Final Annual Report to the Pennsylvania Public Utility Commission

For the period
June 1, 2010 to May 31, 2011

For Act 129 of 2008
Energy Efficiency and Conservation Program

Prepared by Navigant Consulting, Inc.

For

Duquesne Light Company

November 15, 2011

Table of Contents

Abbreviations

CAR	Clerical Adjustment Rate
CFL	Compact Fluorescent Lamp
CPITD	Cumulative Program/Portfolio Inception to Date
CSP	Conservation Service Provider
DLC	Duquesne Light Company
EDC	Electric Distribution Company
EE&C	Energy Efficiency & Conservation
EM&V	Evaluation Measurement and Verification
IQ	Incremental Quarter
IR	Installation Rate
kW	Kilowatt
kWh	Kilowatt-hour
LIEEP	Residential Low-Income Energy Efficiency Program
M&V	Measurement and Verification
MW	Megawatt
MWh	Megawatt-hour
NTG	Net-to-Gross
PA	Pennsylvania
PMRS	Program Management and Reporting System
PQ	Program-Qualifier Rate
PUC	Public Utility Commission
PY	Program/Portfolio Year
PY1	Program Year 1 (December 2009 to May 2010)
PY2	Program Year 2 (June 2010 to May 2011)
PYTD	Program/Portfolio Year to Date
REEP	Residential Energy Efficiency Rebate Program
RR	Realization Rate
RARP	Residential Appliance Recycling Program
SEP	Residential School Energy Pledge
SWE	Statewide Evaluator
TRC	Total Resource Cost
TRM	Technical Reference Manual
UES	Unit Energy Savings
VR	Verification Rate

1 Overview of Portfolio

Act 129, signed October 15th, 2008, mandated energy savings and demand reduction goals for the largest electric distribution companies (EDC) in Pennsylvania. Pursuant to their goals, energy efficiency and conservation (EE&C) plans were submitted by each EDC and approved by the Pennsylvania Public Utility Commission (PUC). This annual report documents the progress and effectiveness of the EE&C accomplishments for Duquesne Light through the end of PY2.

Compliance goal progress as of the end of the reporting period:

Cumulative Portfolio Energy Impacts

- The CPITD reported gross energy savings are 172,433 MWh.
- The CPITD verified energy savings are 168,336 MWh[1], resulting in a realization rate of 97.6% for PY1 and PY2.
- The CPITD verified energy savings represent 119.5% of the 140,885 MWh May 31st, 2011 energy savings compliance target.[2]
- The CPITD verified energy savings represent 39.8% of the 422,565 MWh May 31st, 2013 energy savings compliance target.[3]

Cumulative Portfolio Demand Reductions

- The CPITD reported gross demand reductions are 20.122 MW.
- The CPITD verified demand reductions are 19.501 MW[4], resulting in a realization rate of 96.9% for PY1 and PY2.
- The CPITD verified demand reductions represent 17.3% of the 113 MW May 31st, 2013 demand reductions compliance target.[5]

[1] CPITD energy savings are verified through PY2.
[2] Energy savings compliance target as communicated in EM&V plan, section 1.1.2, page 3.
[3] Energy savings compliance target as communicated in EM&V plan, section 1.1.2, page 3.
[4] CPITD demand reductions are verified through PY2.
[5] Demand reductions compliance targets as communicated in EM&V plan, section 1.1.2, page 3.

Low Income Sector

- The CPITD reported gross energy savings for low-income are 16,403 MWh (including both the low-income portion of the upstream lighting and the low-income programs).
- The CPITD reported gross energy savings from low-income upstream lighting are 14,573 MWh, the remaining low-income programs savings are 1,830 MWh.
- The CPITD verified energy savings for low-income sector programs are 15,646 MWh.[6] The low income portion of the upstream lighting program, resulted in energy savings of 14,570 MWh.
- The program is required to offer a minimum of 5.2 measures to low-income households and to date has offered 26.[7]

Government and Non-Profit Sector

- The CPITD reported gross energy savings for government and non-profit sector programs are 27,690 MWh.
- The CPITD verified energy savings for government and non-profit sector programs are 27,355 MWh.[8]
- The CPITD verified energy savings for government and non-profit sector programs represent 194.2% of the 14,089 MWh May 31st, 2011 energy savings compliance target.[9]
- The CPITD verified energy savings for government and non-profit sector programs represent 64.7% of the 42,257 MWh May 31st, 2013 energy savings compliance target.

Program Year portfolio highlights as of the end of the reporting period:

- The PY2 reported gross energy savings are 168,856 MWh.
- The PY2 verified energy savings are 164,848 MWh.[10]
- The realization rate for energy savings (total program year through the end of PY2) is 98%.
- The PY2 reported gross demand reductions are 19.09 MW.
- The PY2 verified demand reductions are 18.5 MW.[11]
- The realization rate for demand reductions (total program year through the end of PY2) is 97%.
- The PY2 reported participation is 20,935 participants.[12]

Portfolio Cost-Effectiveness for PY2

- The PY2 activities had a benefit cost ratio of 3.7, producing nearly $80 million in net benefits.

Duquesne Light filed its EE&C Plan on July 1, 2009 and received Commission conditional approval on October 22, 2009. Many programs were launched on or about December 1, 2009. Duquesne Light's PY

[6] CPITD energy savings are verified through PY2. PY1 verified LIEEP savings are 510 MWh. PY2 upstream lighting verified savings are 14,570 MWh, and the remaining verified LIEEP savings for PY2 are 1,078 MWh.

[7] The number of measures offered to low-income households, per the Report of Act 129 Low-income Working Group, March 19, 2010 Docket No. 2009-2146801, is to be proportional to the low-income households' share of total energy consumption (7.88%). The total number of measures offered in Duquesne's programs is 66, of which 26 are offered to low-income households, amounting to 39% of all measures offered.

[8] CPITD energy savings are verified through PY2.

[9] Energy savings compliance target as communicated in EM&V plan, section 1.1.2, page 3.

[10] PYTD energy savings are verified through PY2.

[11] PYTD demand reductions are verified through PY2.

[12] Upstream CFL program participants are reported separately and not included in these program participant numbers.

2010 EE&C program accomplishments have been increasing while the ramp-up activities of those programs have been subsiding.

Business process teams have continued to review their processes and make mid course changes while working within the context of the PA PUC approved Plan. Meetings are held at a minimum monthly with the contracted CSPs for the Large Office and Primary Metals segments, the Small Office and Retail segments and the Mixed Industrial and Chemical segments. Events have been attended to continue to build recognition of Watt Choices.

DLC's portfolio of programs has made significant progress towards cost-effectively meeting the Act 129 goals, experienced very high realization rates (ratio of verified to reported savings) with high customer satisfaction. This performance is indicative of the effective program designs, program ramp-up activities, and on-going program marketing and management.

For savings impact evaluation purposes, on October 18, 2011 an evaluation dataset was downloaded directly from the Program Management and Reporting System (PMRS) that contained records of all customer actions taken to implement energy efficiency measures termed "projects" completed by Duquesne Light's EE&C Programs during PY 2010.[13] The program activity for PY2 is summarized in Table 1-1.

[13] This download occurred after a series of data quality checks and validations had occurred, to ensure that the data were an accurate representation of Program Year 2 activity.

Table 1-1: PY2 Program Activity (Gross Reported)[14]

Program	Participants	Reported Total Energy Savings (kWh)	Reported Total Demand Reduction (kW)
Residential: EE Program (REEP): Rebate Program	10,315	41,879,540	2,554
Residential: School Energy Pledge	4,346	1,799,244	64
Residential: Appliance Recycling	3,605	5,620,392	795
Residential: Low Income EE	1,975	15,894,739	1,061
Commercial Sector Umbrella EE	73	2,078,101	544
Healthcare EE	9	1,029,317	104
Industrial Sector Umbrella EE	4	603,176	116
Chemical Products EE	8	14,998,428	2,000
Mixed Industrial EE	38	6,898,894	973
Office Building – Large – EE	67	18,281,878	3,067
Office Building – Small EE	68	1,753,863	389
Primary Metals EE	19	21,635,018	2,627
Government & Non-Profit EE	150	27,690,299	3,250
Retail Stores – Small EE	211	6,298,847	1,260
Retail Stores – Large EE	47	2,394,438	283
Subtotal	20,935	168,856,175	19,088
	(CFLs)		
Residential: EE Program (Upstream Lighting)	799,169	37,960,259	2,209
Residential: Low Income EE (Upstream Lighting)	304,001	14,572,595	951
PY2 Program Activity (Gross Reported)		168,856,175	19,088

A portion of the program-to-date Upstream Lighting program savings is allocated to the Low Income sector based on the portion of DLC's households that are low-income, or 27.74% of Duquesne customers, according to the Act 129 Low-Income Working Group.[15]

[14] Demand savings include line losses of 7%, i.e. demand savings are at the generator level. It should be noted that the 7% line loss factor is a conservative estimate as it represent average losses, rather than losses at peak. This line loss factor may be updated. Energy savings are represented at the meter level without a line loss adjustment.
[15] Act 129 Low-Income Working Group Report. Docket No. M-2009-2146801. March 19, 2010.

1.1 Summary of Portfolio Impacts

A summary of the portfolio reported impacts is presented in Table 1-2. Energy savings values are presented in two forms: at the meter (without 7% line losses) and at the generator (with 7% line losses). Demand reduction values include the 7% line loss factor.

Table 1-2: EDC PY2 Portfolio Energy and Demand Savings Impacts

Impact Type	Total Energy Savings (MWh) at the Meter*	Total Energy Savings (MWh) at the Generator*	Total Demand Reduction (MW)
Reported Gross Impact: Program Year 2	168,856	180,676	19.088
Reported Gross Impact: Cumulative Portfolio Inception to Date	172,433	184,504	20.122
Estimated Impact: PY2 Total Committed	168,856	180,676	19.088
PY2 Verified Impact	164,848	176,387	18.493
PY2 Net Impact	164,848	176,387	18.493
Verified Savings: Cumulative Portfolio Inception to Date	168,336	180,120	19.501

NOTES:

*For energy savings, "At the meter" does not include 7% line losses, while "At the generator" does. Demand reduction includes the 7% line losses.

Table 1-3 below summarizes the total resource summary benefits and costs.

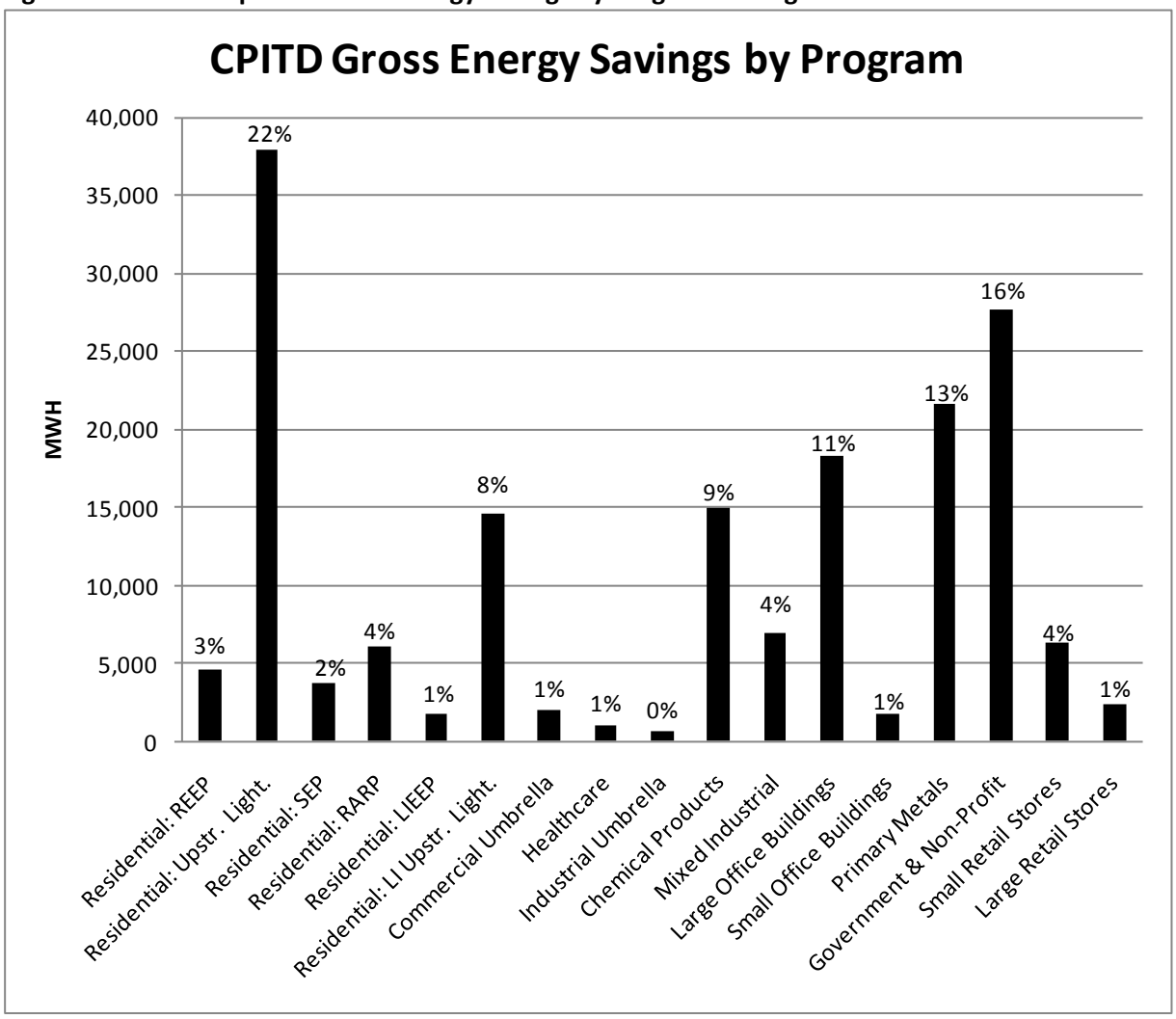
Table 1-3: Verified Portfolio Benefits and Costs for PY2

TRC Category	PYTD
TRC Benefits ($)	$109,665,642
TRC Costs ($)	$30,038,448
Net Benefits ($)	$79,627,194
TRC Benefit-Cost Ratio	3.7

1.2 Summary of Energy Impacts by Program

A summary of the reported energy savings by program is presented in Figure 1-1, including the percantage contrribution of each program to the portfolio savings.

Figure 1-1: CPITD Reported Gross Energy Savings by Program through the End of PY2



A summary of energy impacts by program through the Program Year 2010 is presented in Table 1-4 and Table 1-5. Table 1-5 compares gross impacts to targets set out in DLC's EE&C plan. Note, reported gross savings for PY2 were 104 percent of the plan.

Table 1-4: EDC Reported Participation and Gross Energy Savings by Program through the End of the PY2[16]

Program	Participants		Reported Gross Impact (MWh)	
	PY2	CPITD	PY2	CPITD
Residential: EE Program (REEP): Rebate Program	10,315	13,176	3,919	4,642
Residential: EE Program (Upstream Lighting)	N/A	N/A	37,960	37,960
Residential: School Energy Pledge	4,346	9,096	1,799	3,698
Residential: Appliance Recycling	3,605	3,854	5,620	6,068
Residential: Low Income EE	1,975	3,271	1,322	1,830
Residential: Low Income EE (Upstream Lighting)	N/A	N/A	14,573	14,573
Commercial Sector Umbrella EE	73	73	2,078	2,078
Healthcare EE	9	9	1,029	1,029
Industrial Sector Umbrella EE	4	4	603	603
Chemical Products EE	8	8	14,998	14,998
Mixed Industrial EE	38	38	6,899	6,899
Office Building – Large – EE	67	67	18,282	18,282
Office Building – Small EE	68	68	1,754	1,754
Primary Metals EE	19	19	21,635	21,635
Government & Non-Profit EE	150	150	27,690	27,690
Retail Stores – Small EE	211	211	6,299	6,299
Retail Stores – Large EE	47	47	2,394	2,394
TOTAL PORTFOLIO	20,935	30,091	168,856	172,433

[16] CPITD savings reflect one-time adjustments correcting errors in the program database, including those with respect to the timing (year) of participation.

Table 1-5: EDC Reported Gross Energy Savings by Program through PY2

Program	PY2 Total Gross Savings (MWh)	EE&C Plan Estimate for Program Year (MWh)	Percent of Estimate (%)
Residential: EE Program (includes upstream lighting) [1]	41,880	32,318	130%
Residential: School Energy Pledge	1,799	1,350	133%
Residential: Appliance Recycling	5,620	3,334	169%
Residential: Low Income EE (includes upstream lighting) [1]	15,895	8,587	185%
Commercial Sector Umbrella EE	2,078	5,363	39%
Healthcare EE	1,029	11,395	9%
Industrial Sector Umbrella EE	603	2,515	24%
Chemical Products EE	14,998	6,229	241%
Mixed Industrial EE	6,899	5,557	124%
Office Building – Large – EE	18,282	20,200	91%
Office Building – Small EE	1,754	10,635	16%
Primary Metals EE	21,635	17,139	126%
Government & Non-Profit EE	27,690	24,985	111%
Retail Stores – Small EE	6,299	3,636	173%
Retail Stores – Large EE	2,394	8,765	27%
TOTAL PORTFOLIO	168,856	162,008	104%

NOTES:

[1] Upstream lighting is separated into the REEP and low-income segments.

A summary of evaluation verified energy impacts by program is presented in Table 1-6. The overall portfolio realization rate is 97.6%. Per instruction from the SWE, the PY2 net-to-gross rates are deemed to be 100%.

