

BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Application of	:	Case No. 13-833-EL-POR
The Dayton Power and Light Company for	:	Case No. 13-837-EL-WVR
Approval of Its Energy Efficiency and Peak	:	
Demand Reduction Program Portfolio Plan	:	
for 2013 through 2015	:	

**APPLICATION OF THE DAYTON POWER AND LIGHT COMPANY
FOR APPROVAL OF ITS ENERGY EFFICIENCY AND PEAK REDUCTION
PROGRAM PORTFOLIO PLAN**

The Dayton Power and Light Company (“DP&L” or “the Company”) hereby submits this application seeking approval of the attached 2013 – 2015 energy efficiency and peak demand reduction program portfolio plan (“Program Portfolio”), pursuant to the Ohio Administrative Code (“O.A.C”) §4901:1-39-04.

I. OVERVIEW OF APPLICATION

1. DP&L is a public utility and electric light company as defined by Ohio Revised Code (“R.C.”) §4905.02 and §4905.03(C) respectively, and an electric distribution utility (“EDU”) as defined by R.C. §4928.01(A)(6).

2. R.C. §4928.66(A)(1)(a) required an EDU, starting in 2009, to “implement energy efficiency programs that achieve energy savings equivalent to at least three-tenths of one percent of the total annual average, and normalized kilowatt-hour sales of the electric distribution utility during the preceding three calendar years to customers in this state.” For the plan period, the savings requirement increases “nine-tenths of one per cent in 2013, and one per cent in 2014 and 2015.” In addition, R.C. §4928.66(A)(1)(b) requires an EDU, to “implement peak demand

reduction programs designed to achieve a one per cent reduction in peak demand in 2009 and an additional seventy-five hundredths of one per cent reduction each year through 2018.”

II. BACKGROUND AND HISTORY

3. O.A.C. §4901:1-39-04 required an electric utility to propose its first energy efficiency and peak demand reduction program portfolio plan by January 1, 2010. DP&L’s first Program Portfolio for 2010 through 2012 as approved by the Commission by Opinion and Order dated June 24, 2009 in Case No. 08-1094-EL-SSO was filed pursuant to O.A.C §4901:1-39-04 in Case No. 09-1986-EL-POR on December 23, 2009 and was supplemented by its Notice of Filing Supplement to Application filed and docketed on July 15, 2010 and July 16, 2010. DP&L’s first Program Portfolio was ultimately approved by the Commission by Opinion and Order dated April 27, 2011.

4. The Company has calculated its energy efficiency savings and peak demand reduction benchmarks in accordance with the requirements of R.C. §4928.66. See *In the Matter of the Dayton Power and Light Company’s Portfolio Status Report*, Case No. 10-0303-EL-POR, Case No. 11-1276-EL-POR and Case No. 12-1420-EL-POR. Collectively, the proposed programs within DP&L’s 2013-2015 Program Portfolio provide significant opportunities for energy and cost savings for virtually all of the Company’s customers and is designed to achieve the statutory benchmarks for peak-demand reduction, and meet or exceed the statutory benchmarks for energy efficiency.

III. OVERVIEW OF PROGRAM PORTFOLIO PLAN

5. The Company’s attached Program Portfolio, which satisfies the requirements of O.A.C. §4901:1-39-04(A), provides detail as to the Company’s proposed energy efficiency and peak demand reduction programs for which DP&L seeks Commission approval. This updated

Program Portfolio seeks to build on the success of the current programs while exploring new ways to help customers save through a proposed Pilot Program. Like the Company's existing plan, this Program Portfolio includes a portfolio of energy efficiency programs which pass the Total Resource Cost test on a portfolio basis.

6. The Company requests that the Commission approve the following residential programs, all of which represent a continuation of programs currently being implemented:

- a. Residential Lighting;
- b. Residential HVAC Rebates;
- c. Residential Appliance Recycling;
- d. Residential Low Income Affordability; and
- e. Residential School Education.

7. The Company requests that the Commission approve the following non-residential programs, again, all of which represent a continuation of programs currently being implemented:

- a. Rapid Rebates (Prescriptive Rebates);
- b. Custom Rebates;
- c. Mercantile Self-Direct Rebates; and
- d. PJM Demand Response.

8. The Company also requests that the Commission approve the following Cross Sector Programs:

- a. Customer Education;
- b. Pilot Program; and
- c. Transmission & Distribution Infrastructure Improvements.

It should be noted that the Customer Education Program is the continuation of an approved program currently being implemented and the Pilot Program is a proposed new program. Further, the Transmission and Distribution Infrastructure Improvements Program is being included in this Program Portfolio pursuant to R.C. §4928.66(A)(2)(d), which permits utilities to count transmission and distribution infrastructure improvements that reduce line losses toward compliance benchmarks.

IV. SHARED SAVINGS

9. The Company is also requesting approval of a Shared Savings mechanism that provides an after-tax net benefit of 87% to DP&L’s Customers and 13% to DP&L, based on the Utility Cost Test (UCT), when the Company exceeds its energy efficiency requirements (kWh) by 15%.

Incremental Energy Savings Achievement	Shared Savings Incentive %
< 100%	0.0%
100%-105%	5.0%
>105%-110%	7.5%
>110%-115%	10.0%
>115%	13.0%

10. DP&L will be eligible for shared savings if it exceeds the benchmarks of R.C. §4928.66 (A)(1)(a) and (A)(1)(b) for a particular calendar year.

11. For utility shared savings purposes, total gross, annualized savings against the benchmark requirements will be used in the shared savings calculation. The following programs will not be included in the calculation of the shared savings incentive: Mercantile Self-Direct,

Residential Low Income Affordability, Pilot Program, and Transmission and Distribution Infrastructure Improvements.

12. DP&L understands that it may only count savings for shared savings one-time (meaning there is no double counting of shared savings) and only in the year in which the savings were generated. In a year in which previous years' over-compliance is used to comply with the benchmarks, shared savings shall be based only on impacts generated in the current year.

13. DP&L may only count savings for compliance one time (meaning there is no double counting for compliance) during the plan timeframe of 2013-2015, but reserves the option of either counting any portion of over-compliance in the year of compliance or banking any portion of over-compliance for use in connection with a subsequent year. To reduce the cost of compliance for a future Program Portfolio, any over-compliance achieved may be carried over to the next plan.

V. COST RECOVERY

14. Pursuant to R.C. §4928.66 and O.A.C. §4901:1-39-07, the Company is authorized to recover the costs of its Program Portfolio. The structure and function of the Company's existing cost recovery mechanism, the Energy Efficiency Rider ("EER"), has been approved by the Commission in DP&L's first ESP Case, Case No. 08-1094-EL-SSO. Since the Company's proposed Program Portfolio for 2013-2015 is substantially unchanged from that which has been implemented since 2009, the EER will continue in substantially the same form. The Company is, however, seeking authority, pursuant to R.C. §4928.66(D) in this proceeding to modify its EER in only one respect. DP&L will timely file its updated EER in a separate docket in the upcoming EER true-up proceeding, without inclusion of any projected shared savings. However,

through this proceeding, DP&L's seeks authority to recover any shared savings resulting from the incentive mechanism described in Section IV above. When and if the proposed shared savings mechanism is approved, DP&L will update its EER within 30 days of a Commission order approving of DP&L's shared savings mechanism to incorporate recovery of shared savings through the EER. Finally, no costs related to transmission and distribution infrastructure projects will be included for recovery through the EER.

VI. WAIVER REQUESTS

15. In its June 17, 2009 Entry on Rehearing in Case No. 08-888-EL-ORD, the Commission directed that savings generated from the programs included in an EDU's plan should be based on a pro rated, rather than annualized, accounting methodology. However, the use of a pro rated accounting methodology creates challenges from a planning and reporting perspective and is inconsistent with a subsequent Commission ruling in AEP Ohio's portfolio plan case (Case No. 11-5568-EL-SSO). The Company notes that with the passage of time and actual experience of the implementation of programs and the manner of accounting for energy savings, the annualized accounting methodology is more practical. In light of these factors, the Company respectfully requests that the Commission adopt a consistent approach here and permit savings resulting from DP&L's Program Portfolio to be based on an annualized savings methodology.

16. O.A.C. §4901:1-39-05(C) requires EDUs to file an annual portfolio status report addressing the performance of all of its approved energy efficiency and peak-demand reduction programs by no later than March 15th of each year. In its January 30, 2013 Opinion and Order in Case No. 12-2266-EL-WVR, the Commission granted all Ohio EDUs an extension to file the annual status reports until May 15, 2013. The extended deadline provides for additional

improvement of the accuracy of the data and the evaluation of program impacts as filed in the annual report, which will also further enable the progress toward statewide efficiency goals. Therefore, the Company respectfully requests the requirements of O.A.C.§4901:1-39-05(C) be waived each year for the duration of the Program Portfolio, and that DP&L's annual portfolio status report filing deadline be extended by two months, until May 15th.

VII. CONCLUSION

17. Based upon this Application and the attached supporting materials, the Company respectfully asks that the Commission approve this Application and issue an Opinion and Order that: (i) approves the Company's Program Portfolio, finding it to be just, reasonable, and consistent with statutory requirements and Commission directives; (ii) approves the use of the annualized savings accounting methodology; (iii) approves the requested waiver of O.A.C.§4901:1-39-05(C), so that the annual portfolio status report is due on May 15 of each year for the duration of the Program Portfolio; and (iv) authorizes the Company to recover all prudently incurred costs identified in the Program Portfolio through DP&L's EER, finding such costs to be just and reasonable.

Respectfully submitted,



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Dayton
Power
and Light

April 15

2013

2013-2015 Portfolio Plan
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Executive Summary

Introduction

In keeping with the energy efficiency goals of Ohio Senate Bill 221, DP&L launched a series of energy-efficiency programs in 2009 designed to help customers save energy and money.

DP&L believes that these efforts to-date have been a success. From 2009 through 2012, DP&L's residential and business programs helped customers save 659,605 megawatt hours of energy,¹ or enough energy to power 54,967 homes for a year. In terms of compliance, DP&L has doubled its 2012 cumulative energy benchmark target.

This updated portfolio plan seeks to build on the success of the current programs and help customers save. Included in this plan is a review of the savings potential within the DP&L service area, cost-benefit analyses, implementation plans for a balanced portfolio of energy saving programs, and an overview of DP&L's evaluation, measurement and verification approach.

In developing this updated portfolio of energy efficiency programs, DP&L had the following goals:

- Comply with Ohio's energy efficiency benchmark targets as outlined in O.R.C. §4928.66(A)(1)(a) and O.R.C. §4928.66(A)(1)(b).
- Develop cost-effective programs that provide value to customers.
- Leverage current program successes and lessons learned since 2009.
- Equitably provide savings opportunities for all customer classes.
- Provide a variety of programs in which customers can participate.
- Deliver quality customer programs that promote customer satisfaction with energy efficiency.
- Promote general market transformation and education to promote energy efficiency.
- Capture savings opportunities that have been identified in the market potential study.
- Implement best practices of other successful energy efficiency programs.

¹ 2012 benchmarks and results are estimated. Actual benchmarks and results will be filed in the 2012 Energy Efficiency and Demand Reduction/Response Portfolio Status Report.



- Partner with collaborative members and other utilities when possible to capture program efficiencies and reach various customer groups.

Historical Savings

Since 2009, DP&L has been implementing its programs as filed and approved in Cases No. 08-1094-EL-SSO and No. 09-1986-EL-POR. Current programs to-date are as follows:

Residential:

- Lighting
- HVAC Rebates
- Low Income Affordability
- HVAC Diagnostic & Tune-Up
- Appliance Recycling

Business & Government:

- Prescriptive Rebates
- Mercantile
- Custom Rebates*

Cross Sector:

- Education, Awareness Building & Market Transformation**

*DP&L's Custom Rebate program includes a government audit program, and partnerships with Montgomery County on its DRG3 program and with the University of Dayton and Vectren Energy Delivery of Ohio (Vectren), the local gas distribution utility, for a targeted business audit and marketing program.

**Education, Awareness Building, and Market Transformation includes a school education program implemented by the Ohio Energy Project and public education campaign activities.



Current savings to-date are as follows:

Year	Incremental				Cumulative				
	SB 221 Benchmark	Energy Benchmark (MWh, MW)	Savings Achieved (MWh, MW)	% Compliance	SB 221 Benchmark	Energy Benchmark (MWh, MW)	Savings Achieved (MWh, MW)	% Compliance	
ENERGY									
2009	0.3%	43,919	115,279	262%	0.3%	43,919	115,279	262%	
2010	0.5%	71,717	179,206	250%	0.8%	115,636	294,485	255%	
2011	0.7%	98,700	179,586	182%	1.5%	214,336	474,071	221%	
2012*	0.8%	112,123	185,534	165%	2.3%	326,459	659,605	202%	
DEMAND									
2009	1.00%	29.6	52.2	176%	1.00%	29.6	52.2	176%	
2010	0.75%	21.6	74.6	346%	1.75%	51.2	91.1	178%	
2011	0.75%	21.2	79.1	373%	2.50%	72.4	121.8	168%	
2012*	0.75%	21.0	52.0	248%	3.25%	93.4	122.4	131%	

*2012 benchmarks and results are estimated. Actual benchmarks and results will be filed in the 2012 Energy Efficiency and Demand Reduction/Response Portfolio Status Report.

Table 1 Savings Results to Date, 2009-2012

Portfolio Planning Process

In developing this portfolio, DP&L undertook a comprehensive approach that considered its own experience delivering energy efficiency programs, an analysis of the potential savings within DP&L's service area, programs currently being implemented by other utilities and cost effectiveness results. The final step of the process was to develop implementation plans for each program that includes a budget, projected savings and a timeline.

During the planning process, DP&L also took into account the program design criteria consistent with O.R.C. §4901: 1-39-03, which include the following:

- Benefits to customer classes and potential for broad participation.
- Non-energy benefits.
- Relative advantages and disadvantages of programs.
- Bundling measures for cost effectiveness.
- Addressing market barriers and market transformation.
- Magnitude of energy and demand savings.
- Equity among customer classes.
- Integration with other utility programs.
- Engaging supply chain and leveraging partners.

Further, DP&L has engaged its stakeholder groups since it launched programs in 2009. In addition, two of DP&L's program implementers are collaborative members: The Ohio Energy Project and Ohio Partners for Affordable Energy.

With regard to the portfolio plan, the energy efficiency collaborative stakeholder group is very familiar with DP&L's current and continuing suite of programs. Since the programs began in 2009, the collaborative has met 15 times and was provided with a program update at each meeting. Potential new programs and recovery mechanisms have also been discussed at meetings. These include home performance, appliance rebates, residential direct load control and shared savings. In addition, informal discussions have occurred during these meetings about other utility programs and their potential value, such as pilot programming.

Beyond the formal collaborative meetings, DP&L held a number of discussions with interested parties regarding this specific portfolio plan.



Summary of 2013 to 2015 Plan

Presented below in Table 2 is a summary of the program energy and demand savings for the 2013 – 2015 portfolio plan. It should be noted that savings values have not been calculated for the pilot program and the T&D infrastructure programs. Savings for these programs will be calculated through evaluation, measurement and verification activities and submitted with the annual portfolio status reports.

Programs	Energy (MWH) Savings				Demand (MW) Savings			
	2013	2014	2015	3-Year Total	2013	2014	2015	3-Year Total
Residential Programs								
Lighting	58,318	55,180	50,573	164,071	5.1	6.5	6.0	17.6
HVAC Rebates	8,884	8,734	8,814	26,432	2.7	2.6	2.7	8.0
Appliance Recycling	3,072	4,216	4,274	11,562	0.5	0.7	0.8	2.0
Low Income Affordability	1,118	1,135	1,083	3,336	0.1	0.2	0.2	0.5
School Education	2,476	2,454	2,377	7,307	0.0	0.0	0.0	0.06
Residential Total	73,868	71,719	67,121	212,708	8.4	10.0	9.7	28.1
Business Programs								
Rapid Rebates	47,180	56,634	54,446	158,260	8.3	10.0	9.6	27.9
Custom Rebates	21,147	25,470	28,144	74,761	3.9	4.7	5.2	13.8
Mercantile Self-Direct	6,862	7,842	8,822	23,526	3.2	3.7	4.1	11.0
PJM Demand Response	-	-	-	-	10.0	6.0	6.0	22.0
Business Total	75,189	89,946	91,412	256,547	25.4	24.4	24.9	74.7
Cross-Sector Programs								
Customer Education	-	-	-	-	-	-	-	-
Pilot Program	-	-	-	-	-	-	-	-
T&D Infrastructure Improvement	-	-	-	-	-	-	-	-
Cross-Sector Total	-	-	-	-	-	-	-	-
Other								
Evaluations, Measurement & Verification	-	-	-	-	-	-	-	-
Other Total	-	-	-	-	-	-	-	-
PLAN TOTAL	149,057	161,665	158,533	469,255	33.8	34.5	34.6	102.8

Table 2 Energy (MWh) and Demand (MW) Savings for 2013-2015 Plan

Presented below in Table 3 is a summary of the program costs for the 2013 – 2015 portfolio plan. Costs include incentives, implementation vendor charges and DP&L administrative costs. Implementation vendors for current programs were selected through a request for proposal (RFP) process, as will be any new implementation vendors.

Programs	Program Costs			
	2013	2014	2015	3-Year Total
Residential Programs				
Lighting	\$ 3,117,293	\$ 3,577,528	\$ 3,072,789	\$ 9,767,610
HVAC Rebates	\$ 2,634,624	\$ 2,674,843	\$ 2,784,246	\$ 8,093,713
Appliance Recycling	\$ 460,957	\$ 695,488	\$ 789,656	\$ 1,946,101
Low Income Affordability	\$ 1,135,023	\$ 1,190,987	\$ 1,249,726	\$ 3,575,736
School Education	\$ 282,139	\$ 307,529	\$ 335,373	\$ 925,041
Residential Total	\$ 7,630,036	\$ 8,446,375	\$ 8,231,790	\$ 24,308,201
Business Programs				
Rapid Rebates	\$ 5,741,569	\$ 7,102,257	\$ 7,131,386	\$ 19,975,212
Custom Rebates	\$ 2,329,870	\$ 2,980,151	\$ 3,427,052	\$ 8,737,073
Mercantile Self-Direct	\$ 625,299	\$ 725,938	\$ 831,519	\$ 2,182,756
PJM Demand Response	\$ 104,750	\$ 36,671	\$ 34,007	\$ 175,428
Business Total	\$ 8,801,488	\$ 10,845,017	\$ 11,423,964	\$ 31,070,469
Cross-Sector Programs				
Customer Education	\$ 788,272	\$ 843,451	\$ 902,493	\$ 2,534,216
Pilot Program	\$ 268,691	\$ 1,044,163	\$ 1,068,326	\$ 2,381,180
T&D Infrastructure Improvement	-	-	-	-
Cross-Sector Total	\$ 1,056,963	\$ 1,887,614	\$ 1,970,819	\$ 4,915,396
Other Costs				
Evaluations, Measurement & Verification	\$ 692,963	\$ 748,400	\$ 808,272	\$ 2,249,635
Other Costs Total	\$ 692,963	\$ 748,400	\$ 808,272	\$ 2,249,635
PORTFOLIO TOTAL	\$ 18,181,450	\$ 21,927,406	\$ 22,434,845	\$ 62,543,701

Table 3 Summary of Program Costs for 2013-2015 Plan



Compliance with Ohio Benchmark Targets

Based on the past performance of DP&L's current programs and the projected performance of the programs in this portfolio plan, DP&L projects that it will exceed the compliance benchmarks of O.R.C. §4928.66(A)(1)(a) and O.R.C. 4928.66(A)(1)(b). Presented below in Figures 1 and 2 are DP&L's projections for energy and demand compared to the benchmarks. Results from years 2009 through 2011 are actual as reported in DP&L's annual portfolio reports. Results from 2012 are estimates. Final calculations for 2012 will be filed in DP&L's 2012 annual portfolio status report.

