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BEFORE

THE PUBLIC UTILITIES COMMISSION OF OHIO

PUCO

In the Matter of the Application of Duke)
Energy Ohio, Inc., for Recovery of)
Program Costs, Lost Distribution Revenue) Case No. 12-1857-EL-RDR
and Performance Incentives Related to its)
Save-A-Watt Programs.)

APPLICATION OF DUKE ENERGY OHIO, INC.

1. Duke Energy Ohio, Inc., (Duke Energy Ohio or the Company) is an Ohio corporation engaged in the business of supplying electric transmission, distribution, and generation service in Adams, Brown, Butler, Clinton, Clermont, Hamilton, Montgomery, and Warren Counties in Southwestern Ohio to approximately 690,000 electric customers and 420,000 gas customers.
2. Duke Energy Ohio is a "public utility" as defined by Sections 4905.02 and 4905.03, Revised Code, and an "electric distribution company," "electric light company," "electric supplier," and "electric utility" as defined by Section 4928.01, Revised Code.
3. As an Ohio electric distribution utility, Duke Energy Ohio is subject to the mandates set forth in Amended Substitute Senate Bill 221, codified in Revised Code 4928.66, including, *inter alia*, the requirement to implement energy efficiency programs and peak demand reduction programs.
4. Subsequent to the enactment of the mandates contained in Revised Code 4928.66, the Public Utilities Commission of Ohio (Commission) promulgated rules to facilitate the Commission's oversight of compliance with this new energy law. These rules are set forth in Ohio Administrative Code 4901:1-39-01, *et seq.*

5. In Case No. 08-920-EL-SSO, *et al.*, the Commission approved a Stipulation that included, *inter alia*, a cost recovery mechanism for Duke Energy Ohio's compliance with the energy efficiency and peak demand reduction requirements mandated by Revised Code 4928.66.

6. The Stipulation provided for implementation of Rider DR-SAW (shown in the Duke Energy Ohio electric tariff as Rider DR-SAW and Rider DR-SAWR) beginning on January 1, 2009. With respect to cost recovery, the Stipulation provided the following:

- Rider DR-SAW true-up shall occur in the second quarter of 2012.
- Cost recovery shall be allocated between distribution and transmission customers based on the allocation of distribution revenues as approved in the Company's most recent electric distribution rate case.
- Duke Energy Ohio is eligible for an incentive for achieving energy efficiency above the statutory mandate. The incentive thresholds are set forth in the Stipulation.
- Duke Energy Ohio shall perform measurement and verification as set forth in the Supplemental Testimony of Dr. Richard G. Stevie. Duke Energy Ohio shall hire an independent evaluator for measurement and verification. Costs for the independent measurement and verification shall be capped at five percent of program costs.

7. As stated above, subsequent to the Commission's approval of the Stipulation, the Commission enacted rules to facilitate oversight and compliance with the requirements for energy efficiency and peak demand reduction set forth in Revised Code 4928.66. Rule 4901:1-39-07, O.A.C., provided for the recovery of costs and specified what may be included in a cost recovery mechanism. Rule 4901:1-39-07, states that cost recovery may include "costs due to electric utility peak-demand reduction, demand response, energy efficiency program costs, appropriate lost distribution revenues, and shared savings."

8. The Company submitted its portfolio of programs for compliance with Revised Code 4928.66 and the Commission's rules in Case No. 09-1999-EL-POR. In that proceeding, the Commission ordered Duke Energy Ohio to remove the recovery of lost generation revenues from its Rider DR-SAW. Duke Energy Ohio filed compliance tariffs to remove the inclusion of generation lost revenues from its rates on February 16, 2011.

9. In July of 2011, the Company requested the Commission approve a new cost recovery mechanism, anticipating that Rider DR-SAW would end at the end of 2011. In its application in Case No. 11-4393-EL-RDR, the Company also sought approval of three new energy efficiency programs for inclusion in its portfolio. The Company ultimately submitted all of the requisite information for a renewed approval of its existing portfolio in that proceeding.

10. Duke Energy Ohio has submitted status reports annually as required by 4901:1-39-05(C), in Case No. 10-317-EL-EEC, Case No. 11-1311-EL-EEC and Case No. 12-1477-EL-EEC.

11. In this Application, in support of its request for approval to adjust its Rider DR-SAW to recover costs related to compliance with energy efficiency mandates, Duke Energy Ohio is submitting testimony that sets forth the detail required by the Commission to evaluate whether or not the Company is actually delivering efficient and measurable energy efficiency.

12. Duke Energy Ohio witness Ashlie J. Ossege will provide an overview of the methodology used for Evaluation, Measurement and Verification (EM&V) and the processes by which the Company evaluated its programs. Ms. Ossege will also provide the load impacts used in the true-up process for Rider DR-SAW and the total impacts achieved based upon actual participation. Additionally, Ms. Ossege will present results of the cost-effectiveness of each of the programs as well as the total portfolio of programs in the Company's Rider DR-SAW portfolio, including underlying assumptions and modeling.

13. Duke Energy Ohio witness James E. Ziolkowski will provide information related to the financial and accounting support for Rider DR-SAW. Mr. Ziolkowski will describe the calculation of the Rider DR-SAW revenue requirement for the period January 2009 through December 2011 and his procedure for calculating recovery rates. Mr. Ziolkowski will sponsor Attachments JEZ-1, JEZ-2, JEZ-3 and JEZ-4.

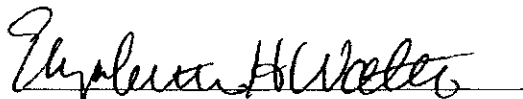
14. Duke Energy Ohio witness Timothy J. Duff will provide a historical overview of the Save-A-Watt programs and Duke Energy Ohio's success with these programs.

Conclusion

As supported by the testimony of the Duke Energy Ohio witnesses filed herewith, the Company respectfully requests that the Commission approve its Application, subject to the terms outlined herein.

Respectfully submitted,

Duke Energy Ohio



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**BEFORE THE
PUBLIC UTILITIES COMMISSION OF OHIO**

In the Matter of the Application of Duke)
Energy Ohio, Inc., for Recovery of)
Program Costs, Lost Distribution) Case No. 12-1857-EL-RDR
Revenue and Performance Incentives)
Related to its Save-A-Watt Programs.)

DIRECT TESTIMONY OF

TIMOTHY J. DUFF

ON BEHALF OF

DUKE ENERGY OHIO, INC.

June 29, 2012

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1

I. INTRODUCTION

1 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

2 A. My name is Timothy J. Duff. My business address is 526 South Church Street,
3 Charlotte, North Carolina 28202.

4 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

5 A. I am employed by Duke Energy Business Services LLC, (DEBS) as General
6 Manager, Retail Customer and Regulatory Strategy, Customer Strategy &
7 Innovation. DEBS provides various administrative and other services to Duke
8 Energy Ohio, Inc., (Duke Energy Ohio or the Company) and other affiliated
9 companies of Duke Energy Corporation (Duke Energy).

10 **Q. PLEASE SUMMARIZE YOUR EDUCATION AND PROFESSIONAL**
11 **QUALIFICATIONS.**

12 A. I graduated from Michigan State University with a Bachelor of Arts in Political
13 Economics and a Bachelor of Arts in Business Administration, and received a
14 Master of Business Administration from the Stephen M. Ross School of Business
15 at the University of Michigan. I started my career with Ford Motor Company and
16 worked in a variety of roles within the Company's financial organization. After
17 five years with Ford Motor Company, I began work with Cinergy in 2001,
18 providing business and financial support to plant operating staff. Eighteen
19 months later, I joined Cinergy's Rates Department, where I provided revenue
20 requirement analytics and general rate support for the company's transfer of three
21 generating plants. After my time in the Rates Department, I spent a short period
22 of time in the Environmental Strategy Department, and then I joined Cinergy's

1 Regulatory and Legislative Strategy Department. After Cinergy merged with
2 Duke Energy in 2006, I worked for four years as Managing Director, Federal
3 Regulatory Policy. In this role, I was primarily responsible for developing and
4 advocating Duke Energy's policy positions with the Federal Energy Regulatory
5 Commission. I assumed my current position in 2010.

6 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE PUBLIC**
7 **UTILITIES COMMISSION OF OHIO?**

8 A. Yes. I have testified in previous cases related to energy efficiency, a revenue
9 decoupling pilot and Duke Energy Ohio's SmartGrid deployment.

10 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**
11 **PROCEEDING?**

12 A. The purpose of my testimony in this proceeding is to discuss the history of the
13 Rider DR-SAW, Energy Efficiency Recovery Rider, programs and the success
14 Duke Energy Ohio has had with this portfolio of programs. Duke Energy Ohio
15 witness Ashlie J. Ossege will discuss how the Company determines program cost-
16 effectiveness and explains the Company's evaluation, measurement and
17 verification process used to verify the results of its portfolio of programs, and
18 Duke Energy Ohio witness James E. Ziolkowski will explain the Rider DR-SAW,
19 and how it is applied to the programs to determine cost recovery.

II. HISTORY OF THE SAW RIDER

20 **Q. PLEASE EXPLAIN THE HISTORY OF RIDER DR-SAW AND HOW IT**
21 **IS STRUCTURED?**

1 A. Duke Energy Ohio proposed the Rider DR-SAW energy efficiency and peak
2 demand cost recovery mechanism in its first Electric Security Plan (ESP) case that
3 was filed on July 31, 2008, immediately after the Ohio General Assembly enacted
4 Amended Substitute Senate Bill 221 (SB 221). The Company applied for
5 approval to implement Rider DR-SAW in order to be compensated for achieving
6 the newly enacted energy efficiency and peak demand reduction targets set by SB
7 221. The Public Utilities Commission of Ohio subsequently approved a
8 Stipulation and Recommendation in that proceeding that included Rider DR-SAW
9 on December 17, 2008. Under Rider DR-SAW, the utility was authorized to
10 collect the lost revenues associated with the energy efficiency impacts, as well as
11 specific percentages of avoided costs achieved through its energy efficiency and
12 demand response programs. This allowed Duke Energy Ohio an opportunity to
13 recover its costs and earn an incentive for exceeding the mandated SB 221
14 benchmarks.

15 **Q. PLEASE EXPLAIN THE INCENTIVE MECHANISM THAT WAS**
16 **PROPOSED AND APPROVED BY THE COMMISSION FOR**
17 **RIDER DR-SAW?**

18 A. Under the Rider DR-SAW approach, Duke Energy Ohio proposed a unique
19 variation of the more traditional shared savings incentive structure. The
20 fundamental difference is that under the Rider DR-SAW approach, the Company
21 does not explicitly recover the costs associated with its programs. Under Rider
22 DR-SAW, the Company is allowed to collect fifty percent of the avoided costs for
23 energy efficiency and seventy-five percent of the avoid costs associated with

demand response. Through the collection of these avoided cost revenues, the Company may recoup the expenses that it incurred by offering the energy efficiency programs and has the ability to earn an incentive with respect to any revenues collected in excess of what is necessary to cover its costs, subject to an earnings cap on the energy efficiency and demand response program expenditures. Due to the lack of experience with the model and its uniqueness, Duke Energy Ohio and the parties to its ESP case agreed to a tiered earnings cap (see Table 1) based upon its ability to exceed its SB 221 targets over the three year ESP period (2009-2011.)

Table 1

Achievement Versus the SB221 Energy Efficiency Mandate	After-Tax Return on Investment Cap
> 125%	15%
116%-125%	13%
111% -115%	11%
101%-110%	6%
≤ 100	0%

After the Company has determined its performance versus its energy efficiency mandates, the Company will multiply its program costs (which include all incentives, administrative costs, evaluation, measurement and verification (EM&V) expenses, marketing and advertising, capital costs and other program related expenses) by the earned applicable after-tax return on investment cap. The product of this calculation establishes the maximum incentive amount that the Company is eligible to earn. This amount adjusted for tax effects is added to

1 the actual program costs incurred and is then compared to the avoided cost
2 revenues (seventy-five percent of demand response and fifty percent of energy
3 efficiency) from the actual impacts recognized by the Company that it is eligible
4 to earn under Rider DR-SAW. As detailed in Witness Ziolkowski's testimony,
5 the lesser of the level of the earned revenues consistent with the calculated
6 earnings cap or the avoided cost revenues that the Company earned during the
7 three year period is used in the calculation of the Rider DR-SAW true-up.

8 **Q. WAS RIDER DR-SAW DESIGNED TO REMOVE THE DISINCENTIVE**
9 **ASSOCIATED WITH A UTILITY OFFERING ENERGY EFFICIENCY?**

10 A. Yes, Rider DR-SAW as stipulated and as approved by the Commission allowed
11 the Company to collect thirty-six months of lost revenues associated with the
12 impacts of its energy efficiency offerings.

13 **Q. DID THE STIPULATION INCLUDE A PROVISION FOR RECEIVING**
14 **CARRYING COSTS FOR OVER OR UNDER COLLECTION OF LOST**
15 **REVENUES?**

16 A. No. Any over or under-collection of lost revenues are to be determined without
17 including carrying costs.

18 **Q. HAS THE COST RECOVERY MECHANISM THAT WAS APPROVED**
19 **AS A COMPONENT OF DUKE ENERGY OHIO'S FIRST ESP BEEN**
20 **CHANGED SINCE THE COMMISSION FIRST APPROVED IT?**

21 A. Yes. After the Company submitted and the Commission approved a stipulated
22 settlement in the Company's first ESP case that included Rider DR-SAW, the
23 Commission enacted rules that facilitate the implementation of energy efficiency

1 and demand reduction for entities regulated by the Commission. These rules are
2 informally referred to as the “Green Rules” and they are set forth in the Ohio
3 Administrative Code in Section 4901:1-39, et seq. In so doing, the Commission
4 enacted a rule that required that the Company re-file its portfolio of programs for
5 approval. The Company did so in Case No. 09-1999-EL-POR. The Commission,
6 in its Opinion and Order in that case, directed the Company to cease to include
7 recovery of lost generation revenue in its calculations. The Company was further
8 directed to submit compliance tariffs for this purpose and it did so on February
9 16, 2011. Duke Energy Ohio witness James E. Ziolkowski will explain the
10 impact of this change and treatment of these revenues for purposes of calculating
11 the current Rider DR-SAW true-up.

12 **Q. WHAT ENERGY EFFICIENCY AND DEMAND RESPONSE PROGRAMS**
13 **WERE ULTIMATELY OFFERED TO DUKE ENERGY OHIO**
14 **CUSTOMERS UNDER RIDER DR-SAW AND APPROVED AS THE**
15 **COMPANY’S PORTFOLIO IN CASE NO. 09-1999-EL-POR?**

16 A. The portfolio of programs approved for inclusion in Rider DR-SAW included the
17 following programs:

- 18 ○ Residential Energy Assessments
- 19
- 20 ○ Smart Saver® for Residential Customers
- 21
- 22 ○ Low Income Services
- 23
- 24 ○ Energy Efficiency Education Program for Schools
- 25
- 26 ○ Power Manager for Residential Customers
- 27 ○ Home Energy Comparison Report

- 1 ○ Nonresidential Energy Assessments
- 2
- 3 ○ Smart Saver® for Nonresidential Customers
- 4
- 5 ○ Power Share for Nonresidential Customers

6 **Q. DID DUKE ENERGY OHIO OFFER ANY OTHER PROGRAMS DURING**
7 **THIS TIMEFRAME THAT WERE NOT INCLUDED IN CASE NO. 09-**
8 **1999-EL-POR?**

9 A. Yes. Consistent with Rule 4901:1-39-05(G), and the Commission's Opinion and
10 Order in Case No. 10-834-EL-POR, Duke Energy Ohio has offered eligible
11 customers the opportunity to participate in the Ohio Mercantile Self-Direct Rebate
12 program. While the Company has included the 54,587 KWh of energy savings
13 and 10.8 KW of capacity savings achieved in determining its performance versus
14 the SB 221 benchmarks, it has not recognized any of the avoided costs revenues
15 associated with the energy and capacity savings from this program.

16

17 **Q. HAS THE COMPANY COMPLIED WITH ALL OF THE DIRECTIVES**
18 **FROM THE COMMISSION IN ITS OPINION AND ORDER IN THE 09-**
19 **1999-EL-POR CASE?**

20 A. Yes. Duke Energy Ohio believes that it has complied with the directives set forth
21 in that Opinion and Order and followed all Commission procedures. For
22 example, the Commission directed the Company to continue to work with its
23 Collaborative and to file specific information in its status reports. The Company
24 has held Collaborative meetings with significant participation on 12/9/2010,
25 02/28/2011, 6/15/2011, 09/8/2011, and 12/12/2011.

1 Additionally, the Company has filed full and complete status reports in Case No.
2 10-0317-EL-EEC, Case No. 11-1311-EL-EEC and Case No. 12-1477-EL-EEC.
3 Finally, the Company is filing this true-up in accordance with the Stipulation and
4 Recommendation and the Commission's Order.

5 **Q. HAS DUKE ENERGY OHIO BEEN SUCCESSFUL IN MEETING ITS**
6 **TARGETED MANDATES FOR ENERGY EFFICIENCY AND PEAK**
7 **DEMAND REDUCTION?**

8 A. Duke Energy Ohio's performance of its energy efficiency portfolio over the three
9 year period of 2009-2011 has been extremely successful with regards to
10 delivering cost effective energy efficiency and demand response offerings to
11 customers. In each of the three years the company not only met, but exceeded its
12 mandated targets for energy efficiency and peak demand reduction. Over the three
13 year period, Duke Energy Ohio had cumulative SB 221 mandates of 328,628
14 MWh. During the same period of time, the Company was able to achieve
15 610,808 MWh of energy efficiency impacts through its portfolio of energy
16 efficiency offerings to customers and 55 MWh through its mercantile self-direct
17 program. This equates to a Duke Energy Ohio achievement of nearly 186% of its
18 mandated SB 221 target over the SAW period. Additionally, during the three
19 year period, the Company has exceeded its mandated capacity reduction targets of
20 111.3 MW by 172.2 MW.

21 **Q. WHAT PROGRAMS WERE THE PRIMARY DRIVERS FOR THE**
22 **COMPANY'S TREMENDOUS SUCCESS DURING THE THREE YEAR**
23 **PERIOD?**

1 While the Company is pleased with the performance of its overall portfolio of
2 programs that, as discussed by Witness Ossege, were deemed cost effective by the
3 Total Resource Cost, the two programs that delivered the most favorable results
4 were the Company's two Smart Saver Programs: Smart Saver for Residential
5 Customers and Smart Saver for Nonresidential Customers. Together these two
6 programs accounted for over 570 million KWh of impacts and nearly \$170
7 million of avoided costs. These programs flourished in large part due to the
8 attractiveness of lighting measures and the likelihood that the weak economy
9 stimulated customer interest in realizing the benefits of investing in energy
10 efficiency opportunities.

11 **Q. PLEASE EXPLAIN HOW THE COMPANY'S ACTUAL**
12 **ACHIEVEMENTS ARE BEING APPLIED WITH RESPECT TO**
13 **DETERMINING ITS ALLOWED LEVEL OF RETURN ON**
14 **EXPENDITURES.**

15 The Company is recognizing 410,785 MWh of its energy efficiency impacts for the
16 purpose of determining its level of allowed incentive and will be adding 200,077
17 MWh of impacts to its preexisting bank of 206,670 MWh. The 410,785 MWh of
18 achievements recognized by the Company equates to 125.00% of its SB 221
19 mandate and means that the Company has earned an allowed return on investment
20 under SAW of 15% on an after-tax basis.

21 **Q. PLEASE EXPLAIN THE APPLICATION OF THE INCENTIVE**
22 **MECHANISM AS IT WAS APPLIED UNDER RIDER DR-SAW BASED**
23 **ON THE DUKE ENERGY OHIO'S ACTUAL PERFORMANCE?**

1 A. During the three year period covered by Rider DR-SAW (2009-2011), the
2 Company overachieved versus its annual mandates by over 25%, which entitles it
3 to have the ability to collect an incentive of 15% of its total program costs. Based
4 on the Company's actual program costs and the application of the 15% earned
5 incentive cap, the maximum amount that the Company was eligible to collect for
6 its claimed energy efficiency impacts was just shy of \$75 million. The avoided
7 cost revenues that the Company earned during the same period from the program
8 impacts was nearly \$90 million. As previously described, the Company is only
9 eligible to collect the lesser of the earned revenues consistent with the calculated
10 earnings cap or the earned avoided cost revenues associated with actual impacts
11 claimed, so witness Ziolkowski utilized the nearly \$75 million of earned revenue
12 rather than the nearly \$90 million in his calculations used for the Rider DR-SAW
13 true-up.

14 **Q. HOW DID THE COMPANY'S PERFORMANCE COMPARE TO THE**
15 **ACTION PLAN PUT FORTH IN THE MARKET POTENTIAL STUDY**
16 **FILED IN THE COMPANY'S FIRST PORTFOLIO PLAN IN CASE NO.**
17 **09-1999-EL-POR?**

18 A. The Action Plan, or portfolio of programs, recommended in the market potential
19 study filed with the Company's program portfolio plan filing in Case No. 09-
20 1999-EL-POR projected to deliver approximately 319 million KWh of energy
21 efficiency impacts with the associated budget of over \$71 million dollars over the
22 three year period (2009-2011), as shown in the table below¹. The Company's

¹ Ohio Market Potential Study for Demand Side Management Programs Final Report, February 9, 2009,
Page 3

1 portfolio of programs, as mentioned earlier, delivered almost twice the energy
2 efficiency impacts at a program cost that is \$10 million less than the amount
3 forecasted to be required in the market potential study.

Energy Savings and Annual Budget for Recommended Programs		
Year	Cumulative GWh	Program Budget(Mils)
2009	65.2	\$16.18
2010	111.8	\$24.14
2011	<u>141.9</u>	<u>\$30.81</u>
Total	318.9	\$71.13

4
5
6 **Q. GIVEN THE SUCCESS UNDER THE COMPANY'S RIDER DR-SAW,**
7 **WHY DID THE COMPANY PROPOSE AN ENERGY EFFICIENCY AND**
8 **PEAK DEMAND COST RECOVERY MECHANISM IN CASE NO. 11-**
9 **4394-EL-RDR THAT IS DIFFERENT FROM THE RIDER DR-SAW COST**
10 **RECOVERY MECHANISM?**

11 **A.** In the Company's application in 11-4393-EL-RDR, the Company requested and
12 most of the intervening parties ultimately stipulated to a cost recovery and
13 incentive mechanism that is different from the mechanism used in Rider DR-
14 SAW. The decision to move away from the SAW mechanism was made for two
15 reasons. First, after its three years of experience with its Rider DR-SAW
16 recovery and incentive mechanism, due to the uniqueness of the model, the DR-
17 SAW recovery mechanism introduced a level of complexity and confusion that is
18 unnecessary when compared with the more established shared savings model.
19 The second reason is related to the fact that Rider DR-SAW was proposed and
20 approved prior to the Commission enacting the Green Rules, and the Company's

1 proposed Shared Savings mechanism aligns better with the constructs created by
2 those guidelines.

III. CONCLUSION

3 **Q. PLEASE DESCRIBE THE COMPANY'S OVERALL PERFORMANCE**
4 **UNDER SAW?**

5 A. Duke Energy Ohio is extremely pleased with its performance during its three
6 years under Rider DR-SAW. Duke Energy Ohio has dramatically exceeded its
7 energy efficiency and demand response mandates and has done so at a cost to
8 customers that was considerably less than the amount projected to be required to
9 simply meet the mandates in its Assessment of Potential that was filed in the
10 Company's Initial Program Portfolio Plan. This success has allowed customers
11 that participated in its programs to realize millions of dollars in direct bill savings
12 and allowed Duke Energy Ohio to avoid significant system costs, which has
13 benefitted both participating and non-participating customers alike.

14 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

15 A. Yes, it does.

BEFORE

THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Application of Duke)
Energy Ohio, Inc., for Recovery of) Case No. 12-1857-EL-RDR
Program Costs, Lost Distribution Revenue)
and Performance Incentives Related to its)
Save-A-Watt Programs.)

DIRECT TESTIMONY OF

JAMES E. ZIOLKOWSKI

ON BEHALF OF

DUKE ENERGY OHIO, INC.

June 28, 2012

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I. INTRODUCTION

1 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

2 A. My name is James E. Ziolkowski, and my business address is 139 East Fourth
3 Street, Cincinnati, Ohio 45202.

4 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

5 A. I am employed by the Duke Energy Business Services LLC (DEBS) as Rates
6 Manager. DEBS provides various administrative and other services to Duke
7 Energy Ohio, Inc., (Duke Energy Ohio or the Company) and other affiliated
8 companies of Duke Energy Corporation (Duke Energy).

9 **Q. PLEASE SUMMARIZE YOUR EDUCATION AND PROFESSIONAL**
10 **EXPERIENCE.**

11 A. I received a Bachelor of Science degree in Mechanical Engineering from the U.S.
12 Naval Academy in 1979 and a Master of Business Administration degree from
13 Miami University in 1988. I am also a licensed Professional Engineer in the state
14 of Ohio.

15 After graduating from the Naval Academy, I attended the Naval Nuclear
16 Power School and other follow-on schools. I served as a nuclear-trained officer
17 on various ships in the U.S. Navy through 1986. From 1988 through 1990, I
18 worked for Mobil Oil Corporation as a Marine Marketing Representative in the
19 New York City area.

20 I joined The Cincinnati Gas & Electric Company (CG&E) in 1990 as a
21 Product Applications Engineer, in which capacity I designed and managed some
22 of CG&E's demand side management programs, including Energy Audits and

JAMES E. ZIOLKOWSKI DIRECT

1 Interruptible Rates. From 1996 until 1998, I was an Account Engineer and
2 worked with large customers to resolve various service-related issues, particularly
3 in the areas of billing, metering, and demand management. In 1998, I joined
4 Cinergy Services, Inc.'s, Rate Department, where I focused on rate design and
5 tariff administration. I was significantly involved with the initial unbundling and
6 design of CG&E's retail electric rates. I was appointed to my current position in
7 January 2008.

8 **Q. PLEASE DESCRIBE YOUR DUTIES AS RATES MANAGER.**

9 A. As Rates Manager, I am responsible for various rider filings, tariff administration,
10 billing, and revenue reporting issues in Ohio and Kentucky. I also prepare filings
11 to modify charges and terms in retail tariffs of Duke Energy Ohio and Duke
12 Energy Kentucky, Inc., (Duke Energy Kentucky) and develop rates for new
13 services. During major rate cases, I prepare cost of service studies and help with
14 the design of the new base rates. I assisted in the development of the retail
15 electric tariffs in the Company's Case No. 03-93-EL-ATA, which established the
16 Company's market-based standard service offer. Additionally, I frequently work
17 with customer contact and billing personnel of Duke Energy Ohio and Duke
18 Energy Kentucky to answer rate-related questions and to apply the retail tariffs to
19 specific situations. Occasionally, I meet with customers and Company
20 representatives to explain rates or provide rate training. I also prepare reports that
21 are required by regulatory authorities.

1 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE PUBLIC**
2 **UTILITIES COMMISSION OF OHIO?**

3 A. Yes. Most recently, I provided testimony before the Public Utilities Commission of
4 Ohio (Commission) in support of Duke Energy Ohio's application for approval of an
5 Electric Security Plan, filed under Case Number 11-3549-EL-SSO. I was also a
6 witness in the Market Rate Offer case, filed under Case Number 10-2586-EL-SSO.

7 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**
8 **PROCEEDING?**

9 A. The purpose of my testimony in this proceeding is to: (i) describe the calculation of
10 the Rider DR-SAWR revenue requirement for the period January 2009 through
11 December 2011, (ii) discuss the procedure calculating the Rider DR-SAWR
12 recovery rates, and (iii) address the termination of Rider DR-SAW and Rider DR-
13 SAWR. The Company's electric tariff contains two SAW-related sheets. Rider DR-
14 SAW describes the calculations of the SAW recovery charges, and Rider DR-
15 SAWR contains the results of the calculations, i.e., the retail recovery rates.

16 **Q. WHAT ARE THE ATTACHMENTS AND SCHEDULES FOR WHICH**
17 **YOU ARE RESPONSIBLE?**

18 A. I am sponsoring the following items:

- 19 • Attachment JEZ-1 – Work papers showing the calculation of Rider DR-SAWR
20 rates
- 21 • Attachment JEZ-2 – Work papers showing the calculation of the Rider DR-
22 SAWR true-up revenue requirement
- 23 • Attachment JEZ-3 – Proposed Rider DR-SAWR tariff sheet – redlined

- 1 • Attachment JEZ-4 – Proposed Rider DR-SAWR tariff sheet – clean

2

3

II. CALCULATION OF SAW REVENUE REQUIREMENT

4 **Q. BRIEFLY DESCRIBE THE RIDER DR-SAW INCENTIVE MECHANISM.**

5 A. Traditional energy efficiency regulatory recovery mechanisms allow the utility to
6 recover program costs, lost revenues, and a percentage of shared savings (avoided
7 costs minus program costs). Under Rider DR-SAW, Duke Energy Ohio does not
8 explicitly recover the direct costs of its programs. Instead, Duke Energy Ohio
9 may collect fifty percent of the avoided costs for energy efficiency programs and
10 seventy-five percent of the avoided costs resulting from demand response
11 programs. The Company may also recover the lost margins that result from the
12 programs.

13 The total avoided cost dollar amount that may be claimed by the Company
14 under Rider DR-SAW is subject to a tiered earnings cap based upon its ability to
15 exceed its targets set forth in Revised Code 4928.66 over the three-year Electric
16 Security Plan period (2009 – 2011).

17 Table 1 in the Direct Testimony of Timothy J. Duff shows the after-tax return on
18 investment (ROI) cap versus the percentage achievement of the Company against
19 the energy efficiency mandate.

20 **Q. WHAT LEVEL OF ACHIEVEMENT VERSUS THE SB 221 MANDATE IS**
21 **THE COMPANY CLAIMING?**

22 A. Duke Energy Ohio achieved greater than one hundred and twenty five percent of

1 the energy efficiency and peak demand mandates, and is claiming the after-tax
2 ROI cap of fifteen percent.

3 **Q. WHAT IS THE PURPOSE OF RIDER DR-SAWR?**

4 A. Rider DR-SAWR is the mechanism through which the revenue requirement and
5 true-up of the Rider DR-SAW revenue requirement is recovered from residential
6 and non-residential customers.

7 **Q. WHAT REVENUES MAY DE – OHIO COLLECT UNDER RIDER SAW?**

8 A. As stated above, Duke Energy Ohio may collect fifty percent of the avoided costs
9 for energy efficiency programs and seventy-five percent of the avoided costs
10 resulting from demand response programs. The Company may also recover the
11 distribution lost margins that result from the programs. The avoided cost dollars
12 are capped such that the Company will not exceed a specified after-tax ROI.

13 **Q. IS THE COMPANY INCLUDING CARRYING COSTS ON LOST**
14 **MARGINS IN THIS APPLICATION?**

15 A. No.

16 **Q. PLEASE EXPLAIN HOW DISTRIBUTION LOST MARGINS ARE**
17 **CALCULATED.**

18 A. The DSMore™ model calculates the kWh and kW reductions associated with
19 each program measure. Based upon the units of participation and load reductions
20 per program measure, the Company then applies lost margin rates to these
21 reductions to calculate the lost margin dollars to be recovered. Company witness
22 Ashlie Ossege describes the DSMore™ model in her testimony.

23 **Q. WHAT IS THE DIFFERENCE BETWEEN LOST REVENUES AND LOST**

1 **MARGINS?**

2 A. In general terms, lost margins equal lost revenues minus variable costs. For
3 example, the lost margin associated with generation would be equal to the total
4 generation revenue minus fuel (a variable cost) minus any other variable O&M
5 costs. Rider DR-SAW allows for the recovery of lost margins, and the Company
6 requests in this filing to recover distribution lost margins associated with Rider
7 DR-SAW measures.