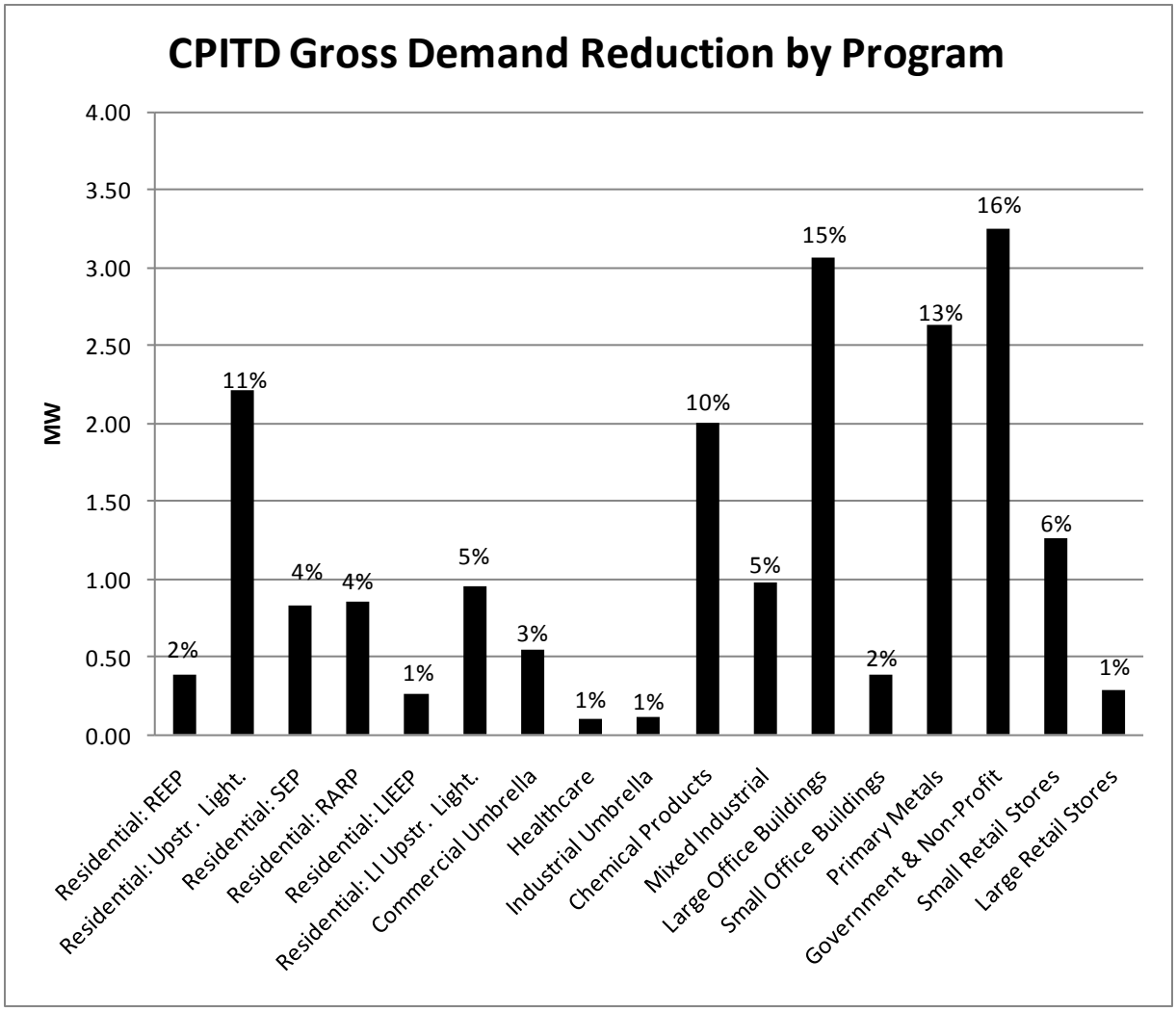
Table 1-6: Verified Energy Savings by Program for PY2

Program	PY2 Reported Gross Impact (MWh)	Realization Rate	PY2 Verified Impact (MWh)	Net-to-Gross Ratio	PY2 Net Impact (MWh)
Residential: EE Program (REEP): Rebate Program	3,919	72.1%	2,827	100%	2,827
Residential: EE Program (Upstream Lighting)	37,960	100.0%	37,953	100%	37,953
Residential: School Energy Pledge	1,799	60.8%	1,095	100%	1,095
Residential: Appliance Recycling	5,620	100.0%	5,620	100%	5,620
Residential: Low Income EE	1,322	81.4%	1,076	100%	1,076
Residential: Low Income EE (Upstream Lighting)	14,573	100.0%	14,570	100%	14,570
Commercial Sector Umbrella EE	2,078	98.8%	2,053	100%	2,053
Healthcare EE	1,029	98.8%	1,017	100%	1,017
Industrial Sector Umbrella EE	603	97.2%	586	100%	586
Chemical Products EE	14,998	97.2%	14,578	100%	14,578
Mixed Industrial EE	6,899	97.2%	6,706	100%	6,706
Office Building – Large – EE	18,282	98.8%	18,061	100%	18,061
Office Building – Small EE	1,754	98.8%	1,733	100%	1,733
Primary Metals EE	21,635	97.2%	21,029	100%	21,029
Government & Non-Profit EE	27,690	98.8%	27,355	100%	27,355
Retail Stores – Small EE	6,299	98.8%	6,223	100%	6,223
Retail Stores – Large EE	2,394	98.8%	2,365	100%	2,365
TOTAL PORTFOLIO	168,856	97.6%	164,848	100%	164,848

1.3 Summary of Demand Impacts by Program

A summary of the reported demand reduction by program is presented in Figure 1-2, including the percantage contrribution of each program to the portfolio savings.

Figure 1-2: Reported Demand Reduction by Program through PY2.



A summary of demand reduction impacts by program through the Program Year 2010 is presented in Table 1-7 and Table 1-8. Table 1-8 compares gross demand impacts to targets set out in DLC's EE&C plan. Note, reported gross demand savings for PY2 were only 41 percent of the plan.

Table 1-7: Participation and Reported Gross Demand Reduction by Program through the End of PY2

	Participants		Reported Gross (MW)	
Program	**PY2**	**CPITD**	**PY2**	**CPITD**
Residential: EE Program (REEP): Rebate Program	10,315	13,176	0.345	0.390
Residential: EE Program (Upstream Lighting)	N/A	N/A	2.209	2.209
Residential: School Energy Pledge	4,346	9,096	0.064	0.828
Residential: Appliance Recycling	3,605	3,854	0.795	0.861
Residential: Low Income EE	1,975	3,271	0.110	0.268
Residential: Low Income EE (Upstream Lighting)	N/A	N/A	0.951	0.951
Commercial Sector Umbrella EE	73	73	0.544	0.544
Healthcare EE	9	9	0.104	0.104
Industrial Sector Umbrella EE	4	4	0.116	0.116
Chemical Products EE	8	8	2.000	2.000
Mixed Industrial EE	38	38	0.973	0.973
Office Building – Large – EE	67	67	3.067	3.067
Office Building – Small EE	68	68	0.389	0.389
Primary Metals EE	19	19	2.627	2.627
Government & Non-Profit EE	150	150	3.250	3.250
Retail Stores – Small EE	211	211	1.260	1.260
Retail Stores – Large EE	47	47	0.283	0.283
TOTAL PORTFOLIO	20,935	30,091	19.088	20.122

Table 1-8: Reported Gross Demand Reduction by Program through PY2

Program	PYTD Total Committed (MW)	EE&C Plan Estimate for Program Year (MW)	Percent of Estimate Committed (%)
Residential: EE Program (includes upstream lighting)	2.554	15.965	16%
Residential: School Energy Pledge	0.064	1.215	5%
Residential: Appliance Recycling	0.795	0.831	96%
Residential: Low Income EE (includes upstream lighting)	1.061	3.501	30%
Commercial Sector Umbrella EE	0.544	1.150	47%
Healthcare EE	0.104	2.445	4%
Industrial Sector Umbrella EE	0.116	0.389	30%
Chemical Products EE	2.000	0.962	208%
Mixed Industrial EE	0.973	0.858	113%
Office Building – Large – EE	3.067	4.400	70%
Office Building – Small EE	0.389	1.940	20%
Primary Metals EE	2.627	2.647	99%
Government & Non-Profit EE	3.250	7.278	45%
Retail Stores – Small EE	1.260	0.780	161%
Retail Stores – Large EE	0.283	1.881	15%
TOTAL PORTFOLIO	19.088	46.242	41%

A summary of evaluation adjusted demand impacts by program is presented in Table 1-9. The overall portfolio realization rate is 96.9%. Per instruction from the SWE, the PY2 net-to-gross rates are deemed to be 100%.

Table 1-9: Verified Demand Reduction by Program through PY2

Program	PY2 Reported Gross Impact (MW)	Realization Rate	PY2 Verified Impact (MW)	Net-to-Gross Ratio	PY2 Net Impact (MW)
Residential: EE Program (REEP): Rebate Program	0.345	81.0%	0.279	100%	0.279
Residential: EE Program (Upstream Lighting)	2.209	99.9%	2.208	100%	2.208
Residential: School Energy Pledge	0.064	70.0%	0.045	100%	0.045
Residential: Appliance Recycling	0.795	100.0%	0.795	100%	0.795
Residential: Low Income EE	0.110	92.4%	0.101	100%	0.101
Residential: Low Income EE (Upstream Lighting)	0.951	89.1%	0.847	100%	0.847
Commercial Sector Umbrella EE	0.544	96.6%	0.525	100%	0.525
Healthcare EE	0.104	96.6%	0.100	100%	0.100
Industrial Sector Umbrella EE	0.116	98.4%	0.114	100%	0.114
Chemical Products EE	2.000	98.4%	1.969	100%	1.969
Mixed Industrial EE	0.973	98.4%	0.958	100%	0.958
Office Building – Large – EE	3.067	96.6%	2.961	100%	2.961
Office Building – Small EE	0.389	96.6%	0.376	100%	0.376
Primary Metals EE	2.627	98.4%	2.585	100%	2.585
Government & Non-Profit EE	3.250	96.6%	3.139	100%	3.139
Retail Stores – Small EE	1.260	96.6%	1.216	100%	1.216
Retail Stores – Large EE	0.283	96.6%	0.273	100%	0.273
TOTAL PORTFOLIO	19.088	96.9%	18.493	100%	18.493

1.4 Summary of Evaluation

Realization rates are calculated to adjust reported savings based on statistically significant verified savings measured by independent evaluators. The realization rate is defined as the percentage of reported savings that is achieved, as determined through the independent evaluation review. A realization rate of 1 or 100% indicates no difference between the reported and achieved savings. Realization rates are determined by certain attributes relative to one of three protocol types. Fully deemed TRM measure realization rates are driven by differences in the number of installed measures. Partially deemed TRM measure[17] realization rates are driven by (1) differences in the number of installed measures and (2) differences in the variables. Custom measure realization rates are driven by differences in the energy savings as estimated at time of installation and savings as determined by the measurement and verification process.

1.4.1 Impact Evaluation

1.4.1.1 Evaluation Groups

Per the utility's EM&V Plan[18], for the purpose of conducting cost-effective EM&V, certain industrial and commercial programs are grouped based on shared characteristics. Commercial sector retail, healthcare, large and small office, public agency/non-profit, and commercial umbrella programs are similar enough in structure to be treated as one evaluation group[19]. All industrial programs function in a similar enough manner that they are treated as one evaluation group. Because of their unique program features, each residential program is evaluated independently. This program level EM&V organization results in seven distinct Evaluation Groups[20], as shown in Table 1-10 below. Note that program theory and logic models have been developed for six of the seven Evaluation Groups.[21]

[17] TRM measures with stipulated values and variables.

[18] Evaluation Measurement and Verification Plan, 2010-2012 Energy Efficiency & Conservation Programs, July 15, 2010 (EM&V Plan), sections 1.2.6 Program Level EM&V Organization, page 12.

[19] Note that in cases where the programs must be consolidated for practical M&V purposes, the sample data can be used to provide estimates at the program level by applying the program group realization rates to each program in the program group.

[20] EM&V Plan Table 1-7: Evaluation Groups, page 13.

[21] Upstream Lighting Program Theory and Logic Model have yet to be developed

Table 1-10: Evaluation Groups

Evaluation Groups	Included Sub Programs
Residential: Appliance Recycling Program (RARP)	Single program group
Residential: Low Income Energy Efficiency Program (LIEEPP)	Single program group
Residential :Energy Efficiency Rebate Program (REEP)	Single program group
Residential: School Energy Pledge Program (SEP)	Single program group
Upstream Lighting Program	Residential Upstream Lighting and Low Income Upstream Lighting
Commercial	Umbrella, Small Office, Large Office, Health Care, Retail, and Government/Non-Profit
Industrial	Umbrella, Primary Metals, Chemical Products and Mixed Industrials

In this section, for the residential, commercial and industrial programs, we describe the sample designs and methods used to produce *ex post* estimates of energy and demand impacts.

Residential

Below, we describe the approach used to produce ex post estimates of gross savings for the four residential programs.

Verified Savings Estimation Approach

For deemed measures, the total ex ante gross kWh (or kW) impact for a given Program Management and Reporting System (PMRS) record is defined as the claimed units installed multiplied by the unit energy savings (UES). With the Verification approach for deemed measures, there are two sub-levels of rigor, basic and enhanced. The level of rigor depends on the size of the savings. The basic level of rigor will be used for measures for which the rebate is less than $2,000. The enhanced level of rigor is reserved for measures for which the rebate is equal to or greater than $2,000. Basic level of rigor involves verification by telephone survey, and enhanced level of rigor involves on-site verification.

The basic level of verification rigor methods for TRM deemed measures involves two basic steps:

1. Survey a random sample of participants to verify installations and estimate verification rates.
2. The claimed ex ante gross kWh and kW impacts for each PMRS record in the population from which the sample was drawn are then multiplied by this verification rate.

The verification used for TRM deemed measures consists of a six-step process:

Step 1. The verification checklist for deemed savings measures includes data downloaded from PMRS and/or taken from hardcopy documentation for each participant installation or can be obtained by telephone or on-site visit. The verification checklist for deemed savings measures includes:

3. Participant has valid utility account number
4. Measure(s) is on approved list and all parameters necessary for calculating savings are present.

5. Proof of purchase identifies qualifying measure and is dated within the period being verified.
6. Rebate payment date is in the current program period being verified (for residential rebates).
7. Unit kWh and kW are correct for each listed measure.
8. Measure was actually installed at the customer site (telephone survey for basic level of rigor).

Step 2. A simple random sample of participants is selected from the PMRS database.

Step 3. Relevant documentation for item #1 through #5 from PMRS or other hardcopy documentation is then obtained for each sampled PMRS record.

Step 4. Because all participants sampled met the criterion of having incentive payments less than $2,000, telephone interviews are conducted with each sampled customer to confirm that they participated in the program, received the rebate, and purchased and installed the efficient measure(s).

Step 5. Using the data collected from program files and telephone surveys, a verification rate (VR) was calculated. The VR was calculated by summing the verified (ex post) savings for all sampled participants, summing the reported (ex ante) savings for all sampled participants, and then dividing the total verified savings by the total reported savings. For the REEP and LIEEP programs, which involved stratification by participation type, the verification rate was calculated for each stratum.

Step 6. The final step involved multiplying each program's verification rate by the total reported savings in the program tracking system for that program, to obtain a total verified savings. For REEP and LIEEP, the total reported savings for each stratum in the program tracking system were multiplied by the appropriate stratum-specific verification rate.

1.4.1.2 Sample Design and Realization Rate Calculation: LIEEP, REEP, RARP and SEP

All residential programs generally use the simple ratio estimator. The reasons for moving to a simple ratio estimator were that the vast majority of the measures installed in these four residential programs are expected to be TRM deemed. This means that the savings are subjected to the basic level of rigor that involved only the verification of installations. The only changes to the estimated gross savings in PMRS would be due to clerical errors and installation rates, which were expected to be minor. Neither the installation rates nor the rate of clerical errors were expected to vary by measure/end use making stratification unnecessary. The resulting verification rate (the ratio of the ex post savings to the ex ante savings) was therefore expected to be very high with a very low variance.

However, there were two primary exceptions to this sampling strategy. For REEP, three strata were defined: 1) efficiency kits, 2) efficiency rebates (non-kits), and 3) upstream lighting. This approach was used under the assumption that while installation rates might not vary very much for rebated products such as Energy Star^{R} refrigerators, it was certainly possible that installation of each item in an efficiency kit might vary among the participants who received them. Also, because Duquesne's LIEEP was defined as low-income participation in the other Act 129 programs, stratification was needed by program type within LIEEP (e.g., low-income REEP rebate participants, low-income REEP kit participants, low-income RARP participants, low-income SEP participants, and low-income Upstream Lighting – in addition to low-income-only refrigerator replacement participants).

The above sample design resulted in a total of 11 residential strata, as shown in Table 1-11 below.

Table 1-11: Residential Strata used for Realization Rate Calculation

Stratum	Program Group	Population Count (line items in project database)	Sample Count (line items verified)	Evaluation Distribution Used
SEP	SEP	4,346	81	Continuous
RARP	RARP	3,605	104	Binomial
REEP Upstream Ltg	REEP	16	16	Continuous
REEP Kits		6,450	27	Continuous
REEP Rebates		3,849	55	Continuous
LIEEP REEP Kits	LIEEP	675	16	Continuous
LIEEP REEP Rebates		72	6	Continuous
LIEEP SEP		871	39	Continuous
LIEEP RARP		161	6	Binomial
LIEEP Refrigerator Replacement		190	7	Binomial
LIEEP Upstream Ltg		6	6	Continuous
Total		**20,241**	**363**	

As described above, a realization rate (or ratio estimate) was calculated for each residential stratum, each of which employed a simple random sampling technique. Final realization rates and relative precision at the program group and residential portfolio level (which aggregate the strata above) were calculated using the stratified ratio estimation approach, following the method outline in Lohr (1999)[22]. The approach outlined in Lohr (1999) was modified slightly to account for verification methods that resulted in binomial, rather than continuous, distributions. Binomial distributions (i.e., results typically resulting in a value of 0 or 1, or "installed" vs. "not installed") were assumed for the RARP strata, LIEEP RARP stratum, and the LIEEP Refrigerator Replacement stratum. For these strata, the calculation of the standard error on the estimated realization rate (or installation rate, in these cases) followed the Wilson Score Interval method outlined by Brown (2001)[23]. This approach provides a better estimate of the relative precision of binomial distributions than the often inappropriately used Ward estimate (specified by the California Evaluation Framework), which breaks down entirely at expected proportions near 1.0 (the value typically expected for an installation verification) or zero (also described in Brown (2001)). Aggregation of the variance of each stratum (calculated depending on the assumed distribution type) was still calculated per Lohr (1999).

Note that, per Duquesne's approved EM&V Plan, no customer-based verification efforts were required to estimate in-service/installation rate or product leakage for the Upstream Lighting Program. Verification efforts consisted only of confirming that energy and demand savings reported in Duquesne's PMRS (tracking system) could be documented based on invoicing details provided by the program implementation contractor, ECOVA (formerly ECOS), with respect to numbers of units, wattages and savings claims. As a result of using this approach, a verification of every database line item (a census

[22] Lohr, Sharon. *Sampling: Design and Analysis*. Pacific Grove, CA: Duxbury Press, 1999, 69-101.

[23] Lawrence D. Brown, T. Tony Cai and Anirban DasGupta. "Interval Estimation for a Binomial Proporation." Statistical Science 16 (2001): 101–133.

approach) was conducted for upstream lighting, resulting in effectively zero *sampling uncertainty*[24] for these strata. As upstream lighting accounts for a large fraction of total residential savings, the result of this approach is such that the relative precision calculated for the residential sector was found to be very low, as detailed in Section 1.4.1.5.

1.4.1.3 Commercial Program Group Sample Design and Realization Rate Calculation

The sample design for the Commercial Program Group used the stratified ratio estimator (Lohr 1999)[25]. As described in the 2010-2012 Energy Efficiency & Conservation Program (EM&V Plan), a stratified ratio estimator is used to adjust the ex ante savings contained in PMRS. The approach is similar to that used for the residential programs except that the sample is stratified by ex ante energy savings (kWh) rather than by sub-program. Additionally, unlike with Residential, all strata standard errors were estimated consistent with Lohr (1999) assuming a continuous distribution of the realization rate. The stratified ratio estimation approach takes advantage of information that is reported in the PMRS tracking system for each project in the program. The two key parameters in the stratified ratio estimate are a) the ratio between ex post (denoted as the "Y' variable) and ex ante (denoted as the "X" variable) and b) the standard error of the estimate. The ratio between ex post and ex ante, which is sometimes referred to as the realization rate, measures the accuracy of the tracking estimates from project to project across the sample of projects. The standard error of the ratio estimate is a measure of the variability in the relationship between the ex post and ex ante estimates. Both estimates help to define the relationship (e.g., the ratio as well as the relative precision of the ratio) between the tracking estimates of savings and the actual project savings.