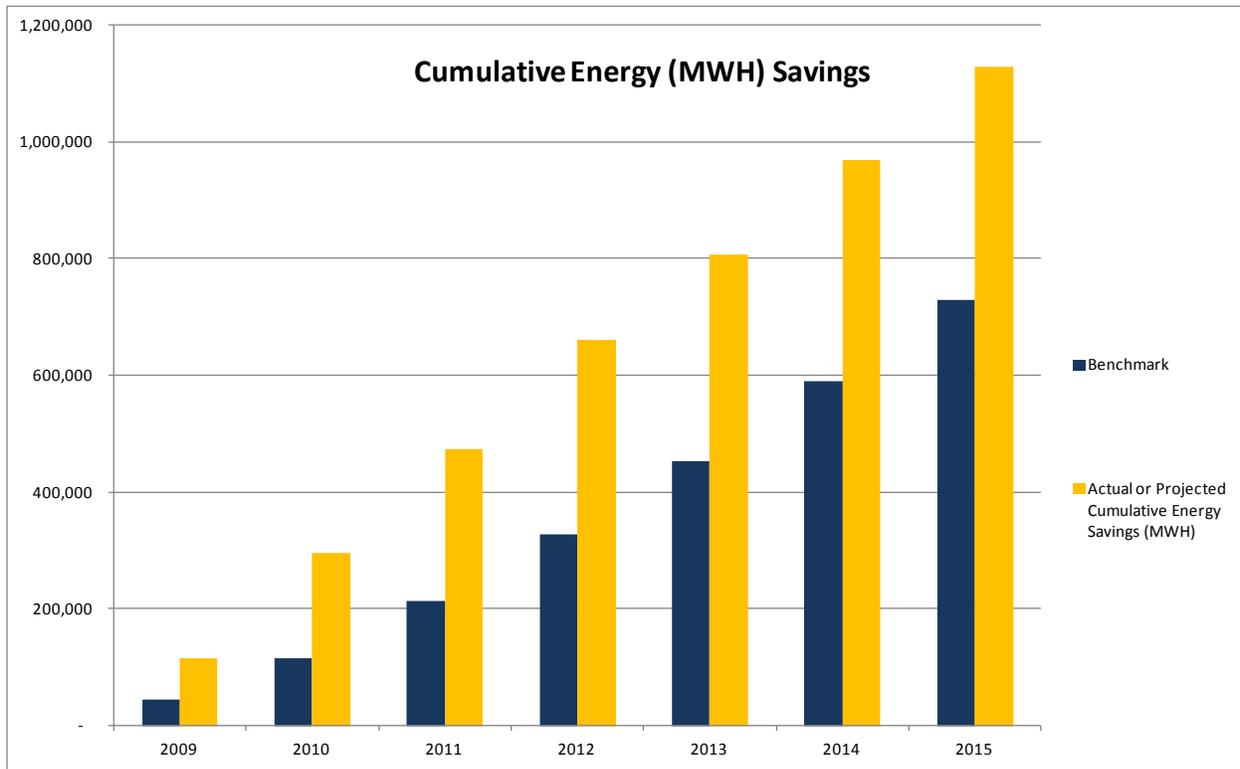


Figure 1 Cumulative Energy (MWh) Savings for 2013-2015 Plan



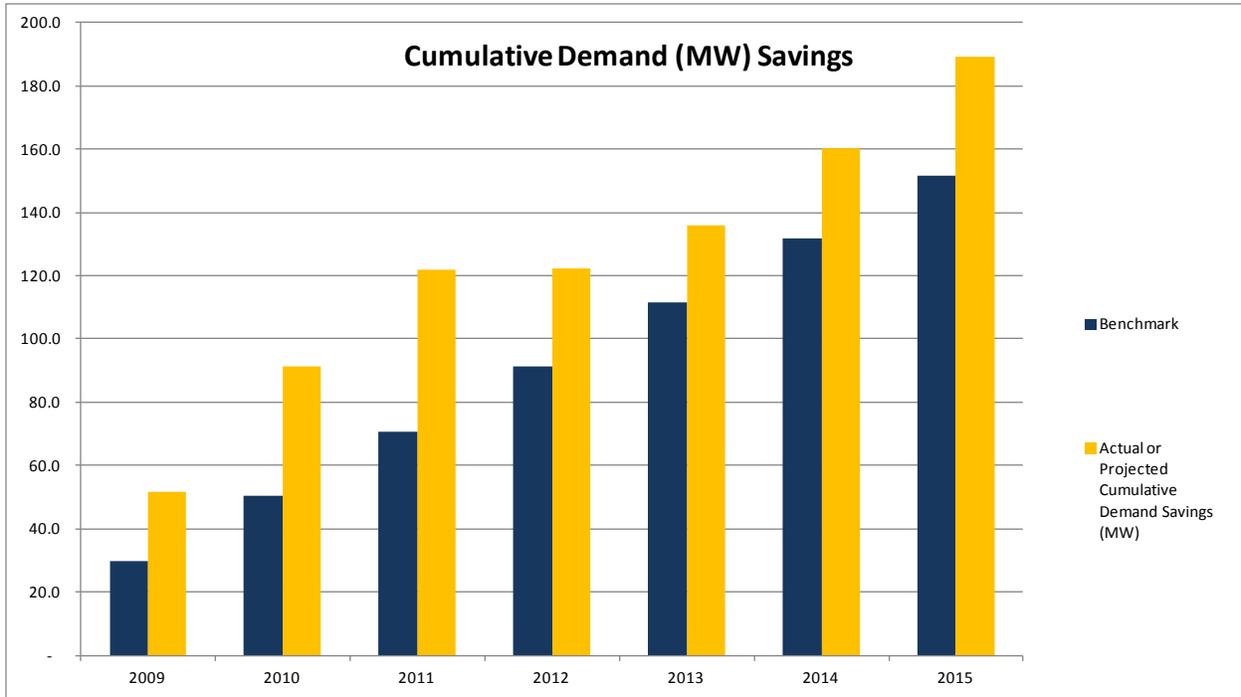


Figure 2 Cumulative Demand (MW) Savings for 2013-2015 Plan

Evaluations, Measurement & Verification

Effective evaluation, measurement and verification (EM&V) play an important role in a quality energy efficiency portfolio. EM&V activities ensure that reported savings are verified, energy and demand calculations are valid, program delivery is effective, customers are satisfied and the overall portfolio is cost-effective.

To date, DP&L's evaluation efforts, in conjunction with its independent evaluator, The Cadmus Group, have been received positively by the state's independent evaluator. In its review of the 2009 evaluations, the state's evaluator concluded, "We have a high level of confidence in this evaluation research..."² Again, in its review of the 2010 evaluations, the state's evaluator concluded, "...we have a high level of confidence in the evaluation findings included in the 2010 evaluation report."³

DP&L is pleased with this positive feedback and believes it is establishing a solid record of program implementation accompanied by an appropriate level of EM&V. Going forward, DP&L plans to follow the same EM&V process that resulted in the positive review by the independent statewide evaluator.

Evaluation activities performed by DP&L's independent evaluator include impact evaluations, process evaluations, tracking system review, savings verifications and cost effectiveness calculations. In addition, DP&L coordinates EM&V activities with the state's independent evaluator, including providing the state's evaluator with an annual evaluations plan for review, survey instruments, and notification of pending site visits. DP&L believes this cooperative approach improves the overall quality and effectiveness of evaluations and plans to continue to work with the statewide evaluator in the future.

² PUCO Case No. 12-0665-EL-UNC, Evergreen Economics "Report of the Ohio Independent Evaluator," page 27.

³ PUCO Case No. 12-0665-EL-UNC, Evergreen Economics "Report of the Ohio Independent Evaluator, page 31.



Cost Effectiveness

In keeping with PUCO rules, DP&L used the Total Resource Cost Test (TRC) as the overall test of the portfolio's cost effectiveness and as a guide to determine the inclusion of programs in the portfolio. Overall, the portfolio is cost-effective as measured by the TRC. In addition, cost effectiveness calculations were performed for the Utility Cost Test (UCT), the Ratepayer Impact Measure (RIM), and the Participant Cost Test (PCT).

For all tests, a program is cost effective when the present value of the benefits is greater than the present value of the costs. What varies among the different cost effectiveness tests is which benefits and costs are included. Using the benefit/cost ratio, an offering is cost effective when the ratio is greater than one.

$$\frac{B}{C} \text{ ratio} = \frac{\text{Present Value of Benefits}}{\text{Present Value of Costs}} \geq 1$$

Total Resource Cost Test (TRC): The TRC measures the benefits of avoided supply costs over the lifecycle incremental costs of the energy efficiency measures and program administrative costs. Unlike the UCT, the TRC considers the full cost of the measure, not just the utility incentive cost.

Utility Cost Test (UCT): The UCT is a valuation of the costs and benefits from the perspective of the utility. It is measured by comparing the value of the supply-side benefits to the incentive and administrative costs associated with the energy efficiency programs. Unlike the TRC, the UCT considers incentive costs as opposed to full incremental measure costs.

Ratepayer Impact Measure (RIM): The RIM is a valuation of the net benefits of the energy efficiency programs from the perspective of the nonparticipants. It is measured by comparing supply-side benefits to the costs of the programs, in terms of utility incentive costs, utility administrative costs and electric monetary savings, or lost revenue from the utility perspective.

Participant Cost Test (PCT): The PCT values the benefits of the programs from the perspective of program participants. It measures the electric monetary savings of the participants as compared to the measures costs net of utility incentives.



	Total Resource Cost Test (TRC)	Utility Cost Test (UCT)	Participant Cost Test (PCT)	Ratepayer Impact Measure Test (RIM)
Residential Programs				
Lighting	3.26	5.67	11.11	0.34
HVAC Rebates	0.43	1.58	1.10	0.38
Appliance Recycling	1.95	1.95	-	0.32
Low Income Affordability	0.49	0.49	-	0.23
School Education	2.43	2.43	-	0.28
Residential Total	1.43	3.13	5.00	0.34
	Total Resource Cost Test (TRC)	Utility Cost Test (UCT)	Participant Cost Test (PCT)	Ratepayer Impact Measure Test (RIM)
Business Programs				
Rapid Rebates	1.21	3.58	2.52	0.48
Custom Rebates	1.93	4.22	4.06	0.51
Mercantile Self-Direct	1.59	6.61	2.31	0.68
PJM Demand Response	-	-	-	-
Business Total	1.41	3.95	2.81	0.51
	Total Resource Cost Test (TRC)	Utility Cost Test (UCT)	Participant Cost Test (PCT)	Ratepayer Impact Measure Test (RIM)
PLAN TOTAL*	1.35	3.18	3.56	0.42

*Costs in plan total include customer education, pilot programming and EM&V.

Table 4 Summary of Cost Effectiveness Scores

Introduction

In keeping with the energy efficiency goals of Ohio Senate Bill 221, DP&L launched a series of energy efficiency programs in 2009 designed to help customers save energy and money. Program offerings are designed to serve all customer classes, including residential, business and cross sector.

For residential customers, DP&L currently offers discounts on compact fluorescents through retailers throughout its service area, rebates on high efficiency central air conditioners and heat pumps, tune-up rebates on existing central air conditioners and heat pumps, and appliance recycling. In addition, DP&L works with collaborative members to deliver low income weatherization and energy education to schools.

For business and government customers, DP&L offers prescriptive rebates on more than 100 measures and custom rebates on an individualized basis. As a part of the custom program, DP&L provides rebates on energy audits for governmental customers and rebates on new construction projects.

To serve both customer sectors, DP&L has undertaken significant efforts to communicate the benefits of the programs and energy efficiency in general through a wide variety of media channels. In addition, to assist with market transformation and education, DP&L now has three-plus years of experience developing relationships with contractors and distributors throughout the area.

DP&L believes that these efforts to-date have been a success. From 2009 through 2012, DP&L's residential and business programs helped customers save 659,605 megawatt hours of energy⁴. This is enough energy to power 54,967 homes for a year. In terms of compliance, DP&L has almost doubled its 2012 cumulative energy benchmark target.

In addition to energy and monetary savings, DP&L's energy efficiency programs have had a positive environmental impact. For instance, saving 659,605 megawatt hours of electricity is the equivalent of the annual greenhouse gas emissions from more than 95,000 passenger vehicles.⁵

This updated portfolio plan seeks to build on the success of the current programs while exploring new ways to help customers save. Included in this plan is a review of the savings potential within the DP&L service area, cost-benefit analyses, implementation plans for a balanced portfolio of energy saving programs, and an overview of DP&L's evaluation, measurement and verification approach.

⁴ 2012 benchmarks and results are estimated. Actual benchmarks and results will be filed in the 2012 Energy Efficiency and Demand Reduction/Response Portfolio Status Report.

⁵ As calculated by the U.S. Environmental Protection Agency's Greenhouse Gas Equivalencies Calculator at www.epa.gov/cleanenergy/energy-resources/calculator.html#results.



Dayton Power and Light Overview

The Dayton Power and Light Company (DP&L) is the principal subsidiary of DPL Inc. As an electric utility, Dayton Power and Light provides service to more than 500,000 customers throughout 6,000 square miles of west central Ohio.

DPL Inc. was acquired by The AES Corporation in 2011. AES is a Fortune 200 global power company. It provides affordable, sustainable energy to 27 countries through a diverse portfolio of distribution businesses as well as thermal and renewable generation facilities. Its workforce of 27,000 people is committed to operational excellence and meeting the world's changing power needs.



Figure 3 DP&L Territory

Dayton Power and Light Facts

Total Customers (As of 12/31/11)	513,383
Residential	454,697
Commercial	50,123
Industrial	1,757
Other	6,806
Total Retail Sales (millions of kWh, 12/31/11)	13,159
Residential	5,257
Commercial	3,208
Industrial	3,313
Other	1,381
Number of Employees (1/1/12)	1,509
Service Territory	6,000 Square Miles
Overhead Line Miles	12,385 Miles
Underground Line Miles	3,451 Miles
Substations	154

Table 5 DP&L Facts



Portfolio Goals and Management

In accordance with O.R.C. §4901: 1-39-04, DP&L is submitting this update to its original energy efficiency portfolio plan. As such, this updated plan seeks to build on the success of DP&L's existing energy efficiency programs, which began in 2009.

DP&L filed its original energy efficiency portfolio plan in October of 2008 and supplemented the plan in July of 2010 as Case No. 09-1986-EL-POR. DP&L's supplemented plan, as modified by the Stipulation filed March 22, 2011, was approved by the Commission on April 27, 2011. The original plan covered seven years (2009 through 2015).

Plan Goals

In developing this updated portfolio of energy efficiency programs, DP&L had the following goals:

- Comply with Ohio's energy efficiency benchmark targets as outlined in O.R.C. §4928.66(A)(1)(a) and O.R.C. §4928.66(A)(1)(b).
- Develop cost-effective programs that provide value to customers.
- Leverage current program successes and program learning since 2009.
- Equitably provide savings opportunities for all customer classes.
- Provide a variety of programs in which customers can participate.
- Deliver quality customer programs that promote customer satisfaction with energy efficiency.
- Promote general market transformation and education to promote energy efficiency.
- Capture savings opportunities that have been identified in the market potential study.
- Implement best practices of other successful energy efficiency programs.
- Partner with collaborative members and other utilities when possible to capture program efficiencies and reach various customer groups.



Management Structure for Energy Efficiency

Responsibility for implementing the energy efficiency programs lies within DP&L's Service Operations division. Currently, there are seven full-time employees in the energy efficiency programs area. Once this plan is fully implemented, DP&L projects there will be 7-9 full-time employees responsible for energy programs.

DP&L's Director of Operations is responsible for the overall plan development, energy efficiency compliance, and the delivery of energy efficiency programs. The Director of Operations reports to the Senior Vice President of Service Operations, who reports to Dayton Power and Light's President and Chief Executive Officer. Reporting up to the Director of Operations is the Manager of Customer Programs, Manager of Evaluations, Measurement & Verification, a Residential Program Manager, two Business Program Managers and a Business Program Analyst.

Program Implementation

For its residential programs, DP&L utilizes third-party implementation vendors and plans to continue to use implementation vendors for future residential programs. DP&L believes that these vendors offer significant value due to their experience running similar programs and their existing relationships with various market participants. Its current vendors were selected through a request for proposal (RFP) process to promote competitive pricing and quality delivery.

For its business programs, DP&L uses its own employees to implement and manage its current programs. DP&L takes this approach, as opposed to hiring an outside implementer, for several reasons. First, implementing programs in-house strengthens DP&L employee knowledge of energy efficiency programs and technologies. Second, it provides DP&L with the opportunity to build relationships with contractor networks and customers, leading to quality customer service. And third, unlike the residential programs, we do not believe that a third-party rebate provider adds significant value at this point. With rebates, for example, potential volume for business customers is lower than for residential customers, and DP&L is able to process this lower volume internally. To supplement its internal resources, DP&L uses external engineering firms to assist with verification audits and engineering consulting on an as-needed basis. Going forward, DP&L plans to continue to implement its business programs internally but will evaluate this approach based on program volume and required knowledge and expertise.

Quality Assurance and Control

A significant element of quality assurance and control is addressed in the evaluation, measurement and verification process section of this plan.

Beyond its extensive EM&V process, DP&L employs additional program controls. For all programs, financial controls are in place, which include documentation requirements for payments, purchase orders to cap properly authorized expenditures, and monthly financial reporting comparing actual expenditures to budgets by program and for the



portfolio as a whole. Program performance, in terms of customer participation, energy savings and demand savings, is also tracked monthly so program adjustments can be made as needed.

For residential programs, a contract has been signed with each implementation vendor that outlines the scope of work, timelines, budgets and terms and conditions that define contract length, conditions for termination as well as other issues.

For business programs, DP&L requires proper documentation in the form of proof of purchase and installation prior to the payment of all rebates. DP&L reserves the right to inspect the installed measure(s) prior to releasing any funds to ensure compliance with program terms and conditions. A verification audit is performed on every rebate greater than \$10,000. Additionally, DP&L audits a random sampling of rebates less than \$10,000.

Tracking Systems, Savings Documentation

Tracking the appropriate data to document savings is an important element of the evaluation, measurement and verification process outlined in this plan. As programs are implemented, DP&L works with its independent evaluator to ensure that data needed to verify savings is being tracked and maintained. Then, annually, DP&L's independent evaluator reviews tracking systems data and savings documentation as a part of its annual evaluation, measurement and verification process.

For residential programs, tracking systems are maintained by each implementation vendor. All tracking systems are electronic and include measure type, purchase and/or installation dates, savings calculations, and customer information when available. Where appropriate, backup documentation exists in the form of receipts and invoices.

For business programs, DP&L tracks savings documentation in-house. Since the inception of its programs, DP&L has provided customers with an online rebate application to capture project data including measures, hours of use, facility type, and customer and vendor information. At the recommendation of the independent evaluator, DP&L enhanced this online application system to include a back-end database that electronically captures all required documentation for each rebate application, including invoices, product specification sheets, calculations and available audit reports. This electronic database system enhances the efficiency and effectiveness with which data can be transferred to the independent evaluator for its review.



Portfolio Plan Development

This section outlines various steps that were taken and elements that were considered during the development of the portfolio plan including the market potential update, various program design criteria, stakeholder participation and alignment with other utility programs.

Market Potential Study

DP&L commissioned The Cadmus Group to update the market potential study it originally developed in 2010. This original study was filed on July 15, 2010 as a part of PUCO Case No. 09-1986-EL-POR. This section summarizes the results of the update.

The updated study analyzed the levels of technical, economic, and realistically achievable potential in DP&L’s service territory for the time period starting in 2013 through 2022. Study results inform energy-efficiency program planning and program design by showing the quantity of available potential and how it is distributed by sector, market segment, and end use.

There are three main types of energy-efficiency potential:

Technical potential assumes that all technically feasible energy-efficiency measures are implemented regardless of their costs or market barriers.

Economic potential represents a subset of technical potential, consisting only of measures meeting cost-effectiveness criteria.

Achievable potential is the portion of long-run economic potential assumed to be reasonably achieved under an acquisition scenario, accounting for barriers to customers’ ability and willingness to participate in utility programs.



Figure 4 Three Types of Energy Efficiency



The original 2010 assessment of energy-efficiency potential involved primary data collection (residential and trade ally surveys) and a comprehensive review of energy efficiency measures. Cadmus assessed technical potential for residential, commercial, and industrial customers. Within each sector, the study distinguished between customer segments or facility types, and applicable end users within each. Cadmus analyzed a list of measures for fifteen residential end users across four segments, ten commercial end users across eighteen facility types, and 13 industrial end users across 13 segments. Overall, the study encompassed over 8,000 permutations of 316 unique measures.

Table 6 shows the number of unique measures and permutations included in the assessment.

Sector	Unique Measures	Permutations Across Segments
Residential	126	1,998
Commercial	174	6,037
Industrial	16	256
Total	316	8,291

Table 6 Number of Unique Measures and Permutations

Primary and secondary data from a variety of sources informed the 2010 assessment. Whenever possible, data specific to DP&L customers were used.

Table 7 summarizes data sources by sector and data category updates used for the 2012 analysis.

Data Category	Residential	Commercial	Industrial	Updated in 2012 Assessment
Baseline Sales and Customers	DP&L Actual - 2012	DP&L Actual - 2012	DP&L Actual - 2012	Yes
Forecasted Sales and Customers	DP&L Forecast	DP&L Forecast	DP&L Forecast	Yes
% Sales by Building Type	Census data	DP&L Customer database	DP&L Customer database	No
End-Use Energy Consumption	Building simulations, Energy Information Administration, ENERGY STAR, etc.	CBECs ⁶	MECS ⁷	Yes, for end uses with new federal standards
Saturations and Fuel Shares	DP&L Residential Appliance Saturation Survey, Lighting Evaluation On-Site Data	CBECs ⁶	--	Residential lighting saturations
Efficiency Shares	Trade Ally Surveys, Secondary Sources, Lighting Evaluation	Secondary Sources	--	Residential lighting efficiency shares
Energy Efficiency Measures	Cadmus measure list, TRM	Cadmus measure list, TRM	DOE IAC Database ⁸	Top 25 saving measures in residential and commercial sectors.

Table 7 Data Sources by Sector

The 2012 assessment relies on much of the primary and secondary data collected for the 2010 assessment. Updates include:

- **DP&L load forecasts:** Baseline forecasts were calibrated to DP&L's 2012 load forecasts.

⁶ Energy Information Administration, Commercial Building Energy Consumption Survey (CBECS), 2003. <http://www.eia.doe.gov/emeu/cbecs/contents.html>.

⁷ Energy Information Administration, Manufacturing Energy Consumption Survey (MECS), 2006. <http://www.eia.doe.gov/emeu/mecs/contents.html>.

⁸ US Department of Energy. Industrial Assessment Centers (IAC) Database. <http://iac.rutgers.edu/database/>.



- **Economic assumptions and avoided costs:** The study used DP&L’s most recent electric avoided costs, as well as other assumptions for economic screening.
- **Treatment of codes and standards:** Federal lighting, water heating, cooling, heat pump, refrigerator, and freezer standards were incorporated into updated baseline forecasts. The impacts of these standards are, therefore, removed from technical, economic, and achievable potentials.
- **Measure cost, savings, and applicability assumptions:** Cadmus identified the top 25 saving measures in the residential and commercial sectors from the 2010 study and reviewed measure cost, savings, and applicability. In the 2010 study, these measures accounted for approximately 71% of residential technical potential and 83% of commercial technical potential.
- **Program achievements:** Cadmus adjusted estimates of energy-efficiency potential to account for DP&L’s PY2010 through PY2012 program activity.

These changes contribute to lower technical potential in residential and commercial sectors.

Table 8 compares 10 year savings, by sector, from the 2010 and 2012 studies.

Sector	Baseline Sales 10-year		Technical Potential - GWh		Technical Potential % of Baseline	
	2012 Study	2010 Study	2012 Study	2010 Study	2012 Study	2010 Study
Residential	5,288	5,867	1,715	2,245	32%	38%
Commercial	3,945	4,391	653	1,055	17%	24%
Industrial	3,643	3,458	406	376	11%	11%
Total	12,876	13,716	2,774	3,676	22%	27%

Table 8 Comparison of 10 Year Technical Potential (GWh)

Two factors drive lower technically feasible savings.

1. **Federal standards:** Federal lighting, water heating, cooling, heat pump, and refrigerator and freezer standards reduced the amount of technically feasible energy efficiency savings available.
2. **Program accomplishments:** Since 2009, DP&L has achieved more than 650 GWh hours of annual savings through its energy-efficiency programs.



Similar to estimated technical potential, economic potential in the 2012 study decreased, as compared to the 2010 study.

Table 9 summarizes cost-effective (economic) energy-efficiency potential from the 2010 and 2012 assessments.