8 **Q. WHAT TYPES OF LOST MARGINS ARE INCLUDED IN THIS TRUE-**
9 **UP?**

10 A. In its Order dated December 15, 2010 in Case No. 09-1999-EL-POR, the
11 Commission stated that "...Duke should remove the recovery of lost generation
12 revenues from its Rider DR-SAW beginning on December 10, 2009." On
13 February 16, 2011, the Company filed a revised Rider DR-SAWR tariff sheet and
14 supporting work papers that reflected the removal of lost generation revenues
15 beginning on December 10, 2009. As the Commission has not issued an Order
16 approving the revised rates, the revised rates were not implemented.

17 In compliance with the December 15, 2010 Order in Case No. 09-1999-
18 EL-POR, the lost margins shown for each program in Attachment JEZ-2 exclude
19 generation lost margins for the period beginning December 10, 2009. Beginning
20 on that date, the calculated lost margins include only distribution margins.

21 **Q. DOES THIS APPLICATION INCLUDE AVOIDED COSTS ASSOCIATED**
22 **WITH THE MERCANTILE SELF-DIRECT PROGRAM?**

23 A. No. The Company included the energy and capacity savings from this program

1 in determining its performance against the Revised Code 4928.66 benchmarks,
2 but it did not include any avoided costs or lost revenues from this program in the
3 Rider DR-SAW true-up calculations. The Company is including \$32,302 of self-
4 direct program costs in its revenue requirement.

5 **Q. WHAT TIME PERIOD DOES THIS TRUE-UP COVER?**

6 A. The Rider DR-SAW program commenced on January 1, 2009 and terminated
7 after December 31, 2011. Therefore, this true-up analysis addresses the calendar
8 years 2009, 2010, and 2011.

9 **Q. PLEASE DESCRIBE IN DETAIL THE SAW REVENUE REQUIREMENT**
10 **CALCULATIONS IN ATTACHMENT JEZ-2.**

11 A. Attachment JEZ-2 contains the source data and revenue requirement calculations
12 for the Rider DR-SAW true-up. The lost revenues and Rider DR-SAW incentive
13 dollars are carried forward and used in Attachment JEZ-1.

14 Attachment JEZ-2, page 1 of 6 summarizes the Rider DR-SAW revenue
15 requirement for the period January 2009 through December 2011. The three-year
16 revenue requirement, including lost revenues and self-direct cost recovery, is
17 \$85,213,554.

18 Attachment JEZ-2 pages 3 through 6 summarize the load impacts,
19 program costs, lost revenues, avoided costs, claimable Rider DR-SAW revenue,
20 and claimed Rider DR-SAW revenue by program for each year and in total. On
21 page 4, the Revenue Claimable numbers represent fifty percent or seventy-five
22 percent of the net present value (NPV) Avoided Costs for the energy efficiency
23 (EE) and demand response (DR) programs, respectively. To the right of the

1 Revenue Claimable columns, the Revenue Claimed dollars are calculated as the
2 Revenue Claimable dollars, adjusted downward to comply with the fifteen percent
3 ROI cap. For the Demand Response programs, Revenue Claimed equals Revenue
4 Claimable. For the EE programs, Revenue Claimed equals Revenue Claimable
5 times sixty-seven percent. The calculation of the sixty-seven percent figure
6 appears on Attachment JEZ-2 page 2.

7 Attachment JEZ-2, page 2 shows the calculations of the MWh
8 achievement level, the maximum allowed (per the cap) revenue for SAW, and the
9 uncapped SAW return from claimed impacts. The 2009-2011 SB221 benchmark
10 is 328,628 MWh. The Company could claim 817,532 MWh of achievement, but
11 to comply with the ROI cap, the Company claims only 410,785 MWh. At this
12 level, the Company achieved one hundred and twenty-five percent of the Revised
13 Code 4928/66 target, and this establishes the fifteen percent ROI cap. Of the
14 410,785 MWh, 409,428 MWh was from Rider DR-SAW portfolio achievement.

15 The right hand column on page 2 shows the calculation of the maximum
16 allowed revenue under the ROI cap of fifteen percent. The maximum allowed
17 revenue is \$74,896,673.

18 At the top of the right hand column on page 2, the Company claims
19 409,428 MWh of SAW portfolio achievements. This figure is calculated by
20 grossing up the \$9.1 million of allowed return for taxes, adding the \$60.8 million
21 of program costs, subtracting the \$14.9 million of claimed demand response
22 revenue, and then dividing this total by the \$89.5 million of claimable EE avoided
23 cost revenue. The resulting percentage of sixty-seven percent is then multiplied

1 by the 610,808 MWh of claimable Rider DR-SAW achievements.

III. RIDER DR-SAW RECONCILIATION RATE CALCULATION

2 **Q. WHAT PROCESS DOES THE COMPANY PROPOSE TO TERMINATE**
3 **AND RECONCILE THE EXISTING RIDER DR-SAW?**

4 A. The Rider DR-SAW program began on January 1, 2009 and was scheduled to
5 terminate on December 31, 2011. The purpose of this filing is to calculate Rider
6 DR-SAW results for the three-year period, and to calculate and implement Rider
7 DR-SAW recovery rates to true up revenues collected against the calculated
8 revenue requirement. Depending on the timing of Orders in this Rider DR-SAW
9 true-up case and the pending Case No. 11-4393-EL-RDR, recovery rates in effect
10 for either of these cases will have to be examined and adjusted to accurately
11 recover the revenue requirements from both programs.

12 **Q. PLEASE EXPLAIN HOW DUKE ENERGY OHIO'S RECENTLY FILED**
13 **DISTRIBUTION BASE RATE CASE IMPACTS THIS RIDER DR-SAW**
14 **TRUE-UP APPLICATION?**

15 A. Rider DR-SAW costs are not part of the distribution base rates and revenue
16 requirement. This Rider DR-SAW true-up application covers the period January
17 1, 2009 through December 31, 2011 and is not affected by the recently filed
18 distribution base rate case filing.

19 **Q. PLEASE EXPLAIN HOW THE COMPANY'S RECENTLY APPROVED**
20 **DECOUPLING RIDER AFFECTS THE SAW TRUE-UP**
21 **CALCULATIONS.**

22 A. Rider DDR was approved on May 30, 2012 in Case No. 11-5905-EL-RDR. On

1 January 1, 2012, the Company began tracking the authorized distribution revenues
2 for each rate class covered by the rider against the actual revenues for the rate
3 classes covered by the rider. The Company will submit an application to establish
4 Rider DDR rates by March 1, 2013 based on the balancing account for each rate
5 class for the period January 1, 2012 through December 31, 2012. The Rider DDR
6 rates will be effective on July 1, 2013. The lost revenue dollars in this Rider DR-
7 SAW true-up filing are based on lost kWh and kW for years 2009, 2010, and
8 2011. Therefore, Rider DDR does not affect the lost revenues to be recovered in
9 this filing.

10 **Q. HOW DOES DUKE ENERGY OHIO'S PROPOSED RIDER EE-PDR IN**
11 **CASE NO. 11-4393-EL-RDR AFFECT THIS FILING?**

12 A. Depending on the timing and contents of an Order in the EE-PDR case, a
13 subsequent Rider DR-SAW true-up filing might be necessary. This would occur
14 if the Commission sets a termination date for Rider DR-SAW after December 31,
15 2011. Because the Rider DR-SAW program achievement targets assumed a
16 three-year program, it is unclear how incentives under Rider DR-SAW would be
17 calculated for 2012.

18 **Q. WILL THE COMPANY MAKE A SUBSEQUENT RIDER DR-SAW**
19 **TRUE-UP FILING?**

20 A. If the Commission affirms that Rider DR-SAW terminated after December 31,
21 2011, another Rider DR-SAW true-up filing will not be necessary.

22 **Q. PLEASE DESCRIBE IN DETAIL THE RIDER DR-SAWR RATE**
23 **CALCULATIONS CONTAINED IN ATTACHMENT JEZ-1.**

JAMES E. ZIOLKOWSKI DIRECT

1 A. Attachment JEZ-1 shows the calculation of the Rider DR-SAWR recovery rates.
2 Page 1 shows the lost margins and claimed revenues for each program from
3 Attachment JEZ-2. The “reconciliation” dollars for both residential and non-
4 residential were the over/under collection amounts from the prior DSM true-up
5 filing in Case No. 09-283-EL-RDR. These dollars must be included because the
6 Rider DR-SAW rate in effect recovers the Rider DR-SAW revenue requirement
7 and the revenue requirement associated with the Rider DSM true-up. Case No.
8 09-283-EL-RDR closed out the old Rider DSM program through December 31,
9 2008 and established a cost recovery rate. That rate has been in effect since
10 August 2010.

11 The Rider DR-SAW true-up revenues, excluding Commercial Activity
12 Tax, appear in column 8 of page 1.

13 Attachment JEZ-1 page 2 shows the annual kWh billing determinants used
14 in the Rider DR-SAW true-up calculation. These billing determinants are the as-
15 filed determinants in the Company’s recently-filed electric distribution base rate
16 case, Case No. 12-1682-EL-AIR. They reflect three months actual and nine
17 months estimated usage for the twelve months ending December 31, 2012.

18 Attachment JEZ-1 page 3, shows the calculation of the recovery rates.
19 The revenue requirements came from page 1, but they were grossed up to recover
20 Commercial Activity Tax. One percent of the non-residential revenue
21 requirement is allocated to Transmission Voltage (Rate TS) customers, and the
22 remaining 99% of the non-residential revenue requirement goes to distribution
23 voltage customers.

1 The recovery rates shown in Attachment JEZ-1 assume recovery over a
2 twelve month period.

IV. CONCLUSION

3 **Q. HOW DOES THE COMPANY PROPOSE THAT ITS TARIFFS,**
4 **INCLUDING THE PREVIOUSLY DISCUSSED RATES AND CHARGES,**
5 **BE IMPLEMENTED?**

6 A. Duke Energy Ohio proposes that the revised tariffs, including the rates and
7 charges complying with the Commission's Order in this case, be effective for
8 twelve months upon issuance of an Order for all customers on a bills rendered
9 basis.

10 **Q. WERE THE ATTACHMENTS DISCUSSED ABOVE PREPARED BY YOU**
11 **OR UNDER YOUR SUPERVISION?**

12 A. Yes.

13 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

14 A. Yes.

15

	(1) Total Program Costs 1/09 through 12/11 (A)	(2) NPV Avoided Cost 1/09 through 12/11 (A)	(3) Lost Margins 1/09 through 12/11 (A)	(4) Revenue Claimable 1/09 through 12/11 (A)	(5) Revenue Claimed 1/09 through 12/11 (A)	(6) Reconciliation Electric (B)	(7) Rider Collection Electric (C)	(8) (Over)/Under Collection (D)
Residential Programs								
Res EE								
Energy Efficiency Education Program for Schools	\$ 2,060,426 \$	729,651 \$	72,771 \$	364,826 \$	244,544 \$		NA	NA
Home Energy Comparison Report	\$ 2,306,383 \$	1,265,654 \$	358,180 \$	632,827 \$	424,187 \$		NA	NA
Residential Energy Assessments	\$ 5,472,763 \$	5,596,335 \$	537,881 \$	2,795,168 \$	1,878,296 \$		NA	NA
Low Income Services	\$ 982,137 \$	1,199,660 \$	127,373 \$	579,825 \$	388,660 \$		NA	NA
Smart Saver for Residential Customers	\$ 18,200,408 \$	83,324,677 \$	6,224,000 \$	41,682,338 \$	27,928,468 \$		NA	NA
Res Demand Response								
Power Manager for Residential Customers	\$ 8,579,433 \$	10,613,617 \$	- \$	7,960,213 \$	7,960,213 \$		NA	NA
							NA	NA
							NA	NA
							NA	NA
							NA	NA
							NA	NA
							NA	NA
							NA	NA
							NA	NA
							NA	NA
Total	\$ 37,201,550 \$	102,691,594 \$	7,320,204 \$	63,999,196 \$	38,820,388 \$	(4,757,252) \$	27,476,815 \$	13,906,505 \$

(D) Column (3) + Column (5) + Column (6) - Column (7).

	(1) Total Program Costs 1/09 through 12/11 (A)	(2) NPV Avoided Cost 1/09 through 12/11 (A)	(3) Lost Margins 1/09 through 12/11 (A)	(4) Revenue Claimable 1/09 through 12/11 (A)	(5) Revenue Claimed 1/09 through 12/11 (A)	(6) Reconciliation Electric (B)	(7) Rider Collection Electric (C)	(8) Overly/Under Collection (D)
Non-Residential Programs								
NonRes EE								
Smart Saver for Nonresidential Customers	\$ 21,112,170	\$ 86,836,339	\$ 2,964,376	\$ 43,418,169	\$ 29,103,410		NA	NA
NonRes Demand Response								
Power Share for Nonresidential Customers	\$ 2,465,545	\$ 9,287,193	\$ -	\$ 6,972,895	\$ 6,972,895		NA	NA
To SAW, but NOT subject to return cap								
Mercantile Self Direct Rebates	\$ 32,302	\$ -	\$ -	\$ 32,302	\$ 32,302		NA	NA
Pre-existing Programs from 2009 Appendix A	\$ -	\$ -	\$ -	\$ -	\$ -		NA	NA
Total	\$ 23,610,017	\$ 96,133,532	\$ 2,964,376	\$ 50,423,366	\$ 36,106,607	\$ 1,494,164	\$ NA	\$ (8,871,318)

(D) Column (3) + Column (5) + Column (6) + Column (7).

**Attachment JEZ-1
Duke Energy Ohio Rider SAWR
Summary of Billing Determinants**

Page 2 of 3

	<u>kWh</u>
Residential Rates RS, ORH, TD, RS3P, RSLI, TD-2012	7,117,952,670
Distribution Level Rates DS, DP, DM, GS-FL, EH, SFL-ADPL, CUR	9,327,039,454
Transmission Level Rate TS	3,137,807,912
Total	19,582,800,036

Note: From As-Filed Case No. 12-1682-EL-AIR
12 Months Ended December 31, 2012
3 Months Actual, 9 Months Estimated

TOTAL REVENUE REQUIREMENT

Attachment JEZ-2
Page 1 of 6

	Res	NonRes	Total
SAW Revenue Requirement with Utility In	38,820,368	36,076,305	74,896,673
SAW Lost Revenues	7,320,204	2,964,376	10,284,579
Self - Direct Cost Recovery	-	32,302	32,302
Total Revenue Requirement	46,140,571	39,072,983	85,213,554

SAW ACHIEVEMENT and TOTAL REVENUE REQUIREMENT

Attachment JEZ-2
Page 2 of 6

SAW UTILITY INCENTIVE

MWH ACHIEVEMENT LEVEL

Target	Updated
2009-2011 SB 221 MWH Benchmark	328,628
Total Claimable Impacts under SAW	
Pre-existing Programs from 2009 Appendix A	206,670
+ Mercantile Self Direct Rebates	55
+ SAW Portfolio Achievement	610,808
Total Claimable Achievement	817,532
Total Claimed Impacts	
Pre-existing Programs from 2009 Appendix A	1,302
+ Mercantile Self Direct Rebates	55
+ SAW Portfolio Achievement	409,428
MWts Claimed for Utility Incentive Level Achievement	410,785
Target Achievement vs SB 221 Target	125.00%
Max Allowable Return on Cost, After-Tax	15.00%
Impacts Banked Forward	
Total Claimable Achievement	817,532
+ Less Amount Claimed For Achievement	(410,785)
Bank forward into Future Utility Incentive Calculations	406,747

UTILITY INCENTIVE CALCULATION

Compute Uncapped SAW Return from Claimed Impacts Only		Updated
SAW Portfolio MWH Claimed for Incentive Achievement		409,428
/ SAW Portfolio MWH Achievement (generating AC Revenue)		610,808
Percent Claimed to be applied to EE Revenue		67.0%
x EE Avoided Costs Revenue Claimable		89,457,153
EE Avoided Costs Revenue Claimed		59,963,662
- Demand Response Revenue Claimed		14,933,107
Total Revenue Claimed before Lost Revenue		74,896,769
+ Cost		(60,779,264)
Product Profit		14,117,505
x Taxes	35.420940%	(5,000,553)
Net Income		9,116,952
/ Cost as Positive		60,779,264
Return on Cost		15.0%
Compute Maximum Allowed Revenue		
Cost		60,779,264
x Max Allowable Return on Cost, After-Tax		15.0%
Maximum Allowed Return on Cost		9,116,890
+ Gross-up for Taxes	35.420940%	5,000,519
+ Return of Cost		60,779,264
Maximum Allowed Capped Revenue		74,896,673
Percent Claimed to be applied to EE Revenue		67.0%
Minimum of Capped or Uncapped		
Total SAW Revenue Claimed before Caps Applied		74,896,769
Maximum Allowed Capped Revenue		74,896,673
Minimum of Claimed or Capped Revenue		74,896,673

SUMMARY

Attachment #22.2
Page 3 of 6

	KWH				KW			
	Incremental, At Plant, Gross Free Riders		Incremental, At Plant, Gross Free Riders		Incremental, At Plant, Gross Free Riders		Incremental, At Plant, Gross Free Riders	
	2009	2010	2011	Total	2009	2010	2011	Total
To SAW, AND subject to return cap								
Res EE								
Energy Efficiency Education Program for Schools	821,743	1,058,149	689,425	2,569,317	116.7	179.8	122.3	418.8
Home Energy Comparison Report	0	2,821,209	13,382,603	16,203,812	0.0	500.4	2,373.7	2,874.1
Residential Energy Assessments	6,622,589	5,980,102	5,051,826	17,654,516	847.9	783.9	497.5	2,129.3
Low Income Services	72,021	3,283,588	1,076,569	4,432,179	9.9	340.0	107.3	457.2
Smart Saver® for Residential Customers	19,066,006	203,504,103	118,432,588	341,002,697	2,489.8	21,722.2	12,309.4	36,521.5
Total	26,582,359	216,647,151	138,633,011	381,862,521	3,464.2	23,526.3	15,410.2	42,400.8
NonRes EE								
Smart Saver for Nonresidential Customers ⁽¹⁾	59,081,150	93,260,445	76,603,530	228,945,126	10,238.1	16,681.4	19,779.2	46,698.8
Total	59,081,150	93,260,445	76,603,530	228,945,126	10,238.1	16,681.4	19,779.2	46,698.8
⁽¹⁾ Includes costs for Energy Assessments								
Res Demand Response								
Power Manager for Residential Customers	0	0	0	0	23,421.1	11,498.5	14,655.4	49,575.1
Total	0	0	0	0	23,421.1	11,498.5	14,655.4	49,575.1
NonRes Demand Response								
Power Share for Nonresidential Customers ⁽²⁾	0	0	0	0	24,345.2	7,881.2	15,519.8	47,746.2
Total	0	0	0	0	24,345.2	7,881.2	15,519.8	47,746.2
⁽²⁾ Includes costs for Energy Assessments								
Total	85,663,509	309,907,597	215,236,542	610,807,647	61,468.7	59,587.5	65,364.7	186,420.8
Total Res	26,582,359	216,647,151	138,633,011	381,862,521	26,885.4	35,024.9	30,065.7	91,975.9
Total NonRes	59,081,150	93,260,445	76,603,530	228,945,126	34,583.3	24,562.6	35,299.0	94,444.9
Total	85,663,509	309,907,597	215,236,542	610,807,647	61,468.7	59,587.5	65,364.7	186,420.8
Total EE	85,663,509	309,907,597	215,236,542	610,807,647	13,702.4	40,207.7	35,189.5	89,099.6
Total Demand Response	0	0	0	0	47,766.3	19,379.7	30,175.2	97,321.3
Total	85,663,509	309,907,597	215,236,542	610,807,647	61,468.7	59,587.5	65,364.7	186,420.8
To SAW, but NOT subject to return cap								
Mercantile Self Direct Rebates	0	0	54,587	54,587	0.0	0.0	10.8	10.8
Pre-existing Programs From 2009 Appendix A	206,669,685	0	0	206,669,685	34,101.7	0.0	0.0	34,101.7
Total	206,669,685	0	54,587	206,724,272	34,101.7	0.0	10.8	34,112.5
Non SAW Programs counting towards SB 221								
Powershare Generators	0	0	0	0	0.0	58,980.2	3,819.2	62,799.4
Non-SAW: CUFA CFL bulb program	100,443	895,621	348,053	1,344,117	10.3	91.9	34.3	136.5
Total	100,443	895,621	348,053	1,344,117	10.3	59,072.1	3,853.5	62,935.9
Total Towards SAW Target	292,333,194	309,907,597	215,291,129	#####	95,570.4	59,587.5	65,375.4	220,533.3
Total Towards SB 221	292,433,638	310,803,217	215,639,182	#####	95,580.7	118,659.6	69,228.9	283,469.2

SUMMARY

Attachment JF/2
Page 4 of 6

	NPV AC				Revenue Claimable			
	NPV for EE, 1-Year Nominal for DR				Before Application of Cap or Claiming towards Achieve			
	2009	2010	2011	Total	2009	2010	2011	Total
To SAW, AND subject to return cap								
Res EE								
Energy Efficiency Education Program for Schools	213,586	307,112	208,953	729,651	106,793	153,556	104,477	364,826
Home Energy Comparison Report	0	184,228	1,081,427	1,265,654	0	92,114	540,713	632,827
Residential Energy Assessments	2,002,892	1,906,596	1,688,847	5,598,335	1,001,446	953,298	844,424	2,799,168
Low Income Services	26,873	845,977	286,801	1,159,650	13,436	422,988	143,400	579,825
Smart Saver® for Residential Customers	6,022,920	49,571,762	27,729,995	83,324,677	3,011,460	24,785,881	13,864,998	41,662,338
Total	8,266,271	52,815,673	30,596,023	92,077,967	4,133,135	26,407,837	15,498,011	46,038,984
NonRes EE								
Smart Saver for Nonresidential Customers ⁽¹⁾	19,934,345	29,721,863	37,180,131	86,836,339	9,967,173	14,860,932	18,590,065	43,418,169
Total	19,934,345	29,721,863	37,180,131	86,836,339	9,967,173	14,860,932	18,590,065	43,418,169
⁽¹⁾ Includes costs for Energy Assessments								
Res Demand Response								
Power Manager for Residential Customers	2,208,368	3,405,214	5,000,035	10,613,617	1,656,276	2,553,910	3,750,027	7,960,213
Total	2,208,368	3,405,214	5,000,035	10,613,617	1,656,276	2,553,910	3,750,027	7,960,213
NonRes Demand Response								
Power Share for Nonresidential Customers ⁽²⁾	1,339,039	3,142,577	4,815,577	9,297,193	1,004,279	2,356,933	3,611,683	6,972,895
Total	1,339,039	3,142,577	4,815,577	9,297,193	1,004,279	2,356,933	3,611,683	6,972,895
⁽²⁾ Includes costs for Energy Assessments								
Total	31,748,023	89,085,327	77,991,766	198,825,116	16,760,863	46,179,611	41,449,786	104,390,260
Total Res	10,474,639	56,220,887	35,996,058	102,691,584	5,789,411	28,961,747	19,248,038	53,999,196
Total NonRes	21,273,384	32,864,440	41,995,708	96,133,532	10,971,452	17,217,864	22,201,748	50,391,064
Total	31,748,023	89,085,327	77,991,766	198,825,116	16,760,863	46,179,611	41,449,786	104,390,260
Total EE	28,200,616	82,537,537	68,176,153	178,914,306	14,100,308	41,268,768	34,088,077	89,457,153
Total Demand Response	3,547,407	6,547,790	9,815,613	19,910,810	2,660,555	4,910,843	7,361,709	14,933,107
Total	31,748,023	89,085,327	77,991,766	198,825,116	16,760,863	46,179,611	41,449,786	104,390,260
To SAW, but NOT subject to return cap								
Mercantile Self Direct Rebates	-	-	-	0	0	0	32,302	32,302
Pre-existing Programs from 2009 Appendix A	-	-	-	0	-	-	-	0
Total	0	0	0	0	0	0	32,302	32,302
Non SAW Programs counting towards SB 221								
PowerShare Generators	-	-	-	0	-	-	-	0
Non-SAW: CUFA CFL bulb program	-	-	-	0	-	-	-	0
Total	0	0	0	0	0	0	0	0
Total Towards SAW Target	31,748,023	89,085,327	77,991,766	198,825,116	16,760,863	46,179,611	41,482,088	104,822,088
Total Towards SB 221	31,748,023	89,085,327	77,991,766	198,825,116	16,760,863	46,179,611	41,482,088	104,822,088

Notes

SAW EE Avoided Cost Sharing	50%
SAW DR Avoided Cost Sharing	75%
Cost Recovery for Mercantile Self Direct	100%

SUMMARY

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	Revenue Claimed				Cost			
	2009	2010	2011	Total	2009	2010	2011	Total
To SAW, AND subject to return cap								
Res EE								
Energy Efficiency Education Program for Schools	71,584	102,929	70,031	244,544	859,031	854,367	347,028	2,060,426
Home Energy Comparison Report	0	61,744	362,443	424,187	0	38,535	2,267,848	2,306,383
Residential Energy Assessments	671,274	639,000	566,021	1,876,296	1,679,282	1,990,662	1,802,819	5,472,763
Low Income Services	9,006	283,531	96,122	388,660	222,201	423,263	(63,327)	582,137
Smart Saver® for Residential Customers	2,018,596	16,614,097	9,293,775	27,926,468	1,712,344	9,484,398	7,903,666	18,200,408
Total	2,770,461	17,701,302	10,388,393	30,860,155	4,472,858	12,791,225	11,358,034	28,622,117
NonRes EE								
Smart Saver for Nonresidential Customers ⁽¹⁾	6,681,044	9,961,355	12,461,011	29,103,410	4,033,684	6,909,590	10,168,896	21,112,170
Total	6,681,044	9,961,355	12,461,011	29,103,410	4,033,684	6,909,590	10,168,896	21,112,170
⁽¹⁾ Includes costs for Energy Assessments								
Res Demand Response								
Power Manager for Residential Customers	1,656,276	2,553,910	3,750,027	7,960,213	2,795,347	3,024,203	2,759,883	8,579,433
Total	1,656,276	2,553,910	3,750,027	7,960,213	2,795,347	3,024,203	2,759,883	8,579,433
NonRes Demand Response								
Power Share for Nonresidential Customers ⁽²⁾	1,004,279	2,356,933	3,611,683	6,972,895	969,884	587,794	907,867	2,465,545
Total	1,004,279	2,356,933	3,611,683	6,972,895	969,884	587,794	907,867	2,465,545
⁽²⁾ Includes costs for Energy Assessments								
Total	12,112,060	32,573,499	30,211,113	74,896,673	12,271,772	23,312,812	25,194,680	60,779,264
Total Res	4,426,737	20,255,212	14,138,419	38,820,368	7,268,205	15,815,428	14,117,917	37,201,550
Total NonRes	7,685,324	12,318,287	16,072,694	36,076,305	5,003,567	7,497,384	11,076,763	23,577,714
Total	12,112,060	32,573,499	30,211,113	74,896,673	12,271,772	23,312,812	25,194,680	60,779,264
Total EE	9,451,505	27,662,656	22,849,404	59,963,565	8,512,235	19,713,920	21,541,094	49,767,249
Total Demand Response	2,660,555	4,910,843	7,361,709	14,933,107	3,759,537	3,598,892	3,653,586	11,012,015
Total	12,112,060	32,573,499	30,211,113	74,896,673	12,271,772	23,312,812	25,194,680	60,779,264
To SAW, but NOT subject to return cap								
Mercantile Self Direct Rebates	0	0	32,302	32,302	0	0	32,302	32,302
Pre-existing Programs from 2009 Appendix A	-	-	-	0	-	-	-	0
Total	0	0	32,302	32,302	0	0	32,302	32,302
Non SAW Programs counting towards SB 221								
Powershare Generators	-	-	-	0	-	-	-	0
Non-SAW: CUFA CFL bulb program	-	-	-	0	-	-	-	0
Total	0	0	0	0	0	0	0	0
Total Towards SAW Target	12,112,060	32,573,499	30,243,415	74,928,975	12,271,772	23,312,812	25,226,982	60,811,566
Total Towards SB 221	12,112,060	32,573,499	30,243,415	74,928,975	12,271,772	23,312,812	25,226,982	60,811,566
Notes								
Avoided Cost Revenue Cons Scalar				67.0%				

SUMMARY

Attachment JEP-2
Page 6 of 6

	Lost Revenue			
	Lost Revenue Lessor of Msr Life, 36 months, or Rate Case	Lost Revenue Less: Msr Share	Lost Revenue Less: Msr Share	Lost Revenue Less: Msr Share
	2009	2010	2011	Total
To SAW, AND subject to return cap				
Res EE				
Energy Efficiency Education Program for Schools	6,751	25,578	40,442	72,771
Home Energy Comparison Report	0	53,114	305,066	358,180
Residential Energy Assessments	70,187	194,602	273,092	537,881
Low Income Services	883	54,745	71,745	127,373
Smart Saver® for Residential Customers	344,213	1,279,861	4,599,926	6,224,000
Total	422,033	1,607,901	5,290,270	7,320,204
NonRes EE				
Smart Saver for Nonresidential Customers ⁽¹⁾	505,293	876,773	1,582,309	2,964,376
Total	505,293	876,773	1,582,309	2,964,376
⁽¹⁾ Includes costs for Energy Assessments				
Res Demand Response				
Power Manager for Residential Customers	0	0	0	0
Total	0	0	0	0
NonRes Demand Response				
Power Share for Nonresidential Customers ⁽²⁾	0	0	0	0
Total	0	0	0	0
⁽²⁾ Includes costs for Energy Assessments				
Total	927,327	2,484,674	6,872,579	10,284,579
Total Res	422,033	1,607,901	5,290,270	7,320,204
Total NonRes	505,293	876,773	1,582,309	2,964,376
Total	927,327	2,484,674	6,872,579	10,284,579
Total EE	927,327	2,484,674	6,872,579	10,284,579
Total Demand Response	0	0	0	0
Total	927,327	2,484,674	6,872,579	10,284,579
To SAW, but NOT subject to return cap				
Mercantile Self Direct Rebates	0	0	0	0
Pre-existing Programs from 2009 Appendix A	0	0	0	0
Total	0	0	0	0
Non SAW Programs counting towards SB 221				
Powershare Generators	0	0	0	0
Non-SAW: CUFA CFL bulb program	0	0	0	0
Total	0	0	0	0
Total Towards SAW Target	927,327	2,484,674	6,872,579	10,284,579
Total Towards SB 221	927,327	2,484,674	6,872,579	10,284,579

Rate Schedule	True-Up Amount (A)	Expected Program Costs	Total SAW Revenue Requirements	Estimated Billing Determinants (B)	SAW Cost Recovery Rider (SAWR)
Residential Rates RS, ORH, TD, RS3P, RSLI, TD-2012	\$ 13,942,756	\$ -	\$ 13,942,756	7,117,952.670 kWh	\$ 0.001959 \$/kWh
Distribution Level Rates DS, DP, DM, GS-FL, EH, SFL-ADPL, CUR	\$ (8,805,499)	\$ -	\$ (8,805,499)	9,327,039.454 kWh	\$ (0.000944) \$/kWh
Transmission Level Rate TS	\$ (88,944)	\$ -	\$ (88,944)	3,137,807.912 kWh	\$ (0.000028) \$/kWh
Total Recovery	\$ 5,048,313	\$ -	\$ 5,048,313	19,582,800.036	
(A) (Over)/Under of Attachment JEZ-1 page 1 multiplied by 1.0026068 for Commercial Activity Tax (CAT).					
(B) Attachment JEZ-1 page 2.					