Ratios are calculated within each stratum and strata weights are applied to arrive at a program-level ratio. A stratum is a subset of the projects in the population that are grouped together based on ex ante savings that are known information. In other words, a stratification of the population into strata is a classification of all units in the population into mutually exclusive strata that span the population. Under this design, each stratum is sampled according to simple random sampling protocols and the weighted estimates of parameters are then applied to the entire population.

For the Commercial sector, the strata used in calculating the overall realization rate and relative precision are described below in Table 1-12.

Table 1-12: Commercial Strata used for Realization Rate Calculation

Stratum	Population Count (line items in project database)	Sample Count (line items verified)	Evaluation Distribution Used
kWh>=3,000,000	4	4	Continuous
300,000<= kWh <3,000,000	24	6	Continuous
100,000<= kWh <300,000	67	10	Continuous
kWh <100,000	530	48	Continuous
Total	**625**	**68**	

[24] Of course, other sources of uncertainty exist beyond *sampling* uncertainty. For instance, uncertainty of actual savings for each CFL exists due to variance in operating hours, assumed baseline wattage, etc. As the approved evaluation technique used *deemed* values for CFL savings, however, that uncertainty is not reflected in the reported relative precision for these measures.

[25] Lohr, Sharon. *Sampling: Design and Analysis*. Pacific Grove, CA: Duxbury Press, 1999, 69-101.

Per the utility's EM&V Plan[26], for measures with rebates less than $2,000, the basic level of verification rigor (telephone verification) was employed. The enhanced level of rigor verification (on-site verification) was applied when measure rebates were equal to or greater than $2,000. The sampling unit for the commercial program was the project, each project having a project ID in the Duquesne tracking system.

Basic Level of Rigor Verification: For Commercial programs, the basic level of verification rigor included obtaining and analyzing hardcopy and electronic documentation for each sampled participant installation. Interviews were conducted with designated customer contacts, as well as facility managers, program implementers, equipment suppliers and installation contractors, as needed, to verify project documentation. Where documentation was inadequate, secondary research was conducted to ascertain required pre- and post equipment definition as well as operating conditions. Project planning documentation was compared with applicable TRM deemed and partially deemed measure values and algorithm inputs. Based upon the review of the aforementioned, reported *ex ante* savings were assessed, corroborated or revised to reflect assessment findings.

Enhanced Level of Rigor Verification: Enhanced rigor verification included an analysis of utility tracking system data, an analysis of project file hardcopy and electronic documentation, and on- site verification of installed equipment. Sample sites were selected for the commercial and industrial sector evaluation groups as described above and in Section 4 Portfolio Results by Program. Where required, equipment was verified on-site by sampling to achieve 90% confidence/20% precision consistent with guidelines prescribed in Audit Plan and Evaluation Framework for PA Act 129 Energy Efficiency and Conservation Programs (Audit Plan)[27]. Interviews were conducted with designated customer contacts, as well as facility managers, program implementers, equipment suppliers and installation contractors, as needed. Building configuration and business operations were researched to confirm key savings determinants such as operating hours and the presence or absence of space cooling or refrigeration. Where documentation was inadequate, secondary research was conducted to ascertain required pre- and post equipment definition as well as operating conditions.

[26] Evaluation Measurement and Verification Plan, 2010-2012 Energy Efficiency & Conservation Programs, July 15, 2010 (EM&V Plan), sections 2.5 and 2.5.1, pages 21 and 22.

[27] GDS Associates, Inc., Nextant, & Mondre Energy, Audit Plan and Evaluation Framework for Pennsylvania Act 129 Energy Efficiency and Conservation Programs. December 1, 2009.

1.4.1.4 Industrial Program Group Sample Design and Realization Rate Calculation

The industrial program group sample design was essentially the same as that used for the commercial program. However, the sampling unit was a project measure, rather than an entire project. The level of verification rigor and estimation of realization rates followed the same guidelines as those used for the commercial program group. The strata used in the stratified ratio estimation differed somewhat from the Commercial sector and are provided below in Table 1-13.

Table 1-13: Industrial Strata used for Realization Rate Calculation

Stratum	Population Count (line items in project database)	Sample Count (line items verified)	Evaluation Distribution Used
kWh>= 3,000,000	3	3	Continuous
3,000,000 > kWh >= 449,000	10	3	Continuous
449,000 > kWh >= 75,000	43	15	Continuous
kWh < 75,000	569	9	Continuous
Total	**625**	**30**	

1.4.1.5 Achieved Confidence and Precision

For the plan year, sample sizes, realization rates and achieved precision at the 90% level of confidence for each program are presented in Table 1-14 below:

Table 1-14: Summary of Realization Rates and Confidence Intervals for kWh and kW

Program	PYTD Sample Participants	Program Year Sample Participant Target	Realization Rate for kWh	Confidence and Precision for kWh	Realization Rate for kW	Confidence and Precision for kW
Residential Sector	341	230	0.97	90% /± 0.5%	0.96	90% /± 0.7%
Non-residential Sector	98	90	0.98	90% /± 4.3%	0.97	90% /± 7.0%
Residential: EE Rebate	82	65	0.97	90% /± 0.6%	0.97	90% /± 0.7%
Residential: School Energy Pledge	81	55	0.61	90% /± 11.1%	0.70	90% /± 9.1%
Residential: Appliance Recycling	104	55	1.00	90% /± 2.5%	1.00	90% /± 2.5%
Residential: Low Income EE	74	55	0.98	90% /± 0.7%	0.89	90% /± 1.6%
Commercial Program	68	64	0.99	90% /± 6.7%	0.97	90% /± 10.7%
Industrial Program	30	26	0.97	90% /± 4.1%	0.98	90% /± 6.4%
TOTAL PORTFOLIO	439	320	0.98	90% /± 2.6%	0.97	90% /± 5.3%
NOTES:						

1.4.2 Process Evaluation

Process evaluations for each of the six evaluation program groups included the following activities:

- Review of program documentation available from public utility commission filings
- Review of program-specific information on Duquesne's website
- Interviews with Duquesne program staff
- Review of marketing materials supplied by Duquesne or its CSPs

- Review of the program logic model supplied in Duquesne's EM&V Plan
- Conduct and analysis of results from program participant surveys conducted during verification of the quarterly savings
- Review of program performance as reported in Duquesne's PMRS (DSM Tracking) system, including review of the tracking system, itself.

Highlights of the process evaluation for each program group are presented in Section 4. It should be noted that Duquesne Light has had to ramp up a major energy efficiency initiative in a relatively short time, and it is to be commended for achieving its energy savings goals for Program Year 2. While there were many start-up issues and practical problems to address (and will continue to be in the future), the utility has responded to these challenges and moved forward. One key area for improvement is the program tracking system, PMRS. The tracking system and its use need to be refined and enhanced. Below, we discuss PMRS and our recommendations for it, in some detail. The tracking system enhancements will benefit all programs.

1.4.2.1 Tracking System Review

Navigant receives three quarterly reports from Duquesne's PMRS. These reports are "Quarterly Completed Measure Report", "Quarterly Completed Project Report" and "Quarterly In-Progress Project Report". The reported information varies slightly for each of the three reports. A matrix of the fields provided for each report is shown below:

Field Name	Quarterly Completed Measure Report	Quarterly Completed Project Report	Quarterly In-Progress Project Report
Program ID	Provided	Provided	Provided
Program Name	Provided	Provided	Provided
Project Number	Provided	Provided	Provided
Measure Name	Provided	Not included	Not included
Incentive	Provided	Provided	Provided
Installed Date	Provided	Provided	Called "In Progress" instead of "Installed Date"
Number of Measures	Provided	Not included	Not included
kWh	Provided	Provided	Provided
kW	Provided	Provided	Provided
Participant Name	Provided	Provided	Provided
Participant Account Number	Provided	Provided	Provided
Participant Street Address	Provided	Provided	Provided
Participant Phone	Provided	Provided	Provided
Claim ID	Provided	Provided	Not included

The PMRS report fields contain the following information:

Field Name	Values (contained in PY2Q3)	Description (contained in PY2Q3)
Program ID	10, 11, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26	Duquesne internal numerical identifier for EE program.

Program Name	Chemical Products (25) CSUP Commercial Umbrella (16) Education (18) HEEP (Health Care) (21) ISUP Industrial Umbrella (22) LIEEP Low Income Residential (14) Mixed Industrial (23) Non Profit (26) Office Buildings - Small (15) Office Buildings-Large (20) PAPP Public Agency Partnership (19) Primary Metals (24) REEP Residential Energy Efficiency (10) Retail Stores (17) RRP Refrigerator Recycling (12) SEP School Energy Pledge (11)	Program name assigned to the program. The text companion to numerical Program ID.
Project Number	Format NNNNNNNNNN.PP.CC	Unique number assigned for each project using the following logic: The first ten digits are unique to a Participant Account Number. The next two digits show the Program ID. The last two digits are assigned subsequently for each project completed by account number.
Measure Name	77 unique entries, e.g. School Energy Program Kit, FC5 ES Refrigerator with 2 doors and 31-60 cu ft	Brief description of the measure.
Incentive	Monetary Value	US dollar value of the incentive provided.
Installed Date	Date	Date the check is cut. If no check cut, date of XXXXX
Number of Measures	Numeric value (integer)	Amount of measures applied.
kWh	Numeric value	kWh savings claimed
kW	Numeric value	kW savings claimed
Participant Name	Last <spaces> First	Name of the Duquesne account holder.
Participant Account Number	13 digit number	Unique Duquesne account number.
Participant Street Address	00000 Street Name, PA ZIP-Code	Account address
Participant Phone	1234567891	10 digit phone number of account holder including area code.

Claim ID	8 digit number	Only used for LIEEP and REEP programs.

Residential Programs

For all residential project updates to PMRS, the Residential Coordinator uses spreadsheets to capture project details and sends them to the PMRS Consultant. The PMRS Consultant updates PMRS based on the spreadsheets after he performs data verification steps; that data verification consists of the account number matching a query within the SEED file that shows the customer's status as "active" and verifies that it is a "residential" customer within the DLC database.

If a low income customer applies for a benefit under REEP, SEP or RRP, the activity is automatically tagged as a LIEEP transaction. The tagging is based on a "low income code" that is associated with the account number. The SWE directed DLC to treat upstream lighting program participation by LIEEP customers in this manner. DLC reported treatment of other program participation by LIEEP customers in this way in all previous quarterly and annual reports, and has been accepted.

The PMRS is the tracking database and project control system for DLC's programs. The PMRS was built from a data dictionary developed by DLC's planning contractor, MCR, and included in the July 2009 program filing. The data being collected forms a firm foundation for tracking program and project progress through the system. The PMRS was created by DLC in-house primarily by a DLC employee who is now an independent consultant who maintains the database and currently is available on only a limited basis.

PMRS Basic Functions, Commercial and Industrial Programs

Overall, the PMRS serves as the program data holder of record. The PMRS is set up to document all DLC energy efficiency programs at the account, project and measure levels and be the primary path for project submissions and approvals, PMRS successfully generates all required compliance data and reports documenting the programs' accomplishments. For Commercial and Industrial programs Conservation Service Providers (CSPs) use the database to access customer files appropriate to the programs they are implementing, and enter project data, including proposed and installed measures, measure costs, savings and similar information. The PMRS provides prescriptive measure baselines, TRC cost effectiveness at the measure level, Effective Full Load Hours and other catalog data derived from the PA TRM. PMRS records estimated and actual measure costs, and estimated and actual project incentives. For custom measures, CSPs can enter baselines and provide other relevant information. DLC project approvals are generated through the PMRS, and participant incentive payments for inspected and verified measures are generated by the designated fulfillment contractor, Helgeson. CSP payments for kWh saved per project are also determined within the PMRS.

The PMRS system was designed primarily in an audit context; it provides a substantial level of security against unauthorized project changes by users, primarily CSPs. CSPs are granted limited rights through system "policies" that control their rights to access or alter data entered into the system. One system strategy is to maintain correct measure data entered by CSPs through extensive use of drop down menus intended to make the system as "foolproof" as possible, according to the PMRS contractor. PMRS also includes a number of internalized routines that pass project data back and forth between DLC and CSPs at each entry, submittal, approval, or other event. CSPs perform under contract many program marketing, assessment, implementation management and oversight functions. CSPs have

contracts to provide opportunities, within their predetermined program segments, for customers to benefit from Watt Choices rebates offered by Duquesne Light. PMRS takes into account the role of the CSP while providing adequate safeguards and security in granting user rights to CSPs. Enhancements and possibly redefinition of PMRS operational roles are being reviewed based upon comments from the current CSPs.

Inputs and Outputs

The PMRS is the channel for projects for Duquesne Light customers either through CSPs or DLC administrative personnel. CSPs and DLC personnel use the PMRS to submit project data, which must be done measure by measure because there is no upload capability. CSPs note the system requires much repetitive data entry of basic information. Because project measure data cannot be uploaded in bulk, CSPs must engage in intensive manual data entry of large numbers of lamps, fixtures, ballasts, etc. This requirement makes it more likely that data entry errors will occur. DLC engaged in a process with CSPs to develop a single common data entry format but, despite their comments regarding their need to upload measure data in bulk, the CSPs did not come to agreement and this PMRS improvement has not been made to date. Once a project is entered and submitted, however, the project is unavailable to the CSP. Even minor corrections must be addressed by emailing or calling the DLC administrator who can make changes to the project. Submitted projects have not yet been approved by DLC, hence locking files does not provide a real measure of security but does generate a lot of otherwise unnecessary work and delays.

There is logic in locking approved projects, but they should remain accessible to CSPs at least for checking project status throughout. Projects as implemented often have differences from planned measures. The quantities and types of measures may change or a specified piece of equipment may not be available and another efficient alternative, possibly with different cost or savings characteristics may legitimately be substituted. Rather than locking the system throughout, it may make more sense to allow CSPs to make changes with a secure log file recording every project change. A log file could also serve as an audit function.

Reporting

There are no defined reports in PMRS that facilitate program management. In the context of the aggressive program ramp-up schedules, limited personnel and IT personnel turn-over, development of the planned PMRS reporting functionality was hindered. Currently information can be pulled from PMRS but there is no mechanism pushing data out to the Administrator or other users. The DLC contract administrator can access data about specific customers, specific projects, measures, but there is no systematic way of regularly having a complete picture of the program at any given moment or over time. The contract administrator can make specific requests and has done so but each request must be specific. The contract administrator recently requested and received a data download of all projects and is developing his own analysis from the data. That analysis still will be static. DLC does have access to a service called Crystal Reports, provided by a DLC contractor. The reports are intended for internal DLC use and there are limits on the number of reports that can be generated. DLC recently sought CSP input on PMRS improvements; DLC is now considering suggestions for enhancements to PMRS for reports and is in the process of prioritizing those enhancements. DLC, at the conclusion of this program year, interviewed each CSP and requested comments and suggestions for both PMRS and policy by which the programs are being implemented. This was an attempt to improve both the system and the policy such that any significant changes could be addressed in a subsequent plan filing. Enhancements and

clarification have been made to the written policy and provided to each of the CSPs for their use moving forward.

Unless a reporting capability is built into the system, the administrator and the CSPs cannot develop an accurate dynamic picture of the how the program is progressing. Many energy efficiency program tracking systems automatically produce weekly or even daily reports along a number of parameters and are easily searchable for information not contained in the defined reports. The ability to have ready access, regular reporting and instant search capability for any desired parameter are essentials for a tracking database to be an effective management tool.

Similarly the CSPs need to have better access to PMRS for tracking purposes. All of the CSPs have their own internal Customer Relationship Management (CRM) systems which they use for project management functions. But information such as project approval dates, customer incentive payment amounts and dates which is the sole province of PMRS can only be estimated in any outside project system. PMRS generates an email on project approval and other key actions, but that happens alongside the system from the CSP perspective, not within it.

Recommendations

PMRS is capturing all required compliance data and successfully provides a secure data environment, as it was designed to do. PMRS improvements are focused on its use as a management tool in the operation of DLC's programs. Based on a review of DLC's PMRS tracking system, the following recommendations are offered:

Recommendation: PMRS changes should be high priority to DLC and adequate resources should be provided. CSPs have made a number of suggestions, which are being reviewed and prioritized.
Rationale: DLC IT staff created PMRS very quickly to ensure there would be a robust tracking database in place. After an initial period of operation, a number of improvements and additions are clearly needed. Some of these changes can be readily accomplished through "policy" changes, while some require investment of programming resources.

Recommendation: We recommend that Duquesne identify program critical administrative processes and cross-train personnel to ensure backups are available. This should include developing in-house expertise and cross-training for PMRS software. DLC should also ensure that PMRS programming continues to be fully documented.
Rationale: PMRS is currently supported by a part time, out-of-state consultant who has only limited remote availability. There does not seem to be a clear succession plan if the current contractor's availability decreases or completely ends.

Recommendation: CSPs should be given access rights to modify proposals before DLC has approved them. Projects should be locked only between approval and entry of final results but should remain accessible so status can be readily checked at any time. CSPs should be able to search any or all of their projects for current status, other relevant data.
Rationale: Project changes are common because of data entry errors, or actual changes in measures proposed. Giving rights to change project information before DLC approval does not compromise security and avoids time spent on otherwise unnecessary phone and email communications. Projects should be locked between approval and entry of final results. This change can be accomplished through system "policy" rules that provide different levels of rights to different types of users.

Recommendation: DLC should develop upload capability to reduce time CSPs currently spend entering data line by line when projects are proposed and again when projects are submitted for final approval and payment. This can best be accomplished by reconvening the group that started the process of developing a common data format for uploads. We suggest that in reconvening, DLC set an aggressive timeline to complete the process, setting out milestones and adoption dates.
Rationale: PMRS was designed with a focus on drop down menus to minimize entry of bad data. There are more than 100 measure codes for C/I programs alone, and concern persists that giving those codes to CSPs could increase errors in submitted projects. However, If CSPs have the codes, they can develop their own check-off mechanisms that generate the correct results and minimize manual data entry. Further, project data entry for completed, inspected projects should be limited only to measures that have changed, rather than providing complete measure data a second time. Developing this capability will take some programming work and require agreement for all CSPs to submit data in a common format, which could be csv or another common file format. These changes would free CSP personnel to spend more time on other critical project activities. This capability is also quite important to DLC because DLC must perform the same data entry for all programs it directly administers and freeing staff time for other program functions would likely enhance staff's ability to administer the program.

Recommendation: PMRS needs a variety of reports that are generated on a regular basis to Administrators and CSPs, depending upon their particular needs. Examples include:

- Daily report to Administrator and DLC, automatically generated, on overall program and project status. Reports generated at segment, CSP, program as a whole levels. Goal attainments in projects and kWh saved; similar broad reach data.
- Aging reports – projects entered; projects formally submitted; projects approved; projects implemented; projects inspected; projects final review; payments. Available to CSPs and Administrators
- Exception reports –define problem types, show problems outstanding, resolution, etc.
- Other reports as identified by the administrator, the CSPs and program staff, including ad hoc reports to satisfy data requests from regulatory oversight.

Rationale: Weekly or even daily reports are critical project management tools. Current reports are few and can only be generated on a "pull" basis – on specific administrator request. Some reports using the Crystal system are limited in type and number that can be generated. Reports should be pushed out to provide up to the minute overall views of program progress, to help identify bottlenecks.