Sector	Baseline Sales 10-year		Economic Potential (GWh)		Economic Potential % of Baseline		Economic as % of Technical	
	2012 Study	2010 Study	2012 Study	2010 Study	2012 Study	2010 Study	2012 Study	2010 Study
Residential	5,288	5,867	801	1,203	15%	21%	47%	54%
Commercial	3,945	4,391	314	810	8%	18%	48%	77%
Industrial	3,643	3,458	403	372	11%	11%	99%	99%
Total	12,876	13,716	1,518	2,385	12%	17%	55%	65%

Table 9 Comparison of 10 Year Economic Potential (GWh)

The decrease in economic potential is driven by the same factors that contribute to the drop in technical potential (codes and standards, program accomplishments). Two additional factors drive the reduction in economic potential, as compared to the 2010 study:

1. **Lower avoided costs:** DP&L's avoided energy costs in 2012 assessment are roughly 33% lower than the avoided costs used in the 2010 assessment. Fewer measures passed the cost-benefit screen with these lower avoided costs, which reduced economic potential.
2. **Updated treatment of commercial lighting:** To account for federal screw base and linear fluorescent lighting standards in the commercial sector, Cadmus treated different lighting technologies separately, as opposed to bundling all technologies into a single measure (the approach used in the 2010). In the 2010 study, the group (package) of lighting technologies was cost-effective. However, in 2012, Cadmus found that while some commercial lighting technologies such as screw base LEDs and high performance linear fluorescents are cost-effective, others, such as High Intensity Discharge (HIDs) fixtures, are not. This led to a reduction in commercial technical potential that is economic (48% in the 2012 study, compared to 77% in the 2010 study).

Achievable Potential

In this study, “achievable” (or “program”) potential has been defined as the portion of economic potential that can be targeted and acquired through DP&L’s energy-efficiency programs, as well as other state and federal energy efficiency programs.

A number of factors account for the gap between economic and achievable potential, including:

- Customer awareness;
- Perceptions of energy efficiency’s value;
- Economic climate; and
- Energy efficiency measures’ first cost.

Cadmus conducted an independent review of 50 electric potential studies, covering 40 states, plus four national studies.⁹ As technical and economic potential can greatly vary based on utility service area characteristics and economic assumptions, the key metric analyzed was the percentage of economic potential deemed achievable. As expected, this percentage varied greatly across these studies, from an average of 40% on the low end to around 80% on the high end. While these studies represent a wide cross-section of utilities and regions, a number of caveats should be considered in applying these numbers to an individual utility:

- **Age of study:** All these studies were conducted between 2000 and 2009, and thus reflect different levels of codes and standards and measure saturations. For example, only recent studies may have accounted for new lighting standards in EISA, which would have lowered potential estimates compared to earlier studies.
- **Location:** Because these studies are taken from across the country, they reflect a range of climates, demographics, and energy prices.
- **Length of study:** These studies typically assess potential over a 10 or 20-year time horizon.
- **Historic DSM accomplishments:** These studies greatly vary in terms of the number of years utilities have been running programs at the time of the study. This can have a large effect on customer awareness, participation levels, and saturation of measures, particularly for low-cost options.

Additionally, energy-efficiency potential studies rely on the best data available at a given time, and the amount of identified potential is subject to change over the planning horizon. Factors that could cause such changes generally fall into three categories:

⁹ The full bibliography of studies is included in Appendix A.

- **Changes in utility forecast data:** These include forecasts of customers and sales as well as energy and capacity costs. Changes in the former two will affect the amount of technical potential available, as a portion of this potential is driven by customer and load growth. Changes in avoided costs will affect economic potential.
- **Changes in measure assumptions and baselines:** In this study, measure savings have been based on current practices, codes, and standards, with costs based on current market conditions. Over time, measure costs may change, emerging technologies may become commercially available, and/or codes and standards may change. Emerging technologies will increase the available potential (though possibly only technical, as they may not be cost-effective) over time, while improved codes and standards will reduce the savings available through utility programs, as more efficient baseline conditions are required.
- **Changes in the economic climate:** At the time of this study, a great deal of uncertainty remains around the rate the local and national economies will recover. Because customers, sales, and energy price forecasts used in this analysis are based on expected trends at the time of the study, deviations from these assumptions could lead to differences in short- and long-term projections. For example, another economic downturn, aside from decreasing numbers of nonresidential customers, and, thus, energy consumption, may limit capital available for energy-efficiency improvements in homes and businesses, and affect DP&L's ability to acquire energy-efficiency resources. Likewise, an economic upswing may provide more opportunities for DP&L to promote energy-efficiency programs.

Due to these uncertainties, and given the wide range of achievability estimates from national potential studies, it is appropriate to consider achievable potential as a range rather than a point estimate. The numbers presented above indicate this available electric potential can be reasonably expected to fall between roughly 40% (low) and 80% (high), with a 60% midpoint as the medium achievable potential.

Table 10 summarizes potential technical, economic, and achievable energy and demand savings.

Potential Scenario	Cumulative Gross Energy Savings at Meter -2022		Cumulative Annual Gross Peak Demand Savings at Meter	
Sector	GWh	Percent of 2022 Forecast Sales	MW	Percent of 2022 Forecast Sales
Residential				
Technical	1,715	32%	345	37%
Economic	801	15%	160	17%
High Achievable	641	12%	128	14%
Medium Achievable	480	9%	96	10%
Low Achievable	320	6%	64	7%
Commercial and Industrial				
Technical	1,059	14%	160	17%
Economic	718	9%	97	10%
High Achievable	574	8%	77	8%
Medium Achievable	431	6%	58	6%
Low Achievable	287	4%	39	4%
Total				
Technical	2,774	22%	505	27%
Economic	1,518	12%	257	14%
High Achievable	1,215	9%	205	11%
Medium Achievable	911	7%	154	8%
Low Achievable	607	5%	103	6%

Table 10 Cumulative Annual Savings – 2022

Total cumulative annual cost-effective (economic) potential in 2022 is 1,518 GWh, which represents roughly 12% of forecast baseline sales, and 257 MW of peak demand savings, which represents about 14% of DP&L's 2022 peak.



Figure 5 and Figure 6 show cumulative annual energy and demand savings for each potential scenario in 2022.

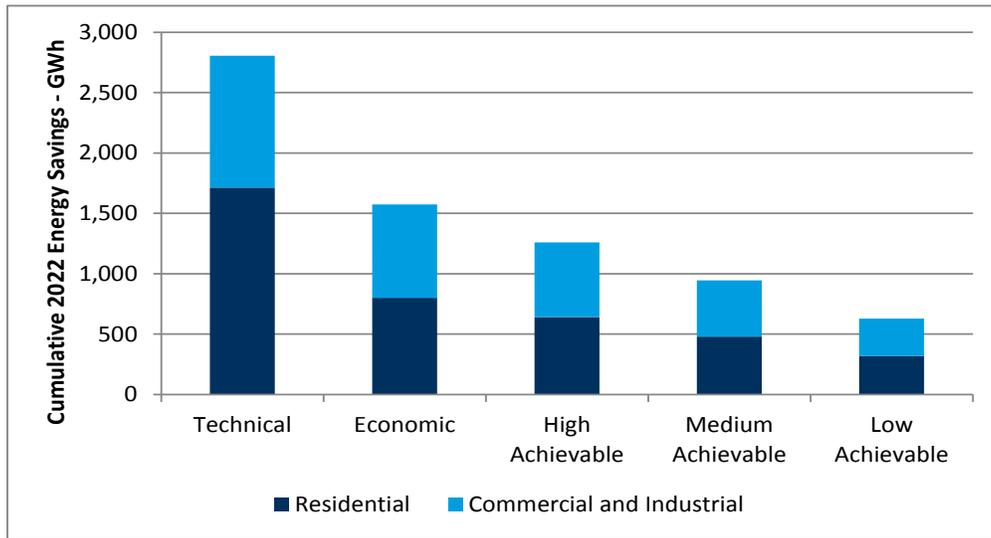


Figure 5 Cumulative Annual Energy Savings - GWh 2022

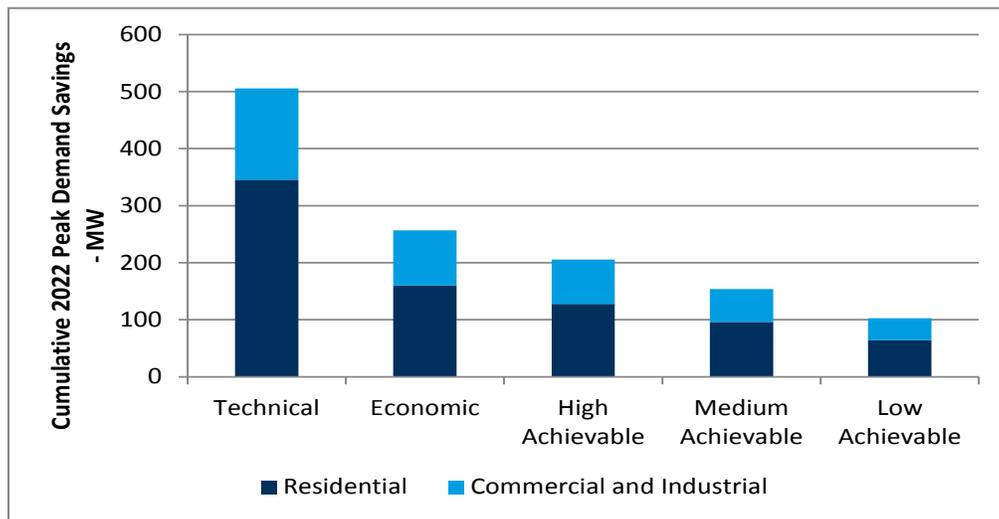


Figure 6 Cumulative Annual Peak Demand Savings - MW 2022

Potential and Ohio Benchmarks

As depicted above, potential savings have declined due to the success of current energy programs and the increased baselines driven by changes in codes and standards. As a result, meeting future Ohio benchmarks will become increasingly challenging based on the current data from the market potential study. Taking the medium achievable scenario and assuming that potential savings are captured in a linear fashion, targets would be achieved through 2018. However, beyond 2018, as the incremental energy benchmark target increases to 2% per year, achieving the benchmarks will become increasingly challenging.

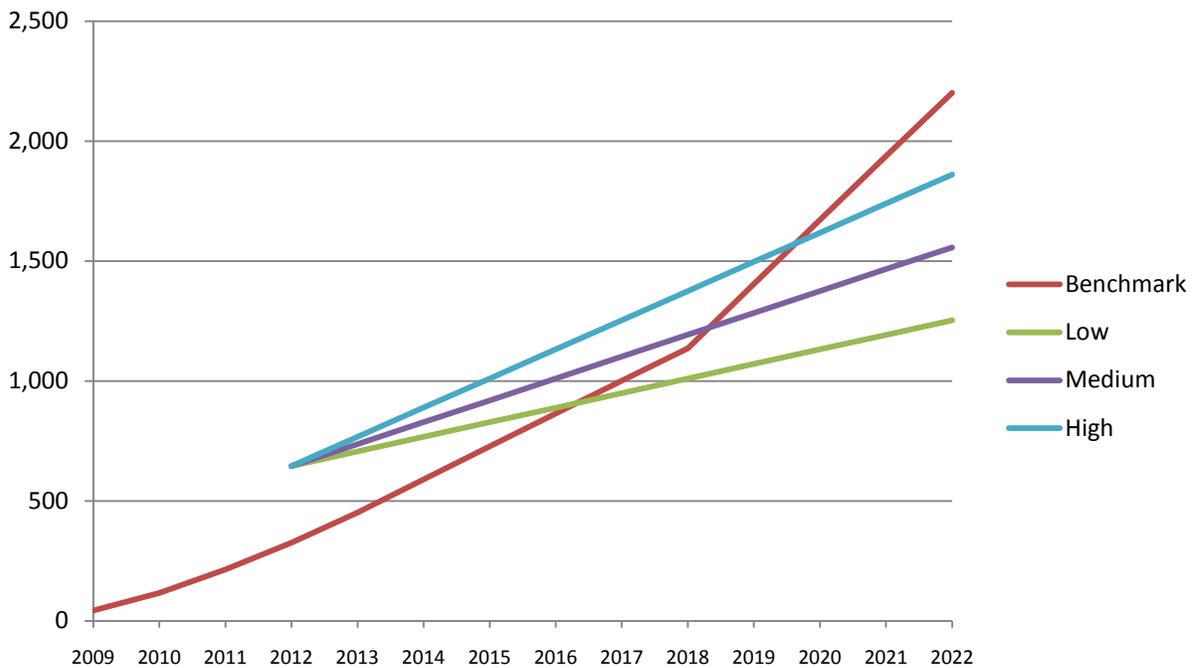


Figure 7 Achievable Scenarios vs. Ohio Energy (GWH) Benchmarks

Note: The achievable potential for each scenario is added to DP&L’s actual, cumulative energy savings as of the end of 2012.



Program Design Criteria

In designing the energy efficiency programs and portfolio as a whole, DP&L took into account the criteria consistent with O.R.C. §4901: 1-39-03, which include the following:

Relative Cost Effectiveness

The primary test used to determine the overall cost effectiveness of the portfolio was the total resource cost test (TRC). Although individual programs are not required to be cost effective, DP&L used the TRC to determine program cost effectiveness as well. The relative cost effectiveness of programs was one of the criteria used in determining the programs to include in the portfolio, although not the only criteria. Other program design criteria include the additional criteria listed in this section.

In addition to the TRC, DP&L also calculated the utility cost test, the ratepayer impact test and the participant cost test at the portfolio level.

A further explanation of the cost effectiveness tests and test data are included in the cost effectiveness section of this plan.

Benefit to All Members of a Customer Class & Potential for Broad Participation

DP&L considered the breadth of potential participation within a customer class. A broader level of potential participation within a customer class provides equity and promotes higher levels of savings.

Magnitude of Energy and Demand Savings

The magnitude of energy and demand savings was taken into account in developing a portfolio that would enable DP&L to reach the statutory benchmarks. The magnitude of energy and demand savings was also taken into account to calculate the cost effectiveness tests, since the greater the savings the greater the benefits. Estimated energy and demand savings are included in each program plan.

Non-Energy Benefits

As stated in O.R.C. §4901: 1-39-04, DP&L's portfolio must be cost effective but individual programs need not be. In accordance with this rule, DP&L considered non-energy benefits beyond cost effectiveness when designing its portfolio. Non-energy benefits include assisting low income groups reduce utility arrears, creating a balanced portfolio that can benefit all customer classes as well as the additional design criteria items listed in this section.



Equity Among Customer Classes

DP&L's portfolio plan seeks to provide equity among customer classes by including programs that can benefit all customer classes, including low income, residential non-heating, residential heating, commercial, industrial and governmental.

Relative Advantages/Disadvantages of Programs

In evaluating programs for inclusion in the portfolio plan, DP&L considered the relative advantages and disadvantage of programs. Advantages and disadvantages considered included potential savings, cost effectiveness, past program successes, and the additional criteria listed in this section.

Integration with Other Utilities' Programs

DP&L currently implements its school education program in conjunction with Vectren, the local gas distribution utility. DP&L also uses the same implementation vendor as AEP and FirstEnergy for the appliance recycling program, which led to the location of the vendor's recycling center in Columbus, Ohio and the creation of new jobs. Using the same implementation appliance recycling vendor has also reduced implementation costs and increased operational flexibility. DP&L has and will continue to integrate programs with other utilities as opportunities arise.

Bundling Measures for Cost Effectiveness

DP&L considered cost effectiveness and developed a TRC score for each program. Programs bundle multiple measures together to create cost effective programs, even though the cost effectiveness of measures within a program varies. Likewise, at the portfolio level, programs are bundled together to provide an overall cost effective portfolio, even though a specific program may not be cost effective.

Engaging Supply Chain, Leveraging Partners

DP&L programs currently engage the supply chain and leverage partners in program delivery. This includes working with lighting manufacturers, area retailers, HVAC contractors and distributors, community action agencies, and commercial and industrial distributors and contractors. These partners are a critical component of the success of the programs. This portfolio plan seeks to continue and build on this success.

Addressing Market Barriers or Failures, Market Transformation

In developing program implementation plans, DP&L considered the program's potential for addressing market barriers or failures in order to deliver energy efficiency to customers. DP&L programs work to overcome these barriers, and transform markets, through economic incentives as well as promotion and education.



Stakeholder Participation

DP&L engaged its stakeholder group with the adoption of its first energy efficiency portfolio plan and has held quarterly meetings of the stakeholder group since it launched its programs in 2009. Meeting topics include updates on program performance, expenditures, evaluation results, program modifications and other topics as requested by collaborative members. In addition, two of DP&L's program implementers are collaborative members: The Ohio Energy Project and Ohio Partners for Affordable Energy.

DP&L also works with its collaborative members outside of the formal meeting process as requested. For instance, DP&L attends events organized by the Ohio Hospital Association to help promote programs in the DP&L area and the value of energy efficiency.

Members of the stakeholder group, also known as the energy efficiency collaborative include representatives of:

City of Dayton	Edgemont Neighborhood Coalition
Greater Dayton Area Hospital Association	Honda of America
Industrial Energy Users	Ohio Consumers' Counsel
Ohio Department of Development	Ohio Energy Project
Ohio Environmental Council	Ohio Hospital Association
Ohio Manufacturers Association	Ohio Partners for Affordable Energy
Public Utilities Commission of Ohio	Sierra Club

The Kroger Company

With regard to the portfolio plan, the energy efficiency collaborative is very familiar with DP&L's current and continuing suite of programs. Since the programs began in 2009, the collaborative has met 15 times and was provided with a program update at each meeting. Potential new programs and recovery mechanisms have also been discussed at meetings. These include home performance, appliance rebates, residential direct load control and shared savings. In addition, informal discussions have occurred about other utility programs and their potential value, such as behavior modification.

Beyond the formal collaborative meetings, DP&L held a number of discussions with interested parties regarding this specific portfolio plan.



Alignment of Programs with Other Utilities

DP&L worked with other utilities in implementing its first portfolio plan and will continue to do so as opportunities present themselves to create program efficiencies and enhance customer service.

In implementing the appliance recycling program, DP&L and AEP selected the same implementation vendor, Jaco. By expanding its footprint in Ohio beyond just one utility, Jaco was able to justify building a recycling center in the Columbus, Ohio area as opposed to using a recycling center out of state, resulting in new jobs for Ohio. The expanded footprint also provides Jaco with more flexibility in scheduling crews for appliance pickups, which enhances customer service.

At the suggestion of the energy efficiency collaborative, DP&L and Vectren have worked together to deliver a school education program that addresses both electric and gas savings. DP&L and Vectren share a number of common customers in the Dayton area, and this combined program creates efficiencies in program delivery and increases the quality of the program for teachers and students alike.

In addition to these programs, DP&L communicates with the other utilities in the state to learn about best practices, other utility programs and common challenges. Beyond Ohio, DP&L is a member of the Midwest Energy Efficiency Alliance (MEEA) and participates in the organization's information-sharing efforts.



Residential Programs

Programs Overview

The following pages contain plans for programs offered to residential customers. These plans are intended to be general implementation guidelines as opposed to specific and detailed operating plans. DP&L has learned through its previous experience that a level of implementation flexibility needs to be maintained to allow for necessary program adjustments.

Expected budgets, participation, and savings have been developed based on past experience, best practices, and implementation vendor projections to demonstrate the expected size and scope of each program. Actual results may vary depending on factors such as customer acceptance, product and technological innovations, changing standards and codes, and evaluation practices.

Likewise, the evaluation plans are intended to provide an overview of the evaluation, measurement, and verification activities that will most likely occur over the three-year portfolio plan period. Detailed evaluation plans will be developed each year to ensure evaluations are following most current evaluation protocols and incorporate any new objectives to help administer the programs more effectively.

Additional information regarding the past implementation and evaluation of existing programs may be found in DP&L's annual energy efficiency and demand reduction/response portfolio status reports.¹⁰

The following are the residential customer programs:

- Lighting
- HVAC Rebates
- Appliance Recycling
- Low Income Affordability
- School Education

¹⁰The most recent portfolio status report is PUCO Case No. 12-1420-EL-POR.



Residential Lighting

Program Description

The Residential Lighting program is an upstream, manufacturer buy-down of efficient lighting, like compact fluorescent light bulbs, sold at the retail level. The program, a continuation from the existing energy efficiency portfolio, will increase the number and variety of energy-efficient light bulbs sold by providing incentives to decrease consumer costs. The program increases consumer awareness and acceptance of energy-efficient lighting technologies and their benefits. Throughout the duration of the portfolio, DP&L will continue to evaluate the addition of efficient lighting products as well as program delivery mechanisms.

Program Objectives

The goal of this program is to sell 4.8 million energy-efficient light bulbs and save approximately 164,071 MWH of energy and 17.6 MW of demand during program years 2013 to 2015. Savings estimates will be calculated in partnership with program implementers and evaluators, and may be influenced by codes and standards, calculations from the Ohio Technical Reference Manual, and ongoing evaluations research.

Targeted Customer Sector

The Residential Lighting Program is designed for all DP&L residential customers who purchase light bulbs through retail channels. All customers taking delivery service from DP&L are eligible for this program regardless of their choice of generation supplier.

Program Duration

This program is designed to run through the duration of this portfolio plan.

Estimated Program Participation Levels

Measure	Incremental Annual Participants			Total 2013-2015
	2013	2014	2015	
CFL General Service	1,324,056	1,677,203	1,509,596	4,510,855
CFL Specialty (Candle, 3-way)	2,100	2,800	2,800	7,700
CFL Reflector	39,816	61,051	67,156	168,023
2x Incandescent	0	60,000	120,000	180,000
Total Efficient Light Bulbs	1,365,972	1,801,054	1,699,552	4,866,578



Program Participation Requirements

Intended program participants are residential customers of DP&L that purchase a qualified light bulb from a participating retailer.

Incentives

Incentives will be offered in the form of a discount at the register at the time of purchase. The decreased cost along with the ease of participation will contribute to influencing customer choice of bulbs purchased.

Marketing Approach

Marketing efforts will include a combination of in-store signage and mass media communications. Marketing materials will promote not only the discount available to customers but the overall savings in energy costs from switching to efficient lighting. In-store, point-of-purchase materials will educate the customer at the time of the purchasing decision. To create general program awareness, mass communications may include radio, print, and web ads, which have been utilized successfully in previous program years.

This product also lends itself well to events at participating retail outlets. Since program launch, DP&L has hosted several live radio remotes at retail locations. These events generate awareness, allow program staff to educate customers one-on-one, and increase purchases of efficient lighting. DP&L will host similar events, as appropriate, throughout the program duration.

Other marketing tactics may include bill stuffers, web pages, and presence at community events.

Implementation Approach

DP&L and implementation partners will negotiate discounts with bulb manufacturers, establish partnerships with retailers, oversee the implementation of cooperative advertising, audit retail outlets to confirm appropriate promotions are being implemented, and track the number of bulbs purchased.

Savings Targets

Incremental Annual Savings				
	2013	2014	2015	Total 2013-2015
Energy (MWh)	58,318	55,180	50,573	164,071
Summer Peak Demand (MW)	5.1	6.5	6.0	17.6



Program Budget

The following budget estimates have been used for planning purposes. DP&L may adjust program budgets as a result of market conditions, participation levels, and EM&V requirements.