Duke Energy Ohio
139 East Fourth Street
106.1
Cincinnati, Ohio 45202

P.U.C.O. Electric No. 19
Sheet No. 106.42
Cancels and Supersedes
Original Sheet No.

Page 1 of 1

RIDER DR-SAWR

ENERGY EFFICIENCY RECOVERY RATE

The DR-SAWR rate shall be determined in accordance with the provisions of Rider DR-SAW, Energy Efficiency Cost Recovery Rider, Sheet No. 107 of this Tariff.

The DR-SAWR to be applied to residential customer bills beginning with the August 2010 _____ revenue month is
~~\$0.000928~~ \$0.001959 per
kilowatt-hour.

The DR-SAWR to be applied to non-residential service customer bills, including transmission service customers participating in SAW programs, beginning with the August 2010 _____ revenue month for distribution service is ~~\$0.001784~~ (\$0.000944) per kilowatt-hour.

The DR-SAWR to be applied to transmission service customer bills, not participating in SAW programs, beginning with the January 2009 _____ revenue month is ~~\$0.000949~~ (\$0.000028) per kilowatt-hour.

Issued by authority of an Order by the Public Utilities Commission of Ohio dated June 9, 2010 _____
in Case No.
0912-2831857-
EL-RDR.

Issued: July 26, 2010

Effective: August 2, 2010

Issued by Julie Janson, President

Duke Energy Ohio
139 East Fourth Street
Cincinnati, Ohio 45202

P.U.C.O. Electric No. 19
Sheet No. 106.2
Cancels and Supersedes
Sheet No. 106.1
Page 1 of 1

RIDER DR-SAWR

ENERGY EFFICIENCY RECOVERY RATE

The DR-SAWR rate shall be determined in accordance with the provisions of Rider DR-SAW, Energy Efficiency Cost Recovery Rider, Sheet No. 107 of this Tariff.

The DR-SAWR to be applied to residential customer bills beginning with the _____ revenue month is \$0.001959 per kilowatt-hour.

The DR-SAWR to be applied to non-residential service customer bills, including transmission service customers participating in SAW programs, beginning with the _____ revenue month for distribution service is (\$0.000944) per kilowatt-hour.

The DR-SAWR to be applied to transmission service customer bills, not participating in SAW programs, beginning with the _____ revenue month is (\$0.000028) per kilowatt-hour.

Issued by authority of an Order by the Public Utilities Commission of Ohio dated _____ in Case No. 12-1857-EL-RDR.

Issued:

Effective:

Issued by Julie Janson, President

BEFORE

THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Application of Duke)
Energy Ohio, Inc., for Recovery of) Case No. 12-1857-EL-RDR
Program Costs, Lost Distribution Revenue)
and Performance Incentives Related to its)
Save-A-Watt Programs.

DIRECT TESTIMONY OF

ASHLIE J. OSSEGE

ON BEHALF OF

DUKE ENERGY OHIO, INC.

June 30, 2012

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VI. CONCLUSION.....	20

I. INTRODUCTION

1 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

2 **A.** My name is Ashlie J. Ossege, and my business address is 139 East Fourth Street,
3 Cincinnati, Ohio 45202.

4 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

5 **A.** I am employed by Duke Energy Business Services LLC, an affiliate of Duke
6 Energy Ohio, Inc. (Duke Energy Ohio, or Company) as Manager, Market
7 Analytics.

8 **Q. PLEASE SUMMARIZE YOUR EDUCATION AND PROFESSIONAL**
9 **EXPERIENCE.**

10 **A.** I graduated from the University of Cincinnati with a Bachelor's Degree in
11 Marketing and Real Estate. I have completed additional course work at the
12 graduate level in quantitative analysis. I am an Instructor in the Graduate
13 Economics Department at the University of Cincinnati, teaching Applied
14 Statistical Programming Methods for Economists.

15 From 1994 to 1997, I was employed by various real estate brokers,
16 including Comey & Shepherd Realtors as a certified Realtor in Ohio. From 1997
17 to 2006, I worked for Cinergy and Duke Energy Ohio as a Lead Market Analyst
18 developing and managing product/program design activities as well as market
19 research projects. Since 2006, I have been employed by Duke Energy Business
20 Services, currently in the role of Manager, Market Analytics supporting energy
21 efficiency research, analytics and evaluation.

22 **Q. PLEASE DESCRIBE YOUR DUTIES AS MANAGER OF MARKET**

1 **ANALYTICS.**

2 **A.** As Manager, Market Analytics, I have responsibilities for a variety of analytical
3 functions including market research data collection and analysis, marketing
4 design testing, energy load analysis, energy efficiency (“EE”) cost effectiveness
5 analysis, impact evaluation studies, and product design research. In this role, I
6 provide services for Duke Energy affiliates, including Duke Energy Ohio.
7 Additionally, I participated on behalf of the Company at public forums held at the
8 Public Utilities Commission of Ohio (Commission) wherein the Commission, its
9 Staff and interested stakeholders developed the Technical Reference Manual
10 (TRM) which is the subject of the Commission’s docket in Case No. 09-512-GE-
11 UNC.

12 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE PUBLIC**
13 **UTILITIES COMMISSION OF OHIO?**

14 **A.** Yes. I have testified before the Ohio Public Utilities Commission in Case No. 11-
15 4393-EL-RDR and before regulatory commissions in other states on matters
16 related to energy efficiency evaluation, measurement and verification (EM&V).

17 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**
18 **PROCEEDING?**

19 **A.** The purpose of my testimony is threefold. First, I provide an overview of the
20 EM&V methodology as well as the processes by which Duke Energy Ohio
21 evaluated its EE programs. Second, I provide the load impacts used in the true-up
22 for Save-A-Watt (DR-SAW) and I report the total impacts achieved based upon
23 actual units of participation. And third, using information on actual program costs

1 incurred and actual units of participation and load impacts, I present the results of
2 the cost-effectiveness for each of the programs as well as the total portfolio. In
3 addition, I review the DSMore™ model that the Company uses to evaluate the
4 cost-effectiveness of energy efficiency programs and discuss the assumptions
5 underlying the modeling.
6

7 **II. OVERVIEW OF EVALUATION, MEASUREMENT AND** 8 **VERIFICATION**

9 **Q. WHAT IS EVALUATION, MEASUREMENT & VERIFICATION?**

10 **A.** Evaluation, measurement and verification of energy efficiency programs, referred
11 to as EM&V, is a process which establishes program load impacts. Evaluation
12 studies and activities determine not only the impacts of energy efficiency
13 programming but also the effectiveness of that programming from the utility and
14 customer perspective and can include program process efficiencies, customer
15 satisfaction, free ridership and spillover effects. Measurement and verification
16 encompasses data collection, monitoring, and analysis associated with the
17 calculation of gross energy and demand savings from individual sites or projects.

18 **Q. WHY IS EM&V AN IMPORTANT COMPONENT OF ENERGY** 19 **EFFICIENCY PROGRAMMING?**

20 **A.** Reductions in consumer loads due to the implementation of energy efficiency
21 programs have an impact on the Company's planning for the need of future
22 resources. EM&V plays a critical role in helping the Company assess the success
23 of the energy efficiency load reductions. This information enables the Company
24 to better meet consumer energy demands. In addition, EM&V provides feedback

1 on the program design and execution from both the utility and customer
2 perspective, which helps in the continuation or future design of effective
3 programs. Finally, Amended Substitute Senate Bill 221 (SB 221) sets forth
4 specific energy efficiency and demand reduction targets with which electric
5 utilities must comply. EM&V provides the necessary information to help the
6 Company and the Commission assess utility compliance with the targets as well
7 as the overall cost-effectiveness of the programs. Due to the Commission's
8 responsibility to monitor and assess how well utilities are meeting these targets,
9 the Commission must have a rational method with which to do so. EM&V
10 processes provide that rational method.

11 **Q. WHAT DIFFERENT TYPES OF EVALUATION DOES DUKE ENERGY**
12 **OHIO UTILIZE?**

13 **A.** There are five types of evaluation that the Company relies upon. First, there is
14 cost effectiveness evaluation, which requires establishing a set of assumptions
15 around impacts and market potential *ex-ante*, or before the program
16 implementation. Second, there is impact evaluation, which strives to estimate the
17 actual energy and demand load reductions realized from a program through
18 billing analysis, engineering analysis, or statistically adjusted engineering models.
19 Third, the Company relies upon measurement, which typically refers to metering,
20 sub-metering, hours-of-use metering using data loggers, and the use of statistical
21 pre- and post-analyses. Usually, measurement is a subset of an impact evaluation.
22 Fourth, there is verification, which refers to the confirmation that customers
23 actually installed the intended measures, that vendors are performing to

1 expectation and that operational factors on the customer site are occurring such
2 that the expected load savings are being realized. Finally, there are also process
3 evaluations that refer to a set of review and auditing methods that ascertain
4 program effectiveness, customer satisfaction and experience, vendor satisfaction
5 and other factors that contribute substantially to program success such as
6 gateways or barriers to entry.

7 **Q. HOW HAS DUKE ENERGY OHIO MEASURED, MONITORED AND**
8 **VERIFIED ITS OHIO DSM PROGRAMS?**

9 **A.** Duke Energy Ohio hired a third party independent evaluator, TecMarket Works,
10 to conduct EM&V for the Rider DR-SAW programs implemented for the period
11 2009 through 2011. TecMarket Works is an independently owned, operated, and
12 managed business providing energy efficiency program evaluation services to
13 governments, regulatory agencies, and utility companies and has over 30 years
14 experience in the energy efficiency evaluation field.

15 TecMarket Works performed EM&V utilizing approaches outlined in Dr. Richard
16 Stevie's testimony provided in Case No. 08-920-EL-SSO in support of the
17 Company's application to implement its Rider DR-SAW portfolio of energy
18 efficiency (EE) and demand response (DR) programs. The EM&V approaches
19 included paper and electronic surveys, field verification and monitoring, customer
20 satisfaction surveys, and early feedback surveys. In addition, Duke Energy Ohio
21 performed system performance tests for its load control resources.

22 Duke Energy Ohio employed TecMarket Works to conduct evaluation studies
23 using techniques such as loggers to capture appliance usage times, load research

1 metering for hourly load analysis, statistical pre- and post-billing analysis using
2 comparison control groups, engineering analysis and modeling, reference and
3 comparisons to impact studies conducted in other regions for similar programs, as
4 well as phone and online interviews. In the process of conducting the EM&V
5 studies, TecMarket Works employed methods consistent with the International
6 Performance Measurement and Verification Protocols, the California Evaluation
7 Framework, and the Model Energy Efficiency Program Impact Evaluation Guide
8 prepared as part of the National Action Plan for Energy Efficiency.

9 **Q. WHICH EM&V STUDIES WERE COMPLETED DURING THE Rider DR-**
10 **SAW PERIOD?**

TABLE 1.

Ossege Attachment	Program	Applicable Report Name	Evaluation Type	Report Date
A	Energy Efficiency Education Program for Schools	Evaluation of Duke Energy's "Get Energy Smart" Program in Ohio - A Process Evaluation Report	Process	January 31, 2011
B	Smart Saver for Nonresidential Customers - Prescriptive	Evaluation of the Non-Residential Smart Saver® Prescriptive Program in Ohio - Results of a Process and Impact Evaluation	Process & Impact	August 29, 2010
C	Residential Energy Assessments - Personalized Energy Report (PER)®	Process Evaluation of the Personalized Energy Report Program in Ohio	Process	December 2, 2010
D	Residential Energy Assessments - Personalized Energy Report (PER)®	Energy Impact Evaluation of the Personalized Energy Report (PER)® Program in Ohio	Process & Impact	December 22, 2011
E	Power Manager®	Process and Energy Impact Evaluation of the Power Manager® Program in Ohio	Process / Impact Review	September 2, 2011 - February 19, 2012

F	PowerShare®	Evaluation of Duke Energy's Ohio PowerShare Program	Process / Impact Review	October 14, 2010 – December 28, 2011
G	Smart Saver for Residential Customers	Evaluation of the Residential Smart Saver® Program in Ohio - Results of a Process Evaluation	Process	November 24, 2010
H	Smart Saver for Residential Customers	Ohio Residential Smart Saver CFL Program - Results of a Process and Impact Evaluation	Process & Impact	June 29, 2010
I	Residential Energy Assessments - Energy Solutions @ Home(formerly Home Energy House Call Plus - Residential Retrofit Pilot)	Process Evaluation of the Energy Solutions @ Home Pilot Program in Ohio and South Carolina	Process	July 26, 2011
J	Non-Residential Energy Assessments	Process and Energy Impact Evaluation of Duke Energy's Ohio Non-Residential Energy Assessment Program	Process	November 15, 2011
K	Smart Saver® for Nonresidential Customers - Custom (formerly Custom Rebate)	Evaluation of the Non-Residential Smart Saver® Custom Program in Ohio	Process	August 12, 2011
L	Low Income Services - Refrigerator Replacement	Evaluation of Duke Energy's Low Income Refrigerator Replacement Program In Ohio - An Impact Evaluation	Process & Impact	December 20, 2011
M	Home Energy Comparison Report	Process and Energy Impact Evaluation of the Home Energy Comparison Report Program in Ohio	Process & Impact	September 9, 2011
N	Energy Efficiency Education Program for Schools	Evaluation of Duke Energy's 2009-2011 "Get Energy Smart" Program in Ohio -An Impact Evaluation Report	Process & Impact	December 22, 2011

O	Residential Energy Assessments - Home Energy House Call	Process and Energy Impact Evaluation of the Home Energy House Call Program in Ohio	Process & Impact	May 16, 2011
P	Smart Saver® for Residential Customers – HVAC	Evaluation of the 2009-2010 Residential Smart Saver® HVAC Program in Ohio Results of an Impact Evaluation	Process & Impact	January 2, 2012

1

2 **Q. WHAT WERE THE COSTS FOR THE EVALUATION, MONITORING**
3 **AND VERIFICATION FOR THE RIDER DR-SAW TIMEFRAME?**

4 **A.** The total EM&V Costs for the DR-SAW timeframe were \$2,535,278.
5 This equates to 4.35% of total programs costs which is consistent with the
6 estimate provided in the stipulation agreement of October 27, 2008.

7 **Q. HOW ARE THE ESTIMATES OF TOTAL LOAD IMPACTS**
8 **DEVELOPED FOR THE RIDER DR-SAW PERIOD?**

9 **A.** The Company used actual measure and program level units of participation along
10 with associated measure level load impacts to prepare the estimate of total load
11 impacts achieved by the Rider DR-SAW programs during the period 2009
12 through 2011. The Company used its initial estimates of measure level impacts
13 for the programs until EM&V results became available. The length of time
14 required to conduct the EM&V studies, as was outlined in the testimony of Dr.
15 Richard Stevie, can span more than two years. As a result, EM&V studies to
16 update the initial load impacts estimates were only available for CFL related
17 programs and the Non-Residential Prescriptive program beginning in the year
18 2011. In addition, the Home Energy Comparison Report (HECR) results received
19 in September 2011 were used as initial estimates for the commercialized version

1 of HECR. For the demand response programs, Power Manager for Residential
2 Customers and Power Share for Nonresidential Customers, demand response
3 capability is measured and updated each year.

4 **Q. ARE YOU FAMILIAR WITH THE COMMISSION'S RULES ON**
5 **ENERGY EFFICIENCY AND EM&V?**

6 **A.** Yes, it is my understanding that the Commission has issued an entry establishing
7 a procedure for the development of protocols for the measurement and
8 verification of energy efficiency and peak demand reduction measures, and on
9 September 30, 2009 the Commission approved the selection of Vermont Energy
10 Investment Corporation (VEIC) to develop the Technical Reference Manual
11 (TRM).

12 The Commission also hired an independent program evaluator to verify energy
13 savings and peak demand reductions as a result of the utilities' EM&V reports.

14 On August 6, 2010 a draft TRM was issued by VEIC. Replies from VEIC to joint
15 objections and comments to the August 6, 2010 Draft TRM from Ohio Electric
16 Distribution Utilities and IEU, Ohio Gas Utilities, Ohio Consumers' Council and
17 other advocacy groups, and OPower, INC were filed on November 15, 2010.

18 **Q. HAS THE TRM BEEN ADOPTED BY THE PUCO?**

19 **A.** According to the response from VEIC in the November 15, 2010 reply, the
20 effective date of the TRM has been deferred by the Commission.

21 **III. MODELING AND COST EFFECTIVENESS RESULTS**

22 **Q. HOW WERE PROGRAMS OR MEASURES MODELED FOR THIS**
23 **FILING?**

1 A. Normally, measures are modeled on a forward-looking basis (*ex ante*) using
2 expectations of participation and costs in order to determine if the measures will
3 be cost effective. For the purpose of this filing, additional analysis was done to
4 include an evaluation of cost effectiveness during the Rider DR-SAW time period
5 using actual program costs, initial or EM&V load impacts, customer incentives
6 paid, free ridership/spillover, and actual number of participants. The outputs of
7 the DSMore™ model were used to determine historical cost-effectiveness of the
8 portfolio.

9 **Q. WHAT IS THE DSMore™ MODEL?**

10 A. DSMore™ is a financial analysis tool designed to evaluate the costs, benefits, and
11 risks of energy efficiency programs and measures. DSMore™ is used as a
12 planning tool to forecast the value of an energy efficiency measure at an hourly
13 level across distributions of weather and/or energy costs or prices. By examining
14 energy efficiency performance and cost effectiveness over a wide variety of
15 weather and cost conditions, the Company is in a better position to measure the
16 risks and benefits of employing energy efficiency measures.

17 The analysis of energy efficiency cost-effectiveness has traditionally
18 focused primarily on the calculation of specific metrics, often referred to as the
19 California Standard tests: Utility Cost Test (UCT), Ratepayer Impact Measure
20 (RIM) Test, Total Resource Cost (TRC) Test, Participant Test (PCT), and Societal
21 Test. DSMore™ provides the results of those tests for any type of energy
22 efficiency program (demand response and/or energy saving).

23 The DSMore™ model has been used for DSM program cost-effectiveness

1 evaluation by the Company for several years, including for the calculation of
2 projected lost revenues for inclusion in certain of the cost effectiveness tests. It
3 was a key component in the process of developing revenue requirements in the
4 Company's energy efficiency proposal in 08-920-EL-SSO, which was approved
5 by the Commission.

6 Generally, the DSMore™ model requires the user to input specific
7 information regarding the energy efficiency measure or program to be analyzed as
8 well as the cost and rate information of the utility. These inputs enable one to
9 then analyze the cost effectiveness of the measure or program from the outputs of
10 DSMore™.

11 **Q. WHAT ENERGY EFFICIENCY PROGRAM OR MEASURE**
12 **INFORMATION IS INPUT INTO THE MODEL?**

13 **A.** In order to perform historical cost effectiveness evaluation, the information
14 required for an energy efficiency program or measure includes, but is not limited
15 to:

- 16 ▪ Number of actual units of participation, including free ridership or
17 spillover;
- 18 ▪ Actual program costs, contractor costs and/or administration costs;
- 19 ▪ Actual customer incentives, demand response credits or other
20 incentives;
- 21 ▪ Measure life, incremental customer costs and/or annual
22 maintenance costs;
- 23 ▪ Load impacts (kWh, kW and the hourly timing of reductions); and

1 ▪ Hours of interruption, magnitude of load reductions or load floors.

2 **Q. WHAT UTILITY INFORMATION IS INPUT INTO THE MODEL?**

3 **A.** The utility information required for the model includes, but is not limited to:

4 ▪ Discount rate;

5 ▪ Loss ratio;

6 ▪ Rate structure, or tariff appropriate for a given customer class for a
7 given jurisdiction;

8 ▪ Avoided costs of energy, capacity, transmission & distribution; and

9 ▪ Cost escalators

10 **Q. WHAT LOAD IMPACTS WERE USED IN THE CALCULATION OF THE**
11 **TRUE UP OF DR-SAW?**

12 **A.** The load impacts used in the true-up of Rider DR-SAW are available in
13 ATTACHMENT Q. including Attachments Q-1 through Q-26.

14

15 **IV. COST-EFFECTIVENESS TESTS**

16 **Q. PLEASE DESCRIBE HOW THE ENERGY EFFICIENCY PROGRAMS**
17 **AND MEASURES WERE ANALYZED.**

18 **A.** The outputs of the DSMore™ model, which contain the net present value of the
19 financial stream of benefits, are compared to the costs to implement the measures.

20 The resultant benefit/cost ratios, or tests, provide a summary of the measure's
21 cost-effectiveness relative to the benefits of its projected load impacts. Duke
22 Energy Ohio uses the same cost effectiveness tests as outlined in the California
23 Standard Practice Manual, which include the Participant Cost Test (PCT), Utility

1 Cost Test (UCT), the Total Resource Costs test (TRC), and the Ratepayer Impact
2 (RIM) Test for a comprehensive screening of energy efficiency measures.

3 • The PCT compares the benefits to the participant through bill savings and
4 incentives from the utility, relative to the costs to the participant for
5 implementing the energy efficiency measure. The costs can include
6 incremental equipment and installation costs as well as increased annual
7 operating cost, if applicable.

8 • The UCT compares utility benefits (avoided energy, capacity and
9 transmission and distribution related costs) to utility costs incurred to
10 implement the program such as administration, marketing, customer
11 incentives, and measure offset costs, and does not consider other benefits
12 such as participant savings or societal impacts. This test compares the cost
13 (to the utility) to implement the measures with the savings or avoided costs
14 (to the utility) resulting from the change in magnitude and/or the pattern of
15 electricity consumption caused by implementation of the program. Avoided
16 costs are considered in the evaluation of cost-effectiveness based on the
17 projected cost of power, including the projected cost of the utility's
18 environmental compliance for known regulatory requirements. The cost-
19 effectiveness analyses also incorporate load (line) losses.

20 • The TRC test compares the total benefits to the utility and to participants
21 relative to the costs to the utility to implement the program along with the
22 costs to the participant. The benefits to the utility are the same as those
23 computed under the UCT. The benefits to the participant are the same as

those computed under the Participant Test, however, customer incentives are considered to be a pass-through benefit to customers. As such, customer incentives or rebates are not included in the TRC.

- The RIM Test, or non-participants test, indicates if rates increase or decrease over the long-run as a result of implementing the program.

Q. WHAT WERE THE RESULTS OF THE DR-SAW PORTFOLIO ANALYSIS?

A. The key parameters required for historical cost-effectiveness tests (leaving projected avoided costs rates unchanged) are the actual units of participation, the actual program costs incurred (not including the cost of EM&V), and the program load impacts, updated with EM&V where applicable.

The program costs for each program are as follows in Table 2:

TABLE 2

Program Name	2009 - 2014 Cumulative Costs⁽¹⁾
Residential Energy Assessments	\$ 4,974,559
Smart Saver® for Residential Customers	\$ 17,979,056
Low Income Services	\$ 504,930
Energy Efficiency Education Program for Schools	\$ 1,921,851
Power Manager for Residential Customers	\$ 8,291,067
Home Energy Comparison Report	\$ 2,137,427
Smart Saver® for Nonresidential Customers	\$ 20,056,270
Power Share for Nonresidential Customers	\$ 2,378,826
Mercantile Self Direct Rebate ⁽²⁾	\$ 32,302
Grand Total	\$ 58,276,288

⁽¹⁾ EM&V costs are a separate component of program costs, thus not included in the table above

⁽²⁾ Costs for Mercantile Self Direct Rebate are included for recovery purposes only and not applicable for an incentive

The units of participation and the load impacts achieved by each program are provided

1 in Table 3:

TABLE 3

Program Name	Number of Participants	Total kWh¹	Total kW²
Residential Energy Assessments	29,958	17,654,516	2,129
Smart Saver® for Residential Customers	4,767,207	341,002,697	36,521
Low Income Services	5,373	4,432,179	457
Energy Efficiency Education Program for Schools	9,678	2,569,317	419
Power Manager for Residential Customers	N/A	N/A	49,575
Home Energy Comparison Report	906,218	16,203,812	2,874
Smart Saver® for Nonresidential Customers	835,904	228,945,126	46,699
Power Share for Nonresidential Customers	N/A	N/A	47,746
Mercantile Self Direct ²	10	54,587	11
Grand Total		610,862,234	186,432

1 Impacts are gross of freeriders at the plant.

2 Mercantile Self Direct impacts support the Company's kWh and kW achievements but are not part of the SAW incentive mechanism.

The historical cost effectiveness test results of the programs offered under Rider DR-SAW are as follows in Table 4:

TABLE 4

Overall Cost Effectiveness - By Program				
Program	UCT	TRC	RCM	ECI
Residential Energy Assessments	1.13	1.20	0.53	82.41
Smart Saver for Residential Customers	4.65	6.16	0.82	15.15
Low Income Services	2.17	2.96	0.67	N/A
Energy Efficiency Education Program for Schools ⁽¹⁾	0.37	0.40	0.28	N/A
Power Manager for Residential Customers	1.26	1.46	1.26	N/A
Home Energy Comparison Report ⁽²⁾	0.60	0.60	0.39	N/A
Smart Saver for Nonresidential Customers	4.36	1.77	1.13	2.51
Power Share for Nonresidential Customers	3.79	10.42	3.79	N/A

(1) The Energy Efficiency Education Program did not perform as well as anticipated primarily due the complexity of customer acquisition through the school channel. After two years of less than anticipated performance, Duke Energy Ohio attempted to improve the program by switching program vendors and shifting funds to more effective programs.

(2) Pilot results were shared with the Duke Energy Community Partnership (Collaborative) on December 12, 2011. The reported results are not representative of a full scale commercialized program, as it reflects energy savings for only the last 3 months of the Rider DR-SAW period.

Overall Cost Effectiveness - By Rate Class				
Rate Class	UCT	TRC	RIM	PCT
Residential	2.85	3.44	0.80	16.57
Non-Residential	4.30	1.93	1.21	2.54

Overall Cost Effectiveness - Total Portfolio				
	UCT	TRC	RIM	PCT
Portfolio	3.41	2.49	0.96	5.01

1 From these results, I conclude that the overall portfolio is cost-effective.

2

3 **V. MARKET TRANSFORMATION**

4 **Q. DO YOU HAVE ANY OTHER DISCUSSION POINTS?**

5 A. Yes, I would like to discuss the potential for market transformation to occur and
6 subsequently have an impact on estimates of energy efficiency load reductions.

7 **Q. PLEASE DESCRIBE HOW THE EM&V ANALYSIS WILL REFLECT**
8 **CHANGES IN THE MARKET AND PARTICIPANT BEHAVIOR OVER**
9 **TIME.**

10 A. Evaluation, measurement and verification conducted over time identifies the
11 magnitude and persistence of the energy efficiency impacts achieved from both
12 program participants, as well as from non-participants. Over time, Duke Energy
13 Ohio's energy efficiency programs can affect the nature of the energy efficiency
14 market such that customer behavior, vendor behavior, and even manufacturer
15 behavior is altered. Where significant momentum is generated with respect to the
16 adoption of increased energy efficiency, it is possible to transform markets such
17 that customers begin to demand more energy efficiency from their vendors,

1 equipment providers, and manufacturers. This increased demand for energy
2 efficiency can occur from “word of mouth” interactions as well as customer
3 exposure to Duke Energy Ohio’s advertising and promotion of energy efficiency
4 or the result of distribution channel partnerships between Duke Energy Ohio and
5 networked trade allies or manufacturers.

6 Importantly, partnership arrangements and distribution networks that Duke
7 Energy Ohio structures to deliver more efficient equipment have an impact both
8 on customers that are aware of the Company’s efforts as well as those that are not.
9 In either case, energy efficiency is likely to be adopted, but the more that Duke
10 Energy Ohio is able to move these markets toward more efficient choices for
11 customers, the more cost effective is Duke Energy Ohio’s realization of efficiency
12 gains. In other words, factors such as these can drive more customers to
13 implement energy efficiency measures without actually receiving the Duke
14 Energy Ohio’s incentives offered. This results in a transformation of the market
15 that would not have occurred without the actions or interventions in the market by
16 Duke Energy Ohio. This market mechanism is often referred to as free driver
17 behaviors, or sometimes labeled as spillover effects, in contrast to the more
18 familiar concept of free ridership.

19 Free riders are those customers who receive an incentive but would have
20 purchased the energy efficiency equipment even without the incentive, whereas
21 free drivers are those customers who purchase energy efficient equipment without
22 an incentive as a result of market transformation. Both market phenomena matter
23 in the prudent pursuit of demand side resources and integrated resource planning.

1 As such, Duke Energy Ohio measures both free rider and free driver impacts to
2 more accurately gauge the overall cost-effectiveness of its energy efficiency
3 efforts.

4 **Q. HOW WILL THESE IMPACTS BE IDENTIFIED?**

5 A. Estimating market transformation impacts combine the science of accepted
6 evaluation protocols with the art of obtaining market information and applying
7 some judgment by EM&V experts. Some of this market phenomena will be
8 measured indirectly but not completely through the EM&V process. Free
9 ridership will be measured through customer surveys, statistical billing analysis,
10 pre- and post- measurement processes and related studies among program
11 participants, whereas spillover impacts will be measured among non-participant
12 customer populations and/or through analysis of manufacturing trends and vendor
13 surveys, or other types of analyses that are able to discern the influence and
14 contribution of these market effects on the adoption of energy efficiency measures
15 and behaviors. Other market interventions would have to be analyzed beyond
16 the intervention of the utility, as well as primary and secondary time-series data.

17

18 **Q. HAS DUKE ENERGY INCLUDED ANY MARKET TRANSFORMATION**
19 **IMPACTS IN ITS ESTIMATE OF THE LOAD IMPACTS?**

20 A. No. For the reasons listed above, the impacts received in subsequent EM&V
21 reports will be used in future Duke Energy Ohio portfolio rider calculations, and it
22 can be assumed that those impacts will naturally reflect where the program's
23 impacts are along the diffusion curve of market transformation.

1 **VI. CONCLUSION**

2 **Q. WHAT CONCLUSION DO YOU DRAW FROM YOUR TESTIMONY?**

3 **A.** Duke Energy Ohio has performed EM&V using a third party evaluator and state-
4 of-the-art methods. In addition, the portfolio of programs has been shown to be
5 historically cost effective with respect to the TRC test.

6 **Q. WERE ATTACHMENTS A-Q26 PREPARED BY YOU OR AT YOUR**
7 **DIRECTION?**

8 **A.** Yes, they were.

9 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

10 **A.** Yes, it does.

Final Report

Evaluation of Duke Energy's "Get Energy Smart" Program in Ohio

A Process Evaluation Report

**Prepared for
Duke Energy**

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Executive Summary

About This Report

This report presents the process evaluation findings for the evaluation of the “Get Energy Smart” Program, also known as the K12 Curriculum Program. For this report, we interviewed ten participating teachers, the program manager, and program implementation managers and staff from Scholastic. We also surveyed student families.

According to the program information:

“The “Get Energy Smart” program goal is to educate children and their families about wise energy usage in their homes and personal choices they can make to save money, protect the environment and address climate change. The curriculum was designed to allow teachers to incorporate the materials into their existing math/science instructional schedules with supplemental activities on the Web.

