Energy Star Products - Gas Furnace with ECM	5.52	5.08	2.46	0.77
Energy Efficiency Web Site (Gas Impacts)				

Residential DSM Program Summary

Residential - Current Programs/Measures	Projected Program Costs 2006	2007	2008	2009	2010	Projected Net Lost Revenues 2006	2007	2008	2009	2010	Projected 10% Shared Savings Before Subtracting Administrative and Marketing Costs 2006	2007	2008	2009	2010
Summer Saver (Air-conditioner)	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 15,210	$ 15,210	$ 15,210	$ 15,210	$ 15,210	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000
Home Energy House Call	$ 812,500	$ 937,500	$ 1,062,500	$ 1,187,500	$ 1,187,500	$ 176,187	$ 203,293	$ 230,398	$ 257,504	$ 257,504	$ 316,063	$ 364,688	$ 413,313	$ 461,938	$ 461,938
Ohio Energy Project (NEED)	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 16,296	$ 16,296	$ 16,296	$ 16,296	$ 16,296	$ 11,700	$ 11,700	$ 11,700	$ 11,700	$ 11,700
Power Manager	$ 1,055,743	$ 3,338,012	$ 3,617,970	$ 4,251,461	$ 4,339,625	$ -	$ -	$ -	$ -	$ -	$ 59,122	$ 186,929	$ 202,606	$ 238,082	$ 243,019
Energy Star Products															
CFL's (Compact Fluorescent Lights)	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,792,560	$1,792,560	$1,792,560	$ 1,792,560	$1,792,560	$ 1,155,000	$1,155,000	$1,155,000	$1,155,000	$ 1,155,000
Torchieres (Floor lamps)	$ 36,000	$ 36,000	$ 36,000	$ 36,000	$ 36,000	$ 37,937	$ 37,937	$ 37,937	$ 37,937	$ 37,937	$ 22,968	$ 22,968	$ 22,968	$ 22,968	$ 22,968
Energy Efficiency Web Site (Electric Impacts)	$ 102,000	$ 122,400	$ 142,800	$ 176,800	$ 204,000	$ 66,814	$ 80,176	$ 93,539	$ 115,810	$ 133,627	$ 52,836	$ 63,403	$ 73,970	$ 91,582	$ 105,672
Room AC Turn-In	$ 50,000	$ 75,000	$ 100,000	$ 125,000	$ 125,000	$ 9,506	$ 14,259	$ 19,012	$ 23,765	$ 23,765	$ 3,350	$ 5,025	$ 6,700	$ 8,375	$ 8,375
AC Check - Pilot	$ 25,000	$ 50,000	$ 100,000	$ 150,000	$ 200,000	$ 5,351	$ 10,701	$ 21,402	$ 32,103	$ 42,804	$ 6,875	$ 13,750	$ 27,500	$ 41,250	$ 55,000
Smart Saver Heat Pump with ECM	$ 35,000	$ 52,500	$ 70,000	$ 70,000	$ 70,000	$ 5,008	$ 7,512	$ 10,017	$ 10,017	$ 10,017	$ 3,290	$ 4,935	$ 6,580	$ 6,580	$ 6,580
Personalized Energy Report Pilot Program	$ 1,078,176	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Pre-Paid Meter - Pilot	$ 277,000	$ 400,000	$ 1,000,000	$ 1,500,000	$ 2,000,000	$ 8,501	$ 170,022	$ 425,054	$ 637,581	$ 850,108	$ 102,490	$ 148,000	$ 370,000	$ 555,000	$ 740,000
Energy Star Products - Gas Furnace /ECM (Elec Impacts	$ -	$ -	$ -	$ -	$ -	$ 20,968	$ 25,161	$ 31,451	$ 41,935	$ 41,935	$ -	$ -	$ -	$ -	$ -
House Call Plus - Research (Elec Heated Homes)	$ 23,500	$ 49,000	$ 76,725	$ 142,450	$ 197,175	$ 1,277	$ 5,106	$ 12,765	$ 25,530	$ 38,296	$ 5,241	$ 10,927	$ 17,110	$ 31,766	$ 43,970
House Call Plus - Research (Gas Heated Homes)	$ 94,000	$ 196,000	$ 306,900	$ 569,800	$ 788,700	$ 1,115	$ 4,462	$ 11,155	$ 22,309	$ 33,464	$ 14,476	$ 30,184	$ 47,263	$ 87,749	$ 121,460
Energy Star Products - Gas Furnace	$ 1,500,000	$ 1,800,000	$ 2,250,000	$ 3,000,000	$ 3,000,000	$ 419,227	$ 503,072	$ 628,841	$ 838,454	$ 838,454	$ 1,096,500	$1,315,800	$1,644,750	$2,193,000	$ 2,193,000
Energy Star Products - Gas Furnace with ECM	$ 275,000	$ 330,000	$ 412,500	$ 550,000	$ 550,000	$ 41,923	$ 50,307	$ 62,884	$ 83,845	$ 83,845	$ 124,300	$ 149,160	$ 186,450	$ 248,600	$ 248,600
Program Administrative and Marketing Costs	$ 2,195,804	$ 2,462,438	$ 3,056,622	$ 3,791,819	$ 4,159,949										
Total Costs, Net Lost Revenues, Shared Savings	$ 8,959,723	$ 11,248,850	$13,632,017	$16,950,830	$18,257,949	$ 2,617,878	$2,936,074	$3,408,520	$ 3,950,857	$4,215,822	$ 2,994,210	$3,502,468	$4,205,909	$5,173,590	$ 5,437,281