Incremental Annual Budget				
	2013	2014	2015	Total 2013-2015
Incentive	\$2,294,833	\$2,545,475	\$2,016,965	\$6,857,273
Marketing & Administrative	\$822,460	\$1,032,053	\$1,055,824	\$2,910,337
Total	\$3,117,293	\$3,577,528	\$3,072,789	\$9,767,610

Participant Costs

Incremental Annual Participant Costs				
	2013	2014	2015	Total 2013-2015
Participant Costs	\$4,070,597	\$5,248,941	\$4,828,265	\$14,147,803

Market Transformation Activities

The Residential Lighting program addresses two primary market barriers that deter customers from switching to efficient lighting: lack of awareness and knowledge of efficient lighting, and upfront cost. Through this program, DP&L will communicate the energy and cost-saving benefits of energy-efficient residential lighting as well as the variety of efficient lighting options available. In addition, program staff will educate customers about how to select efficient light bulbs, considering lumens and degrees Kelvin as opposed to simply wattage. This is of particular importance as lighting standards, defined by the Energy Independence and Security Act (EISA), continue to roll out and the wattage of common and familiar light bulbs is reduced.

The incentive provided will help reduce the upfront cost for customers and facilitate purchases of efficient lighting. The ultimate goal for this program is to create customer demand for efficient lighting and move the market.

EM&V Plan

The impact evaluation approach for Residential Lighting will include: review of the participant database, a review of secondary sources and TRM savings calculations, telephone surveys, on-site lighting inventory, and a cost-effectiveness analysis. The participant database is maintained by the implementation vendor and includes bulb types, package size, wattage, number of packages shipped, assumed wattage replacement and assumed life of bulb. The information will be reviewed for accuracy and reasonableness. The Ohio TRM has been the primary source for calculating savings. However, secondary sources have been referenced and utilized as needed. For example, past evaluation activities have included telephone surveys, on-site lighting inventory and hours of use metering with a randomly selected sample of DP&L's residential population. These data sources provided information such as customer



awareness of CFL's, customer satisfaction and barriers to adoption, penetration and saturation of efficient lighting. Similar surveys will be utilized in future program years if needed.

Cost Effectiveness Results

Benefit-Cost Test	2013-2015 Ratio
Total Resource Cost (TRC)	3.26
Utility Cost Test (UCT)	5.67
Participant Cost Test (PCT)	11.11
Rate Impact Measure (RIM)	0.34

Residential HVAC Rebates

Program Description

The Residential HVAC Rebates program offers rebates for the installation of new or replacement, high efficiency central air conditioning and heat pump systems. The objectives are to increase consumer awareness of energy-efficient products and their benefits as well as motivate customers to purchase efficient HVAC equipment that goes above and beyond the current minimum standard for efficiency.

In 2013, DP&L will ramp-down and discontinue implementation of the existing Residential HVAC Diagnostic & Tune-Up program. This program was designed to obtain energy and demand savings by increasing the efficiency of central air conditioning and heat pump systems. However, due to low program participation and savings, the program will be discontinued during 2013. All program budgets and savings estimates in this document include the Tune-Up program in 2013 but not in 2014 or 2015.

Program Objectives

The goal of this program is to provide rebates for 17,122 new HVAC systems and save approximately 26,432 MWH of energy and 8.0 MW of demand during program years 2013 to 2015. Savings estimates will be calculated in partnership with program implementers and evaluators, and may be influenced by codes and standards, calculations from the Ohio Technical Reference Manual, and ongoing evaluations research.

Targeted Customer Sector

Intended program participants are homeowners or landlords purchasing a new or replacement HVAC unit that will be installed at a residence within the DP&L service territory. All customers taking delivery service from DP&L are eligible for this program regardless of their choice of generation supplier.

Program Duration

This residential HVAC Rebates program is designed to run through the duration of this portfolio plan. In 2013, DP&L will discontinue implementation of the existing Residential HVAC Diagnostic & Tune-Up program.



Estimated Program Participation Levels

Measure	Incremental Annual Participants			Total 2013-2015
	2013	2014	2015	
Central Air Conditioner	2,232	2,302	2,375	6,909
Air Source Heat Pump	1,433	1,488	1,546	4,467
Ground Source Heat Pump	257	267	277	801
Ductless Mini-Split	120	124	129	373
Electronically Commutated Motor	1,450	1,523	1,599	4,572
Total HVAC Rebates	5,492	5,704	5,926	17,122
Total HVAC Tune-Ups	2,500	N/A	N/A	2,500

Program Participation Requirements

Customers must purchase qualifying units through participating HVAC contractors. The customer will receive an instant discount as a line item on the invoice from a participating contractor. Throughout the duration of the portfolio, DP&L will continue to evaluate the addition of efficient HVAC measures as well as program delivery mechanisms.

Incentives

HVAC incentives will be offered in the form of a discount on the invoice from a participating contractor. The decreased cost along with the ease of participation will contribute to influencing customer decisions to move forward with the efficient system installation.

Marketing Approach

The program will be marketed largely through participating HVAC contractors. Since contractors work directly with DP&L customers, they are able to offer rebates at the point-of-sale. Participating contractors are motivated to offer the rebates as a sales tool, providing a discount that a non-participating contractor cannot.

Contractor efforts will be supplemented with direct consumer marketing. Materials will communicate the available discount as well as the benefits of energy efficient HVAC systems. Marketing tactics may include bill stuffers, web pages, mass media advertising, and presence at community events.

Implementation Approach

DP&L and its implementation partner(s) will establish and maintain a participating retailer and contractor network, oversee the implementation of cooperative advertising, audit contractor paperwork, and track the number of rebates issued.



Savings Targets

Incremental Annual Savings				
	2013	2014	2015	Total 2013-2015
Energy (MWh)				
Central Air Conditioner	2,485	2,570	2,656	7,711
Air Source Heat Pump	3,676	3,819	3,715	11,210
Ground Source Heat Pump	1,426	1,481	1,539	4,445
Ductless Mini-Split	268	278	289	834
Electronically Commutated Motor	558	586	616	1,760
HVAC Tune-Ups	471	N/A	N/A	471
Total Energy Savings	8,884	8,734	8,814	26,432
Summer Peak Demand (MW)				
Central Air Conditioner	1.5	1.5	1.5	4.5
Air Source Heat Pump	0.8	0.8	0.8	2.4
Ground Source Heat Pump	0.2	0.2	0.2	0.6
Ductless Mini-Split	.01	.01	.01	.04
Electronically Commutated Motor	0.1	0.1	0.1	0.3
HVAC Tune-Ups	0.2	N/A	N/A	0.2
Total Summer Peak Demand Savings	2.7	2.6	2.7	8.0

Program Budget

The following budget estimates have been used for planning purposes. DP&L may adjust program budgets as a result of market conditions, participation levels, and EM&V requirements.

Incremental Annual Budget				
	2013	2014	2015	Total 2013-2015
Incentive	\$1,675,150	\$1,740,313	\$1,808,012	\$5,223,475
Marketing & Administrative	\$959,474	\$934,530	\$976,234	\$2,870,238
Total	\$2,634,624	\$2,674,843	\$2,784,246	\$8,093,713

Participant Costs

Incremental Annual Participant Costs				
	2013	2014	2015	Total 2013-2015
Participant Costs	\$8,758,679	\$8,871,481	\$9,187,070	\$26,817,230



Market Transformation Activities

The upfront cost required to purchase a new HVAC system is a barrier for customers. The incremental cost required to purchase a system with an efficiency beyond the minimum code is an additional barrier for customers. This program helps ease the cost burden by providing a financial incentive. Since the incentive is only provided for high-efficiency systems, the program is more effective when paired with messaging regarding the energy and cost savings benefits of an efficient HVAC system. Since HVAC contractors work directly with DP&L customers, a goal of the program is to work closely with contractors on how to clearly communicate and properly sell high efficiency systems.

EM&V Plan

The impact evaluation approach for the Residential HVAC Rebate program will include participant billing analysis, engineering calculations and secondary sources, program database review and cost-effectiveness analysis. Savings will be calculated using a combination of billing analyses, engineering calculations, secondary sources and the Ohio TRM. The program database will be reviewed for input accuracy and completeness of data.

The general process evaluation approach will consist of: staff interviews, participant surveys, and/or trade ally surveys (as needed). Staff interviews will focus on program processes and procedures, changes to program design if applicable, training opportunities with customers and contractors, program successes to date and future program challenges.

In the past, telephone surveys targeting stratified samples of program participants were conducted to assess how customers learned about the program, satisfaction with program processes and incentive levels, general information regarding the functionality of replaced equipment, and motivations for replacing existing equipment. Similarly, telephone surveys with participating contractors have been used to understand how well the program is working for their company, their insights into why customers are purchasing high-efficiency equipment, information regarding equipment replaced, and typical business practices. Moving forward participant and trade ally surveys will be used to capture similar information or incorporate new research objectives to help inform program planning as needed.

Impact evaluation for the one year of the tune-up program will include program and implementation staff interviews, engineering analysis, program database review and cost-effectiveness analysis. No process evaluation is planned due to the program ending in 2013.



Cost Effectiveness Results

Benefit-Cost Test	2013-2015 Ratio
Total Resource Cost (TRC)	0.43
Utility Cost Test (UCT)	1.58
Participant Cost Test (PCT)	1.10
Rate Impact Measure (RIM)	0.38

Residential Appliance Recycling

Program Description

The Residential Appliance Recycling program is designed to promote the retirement and recycling of inefficient appliances from households by offering an incentive for turning in working equipment. Appliances are picked up directly from customers' homes and are transported to a facility for recycling. The targeted appliances are refrigerators and freezers, but DP&L may include other appliances as appropriate.

Program Objectives

The goal of this program is to retire 11,775 working appliances and save approximately 11,562 MWH of energy and 2.0 MW of demand during program years 2013 to 2015. Savings estimates will be calculated in partnership with program implementers and evaluators, and may be influenced by codes and standards, calculations from the Ohio Technical Reference Manual, and ongoing evaluations research.

Targeted Customer Sector

The Residential Appliance Recycling Program is designed for all DP&L residential customers with working inefficient appliances. All customers taking delivery service from DP&L are eligible for this program regardless of their choice of generation supplier.

Program Duration

This program is designed to run through the duration of this portfolio plan.

Estimated Program Participation Levels

Measure	Incremental Annual Participants			Total 2013-2015
	2013	2014	2015	
Inefficient Refrigerators and Freezers	3,000	4,275	4,500	11,775

Program Participation Requirements

Intended program participants are residential customers of DP&L who own appliances. Appliances must be standard residential units, from 10 to 30 cubic feet. Refrigerators and freezers will be picked up from any location in the home, including the basement, but there must be a clear path of access. To prove there is energy to be saved, appliances must be plugged in and in working condition at the time of the pick-up.

Incentives

Incentives will be offered in the form of a check mailed to the participating customer.



Marketing Approach

Marketing materials will communicate the incentive available to customers in addition to the long-term energy savings potential from discontinuing the use of an old, inefficient refrigerator or freezer. Promotions will also communicate the environmental benefit of recycling appliance materials and properly disposing of ozone-destroying toxins. Marketing tactics may include bill stuffers, web pages, mass media advertising, and presence at community events, all with the goal of increasing program awareness and customer participation.

Implementation Approach

DP&L will work with an implementation partner that will complete all details of the process including scheduling appointments, picking up qualifying units, and processing payments to participating customers. The implementation vendor will also be responsible for properly deconstructing appliances as well as recycling and disposal of appliance components.

Savings Targets

Incremental Annual Savings				
	2013	2014	2015	Total 2013-2015
Energy (MWh)	3,072	4,216	4,274	11,562
Summer Peak Demand (MW)	0.5	0.7	0.8	2.0

Program Budget

The following budget estimates have been used for planning purposes. DP&L may adjust program budgets as a result of market conditions, participation levels, and EM&V requirements.

Incremental Annual Budget				
	2013	2014	2015	Total 2013-2015
Incentive	\$105,000	\$171,000	\$225,000	\$501,000
Marketing & Administrative	\$355,957	\$524,488	\$564,656	\$1,445,101
Total	\$460,957	\$695,488	\$789,656	\$1,946,101

Participant Costs

Incremental Annual Participant Costs				
	2013	2014	2015	Total 2013-2015
Participant Costs	N/A	N/A	N/A	N/A



Market Transformation Activities

Getting rid of an old refrigerator or freezer can be challenging. Knowing where to take the appliance for recycling is the first hurdle. Then, there are often costs and transportation required. Due to the challenges, many old inefficient appliances simply move to the basement or garage and become second refrigerators or freezers in the home. The appliance recycling program addresses these barriers, providing an easy, no-cost way for customers to dispose of their old appliance. It also provides an incentive payment to customers to encourage them to take action and schedule a pick-up.

EM&V Plan

Evaluations for Appliance Recycling programs differ from most demand side management programs in that savings are incentivized by removing an operable but inefficient measure, rather than rebating a more efficient one. The impact evaluation approach will include a program database review, use of a previously developed regression model to estimate use of removed units, a participant survey, and a cost-effectiveness analysis. Data tracking will be assessed for quality. Participant surveys will be conducted primarily to develop a part-use factor which will then be applied to the estimated use through the regression model. The participant survey will also determine satisfaction, general energy efficiency awareness and performance of implementation vendor.

Cost Effectiveness Results

Benefit-Cost Test	2013-2015 Ratio
Total Resource Cost (TRC)	1.95
Utility Cost Test (UCT)	1.95
Participant Cost Test (PCT)	-
Rate Impact Measure (RIM)	0.32

Residential Low Income Affordability

Program Description

The Residential Low Income Affordability program is designed to identify and implement energy efficiency measures for qualifying homes, thereby reducing the homeowners' electric bill. Home energy audits and inspections will be conducted and cost-effective efficiency measures will be installed. A limited number of health and safety measures may also be addressed through the program.

Program Objectives

The goal of this program is to weatherize approximately 2,689 homes and save approximately 3,336 MWH of energy and 0.5 MW of demand during program years 2013 to 2015. Savings estimates will be calculated in partnership with program implementers and evaluators, and may be influenced by codes and standards, calculations from the Ohio Technical Reference Manual, and ongoing evaluations research.

Targeted Customer Sector

This program is available to low-income residential DP&L electric customers with household incomes up to 200 percent of the federal poverty level. All qualifying customers taking delivery service from DP&L are eligible for this program, regardless of their choice of generation supplier.

Program Duration

This program is designed to run through the duration of this portfolio plan.

Estimated Program Participation Levels

Measure	Incremental Annual Participants			Total 2013-2015
	2013	2014	2015	
Homes Weatherized	853	896	940	2,689

Program Participations Requirements

The program is available to participants with household incomes up to 200 percent of the federal poverty level or who are qualified for one of the following: the Ohio Home Weatherization Assistance Program (HWAP), the Percentage of Income Payment Plan (PIPP), or the Home Energy Assistance Program (HEAP). Eligible households include single-family and multi-family homes.



Incentives

Energy-efficient measures will be installed in customers' homes, at no charge. Property landlords may be required to pay for a portion of the measures installed

Marketing Approach

Program marketing is primarily performed by implementation partners and agencies. As a result, this program requires less direct customer marketing. However, community action agencies may perform supplemental marketing as needed. Marketing tactics may include bill stuffers, web pages, and promotional fliers. Messages will focus on increasing consumer awareness of the services available to them as well as the long-term benefits of energy efficiency.

Implementation Approach

DP&L will work with an implementation partner that will perform home energy audits and the installation of qualified, energy-efficient measures. The implementation partner will ensure that all services, materials, and supplies are of good quality and installed in a professional, workmanlike way, and that all auditors and contractors are trained and certified to complete energy efficiency work. The implementation partner will track the quantity and type of measures installed.

Savings Targets

Incremental Annual Savings				
	2013	2014	2015	Total 2013-2015
Energy (MWh)	1,118	1,135	1,083	3,336
Summer Peak Demand (MW)	0.1	0.2	0.2	0.5

Program Budget

The following budget estimates have been used for planning purposes. DP&L may adjust program budgets as a result of market conditions, participation levels, and EM&V requirements.

Incremental Annual Budget				
	2013	2014	2015	Total 2013-2015
Incentive	\$905,117	\$950,373	\$997,891	\$2,853,381
Marketing & Administrative	\$229,906	\$240,614	\$251,835	\$722,355
Total	\$1,135,023	\$1,190,987	\$1,249,726	\$3,575,736

Participant Costs

Incremental Annual Participant Costs				
	2013	2014	2015	Total 2013-2015
Participant Costs	N/A	N/A	N/A	N/A



Market Transformation Activities

Low income customers often live in inefficient homes in need of upgrades. As a result, energy bills are high and homes are uncomfortable. However, due to financial constraints, customers are often unable to pay their bills or pay for the upgrades needed to reduce energy consumption. By providing no-cost services to eligible customers, this program reduces the homeowners' electric bills and saves them money. The program has the secondary benefit of reducing customer arrearages, which can help save money for all customers.

EM&V Plan

The impact evaluation approach for the Low-Income program will include the following components as needed: engineering analysis, program database review, participant surveys, on-site measure and quality verification and cost-effectiveness analysis. Savings will be calculated based on engineering analyses, data from other sources as well as information from the Ohio TRM. The program database will be reviewed for irregularities in data collection and to ensure that all data needed for evaluation is being collected.

The process evaluation will include participant surveys to collect data regarding participant satisfaction, and document measure installation as well as some potential non-energy benefits. In the past, the low income evaluation included in-depth surveys with agencies and program staff. Moving forward similar in-depth interviews will be conducted with some or all interested program stakeholders.

Cost Effectiveness Results

Benefit-Cost Test	2013-2015 Ratio
Total Resource Cost (TRC)	0.49
Utility Cost Test (UCT)	0.49
Participant Cost Test (PCT)	-
Rate Impact Measure (RIM)	0.23

Residential School Education

Program Description

The Residential School Education program is designed to educate students about energy and energy efficiency, and reduce electricity use of program participants. Take-home energy savings kits are provided to students as well as accompanying classroom curriculum and training for teachers. This program may be delivered jointly with the local gas company in order to educate students about using both gas and electricity efficiently. Kit contents may include:

- CFLs
- Furnace filter whistle
- LED night light
- Foam weather-strip
- Low flow showerhead
- Bathroom sink aerator
- Kitchen sink aerator
- Hot water temperature card
- Energy use gauge thermometer
- Door sweep
- Energy savers booklets
- Flow meter back
- Refrigerator thermometer card

Program Objectives

The goal of this program is to distribute 27,000 take-home energy savings kits and save approximately 7,307 MWH of energy and 0.06 MW of demand during program years 2013 to 2015. Program years run July through June to align with the school calendar. Savings estimates will be calculated in partnership with program implementers and evaluators, and may be influenced by codes and standards, calculations from the Ohio Technical Reference Manual, and ongoing evaluations research.

Targeted Customer Sector

This program is available to school districts in the DP&L service territory.

Program Duration

This program is designed to run through the duration of this portfolio plan.



Estimated Program Participation Levels

Measure	Incremental Annual Participants			Total 2013-2015
	2013	2014	2015	
Energy Savings Kits	9,000	9,000	9,000	27,000

Program Participation Requirements

This program is available to school districts in the DP&L service territory. Energy-savings kits and curriculum are most appropriate for students in grades 5-12. Program participants are asked to complete a survey reporting whether they installed measures in the take home energy savings kits.

Incentives

Take-home kits, curriculum, and classroom materials will be provided to participating schools and teachers at no charge.

Marketing Approach

The program will be promoted to school districts in DP&L's service territory, emphasizing the educational value of the program as well as the availability of the energy savings materials. Marketing tactics may include emails, letters, and personal meetings with curriculum coordinators, principals, or superintendents.

Implementation Approach

DP&L will work with an implementation partner that will develop and maintain relationships with school administrators and teachers. The implementation partner will train teachers, coordinate the distribution of take home energy savings kits, and collect data regarding installation of energy savings measures.



Savings Targets

Incremental Annual Savings				
	2013	2014	2015	Total 2013-2015
Energy (MWh)				
CFLs	219	197	119	535
LED Night Light	28	28	28	85
Low-flow Showerhead	1,059	1,059	1,059	3,178
Bathroom aerators	1,039	1,039	1,039	3,117
Kitchen aerator	131	131	131	393
Total Energy Savings (MWh)	2,476	2,454	2,377	7,307
Summer Peak Demand (MW)				
CFLs	0.02	0.02	0.02	0.06
LED Night Light	0	0	0	0
Low-flow Showerhead	0	0	0	0
Bathroom aerators	0	0	0	0
Kitchen aerator	0	0	0	0
Total Demand Savings (MW)	0.02	0.02	0.02	0.06

Program Budget

The following budget estimates have been used for planning purposes. DP&L may adjust program budgets as a result of market conditions, participation levels, and EM&V requirements.

Incremental Annual Budget				
	2013	2014	2015	Total 2013-2015
Incentive	\$81,077	\$89,185	\$98,103	\$268,365
Marketing & Administrative	\$201,062	\$218,344	\$237,270	\$656,676
Total	\$282,139	\$307,529	\$335,373	\$925,041

Participant Costs

Incremental Annual Participant Costs				
	2013	2014	2015	Total 2013-2015
Participant Costs	N/A	N/A	N/A	N/A

Market Transformation Activities

This program produces measureable energy savings through the installation measures like CFLs and low flow showerheads. However, it is difficult to measure on an absolute



basis the long-term impact of this program since the core and primary motivation is education. The hands-on educational lessons provide an opportunity for students and their families to engage with principles of energy and energy efficiency that will ideally generate awareness and energy-efficient habits throughout their lives.

EM&V Plan

The School Education program impact evaluation will utilize student surveys, which are administered by the program, to verify measure installation, assess baseline usage and summarize behavioral changes. This approach is consistent with previous program evaluations. Participant data will be used to conduct follow-up parent surveys. The follow-up parent survey will determine the installation rate of kit measures after the student survey was completed as well as possible participation in other energy efficiency programs and customer satisfaction. The Ohio TRM and secondary sources will be used to determine deemed savings. In addition simple engineering may be used to determine savings for behavioral changes such as heating/cooling adjustments, water heater temperature adjustment and refrigerator/freezer temperature adjustments. A cost-effectiveness analysis will be conducted.

The process evaluation will consist of interviews with program staff. Program staff surveys will address program processes and procedures, progress on teacher training and the program's effectiveness. These interviews may also address perceived barriers and approaches to overcome as well program successes and future challenges.