The lessons are short, but relevant, and create opportunities for interactive, hands-on learning. Students and families can perform an on-line energy audit of their own homes, which creates an energy report for each participating family. After students perform the audit, those that live in Duke Energy territory receive a free energy efficiency starter kit containing information and the following items:

- 2 CFLs
- Efficient showerhead
- 3 low flow aerators
- Weather stripping
- Educational materials
- Personalized Energy Survey report
- Business reply card (BRC)
- Bag for testing water flow
- Outlet and light switch insulators
- Refrigerator magnet
- Night light
- Light-up ring for kids

Students that do not live in Duke Energy territory receive a kit containing the following items:

- 13 Watt CFL (60 Watt Equivalent)
- Duke Energy Labeled DOE Energy Savers Booklet
- Water Flow Meter Bag
- Duke Energy Supplied Toy (Glow Ring)
- 8 Outlet Gasket Insulators

For the time period June 2009 to April 2010, Duke Energy has provided 3,619 kits to program participants in Ohio who live in and outside of the Duke territory.

Summary of Findings and Recommendations

An overview of the key findings and recommendations identified through this evaluation is presented below.

There were 3,619 student family participants in the K12 program from June 2009 to April 2010. Table 1 below presents the average number of kits distributed by participating teacher, school, and school district. For this program period, there were 56 school districts with participating schools. In these 56 school districts, 224 schools had a total of 802 teachers that participated in the K12 program. An average of 4.4 kits were distributed per participating teacher.

Of the 3,619 kits distributed, 106 kits (2.9%) were sent to non-Duke Energy customers in Ohio. These kits contained fewer items, as described in the above text box. Note that these numbers represent the number of Duke Energy customers that completed the survey and requested kits between April 27, 2009 and June 7, 2010, not actual kit distribution. The number of kits sent would be slightly lower because Duke Energy did not send kits to customers that have received energy efficiency kits through other Duke Energy programs. The average number of kits sent to Non-Duke customers is correct.

Table 1. Distribution of Energy Efficiency Kits

Jurisdiction: Ohio		Average Number of Kits to Non-Duke Energy Customers	Average Number of Kits to Duke Energy Customers	Total Kits Distributed	Range of Number of Kits, Duke Energy and non-Duke Energy Customers
School District	(n=56)	1.9	62.7	3619	0-682
School	(n=224)	0.5	15.7		0-449
Teacher	(n=802)	0.1	4.4		0-31

Evaluation Contractor's Recommendations for Duke Energy to Consider

The following program recommendations are provided by TMW, the independent evaluation contractor. The recommendations are provided to allow Duke Energy to review them with the program manager and the lead administrator so that each recommendation can be accepted, rejected or modified according to the best judgment of the program design professionals.

- 1. Develop a coordinated school targeting and entry-contact strategy that takes advantage of all effective market development efforts to reach newly targeted schools.** For most schools targeted by the program, successful entry into the school is based on Scholastic's market presence and history serving schools, and their reputation as a curriculum builder. This is the primary market development theory regarding why delivering the program thorough organizations like Scholastic is the preferred approach. It builds on existing relationships and service history. That is, the program delivery success hinges on Scholastic's presence and reputation as a high-quality training support organization to the schools targeted by the program. However, teacher interviews suggest that for some schools Duke Energy's BRM relationship with the schools can also be a "door opener" and may, in some circumstances, provide a more effective access route to the school administrators who need to approve the program for their schools. In

addition, Duke Energy has other relationships that can be used to gain support. For example, the Duke Energy Foundation has contacts with school administrators and teachers and provides supportive funding to many schools. They also take part in school board activities and support educational development in the state via a number of efforts. For some schools, entry into the school can be expedited by leveraging Duke Energy's existing relationship through their BRMs¹ or through Duke Energy's extended community relations. These relationships and organizations can be considered when developing a school district contact strategy. This strategy can employ a phased approach for gaining access to new schools so that the support for the program is present and the administrators are receptive enough that they can push the program within their schools.

2. **Select program assessment metrics carefully when evaluating second year program energy savings.** Because the second program year will be implemented with several design changes as well as different fielding approaches compared to the first year, it will be important to understand the relationship between program operations and success (energy savings). Duke Energy and Scholastic should consider developing a set of performance metrics that help track the effects of the program to the operational components that deliver that success. One approach would be to develop several metrics and assess the success of the program across these multiple metrics so that the assessment focuses on savings achieved but also for delivery effectiveness. Such metrics can include savings per teacher, savings per school, savings per district, installations per teacher, surveys and return cards returned per teacher/school/district, students reached per month, etc. These performance metrics can then be compared with the program's operational procedures to identify changes that increase effectiveness and those that do not.
3. **Train program team members on the methodology that is used to calculate energy savings.** All team members should be made to understand that the energy savings are estimated by extrapolating the data from the measures reported on the BRC to the entire population. The requirement to achieve at least a 20% rate of BRC returns stems from the need to minimize self-selection bias by drawing a sample from a wide range of households, not just those households that might already be more receptive to energy efficiency. This better understanding may allow program team members to find other ways of increasing the representativeness of the sample without resorting to high BRC return incentives. See next recommendation as an example.
4. **Consider other methods of decreasing response bias by increasing representativeness of the BRC sample.** The survey and BRC returns that the program is experiencing at this time should be considered the minimum level of acceptance. Surveys and BRC returns should be much higher. We see no reason why surveys and BRC return rates should not be provided by 50% of the students and their parents if it were presented as a homework assignment. Methods should be developed for increasing the BRC response rates. For example, playing upon known methodologies for multi-student partnership efforts, such as randomly divided into pairs and every pair could be asked to make a commitment to have at least one student return the BRC from each pair

¹ BRM: Business Relations Managers, sometimes known as the customer representatives

and the other report to the class the measures installed. The random pairing of students would decrease response bias by encouraging responses from students who tend not to respond.

5. **Work with neighboring utilities to share credit of achieving energy savings.** In a time when energy efficiency and carbon reduction is of increasing importance, growing numbers of states have school energy efficiency programs that overlap geographical regions. While it is important to understand an individual program's achievements for the purpose of improving program operations and program design, utilities should be given energy savings credit for contributing to overall energy supplies in their states and their market transformation efforts to achieve an energy supply objective. A case made to the regulatory agencies for sharing credit would be strengthened by coordination between neighboring utilities. However, splitting individual students within a single class to receive different levels of support based on the location of their parents homes can be expected to substantially decrease cost effectiveness by driving up costs per in-territory student and lower savings by not including all students. We recommend working with the Commission to resolve this issue to: a) count all savings regardless of territory, or b) exclude this program from a cost effectiveness requirement and allow recovery of all costs and incentives as a condition of implementation, or 3) determine if the program can be made cost effective through continued improvements such that it can become cost effective by counting only the savings from homes in Duke Energy's territory, or d) consider terminating the program. We specifically recommend that Duke Energy and the Ohio Collaborative work with the Commission to allow savings from schools operating in multiple utility territories to be credited to the sponsoring utility so that territorial issues do not impact program energy credits or act to erode the apparent cost effectiveness of the program. Base the argument on the fact that it is the energy supplies of the state that are the focus of the legislation and or regulatory policy behind cost effective energy supplies provided to the energy consuming population of the state. If this is not successful, examine the cost effectiveness of the program based on Duke Energy's territory savings and determine if the program is cost effective, can be made cost effective, can be exempted from contributing to a cost effective portfolio, or if it should be terminated.
6. **Continue to explore new program operations, enrollment, and marketing strategies to increase program cost effectiveness.** Duke Energy is working with Scholastic to test new approaches for improving the design and operations of this program. We compliment Duke Energy and Scholastic for their continued efforts to improve the program and encourage the continuation of this improvement approach. For example, in the Carolinas, Duke Energy is considering a new school strategy that does not require in-person visits. For this strategy, DVD presentations are being considered as a way to market to schools that are geographically hard to reach, making personal visits expensive. In assessing this strategy Duke Energy and Scholastic should continue to explore whether DVD is an effective presentation tool for serving as a replacement for in-person program enrollment visits. If this strategy is effective in the Carolinas, consider using this approach in Ohio as well.

In addition, there is some concern on the part of Scholastic that mass marketing efforts are not permitted. Scholastic, on the other hand, recommends the use of local mass marketing efforts to develop positive community support for the program prior to contacting administrators and teachers during the enrollment phase. These options should be tested to determine what actions are worth pursuing on a program basis. However, these efforts have to be considered within a cost effectiveness framework for the program as a whole within the portfolio. If the program cannot be made cost effective, it makes little sense to spend additional dollars building public support for a program that will not continue as a part of the portfolio. We recommend that both Duke Energy and Scholastic explore these and other options to build a program that is both cost effective and that uses an approach that improves response, participation and energy savings to become more cost effective over time.

7. **Review how many 3rd and 4th Grade classes the targeted schools have so that schools receive the appropriate number of teacher kits.** The number of 3rd and 4th grade classrooms was over-estimated in the 2009-2010 program year, resulting in too many kits being sent to the teachers. This was not reported as an issue in the current evaluation, and the average number of kits per school dropped from 11 in 2009 to 7.6 kits in 2010. This issue has likely been resolved as of this report, though further inquiries should be performed to ensure that the appropriate number of teacher kits are being distributed to the schools.

Teacher-Provided Recommendations for Duke Energy To Consider

In addition to the recommendations provided by the evaluation contractor, several teachers provided recommendations that can be considered by the program design professionals. TecMarket Works presents these recommendations from the interviewed teachers from both the Ohio program and the assessment of the program in the Carolinas so that ideas expressed across both states are considered within each state. However, we do not elevate these recommendations to be included with the recommendations from the evaluation contractor. The evaluation contractor recommendations are those that TecMarket Works suggest be implemented into the program (above). The teacher recommendations are provided without judgment as to their appropriateness for the K12 program. These including the following:

- Increase the level of educational and results-related program promotions (flyers, brochures, school examples, etc.) provided to the teachers and school administrators in time to be effectively used.
- Update the program materials to today's standards by adding a multi-media element such as a DVD video or online class activities.
- Develop and incorporate a day-to-day educational/activities planner to stretch the impact of the activities out over several days
- Add a more flexible incentive for teachers to make the effort worthwhile to the teachers who are responsible for success; the incentive can be cash for the class, class activities, or credits for class supplies or other incentives valued by teachers.

- Redesign the website to make it more user-friendly for students and teachers
- Add more online content for students to access at home that would focus on increasing key behaviors and measure installations.
- Develop a simple game for the students to play with their family that would reinforce the behaviors needed and the installation of measures. Distribute it with the kit.
- Develop a song that students can sing in the class or at home that sends a behavior and use message.
- Develop a downloadable application for smartphones that parents and children could use together to track their savings.
- Include a component in which the students write a report of the use of the kit items and have the program incent the report to make it attractive to students and teachers.

Teacher Comments

The teachers also provided additional comments on the program and its operations. These comments are summarized below.

- "The packet of materials was great. Children love being able to touch and hold things."
- "The lessons were brought down to the right level for my class, and "The Magic School Bus" holds a high level of interest for children."
- "The prepaid envelopes were great. We didn't have those last year and I think it made a real difference."
- "The materials need to be designed specifically for the children who are to be exposed to them. The lines of type in some of the materials are still too small."
- "Bring out the integration between the Magic School Bus story and the curriculum's focus and the program's objectives so that they directly support each other."
- "Add more multimedia elements – online, songs, videos, presentations."
- "Need to more effectively structure the program's focus and materials so that it integrates smoothly with the school curriculum that we must follow as well as state standards."

Student Family Surveys

One hundred twenty-six (126) Ohio families that live in Duke Energy's service territory returned the survey. The survey asked the families about what kit items they used and their satisfaction with the items. The most commonly installed items with over 80% installation rates were the kit's 13-watt and 20-watt CFLs and the night light. Respondents also indicated their highest levels of satisfaction with those items, as presented in the table below.

	Percent Installed or Used	Mean Satisfaction Score
13-watt CFL	92.9%	8.7
20-watt CFL	84.1%	8.7
night light	81.0%	8.4
booklet	80.2%	7.9

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low flow showerhead	58.7%	8.2
kitchen aerator	46.0%	8.0
bathroom aerator	42.7%	
switch and outlet gaskets	45.2%	7.9
water temp card	44.4%	8.0
water flow meter bag	16.7%	7.0

In our sample of students there were 44 Duke Energy territory kits sent out to student families containing eight CFLs (4 13-watt and 4 20-watt CFLs). Out of the 176 13-watt CFLs distributed to this group of forty-four survey respondents, 153 of them were installed. This is an installation rate of 86.9%. For the 20-watt CFLs, 114 of the 176 CFLs were installed, providing an installation rate of 64.8%.

Introduction

This report presents the findings for the evaluation of the Get Energy Smart Program. The Get Energy Smart Program provides energy efficiency informational and educational support and resources to 3rd and 4th grade teachers for them to incorporate into their lesson plans. The goal of the program is to use students as an information route to achieve cost effective savings in the homes of the children using the support and assistance of the parents.

There were 224 teachers that participated in the program during the time period of October 2009 and May 2010, and TecMarket Works received the contact information for 64 of these teachers that agreed to be interviewed. The evaluation was comprised of interviews with 10 out of these 64 teachers. The objective of the interviews was to determine program satisfaction, and to gather feedback on the curriculum and to obtain suggestions for improvements. The complete interview instrument can be found in Appendix A: Teacher Interview Instrument.

Methodology

This study consisted of reviews of program materials to understand the focus and scope of the program, process evaluation interviews with Duke Energy program managers, Scholastic program administrators and schoolteachers implementing the program. The interviews focused on methods of operation and implementation, experiences and perspective associated with program design, approaches and results, and levels of satisfaction with the program's materials, communications, and delivery components. The interviews with the teachers also assessed process issues including the ease of signing up for the program, the quality and completeness of the curriculum, the value of the energy recommendations provided and other subjects (see instrument in. In addition, participating students' families were sent surveys.

Program Description

The Energy Efficiency Education Program for Schools reaches out to 3rd and 4th graders in Duke Energy's service territory to educate them about energy efficiency in their homes. Students are given Duke Energy's home energy audit survey to complete. These surveys can be returned to the teacher or mailed back to Duke Energy in prepaid envelopes. The survey can also be taken online. Once the surveys are received and processed, Energy Efficiency Starter kits containing low-cost, energy efficient measures are sent to the home. The kit also contains a business reply card that asks the family to indicate which of the measures in the kit were installed.

Duke Energy introduced this program in the state of Ohio in March of 2009 near the end of the 2008-2009 school year. The program has been funded through 2011.

Process Evaluation Findings

Program Objectives

All the program team members who were interviewed were clear about the objective of the program.

- *"To promote energy efficiency behavior in families, reduce the amount of energy needed by families in the area. To help families save money. To promote Duke Energy's goals of protecting the environment."*
- *"To teach and encourage students and families in NC elementary schools to become more energy efficient at home and in the community."*
- *"[Primary goal is] demonstrating kWh savings by distribution of energy measures into the homes. Second is educating our customer base."*
- *"To educate students about energy efficiency along with state-determined curriculum. Provides kids and families opportunities to receive energy efficient products."*

Roles

Duke Energy serves as the administrator of the program with Scholastic playing a key collaborative role to implement the program under Duke Energy's direction. As the Duke Energy program manager explains, *"Duke brings the business requirements and Scholastic shows how they can meet that need and deliver the program."* Niagara Conservation provides fulfillment of the Energy Efficiency Starter Kits to the students and their families. The staff from all three companies have regular communications through quarterly in-person meetings, monthly reports on outreach activities performed by Scholastic, weekly reports on survey returned, as well as weekly phone calls. The collaboration is working very well according all the interviewees. Duke Energy draws upon Scholastic's expertise and feedback but is responsible for leading the strategic planning. The Duke Energy program manager conducts process checks by accompanying state coordinators on visits and events and provides feedback on their marketing and on operational strategy. The Duke Energy program manager also facilitates event and sponsorship opportunities.

Curriculum

The program targets all 3rd and 4th grade classes within Duke Energy's service territory. Each teacher is sent a boxed kit containing materials that were designed as turnkey lessons on energy efficiency, aligned with each state's curriculum standards in science, math, and language arts, integrated across those disciplines. The materials consist of three lessons with activity sheets for each lesson. These lessons are also available online for those teachers who have Smartboard technology. The lessons are designed by Scholastic's in-house staff. Scholastic has built a national reputation for creating educational materials and they leveraged their core expertise in this area to design appealing lesson plans for the Energy Efficiency Education Program.

Along with the lessons in each box is a booklet of energy saving ideas and 30 family involvement envelopes that contain the Duke Energy home audit survey (Personalized Energy

Report) adapted for this program by adding artwork from the Magic Schoolbus program. Postage paid return envelopes accompany each survey.

Program Marketing and Incentives

The Energy Efficiency Education Program targets all 3rd and 4th grade classes within Duke Energy's Service Territory. In many cases, the schools draw from neighborhoods that are partly serviced by another utility, but students outside of Duke Energy's footprint are not counted by Duke Energy in their goals. Students outside of Duke Energy's footprint are not excluded from the lessons, but their families receive a different energy kit. Their kits do not contain energy efficiency measures and do not contain the Personalized Energy Report. The students outside of Duke Energy's footprint used to receive the same energy efficiency kit. However, after Duke Energy was instructed by one state's regulatory agency that Duke Energy could not claim energy savings outside of Duke Energy territory the kit was adjusted to reflect that decision, lowering the cost of the non-Duke territory kit and the energy savings that could be achieved. This change is consistent with Duke Energy's goal to standardize all programs to maximize design and implementation efficiency and cost effectiveness. TecMarket Works agrees that it makes little sense to spend money to achieve save energy in a home from which the savings cannot be claimed. However, Duke Energy and the Ohio Collaborative need to work with the Commission to acknowledge that energy efficiency ultimately benefits the entire state. If the Commission agrees that education on energy efficiency is an important objective, then savings from schools operating in multiple utility service territories need to be acknowledged in some fashion. The issue of territorial boundaries between neighboring utilities should not be the major barrier.

The program is marketed to the schools and teachers by the state program coordinators. In first year of the program, there were two coordinators for North Carolina, and one each for Ohio and South Carolina. For the second year, there will only be one coordinator for the state of North Carolina. These coordinators have a wide range of responsibilities, including holding informational meetings with administrators, curriculum supervisors, and instructional specialists. They also provide teacher training on energy efficiency and conduct school assemblies and other outreach events for students.

The program includes incentives designed to increase both teacher and student participation. Teachers can receive 15 free classroom books when five or more of their students return the surveys. Teachers were also given an opportunity to win a trip to New York City. However, the teacher interviews indicate that the New York trip was not a good incentive for many teachers because the chance of winning is perceived to be low and not everyone valued a trip to New York. An incentive needs to be attractive to the teachers for it to function as an action inducer.

When students return the home audit survey, their family receives an Energy Efficiency Starter Kit containing a number of low-cost energy efficient measures. In addition to receiving the Energy Efficiency Starter Kit, students who return the surveys are also eligible to participate in a drawing for another incentive. In the first year, this additional survey return incentive was a MacBook Pro laptop computer. In the second year, this survey return incentive will be an Apple iPad.

Included in each Energy Efficient Starter Kit is the household's Personalized Energy Report (PER) and a business reply card (BRC) on which the students are asked to indicate how well they liked each measure and whether they installed the measure. To increase the BRC return rates, students are told that they would be eligible for another incentive drawing. In the first program year, this BRC incentive was an iPod Classic. In the second program year, this incentive will be a Flip mini video camera.

The state program coordinators have found during the first year that the most effective way to market the program was through in-person presentations to the schools. Coordinators report that survey return rates were highest in these schools. The student presentations last approximately 45 minutes, and one program coordinator reports that these presentations are a treat for the students because *"a lot of schools don't have money for bells and whistles"*. Because electricity is not in the 4th grade curriculum, the state coordinator work to tie the topic of energy efficiency to whatever subject matter the students are currently studying. As an example, if the students are studying plants, one coordinator included a presentation of how plant matter is transformed into coal, which is then used to power electric plants.

"I'm getting kids powered up to help their families save money. I'm a good will ambassador, speaking to 200 kids at a time. Everybody walks away feeling good about Duke Energy and Scholastic."

Energy Efficiency Starter Kits

Once the surveys returned, Duke Energy sends a list of customers to Niagara Conservation for fulfillment of the Energy Efficiency Starter Kits. Niagara Conservation is responsible for shipping the kits to the student families and uploading the fulfillment data into Duke Energy's participation database. It is this database that is filed with the regulatory commission.

Duke Energy and Niagara Conservation determined the components of the kit collaboratively. The measures in the kit needed to be easy for the homeowner to understand and to install. They needed to be low cost, simple to use, and useful to the homeowner. The components of the kit are the same for all three states.

Each kit includes:

- 2 CFLs: 1 13-watt, 1 20-watt
 - Or 8 CFLs: 4 13-watt, 4 20-watt
- Efficient showerhead
- 3 low flow aerators
- Weather stripping
- Educational materials
- Personalized Energy Survey report
- Business reply card (BRC)
- Bag for testing water flow
- Outlet and light switch insulators
- Refrigerator magnet

- Night light
- Light-up ring for kids

The fulfillment process seems to be running smoothly; none of the Energy Efficiency Education Program staff have mentioned any issues about the fulfillment of the kits. Typical comments received during the interview were, *"Everything is working well; every step is working well."* Niagara also receives and tracks customer calls in regards to the kit and report that there are very few calls for this program. Customers call when the occasional item is broken, and a replacement is sent out immediately. Other times, customers call in order to find out where they can obtain more of certain kit components. Niagara reports, *"People generally like the materials that we send out."* All the calls are tracked and reported to Duke Energy on a regular basis. The Duke Energy program manager reports that the program team members are *"always looking for things to add or remove from the kit"*.

Surveys

The adapted PER survey itself was perceived to be one of the biggest barriers to participation in the first year for two reasons: 1) the survey was long and some questions required additional research by the homeowner, and 2) the survey asked for the last four digits of the customer's social security number. At the time of this evaluation, both problems had been resolved and the solutions are described below.

The survey was taken from another Duke Energy program, the Personalized Energy Report (PER) program. That program is targeted to adult homeowners who may have been already interested in energy efficiency. There are a number of differences between PER decision-makers and EE Education Program decision-makers. PER customers are more likely to be self-selected and be more open to adopting energy efficiency measures and recommendations. EE Education Program decision-makers are parents whose priority toward energy efficiency is unknown. They may be less receptive to energy efficiency recommendations than the PER customers. This means that their interest in EE perhaps should have been piqued prior to asking them to fill out a 30 question survey that contained detailed questions about their household characteristics. Even though the process of completing the survey was intended as a family activity, in many cases the students attempted to respond by themselves. For example, one question asked what kind of fuel was used in the home heater. Students did not understand this question.

The Duke Energy program manager and the Scholastic coordinators together have identified a number of improvements to be made to the survey for the second year of the Energy Efficiency Education Program. The new survey is designed by Scholastic to be less overwhelming than the 30-question survey, and to have a more educational look and feel that was appropriate for the target customer segment. From a messaging perspective, the Duke Energy program manager thought that interspersing the detailed questions of the PER survey with grade school cartoons may have confused customers. Surveys will be simpler, consisting of only six questions, each tied into an educational learning point that was emphasized in the lessons. The new survey will also have questions in English on one side and Spanish on the other.²

² In the first year, a Spanish version of the 30-question survey was available online.

Duke Energy's home energy survey asked for both the customer account number and the last four digits of the customer's social security number for verification. In most school systems, however, social security numbers are not allowed to be used as IDs. One administrator expressly forbade the teachers to hand out the surveys because it asked for the social security number. After many discussions with Duke Energy, the teachers were allowed to tell students to cross the social security number request off the survey.

Duke Energy receives all the paper and online surveys after which a third party vendor enters the information into a survey response tracking database. The data from the surveys are then passed on to Scholastic on a weekly basis. Scholastic is responsible for maintaining a composite of the data, parsing out activity by school. Scholastic also reviews the data to make sure that multiple teacher surveys are reconciled in the cases when minor variations in spelling are treated as separate records. This has posed a slight problem, as teachers cannot receive their 15 book incentive if the returned surveys are recorded under different spellings of their name prohibiting a grouping of surveys for specific teachers. This problem is being addressed by changing the way information is put into the database so that surveys can be better linked to a specific teacher regardless of spelling errors or incomplete data³.

Business Reply Card (BRC)

The business reply card contains nine questions asking whether the family like the measure and whether they intend to install them. The program coordinators, however, felt that the BRC, on which saving calculations are based are often overlooked in the kit. *"[It's] not shocking that a piece of paper in box of goodies is not returned."* Duke Energy and Scholastic have already taken actions to address this problem and Scholastic has been asked to redesign the card so that it will stand out. The newly redesigned card is in a bright pink color, shaded from dark pink to light pink so that it will stand out and increase the response rate.

Scholastic's service contract includes targets for number of returned surveys and number of returned business reply cards (BRCs). The target number of surveys differs from state to state. Per Scholastic's contract with Duke Energy, Scholastic is expected to deliver a BRC return rate of two out of ten distributed, or 20% of the total sent out in the Energy Efficiency Kits. There is some confusion on the part of Scholastic's managers about the way the BRCs are used in determining program achievements. More than one interviewee believed that only those measures that were reported on the BRC as being installed are counted toward the energy savings. Based upon that belief, they thought that the program's energy savings were grossly under-reported because they were sure that more kits were being used than the raw number of returned BRCs would indicate. However, this is not the case. Savings are credited to the program as a function of the typical per-participant installs as predicted by the surveys that are returned. Another interviewee believed that the target of returning 20% of BRCs was an unreasonably high target and should be replaced by another indicator of actual measures installed. TecMarket Works disagrees and suggests that the goal be no less than 20%. Response rates lower than 20% will require adjusting savings projections to factor in larger reductions of savings estimates to offset self-selection bias. The higher the response rates, the more confident we are that the savings projections are accurate. If the teachers can assign the survey and BRC as

³ The program staff report that for the second program year, a new vendor has been chosen to input survey data into the database.

homework, and they can be given feedback about which of their students did or did not return those two short surveys, TecMarket Works does not see why survey and BRC return rates could reach 50% of participating students.

First Year Challenges

The program is not meeting its stated goals. One person interviewed believed it was because the program needed time to get buy-in at the district level, so that greater access could be gained as opposed to approaching schools individually.⁴ Once district-level approval was obtained, the schools become much more receptive to the EE Education Program's marketing and outreach efforts. While the time it took to develop this strategy may indeed have been a major factor in the program's lack of early goal achievements, the program also has faced a number of issues that are not uncommon to new programs. The EE Education Program in Ohio, for example, received regulatory approval in January of 2009 and was launched in March of 2009. Unfortunately, the launch date coincided with the annual state standardized testing period, which diverted many schools' attention and made program marketing efforts more difficult. One interviewee reported that another glitch occurred during the beginning of the program, when a large number of surveys accumulated in Duke Energy's mail room because no one there knew where to deliver them. Once the surveys were routed correctly, Scholastic was able to use survey return rates to measure the effectiveness of their different marketing approaches.

Overcoming Barriers

The Energy Efficiency Education Program was designed to anticipate known barriers to participation. For teachers, the turnkey lesson materials were offered as a solution if the teachers *"didn't want another paper to grade."* Program coordinators also suggested to teachers that they use the surveys as extra credit homework, or that the survey participation rates could be presented as a game to reach 100% participation.

Program coordinators are always searching for ways to improve participation. Teachers were invited to brainstorm ways to increase student participation and share those ideas. For example, one teacher shared the success she had when she *"included a personal note to the parents with the surveys that were sent home"*. The program coordinators took that idea and created templates of notes that could be adapted by other teachers if they also wished to send personalized notes home with their students.

There are also a number of barriers to parent participation. The program coordinators are aware that there are too many demands on parents' attention, to the extent that parents regularly do not sign and return even critical documents such as their children's report cards. To try to help students get their parents' attention, one program coordinator devised scenarios for the school presentations and coached the students: *"When your parents ask you what is this, don't say 'I don't know...' say 'This is awesome! If you fill this out you get this cool kit!'"*

⁴ Participation rates did not seem to differ from state to state. When asked, none of the interviewees saw any evidence that suggested one state had a higher participation rate than another.

The barriers to parent participation severely impact the survey and BRC return rates. Currently these two items are the main metrics measuring program success. The Duke Energy program manager reports that while the team is still considering marketing to parents, they are wary of doing so because then the program becomes similar to other residential EE survey programs and *“diminishes the education objective”* because according to interviewees it *“just comes down to the survey itself”*.

Lessons Learned

Duke Energy and Scholastic believe that one of the main barriers to reaching the program goals in the first year was the difficulty of getting “buy in” from the schools. They have developed a new contact strategy that targets school districts and the schools in that district, instead of approaching schools individually. Scholastic’s long-standing reputation as a high quality educational resource to schools has also helped the coordinators to open doors that would not have been possible for an unknown company. One program coordinator was able to leverage her pre-existing network of educators to gain access to administrators at the district level, with great success. This access was critical because it allowed coordinators to use their most effective tool for motivating student participation: the school coordinator’s in-person presentation.

The program staff have now refined their entry-contact approach to the following three steps.

1. Approach top-level school administrators first, to gain their approval
2. Provide information about program to curriculum administrators and teachers
3. Make an in-person presentation to the students.

Another lesson learned by the Energy Efficiency Education Program was that in a few cases they really needed Duke Energy to help gain access to the district-level administrators. For example, one program coordinator, after months of resistance from a school district, finally was able to contact a Duke Energy Business Relations Manager (BRM) who immediately was able to procure permission from the school district. At the start of the program coordinators were asked not to contact BRMs until they received permission for that contact. A program coordinator reported they did not receive this permission until Sept 2009, months after the request for permission. The program coordinators suggest that the program would run more cost-effectively if Duke Energy could ask the BRMs to meet with program coordinators and make sure they are aware of the EE Education program. Duke Energy has also established a respected role as a supporter of education through the Duke Energy Foundation. The relationships established through the Duke Energy Foundation might also provide opportunities to gain entry to school districts.

Second Year Changes

The program team agrees that the biggest improvement that could be made to the program has already been addressed, in the redesign of the survey itself.

In an effort to make the program more cost effective, the program management team decided to use lower-cost incentives for the return of the surveys and the business reply cards. This enabled them to hold drawings more frequently, allowing the program managers to advertise the EE Education Program more frequently when they announce the drawing winners.

Program Growth

Any program's first year's start-up and launch costs are higher than steady-state operational costs when compared to the energy savings achieved. In the first year the Energy Efficiency Education program needed to develop a new curriculum and needed to gain entry to school districts at the administrator level. In the second year of program operation, the state coordinators expect to reap some of the benefits of the groundwork that they have laid during the first year. The coordinators expect more teachers to participate the second year per dollar of recruiting efforts, reducing total cost per school and cost per unit of energy saved:

"In the past year we had the teachers who were adventurous and" explorer" types pick up the kit. We're going to have more of the [mainstream] teachers this year, with the administrative support and teacher training that we're setting up. We're getting to the bell curve."

The coordinators have had more lead time during which to introduce the lesson materials to the teachers.

"When you drop it to them in the fall, they don't know how to use it, even though it bears the Scholastic brand, which has been used in schools forever. It's not like they were skeptical, it was just not seen across the board."

In general, the coordinators have had more time to coordination with school events. The coordinators are currently getting ready for a marketing push in October to coincide with Energy Awareness Month. The coordinators have had more time to arrange their efforts to match the timing for the teacher in-service training workshops that are held at the start of each school year. By having more time to prepare, coordinators can schedule their school presentations early, making it easier to get scheduled on the school and teacher calendars.

While the program has gained significant foothold in the first year, one coordinator expressed caution: noting that the program is still laying groundwork in many areas and reported that midstream changes to the program affect the program's credibility. The coordinator gave as an example the disappointed schools she faced when the Kindergarten through First Grade EE Education program planned for year 2 was scaled down from full implementation to a limited pilot program. *"All our people were selling the [K through 1st] program, now we have to go back and say, oops it's not going to happen...So many people are trying to use the school venue to deliver their message. Once you get in there, it's very important to proceed cautiously and professionally and not switch up the game once you're in there."* This person noted that it is important to give the program time to work before changes are made that conflict with the descriptions given to teachers and administrators. This person notes that school support can erode if commitments are abandoned by the program.