Recommendation: Build in quality control checks into PMRS. The data verification steps performed when uploading Residential program participation data into PMRS are not documented, although there are consistent practices followed. We recommend that DLC evaluate these data verification steps, add any checks necessary and formalize these data verification steps. As data are entered, PMRS should either give a warning or not accept data that is not logical, such as rebate payment dates that occur before application dates, and in general incorporate data validation capabilities, for dates, costs and other data types.
Rationale: Maintaining consistent, accurate data is one of the most important aspects of the PMRS database. Simple quality control checks will minimize error in data entry, which is done by hand.

1.5 Summary of Finances

The TRC test demonstrates the cost-effectiveness of a program by comparing the total economic benefits to the total costs. A breakdown of the portfolio finances is presented in Table 1-15.

Table 1-15: Summary of Portfolio Finances: TRC Test[28]

	Category	PY2
A.1	EDC Incentives to Participants	7,922,187
A.2	EDC Incentives to Trade Allies	0
A	**Subtotal EDC Incentive Costs**	7,922,187
B.1	Design & Development	487,291
B.2	Administration	
B.3	Management	6,257,801
B.4	Marketing[1]	702,930
B.5	Technical Assistance	0
B	**Subtotal EDC Implementation Costs[2]**	7,448,022
C	**EDC Evaluation Costs**	371,216
D	**SWE Audit Costs**	500,000
E	**Participant Costs**	21,719,210
	Total TRC Costs[2]	30,038,448
F	**Annualized Avoided Supply Costs[3]**	Not Computed
G	**Lifetime Avoided Supply Costs[4]**	107,072,659
	Total Lifetime Economic Benefits[5]	109,665,642
	Portfolio NPV	79,627,194
	Portfolio Benefit-to-Cost Ratio	3.7

[1]Incentives for SEP and RARP have been included as a Marketing cost as per 2011 TRC Test Order (pg. 36).
[2]TRC Test does not include incentives, which are treated as a transfer from the EDC to the participants.
[3]Included in *Lifetime Avoided Supply Costs* through the use of PV tables or Excel NPV calculations applied at the measure level.
[4]Present value of avoided supply costs.
[5]Present value of avoided supply costs plus present value of avoided costs for incandescent bulbs.

[28] Definitions for terms in following table are subject to TRC Order.

The TRC for each program is presented in Table 1-16.

Table 1-16: Summary of Portfolio Budget by Program

Program	TRC Benefits ($)	TRC Costs ($)	TRC Benefit-Cost Ratio
Residential: EE Rebate	$21,702,956	$4,571,968	4.7
Residential: School Energy Pledge	$715,873	$700,180	1.0
Residential: Appliance Recycling	$3,469,953	$883,764	3.9
Residential: Low Income EE	$8,222,993	$1,198,612	6.9
Commercial Sector Umbrella EE	$1,537,932	$580,663	2.6
Healthcare EE	$784,996	$617,554	1.3
Industrial Sector Umbrella EE	$506,099	$156,132	3.2
Chemical Products EE	$9,123,607	$3,227,976	2.8
Mixed Industrial EE	$5,759,911	$1,399,404	4.1
Office Building – Large – EE	$14,348,150	$3,944,639	3.6
Office Building – Small EE	$1,428,758	$723,351	2.0
Primary Metals EE	$15,590,548	$3,128,237	5.0
Government & Non-Profit EE	$20,467,558	$6,417,715	3.2
Retail Stores EE	$6,006,308	$2,354,911	2.6
Portfolio[1]	$109,665,642	$30,038,448	3.7

Notes:
[1]The Portfolio costs include other costs for programs that are still in development (e.g., DR program development)

2 Portfolio Results by Sector

The EE&C Implementation Order issued on January 15th, 2009 states requirements for specific sectors on page 11. In order to comply with these requirements, each program has been categorized into one of the following sectors:

9. Residential EE (excluding Low-Income)
10. Residential Low-Income EE
11. Small Commercial & Industrial EE
12. Large Commercial & Industrial EE
13. Government & Non-Profit EE

A summary of portfolio gross energy savings and gross demand reduction by sector is presented in Figure 2-1 and Figure 2-2.

Figure 2-1: PYTD Reported Gross Energy Savings by Sector

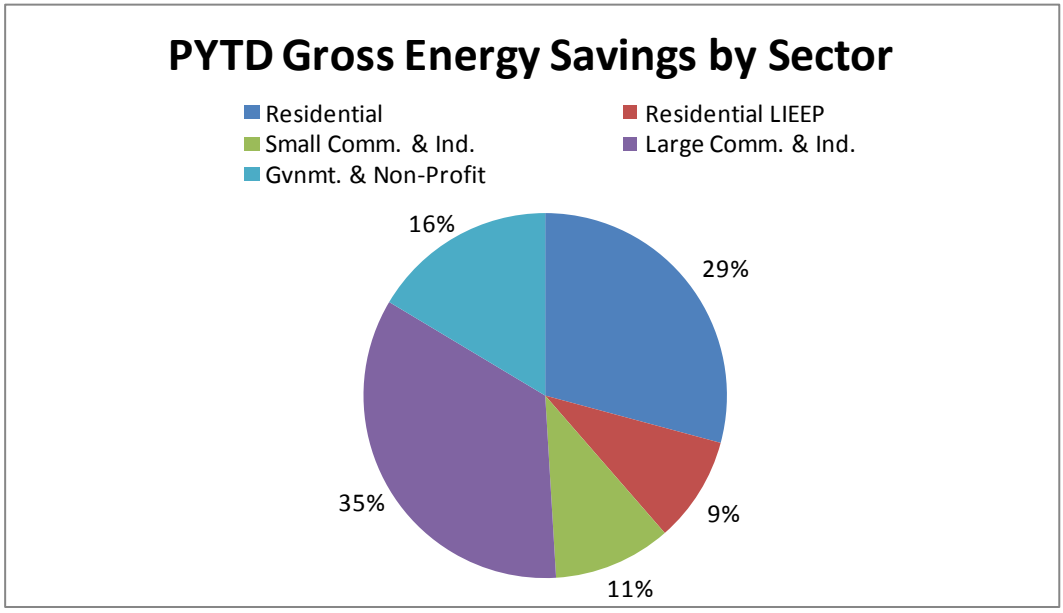
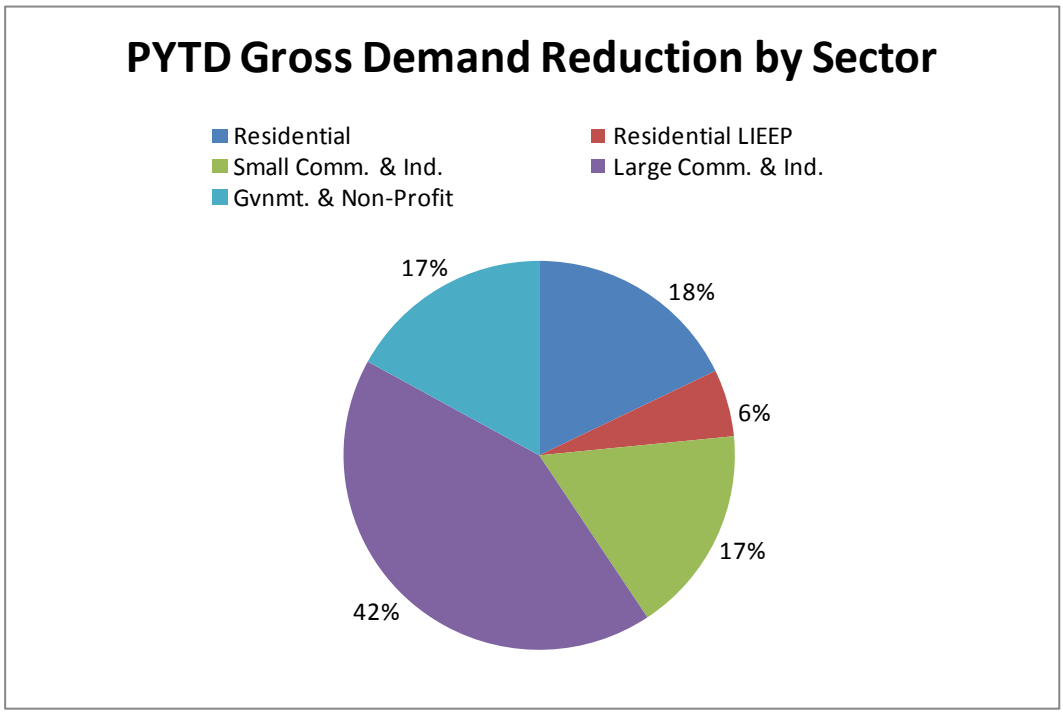


Figure 2-2: PYTD Reported Gross Demand Reduction by Sector



Energy savings by sector are presented in Table 2-1.

Table 2-1: Reported Gross Energy Savings by Sector through the End of the Reporting Period

Market Sector	Reported Gross Impact (MWh)		Total Committed
	PYTD	CPITD	
Residential EE	49,299	52,369	52,369
Residential Low-Income EE	15,895	16,403	16,403
Small Commercial & Industrial EE	17,633	17,633	17,633
Large Commercial & Industrial EE	58,339	58,339	58,339
Government & Non-Profit EE	27,690	27,690	27,690
TOTAL PORTFOLIO	168,856	172,433	172,433

Demand reductions by sector are presented in Table 2-2.

Table 2-2: Reported Gross Demand Reduction by Sector through the End of the Reporting Period

Market Sector	Reported Gross Impact (MW)		Total Committed
	PYTD	CPITD	
Residential EE	3.413	4.288	4.288
Residential Low-Income EE	1.061	1.219	1.219
Small Commercial & Industrial EE	3.282	3.282	3.282
Large Commercial & Industrial EE	8.081	8.081	8.081
Government & Non-Profit EE	3.250	3.250	3.250
TOTAL PORTFOLIO	19.088	20.122	20.122

2.1 Residential EE Sector

The annual sector target for plan year 2010 energy savings is 37,002 MWh and the sector target for annual peak demand reduction is 18.0 MW.

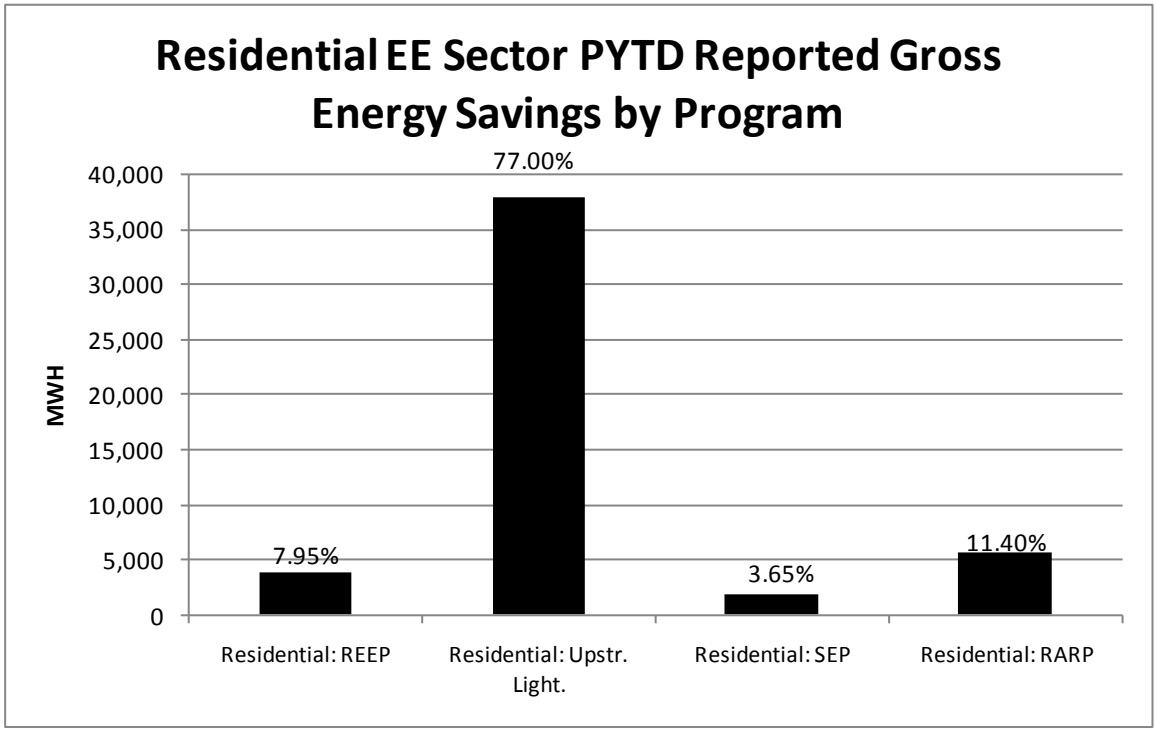
A sector summary of results by program is presented in Table 2-3.

Table 2-3: Summary of Residential EE Sector Incremental Impacts by Program for PY2

Residential EE Sector	PY2 Participants	PY2 Reported Gross Energy Savings (MWh)	PY2 Reported Gross Demand Reduction (MW)
Residential: EE Program (REEP): Rebate Program	10,315	3,919	0.345
Residential: EE Program (Upstream Lighting)	N/A	37,960	2.209
Residential: School Energy Pledge	4,346	1,799	0.064
Residential: Appliance Recycling	3,605	5,620	0.795
Sector Total	18,266	49,299	3.413
NOTES: 799,169 CFLs were distributed under the upstream lighting program in PY2.			

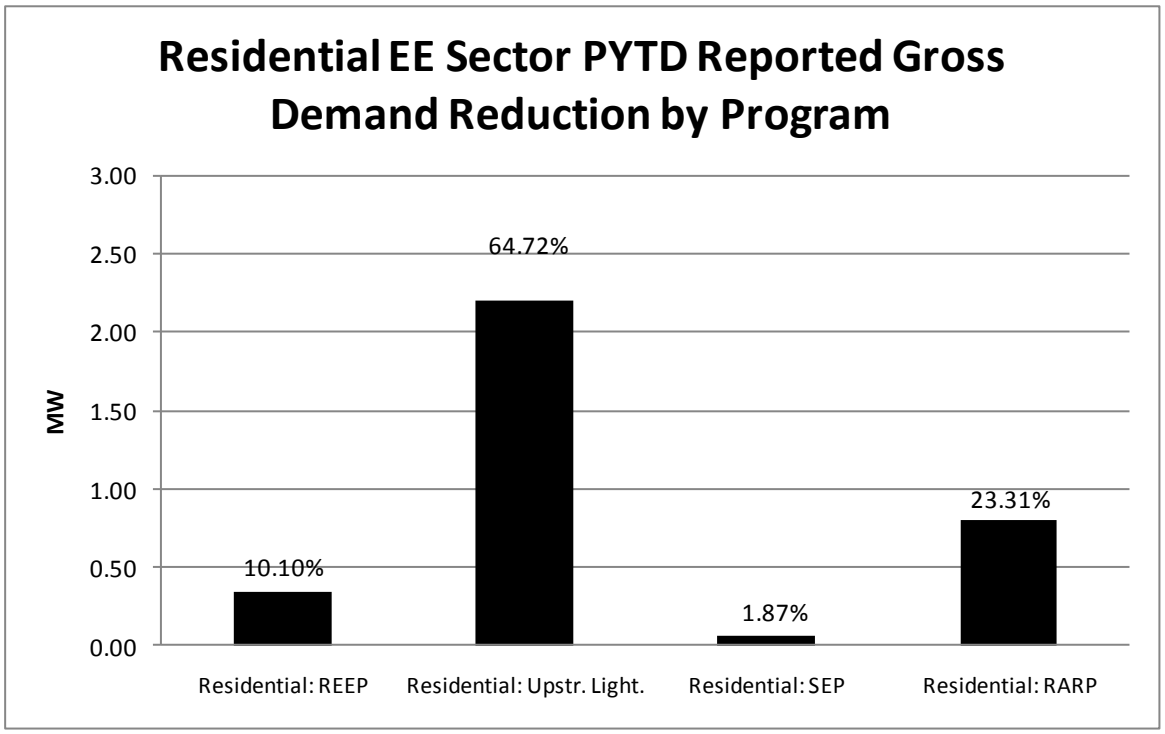
A summary of the sector energy savings by program is presented in Figure 2-3.

Figure 2-3: Summary of Residential EE Sector PYTD Reported Gross Energy Savings by Program



A summary of the sector demand reduction by program is presented in Figure 2-4.

Figure 2-4: Summary of Residential EE Sector PYTD Reported Demand Reduction by Program



2.2 Residential Low-Income EE Sector

The annual sector target for plan year 2010 energy savings is 8,587 MWh and the sector target for annual peak demand reduction is 3.5 MW.

A portion of the Upstream Lighting program is allocated to the Low Income sector based on the portion of DLC's households that are low-income. The Q4 result for the low income sector includes 27.7% of the entire Upstream Lighting program to date savings.

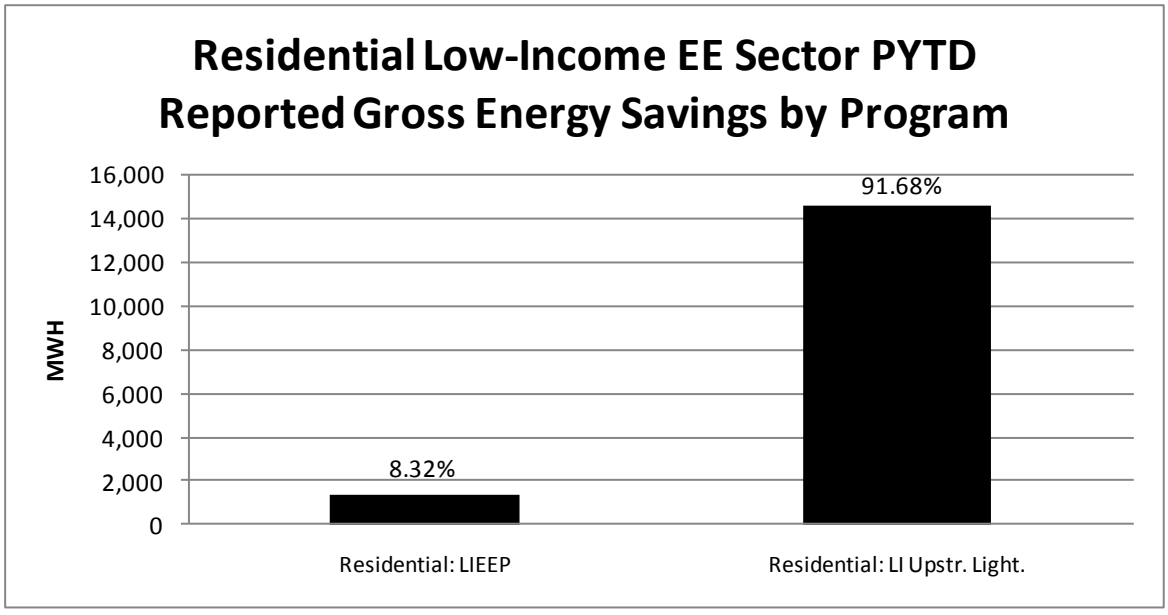
A sector summary of results by program is presented in Table 2-4.

Table 2-4: Summary of Residential Low-Income EE Sector Incremental Impacts by Program for PY2

Residential Low-Income EE Sector	PYTD Participants	PYTD Reported Gross Energy Savings (MWh)	PYTD Reported Gross Demand Reduction (MW)
Residential: Low Income EE	1,975	1,322	0.110
Residential: Low Income EE (Upstream Lighting)	N/A	14,573	0.951
Sector Total	1,975	15,895	1.061
NOTES 304,001 CFLs were distributed under the upstream lighting program in PY2.			