Cost Effectiveness Results

Benefit-Cost Test	2013-2015 Ratio
Total Resource Cost (TRC)	2.43
Utility Cost Test (UCT)	2.43
Participant Cost Test (PCT)	-
Rate Impact Measure (RIM)	0.28

Commercial, Industrial, and Government Programs

Programs Overview

The following pages contain plans for programs offered to commercial, industrial and governmental customers. These plans are intended to be general implementation guidelines as opposed to specific and detailed operating plans. DP&L has learned through its previous experience that a level of implementation flexibility needs to be maintained to allow for necessary program adjustments.

Expected budgets, participation, and savings have been developed based on past experience and best practices to demonstrate the expected size and scope of each program. Actual results may vary depending on factors such as customer acceptance, product and technological innovations, changing standards and codes, and evaluation practices.

Likewise, the evaluation plans are intended to provide an overview of the evaluation, measurement, and verification activities that will most likely occur over the three-year portfolio plan period. Detailed evaluation plans will be developed each year to ensure evaluations are following most current evaluation protocols and incorporate any new objectives to help administer the programs more effectively.

Additional information regarding the past implementation and evaluation of existing programs may be found in DP&L's annual energy efficiency and demand reduction/response portfolio status reports.¹¹

The following are the commercial, industrial, and government customer programs:

- Rapid Rebates
- Custom Rebates
- Mercantile Self-Direct
- PJM Demand Response

¹¹The most recent portfolio status report is PUCO Case No. 12-1420-EL-POR.



Rapid Rebates

Program Description

The Non-Residential Prescriptive Rebate Program (Rapid Rebates[®] Program) provides non-residential customers with incentives for new equipment purchases that reduce energy consumption and demand. Technologies that are covered in the program include energy efficient lighting, HVAC, motors, drives and compressed air. Over 100 unique measures are offered through the Rapid Rebates[®] Program.

Program Objectives

The objective of the program is to help business and government customers overcome the upfront cost hurdle associated with energy efficient technologies. The program is designed to provide simple solutions for business customers who want to operate more efficiently. Savings estimates will be calculated in partnership with program implementers and evaluators, and may be influenced by codes and standards, calculations from the Ohio Technical Reference Manual, and ongoing evaluations research.

Targeted Customer Sector

The Rapid Rebates[®] Program is designed for all DP&L business and government customers who purchase new energy efficient equipment through a manufacturer, distributor or contractor. All business and government customers taking delivery service from DP&L are eligible for this program regardless of their choice of generation supplier.

Program Duration

This program is designed to run through the duration of this portfolio plan.

Estimated Program Participation Levels

The following participation levels have been used for planning purposes. Qualifying measures and participation levels may change as a result of technology, changing codes and standards, EM&V results, and customer and supplier feedback.



Incremental Annual Participants (measures installed)				
Measure Category	2013	2014	2015	Total 2013-2015
Lighting	484,261	575,060	546,307	1,605,628
HVAC	471	618	649	1,738
Motors & Drives	620	683	684	1,987
Compressed Air & Other	3,305	4,338	4,555	12,198

Program Participation Requirements

Business and government customers may purchase any brand of equipment from any supplier they choose, as long as the equipment is new and meets the eligibility requirements detailed on the measure lists. Additionally, equipment must use electricity as the fuel source and be replacing existing equipment or be installed as part of a retrofit or new construction project.

Incentives

Incentives are intended to cover the incremental cost associated with moving to equipment with a higher efficiency rating than the available standard efficiency. Incentives may be adjusted at any time, in response to various factors such as customer demand, changing technology, and market price.

Marketing Approach

Marketing methods include publication of program information on the company website, mass media, print literature, bill inserts, inserts in local business journals, presentations at community- and vendor-sponsored events, one-on-one marketing by DP&L major account managers, and the utilization of a Channel Partner network. Channel Partners are contractors, engineers and distributors with energy efficiency experience. They have participated in DP&L rebate workshops and are familiar with using DP&L rebate programs to help customers save money. Channel Partners are viewed as an invaluable third party “marketing extension” of DP&L’s internal group of program managers. They have direct contact with customers on a daily basis and can influence the customer’s purchasing decisions.

Implementation Approach

DP&L plans to continue to implement and manage the Rapid Rebates[®] Program with internal staff. Implementing the program in-house strengthens DP&L employee knowledge of energy efficiency programs and technologies. It also provides DP&L with the opportunity to build relationships with contractor networks and customers, leading to quality customer service. From time to time, DP&L may evaluate this internal



implementation approach based on program volume and required technical knowledge and expertise.

Savings Targets

The following savings estimates have been used for planning purposes. Qualifying measures and associated savings may change as a result of technology, changing codes and standards, EM&V results, and customer and supplier feedback.

Incremental Annual Savings				
	2013	2014	2015	Total 2013-2015
Energy (MWh)	47,180	56,634	54,446	158,260
Summer Peak Demand (MW)	8.3	10.0	9.6	27.9

Program Budget

The following budget estimates have been used for planning purposes. DP&L may adjust program budgets as a result of market conditions, participation levels, EM&V requirements and emerging technologies.

Incremental Annual Budget				
	2013	2014	2015	Total 2013-2015
Incentive	\$4,785,520	\$5,676,095	\$5,469,919	\$15,931,534
Marketing & Administrative	\$956,049	\$1,426,162	\$1,661,467	\$4,043,678
Total	\$5,741,569	\$7,102,257	\$7,131,386	\$19,975,212

Participant Costs

Incremental Annual Participant Costs				
	2013	2014	2015	Total 2013-2015
Participant Costs	\$16,159,231	\$19,645,926	\$19,157,235	\$54,962,392

Market Transformation Activities

Through the Rapid Rebates[®] Program, DP&L will communicate the energy and cost-saving benefits of energy-efficient upgrades to business customers. The program will also inform manufacturers, engineers, distributors and retailers about customer demand and preferences for energy-efficient technologies. These efforts, combined with the financial incentives provided by the rebates, will help to increase demand for energy efficient products.



EM&V Plan

The impact evaluation approach for the Rapid Rebates program will include a database review, site visits/engineering analysis, stakeholder interviews and a cost-effectiveness analysis. DP&L administers the commercial programs in-house and has developed and maintains a customer database. The database will be reviewed to assure appropriate data are being collected. Site visits will be utilized to verify measures are installed and operating. Engineering analysis will be used to calculate energy savings. The Ohio TRM and secondary source savings calculations and assumptions will be used as a reference to calculate deemed savings.

The process evaluation will include the following as needed: stakeholder interviews, participant and trade ally telephone surveys. These interviews and surveys will address program processes and procedures, progress on customer and contractor education, and the incentive mechanism effectiveness. These interviews may also address perceived barriers to overcome as well as program successes and future challenges.

Cost Effectiveness Results

Benefit-Cost Test	2013-2015 Ratio
Total Resource Cost (TRC)	1.21
Utility Cost Test (UCT)	3.58
Participant Cost Test (PCT)	2.52
Rate Impact Measure (RIM)	0.48

Custom Rebates

Program Description

The Non-Residential Custom Rebate Program provides non-residential customers with incentives for equipment purchases and industrial process improvements that reduce energy consumption and demand. Custom Rebates are for equipment that is not covered by DP&L's prescriptive rebate program and is generally best suited for customized industry-specific or facility-specific applications. Energy efficient new construction projects and subsidized facility audits are also included in the Custom Rebate Program.

Program Objectives

The objective of the program is to help business and government customers overcome the upfront cost hurdle associated with energy efficient technologies and to promote innovative and emerging technologies. Savings estimates will be calculated in partnership with program implementers and evaluators, through data-logging of equipment and processes, and may be influenced by codes and standards, calculations from the Ohio Technical Reference Manual, and ongoing evaluations research.

Targeted Customer Sector

The Custom Rebate Program is designed for all DP&L business and government customers who purchase new energy efficient equipment through a manufacturer, distributor or contractor. All business and government customers taking delivery service from DP&L are eligible for this program regardless of their choice of generation supplier. DP&L will explore targeting various customer segments to determine potential savings and develop appropriate targeted marketing efforts. For instance, DP&L will use its customer database and other available sources to identify data centers in the region and follow up with targeted marketing depicting how the custom rebate programs can be used to help a data center save money and energy.

Program Duration

This program is designed to run through the duration of this portfolio plan.

Estimated Program Participation Levels

The following participation levels have been used for planning purposes. Qualifying measures and participation levels may change as a result of technology, changing codes and standards, EM&V results, and customer and supplier feedback.



Incremental Annual Participants (units rebated)				
Measure Category	2013	2014	2015	Total 2013-2015
Equipment/Process Rebates	125	151	166	442
New Construction	10	12	14	36
Facility Audits	60	80	80	220

Program Participation Requirements

Business and government customers may purchase any brand of equipment from any supplier they choose, as long as the equipment is new and meets the eligibility requirements. Equipment must use electricity as the fuel source and be replacing existing equipment or be installed as part of a retrofit or new construction project. Customers must apply for a Custom Rebate prior to beginning their project. The pre-approval phase allows DP&L the opportunity to perform pre-installation auditing (in some cases, metering) of the affected systems.

Incentives

Incentives are intended to cover the incremental cost associated with moving to equipment with a higher efficiency rating than the available standard efficiency. Incentives are limited to 50% of the installed project cost. Incentives may be adjusted at any time, in response to factors such as customer demand, changing technology, and market price.

Marketing Approach

Marketing methods include publication of program information on the company website, mass media, print literature, bill inserts, inserts in local business journals, presentations at community- and vendor-sponsored events, one-on-one marketing by DP&L major account managers, and the utilization of a Channel Partner network. Channel Partners are contractors, engineers and distributors with energy efficiency experience. They have participated in DP&L rebate workshops and are familiar with using DP&L rebate programs to help customers save money. Channel Partners are viewed as an invaluable third party “marketing extension” of DP&L’s internal group of program managers. They have direct contact with customers on a daily basis and can influence the customer’s purchasing decisions.



Implementation Approach

DP&L plans to continue to implement and manage the Custom Rebate Program with internal staff. Implementing the program in-house strengthens DP&L employee knowledge of energy efficiency programs and technologies. It also provides DP&L with the opportunity to build relationships with contractor networks and customers, leading to quality customer service. From time to time, DP&L may evaluate this internal implementation approach based on program volume and required technical knowledge and expertise.

Savings Targets

The following savings estimates have been used for planning purposes. Qualifying measures and associated savings may change as a result of technology, changing codes and standards, EM&V results, and customer and supplier feedback.

Incremental Annual Savings				
	2013	2014	2015	Total 2013-2015
Energy (MWh)	21,147	25,470	28,144	74,761
Summer Peak Demand (MW)	3.9	4.7	5.2	13.8

Program Budget

The following budget estimates have been used for planning purposes. DP&L may adjust program budgets as a result of market conditions, participation levels, EM&V requirements and emerging technologies.

Incremental Annual Budget				
	2013	2014	2015	Total 2013-2015
Incentive	\$1,580,250	\$1,998,095	\$2,318,812	\$5,897,157
Marketing & Administrative	\$749,620	\$982,056	\$1,108,240	\$2,839,916
Total	\$2,329,870	\$2,980,151	\$3,427,052	\$8,737,073

Participant Costs

Incremental Annual Participant Costs				
	2013	2014	2015	Total 2013-2015
Participant Costs	\$4,361,493	\$5,514,740	\$6,399,920	\$16,276,153



Market Transformation Activities

Through the Custom Rebate Program, DP&L will communicate the energy and cost-saving benefits of energy-efficient upgrades to business customers. The program will also inform manufacturers, engineers, distributors and retailers about customer demand and preferences for energy-efficient technologies. Combined with financial incentives in the form of rebates, these activities will help to increase the demand for energy efficient products.

EM&V Plan

The Custom Rebates program offers incentives for projects not eligible under the Rapid Rebate program. Therefore, evaluations under this program will require a broad range of activities which may include, but not limited to, the following: program database review, stakeholder interviews, participant surveys, site visits/engineering analysis, and cost effectiveness analysis.

The database will be reviewed to assure appropriate data are being collected. Site visits will be utilized to verify measures are installed and operating. Engineering analysis will be used to calculate energy savings. Secondary sources and assumptions will be used as a reference to calculate deemed savings.

The process evaluation will include the following as needed: stakeholder interviews, participant and trade ally telephone surveys. These interviews and surveys will address program processes and procedures, progress on customer and contractor education, and the incentive mechanism effectiveness. These interviews may also address perceived barriers to overcome as well program successes and future challenges.

Cost Effectiveness Results

Benefit-Cost Test	2013-2015 Ratio
Total Resource Cost (TRC)	1.93
Utility Cost Test (UCT)	4.22
Participant Cost Test (PCT)	4.06
Rate Impact Measure (RIM)	0.51



Mercantile Self Direct Rebates

Program Description

The Non-Residential Mercantile Self-Direct Program allows mercantile customers who have successfully identified and documented savings from energy efficiency projects on a rolling 3-year historical basis to apply for a one-time incentive payment or an exemption from the Energy Efficiency Rider (EER). DP&L will implement this program in accordance with Ohio law and PUCO rules.

Program Objectives

The objective of the program is to allow mercantile customers the ability to commit energy efficiency projects for integration toward DP&L's energy efficiency compliance benchmarks.

Targeted Customer Sector

This self-direct program is available to customers who consume 700,000 kWh or more per year or are part of a regional or national account and who commit their demand and energy savings to be integrated into DP&L's energy efficiency programs. All mercantile customers taking delivery service from DP&L are eligible for this program regardless of their choice of generation supplier.

Program Duration

This program is a continuing program and is designed to run through the duration of the PUCO mercantile self-direct program. DP&L will implement this program as Ohio law and PUCO rules permit.

Estimated Program Participation Levels

The following participation levels have been used for planning purposes. Qualifying measures and participation levels may change as a result of technology, changing codes and standards, EM&V results, and customer and supplier feedback.

Incremental Annual Participants (Applications filed with PUCO)				
Measure Category	2013	2014	2015	Total 2013-2015
One-time incentive payments	14	16	18	48

Program Participation Requirements

Business and government customers may purchase any brand of equipment from any supplier they choose, as long as the equipment is new and meets the eligibility



requirements. Equipment must use electricity as the fuel source and be replacing existing equipment or be installed as part of a retrofit project. Projects receiving a one-time incentive are required to conform to the measure eligibility requirements of the Rapid Rebates[®] and/or Custom Rebate Programs.

Incentives

Per Case No. 10-834-EL-EEC, the one-time incentive payments will not exceed 50% of the total project cost. EER exemption requests are based on the percentage of demand and energy saved versus the overall customer demand and energy consumed. The EER exemption is proposed to last as long as the percentage of savings achieved by the customer exceeds the legislated demand and/or energy targets. Customers may participate as an individual facility or have the option to aggregate all facilities into a single application. All applications are filed at the PUCO individually and reviewed on a case-by-case basis. All mercantile self-direct applications must be approved by the PUCO prior to taking effect.

Marketing Approach

Marketing methods include presentations at community- and vendor-sponsored events, one-on-one marketing by DP&L major account managers, and the utilization of a Channel Partner network. Channel Partners are contractors, engineers and distributors with energy efficiency experience. They have participated in DP&L rebate workshops and are familiar with using DP&L rebate programs to help customers save money. Channel Partners are viewed as an invaluable third party “marketing extension” of DP&L’s internal group of program managers. They have direct contact with customers on a daily basis and can influence the customer’s purchasing decisions.

Implementation Approach

DP&L plans to continue to implement and manage the Mercantile Self-Direct Program with internal staff. Implementing the program in-house strengthens DP&L employee knowledge of energy efficiency programs and technologies. It also provides DP&L with the opportunity to build relationships with contractor networks and customers, leading to quality customer service. From time to time, DP&L may evaluate this internal implementation approach based on program volume and required technical knowledge and expertise.



Savings Targets

The following savings estimates have been used for planning purposes. Qualifying measures and associated savings may change as a result of technology, changing codes and standards, EM&V results, and customer and supplier feedback.

Incremental Annual Savings				
	2013	2014	2015	Total 2013-2015
Energy (MWh)	6,862	7,842	8,822	23,526
Summer Peak Demand (MW)	3.2	3.7	4.1	11.0

Program Budget

The following budget estimates have been used for planning purposes. DP&L may adjust program budgets as a result of market conditions, participation levels, EM&V requirements and emerging technologies.

Incremental Annual Budget				
	2013	2014	2015	Total 2013-2015
Incentive	\$495,817	\$566,648	\$637,479	\$1,699,944
Marketing & Administrative	\$129,482	\$159,290	\$194,040	\$482,812
Total	\$625,299	\$725,938	\$831,519	\$2,182,756

Participant Costs

Incremental Annual Participant Costs				
	2013	2014	2015	Total 2013-2015
Participant Costs	\$2,508,835	\$2,867,240	\$3,225,645	\$8,601,720

Market Transformation Activities

Through the Mercantile Self-Direct Program, DP&L will communicate the energy and cost-saving benefits of energy-efficient upgrades to business customers. The program will also inform manufacturers, engineers, distributors and retailers about customer demand and preferences for energy-efficient technologies. Combined with financial incentives, these activities will help to strengthen demand for energy efficient products.

EM&V Plan

DP&L administers the Mercantile Self Direct program in-house. A third-party auditor may be utilized to verify measures are installed and operating. Engineering analysis will be used to calculate energy savings. The Ohio TRM and secondary source savings calculations and assumptions will be used as a reference to calculate deemed savings.



Cost Effectiveness Results

Benefit-Cost Test	2013-2015 Ratio
Total Resource Cost (TRC)	1.59
Utility Cost Test (UCT)	6.61
Participant Cost Test (PCT)	2.31
Rate Impact Measure (RIM)	0.68



PJM Demand Response

Program Description

The Non-Residential Demand Response program allows mercantile customers to commit their PJM Demand Response Program attributes to DP&L.

Program Objectives

The objective of the program is to supplement the peak demand reductions achieved from energy efficiency programs in order to ensure compliance with the peak demand reduction benchmarks. Savings will be claimed based on the actual peak demand response participating customers report into PJM's eLRS system in a given program year.

Targeted Customer Sector

This program is available to customers who consume 700,000 kWh or more per year or are part of a regional or national account and who commit their peak demand savings to be integrated into DP&L's energy efficiency programs. All mercantile customers taking delivery service from DP&L are eligible for this program regardless of their choice of generation supplier.

Program Duration

This program is designed to run through the duration of this portfolio plan.

Estimated Program Participation Levels

Participation levels will vary based on DP&L's need for supplemental peak demand in each program year, the load size of participating customers and incentive levels offered. Participation will be managed by the curtailment service providers (CSP).

Program Participation Requirements

Qualifying customers must meet the requirements of the PJM Demand Response program and be participating in the program through a CSP.



Incentives

Incentive payments will be made to the CSP(s) who is successful in winning the annual request for proposal (RFP) issued by DP&L. Every attempt will be made to award this contract to the low bidder, ensuring a market-based approach and greatest economic efficiency. The share of incentive passed through to customers will be at the discretion of the CSP.

Marketing Approach

The Demand Response program will be marketed on an annual, as-needed basis, through an RFP process to all CSPs operating within DP&L's service area.

Implementation Approach

DP&L will issue an annual RFP seeking demand reduction "commitments" from CSPs on behalf of their DP&L mercantile customers. DP&L plans to continue to implement and manage the Demand Response Program with internal staff.

Savings Targets

The following savings estimates have been used for planning purposes. Supplemental peak demand savings needed may change as a result of technology, changing codes and standards, EM&V results, and customer and supplier feedback.

Incremental Annual Savings				
	2013	2014	2015	Total 2013-2015
Summer Peak Demand (MW)	10.0	6.0	6.0	22.0

Program Budget

The following budget estimates have been used for planning purposes. DP&L may adjust program budgets as a result of market conditions, participation levels, and EM&V requirements.

Incremental Annual Budget				
	2013	2014	2015	Total 2013-2015
Incentive	\$97,550	\$29,471	\$26,807	\$153,828
Marketing & Administrative	\$7,200	\$7,200	\$7,200	\$21,600
Total	\$104,750	\$36,671	\$34,007	\$175,428



Participant Costs

Incremental Annual Participant Costs				
	2013	2014	2015	Total 2013-2015
Participant Costs	N/A	N/A	N/A	N/A

Cost Effectiveness Results

Benefit-Cost Test	2013-2015 Ratio
Total Resource Cost (TRC)	-
Utility Cost Test (UCT)	-
Participant Cost Test (PCT)	-
Rate Impact Measure (RIM)	-

Cross Sector Programs

PROGRAMS OVERVIEW

The following pages contain plans for programs that impact all customer classes. These plans are intended to be general implementation guidelines as opposed to specific and detailed operating plans. DP&L has learned through its previous experience that a level of implementation flexibility needs to be maintained to allow for necessary program adjustments.

Given the unique nature of the cross-sector programs, elements such as expected participation and savings are not included. Further, the transmission and distribution infrastructure section is included as recognition that Ohio law allows infrastructure projects to be counted toward compliance benchmarks.

Additional information regarding the past implementation of existing programs may be found in DP&L's annual energy efficiency and demand reduction/response portfolio status reports.¹²

The following are the cross-sector programs:

- Customer Education
- Pilot Program
- Transmission & Distribution Infrastructure Improvements

¹²The most recent portfolio status report is PUCO Case No. 12-1420-EL-POR.



Customer Education

Program Description

Customer education will be a broad based mass communications effort to promote the value of energy efficiency, and, at the same time, to provide a general level of marketing support for DP&L's programs. Overall messages communicated to customers may include energy efficiency saves customers money, energy efficiency can increase comfort, and energy efficiency is good for the environment. DP&L will use a variety of mass communication channels to reach customers including television, print, the web, and promotional events. This effort may include providing customers with additional educational information through DP&L's web site, dpandl.com.

Program Objectives

The Customer Education program is designed to communicate the value of energy efficiency and increase the awareness of available energy efficiency programs. The program will also provide a general level of program marketing support, helping to promote the continued expansion of customer participation in energy efficiency programs.

Targeted Customer Sector

This program is designed to reach all customers taking delivery service from DP&L, regardless of their choice of generation supplier.

Program Duration

This program is designed to run through the duration of this portfolio plan.

Estimated Program Participation Levels

Measure	Incremental Annual Participants			Total 2013-2015
	2013	2014	2015	
N/A	N/A	N/A	N/A	N/A

Program Participation Requirements

N/A

Incentives

N/A



Marketing Approach

DP&L will utilize a variety of marketing and communication channels that may include mass media, the web, news releases, bill inserts, DP&L's web site, and promotional events.

Implementation Approach

The education and outreach activities will be coordinated by DP&L's Energy Programs staff while leveraging additional company resources such as Corporate Communications.

Savings Targets

Due to the educational nature of this program, there are no savings goals.

Program Budgets

The following budget estimates have been used for planning purposes. DP&L may adjust program budgets as a result of market conditions, participation levels, and EM&V requirements.