In the interviews, all of the state coordinators identified one area of improvement that would they report will have the biggest impact on program participation: the use of mass marketing techniques such as news releases, radio, TV and billboard advertisements. They report that Duke Energy has expressed concerns about who is exposed to program marketing information, especially in areas where that information could be seen by non-Duke Energy customers, and

has directed Scholastic to market only to 3rd and 4th graders in Duke Energy's service territory. According to the interviewees, this rules out the use of mass media marketing efforts, even in regions where Duke Energy is the primary electric utility. However, because Duke Energy does frequently serve regions that neighbor other utilities' service territories, there may be sensitivities to marketing programs offered by one utility but not by another. For example, neighboring utilities that do not offer a school energy program with free energy efficiency kits may be negatively compared to Duke. Duke Energy may wish to share their specific marketing concerns with the state program coordinators. It would help them better understand reasons behind the marketing restrictions. The interviews report that they are frustrated by the high degree of lost marketing opportunities that have direct impact upon Scholastic's contractual service objectives and obligations.

The program coordinators are Duke Energy's main points of contact with the customers. These coordinators are able to provide feedback that Duke Energy would otherwise never receive. The coordinators have already demonstrated innovative solutions to addressing program barriers. The coordinators may similarly be able to provide innovative solutions to the mass marketing restriction once the parameters of the restriction are fully understood.

Program Metrics

Duke Energy and Scholastic use multiple metrics for tracking the EE Education program achievements. One metric is the survey return rate as measured against projections made at the beginning of the program year. Another metric is the business reply card return rate, measured against projections. Yet another is the number of measures reported on the BRC. The ultimate objective is to demonstrate that customers installed the measures and thus achieved energy savings. Without substantial installations, the program cannot hope to be cost effective.

The survey return rate is tracked on a weekly basis and allows the program coordinators to receive immediate feedback about how effective their past week's presentations have been. The BRC return rate is also tracked on a weekly basis, but the interviewees have inaccurate information regarding how the BRCs are used.

The Duke Energy program manager reports that the energy savings credited to the program are estimated by sampling and tallying measures reported on the returned BRCS. Scholastic has been contracted to achieve a return of 20% of the BRCs sent out. However, it is not clear to some of the interviewees whether the primary metric of program success is the BRC return rate itself or the energy savings attributed to the program. This has led to some concern by Scholastic about how program success is measured. While the program coordinators can work to influence the students, the survey return rate is one step removed from the program coordinator's efforts and parental involvement which is hard to obtain, is usually required. Because the number of BRCs returned is contingent upon the number of surveys returned, the program team has even less influence over each the BRC return rate. Some of the program coordinators believe that the program's energy savings are determined solely by the number of measures reported on the BRCs, and that if the BRCs are not returned, no energy savings would be counted from that household. This misunderstanding has led to some unnecessary stress on the part of the program coordinators: *"I feel strongly that the kits are being used, even if the BRC is not returned."*

The program staff have been struggling to find other ways to capture the number of energy measures the families actually installed and have made some suggestions to Duke Energy's management. One suggestion is to have an online carbon calculator where students and families could enter the measures they installed and get instant feedback on how much energy or carbon is saved. This would also provide an alternate and highly automated way to convey that information to Duke Energy in addition to the BRC if there is a way to rule out false entries as students consider what-if scenarios to see what the savings would be under installation conditions not yet taken.

Most energy efficiency programs try to provide additional verification of the measures installed, without relying solely on customer self reports. Other ongoing evaluation studies for Duke Energy are finding that on-site examinations found both over- and under-reported installs. That is, some measures reported as installed were actually missing, but some measures had been installed that were not reported. In order to adjust savings for this condition it would be necessary to conduct on-site in-home examinations to confirm or adjust reported installation rates.

It is also important to identify good metrics for evaluating the achievements of the EE Education program's second year. The second year is usually the period in which the benefits of the startup efforts will come to fruition. Because the second year program was scaled down, one of the main first-year activities (the coordinator outreach activities that have been unanimously identified by interviewees as a driver of success,) is critical to be compared against the same standard applied during the first year's achievements. The program management team may already be considering these issues. Because it is difficult to identify a single best metric, the program management may wish to calculate several success metrics and see how well they predict actual success (energy savings). For example, if the program managers are expecting a higher survey return rate in the second year, they may choose to calculate BRC and survey return rate in the first and second years as a function of 1) number of school presentations, 2) number of students who attend the presentations 3) perceived value of the second year incentives versus the perceived value of the first year incentives, 4) number of districts that approve the lesson materials, etc. This diverse toolkit of metrics will also enable Scholastic and Duke Energy to track which components of the program delivery process are most effective, as well as to identify any components that might be improved.

The difficulty in finding appropriate metrics is due in part to the fact that there are several links in the causal chain leading from program activity to BRC response. The program coordinators believe that the program's activities are planting seeds of action for the future generation of decision makers. Unfortunately, the cost-benefit discount rate calculation requirements established by the regulatory agency of Ohio does not currently allow for counting the value of potential future energy savings. Duke Energy may wish to have their evaluation contactor conduct spillover surveys to gauge both student and family interest in other measures and actions over the post program participation period to see if there are additional savings not counted in the current approach.

Program Successes

The program has had many hard-earned successes and in the interviews the program team members shared their thoughts on what the program's greatest achievements have been, in their own words.

The curriculum is well received by the teachers and is perceived as providing a valuable addition to the school's curriculum:

"From an educational point of view, [the lessons] are very well set up. Teachers really like the lessons and activity sheets; they fit well"

"Really is a solid curriculum. [It] fits nicely and is very turnkey for teachers to implement. It's in accordance with individual state standards. [Teachers can see] it's legitimate and can use it and see value with it right away."

"Even though everything is about going green, it hasn't been taught heavily in school system."

"K12 program is being adopted as part of the school strategic plan in Guilford and Charlotte-Mecklenburg districts"

The program coordinators have identified an effective three-step strategy for gaining access to classrooms and teachers

"Being more strategic in our efforts. We have been able to get district-wide adoption. Our strategic approach is a bit more advanced and that will serve us well going forth."

"Doing well creating network at the administrator level. We're getting good respect for what we're trying to do, getting the message out."

The program team members are passionate about the program's methods and objectives, and are able to relay that enthusiasm to the students and teachers.

"I'm very passionate about this, I'm very committed to making teachers find this interesting and relevant."

"I think it's wonderful that thanks to Duke, students are able to get these free presentations and that families are able to get these tools to save energy...that energy efficiency is in the mailbox and on the radar of every 3rd and 4th grade teacher. It needs to be on the radar of every American but you have to start somewhere."

"I think it's one of the most important things they're doing and I think they should keep doing it."

Summary

In summary, the Energy Efficiency Education Program faced and overcame a number of challenges that are not unusual for a new program's first year of operations. These startup costs have been paid, and the result is that the program has learned valuable lessons that have enabled them to improve the second year's operations. Access to classrooms is critical and the EE Education Program has made significant inroads into the school districts and created a network of schools that have had successes offering the lesson materials to their students. The program team has determined an effective top-down strategy with which to approach new school districts. The survey is a second critical component of the program, as it is the point of access into the families. The program team has successfully targeted student and family concerns with the PER survey and redesigned a new survey to address those concerns.

"The coordinators have a year of knowing what does work and what doesn't. They're now doing the presentations that they know works best."

In the second year, these lessons learned are expected to pay off in more cost-effective program operations and higher participation rates per survey sent out. The program itself is gaining momentum among the educational community.

"I think that the program is on the cusp of taking off. There are a lot of things that are play...awareness is starting to spread."

There will certainly be more challenges in the second year. The in-depth interviews found that the Duke Energy and Scholastic team members have a successful working relationship that allows Scholastic program coordinators to innovate solutions to barriers that they are able to see day to day. The ability to respond to quickly and flexibly value be one of the program's most valuable assets in resolving any future challenges.

Results from the Interviews with the Teachers

The Interviewed Teachers

Ten out of sixty-three grade school teachers for which we had contact information and were willing to be interviewed about their experience with and use of the Get Energy Smart program were interviewed. Six of the teachers identified themselves as science teachers, and all ten teach elementary school children in grades 1-5 and utilized the Get Energy Smart curriculum. Three teachers had also taught Duke Energy and Scholastic's Get Energy Smart program in the 2008-2009 school year.

Program Objectives

All ten teachers surveyed agreed with and supported the program's objectives. However, only three of the teachers interviewed identified the program objective of cost-effective energy savings. Seven of the teachers interviewed were not presented with the program objective of cost-effective energy savings or if they were, they did not fully understand these objectives well.

Every teacher surveyed identified the program's objectives as teaching children to conserve energy and natural resources. Eight of the teachers identified the program's lessons as going further than the student and informing the students' parents about energy-saving opportunities. Five of the teachers (half) indicated that the objective was to get students and parents to use the energy efficiency actions and three mentioned the program objective of cost-effective net energy savings specifically. One of the teachers had participated in the Get Energy Smart program previously and two had not.

The objectives of the program and the reason the program is funded by Duke Energy is first and foremost to cost-effectively reduce energy consumption in the homes of the students. This goal is to be reached via the educational components of the program. All interviewed teachers expressed an opinion that the primary goals of the program were educational rather than achieving cost effective energy resources. Five teachers indicated that they felt that Duke Energy's primary goal of energy-efficient savings or behavior was different than the teachers' goal of education, but all five also indicated that these goals were compatible. It is good that the teachers understand the importance of reaching the energy goals via the educational process, however the education is the route by which the program's goal are achieved. It is the education, if done in a way that results in high percentages of installed actions, that will lead to goal achievement. These are inseparable concepts. However, the program needs to focus on making sure the schoolteachers and administrators understand that the objective is energy savings, without cost effective energy savings, there can be no educational program unless a different success metric is adopted by the Commission for this program.. In addition, the program's management needs to be sensitive to the objectives of the teachers and focus on the education aspects of the program and not necessarily the program's goal of energy savings. Teachers should clearly understand that the success of the program and its continued operations is based not on the educational accomplishments of the program, but on the educational processes' ability to produce cost effective savings. Education without the corresponding savings is not indicative of a successful program for providing least cost energy supplies, the Commission's primary responsibility and the reason for the program.

Program Timing

Teachers who have a more flexible curriculum and greater autonomy in their classroom found the program to be useful within their established curriculum, however, those without a flexible curriculum found the Get Energy Smart Program difficult to integrate into the state's certified curriculum. Two teachers noted that even though the program met state academic standards, replacing another piece of curriculum with Get Energy Smart programs still took extra planning and administration approval.

Definition of Success

Three of the teachers defined program success as having students become aware of energy-saving strategies in their home, and seven teachers said that having students actually use those strategies in real life would define success. Of those seven teachers, three indicated that they thought that Duke Energy's definition would differ from their own and that Duke Energy's definition would include measurable net savings. All teachers said they thought the school administration would view success in the same way as the teachers, i.e. the success of the educational efforts in teaching energy efficiency and related issue.

Communication Between Teachers and Parents

Most communication between teachers and parents is achieved through the students. Teachers who collected the completed surveys from students reported a high rate of participation from the parents in filling out the survey. Two teachers offered an incentive such as candy or gum to students to return the completed surveys and then sent them out themselves.

Communication Between Teachers and Program Administration

Two of the ten teachers reported that they had no or very little interaction with the program's administrator. Three teachers received the program materials from the program's administrative manager, and five others attended a presentation at the school provided by the program administrator. The three teachers that received the program materials directly from the program administrator reported that they had had some level of discussions about the program and the program's goals and procedures with the program administrator. The number of teachers reporting interactions has increased year over year from one to three, however this finding is from a sample size of 10 teachers who are self-selected interviewees.

There is still a need to increase the level of interaction between the program's administrator and the teachers responsible for program delivery so that the goals of the program can be shared with the teachers and to obtain stronger support for those goals and to push for a stronger focus on installations and card returns or other approaches for gaining installation information.

Communication Between Teachers and Duke Energy

Communication between Duke Energy and the teachers is minimal. Five teachers attended program presentations at their school in which Duke Energy representatives were in attendance. However, none of the others had contact with Duke Energy staff prior to or during the program. All ten of the teachers indicated that the program's objectives and activities were easily understood from the materials provided and no extra training or interaction was needed, however, as noted earlier, this exchange was not completely effective at communicating the program's primary goal to the teachers. Three teachers indicated that more communication from

Duke Energy may increase teacher participation levels. However, it is not clear that presentations by Duke Energy staff will have an effect on teacher support or participation, or be more effective at causing teachers to better understand the program's goals. What is clear is that there is a need to better communicate the programs goals to the teachers so that the goal may be more effectively addressed by the teachers. This may be effectively accomplished via the program administrator who is most in contact with the school administrators and teachers.

Participation Levels from Teachers

The interviewed teachers had several suggestions to increase the participation levels. More direct communication with teachers beforehand from the program administrator or the Duke Energy program manager with the school administrators and teachers was the most commonly cited suggestion from the interviewed teachers for ideas that would increase participation. The amount of time available to the teachers for the program's educational message was cited four times as an impediment to teacher participation. All four teachers said that administrative approval and integration of the curriculum would be the best way to remove this impediment.

Eight of the teachers interviewed thought the teacher incentives had a positive effect on participation. Several teachers mentioned that a more flexible classroom incentive in addition to the Scholastic books would be welcome and help increase participation even more. Five of the teachers (50%) said they would be excited by a trip to New York City but did not believe their chances of winning were high enough to influence participation. The other 50% did not indicate that a trip to New York would be something that they would value.

Other suggestions provided by the teachers included:

- *Increase the level of educational and results-related program promotions (flyers, brochures, school examples, etc.) provided to the teachers and school administrators in time to be effectively used.*
- *Update the program materials to today's standards by adding a multi-media element such as a DVD video or online class activities.*
- *Develop and incorporate a day-to-day educational/activities planner to stretch the impact of the activities out over several days*
- *Add a more flexible incentive for teachers to make the effort worthwhile to the teachers who are responsible for success; the incentive can be cash for the class, class activities, or credits for class supplies or other incentives valued by teachers*
- *Redesign the website to make it more user-friendly for students and teachers.*

Participation from Families

Teachers were asked about ways to improve energy-saving behaviors in the student's homes as well as increase the installation and use rate of measures in the kits

Six of the ten teachers surveyed were employed at schools that had received presentations from the Duke Energy representative. All six reported that they were pleased with the added dimension the presentation provided to the program and the enthusiasm it generated for the students.

During the interview, teachers were asked for their ideas that would lead to increased savings through higher measure installation levels and increased application of energy efficient behaviors. The teachers provided the following suggestions:

- *Add more online content for students to access at home that would focus on increasing key behaviors and measure installations.*
- *Develop a simple game for the students to play with their family that would reinforce the behaviors needed and the installation of measures. Distribute it with the kit.*
- *Develop a song that students can sing in the class or at home that sends a behavior and use message.*
- *Develop a downloadable application for smartphones that parents and children could use together to track their savings.*
- *Include a component in which the students write a report of the use of the kit items and have the program incent the report to make it attractive to students and teachers.*

What Works Well

All ten interviewed teachers said that they enjoyed the program and considered it to be successful. Teachers were asked what worked well about the program and what attracted them to it. The most common response was the inclusion of the CFL and other materials for the students to see.

Responses also included:

- *"The program materials were very eye-catching and got my interest right away."*
- *"The programs materials were all put together and ready to go."*
- *"The lesson plan was just about the right length and ability-level for our class."*
- *"We found we could tie the lessons in with several subjects. We used math to calculate energy savings over a period of time and also talked about energy's relationship to natural resources in science class."*
- *"The packet of materials was great. Children love being able to touch and hold things."*
- *"The lessons were brought down to the right level for my class, and "The Magic School Bus" holds a high level of interest for children."*
- *"One of my favorite parts was passing the program materials out to the kids and seeing their faces light up. It was a really good thing for me to see."*
- *The prepaid envelopes were great. We didn't have those last year and I think it made a real difference.*

Areas for Potential Improvements

Most responses for improving the program dealt with the design and layout of the activity sheets, adding more multimedia, and associating the lessons more directly with "The Magic School Bus" and the state standards. Three teachers indicated that adding a video component would be a way to improve the curriculum.

Responses included:

- *"The materials need to be designed specifically for the children who are to be exposed to them. The lines of type in some of the materials are still too small."*
- *"Make the materials more attractive by using pictures and figures."*
- *"Bring out the integration between the Magic School Bus story and the curriculum's focus and the program's objectives so that they directly support each other."*
- *"Add more multimedia elements – online, songs, videos, presentations." "Need to more effectively structure the program's focus and materials so that it integrates smoothly with the school curriculum that we must follow as well as state standards."*

Student Family Survey Results: Duke Energy Customers

Surveys were sent to 377 K12 participant families that live in Duke Energy's territory in Ohio. Ohio families returned a total of 126 surveys. The responses to the surveys are provided below.

Use of the K12 Kit's Measures

CFLs

The CFLs included in the K12 kit were installed by a high percent of recipients. Over 92% of the recipients installed the 13-watt CFL. Table 2 below shows a summary of the responses to the questions about the 13-watt CFL. Most of the kit recipients replaced a 45-70-watt bulb with the 13-watt CFL, and the replacement was done on lights that were used 3-4 hours per day on average. The same information can be found in Table 3 for the 20-watt CFL.

Table 2. Frequency of Installation: 13-watt CFL

	Ohio Kits (n)	Ohio Kits (%)
Installed 13w bulb		
Yes	117	92.9%
No	8	6.3%
Don't Know/Blank	1	0.8%
Wattage of bulb removed		
Less than 44w	1	0.9%
45-70w	81	71.7%
71-99w	23	20.4%
Greater than 100w	8	7.1%
Hours of use per day		
<1	4	3.5%
1-2	31	27.2%
3-4	45	39.5%
5-10	31	27.2%
11-12	2	1.8%
13-24	1	0.9%

Table 3. Frequency of Installation: 20-watt CFL

	Ohio Kits (n)	Ohio Kits (%)
Installed 20w bulb		
Yes	106	84.1%
No	17	13.5%
Don't Know/Blank	3	2.4%
Wattage of bulb removed		
Less than 44w	3	2.9%
45-70w	57	54.3%
71-99w	32	30.5%
Greater than 100w	13	12.4%
Hours of use per day		
<1	7	7.3%
1-2	22	22.9%
3-4	44	45.8%
5-10	18	18.8%
11-12	4	4.2%
13-24	1	1.0%

Four respondents that did not receive the additional six CFLs (4.8%)⁵ indicated that they removed at least one of the CFLs because they had burned out or the bulb wasn't working properly.

Thirty-nine (48%) of the respondents that did not receive the additional six CFLs have purchased additional CFLs since receiving the kit, with those respondents indicating that they have purchased an additional 6.1 CFLs per household. One person who did not previously have any CFLs installed noted that every socket in their household now has a CFL installed. Another person reported that they have replaced 12 bulbs with CFLs, and also removed six 100-watt bulbs and replaced those with six 45-watt bulbs.

Previous Use of CFLs

Seventy-eight of the respondents (61.9%) indicated that they had at least one CFL installed in their homes previous to receiving the K12 kit. These families report that they have from one to over 40 CFLs installed in their homes, with the average reported number of CFLs being previously installed being 7.1 CFLs per home.

Twenty-six of the respondents (20.6%) indicated that they were not planning on purchasing CFLs before receiving the kit, and thirty-three were possibly planning on buying CFLs. Fifty-seven of them (45%) indicated that they did plan on purchasing CFLs, and three indicated that they had already installed CFLs in all of their household's sockets.

Low-Flow Showerhead

A sizable percentage of the kit recipients (58.7%) said that they had installed the low-flow showerhead. All but one respondent that installed it indicated that the showerhead was easy to install. Of those that didn't install it, eight said it was not easy to install.

Table 4. Frequency of Installation: Low-Flow Showerhead

	Ohio Kits (n)	Ohio Kits (%)
Installed low-flow showerhead		
Yes	74	58.7%
No	51	40.5%
Don't Know/Blank	1	0.8%
Showers Taken Per Week (n=74)		
0-4	2	2.7%
5-10	22	29.7%
11-15	17	23.0%
16-20	16	21.6%
21+	17	23.0%
Flow of Water after install (n=72)		
Less than old showerhead	37	51.4%
About the same	29	40.3%
More than old showerhead	6	8.3%
Used the teflon tape (n=70)		
Yes	56	80.0%
No	14	20.0%

⁵ Results for the extra CFLs are reported separately in the section "Additional CFL Kit".

Previous Use of Showerheads

Eighty of the respondents (63.5%) indicated that they did not have a low-flow showerhead installed in their home before receiving the K12 kit.

Seventy-eight of the respondents (61.9%) indicated that they were not planning on purchasing any low-flow showerheads before receiving the kit, and sixteen were possibly planning on buying one or more. Twelve of them (9.5%) indicated that they did plan on purchasing low-flow showerheads, and six indicated that they had already installed low-flow showerheads in all of their household's showers. Seven respondents indicated that they have purchased additional low-flow showerheads.

Faucet Aerators

The customers were less likely to install the faucet aerators included in the K12 kit. Close to half of the kit recipients installed either or both of the aerators.

Nine respondents indicated why they did not install one or both of the aerators:

- "I only received one aerator." (n=3)
- "Aerators did not fit." (n=3)
- "I did not think that it would be beneficial."
- "I could not get the old aerators off when I tried to install the new ones."
- "The kitchen aerator leaked and was not functional and hung too low."

Table 5. Frequency of Installation: Bathroom Faucet Aerator

	Ohio Kits (n)	Ohio Kits (%)
Installed the bathroom aerator		
Yes	53	42.7%
No	65	52.4%
Don't Know/Blank	8	6.5%
Aerator already installed		
Yes	9	17.3%
No	43	82.7%
Don't Know		
Estimate of water flow		
Less than the old unit	25	62.5%
About the same as the old unit	11	27.5%
More than the old unit	4	10.0%

Everyone that installed it indicated that the bathroom faucet aerator was easy to install. Of those that didn't install it, two said it was not easy to install.

Table 6. Frequency of Installation: Kitchen Faucet Aerator

	Ohio Kits (n)	Ohio Kits (%)
Installed the kitchen aerator		
Yes	58	46.0%
No	61	48.4%
Don't Know/Blank	7	5.6%

Aerator already installed (n=62)		
Yes	48	77.4%
No	14	22.6%
Don't Know	0	0.0%
Estimate of water flow		
Less than the old unit	25	52.1%
About the same as the old unit	17	35.4%
More than the old unit	6	12.5%

Everyone that installed it indicated that the kitchen faucet aerator was easy to install. Of those that didn't install it, three said it was not easy to install.

Previous Use of Faucet Aerators

Seventy-six of the respondents (63%) indicated that they did not have any faucet aerators installed in their home before receiving the K12 kit.

Ninety-six of the respondents (82.8%) indicated that they were not planning on purchasing any faucet aerators before receiving the kit, and thirteen were possibly planning on buying one or more. Five of them (4.3%) indicated that they did plan on purchasing faucet aerators. Three respondents indicated that they have purchased additional (one, three, and four) faucet aerators.

Outlet and Switch Gaskets

About four out of ten of the recipients installed the outlet and switch gaskets. The kit provided 12 gaskets in total, but unfortunately many of them were installed on interior walls where they do not provide any energy savings.

Table 7. Frequency of Installation: Outlet Gaskets

	Ohio Kits (n)	Ohio Kits (%)
Installed the gaskets		
Yes	57	45.2%
No	65	51.6%
Don't Know	4	3.2%
Number installed interior wall		
1-2	17	19.5%
3-5	16	18.3%
6-8	2	2.3%
9-12	2	2.3%
Don't Know	4	4.6%
Number installed exterior wall		
1-2	11	12.6%
3-5	9	10.3%
6-8	14	16.1%
9-12	7	8.0%
Don't Know	5	5.7%

Previous Use of Gaskets

Ninety-four of the respondents (77%) indicated that they did not have any gaskets installed in their home before receiving the K12 kit.

Eighty-three of the respondents (69.7%) indicated that they were not planning on purchasing any gaskets before receiving the kit, and ten were possibly planning some. Thirteen of them (10.9%) indicated that they did plan on purchasing additional gaskets. Six respondents indicated that they have purchased additional (mean = 10.7) gaskets.

Water Flow Meter Bag

Only about 17% of the recipients used the water flow meter bag. Only a small number of people decreased the rate of flow of their water after using the water flow meter bag.

Table 8. Frequency of Use: Water Flow Meter Bag

	Ohio Kits (n)	Ohio Kits (%)
Used the Water Meter Bag		
Yes	21	16.7%
No	101	80.2%
Don't Know	4	3.2%
Tested in Shower		Percent of Those Using the Item
Hot Water	4	19.0%
Cold Water	3	14.3%
Both	9	42.9%
Adjusted GPM down	3	14.3%
Tested in Kitchen		
Hot Water	2	9.5%
Cold Water	5	23.8%
Both	7	33.3%
Adjusted GPM down	4	19.0%
Tested in Bathroom		
Hot Water	2	9.5%
Cold Water	1	4.8%
Both	6	28.6%
Adjusted GPM down	2	9.5%
Tested in Utility Sink		
Hot Water	2	9.5%
Cold Water	1	4.8%
Both	2	9.5%
Adjusted GPM down	2	9.5%
Tested in Other Area		
Hot Water	1	4.8%
Cold Water	0	0.0%
Both	2	9.5%
Adjusted GPM down	2	9.5%

Water Temperature Gauge Card

About 44% of the recipients used the water temperature gauge card that was included with the kit. Of those that did use it, the most common temperature reading was 120 degrees. Two (3.5%) of those that used it had their water temperature set at 150 degrees or higher, and ten of them lowered the temperature setting on their water heater.

Table 9. Frequency of Use: Water Temperature Gauge Card

	Ohio Kits (n)	Ohio Kits (%)
Used the Water Temperature Card		
Yes	56	44.4%
No	57	45.2%
Don't Know	13	10.3%
Temperature Reading		Percent of Those Using the Item
120	32	57.1%
130	12	21.4%
140	8	14.3%
150+	2	3.6%
Adjusted Water Temperature		
Yes	10	17.9%
No	42	75.0%
Don't Know	2	3.6%

Temperature readings after adjustment for the ten respondents that adjusted their water temperature were:

- 120 (n=5)
- 130 (n=3)
- 140
- 150+

One respondent increased their water temperature from 120 to 130.

LED Night Light

The night light is a very popular item with 81% of survey respondents using it. However, only 51% of those using this item used it in place of another night light.

Table 10. Frequency of Use: LED Night Light

	Ohio Kits (n)	Ohio Kits (%)
Using the Night Light		
Yes	102	81.0%
No	19	15.0%
Don't Know	5	4.0%
Installed		
In a previously empty outlet	44	43.1%
Replaced another light	52	51.0%
Don't Know/Blank	6	5.9%

Magnet

Just over four out of ten of the recipients recalled receiving the magnet. Of the thirty-five people that indicated where they placed it, 86% indicated that the magnet is on their refrigerator or elsewhere in the kitchen.

Table 11. Frequency of Use: Magnet

	Ohio Kits (n)	Ohio Kits (%)
Recalls Receiving the Magnet		
Yes	53	42.0%
No	37	29.4%
Don't Know	36	28.6%
Placement of Magnet		
Refrigerator/Kitchen	30	85.7%
Cabinet	3	8.6%
Drawer/put away	1	2.9%
Trash	1	2.9%

Duke Energy Web Site

Survey respondents indicate that there is some confusion about mercury in CFLs. The majority of respondents (44.4%) report that they are not concerned about mercury in CFLs.

	Ohio Kits (n)	Ohio Kits (%)
Concerned About Mercury in CFLs		
Yes	33	26.2%
No	56	44.4%
Don't Know	33	26.2%
Blank	4	3.2%
Found Safe Handling Tips on Web		Percent of Those Going to Web Site
Yes	16	66.7%
No	6	25.0%
Don't Know	2	8.3%
Didn't Visit Site	105	83.3%

The sixteen respondents that did find the CFL safe handling tips were all satisfied with the information provided. Of those that were concerned about mercury, four read the tips on Duke Energy's web site and changed their opinion of CFLs, two did not, and the others were still unsure. One person said that reading the tips increased her awareness of the issue.

DOE Energy Savers Booklet

Four out of five respondents indicated that they read the booklet that was included in the kit, and many of them read it and discussed it with their families or plan to do so.

	Ohio Kits (n)	Ohio Kits (%)
Read the Booklet		
Yes	101	80.2%

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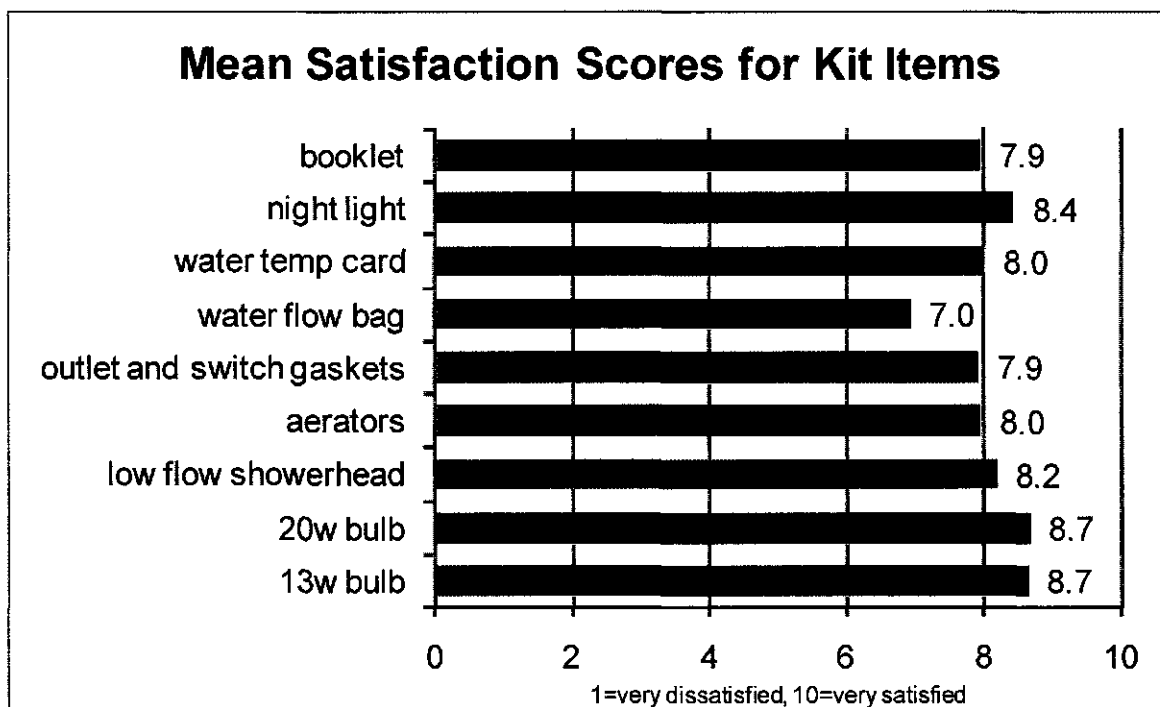
Evaluation Findings

No but will	23	18.3%
Don't Know	2	1.6%
Read the Booklet and Discussed with Family		
Yes	38	40.4%
No but will	41	43.6%
Don't Know	15	16.0%

Satisfaction with Kit Items

Respondents indicate a high level of satisfaction with the kit items. Mean satisfaction scores were highest (8.7 out of 10) with the CFLs and the night light.