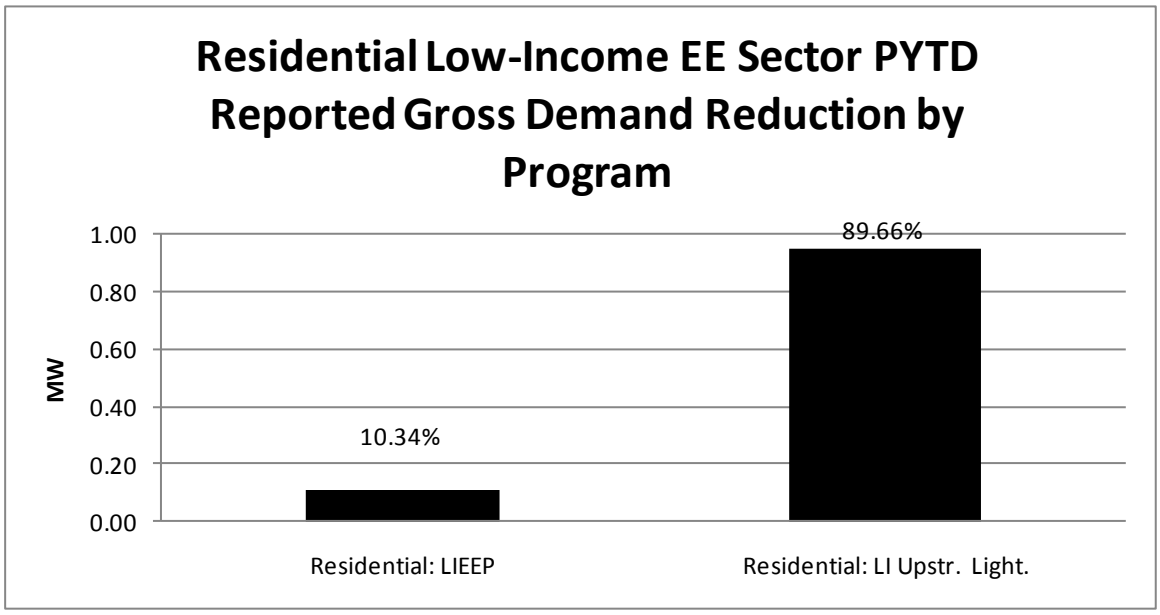
A summary of the sector energy savings by program is presented in Figure 2-5.

Figure 2-5: Summary of Residential Low-Income EE Sector PYTD Reported Gross Energy Savings by Program



A summary of the sector demand reduction by program is presented in Figure 2-6.

Figure 2-6: Summary of Residential Low-Income EE Sector PYTD Reported Demand Reduction by Program



2.3 Small Commercial & Industrial EE Sector

The annual sector target for plan year 2010 energy savings is 31,419 MWh and the sector target for annual peak demand reduction is 5.7 MW.

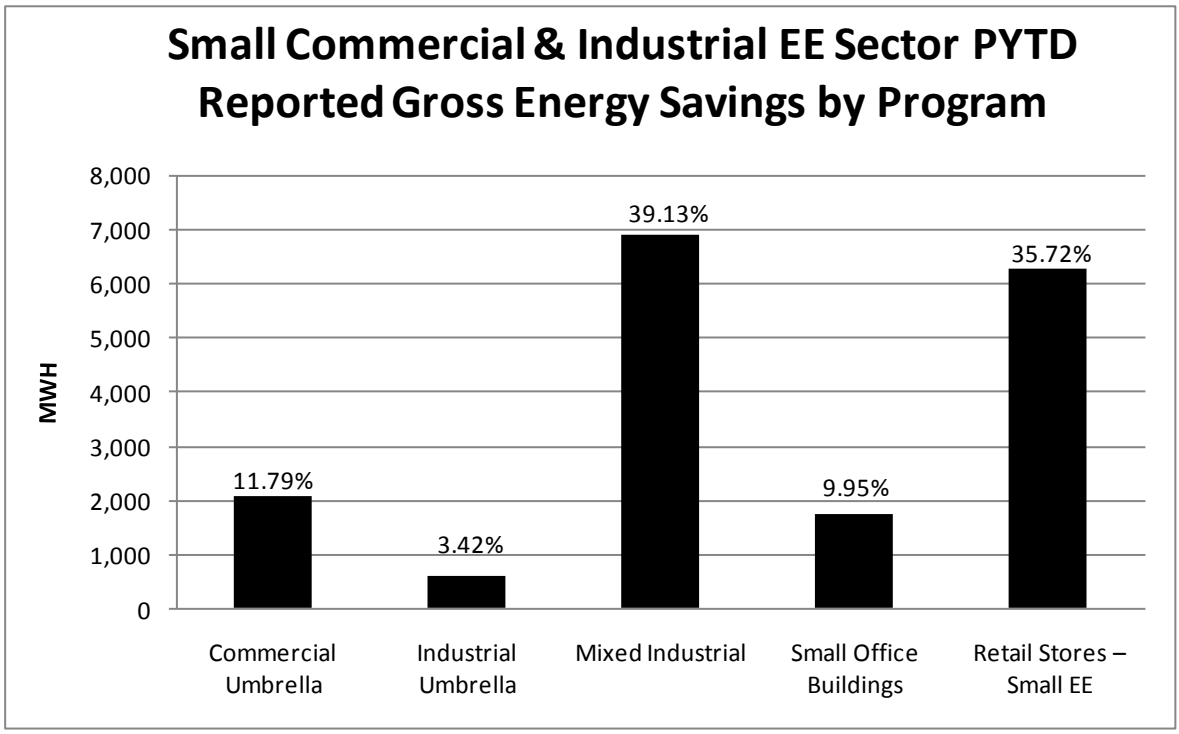
A sector summary of results by program is presented in Table 2-5.

Table 2-5: Summary of Small Commercial & Industrial EE Sector Incremental Impacts by Program for PY2

Small Commercial & Industrial EE Sector	PYTD Participants	PYTD Reported Gross Energy Savings (MWh)	PYTD Reported Gross Demand Reduction (MW)
Commercial Sector Umbrella EE	73	2,078	0.544
Industrial Sector Umbrella EE	4	603	0.116
Mixed Industrial EE	38	6,899	0.973
Office Building – Small EE	68	1,754	0.389
Retail Stores – Small EE	211	6,299	1.260
Sector Total	394	17,633	3.282

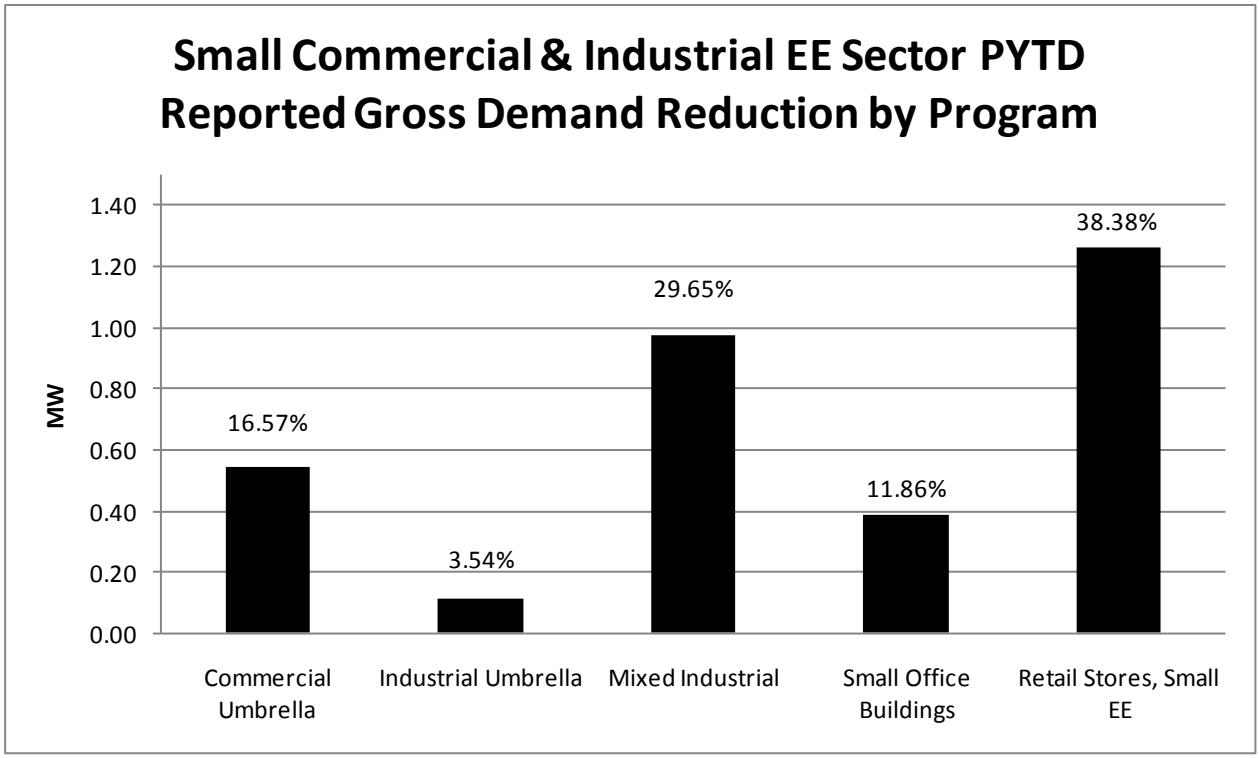
A summary of the sector energy savings by program is presented in Figure 2-7.

Figure 2-7: Summary of Small Commercial & Industrial EE Sector PYTD Reported Gross Energy Savings by Program



A summary of the sector demand reduction by program is presented in Figure 2-8.

Figure 2-8: Summary of Small Commercial & Industrial EE Sector PYTD Reported Demand Reduction by Program



2.4 Large Commercial & Industrial EE Sector

The annual sector target for plan year 2010 energy savings is 60,015 MWh and the sector target for annual peak demand reduction is 11.8 MW.

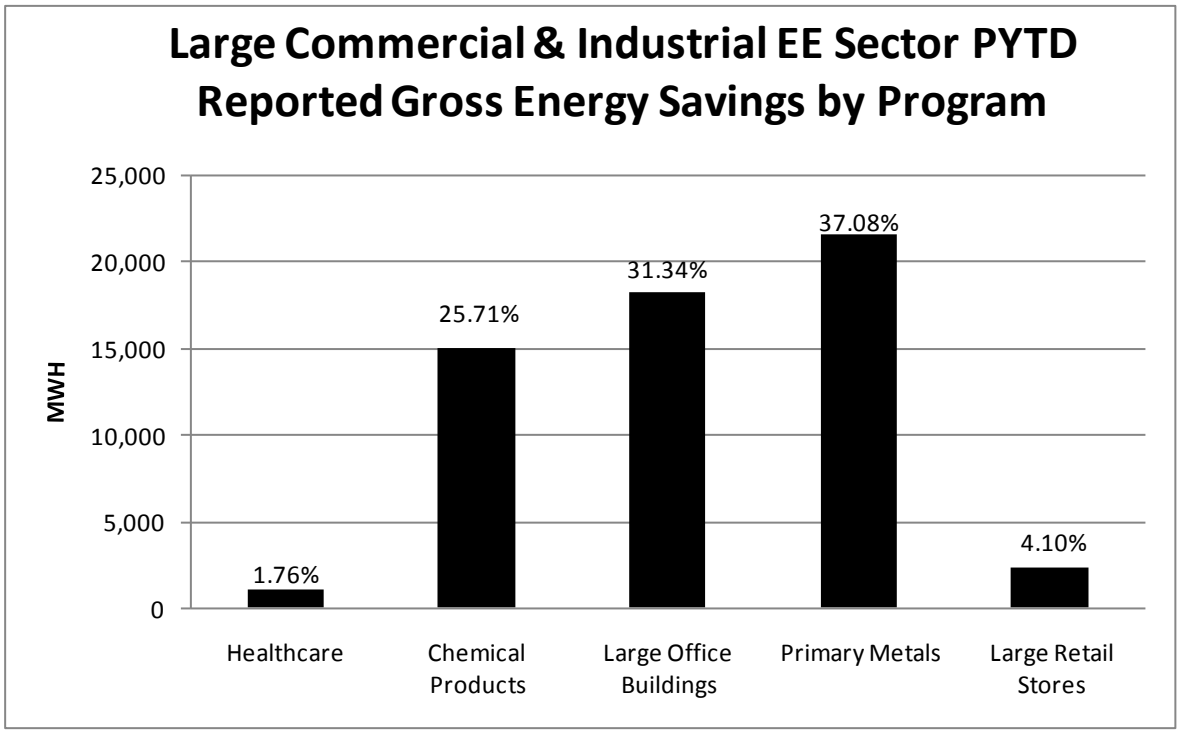
A sector summary of results by program is presented in Table 2-6.

Table 2-6: Summary of Large Commercial & Industrial EE Sector Incremental Impacts by Program for PY2

Large Commercial & Industrial Sector	PYTD Participants	PYTD Reported Gross Energy Savings (MWh)	PYTD Reported Gross Demand Reduction (MW)
Healthcare EE	9	1,029	0.104
Chemical Products EE	8	14,998	2.000
Office Building – Large – EE	67	18,282	3.067
Primary Metals EE	19	21,635	2.627
Retail Stores – Large EE	47	2,394	0.283
Sector Total	150	58,339	8.081

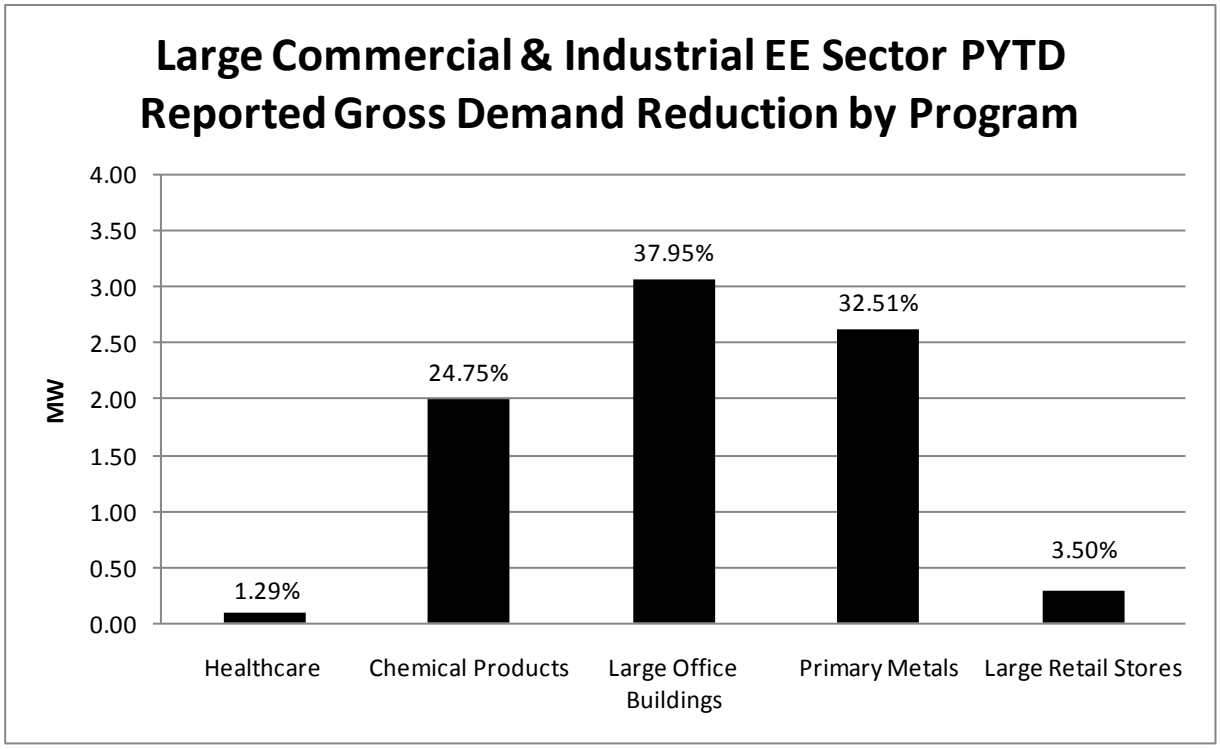
A summary of the sector energy savings by program is presented in Figure 2-9.

Figure 2-9: Summary of Large Commercial & Industrial EE Sector PYTD Reported Gross Energy Savings by Program



A summary of the sector demand reduction by program is presented in Figure 2-10.

Figure 2-10: Summary of Large Commercial & Industrial EE Sector PYTD Reported Demand Reduction by Program



The large commercial and industrial sector includes an overall umbrella program structure and specialized programs designed to promote specific technologies or target specific market segments while incorporating the umbrella program savings impacts and incentive levels.

The large commercial and industrial programs are designed to provide a comprehensive approach to energy savings and permanent demand reduction, and address a full range of efficiency opportunities (from low cost improvements to entire system upgrades) with Duquesne Light customers. Each sub-program provides the following services:

14. Targeted and comprehensive on-site walk-through assessments and professional grade audits to identify energy savings opportunities.
15. Efficiency studies/reports that detail process and equipment upgrades that present the greatest potential for energy/cost savings.
16. Support to access rebates and incentives available across electric measures designed to help defray upfront costs of installing the equipment.
17. Coordination with local chapters of key industry associations to promote energy efficiency improvements through trusted sources and encourage market-transforming practices among equipment vendors and purchasers.

Duquesne Light has chosen the following Conservation Service Providers (CSPs) to implement large commercial and industrial sector programs:

18. Primary Metals and Large Offices: Roth Bros, Inc. and Enerlogics Networks, Inc.
19. Chemical Products: Global Energy Partners, LLC
20. Mixed Industrial: Global Energy Partners, LLC
21. Large Retail: All Facilities Energy Group

2.5 Government & Non-Profit EE Sector

The annual sector target for plan year 2010 energy savings is 24,985 MWh and the sector target for annual peak demand reduction is 7.3 MW.

A sector summary of results by program is presented in Table 2-7.

Table 2-7: Summary of Government & Non-Profit EE Sector Incremental Impacts by Program for PY2

Governmental/Non-Profit EE Sector	PYTD Participants	PYTD Reported Gross Energy Savings (MWh)	PYTD Reported Gross Demand Reduction (MW)
Government & Non-Profit EE	150	27,690	3.250
Sector Total	150	27,690	3.250

A visual summary chart of the sector energy savings and demand reduction by program is not warranted because only one program exists within the sector.

The Public Agency Partnerships program targets federal, state and local governments, including municipalities, school districts, institutions of higher education and nonprofits (per Act 129).

Local Government Partnerships were established through execution of a memorandum of understanding (MOU) by and between Duquesne and selected local governmental agencies. The MOU established working groups comprised of Duquesne and agency representatives and: identifies project areas within agency departments (and jurisdictional agencies); defines project scopes of service; and establishes project agreements to co-fund agreed-to projects. Partnership agreements have been structured with Allegheny County and the City of Pittsburgh.

Bi-monthly meetings have been occurring with the officials from Allegheny County and Duquesne Light which have partnered to provide over 100 municipalities the opportunity to have audits performed in their county facilities and provide opportunities to take action to save energy, money and the environment by participating in Watt Choices.