Incremental Annual Budget				
	2013	2014	2015	Total 2013-2015
Incentive	N/A	N/A	N/A	N/A
Marketing & Administrative	\$788,272	\$843,451	\$902,493	\$2,534,216
Total	\$788,272	\$843,451	\$902,493	\$2,534,216

Participant Costs

Incremental Annual Participant Costs				
	2013	2014	2015	Total 2013-2015
Participant Costs	N/A	N/A	N/A	N/A

Market Transformation Activities

This program helps to transform the market by educating customers about the value of energy efficiency and the opportunity to make lasting changes to decrease their energy usage. This, in turn, will help drive customer actions toward energy efficiency and increase the demand for energy efficient products.

EM&V Plan

Due to the educational nature of this program and the fact that no savings are claimed, there is no evaluations, measurement and verification plan.



Cost Effectiveness Results

Due to the educational nature of this program and the fact that no savings are claimed, cost effectiveness tests are not performed at the program level. However, the costs associated with customer education are included in the cost effectiveness tests performed for the portfolio as a whole.



Pilot Program

Program Description

Pilot programs are intended to allow DP&L the flexibility to research or pilot programs to test their feasibility for cost-effective savings and potential inclusion in future portfolio plans.

Program Objectives

The objective of the Pilot Program is to develop and deploy new opportunities as they arise. Results of pilot programs may also inform mid-stream adjustments to the current plan programs as needed. Implementation plans and pilot program results will be shared with the DP&L Energy Efficiency Collaborative. Any energy or peak demand savings realized from pilot programs shall count toward the annual energy efficiency targets. Savings estimates will be calculated in partnership with program implementers and evaluators, and may be influenced by codes and standards, calculations from the Ohio Technical Reference Manual, and ongoing evaluations research.

Targeted Customer Sectors

The Pilot Program is intended to cover all DP&L customer segments, both residential and business. All customers taking delivery service from DP&L will be eligible for participation in pilot programs regardless of their choice of generation supplier.

Program Duration

DP&L's ability to deploy pilot programs will begin upon portfolio approval and run through the duration of this portfolio plan.

Estimated Program Participation Levels

Estimated participation levels will be dependent on the specific pilot programs being implemented.

Program Participation Requirements

Program participation requirements will be dependent on the specific pilot programs being implemented.

Incentives

Incentives will vary based on the programs being implemented.



Marketing Approach

The marketing approach will be dependent on the pilot programs being implemented.

Implementation Approach

Pilot programs will be screened for implementation based on a variety of factors including:

- Customer demand/participation levels
- Savings potential
- Estimated cost
- Channel Partner engagement
- Collaborative input
- Non-energy benefits

Savings Targets

No specific programs are planned as a part of the Pilot Program. As a result, it is not possible to project energy and demand savings. However, any energy or peak demand savings realized from pilot programs will count toward the annual energy efficiency targets.

Incremental Annual Savings				
	2013	2014	2015	Total 2013-2015
Energy (MWh)	N/A	N/A	N/A	N/A
Summer Peak Demand (MW)	N/A	N/A	N/A	N/A

Program Budget

The following budget estimates have been used for planning purposes. DP&L may adjust program budgets as a result of market conditions, participation levels, and EM&V requirements.

Incremental Annual Budget				
	2013	2014	2015	Total 2013-2015
Incentive	\$188,084	\$730,914	\$747,828	\$1,666,826
Marketing & Administrative	\$80,607	\$313,249	\$320,498	\$714,354
Total	\$268,691	\$1,044,163	\$1,068,326	\$2,381,180



Participant Costs

Participant costs will be dependent on the programs being implemented.

Market Transformation Activities

Market transformation activities will be dependent on the programs being implemented.

EM&V Plans

EM&V plans will be dependent on the programs being implemented.

Cost Effectiveness Results

Cost effectiveness results will be dependent on the programs being implemented. In the early years of a pilot program, it is possible that a pilot program will not be cost effective in its initial stages of delivery due to start up costs.

Transmission & Distribution Infrastructure Improvements

Program Description

In the discussion of Ohio's energy efficiency and demand benchmarks, Ohio Revised Code Section 4928.66(A)(2)(d) provides, in part, "Programs implemented by a utility may include demand-response programs, customer-sited programs, and transmission and distribution infrastructure improvements that reduce line losses."

Consistent with this provision, DP&L will undertake various infrastructure improvements that reduce line losses and count the savings toward its statutory benchmarks as a part of its overall compliance efforts. Savings will be reported in its annual energy efficiency and demand reduction/response portfolio status report. However, DP&L is not seeking to recover program costs through the Energy Efficiency Rider. DP&L is including the infrastructure program in this portfolio plan to note that it will be reporting savings annually and counting the savings toward its benchmarks.

In addition to energy savings, these projects can produce a number of ancillary benefits such as:

- Strengthening reliability for customers as older equipment is replaced.
- Increasing the available capacity on the existing transmission and distribution system to serve customers.
- Realizing energy savings without various external costs, such as program marketing, required of traditional energy efficient programs.

Savings can be generated as a result of a number of different types of infrastructure projects which could include:

- Increasing the operating voltage on the distribution system. For instance, DP&L is undertaking a multi-year project to upgrade distribution voltage from 4 kV to 12 kV (PUCO Case No. 11-6010-EL-POR). This reduces the associated peak power losses and energy losses due to load. Specifically, power losses on a 4 kV system are nine times higher than on a 12 kV system to serve an equivalent load. System hardware replaced with this type of project includes insulators, cutouts, cross arms, arrestors and transformers.
- Optimizing the power flow on the transmission system through the real-time regulation and management of voltages and VARs, thereby reducing line losses, energy consumption and peak demand. This can be accomplished by reducing reactive power and optimizing voltage to reduce line current and line losses. As



reactive power is reduced through the management of VARs, power factor is improved on the transmission system, which in turn reduces the current required to meet existing system loads. In addition, the improvement in system power factor optimizes voltage as well, which in turn further reduces the current required to meet system load and reduces line loss. As a part of this plan, DP&L will explore the feasibility and savings potential of volt/var optimization.

- Utilizing Conservation Voltage Reduction (CVR) technologies on the distribution system to optimize voltage and VARS, thereby reducing line losses, energy consumption and peak demand.
- Adding and controlling capacitor banks on the distribution system. Capacitor banks increase the power factor on the system by reducing VAR flows to optimize the peak flow of energy and reducing peak demands.
- Re-conductoring transmission and distribution lines with lower impedance conductors. As the impedance (resistance) is lowered line loss is reduced, saving energy across the system.
- Installing distribution voltage regulators to optimize voltage flow and reduce losses on the distribution system.

EM&V Plan

The evaluation, measurement and verification of the savings related to each project will be conducted by DP&L's independent evaluations consultant. Given the unique nature of the projects, DP&L will work with the independent evaluator to develop an appropriate evaluations plan. Depending on the project, the plan could include independent verification of completed work, engineering models to verify savings and supplemental metering. The results will be included in the independent evaluator's report which is submitted with DP&L's annual portfolio status report.

Evaluation Measurement & Verification

EM&V History and Overview

Effective evaluation, measurement and verification (EM&V) play an important role in a quality energy efficiency portfolio. EM&V activities ensure that reported savings are verified, energy and demand calculations are valid, program delivery is effective, customers are satisfied and the overall portfolio is cost-effective.

Through a request-for-proposal (RFP) process, DP&L selected Cadmus to conduct independent EM&V for its portfolio of programs. To date, Cadmus has conducted EM&V for the 2009, 2010, and 2011 program years and produced a report for each of the three years. DP&L has submitted the Cadmus reports as a part of its annual energy efficiency and demand-reduction portfolio status reports.

Evergreen Economics (the independent statewide evaluator) has reviewed the 2009 and 2010 Cadmus reports. In its review of the 2009 Cadmus report, Evergreen states:

“In general, we found the 2009 DP&L evaluations report to be thorough and adhering to industry best practices for evaluating these types of programs. **We have a high level of confidence in this evaluation research** (emphasis added) and do not have any specific recommendations for changes to DP&L’s 2009 reported savings.”¹³

Likewise, in its review of the 2010 Cadmus report, Evergreen states:

“The Cadmus evaluation report covering the 2010 DP&L programs was included as an appendix to DP&L’s 2010 Portfolio Status Report Update filings. As with their 2009 report, we found the 2010 Cadmus report to be very thorough and adhering to standard evaluation practices for the types of programs covered. The evaluation methods followed were also consistent with the evaluation plan approved by the Independent Evaluator prior to the start of the 2010 evaluation work. The evaluation report itself followed the report outline developed by the Independent Evaluator and had all the required elements. Given these findings, in addition to our participation in survey instrument review and attending some of the on-site visits conducted by Cadmus during the analysis period, **we have a high level of confidence in the evaluation findings included in the 2010 evaluation report** (emphasis added). As a consequence, we do not have any specific recommendations for changing the savings reported by DP&L in 2010.”¹⁴

DP&L is pleased with this positive feedback and believes it is establishing a solid record of program implementation accompanied by an appropriate level of EM&V. Going

¹³PUCO Case No. 12-0665-EL-UNC, Evergreen Economics “Report of the Ohio Independent Evaluator,” page 27.

¹⁴PUCO Case No. 12-0665-EL-UNC, Evergreen Economics “Report of the Ohio Independent Evaluator, page 31.



forward, DP&L plans to follow the same EM&V process that resulted in the positive review by the Independent Statewide Evaluator.

DP&L's EM&V APPROACH

DP&L's past and current approach to EM&V stands on four pillars:

1. Evaluation is integral to the overall portfolio and is best organized as an adaptive process;
2. Evaluation at the program and measure level are prioritized based on several factors such as uncertainty and available budget;
3. Evaluations are based on industry-standard methods and well-established protocols; and
4. Evaluation plans are flexible to accommodate portfolio changes.

Pillar One: Evaluation is Integrated

DP&L believes that it is important to work with an independent evaluator throughout the entire life cycle of an energy efficiency program and the portfolio as a whole. This approach calls for the independent evaluator to be involved at various stages in a program or portfolio's life cycle, including planning, implementation and post-implementation assessment. As shown in the figure below, this adaptive approach allows DP&L to benefit from its evaluator's experience, receive timely feedback and make adjustments throughout the life of the program.

Ongoing Evaluations Input Helps Ensure Programs Are Implemented Effectively

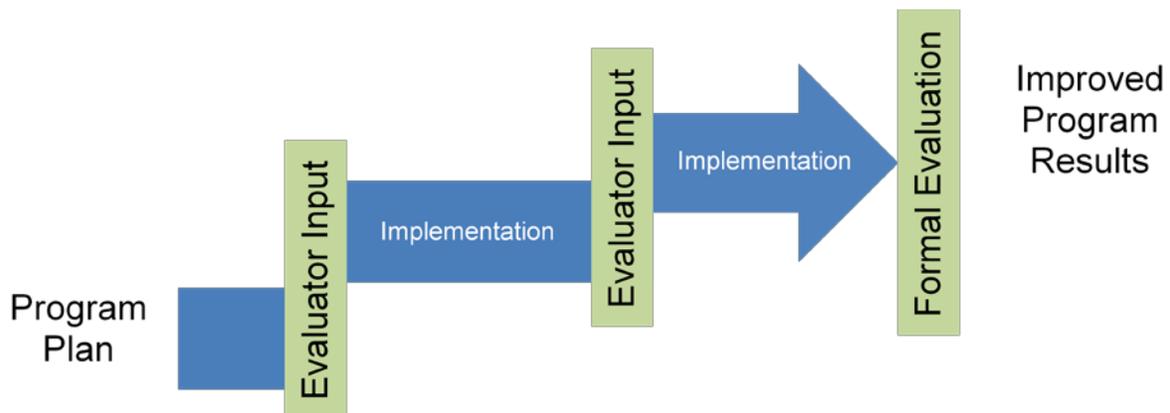


Figure 8 Ongoing Evaluations Process

This approach is in direct contrast to the approach commonly taken in a previous era of energy efficiency where the EM&V firm only provided feedback after a program had been implemented. By that time, the program may have ended or it may have been difficult and costly to make program adjustments. By pro-actively including the independent evaluator throughout the program lifecycle, DP&L believes its programs are stronger and its savings results are more consistent with general industry practices.

Pillar Two: Evaluation Tasks are Prioritized

Evaluation plans and objectives at the program and measure level are prioritized to allocate evaluation resources based on the following:

- A program's estimated contribution (MWh and MW) to the whole portfolio savings.
- The stage in a program's life cycle.
- A program's budget share of the whole portfolio.
- The expected degree of uncertainty in a program's savings.
- The input values currently listed in the Technical Reference Manual (TRM).
- The life expectancy of a program.
- The importance of a program to market transformation and awareness.
- Specific research issues relevant to particular programs.
- Whether any special features of a program require exceptional evaluation effort.

Evaluation plans designed around the above issues will help ensure DP&L uses evaluation resources appropriately and where they are most needed.

Pillar Three: Evaluations Adhere to Accepted and Proven Protocols

DP&L expects and requires all plans and work are prepared in a manner meeting industry standards and established protocols. These include: (1) International Program Measurement and Verification Protocols: Concepts and Options for Determining Energy and Water Savings Volume 1, April 2007; (2) Model Energy Efficiency Program Impact Evaluation Guide: A Resource of the National Action Plan for Energy Efficiency, November 2007; (3) Electric Power Research Institute: Guidebook for Energy Efficiency Program Evaluation, Measurement, and Verification, 2008; and (4) the protocols being developed by the U.S. Department of Energy under its Uniform Methods Project.

Pillar Four: Evaluations Must be Flexible and Adaptive

Finally, DP&L believes that successful and useful evaluations begin from well-conceived and comprehensive evaluation plans. At the same time, various influences such as changes in program design, regulatory environment, and market trends require that evaluation plans (and those implementing the plans) be adaptable to mid-course adjustments. DP&L views evaluation plans as a living document, which may change during the program cycle.



EM&V PLANNING

Before evaluation work begins for each calendar year, DP&L's independent evaluator develops a comprehensive evaluations plan for each program. Elements of each program's plan will conform to the independent state evaluator template which includes the following sections:

- Program description,
- Evaluation objectives,
- Overall evaluation approach,
- Impact evaluations,
- Process evaluations,
- Tracking system review,
- Sampling plan, and
- An evaluations schedule.

In developing the plan, the independent evaluator takes into account the availability of data from previous EM&V results, the relative size of the program within the overall portfolio, implementation staff feedback, and any changes to program design that may require additional evaluations. Depending on the program, impact evaluations may include engineering analysis, billing analysis, site visits and a review of calculations. Process evaluations may include telephone surveys and interviews with various market participants.

The impact evaluation objectives are as follows:

- Determine program and portfolio cost-effectiveness;
- Assess the appropriateness of the program's gross *ex ante* claimed savings; and
- Calculate gross *ex post* savings estimates.

Primary process evaluation objectives are:

- Assess overall satisfaction with the program;
- Identify any changes to program design and delivery that would improve performance;
- Assess the effectiveness of program marketing and outreach; and
- Identify barriers and how effectively the programs are overcoming them.

PROGRAM PROCESS REVIEW

The process evaluation focuses on qualitative assessments of the program's design, operation, and implementation. DP&L's independent evaluator will assess how well the program is functioning by using multiple industry standard approaches, such as a telephone survey with customers, contractors, or other stakeholders. Depending on the type of program and overall objectives, in-depth interviews or focus groups may be used to gather deeper qualitative data from these stakeholders.



Process objectives will be identified in the evaluation planning stage each year and include DP&L, evaluator and any third-party program implementers. Ensuring all parties are involved in the process planning will confirm process objectives not only produce results needed from the independent evaluator perspective, but also from the program implementers so they receive feedback to make necessary course corrections.

ESTIMATION OF GROSS SAVINGS

DP&L primarily uses the Ohio Technical Reference Manual (TRM) as well as other appropriate data specific to each measure to report *ex ante* or “pre-evaluation savings” estimates. This *ex ante* value is reported to the independent evaluator along with appropriate back-up data. The evaluator then reviews the savings estimates for each program and assesses the reasonableness of the values. This assessment includes:

- Review of deemed savings, such as those found in the draft Ohio TRM;
- On-site visits to collect information regarding installation rates;
- Simple engineering calculations; and
- Statistical analysis.

As stated previously, DP&L works with its independent evaluator throughout the program lifecycle, which includes establishing reasonable *ex ante* values. This, combined with using the Ohio TRM, prevents surprises at the end of the evaluation and affords implementers the opportunity to adjust program design in order to meet the savings goals. Further, this approach helps minimize differences between program and portfolio realization rates.

CALCULATING COST EFFECTIVENESS

DP&L’s independent evaluator calculates cost effectiveness for individual programs and the portfolio as a whole. Cost effectiveness is calculated based on costs incurred by DP&L and participants, energy savings and avoided capacity and energy wholesale prices. Four cost effectiveness tests are calculated for each program and the portfolio as a whole: Total Resource Cost Test (TRC), Utility Cost Test (UCT), Ratepayer Impact Measure Test (RIM), and Participant Cost Test (PCT).

REPORTING

DP&L submits the independent evaluator report as an appendix to its annual energy efficiency and demand reduction/response portfolio status report. The EM&V report includes an executive summary, a comprehensive review of program-by-program evaluations, recommendations and cost effectiveness results.

STATEWIDE EVALUATOR

The PUCO has appointed an independent statewide evaluator, Evergreen Economics, to review and monitor the Ohio utilities energy efficiency program evaluation. In cooperation with this process, DP&L provides Evergreen with a copy of each year’s evaluation plan for their review as well as survey instruments used throughout the year.



DP&L also provides Evergreen with notice of pending site visits providing Evergreen with the opportunity to participate. Further, DP&L has adopted Evergreen's planning template and reporting template to help facilitate the efficient and cost effective review of DP&L's programs.

DP&L believes this cooperative approach improves the overall quality and effectiveness of evaluations and plans to continue to work with the statewide evaluator in the future.



Cost Effectiveness

OVERVIEW

In compliance with PUCO rules, DP&L used the Total Resource Cost Test (TRC) as the overall test of the portfolio’s cost effectiveness and as a guide to determine the inclusion of programs in the portfolio. Overall, DP&L’s portfolio is cost-effective as measured by the TRC. In addition, cost effectiveness calculations were performed using the Utility Cost Test (UCT), the Ratepayer Impact Measure (RIM), and the Participant Cost Test (PCT).

For all tests, a program is cost effective when the present value of the benefits is greater than the present value of the costs. What varies among the different cost effectiveness tests is which benefits and costs are included. Using the benefit/cost ratio, an offering is cost effective when the ratio is greater than one.

$$\frac{B}{C} \text{ ratio} = \frac{\text{Present Value of Benefits}}{\text{Present Value of Costs}} \geq 1$$

Total Resource Cost Test (TRC): The TRC measures the benefits of avoided supply costs over the lifecycle incremental costs of the energy efficiency measures and program administrative costs. Unlike the UCT, the TRC considers the full cost of the measure, not just the utility incentive cost.

$$\text{Total Resource Benefits} = \text{PV} \left(\sum_{\text{Year}=1}^{\text{Measure Life}} \left(\sum_i^{i=8760} (\text{impact}_i \times \text{avoided cost}_i) \right) \right)$$

$$\text{Total Resource Costs} = \text{PV} (\text{incremental measure costs} + \text{utility administrative costs})$$

Utility Cost Test (UCT): The UCT is a valuation of the costs and benefits from the perspective of the utility. It is measured by comparing the value of the supply-side benefits to the incentive and administrative costs associated with the energy efficiency programs. Unlike the TRC, the UCT considers incentive costs as opposed to full incremental measure costs.

$$\text{Utility Benefits} = \text{PV} \left(\sum_{\text{Year}=1}^{\text{Measure Life}} \left(\sum_i^{i=8760} (\text{impact}_i \times \text{avoided cost}_i) \right) \right)$$

$$\text{Utility Costs} = \text{PV} (\text{utility incentive costs} + \text{utility administrative costs})$$



Ratepayer Impact Measure (RIM): The RIM is a valuation of the net benefits of the energy efficiency programs from the perspective of the nonparticipants. It is measured by comparing the supply-side benefits to the costs of the programs, in terms of utility incentive costs, utility administrative costs and electric monetary savings, or lost revenue from the utility perspective.

$$\text{Ratepayer Benefits} = \text{PV} \left(\sum_{\text{Year}=1}^{\text{Measure Life}} \left(\sum_i^{i=8760} (\text{impact}_i \times \text{avoided cost}_i) \right) \right)$$

$$\text{Ratepayer Costs} = \text{PV} (\text{utility incentive costs} + \text{utility admin costs} + \text{lost revenue})$$

Participant Cost Test (PCT): The PCT values the benefits of the programs from the perspective of program participants. It measures the electric monetary savings of the participants as compared to the measures costs net of utility incentives.

$$\text{Participant Benefits} = \text{PV} \left(\sum_{\text{Year}=1}^{\text{Measure Life}} \left(\sum_i^{i=8760} (\text{impact}_i \times \text{rate}_i) \right) \right)$$

$$\text{Participant Costs} = \text{PV} (\text{net participant measure costs})$$

Presented below in Table 11 are the discount rates applied to each cost-effectiveness test.

Benefit – Cost Test	Discount Rate
TRC	8.95%
UCT	8.95%
RIM	8.95%
PCT	10.00%

Table 11 Discount Rates



Presented below in Table 12 is the cost effectiveness for each program and for the portfolio as a whole by the various tests.

	Total Resource Cost Test (TRC)	Utility Cost Test (UCT)	Participant Cost Test (PCT)	Ratepayer Impact Measure Test (RIM)
Residential Programs				
Lighting	3.26	5.67	11.11	0.34
HVAC Rebates	0.43	1.58	1.10	0.38
Appliance Recycling	1.95	1.95	-	0.32
Low Income Affordability	0.49	0.49	-	0.23
School Education	2.43	2.43	-	0.28
Residential Total	1.43	3.13	5.00	0.34
	Total Resource Cost Test (TRC)	Utility Cost Test (UCT)	Participant Cost Test (PCT)	Ratepayer Impact Measure Test (RIM)
Business Programs				
Rapid Rebates	1.21	3.58	2.52	0.48
Custom Rebates	1.93	4.22	4.06	0.51
Mercantile Self-Direct	1.59	6.61	2.31	0.68
PJM Demand Response	-	-	-	-
Business Total	1.41	3.95	2.81	0.51
	Total Resource Cost Test (TRC)	Utility Cost Test (UCT)	Participant Cost Test (PCT)	Ratepayer Impact Measure Test (RIM)
PLAN TOTAL*	1.35	3.18	3.56	0.42

*Costs in plan total include customer education, pilot programs and EM&V.