	Count	Minimum Score	Maximum Score	Mean Score	Median Score
13-watt CFL	120	1	10	8.7	9
20-watt CFL	118	1	10	8.7	9
low flow showerhead	94	1	10	8.2	9
kitchen and bathroom aerators	90	2	10	8.0	8
switch and outlet gaskets	90	2	10	7.9	8
water flow meter bag	61	1	10	7.0	7
water temp card	75	2	10	8.0	8
night light	115	1	10	8.4	9
booklet	99	4	10	7.9	8



Respondents' General Comments

The survey provided an area for the respondents to add their thoughts about the program. Their comments are listed below:

- "Duke Energy provided us with light which helps us a lot. Thanks."
- "Enjoyed the items in the kit and installing them with our child."
- "Excellent program!"
- "Great service offered. Kids very involved."
- "Helps kids learn about saving money."
- "I already knew about the energy saving methods and was already doing everything and planning on doing more before receiving kit."
- "I believe this is a great effort. All of us should take more concern about our environment. Thank you Duke Energy for providing the information and resources to move this forward."
- "I like it because it saves me money."
- "I think this is a great program. It gets you to think about how to save money."
- "I thought this was a great idea. My daughter helped me install all the products and she learned a lot."
- "I want the aerators to pull down or have a valve for full flow. It takes way too long to fill up a coffee pot, dog bowl, etc."
- "It is great."
- "It was good to work on the lighting and find different ways to cut back on water."
- "It was helpful and very satisfying."
- "It was helpful. Thanks."
- "Some of the info was very useful, some I had already learned. Thanks for the free products."
- "Thank you, I cannot tell you how much we appreciate Duke Energy."
- "The booklet with box info has been useful for my house."
- "The kit really helped us to recognize areas that we needed to improve on to save more energy."
- "This is a really good program! Thanks for everything. I just recently moved into a house and I really look forward to trying some of these low-flow showerheads and CFL bulbs."
- "This was very informative program thanks so much for offering it. We have learned a lot."
- "Very good program."
- "Very happy with kit."
- "Very helpful! This country needs this!"
- "Very informative. I now buy the light bulbs because of this program."
- "Very useful items."
- "We already had a very energy efficient home. We did many of these activities when we first bought our home. We do ongoing checks."
- "Would like to have another kit since we are moving to a new place. Wish we would have never left the stuff at the old house."
- "I loved the equipment that was sent to me. I was made aware of ways to achieve energy savings. Thank you."
- "Liked the program very much."

- "Several of the items in the kit I couldn't use because they were male/female and my sinks or whatever were the opposite."
- "The chance for students to win an iPod if they completed the questionnaire was a very clever idea. This motivated my daughter to complete the survey and I think that she really learned from it."
- "I think that Duke takes such actions to inform and make our citizens be more energy efficient. Great. Also very much encourage this to be taken to schools for students to learn and for younger generations to apply."
- "Thanks for the great items."
- "Thanks for the information and the packet."
- "Excellent program, it should be useful to anyone interested in conserving energy."
- "It was a great educational tool for our family."
- "Great program."
- "Thanks. We were able to try these products without spending the money to do so."
- "We installed nearly all of the CFLs and aerators in our house but we are moving soon so we will use all of the items in the new house."
- "Good program, but some of the lights broke in transit. One caused a lamp to pop and catch fire."
- "Very informative, great information."
- "Great program, the kids loved it."
- "I gave the showerheads and aerators to someone at work to install."
- "Awesome program, I think it's great."
- "I think this program is a great idea. It really encourages people to try and save energy and their hard earned money."

Additional CFL Kit

Some of the student families received a kit containing eight CFLs instead of two. 133 surveys were sent to these families in the three states (OH, NC, SC), and Ohio families returned 44 surveys.

Survey respondents indicated that their satisfaction with the 13-watt CFLs was 8.9 on a scale of 1 to 10, with 1 meaning they were very dissatisfied and 10 meaning they were very satisfied. Respondents indicated that their satisfaction with the 20-watt CFLs was 9.0 on the same scale.

	Ohio CFL Kits (n)	Ohio CFL Kits (%)	Ohio CFL Kits (n)	Ohio CFL Kits (%)
Installed 13w bulb #1			Installed 13w bulb #2	
Yes	44	100.0%	42	95.5%
No	0	0.0%	2	4.5%
Don't Know/Blank	0	0.0%	0	0.0%
Wattage of bulb				

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Evaluation Findings

removed				
Less than 44w	1	2.3%	1	2.4%
45-70w	37	84.1%	36	85.7%
71-99w	5	11.4%	4	9.5%
Greater than 100w	1	2.3%	1	2.4%
Hours of use per day				
<1	2	4.5%	5	11.9%
1-2	16	36.4%	8	19.0%
3-4	15	34.1%	16	38.1%
5-10	10	22.7%	13	31.0%
11-12	1	2.3%	0	0.0%
13-24	0	0.0%	0	0.0%
Installed 13w bulb #3			Installed 13w bulb #4	
Yes	36	81.8%	31	70.5%
No	5	11.4%	10	22.7%
Don't Know/Blank	3	6.8%	3	6.8%
Wattage of bulb removed				
Less than 44w	2	5.6%	1	3.3%
45-70w	27	75.0%	21	70.0%
71-99w	6	16.7%	8	26.7%
Greater than 100w	1	2.8%	0	0.0%
Hours of use per day				
<1	7	20.0%	6	17.6%
1-2	7	20.0%	7	20.6%
3-4	9	25.7%	12	35.3%
5-10	11	31.4%	9	26.5%
11-12	1	2.9%	0	0.0%
13-24	0	0.0%	0	0.0%

Out of the 176 13-watt CFLs distributed to this group of survey respondents, 153 of them were installed. This is an installation rate of 86.9%. For the 20-watt CFLs, 114 of the 176 CFLs were installed, which is an installation rate of 64.8%.

	Ohio CFL Kits (n)	Ohio CFL Kits (%)	Ohio CFL Kits (n)	Ohio CFL Kits (%)
Installed 20w bulb #1			Installed 20w bulb #2	
Yes	38	90.5%	34	81.0%
No	4	9.5%	7	16.7%
Don't Know/Blank	0	0.0%	1	2.4%
Wattage of bulb removed				
Less than 44w	0	0.0%	0	0.0%
45-70w	25	65.8%	22	66.7%
71-99w	11	28.9%	11	33.3%
Greater than 100w	2	5.3%	0	0.0%
Hours of use per day				
<1	5	13.2%	2	5.9%
1-2	10	26.3%	10	29.4%
3-4	16	42.1%	14	41.2%
5-10	5	13.2%	8	23.5%

TecMarket Works

Evaluation Findings

11-12	2	5.3%	0	0.0%
13-24	0	0.0%	0	0.0%
Installed 20w bulb #3			Installed 20w bulb #4	
Yes	25	56.8%	17	38.6%
No	16	36.4%	23	52.3%
Don't Know/Blank	3	6.8%	4	9.1%
Wattage of bulb removed				
Less than 44w	0	0.0%	1	5.9%
45-70w	11	45.8%	4	23.5%
71-99w	11	45.8%	8	47.1%
Greater than 100w	2	8.3%	4	23.5%
Hours of use per day				
<1	3	13.0%	2	11.8%
1-2	10	43.5%	5	29.4%
3-4	5	21.7%	5	29.4%
5-10	5	21.7%	5	29.4%
11-12	0	0.0%	0	0.0%
13-24	0	0.0%	0	0.0%

The survey asked the families if any of the CFLs were removed, and only five (11.4%) removed one or more bulbs for the following reasons:

- burned out (n=2)
- not bright enough
- broken
- caught fire in the lamp
- did not work with dimmer fixture

Thirty-one (70.5%) indicated that they had an average of 6.1 CFLs installed in their homes before receiving the K12 kits. Twenty-five (56.8%) of the respondents were planning on buying more CFLs, six (13.6%) were not. Eleven (25%) indicated that they were "maybe" planning on buying additional CFLs before receiving the kit. Thirteen respondents (29.5%) have since purchased an average of 5.75 CFLs.

Kits Sent to Non-Duke Energy Customers

Eighteen surveys were sent to non-Duke Energy customers in Ohio, and eight surveys were returned. Non-Duke Energy customers that participated in the K12 program received a kit with the following items:

- 13-watt CFL
- Outlet and light switch insulators
- Bag for testing water flow
- Water temperature card
- DOE booklet

Use of the K12 Kit's Measures

CFL

The CFL included in the K12 kit was installed by all of the non-Duke Energy participants. Table 12 below shows a summary of the responses to the questions about the 13-watt CFL. Most (75%) of the Kit recipients replaced a 45-70-watt bulb with the 13-watt CFL, and the replacement was done on lights that were usually used 3-4 hours per day on average.

Table 12. Frequency of Installation: 13-watt CFL

	Ohio Kits (n)	Ohio Kits (%)
Installed 13w bulb		
Yes	8	100%
No	0	-
Don't Know/Blank	0	-
Wattage of bulb removed		
Less than 44w	0	-
45-70w	6	75.0%
71-99w	2	25.0%
Greater than 100w	0	-
Hours of use per day		
<1		-
1-2	1	14.3%
3-4	4	57.1%
5-10	2	28.6%
11-12	-	-
13-24	-	-

One respondent (12.5%) indicated that they removed at the CFL because it had burned out.

Five (62.5%) of the respondents have purchased additional CFLs since receiving the kit, with those respondents indicating that they have purchased an additional 9.6 CFLs per household.

Previous Use of CFLs

Four of the respondents (50%) indicated that they had at least one CFL installed in their homes previous to receiving the K12 kit. These families report that they have from three to fifteen CFLs installed in their homes, with the average reported number of CFLs being previously installed being 9.0 CFLs per home.

Five of the respondents (62.5%) indicated that they were planning on purchasing CFLs before receiving the kit, and one was possibly planning on buying CFLs. Two of them (25%) indicated that they did plan on purchasing CFLs because they had already installed CFLs in all of their household's sockets.

Outlet and Switch Gaskets

Five of the eight respondents installed the outlet and switch gaskets. The kit provided 8 gaskets in total, but unfortunately many of them were installed on interior walls where they do not provide any energy savings.

Table 13. Frequency of Installation: Outlet Gaskets

	Ohio Kits (n)	Ohio Kits (%)
Installed the gaskets		
Yes	5	62.5%
No	2	25.0%
Don't Know	1	12.5%
Number installed interior wall		
1-2	3	60.0%
3-5	2	40.0%
6-8	-	-
Don't Know	-	-
Number installed exterior wall		
1-2	1	25.0%
3-5	2	50.0%
6-8	1	25.0%
Don't Know	-	-

Previous Use of Gaskets

Seven of the respondents (87.5%) indicated that they did not have any gaskets installed in their home before receiving the K12 kit.

Four of the respondents (50%) indicated that they were not planning on purchasing any gaskets before receiving the kit, and three were possibly planning some. One respondent (12.5%) indicated that they did plan on purchasing gaskets. One respondent indicated that they have purchased an additional 12-24 gaskets since receiving the K12 kit.

Water Flow Meter Bag

About 38% of the recipients used the water flow meter bag. Only one respondent decreased the rate of flow of their water after using the water flow meter bag. Two respondents made adjustments that resulted in increased GPM after testing their water flow rate.

Table 14. Frequency of Use: Water Flow Meter Bag

	Ohio Kits (n)	Ohio Kits (%)
Used the Water Meter Bag		
Yes	3	37.5%
No	3	37.5%
Don't Know	2	25.0%
Tested in Shower		
Hot Water	-	
Cold Water	1	
Both	2	
Adjusted GPM down	-	
Tested in Kitchen		
Hot Water	1	
Cold Water	-	
Both	1	
Adjusted GPM down	1	
Tested in Bathroom		
Hot Water	-	

TecMarket Works

Evaluation Findings

Cold Water	1	
Both	3	
Adjusted GPM down	-	
Tested in Utility Sink		
Hot Water	-	
Cold Water	-	
Both	-	
Tested in Other Area		
Hot Water	-	
Cold Water	-	
Both	1	
Adjusted GPM down	-	

DOE Energy Savers Booklet

Seven out of eight respondents indicated that they read the booklet that was included in the kit, and many of them read it and discussed it with their families.

	Ohio Kits (n)	Ohio Kits (%)
Read the Booklet		
Yes	7	87.5%
No but will	1	12.5%
Don't Know	-	
Read the Booklet and Discussed with Family		
Yes	5	83.3%
No but will	1	16.7%
Don't Know	-	-

Satisfaction with Kit Items

Respondents indicate a high level of satisfaction with the kit items. Mean satisfaction scores were highest (8.7 out of 10) with the switch and outlet gaskets.

	Count	Minimum Score	Maximum Score	Mean Score	Median Score
13-watt CFL	8	7	10	8.6	8.5
switch and outlet gaskets	7	5	10	8.7	10
water flow meter bag	5	6	10	8.6	10
booklet	7	7	10	8.6	9

Respondents' General Comments

The survey provided an area for the respondents to add their thoughts about the program. Their comments are listed below:

- “It was a great incentive to start replacing our bulbs with CFLs. My grandson loved that he got to bring home the items from school to help reduce our energy use at home.”
- “Thanks for implementing a green initiative.”

TecMarket Works

Evaluation Findings

- “It was a great tool to get us started.”
- “It’s a great way to save.”

Appendix A: Teacher Interview Instrument

Name: _____

School: _____

We are conducting this interview to obtain your opinions about and experiences with the Get Energy Smart Program. We'll talk about the Get Energy Smart Program and its objectives, your thoughts on improving the program, and the materials and support provided to the teachers. The interview will take about 20-30 minutes to complete.

1. Please describe your program-associated role and scope of responsibility. What is it that you are responsible for as it relates to this program?

Program Objectives

2. Please describe your understanding of the Get Energy Smart Program's current objectives.
3. Are these the right objectives or would you change them in any way? If yes, what would you change? How do you think this change would affect how the program is operated or managed?
4. In your opinion, which objectives do you think are best being met or will be met?
5. How would you define success for this program? What has to occur for you to consider this program successful? Is this different than how your school administration would describe success? How?
6. What is it about this program that makes it attractive to you personally? What about it does your school's administration like?

Operational Efficiency

7. Please review with us how the program 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.
8. 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?

9. Describe the evolution of the Get Energy Smart Program. How has the program changed since you first became a partnering teacher? How well have these changes worked for you, and for your school?
10. Do you have suggestions for improvements to the program that would increase participation rates or interest levels from the teachers?
11. Do you have suggestions for improving or increasing energy impacts gained through the student's families?
12. Do you have suggestion for making the program operate more smoothly or effectively?

Program Design & Implementation

13. *(If not captured earlier)* Please explain how the communications and interactions between the teachers, families, and Get Energy Smart management team work. Do you think these interactions or means of communication should be changed in any way? If so, how and why?
14. What are your thoughts on how the Program is presented to teachers? How effective is this approach? Do you have suggestions for improving the presentation approach? How about the school, is the program presented to the school administration in an effective way? Any issues you see in this or are there any changes you would make?
15. Do you utilize the full curriculum provided, or do you skip some sections of the curriculum? *If skipping some*, Which components are you skipping and why? Can they be improved in some way that would make them more valuable?
16. Do you feel that you are getting adequate program or program concept training and program information? What can be done that could help improve your and other teachers' effectiveness?
17. Overall, what about the program works well and why?
18. What doesn't work well and why? Do you think this discourages participation or teacher interests?
19. In what ways can the program operations or operational efficiencies be improved?
20. Should the program be focusing effort on attracting more participating schools or teachers? *If yes*, How should the program do this?

21. The key aspect of this program that makes it worthwhile for utility companies is the amount of energy savings achieved. What can Duke Energy do to achieve higher installation rates of the kit items?
22. What can be done to encourage higher levels of energy efficient behaviors in the student's homes?
23. Thinking about all aspects of the program, If you could change anything about the program, what would you change and why?
24. Are there any other issues or topics you think we should know about and discuss for this evaluation?

Appendix B: Program Manager Interview Protocol

Name: _____

Title: _____

We are conducting this interview to obtain your opinions about and experiences with the K12 Curriculum program, which I will refer to as the K12 program. We'll talk about the K12 Program and its objectives, your thoughts on improving the program, and the materials and support provided to the teachers. The interview will take about 40-60 minutes to complete. May we begin?

1. Please describe your role and scope of responsibility in detail. What is it that you are responsible for as it relates to this program?

Program Objectives

2. Please describe your understanding of the K12 Program's current objectives.
3. Are these the right objectives or would you change them in any way? If yes, what would you change? How do you think this change would affect how the program is operated or managed?
4. In your opinion, which objectives do you think are best being met or will be met?
5. Is there any kind of selection criteria that schools are required to meet in order to participate? What are these and how do you implement these selection criteria?
6. Is there a target number of schools or teachers that Duke Energy would like to see participate? If so, how many? Has this goal been reached?
7. How do you define success for this program? What has to occur for you to consider this program successful?

Operational Efficiency

8. Please review with us how the K12 operates relative to your duties, that is, please walk us through the processes and procedures and key events that allow you to currently fulfill your duties.
9. 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?
10. Describe the evolution of the K12 Program. How has the program changed since it was first planned?

11. Do you have suggestions for improvements to the program that would increase participation rates or interest levels from the teachers?
12. Do you have suggestions for improving or increasing energy impacts gained through the student's families?
13. Do you have suggestion for making the program operate more smoothly or effectively?

Program Design & Implementation

14. *(If not captured earlier)* Please explain how the communications and interactions between the teachers, families, and K12 management team work. Do you think these interactions or means of communication should be changed in any way? If so, how and why?
15. How do you market the program to teachers? How effective is this approach? What other approaches have you considered?
16. How do you select which schools or school districts to target? Is there anything that should be changed about this selection process?
17. Describe your tracking process with the schools and teachers/classes, and number of students.
18. How do you determine what measures or behavior change suggestions should be included in the program's push efforts? Are key industry experts, trade professionals or peers used for assessing what the technologies or behavioral suggestions should be included in the program? If so, how does this work?
19. What kinds of measures or behaviors have you considered but have elected not to include? Why did you not include them?
20. Are key industry experts and trade professionals used in other advisory roles? If so how does this work and what kinds of support are obtained?
21. Describe the K12 training and development approach. Are teachers getting adequate program training and program information? What can be done that could help improve teachers' effectiveness? Can we obtain training materials that are being used?
22. How are the training materials developed? Who is involved in this and what are their roles?

23. What educational system associated market information, research or market assessments are you using to determine the best target schools or school systems on which to focus program efforts?
24. What school system market information, research or assessments are you using to identify key systematic barriers to the program or to participation to develop more effective delivery mechanisms?
25. Overall, what about the K12 program works well and why?
26. What doesn't work well and why? Do you think this discourages participation or teacher interests?
27. Can you identify any kind of Duke Energy-associated, school system associated, or other operational barriers that impede a more efficient program design or operation?
28. In what ways can the program operations or operational efficiencies be improved?
29. Should the program be focusing effort on attracting more participating schools or teachers? If yes, in what ways can the program attract more participating schools or teachers?
30. What should the program do to encourage higher installation rates of the kit items?
31. What can be done to encourage higher levels of energy efficient behaviors in the student's homes?
32. What do you do to make sure that the best information and practices are being used in K12 operations? What should you or Duke Energy be doing to improve the program?
33. Thinking about all aspects of the program, If you could change anything about the program, what would you change and why?
34. Are there any other issues or topics you think we should know about and discuss for this evaluation?


Appendix C: Student Family Surveys

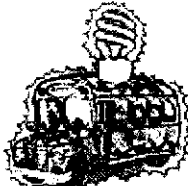
(need to get final versions from Trisha)

Appendix D: Program Collateral

Out of 345 students returning the survey, Duke Energy was able to match 304 to their teacher. Of those 304, 17 were in a classroom where the teacher handed out the notification flyer. That is 5%. The following images are examples of advance notifications of the program:

Questionnaire





Win an iPod!

Help Duke Energy better serve your community. Answer the questions below to let us know what you think about the **Energy Efficiency Kit** you received. Once you have completed and sent in this questionnaire, you will be eligible to win a brand-new iPod!

1. Did you install the energy efficiency materials included in this kit?

☐ Yes, I installed them.

☐ No, but I plan to install them. When? _____

☐ No, and I do not plan on installing them. Why not? _____

7. Have you used any of the kit's materials in your home? If so, which ones? _____

8. What would make the kit's materials more useful to you? _____

9. How would you rate the kit and its materials? (1 being poor and 5 being great)

1 2 3 4 5

2. What items have you installed/will you install?

☐ CFL ☐ Switch Plate Gaskets

☐ Low-flow Aerators ☐ Low-flow Showerhead

3. Did you find the installation instructions easy to understand?

☐ Yes, the instructions were clear.

☐ No, the instructions were difficult to follow.

4. Were the materials in your kit sufficient and durable?

☐ Yes, everything was sufficient and durable.

☐ No, we expected a more sufficient and/or durable set of materials.

5. Is the issue of energy efficiency important to you?

☐ Yes, it is an important issue to our family.

☐ No, we rarely take energy efficiency under consideration.

6. What part of this kit was the most valuable to your family? _____

You must include your name and full address below to receive prizes.

Thank you for participating!

First Name _____ Last Name _____

E-mail Address _____


Address _____

City _____ State _____ Zip _____

*For additional terms and conditions, including complete rules, please read entire questionnaire and prize drawing. Your survey responses are confidential and will be used only in an anonymous, statistical summary. You will not be asked to buy anything based on your participation, and we will not share your personally identifiable information with any third party.

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Duke Energy (Family)



POWER
ON THE ROAD
DISCLOSED FROM



page 1 of 1

SCHOLASTIC

Get Energy Smart!


See below for what this program has in store for you!


Your school can win:

- A Duke Energy Magic School Bus kit with science lessons, activities, energy efficiency tools, and more!

Plus, a chance to win...

- A teacher's trip for two to New York City, including travel, accommodations, and meals!
- A school visit from Scholastic's Traveling Magic School Bus!
- Class sets of Scholastic books!






Families can win:



- An Energy Efficiency Starter Kit
- A personalized home energy report

Plus, a chance to win...

- A Mac laptop computer!
- An Apple iPod!





For information about how to win these great prizes, visit

[illegible]

Duke Energy

Dear Principal,

We want to let you know about an exciting PBS® program that will be arriving at your school in September. This program has been created by Duke Energy and Scholastic to help your students explore their interests about a variety of things.


Your school will receive several free Scholastic Smart Kids, which include interactive stories and activities for your 3rd- and 4th-grade classrooms. These books and activities are designed to meet your state's standards in math, science, and language arts. Please share the Scholastic Smart Kids with all of your 3rd- and 4th-grade teachers.

Scholastic Smart Kids will encourage your staff and students to think about what they can do to reduce energy usage at school and at home. Scholastic will send a Scholastic Smart Kids to your school and look for ways your school can be more energy efficient. To help spread the word about the program, we have created the following items that are included in this packet:

- Informational poster (to hang in the hallway)
- An energy-saving poster (to hang in the hallway)
- Energy-saving poster (to display in the school hallway)

In addition to the easy-to-read Smart Kids and activities, the Scholastic Smart Kids program also offers opportunities for fun energy competitions and workshops for your school. For more energy-saving tips, please visit our website at www.scholastic.com/energy or call 1-800-848-8888. Find out what else Duke Energy is doing for your community at www.duke-energy.com/scholasticenergy.com.

Sincerely,
Duke Energy
and Scholastic



page 1 of 1

The following images are examples of program promotional materials:

ENERGY EFFICIENCY EDUCATION PROGRAM FOR THE CAROLINAS

JUNE 2009



What are the goals of this program?

- Educate students on energy efficiency and encourage them to think about energy usage at school and at home.
- Encourage their families to complete energy audit surveys, and use the results to make their homes more energy efficient.
- Provide free energy efficiency kits and items such as compact fluorescent light bulbs (CFLs) to students, and encourage their use in the home.

How does it work?

- Duke Energy is partnering with Scholastic Inc. (leading provider of educational materials) and a teacher advisory board to provide learning activities and resource materials for use in the classroom.
- The core of the program is the co-developed "Get Energy Smart" curriculum, which includes both online (www.scholastic.com/energysmart) and printed materials to supplement the schools' science and math curriculum.
- Duke Energy's "Kids with Energy" Web site, a companion to the "Get Energy Smart" site, provides more energy efficiency information and resources (www.duke-energy.com/kidswithenergy).
- Duke Energy provides Home Energy Audit Survey materials for students to take home and complete with their parents/guardians.

Who can participate?

- Currently the program is designed for students in grades 3 and 4. Eventually it will extend to other K-12 grade levels.
- The program is offered to public and private schools within Duke Energy's service area in North Carolina and South Carolina, starting in August 2009.



page 1 of 2

What are the benefits to the schools, students and their families?

- The "Get Energy Smart" materials meet North Carolina and South Carolina academic content standards.
- The program can help schools reduce energy consumption at their facilities through:
 - Greater overall awareness of energy efficiency in the school community
 - Use of energy efficiency education kits, tools and good practices on site.
- Energy efficiency lesson plans, learning activities and kits are provided at no cost.
- Teachers receive training in workshops conducted by Scholastic, as well as Continuing Education Units.
- Students learn about energy use and efficiency, and take that knowledge and energy efficiency tools home to their families to assist in lowering energy costs.
- Classrooms receive incentive awards, based on their degree of participation (such as certificates, classroom science books or class field trips).

What are the program costs?

- "Get Energy Smart" is part of Duke Energy's energy efficiency program portfolio that was approved by the Public Service Commission of South Carolina and the North Carolina Utilities Commission. There is no direct cost to administrators, teachers, parents, or students for the program curriculum, activities or participation incentives.

When is the program available?

- The curriculum is available throughout the school year, beginning in August 2009.
- Teacher workshops, planning and evaluation meetings for teachers will occur during the school year, as well as the summer months.

What kind of support is available for teachers?

- A Duke Energy/Scholastic regional program coordinator will provide teacher workshops, develop volunteers, handle local operations and serve as a central point of contact for schools.
- Educators may contact their North Carolina state coordinator at energysmartNC@scholastic.com or their South Carolina state coordinator at energysmartSC@scholastic.com.
- Scholastic provides weekday support via a toll-free phone number: 1-800-347-8301, Monday through Friday.

Where can we find more information on the "Get Energy Smart" Program?

- Visit us today at www.scholastic.com/energysmart and www.duke-energy.com/kidswithenergy.
- Call Scholastic toll free at 1-800-347-8301.
- Or contact your Duke Energy business relations manager.

What other programs are available?

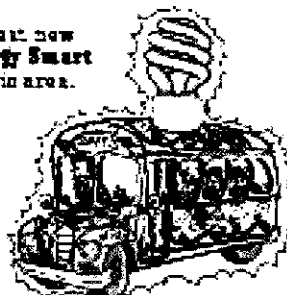
- You can arrange for Energy Assessments for your school facilities -- online, by phone or on site. Learn more at our Web site. For North Carolina, visit <http://www.duke-energy.com/north-carolina-large-business/energy-efficiency/energy-assessments.asp>. For South Carolina, visit <http://www.duke-energy.com/south-carolina-large-business/energy-efficiency/energy-assessments.asp>.
- Schools are also eligible for Duke Energy Smart \$averSM incentives, which can help offset upfront costs, reduce payback time for energy efficiency measures and accelerate energy savings. Please visit Duke Energy's Web site for further details about the Smart \$aver program. For North Carolina, visit <http://www.duke-energy.com/north-carolina-business/energy-management/energy-efficiency-incentives.asp>. For South Carolina, visit <http://www.duke-energy.com/south-carolina-business/energy-management/energy-efficiency-incentives.asp>.
- For more information, contact your Duke Energy business relations manager, or visit us online at www.duke-energy.com.



Attention

3rd- and 4th-Grade Teachers and Administrators!

Hello! My name is Michelle White, and I want to share with you a great new educational program from Duke Energy and Scholastic. The **Get Energy Smart** program has been created especially for teachers in the southern Ohio area. As part of the program, every 3rd- and 4th-grade teacher within the Duke Energy service area will receive a free educational kit created by Scholastic. These kits, which feature *Ms. Frizzle* and *The Magic School Bus*, are being sent directly to your school. Read on to find out how you can get the most out of this great new program or visit scholastic.com/energysmart for more details.



1. Keep an eye out for a big box with the Magic School Bus on it and open it right away!
2. Complete the lessons inside with your students. These lessons and activities will help your class learn about energy efficiency. Best of all, the lessons are correlated to Ohio Academic Content Standards in science, language arts, and social studies. You don't need to wait until you are "teaching science" to get to these lessons.
3. Send the family materials home with your students. These valuable materials contain tips on energy efficiency, at-home activities, and a Home Energy Survey. By completing this survey your students' families will learn how to save money and help the environment. The survey comes in a prepaid envelope so all families need to do is complete it and drop it in the mail. Families can also find details about completing the survey online at scholastic.com/energysmart. Families who fill out the survey will:
 - Receive a free **ENERGY EFFICIENCY KIT** with CFLs, aerators, outlet insulators, and a fan box!
 - Receive a free energy report with suggestions on how to reduce energy bills!
 - Be entered to win one of two free laptop computers!

If you have any questions about this program, please feel free to contact me, your Ohio Program Coordinator for Get Energy Smart at energysmartOH@scholastic.com or call 1-800-347-8301. I would be happy to answer any questions you have or even schedule a visit to your school to show you how to best use these materials in your classroom. I look forward to helping you and your students Get Energy Smart!

Sincerely,

Michelle White

Prizes for the Classroom

If at least five of your students' families return their surveys, you will automatically receive a set of 19 books to add to your classroom library. Plus you will be eligible to win a class visit from *Ms. Frizzle* and *The Magic School Bus* and a trip for two to New York City!



Start getting energy smart now with this fun word search!

S S A N E A R T H T
M V W O I N T A E H
A T C I R T C E L E
G R G T T L F C E R
I A N A P C E R G M
C M B L O O H C S O
Y S A U I S W P O S
W M E S S R P E U T
P L E N E R G Y R A
E F F I C I E N T T

BUS	ENERGY	POWER
CFL	HEAT	SCHOOL
EARTH	INSULATION	SMART
EFFICIENT	LAMP	SWITCH
ELECTRIC	MAGIC	THERMOSTAT

Once you have circled all of the words in the list above, write down the remaining letters in order. These remaining letters will spell out a secret message from Ms. Frizzle!



Visit www.scholastic.com/energysmart for more games and activities, as well as energy efficiency tips for home and school.

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Attention, 3rd and 4th Grade Teachers:

Welcome to **Get Energy Smart!** Join your 3rd- and 4th-grade students on a journey through the science of energy with Ms. Frizzle and *The Magic School Bus*. The program's academic standards-based lessons and worksheets teach students the value of conserving energy while reinforcing important science, math, and language arts skills.


PLUS! In addition to the **FREE** kit delivered to your classroom, you will have a chance to win these great prizes:

- a trip for two to New York City, including a shopping trip to the Scholastic store and museum passes
- a classroom visit from *The Magic School Bus*
- a class set of books from Scholastic

Find out how you could win by visiting
www.scholastic.com/energysmart for more information.

The program's easy energy
conservation ideas can lead
to lower energy use and
a cleaner environment!
We hope this helps your
students **Get Energy Smart!**

Feel free to contact Maria Phillips-McPherson, your North Carolina state program coordinator, at energysmart@scholastic.com with any questions. Maria is available to do energy efficiency presentations and workshops at your school. Send an e-mail now to get us set up!



• Attention, Administrators:

Welcome to **Get Energy Smart!** Created by Duke Energy and Scholastic, this program will encourage your staff and students to think about what they can do to save energy and reduce energy costs at school and at home! Your 3rd and 4th-grade classrooms will receive a **FREE** kit complete with standards-based lessons, energy-saving tools, and hands-on student activities.