In addition, several institutions of higher education have executed MOUs and have been involved in discussions and currently there are dozens of projects being evaluated as a result of these types of partnerships.

3 Demand Response

On May 9, 2011, Duquesne filed a petition asking that the Commission approve a proposed change to eliminate the residential and small/midsized commercial and industrial ("C&I") air conditioning cycling demand response ("DR") programs as they are not cost effective. The resulting funds from the residential DR program are proposed to be shifted to the existing residential energy efficiency programs and held in reserve until Duquesne determines the most prudent use of the funds for the residential customers and files with this Commission for approval to expend those funds in a particular program(s). The resulting funds from the small/midsized C&I DR are proposed to be shifted into the existing Large C&I DR program, which has shown very cost effective demand reductions.

4 Portfolio Results by Program

Duquesne Light prepared a comprehensive Evaluation Measurement and Verification Plan for its 2010-2012 Energy Efficiency & Conservation Programs (EM&V Plan). This EM&V Plan was reviewed by the Statewide Evaluator (SWE) and serves as the basis for EM&V performed of its Act 129 Programs. Additionally, Duquesne Light prepared a PY 2009 EM&V Report that was submitted and reviewed by the SWE. Both the EM&V Plan and PY 2009 EM&V Report went through a comment process with the SWE, whereby final comments were received and incorporated on August 31, 2010. These SWE reviewed and approved documents serve as the basis for EM&V activity performed and are referred to in the following sections.

4.1 Residential: Energy Efficiency Rebate Program

The Residential Energy Efficiency Rebate Program (REEP) is designed to encourage customers to make an energy efficient choice when purchasing and installing household appliance and equipment measures by offering customers educational materials on energy efficiency options and rebate incentive offerings. Program educational materials and rebates are provided in conjunction with an on-line survey. REEP also provides energy efficiency measures in the form of energy efficiency kits provided free of charge to Duquesne Light customers attending targeted community outreach events.

An upstream/midstream CFL program was initiated July 2010 with several targeted area retail establishments. This program provides point of purchase discounts for customers as well as an incentive for participation by the retail store. This is a more streamlined approach to discounting and is more readily engaged by customers because no rebate forms are necessary and processing costs for those forms are non-existent. In addition, events are held monthly within some of the stores to educate consumers on energy efficiency products as well as providing a platform to more broadly educate on other programs within the Watt Choices offerings. As summarized in Table 4.1, fifteen retailers with 164 stores are participating in the program.

Table 4-1: Participants in ECOVA Upstream/Midstream Program

Retailer	Total Stores	Status
ACE	2	Active
Costco	2	Active
CVS	29	Active
Do It Best	8	Active
Dollar Tree	16	Active
Family Dollar	37	Active
Goodwill Industries	7	Active
Independent Hardware Store	6	Active
Lowe's	7	Active
Sam's Club	3	Active
The Home Depot	9	Active
Techni-Art Online	1	Active
Wal-Mart	5	Active
True Value	3	Active
Giant Eagle	29	Active
Total Active	**164**	
Cardello	2	Non-Active
Kuhn's Quality Foods	7	Non-Active
True Value	10	Non-Active
Total Non-Active	**19**	
Grand Total	**183**	

4.1.1 Program Logic

Program Theories, Logic Models & Performance Indicators are provided in the EM&V Plan at Section 1.2.5. Program logic diagrams are provided in EM&V Plan Appendix E, Figure E-2 for the Residential Energy Efficiency Rebate Program.

4.1.2 Program M&V Methodology

The program's M&V approach is laid out in Section 1.4 above.

Consistent with Duquesne Light's EM&V Plan Sections 2.5 and 2.5.1, the basic level of verification rigor will be used for TRM deemed savings measures and measures with rebates less than $2,000 consisting of the six-step process identified in Section 1.4. REEP program specific variances from Section 1.4 and program specific information are outlined below.

Step 1 – Verification Checklist: No variances from Section 1.4.

Step 2 – Random Sampling: Simplified random sample of participants selected from PMRS.

As related above in Section 1.4, For REEP, three strata were defined: 1) efficiency kits, 2) efficiency rebates (non-kits), and 3) upstream lighting. This approach was used under the assumption that while installation rates might not vary very much for rebated products such as Energy Star® refrigerators, it was certainly possible that installation of each item in an efficiency kit might vary among the participants who received them.

In Duquesne's EM&V Plan Table 2-10, the annual sample size target for REEP was 65, with a targeted level of confidence and precision of 9.2%. Table 4-2, below, presents the actual sample sizes and the precision of the estimate at 90% confidence for each stratum within the program.

Table 4-2: Sample Design for the REEP Program

Residential Program Savings and Precision					
Program	**PYTD Sample Participants**	**Realization Rate for kWh**	**Confidence and Precision for kWh**	**Realization Rate for kW**	**Confidence and Precision for kW**
REEP Upstream Lighting	16	100%	90% /± 0%	100%	90% /± 0%
REEP Kits	27	61%	90% /± 15.2%	62%	90% /± 12.4%
REEP Rebates	55	97%	90% /± 7.3%	97%	90% /± 6.5%

Step 3 – Measure/Project Qualification: The evaluation team reviewed and confirmed relevant documentation for check list criteria item 1 through 4 described under Step 1 from PMRS, or other electronic or hardcopy documentation obtained for each sampled PMRS record.

1. Participant has a valid utility account number: All sampled participants had active Duquesne Light account numbers (these were found to be validated in PMRS via linkage to the Customer Information System).
2. Measure is on approved list: All sampled project measures were confirmed to be either listed in Duquesne Light's residential rebate catalog containing approved measures or provided by Duquesne Light in a community outreach energy efficiency kit.
3. Proof of Purchase: Select PY2 sampled rebate applications and supporting proof or purchase data were requested and reviewed to ensure proof of purchase supported the rebate request. In PY2 no exceptions were noted.

Step 4 – Deemed Savings Verification: No variances from Section 1.4.

Step 5 – Participation and Installation Verification: Telephone interviews of each sampled customer confirmed participation in the program, receipt of a rebate or EE Kit, and installation of the energy saving measure(s). If the TRM included deemed savings values and/or protocols incorporating in-service rates (ISR), verification surveys confirmed program participation and participant purchase or otherwise receipt of subject energy efficiency products (i.e., in the case of EE kits provided participants at no cost). Telephone surveys were tailored to the product promotion and included questions designed to verify participants obtained and installed the EE products. For the Upstream Lighting program component, the program administrator's invoices and related detailed documentation were reviewed to ensure that measure counts and reported savings were both accurate (per the TRM) and the same as what the utility's tracking system was reporting.

Step 6 – Program Realization Rate: As related in above in Section 1.4.1.2, the program realization rate is calculated using the verified energy and demand savings from telephone interviews, as summarized below:

Table 4-3: Summary Program Realization Rate

REEP Savings and Precision					
Savings Type	**Claimed Savings**	**Verified Savings**	**Realization Rate**	**Std Error on Verified Savings**	**Relative Precision @ 90% Confidence:**
kWh	41,879,540	40,780,550	97%	159,799	0.64%
kW	2,387	2,324	97%	10	0.68%

4.1.3 Program Sampling

Program sampling is described above in Section 1.4.

4.1.4 Process Evaluation

The process evaluation for REEP was conducted as described in Section 1.4.2 above.

The process evaluation found the following:

- The program is quite successful and is more than meeting its savings goals, due primarily to the Upstream Lighting program. However, savings from the kit component are being achieved at a lower realization rate than projected.

- In light of the relatively low savings in REEP outside of the Upstream Lighting component and the fact that the contribution of this component to program savings may change significantly with the advent of new federal light bulb manufacturing requirements, additional internal/external resources may be needed to bolster marketing efforts for the program, especially its rebate component. As noted in the SEP process evaluation section, including REEP promotional materials in the energy efficiency kits that are mailed to SEP participants could be a highly effective way of getting these materials seen.

- The program group's web pages are effective and easy to use.

- Program participant satisfaction with the program and the rebated products promoted by it is quite high. Participants are also satisfied with the kits they received.

- According to participant survey results, the most frequently reported source of program awareness was online/website advertising. Bolstering participation with respect to the rebate component will require increased marketing at the retailer level (see below).

- During PY2, Duquesne did not work with retailers to promote residential rebates in their stores, for example by prominently displaying tear sheets next to appliances that qualify for rebates. Some retailers promoted REEP rebates based on their own initiative, but this is not a reliable source of promotion for Duquesne. In the past, Duquesne requested a quote for this type of promotion from ECOVA, but the cost was deemed to be unjustifiable. DLC has since come to an

agreement with ECOVA at a justifiable cost to engage in retailer promotional activity, and this program went into effect in Fall 2011.

- Based on limited survey results rates collected from Q3 and Q4 participants which indicate low installation rates for furnace whistles and LED nightlights, Duquesne should investigate the cost-effectiveness of including these measures in the efficiency kits.

- ECOVA, Duquesne's Upstream Lighting program administrator, provides detailed documentation along with its invoices, which allows the utility to report savings into PMRS. However, information on the "measure" purchased is based on manufacturer product names and most manufacturers identify their CFL products in terms of their incandescent equivalents. This means that the Residential Coordinator can only estimate the actual wattage of the CFLs sold. The utility should require that its program administrator provide the actual wattage of the CFLs sold in each product category (SKU), so that checks on the accuracy of reported savings can be made on an ongoing basis.

4.1.5 Program Partners and Trade Allies

Duquesne Light continued to work through local government partnerships with the City of Pittsburgh as well as Allegheny and Beaver Counties to coordinate delivery of its Act 129 program services.

ECOVA is the implementation contractor for the upstream/midstream program and has enrolled 15 retailers with 164 store locations into the program.

4.1.6 Program Finances

A summary of the project finances are presented in Table 4-4.

Table 4-4: Summary of Program Finances: TRC Test (REEP)[29]

	Category	PY2
A.1	EDC Incentives to Participants	998,166
A.2	EDC Incentives to Trade Allies	0
A	**Subtotal EDC Incentive Costs**	998,166
B.1	Design & Development	88,224
B.2	Administration	0
B.3	Management	1,568,890
B.4	Marketing	93,683
B.5	Technical Assistance	0
B	**Subtotal EDC Implementation Costs**	1,750,797
C	**EDC Evaluation Costs**	66,422
D	**SWE Audit Costs**	89,855
E	**Participant Costs**	2,664,894
	Total TRC Costs[1]	4,571,968
F	**Annualized Avoided Supply Costs[2]**	Not Computed
G	**Lifetime Avoided Supply Costs[3]**	19,847,656
	Total Lifetime Economic Benefits[4]	21,702,956
	Program NPV	17,130,988
	Portfolio Benefit-to-Cost Ratio	4.7

[1]TRC Test does not include incentives, which are treated as a transfer from the EDC to the participants.
[2]Included in *Lifetime Avoided Supply Costs* through the use of PV tables or Excel NPV calculations applied at the measure level.
[3]Present value of avoided supply costs.
[4]Present value of avoided supply costs plus present value of avoided costs for incandescent bulbs.

[29] Definitions for terms in following table are subject to TRC Order.

4.2 Residential: School Energy Pledge Program

The School Energy Pledge (SEP) program is designed to teach students about energy efficiency, have them participate in a school fundraising drive, and help their families to implement energy-saving measures at home. Energy efficiency impacts take place in student homes when families adopt energy efficiency measures that students learn about at school. Through the SEP, families complete a pledge form wherein they commit to install energy efficiency measures provided in an SEP Energy Efficiency Tool Kit (SEP EE Kit) provided free of charge. In return for a family's commitment to install, the participating school receives an incentive of $25.

4.2.1 Program Logic

Program Theories, Logic Models & Performance Indicators are provided in the EM&V Plan at Section 1.2.5. Program logic diagrams are provided in EM&V Plan Appendix E, Figure E-3 for the Residential School Energy Pledge Program.

4.2.2 Program M&V Methodology

The program's M&V approach is laid out above in Section 1.4.

Consistent with Duquesne Light's EM&V Plan Sections 2.5 and 2.5.1, the basic level of verification rigor will be used for TRM deemed savings measures and measures with rebates less than $2,000 consisting of the six-step process identified in Section 1.4. SEP program specific variances from Section 1.4 and program specific information are outlined below.

Step 1 – Verification Checklist: No variances from Section 1.4.

Step 2 – Random Sampling: Simplified random sample of participants selected from PMRS.

As related above in Section 1.4 Sample Design: SEP, the sample design for the SEP Program involved the use of the simple ratio estimator. The targeted annual sample size for the SEP Program was 55 with a targeted level of confidence and precision of 9.9%. Table 4-5, below, presents the actual sample size and the precision of the estimate at 90% confidence for the program.

Table 4-5: Sample Design for the SEP Program

Residential Program Savings and Precision					
Program	**PYTD Sample Participants**	**Realization Rate for kWh**	**Confidence and Precision for kWh**	**Realization Rate for kW**	**Confidence and Precision for kW**
Residential: School Energy Pledge	81	61%	90% /± 11.1%	70%	90% /± 9.1%

Step 3 – Measure/Project Qualification: The evaluation team reviewed and confirmed relevant documentation for check list criteria item 1 through 4 described under Step 1 from PMRS, or other electronic or hardcopy documentation obtained for each sampled PMRS record.

1. Participant has a valid utility account number: All sampled participants had active Duquesne Light account numbers (these were found to be validated in PMRS via linkage to the Customer Information System).
2. Proof of Participation: Select PY2 sampled SEP applications were requested and reviewed to ensure inclusion in the participant database. In PY2 no exceptions were noted. However, PMRS records for some of the participants showed $25 incentives, while others showed no incentive payments. The utility is in the process of resolving this issue.

Step 4 – Deemed Savings Verification: No variances from Section 1.4.

Step 5 – Participation and Installation Verification: Telephone interviews of each sampled customer confirmed participation in the program, receipt of the SEP EE Kit, and installation of the energy saving measures. Telephone surveys are tailored to the product promotion and include questions designed to verify participants obtained the EE products.

Step 6 – Program Realization Rate: As related in above in Section 1.4.1.2, the program realization rate is calculated using the verified energy and demand savings from telephone interviews, as summarized below:

Table 4-6: Summary Program Realization Rate

SEP Savings and Precision					
Savings Type	**Claimed Savings**	**Verified Savings**	**Realization Rate**	**Std Error on Verified Savings**	**Relative Precision @ 90% Confidence:**
kWh	1,799,244	1,094,735	61%	5,430,776,730	11.07%
kW	60	42	70%	5	9.06%

4.2.3 Program Sampling

Program sampling is described above in Section 1.4.

4.2.4 Process Evaluation

The process evaluation for SEP was conducted as described in Section 1.4.2 above.

The process evaluation found the following:

- The SEP program is exceeding its savings goals, though installation rates are lower than projected for kit items.
- The SEP program is designed to teach students about energy efficiency and help their families to implement energy-saving measures at home by providing a complimentary kit to participating families. The program appears to be a success with over 30 schools on the waiting list earlier in the year. Given the interest of schools, it is likely that the program will continue to have no trouble in obtaining school participants in the future.

- As indicated in the logic model for this program, the program is specifically designed to induce households to undertake other conservation measures and build awareness/willingness to participate in other DLC programs in the future. However, spillover and broad marketing benefits accruing from this program were not quantified and are not reflected in the benefit-cost analysis.

- The program web pages are well-designed and easy to use. While it is easy to locate contact information for follow up questions or to enroll a school, it might be helpful to include more information on the impacts of the program so far and provide more information on participation and enrolment processes. Providing information on successes to date – perhaps in the form of a graphic showing progress toward goals – might be an effective approach to building enthusiasm for the program, especially if Duquesne decides to expand the program to enable and encourage self-directed energy-saving activities on the part of participating schools (e.g., in the form of inter-school competitions). Such feedback is a key element in programs that attempt to change behavior and encourage spillover savings actions.

- Participant satisfaction with the program is quite high.

- Awareness of the program is driven at the customer level primarily by students bringing home pledge forms and telling their parents about the program. There is a waiting list of schools interested in participating in the program.

- In the past, in order to collect feedback and verify that SEP kits have been received by participants, Duquesne has run an auto dial outreach campaign in the past. The call outs were performed by Duquesne's call center personnel and results were fed back to Residential Coordinator. Duquesne may want to run the auto dial outreach program in the future to gain customer feedback and determine whether the participants have any questions about using any of the items in the kit.

- The completed pledge forms are sent back by the school to Duquesne in batches, which are entered by Duquesne staff. MCR uses an automated scan system to verify customer account information.

- Based on limited survey results collected from Q3 and Q4 participants which indicate low installation rates for furnace whistles, Duquesne should investigate the cost-effectiveness of including this measure in the SEP efficiency kits going forward.

4.2.5 Program Partners and Trade Allies

The School Energy Pledge Program was implemented as a partnership between Duquesne Light and regional elementary schools. Duquesne Light also partnered with participating student families that "pledged" to install energy efficient products in return for a $25 donation to their child's school.

4.2.6 Program Finances

A summary of the project finances are presented in Table 4-7.

Table 4-7: Summary of Program Finances: TRC Test (SEP)[30]

	Category	PY2
A.1	EDC Incentives to Participants[1]	$0
A.2	EDC Incentives to Trade Allies	0
A	**Subtotal EDC Incentive Costs**	0
B.1	Design & Development	15,846
B.2	Administration	0
B.3	Management	514,619
B.4	Marketing[1]	59,749
B.5	Technical Assistance	0
B	**Subtotal EDC Implementation Costs**	590,214
C	**EDC Evaluation Costs**	10,273
D	**SWE Audit Costs**	14,729
E	**Participant Costs**	84,964
	Total TRC Costs[2]	700,180
F	**Annualized Avoided Supply Costs[3]**	Not Computed
G	**Lifetime Avoided Supply Costs[4]**	667,868
	Total Lifetime Economic Benefits[5]	715,873
	Program NPV	15,693
	Portfolio Benefit-to-Cost Ratio	1.0

[1]Incentives have been included as a Marketing cost as per 2011 TRC Test Order (pg. 36).

[2]TRC Test does not include incentives, which are treated as a transfer from the EDC to the participants.
[3]Included in *Lifetime Avoided Supply Costs* through the use of PV tables or Excel NPV calculations applied at the measure level.
[4]Present value of avoided supply costs.

[5]Present value of avoided supply costs plus present value of avoided costs for incandescent bulbs.

[30] Definitions for terms in following table are subject to TRC Order.

4.3 Residential: Appliance Recycling Program

The Residential Appliance Recycling Program (RARP) seeks to produce cost-effective, long-term, coincident peak demand reduction and annual energy savings in residential market sector by removing operable, inefficient, primary and secondary refrigerators and freezers from the power grid in an environmentally safe manner.

To stimulate participation, RARP offers incentives for eligible refrigerators ($35) and freezers ($35). In addition, the program collaborates with other utility programs such Low Income Energy Efficiency Program, the Public Agency Partnership Program and is implemented in a manner consistent with appliance recycling programs across Pennsylvania by using a common implementation contractor (JACO).

4.3.1 Program Logic

Program Theories, Logic Models & Performance Indicators are provided in the EM&V Plan at Section 1.2.5. Program logic diagrams are provided in EM&V Plan Appendix E.

4.3.2 Program M&V Methodology

The program's M&V approach is laid out above in Section 1.4.