Table 12 Cost Effectiveness by Program and Total Portfolio



PROGRAM BENEFIT COMPONENTS

Benefits counted in the TRC, Utility, RIM, and PCT include the full value of time and seasonally differentiated energy and capacity costs. They also take into account avoided line losses. For each energy-efficiency measure included in a program, hourly (8,760) system-avoided costs were applied to estimate hourly impacts derived using hourly load shapes of the affected end use.

To calculate the peak load impacts from energy-efficiency measures, end-use load shapes were used to identify the average reduction in demand over DP&L’s top 100 peak demand hours. Non-energy benefits such as water savings were not factored into the calculation. Line loss assumptions are specified in Table 13.

Sector	Energy Line Losses	Demand Line Losses
Residential	7.37%	8.37%
Commercial & Industrial	4.06%	5.21%

Table 13 Line Loss Assumptions Used in Cost Effectiveness Calculations

PROGRAM COST COMPONENTS

The following are the cost components included in the cost-effectiveness analysis.

Incremental measure costs: The incremental purchase cost of the energy efficiency measure to the participant.

Utility administrative costs: The administrative costs incurred by the utility to run the program, including program development, implementation vendor administrative costs, marketing, operation, and evaluations, measurement and verification.

Utility incentive costs: Direct incentives paid to customers by either the utility or the utility’s implementation vendor.

Lost revenue: This can also be defined as the participants’ electric monetary benefits. It is the energy impact multiplied by the retail rate. It is also a benefit in the PCT.

Net participant measure costs: The incremental purchase cost of the energy efficiency measure to the participant net of utility incentives paid to the participant.

Cost categories and whether they are applied at the program or portfolio level are summarized in Table 14.

Cost Category	Level Cost Applied	Description
Implementation Vendor, Direct Program Marketing	Program	Costs paid to program implementation vendors; costs to market individual programs.
Incentives	Program	Incentives paid to customers for each program.
DP&L Administrative	Program & Portfolio	DP&L costs assigned to a specific program are applied at the program level.
General Education, Market Transformation	Portfolio	Costs associated with education and market transformation.
Evaluations, Measurement & Verification	Portfolio	Costs associated with performing EM&V activities.

Table 14 Cost Categories and Descriptions



PROJECTED NET BENEFITS

Presented below in Table 15 is a summary of the net benefits by programs and for the portfolio as a whole, categorized by cost effectiveness test.

	Total Resource Cost Test (TRC)	Utility Cost Test (UCT)	Participant Cost Test (PCT)	Ratepayer Impact Measure Test (RIM)
Residential Programs				
Lighting	\$35,348,038	\$41,973,572	\$129,746,929	(\$100,116,379)
HVAC Rebates	(\$15,535,899)	\$4,309,497	\$2,443,804	(\$19,002,762)
Appliance Recycling	\$1,679,375	\$1,679,375	\$8,786,987	(\$7,457,940)
Low Income Affordability	(\$1,677,176)	(\$1,677,176)	\$3,458,304	(\$5,377,863)
School Education	\$1,214,391	\$1,214,391	\$6,270,448	(\$5,334,564)
Residential Total	\$21,028,729	\$47,499,659	\$150,706,472	(\$137,289,508)
Business Programs				
Rapid Rebates	\$11,408,247	\$47,134,952	\$75,616,473	(\$70,072,788)
Custom Rebates	\$16,175,627	\$25,622,771	\$44,929,943	(\$31,787,975)
Mercantile Self-Direct	\$4,865,741	\$11,170,769	\$10,196,711	(\$6,207,313)
PJM Demand Response	(\$19,874)	(\$167,058)	\$146,497	(\$167,058)
Business Total	\$32,429,741	\$83,761,434	\$130,889,624	(\$108,235,134)
	Total Resource Cost Test (TRC)	Utility Cost Test (UCT)	Participant Cost Test (PCT)	Ratepayer Impact Measure Test (RIM)
PLAN TOTAL*	\$46,947,820	\$124,750,442	\$281,596,095	(\$252,035,291)

*Costs in plan total include customer education, pilot programs and EM&V.

Table 15 Projected Net Benefits



Appendix A
Market Potential Update





Memorandum

To: Dayton Power and Light
 From: The Cadmus Group, Inc.
 Subject: 2013 Energy-Efficiency Potential Study Update
 Date: 02/26/2013

Overview

This memo summarizes the results from an independent study of the electric energy-efficiency potential in Dayton Power and Light's (DP&L) service territory from 2013 to 2022. DP&L commissioned the study to investigate levels of technical, economic, and achievable potential in its service area. Study results inform DP&L's energy-efficiency planning and program design by identifying the quantity of available potential and how it is distributed by sector, market segment, and end use.

The assessment's primary objective was to identify and characterize achievable, cost-effective, electric energy-efficiency potential. In 2010, The Cadmus Group, Inc., completed a potential study, which involved primary data collection (telephone surveys) of residential customers and trade allies, and a compilation of secondary sources such as the Energy Information Administration (EIA), to inform the commercial and industrial sector. For 2013, Cadmus updated this study by incorporating:

- DP&L's most-recent economic assumptions (e.g. discount rate, line loss, etc.) and avoided costs;
- New codes and standards;
- Updates to measure costs and savings for the 25 highest-saving commercial and residential measures from the 2010 potential study; and
- DP&L's program achievements through 2012.

These updates, as well as the data prepared for the 2010 assessment, provide a foundation for estimating three distinct types of energy-efficiency potential, defined as follows.

- **Technical potential** assumes that all technically feasible energy-efficiency measures are implemented regardless of their costs or market barriers.



- **Economic potential** represents a subset of technical potential, consisting only of measures meeting cost-effectiveness criterion.
- **Achievable potential** is the portion of long-run economic potential assumed to be reasonably achieved under an acquisition scenario, accounting for barriers to customers' ability and willingness to participate in utility programs.

Technical potential was estimated using a bottom-up approach. Cadmus began by considering a comprehensive set of electric, energy-efficiency measures applicable to each sector (e.g. commercial) and market segment (e.g. retail, office). Technical measure data were used in conjunction with market characteristics to determine likely long-term saturations for each measure in specific sectors and market segments. This assessment resulted in a technical potential supply curve at the measure level, which was screened for cost-effectiveness to determine economic potential. Achievable potential levels were determined largely by benchmarking against assessments in other jurisdictions, as described in Table 4.

Technical and Economic Energy-Efficiency Potential

Scope of Analysis

This section presents technical and economic potential by fuel, followed by more detailed results for each fuel and sector combination.

Within each sector, the study distinguished between customer segments or facility types, and applicable end uses within each. Cadmus analyzed a list of measures for 15 residential end uses across four segments, 10 commercial end uses across 18 facility types, and 13 industrial end uses across 13 segments.

It is important to note Cadmus did not include consumption and load forecasts for Wright-Patterson Air Force Base in this study, due to: the size of the base, its specialized consumption and end uses as well as its status as a potential self-direct customer and participant in federal stimulus programs to improve the energy efficiency of military infrastructure.¹⁵

Summary of Resource Potential

Table 1 displays 2022 technical, economic, and achievable potential by sector. The study indicates approximately 2,774 GWh of cumulative, technically feasible, electric, energy-efficiency potential over the 10-year planning horizon. If all technical potential was achievable, it would amount to a 22% reduction in 2022 forecasted retail sales. The

¹⁵ Department of Defense Expenditure Plans, American Reinvestment and Recovery Act 2009, http://mccaskill.senate.gov/pdf/ARRA_DoD_Expenditure_Plans.pdf

study also indicates approximately 1,518 GWh of economic (cost-effective) potential (12% of 2022 sales), about 53% of which would be in the residential sector.

Demand impacts of energy-efficiency measures are also shown in Table 1. These impacts were estimated based on the averaged MW saved during the summer on-peak period, which is defined as June through August on weekdays between 3:00 pm and 6:00 pm. In 2022, the identified economic potential is expected to equal 257 MW, approximately half of which is in the residential sector.

Potential Scenario	Cumulative Gross Energy Savings at Meter -2022		Cumulative Annual Gross Peak Demand Savings at Meter		
	Sector	GWh	Percent of 2022 Forecast Sales	MW	Percent of 2022 Forecast Sales
Residential					
Technical	1,715	32%	345	37%	
Economic	801	15%	160	17%	
High Achievable	641	12%	128	14%	
Medium Achievable	480	9%	96	10%	
Low Achievable	320	6%	64	7%	
Commercial and Industrial					
Technical	1,059	14%	160	17%	
Economic	718	9%	97	10%	
High Achievable	574	8%	77	8%	
Medium Achievable	431	6%	58	6%	
Low Achievable	287	4%	39	4%	
Total					
Technical	2,774	22%	505	27%	
Economic	1,518	12%	257	14%	
High Achievable	1,215	9%	205	11%	
Medium Achievable	911	7%	154	8%	
Low Achievable	607	5%	103	6%	

Table 1 Potential by Sector (Cumulative 2022)

Residential Sector Details

Baseline Sales

Residential customers account for 41% of DP&L's projected 2022 sales. These customers were split into four distinct segments, based on home type and income level to align with DP&L's programs. Single-family homes accounted for 64% of residential baseline sales, followed by low-income single-family (19%), multifamily¹⁶ (13%), and low-income multifamily (4%).

¹⁶ The "multifamily" segment is composed of buildings with four or more dwelling units.



Figure 1 displays residential baseline sales by end use. Heating, cooling, lighting, plug load, and appliance end uses comprise a majority of residential sector energy use. This distribution of end-use consumption was derived using a bottom-up approach, based on equipment saturations and fuel shares from the residential phone surveys and unit energy consumption values from secondary sources.

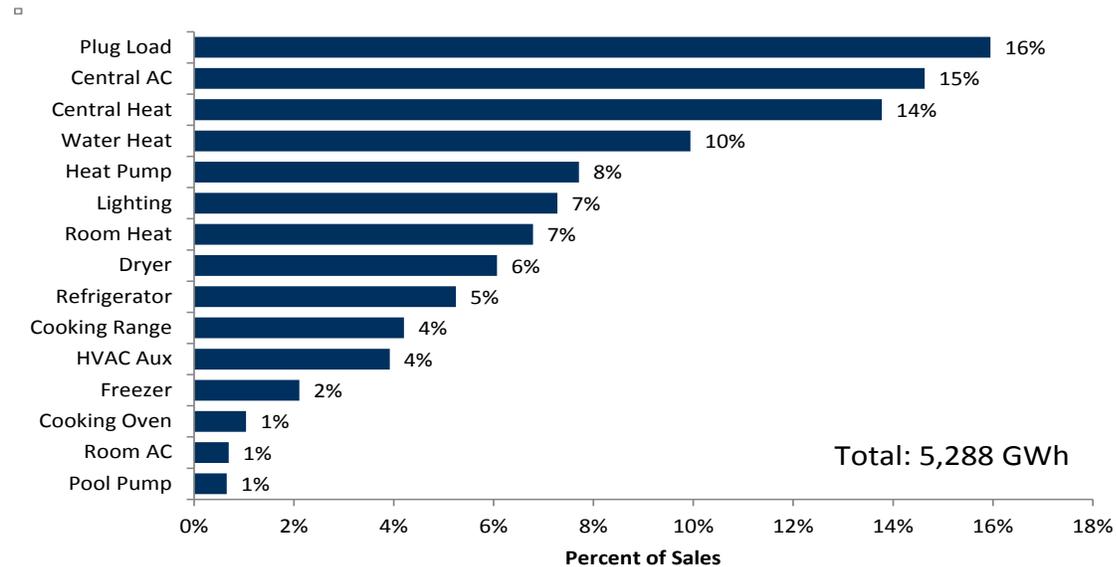


Figure 1 Residential Baseline Sales by End Use

Economic Potential

The residential sector presents a variety of potential savings sources, including equipment efficiency upgrades (e.g., high-efficiency air conditioning, ENERGY STAR refrigerators), improvements to building shells (e.g., insulation, windows, air sealing), and increases in lighting efficiency (e.g., CFLs, LED interior lighting).

As shown in Figure 2, single-family homes represent 63% of total residential economic potential. Low-income and multifamily homes represent smaller shares of overall potential (20% and 13%, respectively). The main driver of these results is each home type's proportion of baseline sales, but other factors, such as measure applicability and saturation play an important role in determining potential.

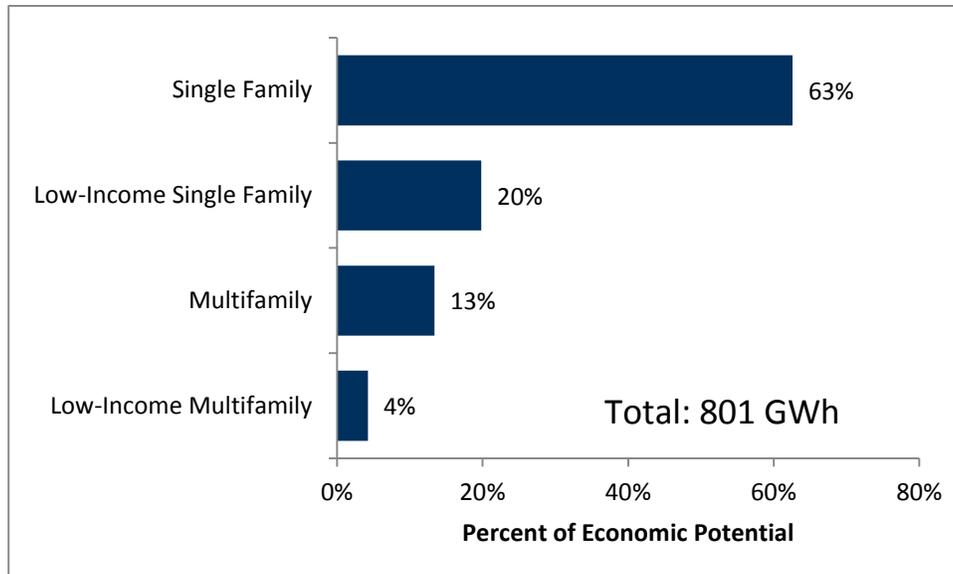


Figure 2 Residential Economic Potential by Segment

Table 2 compares 10-year residential economic potential by end use from the 2010 potential study and the 2012 study update. Total 10-year economic potential is approximately 400 GWh lower in the updated 2012 assessment, compared to the 2010 study. Nearly all of the decrease are due to lighting and plug load end uses. Specifically:

- DP&L's program achievements over the last three years drove down potential lighting savings; in 2010, 2011, and 2012 DP&L's upstream lighting program has saved roughly 300 GWh.
- Plug savings decreased due to updated savings for Smart Strips.

Over half of residential economic potential is in HVAC end uses (heat pumps, cooling, heating). The highest savings measures include, duct sealing, infiltration control (caulking, weather stripping, etc.), and ceiling insulation.

End Use	Economic Potential - 2012 Study ^b	Economic Potential - 2010 Study ^c	Economic Potential as % of Base Sales - 2012 Study ^c	Economic Potential as % of Base Sales - 2010 Study ^d	Economic Potential as % of Technical Potential - 2012 Study	Economic Potential as % of Technical Potential - 2010 Study
Central AC	140 (18%)	88 (7%)	18%	14%	35%	24%
Central Heat	135 (17%)	96 (8%)	19%	16%	52%	46%
Cooking Oven	0 (0%)	0 (0%)	0%	0%	0%	0%
Cooking Range	0 (0%)	0 (0%)	0%	0%	0%	0%
Dryer	0 (0%)	11 (1%)	0%	3%	0%	100%
Freezer	50 (6%)	79 (7%)	45%	48%	100%	95%
Heat Pump	106 (13%)	70 (6%)	26%	22%	63%	49%
HVAC Aux	25 (3%)	78 (7%)	12%	32%	89%	76%
Lighting	80 (10%)	391 (32%)	21%	41%	60%	90%
Plug Load	25 (3%)	127 (11%)	3%	15%	17%	50%
Pool Pump	7 (1%)	10 (1%)	20%	28%	75%	100%
Refrigerator	62 (8%)	93 (8%)	22%	27%	75%	80%
Room AC	1 (0%)	2 (0%)	2%	6%	5%	14%
Room Heat	40 (5%)	43 (4%)	11%	10%	33%	31%
Water Heat	131 (16%)	116 (10%)	25%	22%	60%	45%
Total	801 (100%)	1,203 (100%)	15%	21%	47%	54%

Table 2 10-Year Residential Economic Potential by End Use (GWh)

^a Cumulative annual GWh savings, at meter, in 2022. Percentages in parenthesis represent sum of total

^b Cumulative annual GWh savings, at meter, in 2019. Percentages in parenthesis represent sum of total.

^c Sales in 2022

^d Sales in 2019

Commercial Sector Details

Baseline Sales

Commercial customer consumption accounted for 31% of DP&L's projected 2022 sales. Large commercial customers—defined as those qualifying for the self-direct mercantile program¹⁷—accounted for 66% of the commercial sector sales, while small commercial customers accounted for 34%.

Cadmus developed commercial segmentation using DP&L's nonresidential customer database, classifying customers based on Standard Industrial Classification SIC codes.¹⁸ Office and miscellaneous commercial customers comprised nearly half of commercial consumption, at 25% and 21%, respectively (Figure 3). The miscellaneous segment was a combination of customers not fitting into one of the other categories

¹⁷ Customers with annual consumption greater than 700,000 kWh.

¹⁸ It is difficult to classify buildings by SIC code, thus, the segmentation is a "best" approximation.



(e.g., churches, assembly structures, museums, mechanic shops), and those without sufficient information to be classified. Education (14%), health (13%), and retail (11%) facilities also accounted for a significant portion of commercial consumption.

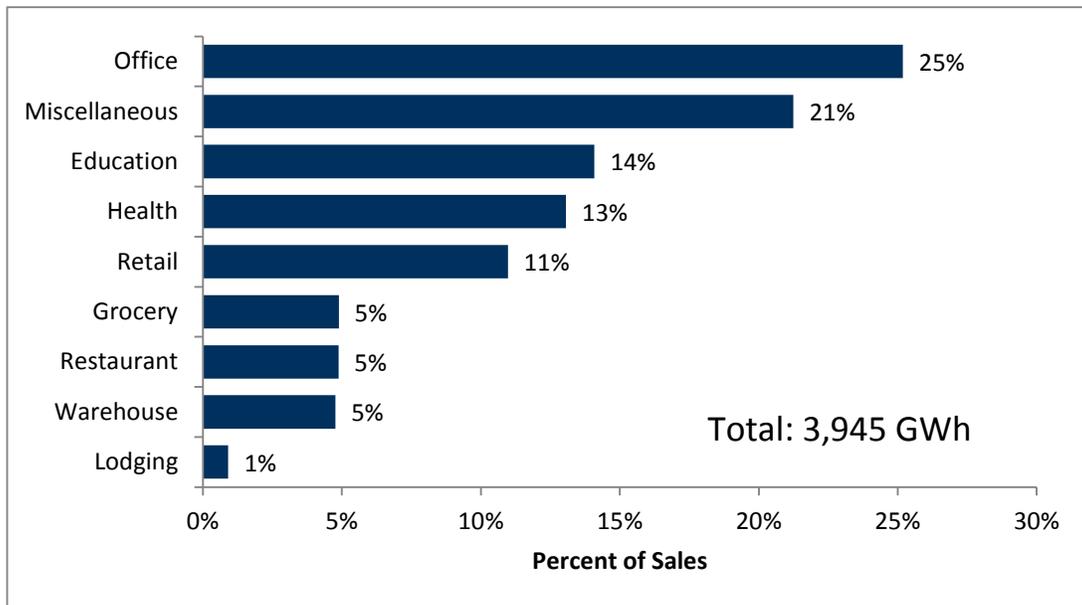


Figure 3 Commercial Baseline Consumption by Segment

Lighting and plug load end uses made up a majority of the commercial sector baseline consumption, at 36% and 25%, respectively. HVAC Auxiliary (17%), cooling (8%, includes chillers and packaged units), refrigeration (7%), and other end uses (5%) comprised the balance (Figure 4).

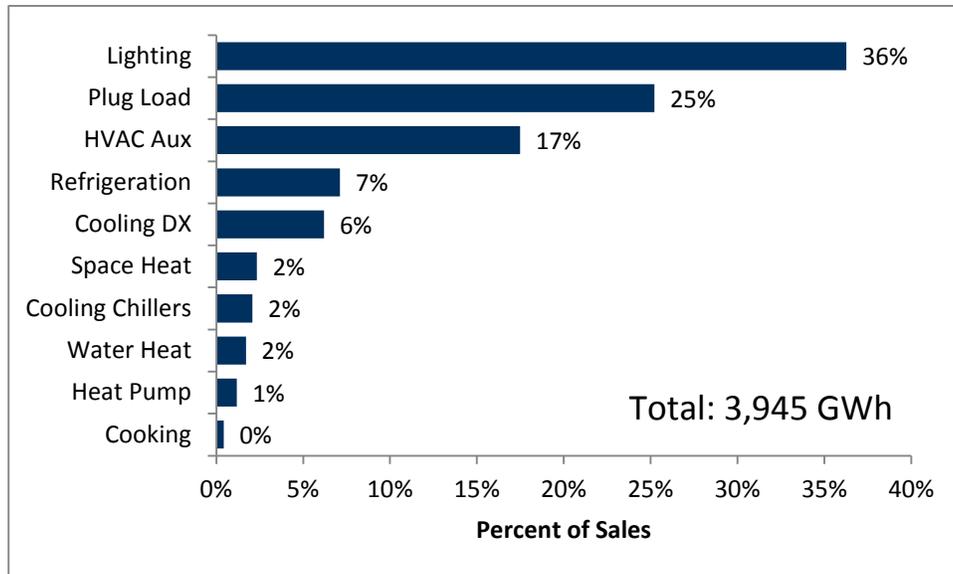


Figure 4 Commercial Baseline Consumption by End Use

Economic Potential

Based on measures included in this assessment, economic potential in the commercial sector is expected to be approximately 314 GWh by 2022, an 8% reduction in forecasted consumption. As a percentage of forecasted sales, economic potential in the commercial sector (about 8%) is lower than the residential sector (about 15%).

As shown in Figure 5, offices and miscellaneous buildings represent the two largest sources of commercial electric potential, with 25% and 21%, respectively. Considerable savings opportunities are expected in two commercial sector segments: retail (11%) and education (14%). Note this distribution is very similar to that for baseline sales (Figure 3), but it differs due to applicability and saturation of measures across segments.