With **Get Energy Smart**, participating 3rd and 4th-grade teachers will receive a **FREE** classroom energy efficiency kit and have a chance to win exciting prizes for the classroom.

PLUS! Your school can begin to become more energy efficient when your classrooms use the lessons and materials provided in their kit.


Visit www.scholastic.com/energysmart for more information.

If you have any questions, please call 1-800-347-8301.

Feel free to contact Mark Phillips, McPherson, your North Carolina state program coordinator, at energysmart@scholastic.com with any questions. Mark is available to do energy efficiency presentations and workshops at your school. Send an e-mail now to get one too!

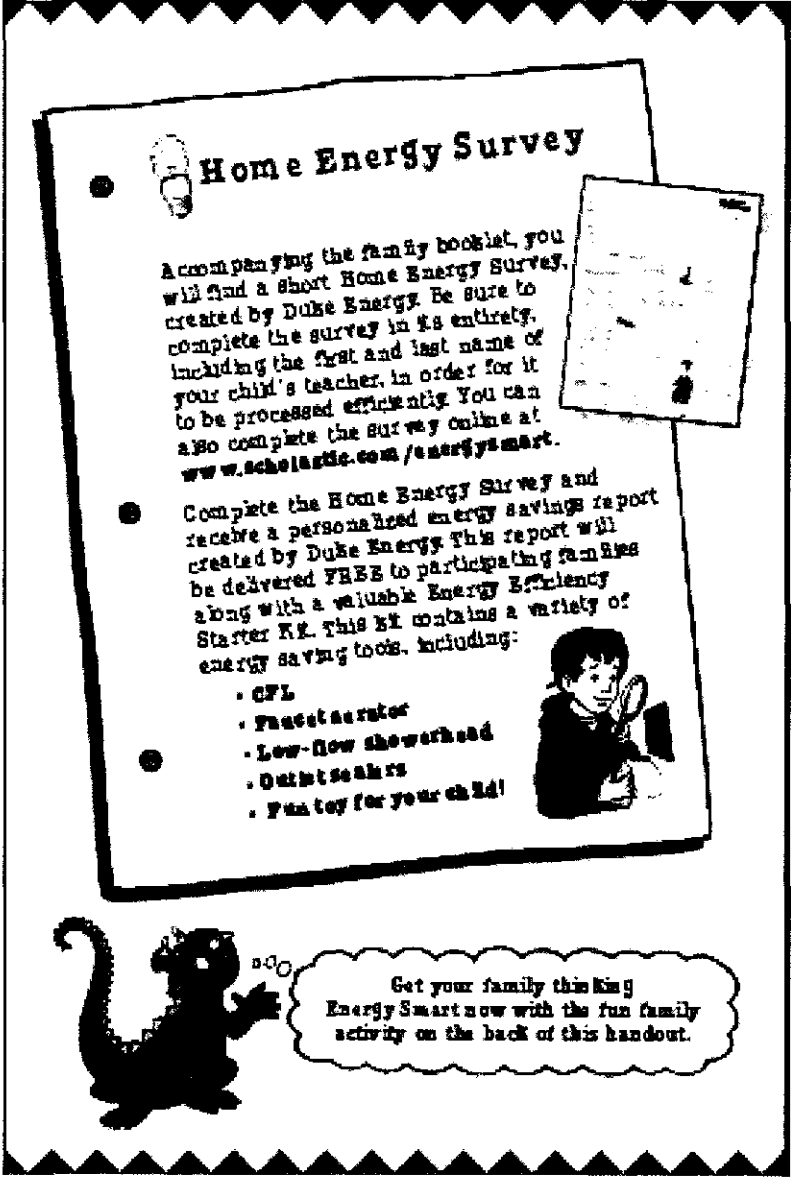


McPherson School Bus



page 1 of 1

Duke Energy



Home Energy Survey

Accompanying the family booklet, you will find a short Home Energy Survey, created by Duke Energy. Be sure to complete the survey in its entirety, including the first and last name of your child's teacher, in order for it to be processed efficiently. You can also complete the survey online at www.scholastic.com/energysmart.

Complete the Home Energy Survey and receive a personalized energy savings report created by Duke Energy. This report will be delivered FREE to participating families along with a valuable Energy Efficiency Starter Kit. This kit contains a variety of energy saving tools, including:

- CFL
- Faucet aerator
- Low-flow showerhead
- Outlet seals
- Fun toy for your child!

Get your family thinking Energy Smart now with the fun family activity on the back of this handout.

page 2 of 4

Each 3rd- or 4th-grade family that completes
the Home Energy Survey is eligible
to win these great prizes!

Be sure to include the full name of your
child's teacher on your survey.

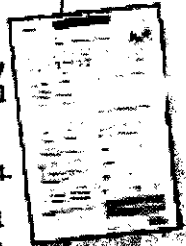
Fill out the survey for your
chance to win!

In addition to receiving the Energy
Efficiency Starter Kit from Duke
Energy, your family will automatically
be entered to win one of two brand-
new, fully loaded laptops!



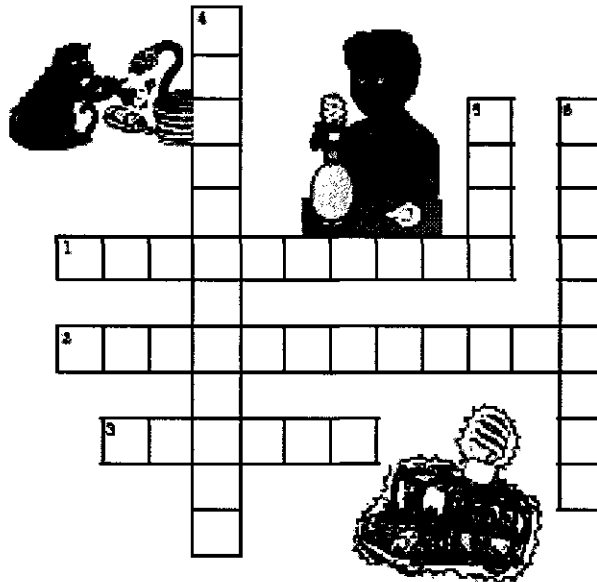
**BONUS CHANCE
TO WIN!**

Inside the
Energy Efficiency
Starter Kit, you'll
find a short
questionnaire
about the program.
Just fill out this
card and you will
be entered to win
an additional prize:
one of five iPods!



*For official rules, please visit
www.scholastic.com/energysmart.

Get Energy Smart with this fun, family-friendly game.



ACROSS

1. You can use this to control the temperature in your home
2. This kind of light bulb gets pretty hot and uses a lot of energy
3. This smart scientist invented the light bulb

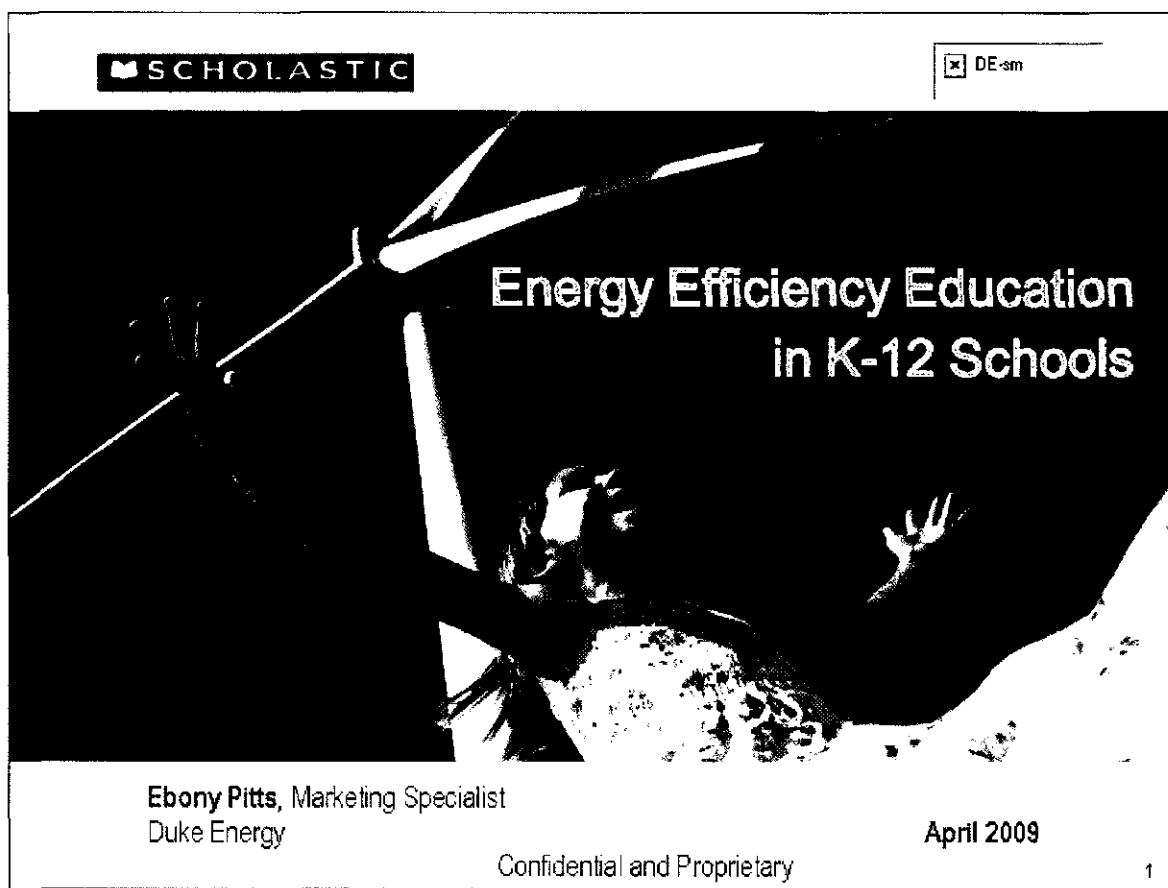
DOWN

4. Using energy responsibly, not wasting it
5. A unit of measure of electric power
6. Energy efficiency is one way to reduce _____

For more games and activities, visit



For more games and activities, visit
www.ossege.com/energygames



The image is a presentation slide from Scholastic. At the top left is the Scholastic logo, which consists of a stylized 'S' inside a square followed by the word 'SCHOLASTIC'. At the top right is a small box containing a close button (an 'x' in a square) and the text 'DE-sm'. The main body of the slide features a black and white photograph of a young child with their arms outstretched, standing in front of a large, modern building with a glass facade. Overlaid on the right side of the photograph is the title 'Energy Efficiency Education in K-12 Schools' in a large, white, sans-serif font. At the bottom left of the slide, the text 'Ebony Pitts, Marketing Specialist' and 'Duke Energy' is displayed. At the bottom right, the date 'April 2009' is shown. In the center of the bottom edge, the text 'Confidential and Proprietary' is written. A small number '1' is located in the bottom right corner of the slide.


SCHOLASTIC DE-sm

Energy Efficiency Education in K-12 Schools

Ebony Pitts, Marketing Specialist
Duke Energy

April 2009

Confidential and Proprietary 1

**Energy Efficiency Education**


DE-sm

Duke Energy Introduces a New Energy Efficiency School Program

- A program that...
 - delivers Energy Efficiency education across Duke Energy's five jurisdictions
 - is engaging to administrators, teachers, students and parents
 - results in reduction of energy use for the participants and can be tracked at the household level
- Student population K - 12
 - NC = 336,000 ■ KY = 62,000
 - SC = 248,000 ■ IN = 483,000
 - OH = 261,000

Duke Energy Service Territory

Service Territory_.jpg



Energy Efficiency Education

About the **Get Energy Smart** Program

- Co-developed with Scholastic
- **Get Energy Smart Teaching Materials:**
 - Targets grades 3-4
 - Focuses on the value of saving energy
 - Based on *The Magic School Bus* science book series
 - Features lessons & activities that meet state academic standards
- **Get Energy Smart Family Materials:**
 - Family Booklet with energy efficiency related activities and information
 - Home Energy Survey for families

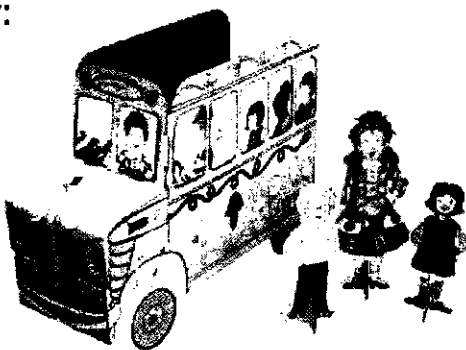
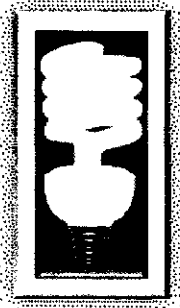
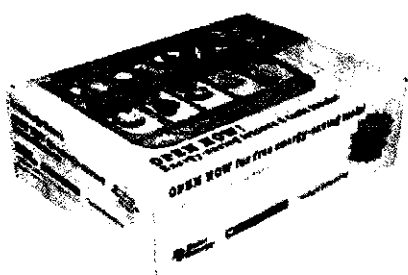
3

Energy Efficiency Education

DE-sm


Additional **Get Energy Smart** Kit Components

- Box turns into “pop-out” *Magic School Bus*, Ms. Frizzle, and other series characters for display in the classroom.
- Classroom poster featuring energy efficiency messaging and an image of a CFL bulb that turns on and off.
- Hands-on energy-saving sampler:
 - CFL
 - Low-Flow Aerator
 - Outlet Sealer
 - Light Switch sealer




4

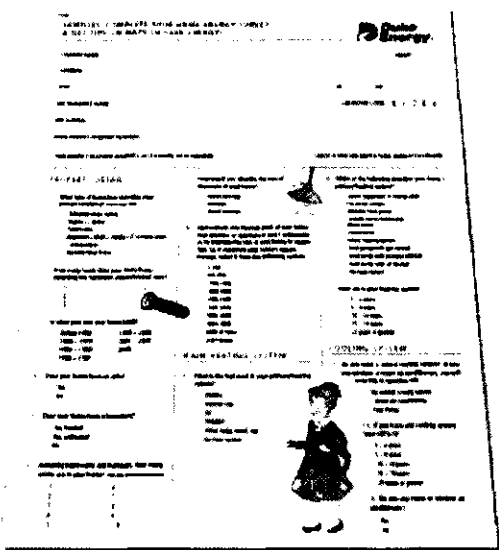
Energy Efficiency Education

 DE-sm

Get Energy Smart Family Materials:

- 8-page Family Booklets for students to bring home
- Home Energy Survey for families to complete and return to Duke Energy
- Incentives for family participation, including:
 - Laptop Computers
 - iPods





5

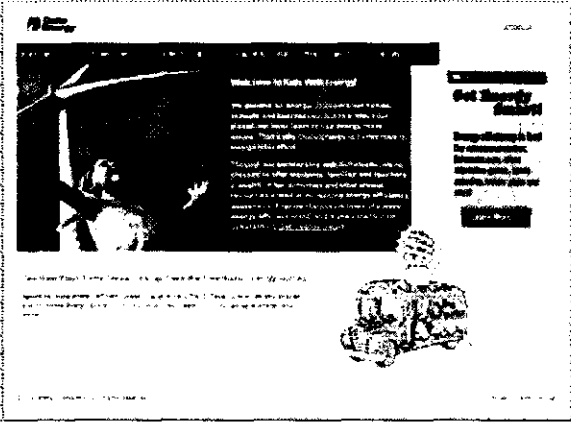
DE-sm

Energy Efficiency Education

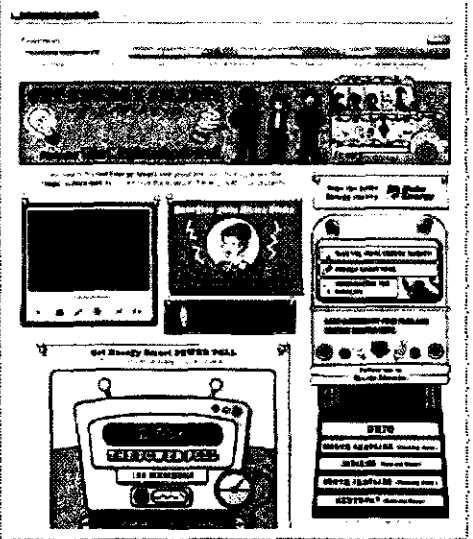
Get Energy Smart

Supporting co-branded Web sites offer online communities, free downloadable materials and other resources for teachers and family.


Kids with Energy



Get Energy Smart!




6

**Energy Efficiency Education**


DE-sm

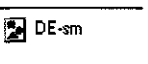
How Do Teachers and Administrators Benefit?

- Free, professional lessons and activities
- Training Workshops
- Continuing Education Units
- Classroom incentives
 - Magic School Bus science kit
 - Eligible for educational trip to visit Scholastic offices in New York
 - Visit from Miss Frizzle and the traveling Magic School Bus!




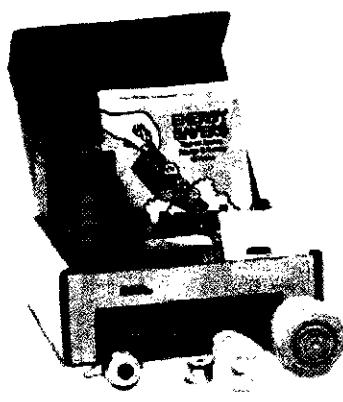
7

**Energy Efficiency Education**



How Do Students and Families Benefit?

- Participating families become eligible for a free **Efficiency Kit and Family Report!**
- The kit contains:
 - Items to help families lower energy costs.
- Family Report:
 - Useful tips to help manage energy use.



Energy Efficiency Education

DE-sm

How to Learn More about **Get Energy Smart** ?

Ebony Pitts, K12 Program Manager
Duke Energy
Phone: 704-382-0882
E-mail: epitts@duke-energy.com

Tricia MacGill, Project Manager
Scholastic, Inc.
Phone: 212-343-6852
E-mail: tmacgill@scholastic.com

Resources:

- www.scholastic.com/energysmart
- www.duke-energy.com/kidswithenergy
- Call Scholastic toll free at 1-800-347-8301 / Email State Coord.
- Or contact your Duke Energy Business Relations manager

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Appendix E: Early Feedback Report of 9/11/09

Executive Summary

About This Report

This report presents the early feedback findings for the evaluation of the “Get Energy Smart” Program, also known as the K12 Curriculum Program. For this early feedback report, we interviewed ten participating teachers, the program manager, and the program implementation manager from Scholastic.

According to the program information:

“The “Get Energy Smart” program goal is to educate children and their families about wise energy usage in their homes and personal choices they can make to save money, protect the environment and address climate change. The curriculum was designed to allow teachers to incorporate the materials into their existing math/science instructional schedules with supplemental activities on the Web.

The lessons are short, but relevant, and create opportunities for interactive, hands-on learning. Students and families can perform an on-line energy audit of their own homes, which creates an energy report for each participating family. After students perform the audit, they receive a free energy efficiency starter kit containing information and the following items:

- Earth Massage Showerhead, 1.5 GPM
- Kitchen Aerator with Swivel & Flip Valve, 1.5 GPM
- Water Flow Meter Bag
- Hot Water Temperature Gauge Card
- 13 watt CFL (60 watt equivalent) Energy Star Approved
- 20 watt CFL (75 watt equivalent) Energy Star Approved
- Bathroom Faucet Aerator, 1.0 GPM Needle Spray
- Combination Pack of Switch / Outlet Gasket Insulators (12 per pack)
- Energy Efficient Limelight Style Night Light
- Duke Energy Labeled DOE Energy Savers Booklet
- Small Roll of Teflon Tape
- Duke Energy Supplied Product Info / Instruction Sheet
- Duke Energy Supplied CFL Magnet
- Duke Energy Supplied Kit Label

Since the Ohio K-12 program started in March of 2009, Duke Energy has had approximately 1,200 participants that were able to receive EE Kits with 2,400 CFLs. In addition, another 794 CFLs were distributed.

Summary of Findings and Recommendations

An overview of the key findings and recommendations identified through this evaluation is presented below.

Evaluation Contractor's Recommendations for Duke Energy to Consider

The following program recommendations are provided by TMW, the evaluation contractor. The recommendations are provided to allow Duke Energy to review them with the program manager and the lead administrator so that each recommendation can be accepted, rejected or modified according to the best judgment of the program design professionals.

1. Duke Energy should restructure the program so that the delivery of the energy saving actions information collected from students and parents is the one of the criteria for receipt of program incentives. Duke should establish a minimum survey return rate for identifying behaviors and actions taken, and set incentives so that the higher the survey return rate achieved from the program administrator and the school, the larger the incentive received. Duke should also consider an incentive structure based on the level of energy actions taken and reported in the collected surveys. Duke should identify a set of behavior change and actions taken metrics and use these metrics as one of the key criteria for assessing the performance of the program and the delivery of that program by the program administrator. Consider adding a stronger focus in school/teacher presentations and discussions that focuses on the need for high survey response rates.
2. While some students attend a school located within Duke Energy's territory, yet live in a home outside of that territory, the savings from that student's home should be counted as a Duke Energy program accomplishment. TecMarket Works recommends that savings from the program be tracked as a function of school location and participant's actions rather than the address of the participating student's home. This is consistent with current practice. This recommendation is provided to encourage the continuation of this approach rather than developing a program accounting system that allocates savings to utilities based on the address of the parent. A conversion to a participant address-based energy savings tracking system would increase costs without substantially improving the reliability of the savings estimates. Consider modifying the program screening efforts to allow all students in a participating class to receive the program kits, regardless of the location of their home. Work with the Commission to allow savings from schools operating in multiple utility territories to be credited to the sponsoring utility so that territorial issues do not impact program energy credits.
3. Examine if inexpensive mass media efforts such as public service announcements, interest stories in local newspapers, and topic specific public interest discussion programming can be employed to increase program knowledge, public acceptance, market pull, and help create a pre-existing receptive atmosphere from administrators, teachers and the communities that can increase enrollment efficiency.
4. Schedule the program's field efforts to be carefully integrated into the individual school's pre-established curriculum and teacher workload so that the efforts are not placed in competition for teacher's time at key bottlenecks and can be more efficiently integrated into the curriculum.
5. Assess if the energy saving actions induced by the program are impacted by the flexibility of the school's curriculum to see if the program is more cost effective when

integrated into schools that have a more flexible curriculum. Then target or prioritize targeting and field efforts to achieve the highest level of energy actions taken while maintaining support and teacher/administrator/student learning and satisfaction.

6. Work more directly with the teachers, through the school administrators, to coordinate the program's field efforts, stress the program's primary objectives, clarify the efforts and information needed to document and count the savings, achieve teacher support, and arrange for follow-up information gathering for evaluation needs.
7. If not already accomplished, assess the relationship between students, teachers and parents to identify the grade levels at which the program-provided energy technologies are installed and used, the recommended behavior changes are taken and the system-level carbon reductions are achieved and focus the program's efforts on these grades.
8. Increase the attention given to helping teachers understand that the goal of the program, and the primary criteria on which program decisions are based, that is achieved installations of the program-provided technologies, the adoption of program-recommended behavior changes, and the level of achieved carbon emission reductions, rather than a more general goal of educating children. Education is not the primary goal of the program, but the vehicle by which the program's objectives are reached.
9. Consider requiring a presentation by the program administrator attended by at least 70% or 80% of the participating teachers (or some other level) as a condition of program participation. If well-executed this presentation can help convey the program's importance and goals to the teachers, obtain added support, increase teacher satisfaction, increase the percentage of surveys received and provide a vehicle for teachers to exchange ideas and discuss possible/successful educational approach scenarios with other teachers and the program administrator.
10. Duke should drop the requirement for the parents of students to provide a part of their social security number (last four digits) on the participant survey. Requiring parents to report the last four digits of their social security number is viewed as an identity-theft security risk to some of the parents, thereby reducing the ability of the program to document results. Removing this requirement will increase survey response and improve the ability of the program to document program impacts.
11. A number of comments received from the teachers focused on the need to reexamine the program materials and potentially have them redesigned. This process evaluation excluded the assessment of the program materials to determine their appropriateness for each of the targeted grade levels. Duke should consider having a skilled grade-level-specific materials design expert examine the program materials to make sure that they are structured to match the ability of the teachers to present them effectively for each of the targeted grades and for the children within those grades. The assessment should focus on delivering educational content in a way that leads to increased actions (behaviors and measure installs) and the associated energy savings.

Teacher-Provided Recommendations for Duke Energy To Consider

In addition to the recommendations provided by the evaluation contactor, several teachers provided recommendations that can be considered by the program design professionals.

TecMarket Works presents these recommendations from the interviewed teachers, but does not elevate these recommendations to be included with the recommendations from the evaluation contactor. The evaluation contractor recommendations are those that TecMarket Works suggest be implemented into the program (above). The teacher recommendations are provided without judgment as to their appropriateness for the K12 program. These including the following:

12. Arrange to have the timing of the program's field efforts to not coincide with the annual Ohio Achievement tests, as this was a challenge for some of the 4th grade teachers by making it difficult for them to fit the Get Energy Smart curriculum into their lesson plans.
13. Increase the level of direct communication between teachers, school administrators, the program administrator and Duke Energy in order to increase program support and teacher participation.
14. Consider adding a work booklet to the course materials for students to take home that would add focus to the energy saving behaviors that need to be implemented. This can also focus on kit measure use and emphasize the benefits to the family, the utility and the world.
15. Consider adding an online content component for students to access at home that would focus on increasing key behaviors and measure installations.
16. Consider developing a simple game for the students to play with their family that would reinforce the behaviors needed and encourage the installation of measures.
17. Include a magnet in the package that can be used to send a use or behavior message. "It never hurts to have a magnet in there."
18. Schedule a parents' night at the school for a Duke Energy presentation so that the parents and the school can work as a team with the program.
19. Include a component in which the students write a report of the use of the kit items and have the program incent the report to make it attractive to students and teachers.
20. Arrange to have the energy kits distributed earlier, more closely to the Christmas break to compensate for the need to focus on the Ohio Achievement tests in the spring.
21. Increase the level of educational and results-related program promotions (flyers, brochures, school examples, etc.) provided to the teachers and school administrators in time to be effectively used.
22. Have the program administrator and Duke Energy host a workshop for teachers on the program early in the contact phase. Include presentations hosted by Duke Energy.

23. Redesign the materials and activities to make them more teaching-friendly and student friendly by using larger size print and including more pictures.
24. Update the program materials to today's standards by adding a multi-media element such as a DVD video or online activity.
25. Develop and incorporate a day-to-day educational/activities planner to stretch the impact of the activities out over several days.
26. Add an incentive for teachers to make the effort worthwhile to the teachers who are responsible for success "because teachers like incentives, too"; the incentive can be cash for the class, class activities, or credits for class supplies or other incentives valued by teachers.
27. Redesign the web site to make it more user-friendly for students and teachers so that it can be integrated into the teaching environment.
28. Add a booklet to the course materials for students to take home to work with that would add focus to the behaviors that need to be implemented. This can also focus on measure use and emphasize the benefits to the family, the utility and the world.
29. Develop a song that students can sing in the class or at home that sends a behavior and use message. "My students respond well to little songs and ditties. We made our own little songs about how to save energy."
30. The materials need to be designed specifically for the children who are to be exposed to them. "The lines of type in some of the materials were too small. I had to re-type the sheets and split up the questions 1-4 on the front and 5-8 on the back" so that the children could better comprehend them.
31. Make the materials more attractive by using pictures and figures; "Clip art (with Mrs. Frizzle, etc.) is important" for this grade level.
32. Better incorporate the Magic School Bus into the curriculum and the focus of the program so that the message is clear and integrated; "I put the Magic School Bus together and there didn't seem to be a connection...having a book or story written specifically for it would be helpful."
33. Need to more effectively structure the program's focus and materials so that it integrates smoothly with the school curriculum that we must follow; "It has to go with the curriculum. I don't have time for experiments. Maybe have lessons that are coordinated with and support the state standards."
34. Develop a rainy day program video to use as a supplemental program tool; "A 20-minute assembly, or even a video sent out to the schools; we have plenty of rainy and snowy days."

Teacher Comments

The teachers also provided additional comments on the program and its operations. These comments are summarized below.

- “The materials were very eye-catching and got my interest right away.”
- “The program materials were all put together and ready to go.”
- “The lesson plan was just about right for our class.”
- “We found we could tie the lessons in with several other subjects. We used math to calculate energy savings over a period of time and also talked about energy’s relationship to natural resources in science class.”
- “The packet of supplies was great. Children love being able to touch and hold things.”
- “The Magic School Bus holds a high level of interest for children.”
- “One of my favorite parts was passing the program materials out to the kids and seeing their faces light up. It was a really good thing for me to see.”

Introduction

This report presents the findings for the evaluation of the Get Energy Smart Program. The Get Energy Smart Program provides energy efficiency informational and educational support and resources to 3rd and 4th grade teachers for them to incorporate into their lesson plans. The goal of the program is to use students as an information route to achieve cost effective savings in the homes of the children using the support and assistance of the parents.

The evaluation was comprised of interviews with 10 out of the 58 teachers that participated in the program last semester (spring 2009). The objective of the interviews was to determine program satisfaction, and to gather feedback on the curriculum and any suggested changes or improvements.

Methodology

This study consisted of reviews of program materials to understand the focus and scope of the program, process evaluation interviews with Duke Energy program managers, Scholastic program administrators and schoolteachers implementing the program. The interviews focused on methods of operation and implementation, experiences and perspective associated with program design, approaches and results, and levels of satisfaction with the program's materials, communications, and delivery components. The interviews with the teachers also assessed process issues including the ease of signing up for the program, the quality and completeness of the curriculum, the value of the energy recommendations provided and other subjects. The purpose of these examinations and interviews is to provide Duke Energy with an early feedback report assessing the program's operations early enough to be used to guide program design efforts for the second phase of the program's multi-state rollout.

Evaluation Findings

Program Design and Operations

Overall we have found this program to be very well designed, operated and managed. The Duke Program Manager is well informed and has an expert level of knowledge about the program and its operational environment. The Duke Program Manager is focused on the program and remains active in her search for ways to improve the program. Likewise, we found the Scholastic program manager to be well informed and have an expert level of knowledge about the program and its day-to-day activities. The design and operations of the program is impressive and reflects a level of dedication by both Duke Energy and Scholastic.

The interviewees were able to address all of the evaluation topics explored during the interviews, indicating not only an expert level of knowledge about their program, but demonstrating a history of focusing on the program, the operation of the program, and a high level of individual understanding of the objectives of the program. There is a concerted effort on the part of both of these key individuals to make this program a showcase for these types of programs.

The responsibility for overall program design and operation, as well as the overall responsibility for implementation, rests with the Duke Program Evaluation Manager. The Duke Manager is also responsible for program performance, tracking and reporting performance progress to the Duke Energy senior portfolio managers, contracting and contract management, and for the overall success of the program. The Duke Manager in conjunction with other Duke managers is also responsible for strategic program planning and integrating the program into the Duke energy efficiency program portfolio. The responsibility for the in-field day-to-day operations of the program rests with the Scholastic Program Manager. Scholastic is responsible for the successful implementation of the program and the acquisition of net cost effective energy savings obtained via the delivery of program services into the targeted schools and classrooms. The detailed implementation efforts at the school level rests with the Scholastic Program Manager who is supported by Scholastic's field management staff who, together with the Program Manager, works with the school administrators and teachers to implement the program. The development and delivery of educational materials and in-class approaches to achieve the energy saving objective is the responsibility of the Scholastic team. The responsibility for educational training, and therefore the acquisition of energy savings, ultimately rests in the relationship skills, teaching skills, management skills of the teachers who must bring the program to the key participants, who are the parents of the students that must make sure the actions that save energy are taken. The Duke Program Managers also support key field efforts via personal appearances during key presentations and discussions with Scholastic staff, school administrators and teachers. The larger school districts and schools that have an assigned Duke Energy Business Relations Manager will support the program's efforts to engage school administrators and senior management personal within the school system to help obtain and build support and participation. School districts and schools without an assigned Business Relations Manager will be approached by the Scholastic Manager and in several cases by the Duke Program Manager to gain participation and support.