Consistent with Duquesne Light's EM&V Plan Sections 2.5 and 2.5.1, the basic level of verification rigor used for TRM deemed savings measures and measures with rebates less than $2,000 consists of a six-step process identified in Section 1.4. RARP program specific variances from Section 1.4 and program specific information are outlined below.

Step 1 – Verification Checklist: No variances from Section 1.4

Step 2 – Random Sampling: Simplified random sample of participants selected from PMRS. In EM&V Plan Table 2-10, the targeted annual sample size for the RARP Program is 55, with a targeted level of confidence and precision of 9.9%. Table 4-8, below, presents the actual sample size and the precision of the estimate at 90% confidence for the program.

Table 4-8: Sample Design for the RARP Program

Residential Program Savings and Precision					
Program	**PYTD Sample Participants**	**Realization Rate for kWh**	**Confidence and Precision for kWh**	**Realization Rate for kW**	**Confidence and Precision for kW**
Residential: Appliance Recycling	104	100%	90% /± 2.5%	100%	90% /± 2.5%

Step 3 – Measure/Project Qualification: Relevant documentation for item #1 through #4 from PMRS, or other hardcopy documentation (JACO order sheet) is then obtained for each sampled PMRS record.

1. Participant has a valid utility account number
   Participant account numbers are validated in PMRS via linkage to the Customer Information System.

2. Measure on application matches PMRS record. No exceptions are noted for PY2.
3. Incentive amount on application matches PMRS record. No exceptions are noted for PY2.

Step 4 - Deemed Savings Verification: All energy efficiency measures delivered by the RARP have deemed savings specified in the current TRM. Beginning June 1, 2011, the Commission approved new refrigerator/freezer protocols as described in the 2010 TRM. These provide a value of 1,728 kWh for refrigerators/freezers that have been retired and a value of 1,274 kWh for refrigerators/freezers that have been retired and replaced with ENERGY STAR appliances.[31] A separate Interim Measure Resolution specified that the savings to be deemed for recycled refrigerators/freezers replaced with standard (non-Energy Star) refrigerators/freezers should be 1,091 kWh and 0.1353 kW. The fifth checklist criterion described under Step 1 in Section 1.3 is addressed through comparison of PMRS tracking system unit kWh and kW with TRM or interim TRM update deemed savings values. Under the TRM Refrigerator/Freezer Retirement is treated as the one measure where the number of units is multiplied by specified savings per unit, depending on the type of replacement appliance, if any. Unit savings are defined as below:

Table 4-9: Refrigerator/Freezer Recycling – References

Component	kWh Savings	kW Savings	Coincidence Factor
Retirement	1,728	0.2376	0.62
Replaced with Energy Star	1,274	0.158	0.62
Replaced with Non-Energy Star	1,091	0.1353	0.62

The change in the specification of the deemed measure savings for each type of appliance recycling scenario occurred after the measures were entered into the PMRS database for PY2. In order to account for the revised savings, Navigant had to create an adjusted savings per unit for each RARP measure. Based on data collected by JACO at the time of appliance pickup, Navigant found the distribution of primary and secondary units, as well as the number of appliances replaced or retired. For primary units, it is assumed that every unit is replaced (100%). For secondary units, Navigant used an average of replacement rates reported in the JACO database for PY2 and those reported in PY2 telephone verification surveys (34% replacement and 66% retirement). Data from telephone verification surveys were also used to find the percent of refrigerator/freezer replacement participants who replaced their refrigerator/freezer with an Energy Star refrigerator/freezer (87%) versus a non-Energy Star refrigerator/freezer. Table 4-10 shows these distributions, as well as the total average energy and demand savings to be used for the PY2 RARP measures: 1,506 kWh energy savings and 0.1992 kW demand savings.

[31] See Attachment C of the 2010 TRM Recycling Protocol for the 1,728 kWh, and Attachment B of the 2010 Refrigerator / Freezer Recycling and Replacement for 1,274 kWh.

Table 4-10: Refrigerator/Freezer Recycling – References

Unit	Action	Replacement Type	Total %*	kWh Savings per unit	kW Savings per Unit
Primary Unit (19%)	Replace (100%)	Energy Star (87%)	17%	1,274	0.158
		Standard (13%)	2%	1,091	0.1353
Secondary Unit (81%)	Replace (34%)	Energy Star (87%)	24%	1,274	0.158
		Standard (13%)	4%	1,091	0.1353
	Retire (66%)		53%	1,728	0.2376
			100%	1,506	0.1992

*Total % = (Unit %) x (Action %) x (Replacement Type %)

Step 5 – Participation and Installation Verification: Telephone surveys are employed for impact verification of measures receiving basic level of rigor verification (i.e., deemed savings measures with rebates less than $2000). RARP telephone interview surveys were performed with sampled customers to confirm participation in the program (i.e., that their refrigerator/freezer was recycled through the program, as well as how many units were so removed.

Step 6 – Program Realization Rate: As related in above in Section 1.4.1.2, the program realization rate is calculated using the verified energy and demand savings from telephone interviews, as summarized below. Note that the higher-than-100% realization rate is the result of multiple units being recycled while the reported values in PMRS showed only one unit being recycled.

Table 4-11: Summary Program Realization Rate

RARP Savings and Precision					
Savings Type	**Claimed Savings**	**Verified Savings**	**Realization Rate**	**Std Error on Verified Savings**	**Relative Precision @ 90% Confidence:**
kWh	5,620,392	5,620,392	100%	86,620	2.53%
kW	743	743	100%	11	2.53%

4.3.3 Program Sampling

Program sampling is described above in Section 1.4.

4.3.4 Process Evaluation

The process evaluation for RARP was conducted as described in Section 1.4.2 above.

The process evaluation found the following:

- The program is quite successful and is more than meeting its savings goals.

- According to participant surveys, awareness of the program is being driven mostly by bill inserts, but also by word of mouth. Other marketing efforts include television ads, direct mail, billboards, and newspaper articles.

- Participants are very satisfied with all aspects of the program, including the sign-up process, the amount of time it took between sign-up and appliance removal and between appliance removal and incentive payment, the appliance removal team, and even the amount of the incentive. Over half of those surveyed said that they have a more favorable opinion of Duquesne Light as a result of their participation experience.

- JACO is Duquesne's Conservation Service Provider for refrigerator and freezer recycling, from scheduling pick up to final appliance recycling, including program marketing. When Duquesne signed the contract with JACO, Duquesne had no internal marketing budget and welcomed that JACO would cover marketing as part of the "per application" fee. In light of the existing demands on the Residential Coordinator, this arrangement should be maintained. Coordination between JACO and Duquesne marketing and especially program cross-marketing efforts should be enhanced.

- Additionally, the JACO relationship is satisfactory, but could benefit from greater responsiveness on JACO's end. While Duquesne's Residential Coordinator interacts directly with a senior manager at JACO, her contact has many other responsibilities and responses have occasionally been slow. The program is largely running itself and is on goal but issues that arose in the past were slow to get resolved. We recommend requesting a dedicated account representative for the Duquesne account, should a responsiveness issue arise in the future.

4.3.5 Program Partners and Trade Allies

The program implementer (JACO) is implementing similar programs for the other Pennsylvania EDCs, promoting consistent regional treatment, increasing efficiencies and reducing customer confusion.

4.3.6 Program Finances

A summary of the project finances are presented in Table 4-12.

Table 4-12: Summary of Program Finances: TRC Test (RARP) [32]

	Category	PY2
A.1	EDC Incentives to Participants[1]	$0
A.2	EDC Incentives to Trade Allies	0
A	**Subtotal EDC Incentive Costs**	0
B.1	Design & Development	11,636
B.2	Administration	0
B.3	Management	382,589
B.4	Marketing[1]	143,338
B.5	Technical Assistance	0
B	**Subtotal EDC Implementation Costs**	537,563
C	**EDC Evaluation Costs**	9,048
D	**SWE Audit Costs**	12,096
E	**Participant Costs**	325,057
	Total TRC Costs[2]	883,764
F	**Annualized Avoided Supply Costs[3]**	Not Computed
G	**Lifetime Avoided Supply Costs[4]**	3,469,953
	Total Lifetime Economic Benefits	3,469,953
	Program NPV	2,586,189
	Portfolio Benefit-to-Cost Ratio	3.9

[1]Incentives have been included as a Marketing cost as per 2011 TRC Test Order (pg. 36).
[2]TRC Test does not include incentives, which are treated as a transfer from the EDC to the participants.
[3]Included in *Lifetime Avoided Supply Costs* through the use of PV tables or Excel NPV calculations applied at the measure level.
[4]Present value of avoided supply costs.

[32] Definitions for terms in following table are subject to TRC Order.

4.4 Residential: Low Income Energy Efficiency Program

The Low-Income Energy Efficiency Program (LIEEP) is designed as an income-qualified program providing services to assist low-income households to conserve energy and reduce electricity costs. The objective of this program is to increase qualifying customers' comfort while reducing their energy consumption, costs, and economic burden.

In PY 2010 the LIEEP savings by income qualifying customers were delivered by the Residential Energy Efficiency Program (REEP) and the Residential Appliance Recycling Program (RARP).

Commencing in Q4, a portion of the Upstream Lighting program is allocated to the Low Income sector based on the portion of DLC's households that are low-income, 27.74% of the entire Upstream Lighting program to date savings.[33]

4.4.1 Program Logic

Program Theories, Logic Models & Performance Indicators are provided in the EM&V Plan at Section 1.2.5. Program logic diagrams are provided in EM&V Plan Appendix E, Figure E-1 for the Residential Low Income Program. However, the current logic model is not an accurate representation of how the program is implemented, referring as it does to energy audits and the use of weatherization contractors. Such activity is occurring but it is occurring outside the Act 129 program. Instead, the program works with local government and housing authorities to identify apartment complexes with a large low income population. The Residential Coordinator works with the apartment complex management to raise awareness for the program and identifies possible energy efficiency measures, for example refrigerator replacement or CFL installations, both of which are offered for free. In addition, the program is defined such that any program activity in the REEP (including Upstream Lighting), RARP, or SEP program on the part of customers identified as low-income are assigned to the low-income program, including savings and costs.

4.4.2 Program M&V Methodology

The program's M&V approach is laid out above in Section 1.4.

Consistent with Duquesne Light's EM&V Plan Sections 2.5 and 2.5.1, the basic level of verification rigor will be used for TRM deemed savings measures and measures with rebates less than $2,000 consisting of the six-step process identified in Section 1.4. LIEEP Program specific variances from Section 1.4 and program specific information are outlined below.

Step 1 – Verification Checklist: No variances from Section 1.4.

Step 2 – Random Sampling: Because Duquesne's LIEEP was partially defined as low-income participation in the other Act 129 programs, stratification was needed by program type within LIEEP (e.g., low-income REEP rebate participants, low-income REEP kit participants, low-income RARP participants, low-income SEP participants, and low-income Upstream Lighting – in addition to low-income-only refrigerator replacement participants). In EM&V Plan Table 2-10, the targeted annual sample size for the LIEEP Program is 55, with a targeted level of confidence and precision of 10.0%. The sample was allocated proportionally to the total number of LIEEP participants in each residential program (REEP, SEP, RARP

[33] Act 129 Low-Income Working Group Report. Docket No. M-2009-2146801. March 19, 2010.

and Refrigerator Replacement). Table 4-13, below, presents the actual sample size and the precision of the estimate at 90% confidence for the program.

Table 4-13: Sample Design for the LIEEP Program

Residential Program Savings and Precision					
Program	**PYTD Sample Participants**	**Realization Rate for kWh**	**Confidence and Precision for kWh**	**Realization Rate for kW**	**Confidence and Precision for kW**
LIEEP REEP Kits	16	75%	90% /± 7.4%	80%	90% /± 7.0%
LIEEP REEP Rebates	6	106%	90% /± 8.9%	100%	90% /± 0%
LIEEP SEP	39	61%	90% /± 15.6%	75%	90% /± 13.0%
LIEEP RARP	6	100%	90% /± 31.1%	100%	90% /± 31.1%
LIEEP Refrigerator Replacement	7	100%	90% /± 27.9%	100%	90% /± 27.9%
LIEEP Upstream Lighting	6	100%	90% /± 0.0%	89%	90% /± 0.0%

Step 3 – Measure/Project Qualification: The evaluation team reviewed and confirmed relevant documentation for check list criteria item 1 through 4 described under Step 1 from PMRS, or other hardcopy documentation obtained for each sampled PMRS record. This was done for LIEEP participants in the SEP program.

1. Participant has a valid utility account number: All sampled participants had active Duquesne Light account numbers (these were found to be validated in PMRS via linkage to the Customer Information System).
2. Proof of Participation: Select PY2 sampled SEP applications were requested and reviewed to ensure inclusion in the participant database. In PY2 no exceptions were noted.

Step 4 - Deemed Savings Verification: No variances from Section 1.4.

Step 5 – Participation and Installation Verification: Telephone surveys are employed for impact verification of measures receiving basic level of rigor verification (i.e., deemed savings measures with rebates less than $2000). Of the sampled LIEEP participant projects, 22% are EE kits, 53% are school EE kits, 8% are recycled refrigerators or freezers, 9% are refrigerator replacements, and 8% are EE product rebates. Telephone surveys were tailored to the product promotion and include questions designed to verify participants obtained the EE products. The primary function of the verification survey is to confirm program participation and participant installation and use of items obtained through the program.

Step 6 – Program Realization Rate: As related in above in Section 1.4.1.2, the program realization rate is calculated using the verified energy and demand savings from telephone interviews, as summarized below:

Table 4-14: Summary Program Realization Rate

LIEEP Savings and Precision					
Savings Type	**Claimed Savings**	**Verified Savings**	**Realization Rate**	**Std Error on Verified Savings**	**Relative Precision @ 90% Confidence:**
kWh	15,894,739	15,645,876	98%	68,752	0.72%
kW	991	887	89%	8	1.56%

4.4.3 Program Sampling

Program sampling is described above in Section 1.4.

4.4.4 Process Evaluation

The process evaluation for LIEEP was conducted as described in Section 1.4.2 above.

The process evaluation found the following:

- The program is meeting its savings targets primarily as a result of the inclusion of a portion of savings from the Upstream Lighting initiative.

- So far, LIEPP segment customers have been hard to reach and Duquesne's Residential Coordinator would like to see program participation improve. Due to ongoing low income customer segment efforts by Duquesne, many traditional low income customer measures, such as weatherization, are not applied through the LIEEP. A major hurdle to reaching more customers is the time intense search to find suitable apartment complexes that justify a refrigerator or bulb replacement project.

- The LIEEP program is the only program that currently does not have dedicated CSP support. Duquesne could put more focus on the program by hiring a dedicated, experienced CSP that can design and administer a program in conjunction with Duquesne's unique parameters (i.e., the existing non-Act 129 low income efficiency activity already being performed). A request for proposals that identified the current situation and asked for solutions might at least provide additional ideas that could be tried.

- A further opportunity to increase program awareness in the low income target group may be to directly market towards low income accounts. While Duquesne does not currently have systems functionality to send targeted bill stuffers, other direct mail opportunities could potentially be identified.

- Awareness of the program's refrigerator replacement component derives from specific outreach activities by the Residential Coordinator. Awareness of other components of LIEEP is being driven as indicated in the process evaluation sections of the summaries of these programs above.

- Customer participant satisfaction is high, reflecting the high satisfaction ratings received from customers with regard to the other residential programs of which low-income customers partake (REEP, RARP and SEP).

- Based on the limited survey results rates collected from Q3 and Q4 participants which indicate low installation rates for furnace whistles and LED nightlights, Duquesne should investigate the cost-effectiveness of including these measures in the efficiency kits.

4.4.5 Program Partners and Trade Allies

Consistent with its filed program plan, LIEEP is being delivered through Public Agency Partnership arrangements whereby Duquesne Light partners with local government (cities and counties and their jurisdictional agencies) to deliver program services. This program design leverages program resources and enables it to reach a greater number of participants while retaining its status as a cost-effective resource program.

4.4.6 Program Finances

A summary of the project finances are presented in Table 4-15.

Table 4-15: Summary of Program Finances (LIEEP Program)

	Category	PY2
A.1	EDC Incentives to Participants	$439,492
A.2	EDC Incentives to Trade Allies	0
A	**Subtotal EDC Incentive Costs**	439,492
B.1	Design & Development	30,420
B.2	Administration	0
B.3	Management	223,048
B.4	Marketing	32,820
B.5	Technical Assistance	0
B	**Subtotal EDC Implementation Costs**	286,288
C	**EDC Evaluation Costs**	23,317
D	**SWE Audit Costs**	31,334
E	**Participant Costs**	857,672.51
	Total TRC Costs[1]	1,198,612
F	**Annualized Avoided Supply Costs**[2]	Not Computed
G	**Lifetime Avoided Supply Costs**[3]	7,533,316
	Total Lifetime Economic Benefits[4]	8,222,993
	Program NPV	7,024,381
	Portfolio Benefit-to-Cost Ratio	6.9

[1]TRC Test does not include incentives, which are treated as a transfer from the EDC to the participants.
[2]Included in *Lifetime Avoided Supply Costs* through the use of PV tables or Excel NPV calculations applied at the measure level.
[3]Present value of avoided supply costs.
[4]Present value of avoided supply costs plus present value of avoided costs for incandescent bulbs.

4.5 Commercial Sector Programs

4.5.1 Commercial Overview

The Commercial Sector includes an overall umbrella program and five market segment programs. The umbrella program provides energy efficiency services to smaller customer segments not directly served by specific market segment programs. The market segment programs, including Small Office, Large Office, Public Agency, Retail, and Healthcare, are implemented by specialized contractors implementing programs tailored to overcome known segment-specific barriers to program participation. All programs provide the same measures and incentive levels to ensure fair and transparent treatment of customers across all segments.

The commercial programs are designed to help commercial customers assess the potential for energy-efficiency project implementation, cost and energy savings, and, for appropriate customers, provide follow-through by installing measures and verifying savings. The following program services are provided in each sub-program:

- Auditing of building energy use
- Provision of targeted financing and incentives
- Project management and installation of retrofit measures
- Training, and technical assistance

The following organizations are responsible for implementing the commercial sector programs:

- Large Office: Roth Bros, Inc. and Enerlogics Networks, Inc.
- Small Office: AllFacilities Energy Group
- Retail: AllFacilities Energy Group
- Healthcare: Duquesne Light
- Governmental and Non-Profit Programs: Duquesne Light and Governmental Partners including: Allegheny County, Allegheny County Economic Development, Allegheny County Housing Authority, City of Pittsburgh and Beaver County Housing Authority

4.5.2 Program Logic

Program Theories, Logic Models & Performance Indicators are provided in the EM&V Plan at Section 1.2.5. Program logic diagrams are provided in EM&V Plan Appendix E.

4.5.3 Program EM&V Methodology

The program's M&V approach is laid out above in section 1.4.

4.5.4 Commercial Sector Evaluation Group Impact Evaluation

Per the utility's EM&V Plan, for the purpose of conducting cost-effective EM&V, certain industrial and commercial programs were grouped based on shared characteristics. Commercial sector retail, healthcare, large and small office and public agency partnership programs were similar enough in structure to be treated as one evaluation group. For PY2, the Commercial Sector Evaluation Group program activity subject to EM&V is summarized by program in Section 1.4.