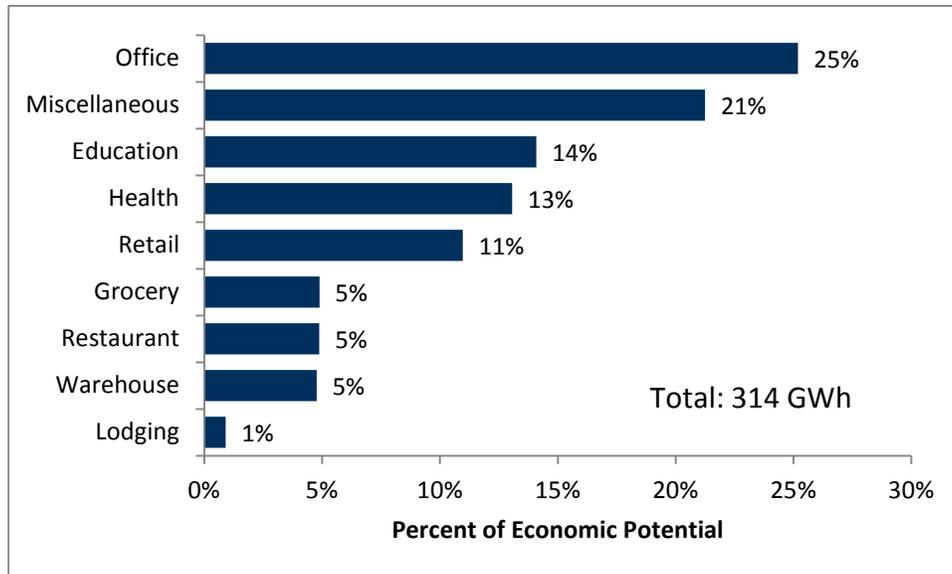


Figure 5 Commercial Economic Potential by Segment

Table 3 compares 10-year commercial economic potential by end use from the 2012 and 2010 assessments. Lighting measures contribute the most cost-effective savings of any end use, contributing 121 GWh in 2022 (39% of total technical potential). However, in the 2010 assessment 10-year lighting economic potential equated to 496 GWh (61% of total technical potential). The decrease in commercial savings is driven by:

- Commercial lighting standards, which were not explicitly modeled in the 2010 assessment, reduce potential lighting savings.
- For the 2012 study, Cadmus tested the cost-effectiveness of different lighting technologies individually (e.g. linear fluorescents, screw base lamps, high intensity discharge lamps). For the 2010 study, Cadmus treated all these technologies as a package and did not test individual technologies for cost-effectiveness. Eighty-nine percent of technical lighting potential in the 2010 study was cost-effective, while 53% of lighting potential in the 2012 study is cost-effective.
- Lower auxiliary HVAC (motors) savings due to updates to ECM savings and applicability.

End Use	Economic Potential - 2012 Study ^a	Economic Potential - 2010 Study ^b	Economic Potential as % of Base Sales - 2012 Study ^c	Economic Potential as % of Base Sales - 2010 Study ^d	Economic Potential as % of Technical Potential - 2012 Study	Economic Potential as % of Technical Potential - 2010 Study
Cooking	0 (0%)	0 (0%)	1%	1%	8%	6%
Cooling Chillers	10 (3%)	14 (2%)	13%	19%	31%	43%
Cooling DX	17 (5%)	21 (3%)	7%	8%	17%	19%
Heat Pump	2 (1%)	2 (0%)	5%	4%	19%	18%
HVAC Aux	93 (30%)	169 (21%)	14%	24%	62%	88%
Lighting	121 (39%)	496 (61%)	8%	27%	53%	89%
Plug Load	13 (4%)	46 (6%)	1%	5%	51%	87%
Refrigeration	50 (16%)	56 (7%)	18%	18%	85%	93%
Space Heat	2 (1%)	3 (0%)	3%	4%	10%	13%
Water Heat	4 (1%)	5 (1%)	7%	7%	30%	38%
Total	314 (100%)	811 (100%)	8%	19%	48%	77%

Table 3 10-Year Commercial Economic Potential by End Use (GWh)

^a Cumulative annual GWh savings, at meter, in 2022. Percentages in parenthesis represent sum of total.

^b Cumulative annual GWh savings, at meter, in 2019. Percentages in parenthesis represent sum of total.

^c Sales in 2022

^d Sales in 2019

Industrial Sector Details

Industrial customer consumption accounted for 28% of DP&L's projected 2022 sales. In this study, industrial customers were defined as nonresidential customers not classified into a commercial business category. Thus, this sector includes manufacturing industries as well as mining, irrigation, agriculture, and so on. Similarly to the commercial sector, Cadmus developed the industrial segmentation using SIC codes from DP&L's customer database.

Figure 6 displays industrial baseline sales by end use. A large portion of consumption is attributed to motor applications (19%). HVAC and Pumps each account for 13% of baseline sales. Combined, process end uses (heat, cool, air compressors, and refrigeration) account for 29% of baseline sales.

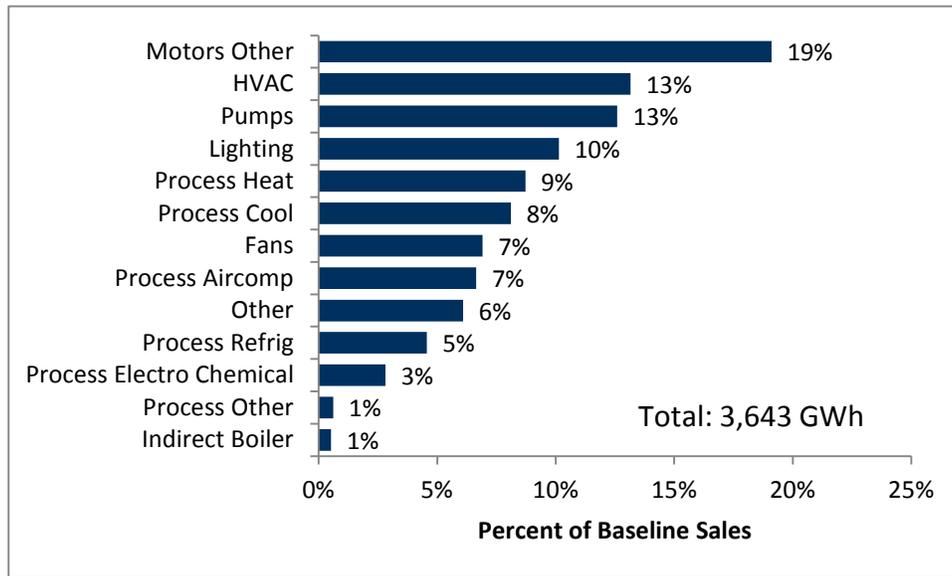


Figure 6 Industrial Baseline Sales by End Use

Figure 7 shows baseline consumption by industrial sector. The largest industrial sectors, by consumption, are transportation manufacturing and food processing, each representing 14% of baseline consumption. Miscellaneous manufacturing accounts for 15% of industrial baseline sales. Chemical manufacturing and machinery are also sizable sectors, at 13% and 10%, respectively.

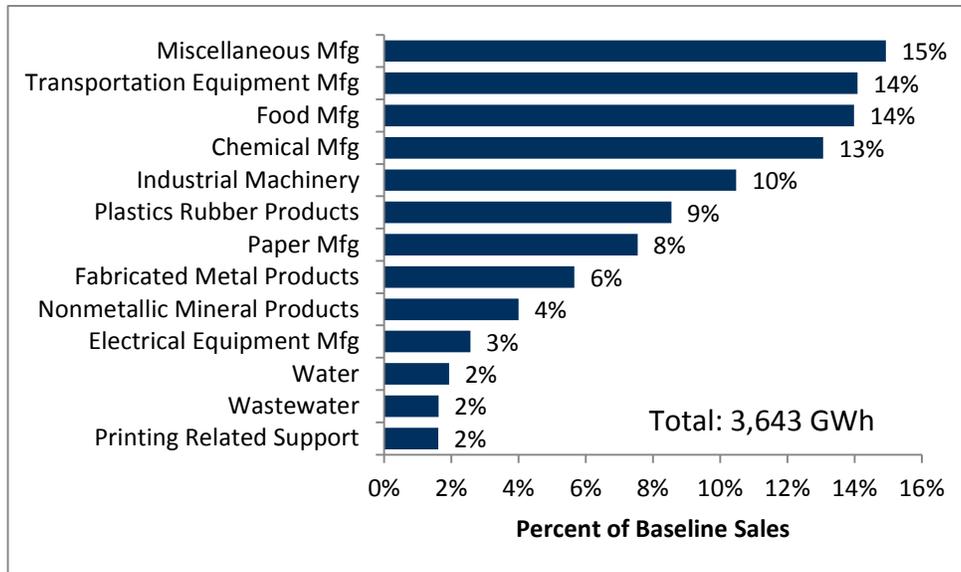


Figure 7 Industrial Baseline Sales by Segment

Economic Potential

Technical and economic energy-efficiency potential for industrial customers was estimated for major end uses within 13 major industrial segments, as illustrated in Figure 8. Across all industries, economic potential totals approximately 403 GWh over the 10-year planning horizon, corresponding to an 11% reduction in forecasted 2022 industrial consumption.

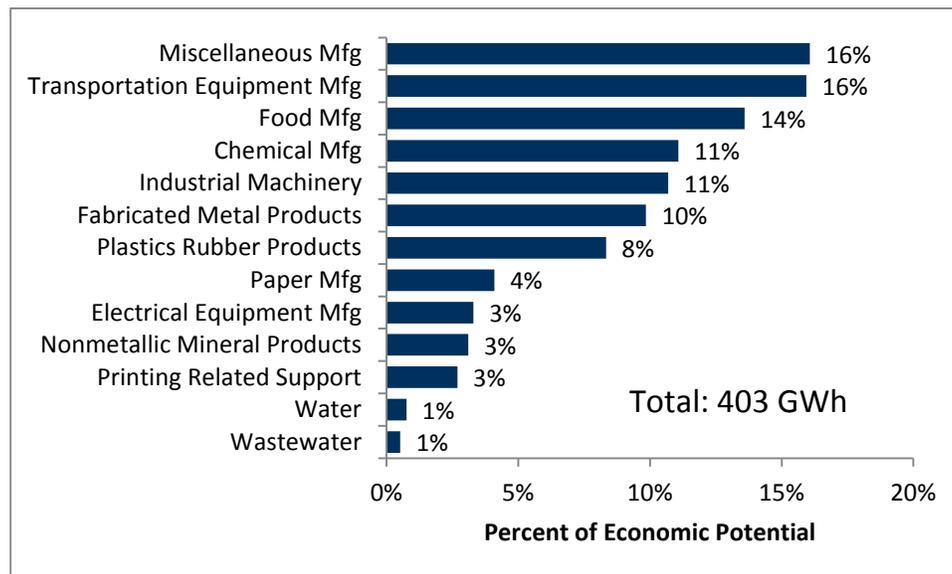


Figure 8 Industrial Economic Potential by Segment

The majority of electric economic potential in the industrial sector can be attributed to improvements in process efficiency (heating, cooling, compressed air, etc.), which account for half of the industrial economic potential, (Figure 9). Gains in HVAC and motor efficiency are also significant potential sources, with 22% and 9%, respectively. A small amount of additional potential exists for lighting and other facility improvements (Figure 9).

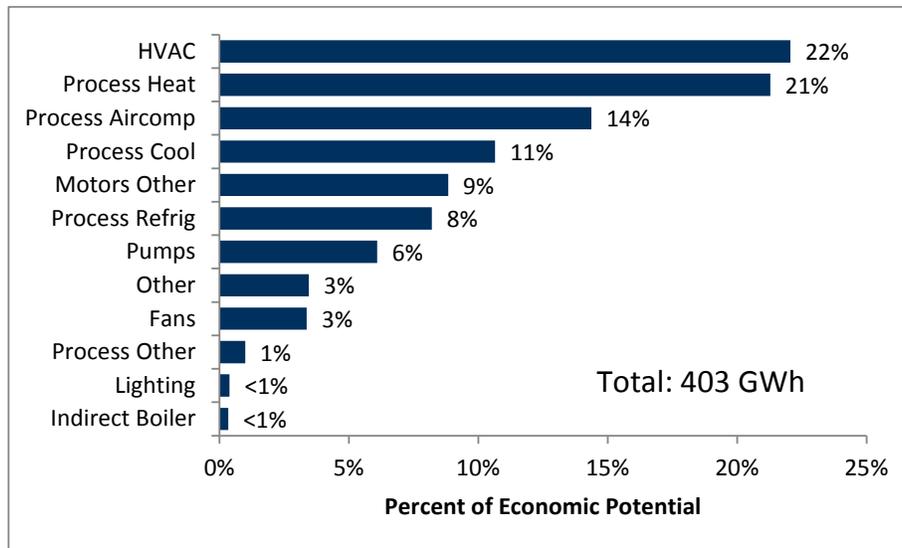


Figure 9. Industrial Economic Potential by End Use

Achievable Potential

In this study, “achievable” (or “program”) potential has been defined as the portion of economic potential that can be targeted and acquired through DP&L’s energy-efficiency programs, as well as other state and federal energy efficiency programs.

A number of factors account for the gap between economic and achievable potential, including:

- Customer awareness;
- Perceptions of energy efficiency’s value;
- Economic climate; and
- Energy-efficiency measures’ first cost.

Cadmus conducted an independent review of 50 electric potential studies, covering 40 states, plus four national studies (Table 4). As technical and economic potential can greatly vary based on utility service area characteristics and economic assumptions, the key metric analyzed was the percentage of economic potential deemed achievable. As expected, this percentage varied greatly across these studies, from an average of 40%

on the low end to around 80% on the high end. While these studies represent a wide cross-section of utilities and regions, a number of caveats should be considered in applying these numbers to an individual utility:

- **Age of study:** All these studies were conducted between 2000 and 2009, and thus reflect different levels of codes and standards and measure saturations. For example, only recent studies may have accounted for new lighting standards in EISA, which would have lowered potential estimates compared to earlier studies.
- **Location:** Because these studies are taken from across the country, they reflect a range of climates, demographics, and energy prices.
- **Length of study:** These studies typically assess potential over a 10 or 20-year time horizon.
- **Historic DSM accomplishments:** These studies greatly vary in terms of the number of years utilities have been running programs at the time of the study. This can have a large effect on customer awareness, participation levels, and saturation of measures, particularly for low-cost options.

Table 4. Bibliography of Energy-Efficiency Potential Studies

Study Title	Author	Date	Region
The New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest	SWEEP	2003	Arizona
BC Hydro Conservation Potential Review	Marbek	2002	British Columbia
Energy Efficiency Technical Potential Study	GDS	2005	Kentucky - Big Rivers
California Statewide Residential Sector Energy Efficiency Potential Study	Kema	2003	California
California Commercial End-Use Survey	Itron	2006	California
California Statewide Commercial Sector Energy Efficiency Potential Study	Xenergy	2002	California
California Energy Efficiency Potential Study	Itron	2006	California
Colorado DSM Market Potential Study	KEMA, Quantum	2006	Colorado
The New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest	SWEEP	2003	Colorado
Independent Assessment of Conservation and Energy Efficiency Potential for Connecticut and the Southwest Connecticut Region	GDS, Quantum	2004	Connecticut
Energy Efficiency & Renewable Energy Economy Study	Kema	2009	Connecticut
Potential for Energy Efficiency and Renewable Energy to Meet Florida's Growing Energy Demand	ACEEE	2008	Florida



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The New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest	SWEEP	2003	Arizona
BC Hydro Conservation Potential Review	Marbek	2002	British Columbia
Energy Efficiency Technical Potential Study	GDS	2005	Kentucky - Big Rivers
California Statewide Residential Sector Energy Efficiency Potential Study	Kema	2003	California
California Commercial End-Use Survey	Itron	2006	California
California Statewide Commercial Sector Energy Efficiency Potential Study	Xenergy	2002	California
California Energy Efficiency Potential Study	Itron	2006	California
Colorado DSM Market Potential Study	KEMA, Quantum	2006	Colorado
The New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest	SWEEP	2003	Colorado
Assessment of Energy Efficiency Potential in Georgia	ICF	2005	Georgia
National Transmission Grid Study	ORNL	2001	Iowa
Assessment of Energy and Capacity Savings Potential in Iowa	Cadmus	2008	Iowa - Alliant
Assessment of Energy and Capacity Savings Potential in Iowa	Cadmus	2008	Iowa - MidAmerican
Kansas Energy Council EE Potential Study Draft Results	Summit Blue	2008	Kansas
Electric Energy Efficiency Plan	Exeter/OEI	2003	Maine
Energy Efficiency: First Fuel for a Clean Energy Future	ACEEE	2008	Maryland
Fitchburg Gas and Electric Light Company, Massachusetts Electric Company, NSTAR, and Western Massachusetts Electric Company: The Remaining Electric Energy Efficiency Opportunities in Massachusetts	RLW Analytic, SFMC	2007	Massachusetts
The Remaining Electric Energy Efficiency Opportunities in Massachusetts. Middletown, Conn. and Middleton, Wisc.	RLW Analytics, SFMC	2001	Massachusetts
Colorado DSM Market Potential Assessment	Kema	2006	Midwest
Minnesota's Next Generation Energy Act of 2007	Strom	2005	Minnesota
The New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest	SWEEP	2003	Nevada
Economically Achievable Energy Efficiency Potential in New England	OEI	2004	New England
Additional Opportunities for Energy Efficiency in New Hampshire	GDS	2009	New Hampshire
New Jersey Energy Efficiency and Distributed Generation Market Assessment	Kema	2004	New Jersey



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The New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest	SWEEP	2003	Arizona
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Energy Efficiency Technical Potential Study	GDS	2005	Kentucky - Big Rivers
California Statewide Residential Sector Energy Efficiency Potential Study	Kema	2003	California
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California Energy Efficiency Potential Study	Itron	2006	California
Colorado DSM Market Potential Study	KEMA, Quantum	2006	Colorado
The New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest	SWEEP	2003	Colorado
The New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest	SWEEP	2003	New Mexico
New York State Energy Research and Development Authority, Energy Efficiency and Renewable Energy Resource Development Potential in New York State - Final Report	Optimal, ACEEE, et al	2003	New York
Study of the Feasibility of Energy Efficiency as an Eligible Resource as Part of a Renewable Portfolio Standard for the State of North Carolina	GDS	2006	North Carolina
Sixth Northwest Power Plans	NWP&CC	2009	Northwest
Energy Efficiency and Conservation Measure Resource Assessment for the Residential, Commercial, Industrial and Agricultural Sectors.	Ecotope, ACEEE, Tellus	2003	Oregon
Assessment of Long-Term, System-Wide Potential for Demand Side and Other Supplemental Resources	Cadmus	2007	PacifiCorp
Potential for Energy Efficiency, Demand Response, and Onsite Solar in Pennsylvania	ACEEE	2009	Pennsylvania
Opportunity Report	Rhode Island Energy Efficiency and Resources Management Council (EERMC)	2008	Rhode Island
The New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest	SWEEP, ACEEE	2002	Southwest
Power to Save: An Alternative Path to Meet	OEI	2007	Texas



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The New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest	SWEEP	2003	Arizona
BC Hydro Conservation Potential Review	Marbek	2002	British Columbia
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California Statewide Residential Sector Energy Efficiency Potential Study	Kema	2003	California
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Colorado DSM Market Potential Study	KEMA, Quantum	2006	Colorado
The New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest	SWEEP	2003	Colorado
Electric Needs in Texas, Potential for Energy Efficiency, Demand Response, and Onsite Renewable Energy to Meet Texas' Growing Electricity Needs	ACEEE	2007	Texas
Assessment of the Feasible and Achievable Levels of Electricity Savings from Investor Owned Utilities in Texas: 2009-2018	Itron	2008	Texas
Assessment of Achievable Potential from Energy Efficiency and Demand Response Programs in the U.S.	EPRI	2009	U.S.
Unlocking Energy Efficiency in the U.S. Economy	McKinsey	2009	U.S.
Clean Energy Future study	IWG/ORNL	2000	U.S.
Southwest Energy Efficiency Project	SWEEP	2001	Utah
The New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest	SWEEP	2003	Utah
Vermont Department of Public Service Electric and Economic Impacts Maximum Achievable Statewide Efficiency Savings, 2003–2012: Results and Analysis Summary	Optimal Energy/VEIC	2002	Vermont
Vermont Electric Energy Efficiency Potential Study	GDS	2007	Vermont
Comprehensive Assessment of Demand-Side Resource Potentials (2010-2029)	Cadmus	2009	Washington - PSE
Comprehensive Assessment of Demand-Side Resource Potentials (2008-2027)	Quantec	2006	Washington - PSE
Conservation Potential Assessment (2007-2026)	Quantec	2007	Washington - Tacoma
Energy Efficiency and Customer-Sited Renewable Resource Potential in Wisconsin for the years 2012 and 2018	Energy Center	2009	Wisconsin



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The New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest	SWEEP	2003	Colorado
The New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest	SWEEP	2003	Wyoming

Additionally, energy-efficiency potential studies rely on the best data available at a given time, and the amount of identified potential is subject to change over the planning horizon. Factors that could cause such changes generally fall into three categories:

- **Changes in utility forecast data:** These include forecasts of customers and sales as well as energy and capacity costs. Changes in the former two will affect the amount of technical potential available, as a portion of this potential is driven by customer and load growth. Changes in avoided costs (e.g., due to the future effects of carbon taxes) will affect economic potential.
- **Changes in measure assumptions and baselines:** In this study, measure savings have been based on current practices, codes, and standards, with costs based on current market conditions. Over time, measure costs may change, emerging technologies may become commercially available, and/or codes and standards may change. Emerging technologies will increase the available potential (though possibly only technical, as they may not be cost-effective) over time, while improved codes and standards will reduce the savings available through utility programs, as more efficient baseline conditions are required.
- **Changes in the macroeconomic climate:** At the time of this study, a great deal of uncertainty remains around the rate the local and national economies will recover. Because customers, sales, and energy price forecasts used in this analysis are based on expected trends at the time of the study, deviations from these assumptions could lead to differences in short- and long-term projections. For example, another economic downturn, aside from decreasing numbers of nonresidential customers, and, thus, energy consumption, may limit capital available for energy-efficiency improvements in homes and businesses, and

affect DP&L's ability to acquire energy-efficiency resources. Likewise, an economic upswing may provide more opportunities for DP&L to promote energy-efficiency programs.

Due to these uncertainties, and given the wide range of achievability estimates from national potential studies, it is appropriate to consider achievable potential as a range rather than a point estimate. The numbers presented above indicate this available electric potential can be reasonably expected to fall between roughly 40% (low) and 80% (high), with a 60% midpoint as the medium achievable potential.



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Summary: Application for approval of its energy efficiency and peak demand reduction program portfolio plan for 2013 through 2015 electronically filed by Mr. Tyler A. Teuscher on behalf of The Dayton Power and Light Company