This is an effective structure with responsibility for performance embedded in positions that can effectively implement the program in a way that the program's objectives can be accomplished.

TecMarket Works provides no recommendations for changes to this overall structure and approach. It is a well designed and effective integrated operational and management approach.

With the move toward programs that are viewed as generation assets the K-12 program has gone through some refinements in presentation and focus. According to the program manager, the program has been recreated to be more focused on delivering a curriculum that meets the educational objectives of the teachers and school administrators, but also meets the energy action objectives on which the program is now based. According to the interviews with both the Duke Energy and Scholastic managers, they have trimmed some of the “bells and whistles” that were more general education and activity-focused and realigned the curriculum to focus more on the things that can lead to energy savings. According to the interviewees, this has led to a win-win situation in that the education is still provided, but that real savings are coming from that education. TecMarket Works did not conduct an assessment of these approaches as part of this early feedback evaluation. As a result, we are unable to confirm that the new curriculum focuses on teaching those things that lead to household energy savings; however, a review of teacher comments presented later in this report suggests the teachers were very satisfied with the education materials provided and their ability to use them effectively. While there are several suggestions from teachers calling for change, these changes are more presentation, operational and coordination changes rather than subject matter changes. However, the focus of the teachers is not on achieving savings, but in providing an energy education. Likewise, the focus of the Scholastic program objectives is also on the educational aspects of the program rather than on the energy savings requirements. As a result, TecMarket Works is unable to provide an assessment determining if the program’s materials and approaches are now more focused on energy savings and what students and parents can do in their homes. TMW does agree with the Duke Energy Program Manager that the program is in competition with a required curriculum and that the Duke message is not required. As a result, this program must prepare its materials and messages to satisfy the school administrators and the teachers who are responsible to an approved curriculum. As noted by the program manager, “we are up against mandated curriculums that are required, we are not required, so we are operating in competition with what is required.” This statement accurately captures Duke’s position within the educational field. Duke Energy must provide a program that causes actions to be taken, yet it must do that within an administrative environment that is focused on a broader energy education. If the program moves too far toward teaching only household energy savings actions, it will erode the support of the educational community. If the program moves toward a broader energy education, it will erode the net savings that can be achieved. The program design function must operate in this dual-purpose framework and balance the program’s needs with the needs of the educational community and the state educational curriculum. The Duke Program Manager is keenly aware of this balancing act and the need to be successful within this dual-purpose framework.

Interviews with the Scholastic Program Manager indicate that they are very familiar with the state standards for curriculums and curriculum development and have developed the program materials to integrate into the state’s educational curriculum. However, information from the teachers suggest that schools that have stricter curriculum requirements that tend to not permit deviation from the approved curriculum, or teachers with less flexibility on what they teach and how they teach report less success in integrating the program materials into their lesson plans.

Teachers with more flexibility in their lesson plans report more successful integration of the programs materials (see teacher survey results section of this report).

Ultimately, the success of this program rests on the ability of the Scholastic team, working with Duke Energy, to have teachers engaged with their students in a way that convinces parents to work with their children to implement energy saving actions in their homes. From this perspective, the program is not an educational program for children, but is a parent motivation program. The success of the program depends not on the educational ability of teachers to convey energy concepts and control actions to students, but on the ability to move the student-parents combination to action by motivating those students to act as the communications conduit to parents. The role of the energy education is essentially the approach for implementing a call-to-action to both the students and their parents while meeting the general energy education needs of the schools and teachers. This message needs to be conveyed to the Scholastic team and to the school administrators and teachers. While the message is there to a limited degree, it does not seem to be clearly articulated to the extent that this condition drives key program interaction and operational systems. At this time, educating students about energy concepts in general appears to be the single most important objective of the program beyond the Duke Energy offices.

Need for Communication of Program Objectives

The program has a number of objectives. These objectives reflect the overall mission of the energy efficiency portfolio as well as the educational efforts designed to achieve the measure installations, behavior changes and carbon reduction objectives. According to the Duke Program Manager, the program's objectives include:

1. Acquiring \$4 million in earnings before taxes (EBT) via a cost recovery mechanism under which recovery is based on documented energy savings.
2. Delivering net energy savings via an educational program / approach via young children.
3. Acquiring non-energy benefits in the form of carbon reductions and avoided plant construction.
4. Acquire a positive impact on customer satisfaction rates within Dukes markets.
5. Influence and modify customer energy management behavior to be more energy efficient.

These objectives appear to be well-grounded within the regulatory objectives associated with Duke Energy's energy efficiency program portfolio. These objectives are to acquire cost effective energy resources for Duke Energy's service territory. According to the Program Manager, these are the right objectives because they merge the energy acquisition framework with the educational framework for acquiring the energy objectives. TecMarket Works agrees with this assessment. We recommend no changes to these program objectives.

However, we found a significant disconnect between the Duke Program Manager's program objectives and the objectives of the Scholastic Program Manager. Essentially the two managers are focused on different key objectives for the same program. According to Scholastic, the primary objectives of the program are:

1. To educate consumers about energy efficiency via a “children-as-ambassadors-to-the-family” approach.
2. Meeting program reporting criteria at a state level.
3. Achieve lifeline / lifestyle behaviors that save energy.

The Scholastic Program Manager had not heard that there was a power supply objective for the program and was unfamiliar with the EBT concept for specific levels of energy efficiency obtained through the program. The Program Manager has also not heard that there is a measure installation objective needed to acquire the energy savings. For the Scholastic part of the contracted service, the objectives appear to be more education-focused, reporting-focused, and lastly, behavior change-focused without a specific quantifiable or documented energy or installation-related objective.

This difference is not new to these types of programs and is often present in educational programs that find themselves operating within two different corporate missions associated with the organizations for which they are employed. Essentially, Duke Energy is a regulated utility that is responsible for cost effectively saving energy within a regulated structure defining cost effectiveness. As a result, Duke Energy is focused on the documented net energy saving objectives for the energy efficiency portfolio within which this program must operate. Within the regulatory paradigm the key metric is cost effective energy savings achieved via installed technologies or implemented behavior changes. This means that the program must provide, as its primary deliverable, actions that cause energy savings that are less expensive than what it costs to provide that energy via conventional means. That is, it is an alternative energy supply program that must operate with the cost caps associated with conventional supplies. Within this structure, all other objectives are secondary to this primary objective. Duke Energy’s program objectives are consistent with this paradigm. This is also the focus of the Duke Program Manager and the reason for offering this program within the Duke portfolio. The Scholastic Program Manager operates from a different framework and is focused on the educational impacts of the program and the ability to integrate the program into established curriculums. As a result, the Scholastic Program Manager’s primary objective is to educate participating children, and have that education carried to the parents via an ambassador approach. In this paradigm, the focus is on education transfer.

These paradigms are somewhat in conflict because in the eyes of the Scholastic Program Manager, educational transfer is the primary end objective of the program, diluting the focus from the primary regulatory objective of the program. This disjoint has led to a program that is not tailored to the need to obtain energy impact behavior change information from the participating students or their parents, preventing Duke from accurately monitoring program progress or effectiveness. The program is essentially structured to be an educational program that has the potential to produce savings, but documenting that potential or setting management, progress or financial benchmarks necessary to track savings are not placed at a level of importance necessary for an energy saving program. Within a regulatory environment, utility energy efficiency portfolio structures that focus resources on efforts that provide least-cost, cost effective energy supplies equitably across multiple market sectors, all programs should be established in a way that allows Duke to maintain an accurate understanding of the program’s energy impacts. As a result, this program’s operational environment and supportive tracking

mechanisms needs to be adjusted so that the focus of the program, particularly in the eyes of the people responsible for delivering on those objectives, is on obtaining installed actions and achieved behavior changes providing cost effective energy resources via an educational framework. At the same time the program should maintain an educational focus associated with meeting the educational objectives of the program administrators who approve the program, the teachers responsible for supporting and fielding the program, and the student's need for a high quality energy education.

We do not suggest that this is an easy objective. TecMarket Works understands that the more the program pushes the educational community toward obtaining installed actions or behavior changes, potentially the less support the program will enjoy from that community. The program must, after all, work within an educational community in which education is the primary objective. We do not suggest that the educational community will implement the program so that Duke Energy can accomplish its regulatory-focused EBT objectives. Such a concept would not be received well within the educational community. Nor do we suggest that the educational community will agree to produce specific levels of energy savings within the homes of their students. However, we do recommend that the program implementers understand that the program inclusion within the Duke Energy portfolio is dependent on acquiring net cost effective energy savings when compared to the program's cost. While educating children about energy in general and specify about how to become more energy efficient is an admirable objective, and is one supported by Duke Energy and the educational community, this objective falls short of being the program's primary objective. Thus there is a need to have not only Duke Energy focus on the primary program objective, but also have the program contractor also focus on that objective and established program designs and operational practices that place this objective as the primary objective, and incorporate program progress and monitoring systems that are both reliable and allow both Scholastic and Duke Energy to monitor monthly or quarterly progress toward that objective.

The program is not far from this objective now, and requires only a few modifications to move the installation and behavior change objective up to be the primary objective. However, we are not suggesting that this program adjustment is an easy one, or that it has yet to be explored by the Duke Program Manager. The Duke Program Manager is already keenly aware of the need for the program to be cost effective and provide new net energy resources within the Duke portfolio. However, interviews with the Scholastic Program Manager suggested a struggle with this objective and a need to compromise with schools and teachers so that the program has the appearance of supporting the educational objective more than the installation and behavior change objective. This is understandable in view of the different organization objectives between Duke Energy, Scholastic and the school districts targeted by the program.

However, in examining the program's operations, TecMarket Works found the single most important effort associated with the program's ability to track and document actions taken (the survey of actions taken by students and parents) and achieved savings to be one of the least important efforts for the schools and the teachers responsible for obtaining that information and delivering it to Duke Energy. As a result, Duke should restructure the program so that the delivery of the energy action information collected from students and parents is one of the key operational performance criteria on which receipt of the payments to the program administer is

based and is one of the key criteria on which incentives to schools and teachers is structured. This can be established as an operational reward for meeting the threshold rather than a penalty for non-performance. Duke should establish a minimum survey return rate for identifying behaviors and actions taken, and then set incentives to reward high-performance so that the higher the survey return rate achieved, the larger the program payments and incentive received. TecMarket Works suggests that the survey return goal be set at 80% of households to receive full incentive, with a 50 percent return rate for receipt of a survey return incentive.

These incentives should also be calibrated so that the program is cost effective, with higher payments conditional on energy implementation actions taken by impacted customers. Duke Energy should identify a set of survey response and behavior change and actions taken metrics and use these metrics as one of the key criteria for assessing the performance of the program and the delivery of that program by the program administrator. The success of the program rests on net energy savings acquired. The actions that are needed to deliver on this objective should be the key monthly or quarterly performance success indicator for both Duke Energy and Scholastic.

Successful Program Roll Out

From the program information reviewed by TecMarket Works, the interviews with the Duke Energy and Scholastic Managers, as well as the surveys with participating teachers, the program is being effectively organized, fielded and operated, and is well received by the schools and teachers. There appears to be a well-structured operational approach that has successfully rolled out the Ohio program in March of this year, and a program service delivery that has already begun to acquire energy savings. This is a significant accomplishment and reflects well on Duke Energy, Scholastic, and the ability of the service providers to design and launch services within an environment from which change in structured curriculums typically take substantial amounts of time to acquire. The elementary school educational system is one that is guided by standardized curriculums developed, reviewed and modified over the course of several years. Designing, embedding, and delivering services successfully within this environment in such a short period of time reflects well on all parties involved. The surveys with the teachers indicates that the program's materials were designed in a way that they could be integrated into the curriculum and into the teacher's individual approaches within their ability to tailor that approach. While several teachers noted that they would like to see changes in the materials and in the interactive approach (see teacher and TecMarket Works recommendations in this report) the program's materials and approach was successfully implemented. The focus of management's efforts can now turn to fine-tuning the program's operations, improving the interaction with teachers and schools, adjusting program materials to focus more on program objectives, developing end-result incentives and compensation structures and developing a progress tracking system that focuses on key metrics.

Targeting and Enrollment of Schools and School Districts

The program targets all schools within Duke's territory. The two targeting criteria are:

1. Location of the school(s) within Duke's Energy's service territory.
2. The school(s) has to have an account with Duke Energy.

However, Duke Energy and Scholastic have structured the outreach and enrollment efforts more strategically than these two criteria suggest. Early in the program development process, the schools and schools systems operating in Duke Energy's territory were prioritized, placing the largest districts and schools at the top of the list. The outreach and enrollment efforts then focused on the largest schools, many of which were large enough that they had assigned Business Relationship Managers. These Business Relationship Managers were effectively used to help gain access to school administrators who must approve of the program's integration within the grade-level curriculum associated with each school. As contact was established with the larger schools, successful enrollments began to be captured. The program then moves down the priority list, taking into account location and effective time-use considerations, and begins working to contact the rest of the schools. This allowed Scholastic and the Duke team to contact schools first targeting the size of the school but not bypassing smaller schools that were easily reached within this targeting approach. This is a good strategy and this process is continuing.

In addition to these efforts, Scholastic provides direct mail pieces to the teachers within the district presenting the program and the program materials. TecMarket Works does not recommend mass marketing approaches aimed at convincing schools to come to the program for voluntary enrollment. However, the use of limited mass marketing might be effective at making parents, teachers and school administrators aware of the program and to help establish a market pull component in addition to the current market push initiatives currently used. Mass marketing is expensive; however, radio and TV stations have a public service obligation that makes it possible for short spots to be developed inexpensively. Radio and TV stations also air public interest stories and conversations when they think there is some level of interest for that information. In addition, newspapers, especially local newspapers, often desire local stories to add to their papers. With the keen public interest on climate change and carbon reduction, and public interest in controlling utility costs and plant construction, it may be possible to inexpensively provide a coordinated set of mass market efforts that can be used as market pull strategies that work in conjunction with the program's direct personal contact with the schools and targeted follow-up communications and relying only on the teachers to reach the students and their parents.

Under a well-structured program design that is supported by the schools and teachers, the students themselves can be effective at reaching their parents to inform them about the program. The use of mass media, to the extent possible within program resources, can amplify the student-parent efforts and act as market pull initiatives to pre-dispose school administrators and teachers to the program prior to program contact. The program must be effective at reaching parents and gaining their support and participation for the program to be cost effective from an energy savings perspective. However, the design of the program must engage the child-parent relationship in a way that makes energy efficiency communications and behavior change possible. The examination of the program materials and communication strategies and systems is beyond the scope of this evaluation. However, TecMarket Works encourages Duke Energy and Scholastic to make sure that the communications systems between the teacher, the student and the parent are expertly incorporated into the materials, presentations and operations of the program. The program's strategy to reach 70,000 households via the teacher-student-parent relationship is aggressive. However, according to the Duke Program Manager, this objective is based on the need for a specific level of energy savings needed to support the program's costs. TecMarket Works makes no specific recommendations for these teacher-student-parent

communication strategies at this time. However, TecMarket Works finds that the targeting approach used to prioritize and contact schools and school districts to be an effective approach. TecMarket Works provides no recommendations for changes to this approach. Further, TecMarket Works agrees with the expressed opinion of the Duke Program Manager that the ability of the program to rapidly and effectively reach key school and school system decision makers and gain their support is critical to the success of the program. The targeting approach used by Duke Energy and Scholastic is structured to maximize that contact.

Duke Energy has set a goal of gaining program participation from at least 50 percent of the schools in their service territory within the programs initial offerings. In view of the need to independently and sequentially convince each district and school to participate, and incorporate the program's messages within the teaching schedule, this is an aggressive goal. The evaluation did not include assessing the pace of the enrollment process or the number of homes included in current efforts or homes capable of moving through the participation pipeline during the initial offering. However, Duke Energy is monitoring progress toward this objective.

Defining and Tracking Success

As noted earlier in this report, the program's goal is to gain participation from 50 percent of the schools, reaching 70,000 homes during the initial offering. Also, as noted earlier, there is a lack of an approach for tracking actions taken or behaviors modified as a result of the program. These are the most important outcomes of the program that lead to energy savings, but these issues are covered in other sections of this report and do not need to be repeated here. However, TecMarket Works suggests that the most important indicator of success must not be the percent of schools reached or the number of households represented, but the amount of energy projected to be saved as a result of the actions and behavior caused by the program. TecMarket Works recommends establishing a per student energy savings objective based on the anticipated actions taken and behaviors influenced by the program, and set monthly or quarterly ex post energy saving objectives and plot program performance against those objectives. The primary method of tracking progress can be the surveys of actions taken provided by the students and parents. These data can be entered into a progress-tracking database so that ongoing energy impact performance can be monitored.

In tracking progress, it is not necessary to adjust saving projections based on the address of the impacted household. While some student's homes may not have a Duke Energy Account and attend a school that does, the savings from these homes should not be subtracted from the projected savings achieved by the Duke program. In the opinion of TecMarket Works, these savings should be fully credited to the Duke Energy Program. The reasons for this recommendation is that as the state moves toward a more comprehensive energy efficiency framework, covering all parts of the state, the spillover savings that are observed in a non-Duke Energy territory home will be offset by savings caused by other programmatic efforts outside of Duke Energy's territory that do spillover into Duke's territory. The net difference as a result of these adjustments will be minimal, yet the efforts needed to track each student's address to adjust savings based on the position of that address within Duke's territory will increase both program costs and evaluation costs with little net savings impacts to justify these expenses. TecMarket Works recommends that savings from the program be tracked as a function of participant's actions rather than the address of the participating student's home.

Teacher Training Support

The program has developed a multi-step teacher-training program to help assure that the program materials are well understood and that the program is effectively presented. This training approach includes:

1. Presentations and discussions by Scholastic personnel, a training kit sent to each teacher with training materials and presentation information, coupled with a website that presents the program and describes what it does and how it works.
2. A teacher workshop that goes over and discusses all materials and approaches.
3. In-school presentations during which live demonstrations of the materials are presented and discussed.
4. Program customer service support line that teachers can call to obtain added support and information for specific issues.

In addition to these training services, the Scholastic team maintains e-message boards and e-mail support to the teachers and attends many of the teachers meetings and school meetings in which the programs is discussed. Scholastic also makes their four program coordinators available to the teachers and the schools to address any issues or questions that arise across the implementation process. These coordinators report their actions and contacts to the Scholastic Program Manager each week.

From the perspective of the Duke Energy and Scholastic program managers, these tools work well and meet the majority of training needs. Scholastic is responsible for the development of the training and training materials and coordinates with the Duke call center to help Duke train the call center staff so that they can address issues that are brought to the call center. If the call center cannot address an issue, they refer the caller to the program manager for assistance. This training seems to function well with teachers reporting that they appreciate the training and assistance provided.

Monthly Budgeting and Reporting Requirements

One of the programmatic conditions identified during the process evaluation was the number of budgets under which the program operates. According to the results of the management interviews, the program is operating under multiple sets of operational and reporting budgets that must be tracked and updated each month. It appears that the program operates under 10 different budgets across the Duke territories. Questions to the Scholastic Program Manager confirmed that they have two budgets per year for each state, totaling 10 operational budgets that must be tracked and updated each month. TecMarket Works inquired into the amount of management time that was spent tracking the 10 different budgets each month. The manager was not sure of the total amount of time spent tracking the 10 budgets, but did indicate that a significant amount of program resources are spent tracking the 10 monthly budgets and reporting line item expenditures and changes to those budgets. TecMarket Works did not examine these budgets or assess the need for the maintenance of 10 different budgets each month and is not in a position to determine the need for or adequacy of these processes within an early feedback process evaluation. However, TecMarket Works recommends that Duke Energy review their budgeting, budget tracking, and reporting requirements to see if the process can be streamlined without impacting management monitoring, cost control, or oversight responsibilities. The regulatory

process often requires a state-specific, program-specific monthly accounting and reporting effort, and utility companies have an obligation to provide adequate oversight for their programs. These conditions set the requirements for monthly expenditure tracking and progress reporting. However, we agree that the process needs to be as streamlined as much as possible while meeting the regulatory and management requirements of energy efficiency programs.

Results from the Interviews with the Teachers

The Interviewed Teachers

Ten grade school teachers were interviewed about their experience with and use of the Get Energy Smart program. Six of the teachers identified themselves as science teachers, and all ten teach elementary school children in grades 1-5 and utilized the Get Energy Smart curriculum.

Program Objectives

All ten teachers surveyed agreed with and supported the program's objectives. However, none of the teachers interviewed were presented with the program objective of cost-effective energy savings; or if they were, they did not fully understand these objectives well. Every teacher surveyed identified the objectives of the program as teaching children to conserve energy and resources, and six of the teachers identified the program's lessons as going further than the student and informing the students' parents about energy-saving opportunities. Five of the teachers (half) indicated that the objective was to get students and parents to use the energy efficiency actions. This is probably the closest to the actual goal of the program, but still misses the primary program goal – cost effective net energy savings. The objectives of the program and the reason the program is funded by Duke Energy is first and foremost to cost effectively reduce energy consumption in the homes of the students. This goal is to be reached via the educational components of the program. All interviewed teachers expressed an opinion that the goals of the program were educational rather than achieving cost effective energy resources. It is good that the teachers understand the importance of reaching the goals via the educational process, but the education is the route by which the program's goal is to be reached. The program needs to focus on making sure the schoolteachers and administrators understand that the objective is energy savings, while the tool to allow this to occur is through the educational process. The program needs to be sensitive to the objectives of the teachers and focus on the education aspects of the program and not necessarily the program goal of energy savings. However, the teacher should clearly understand that the success of the program and its continued operations is based not on the educational accomplishments of the program, but on the educational processes' ability to produce cost effective savings.

Program Timing

Teachers who have a more flexible curriculum and greater autonomy in their classroom found the program to be useful within their established curriculum, however, those without a flexible curriculum found the Get Energy Smart Program difficult to integrate into the state's certified curriculum. In addition, the timing of the program near the Ohio Achievement tests was a challenge for some teachers.

Definition of Success

Half (5) of the teachers defined success in the program as having students become aware of energy-saving strategies in their home, and four teachers said that having students actually use those strategies in real life would define success. One teacher defined success as having the families of her class fill out the form and return them to Duke Energy. Nine out of ten teachers said they thought the school administration would view success in the same way as they did as teachers. One teacher said that the school administration would have a different definition of success than the teachers. In that case, the teacher's definition was based on real world use while

the administration's definition would be based on test results. None of the teachers or administrators interviewed identified the production of net cost effective energy savings as a program goal.

Communication Between Teachers and Parents

Most communication between teachers and parents was achieved through the students. Teachers who collected the completed surveys from students reported a high rate of participation from the parents in filling out the survey. Three teachers offered an incentive such as candy or gum to students to return the completed surveys. One suggestion from a teacher who did not collect completed surveys was for Duke to include envelopes or even stamps with the energy survey so that the families could easily return them at no cost.

Communication Between Teachers and School Administration

Six of the ten teachers reported that they had no or very little interaction with the program's administrator. One teacher received the program materials from the program's administrative manager, and three others attended a presentation at the school provided by the program administrator. Only one teacher that had received the program materials directly from the program administrator reported that they had had some level of discussions about the program and the program's goals and procedures with the program administrator. There is a need to increase the level of interaction between the program's administrator and the teachers responsible for program delivery so that the goals of the program can be shared with the teachers and to obtain stronger support for those goals.

Communication Between Teachers and Duke Energy

Communication between Duke Energy and the teachers was minimal. Three teachers attended program presentations at their school in which Duke representatives were in attendance. However, none of the others had any contact with Duke Energy staff prior to or during the program. All ten of the teachers indicated that the program's objectives and activities were easily understood from the materials provided and no extra training was needed, however, as noted earlier, this exchange was not effective at communicating the program's primary goal to the teachers. Several teachers indicated that more communication from Duke Energy may increase teacher participation levels. However, it is not clear that presentations by Duke staff will have an effect on teacher support or participation, or be more effective at causing teachers to better understand the program's goals. What is clear is that there is a need to better communicate the programs goals to the teachers so that the goal may be more effectively focused on by the teachers, and this may be effectively accomplished via the program administrator who is most in contact with the school administrators and teachers.

Participation Levels from Teachers

The interviewed teachers had several suggestions to increase the participation levels. Three teachers said that *"a box just showed up at my room,"* indicating that they were expected to assess the package materials, buy into and support the program's objectives, and effectively implement the educational efforts designed to achieve the net energy resource goal. This is probably asking too much from a teacher already pressed by an inflexible curriculum and may be too much to ask of teachers in general. Two of those teachers also noted that they saw several unused program boxes at their schools and were unsure of their function or purpose. More direct

communication with teachers beforehand from the program administrator or the Duke Energy program manager with the school administrators and teachers was the most commonly cited suggestion from the interviewed teachers for ideas that would increase participation. The amount of time available to the teachers for the program's educational message was cited three times as an impediment to teacher participation. These teachers reported that they could not fit the curriculum into their lesson plans because of the Ohio Achievement tests (for 4th graders) competed for the same time block. Other teachers reported that the program's curriculum came to them too late in the year to be effectively integrated into the class schedule. Other suggestions provided by the teachers included:

- Integrating the program more closely with the state's educational standards.
- Arrange to have the energy kits distributed earlier, more closely to the Christmas break to compensate for the need to focus on the Ohio Achievement tests in the spring.
- Increase the level of educational and results-related program promotions (flyers, brochures, school examples, etc.) provided to the teachers and school administrators in time to be effectively used.
- Have the program administrator and Duke Energy host a workshop for teachers on the program early in the contact phase. Include presentations hosted by Duke Energy.
- Redesign the materials and activities to make them more teaching-friendly and student friendly by using larger size print and including more pictures.
- Update the program materials to today's standards by adding a multi-media element such as a DVD video or online activity.
- Develop and incorporate a day-to-day educational/activities planner to stretch the impact of the activities out over several days
- Add an incentive for teachers to make the effort worthwhile to the teachers who are responsible for success "because teachers like incentives, too"; the incentive can be cash for the class, class activities, or credits for class supplies or other incentives valued by teachers
- Redesign the website to make it more user-friendly for students and teachers.

Participation from Families

Teachers were asked about ways to improve energy-saving behaviors in the student's homes as well as increase the installation and use rate of measures in the kits. One teacher noted that several of her students' families were alienated by the program's operations by being asked to include their social security number and Duke customer number on their survey. According to this teacher, this requirement substantially limits the number surveys that can be returned. Inclusion of this data on the survey essentially converts the survey from being a program feedback tool, to a financial risk and privacy invasion activity for some of the families being asked to complete them.

One 5th grade teacher reported that she had students who filled out the survey only to receive a letter from the program indicating that they did not qualify for the kit. This was disheartening for the both the teacher and the students who were selectively excluded from the program.

Four of the ten teachers surveyed were at schools that had received presentations from the Duke Energy representative. All four reported that they were pleased with the added dimension the

presentation provided to the program and the enthusiasm it generated for the students. One teacher noted that many of her students showed up for an optional day of school solely to see presenter Michelle White for a second time. While this indicates a strong demand for the presentation, it also suggests that the presentation may not have been scheduled at the best time for the students who did not have to attend the optional day.

During the interview, teachers were asked for their ideas that would lead to increased savings through higher measure installation levels and increased application of energy efficient behaviors. The teachers provided the following suggestions:

- Add a booklet to the course materials for students to take home to work with that would add focus to the behaviors that need to be implemented. This can also focus on measure use and emphasize the benefits to the family, the utility and the world.
- Add an online content component for students to access at home that would focus on increasing key behaviors and measure installations.
- Develop a simple game for the students to play with their family that would reinforce the behaviors needed and the installation of measures.
- Develop a song that students can sing in the class or at home that sends a behavior and use message. "My students respond well to little songs and ditties. We made our own little songs about how to save energy."
- Include a magnet in the package that can be used to send a use or behavior message. "It never hurts to have a magnet in there."
- Schedule a parents' night at the school for a Duke Energy presentation so that the parents and the school can work as a team with the program.
- Include a component in which the students write a report of the use of the kit items and have the program incent the report to make it attractive to students and teachers.

What Works Well

All ten interviewed teachers said that they enjoyed the program and considered it to be successful. Teachers were asked what worked well about the program and what attracted them to it. The most common response was the inclusion of the CFL and other materials for the students to see.

Responses also included:

- "The program materials were very eye-catching and got my interest right away."
- "The programs materials were all put together and ready to go."
- "The lesson plan was just about the right length and ability-level for our class."
- "We found we could tie the lessons in with several subjects. We used math to calculate energy savings over a period of time and also talked about energy's relationship to natural resources in science class."
- "The packet of materials was great. Children love being able to touch and hold things."
- "The lessons were brought down to the right level for my class, and "The Magic School Bus" holds a high level of interest for children."
- "One of my favorite parts was passing the program materials out to the kids and seeing their faces light up. It was a really good thing for me to see."

Areas for Potential Improvements

Most responses for improving the program dealt with the design and layout of the activity sheets, adding more multimedia, and associating the lessons more directly with “The Magic School Bus” and the state standards. Three teachers indicated that adding a video component would be a way to improve the curriculum.

Responses included:

- The materials need to be designed specifically for the children who are to be exposed to them. “The lines of type in some of the materials are too small.
- Make the materials more attractive by using pictures and figures
- Bring out the integration between the Magic School Bus story and the curriculum’s focus and the program’s objectives so that they directly support each other.
- Need to more effectively structure the program’s focus and materials so that it integrates smoothly with the school curriculum that we must follow.
- Develop a 20-minute rainy day program video to use as a supplemental program tool.

Final Report

**Evaluation of the
Non-Residential Smart \$aver[®]
Prescriptive Program in Ohio**

Results of a Process and Impact Evaluation

**Prepared for
Duke Energy**

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August 29, 2010

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Executive Summary

Summary of Findings

This Executive Summary provides an overview of the key findings identified through this evaluation.

Significant Process Evaluation Findings

- The trade allies and commercial customers would like to have the prescriptive program application process available online. This would make the program operate more smoothly for both Duke Energy staff and the Smart Saver[®] partnering trade allies and would speed accessibility to the participation process and eliminate problems with obtaining hard-copy application forms and transmitting them via fax.
- The trade allies are disappointed that Duke Energy's bonus incentive was eliminated as a benefit to these customers because they said that it was an effective selling point for them to use with their customers in terms of return on investment. Trade allies suggest that more net savings can be acquired with the bonus incentive than without it.
- The trade allies would like an increase in collaborative marketing between Duke Energy and the trade allies to raise awareness of the program. To achieve this they suggested that Duke Energy provide more literature on the program to the trade allies and to a list of targeted contacts supplied by trade allies. Several trade allies also would like to see Duke Energy initiate a preferred vendor program for the Non-Residential Smart Saver[®] Program.

Significant Impact Evaluation Findings

- Even though these algorithms are not the source of record for program impact calculations, the measure savings algorithms in the third-party program tracking database contain errors. Program accomplishments should be tracked using measure counts from the program tracking database and unit energy savings from program design calculations contained within DSMore until the errors can be corrected. Duke Energy was aware of this problem, and steps will be taken to correct this issue.
- Customer self-reported fixture watts for new and replaced fixtures are inconsistently reported and proving to be unreliable. We suggest removing this information from the applications to reduce customer burden.
- Energy and demand savings realization rates for kWh and kW for high bay lighting were very close to 1.0, indicating the program planning estimates provide a good indication of average high bay lighting participant savings.