Residential Program Summary for 2006

Residential - Current Programs/Measures	Costs	Lost Revenues	Net of Cost Shared Savings	Total
Summer Saver (Air-conditioner)	$ 250,000	$ 15,210	$ 13,250	$ 278,460
Home Energy House Call	$ 812,500	$ 176,187	$ 312,313	$ 1,300,999
Ohio Energy Project (NEED)	$ 150,000	$ 16,296	$ 10,200	$ 176,496
Power Manager	$ 1,055,743	$ -	$ 59,122	$ 1,114,865
Energy Star Products				
CFL's (Compact Fluorescent Lights)	$ 1,000,000	$ 1,792,560	$ 1,066,242	$ 3,858,802
Torchieres (Floor lamps)	$ 36,000	$ 37,937	$ 22,968	$ 96,905
Energy Efficiency Web Site (Electric Impacts)	$ 102,000	$ 66,814	$ 49,266	$ 218,080
Room AC Turn-In	$ 50,000	$ 9,506	$ (2,150)	$ 57,356
AC Check - Pilot	$ 25,000	$ 5,351	$ 6,125	$ 36,476
Smart Saver Heat Pump with ECM	$ 35,000	$ 5,008	$ (1,890)	$ 38,118
Personalized Energy Report Pilot Program	$ 1,078,176	$ -	$ -	$ 1,078,176
Pre-Paid Meter - Pilot	$ 277,000	$ 8,501	$ 101,490	$ 386,991
Energy Star Products - Gas Furnace /ECM (Elec Impacts	$ -	$ 20,968	$ -	$ 20,968
House Call Plus - Research (Elec Heated Homes)	$ 23,500	$ 1,277	$ 4,941	$ 29,717
House Call Plus - Research (Gas Heated Homes)	$ 94,000	$ 1,115	$ 6,636	$ 101,753
Energy Star Products - Gas Furnace	$ 1,500,000	$ 419,227	$ 525,750	$ 2,444,977
Energy Star Products - Gas Furnace with ECM	$ 275,000	$ 41,923	$ 58,025	$ 374,948
			$ -	$ -
Program Administrative and Marketing Costs	$ 2,195,804		$ (48,072)	$ 2,147,731
Total Shared Savings Net of Other Costs				
Total Costs, Net Lost Revenues, Shared Savings	$ 8,959,723	$ 2,617,878	$ 2,184,216	$13,761,817

Breakdown Between Electric and Gas

	Electric Costs	Electric Lost Revenues	Electric Shared Savings	Electric Total
Summer Saver (Air-conditioner)	$ 250,000	$ 15,210	$ 13,250	$ 278,460
Home Energy House Call	$ 812,500	$ 176,187	$ 312,313	$ 1,300,999
Ohio Energy Project (NEED)	$ 150,000	$ 16,296	$ 10,200	$ 176,496
Power Manager	$ 1,055,743	$ -	$ 59,122	$ 1,114,865
Energy Star Products				
CFL's (Compact Fluorescent Lights)	$ 1,000,000	$1,792,560	$1,066,242	$ 3,858,802
Torchieres (Floor lamps)	$ 36,000	$ 37,937	$ 22,968	$ 96,905
Energy Efficiency Web Site (Electric Impacts)	$ 102,000	$ 66,814	$ 49,266	$ 218,080
Room AC Turn-In	$ 50,000	$ 9,506	$ (2,150)	$ 57,356
AC Check - Pilot	$ 25,000	$ 5,351	$ 6,125	$ 36,476
Smart Saver Heat Pump with ECM	$ 35,000	$ 5,008	$ (1,890)	$ 38,118
Personalized Energy Report Pilot Program	$ 1,078,176	$ -	$ -	$ 1,078,176
Pre-Paid Meter - Pilot	$ 277,000	$ 8,501	$ 101,490	$ 386,991
Energy Star Products - Gas Furnace /ECM (Elec Impacts	$ -	$ 20,968	$ -	$ 20,968
House Call Plus - Research (Elec Heated Homes)	$ 23,500	$ 1,277	$ 4,941	$ 29,717
Program Administrative and Marketing Costs	$ 1,651,304		$ (48,072)	$ 1,651,304
Total Costs, Net Lost Revenues, Shared Savings	$ 6,546,223	$2,155,613	$1,593,803	##########

Breakdown Between Electric and Gas

	Gas Costs	Gas Lost Revenues	Gas Shared Savings (1)	Gas Total
House Call Plus - Research (Gas Heated Homes)	$ 94,000	$ 1,115	$ 6,638	$ 101,753
Energy Star Products - Gas Furnace	$ 1,500,000	$ 419,227	$ 525,750	$2,444,977
Energy Star Products - Gas Furnace with ECM	$ 275,000	$ 41,923	$ 58,025	$ 374,948
Program Administrative and Marketing Costs	$ 544,500			$ 544,500
Total Costs, Net Lost Revenues, Shared Savings	$ 2,413,500	$ 462,265	$ 590,413	$3,466,178