The impact evaluation for Q1 and Q2 participants has been reported in earlier quarterly reports. For Q3 and Q4, Commercial Evaluation Group projects completed between 12/1/2010 and 2/28/2011, and between 3/1/2011 and 5/31/2011, were extracted from Duquesne Light's program tracking system and broken into strata based on project kWh savings by applying the following strata boundaries:

Table 4-16: PY2-Q3 Commercial Strata Boundaries

Strata	Strata Boundaries	N	n
1	kWh < 11,290	66	4
2	11,290 =< kWh =< 42,000	24	4
3	kWh > 42,000	13	5

Table 4-17: PY2-Q4 Commercial Strata Boundaries

Strata	Strata Boundaries	N	n
1	kWh >= 3,000,000	4	4
2	300,000 <= kWh < 3,000,000	21	3
3	100,000 <= kWh < 300,000	57	3
4	kWh < 100,000	239	2

Random samples were drawn from each stratum (across all programs within the commercial program group) as described in Section 1.4. Verification levels of rigor, either basic or enhanced, were assigned to sampled projects consistent with Duquesne Light's EM&V Plan[34]. Claimed project savings were assessed utilizing verification activities that included desk audit of project files, telephone interviews and on-site verification audits, supplemented as necessary by additional secondary research. The following table summarizes verification findings:

Table 4-18: PY2-Q3 Commercial Sector Evaluation Group Results

Strata	Sample Quota	Program	Project	Verification Rigor	Claimed		Verified	
					kWh	kW	kWh	kW
1	4	Retail Stores	7000006642.17.01	Onsite	9,579	2.31	9,579	2.31
		Office Buildings - Small	8000506525.15.01	Telephone	5,756	0.39	0	0
		Office Buildings-Large	7000006716.20.01	Telephone	8,199	2.45	8,199	2.45
		Office Buildings-Large	8000006626.20.01	Telephone	6,559	1.96	6,559	1.96
2	4	Retail Stores	2000006296.17.01	Onsite	13,515	2.03	13,515	2.03
		Retail Stores	2000006578.17.01	Onsite	11,697	1.67	11,697	1.67
		CSUP Commercial Umbrella	3000563306.16.01	Telephone	25,701	5.24	25,701	5.24
		Retail Stores	9000585089.17.01	Telephone	11,772	0.68	6,577	0.38
3	5	Education	4000659787.18.01	Onsite	58,544	14.59	62,571	15.59
		HEEP (Health Care)	3000420016.21.01	Onsite	74,075	11.24	60,425	9.11
		CSUP Commercial Umbrella	0000489299.16.01	Onsite	122,304	26.66	122,304	26.66
		Education	9000008787.18.04	Onsite	206,200	32.70	198,217	13.46
		PAPP Public Agency Partnership	9000679872.19.02	Onsite	1,614,099	158.90	1,555,762	168.65

[34] Ibid footnote 5

Table 4-19: PY2-Q4 Commercial Sector Evaluation Group Results

Strata	Sample Quota	Program	Project	Verification Rigor	Claimed		Verified	
					kWh	kW	kWh	kW
1	4	PAPP Public Agency Partnership	7000006489.19.01	Onsite	6,262,835	716.88	2,438,981	278.42
		Office Buildings-Large	8000006714.20.02	Onsite	5,173,959	367.68	6,726,295	1,260.48
		PAPP Public Agency Partnership	3000007948.19.01	Onsite	4,209,014	285.10	4,284,871	338.42
		Non Profit	4000640704.26.01	Onsite	3,052,204	0	7,256,282	204
2	3	Education	9000008787.18.06	Onsite	885,175	53.88	792,834	53.88
		Education	6000006762.18.01	Onsite	637,210	38.83	572,340	38.83
		Non-Profit	9000650311.26.01	Onsite	532,485	60.79	546,834	62.42
3	3	PAPP Public Agency Partnership - AF	6000520686.31.03	Onsite	91,523	5.56	59,298	2.81
		Office Buildings-Large	9000009008.20.01	Onsite	168,280	19.21	168,280	19.21
		PAPP Public Agency Partnership - AF	9000527301.31.01	Onsite	47,830	3.05	25,184	1.29
4	2	Retail Small	8000552366.17.01	Onsite	44,199	11.75	27,818	0
		Education	4000008682.18.01	Onsite	3,913	0.52	4,094	0

As reflected in Duquesne Light's EM&V Plan and Section 1.4 of this report, the commercial sector PY2-Q3 and Q4 claimed savings impacts were evaluated through application of stratified sampling of commercial sector projects implemented between 12/1/2010 and 5/31/2011. During this period, commercial sector programs completed 625 projects. The sampling approach resulted in on-site enhanced verification for most of the PY2-Q3 and Q4 commercial sector projects. The Q3 and Q4 verification results were combined with the results reported in the Q1 and Q2 quarterly reports. The following table summarizes verification findings for the commercial sector projects:

Table 4-20: PY2 Commercial Sector Evaluation Group Results

Programs	Projects	Reported		Verified		Realization (%)	
		kWh	kW	kWh	kW	kWh	kW
Commercial Umbrella	6	601,216	165	595,234	163	99.0%	99.1%
Health Care EE	1	74,075	11	60,425	9	81.6%	81.1%
Office Buildings – Small	5	250,247	55	246,015	54	98.3%	98.0%
Office Buildings-Large	10	8,637,367	786	9,689,039	1,562	112.2%	198.6%
Government/Non-Profit	22	17,924,506	1,447	18,140,443	1,234	101.2%	85.3%
Retail Stores	24	768,224	165	761,293	149	99.1%	90.0%
Totals	68	28,255,634	2,630	29,492,450	3,170	104.4%	120.6%

The weight averaged verification rates described above are applied to the claimed savings of the population of projects in strata from which the sampled projects were drawn. The following table presents the PY2 Commercial Sector Evaluation Group verified savings and realization rates. These results are notable for the high realization rates, which are due largely to very conservative savings estimation on the part of the CSPs and Duquesne.

Table 4-21: PY2 Commercial Sector Evaluation Group Verified Savings

Commercial Program Savings and Precision					
Savings Type	**Claimed Savings**	**Verified Savings**	**Realization Rate**	**Std Error on Verified Savings**	**Relative Precision @ 90% Confidence:**
kWh	59,526,743	58,806,693	99%	2,396,288	6.70%
kW	8,315	8,029	97%	523	10.71%

4.5.5 Process Evaluation

The process evaluation for the commercial program was conducted as described in Section 1.4.2 above.

The process evaluation found the following:

- **Goals.** Some programs within the commercial program group are meeting or exceeding their goals while others are not.

- At the aggregate level, the commercial program group is at 70% of its energy savings goal for Program Year 2.

- The energy savings goal was exceeded for the largest program – government/non-profit – and was almost attained for the next largest program – large offices.

- Except for the retail program, energy savings obtained through the remaining programs – healthcare, small offices, large retail, and commercial umbrella – were less than 40% of goal, with small office below 20% and healthcare below 10%. Retail program energy savings were at 70% of goal (with small retail exceeding its target and large retail at less than 30% of target). The commercial umbrella program was designed as a catch-all for hard-to-reach customers, and was expected to underperform. Due to the success of small retail and large office, overall retail and overall office savings were at about two-thirds of their respective goals. Small Office goal attainment may have been impacted by an unexpected limitation in maximum project size from 300 kW to 200kW and by DLC's difficulties in providing all the seed files expected. The Small Office CSP has expressed a concern that mixed use facilities and 'parent-child' situations have inhibited their goal attainment. Duquesne will review these issues as it refines its programs moving forward.

- DLC has had to ramp up a major energy efficiency initiative in a very short time span, and should be congratulated for the success it has had to date. The program experienced typical start-up problems with misinterpretations of program rules and requirements and relationships between DLC and contractors.

- **Manual interactions with CSPs.** Key interactions required with the CSPs occur through emails and phone calls, a time-consuming method to obtaining needed information and determining project status. While weekly discussions do occur with each CSP to expedite the project review process, better access to the tracking system on the part of CSPs could help reduce the level of such manual interaction.

- **Segmentation.** Segmentation of program administration was done based on market sectors. There are several recommendations for segmentation:
- The Large and Small Office segmentation should be re-examined. Rather than dividing the office segment by maximum demand, it might make more sense to look at business type and ownership. Provision should be made for more customer-centered approaches. For example, Small and Large Office CSPs could develop coordinated customer-focused marketing and develop protocols for which CSP takes lead roles in varying situations. This is not a simple task. (See below)
- The lines of separation between these segments are not always appropriate. Some Large Office customers have one or more facilities in the Small Office segment – it does not make sense for a customer to have to deal with multiple CSPs or DLC and CSPs. Similarly, many multi-use facilities are best approached through property owners/managers. Overall, a more customer-centered approach should produce more short term-projects and help develop relationships that lead to further efficiency projects over the medium- to long- term.
- DLC needs to clarify and rectify the limitation of Small Office projects to customers with a maximum of 200kW. Program design and CSP contract calls for projects with 300 kW and it impacts the project size and acquisition costs and, of course, affects the CSP's ability to attain savings goals. This may not continue to be relevant if the Office program segmentation is re-designed.
- DLC should consider assigning the Commercial Umbrella segment to the Office segment and explore whether existing CSPs can integrate it into their operations. Navigant believes there is a need for combined and coordinated addressing of certain segments. For reasons noted above, there is a lot of coincidence among Office and Retail. Combining them may offer economies of effort and find better customer reception. DLC has a very small program staff and its time might be better spent administering the program and in oversight, especially ensuring quality control is maintained.

- **Promotion.** DLC should consider cooperative advertising involving CSPs and trade allies. Currently, CSP market to their own segments. Cooperative advertising can serve to build the Watt Choices' brand, especially if logos, signage, message reach down to the trade ally level. The program group's web pages are effective and easy to use.

- **Satisfaction.** Participant satisfaction with the program and the equipment installed is high, with the appeal of energy savings and the program's incentives as the two most frequently reported drivers of participation. However, several participants offered suggestions for improving the program, including (1) notification of the specific measures or project for which an incentive check is being sent (customers with multiple applications can find it hard to know which project the incentive is for), (2) speeding up rebate turn-around time (while in the first year of a program one can expect processing times to improve over time, a third reported waiting more than eight weeks for their rebate checks), and (3) reducing the amount of paperwork required in

the program. Program participant survey results indicated that acceptable efficiency measure payback times range from 1-9 years, with three years as the most frequently reported acceptable time frame.

- **Awareness.** Awareness of the program is most often stemming from interactions with Duquesne staff and with the customer's contractors.

- **Account Executive Roles.** Account Executive (AE) participation in developing leads and projects should be strengthened. Adding an energy efficiency component to compensation packages is a very good motivator. AEs generally have the best knowledge of customers and their facilities and can advise on short term and long term efficiency improvement paths. A close relationship among AEs and CSPs also shows customers the depth of DLC's buy-in to energy efficiency and assures them these efforts will continue and can be integrated into capital planning over more than one cycle.

- **Customer Listing Files Provided to CSPs.** Improvement is needed:
    - DLC has made considerable efforts to improve the existing files but it has been unable to provide all the files expected in the Small Office segment
    - Owner information should be in place and up to date. It is often missing or inaccurate.
    - NAIC codes should replace SIC codes (can be transitioned with new CIS activation). Customers are coded by SIC codes, which are often inaccurate. NAIC codes are current and better descriptors.

- **"Retroactive" Projects.**
    - DLC retroactive project reviews can be used to identify customers that have demonstrated receptivity to efficiency improvements. These customers can then be targeted for further efficiency improvements through later marketing efforts, to maximize savings and the potential for encouraging ongoing efficiency improvements.

- **PMRS.** As noted earlier in this report, there are several issues with how CSPs interact with the program tracking system which, if resolved, would facilitate better relationships with the CSPs and likely more efficient work activity.

- **Project documentation.** Program staff interviews and on-site verification surveys uncovered two issues that need to be addressed:
    - Improve savings estimates by taking more care to review and document all savings variables. In the projects verified on site, CSPs and Duquesne estimates often tended to be quite conservative, so that this issue did not result in overstatement of savings but rather understatement. In this sense it contributed to a higher realization rate when savings were verified on site. However, the opposite could be true in the future. While such differences between claimed and verified energy savings are likely to be identified and addressed through the verification process, better savings estimates would provide a more accurate ongoing picture of program performance for program management.
    - Facilitate verification of savings claims by providing better documentation of measure locations, types and counts. This is important so that savings can be verified easily and so that savings from implemented measures will not be decreased simply because the

measures could not be found on site (e.g., if the customer has staff turnover and no one can identify where measures were installed).

4.5.6 Program Partners and Trade Allies

In addition to the implementation contractors noted above, Duquesne Light continues to work through local government partnerships with the City of Pittsburgh, Allegheny and Beaver Counties as well as major universities and healthcare providers to coordinate delivery of its Act 129 program services.

4.5.7 Program Finances

A summary of the project finances are presented in Tables 4-22 through 4-27.

Table 4-22: Summary of Program Finances: TRC Test (Commercial Umbrella, Small and Large)[35]

	Category	PY2
A.1	EDC Incentives to Participants	$249,501
A.2	EDC Incentives to Trade Allies	0
A	**Subtotal EDC Incentive Costs**	249,501
B.1	Design & Development	12,749
B.2	Administration	0
B.3	Management	110,455
B.4	Marketing	14,502
B.5	Technical Assistance	0
B	**Subtotal EDC Implementation Costs**	137,706
C	**EDC Evaluation Costs**	9,896
D	**SWE Audit Costs**	13,239
E	**Participant Costs**	419,822
	Total TRC Costs[1]	580,663
F	**Annualized Avoided Supply Costs[2]**	Not Computed
G	**Lifetime Avoided Supply Costs[3]**	1,537,932
	Total Lifetime Economic Benefits	1,537,932
	Program NPV	957,269
	Portfolio Benefit-to-Cost Ratio	2.6

[1]TRC Test does not include incentives, which are treated as a transfer from the EDC to the participants.
[2]Included in *Lifetime Avoided Supply Costs* through the use of PV tables or Excel NPV calculations applied at the measure level.
[3]Present value of avoided supply costs.

[35] Definitions for terms in following table are subject to TRC Order.

Table 4-23: Summary of Program Finances: TRC Test (Office- Small)

	Category	PY2
A.1	EDC Incentives to Participants	$159,197
A.2	EDC Incentives to Trade Allies	0
A	**Subtotal EDC Incentive Costs**	159,197
B.1	Design & Development	25,185
B.2	Administration	0
B.3	Management	185,102
B.4	Marketing	26,467
B.5	Technical Assistance	0
B	**Subtotal EDC Implementation Costs**	236,754
C	**EDC Evaluation Costs**	18,507
D	**SWE Audit Costs**	25,263
E	**Participant Costs**	442,827
	Total TRC Costs[1]	723,351
F	**Annualized Avoided Supply Costs**[2]	Not Computed
G	**Lifetime Avoided Supply Costs**[3]	1,428,758
	Total Lifetime Economic Benefits	1,428,758
	Program NPV	705,407
	Portfolio Benefit-to-Cost Ratio	2.0

[1]TRC Test does not include incentives, which are treated as a transfer from the EDC to the participants.
[2]Included in *Lifetime Avoided Supply Costs* through the use of PV tables or Excel NPV calculations applied at the measure level.
[3]Present value of avoided supply costs.

Table 4-24: Summary of Program Finances: TRC Test (Office - Large)

	Category	PY2
A.1	EDC Incentives to Participants	$1,068,485
A.2	EDC Incentives to Trade Allies	0
A	**Subtotal EDC Incentive Costs**	1,068,485
B.1	Design & Development	48,018
B.2	Administration	0
B.3	Management	407,943
B.4	Marketing	52,791
B.5	Technical Assistance	0
B	**Subtotal EDC Implementation Costs**	508,752
C	**EDC Evaluation Costs**	37,353
D	**SWE Audit Costs**	49,930
E	**Participant Costs**	3,348,604
	Total TRC Costs[1]	3,944,639
F	**Annualized Avoided Supply Costs**[2]	Not Computed
G	**Lifetime Avoided Supply Costs**[3]	14,348,150
	Total Lifetime Economic Benefits	14,348,150
	Program NPV	10,403,511
	Portfolio Benefit-to-Cost Ratio	3.6

[1]TRC Test does not include incentives, which are treated as a transfer from the EDC to the participants.
[2]Included in *Lifetime Avoided Supply Costs* through the use of PV tables or Excel NPV calculations applied at the measure level.
[3]Present value of avoided supply costs.

Table 4-25: Summary of Program Finances: TRC Test (Retail)

	Category	PY2
A.1	EDC Incentives to Participants	$596,598
A.2	EDC Incentives to Trade Allies	0
A	**Subtotal EDC Incentive Costs**	596,598
B.1	Design & Development	29,444
B.2	Administration	0
B.3	Management	471,565
B.4	Marketing	32,290
B.5	Technical Assistance	0
B	**Subtotal EDC Implementation Costs**	533,299
C	**EDC Evaluation Costs**	22,515
D	**SWE Audit Costs**	30,284
E	**Participant Costs**	1,768,813
	Total TRC Costs[1]	2,354,911
F	**Annualized Avoided Supply Costs**[2]	Not Computed
G	**Lifetime Avoided Supply Costs**[3]	6,006,308
	Total Lifetime Economic Benefits	6,006,308
	Program NPV	3,651,397
	Portfolio Benefit-to-Cost Ratio	2.6

[1]TRC Test does not include incentives, which are treated as a transfer from the EDC to the participants.
[2]Included in *Lifetime Avoided Supply Costs* through the use of PV tables or Excel NPV calculations applied at the measure level.
[3]Present value of avoided supply costs.

Table 4-26: Summary of Program Finances: TRC Test (Government/Non-Profit)

	Category	PY2
A.1	EDC Incentives to Participants	$2,402,914
A.2	EDC Incentives to Trade Allies	0
A	**Subtotal EDC Incentive Costs**	2,402,914
B.1	Design & Development	81,100
B.2	Administration	0
B.3	Management	225,216
B.4	Marketing	88,239
B.5	Technical Assistance	0
B	**Subtotal EDC Implementation Costs**	394,555
C	**EDC Evaluation Costs**	62,044
D	**SWE Audit Costs**	83,439
E	**Participant Costs**	5,877,677
	Total TRC Costs[1]	6,417,715
F	**Annualized Avoided Supply Costs**[2]	Not Computed
G	**Lifetime Avoided Supply Costs**[3]	20,467,558
	Total Lifetime Economic Benefits	20,467,558
	Program NPV	14,049,842
	Portfolio Benefit-to-Cost Ratio	3.2

[1]TRC Test does not include incentives, which are treated as a transfer from the EDC to the participants.
[2]Included in *Lifetime Avoided Supply Costs* through the use of PV tables or Excel NPV calculations applied at the measure level.
[3]Present value of avoided supply costs.

Table 4-27: Summary of Program Finances: TRC Test (Healthcare)

	Category	PY2
A.1	EDC Incentives to Participants	$57,079
A.2	EDC Incentives to Trade Allies	0
A	**Subtotal EDC Incentive Costs**	57,079
B.1	Design & Development	27,065
B.2	Administration	0
B.3	Management	72,415
B.4	Marketing	29,522
B.5	Technical Assistance	0
B	**Subtotal EDC Implementation Costs**	129,002
C	**EDC Evaluation Costs**	20,766
D	**SWE Audit Costs**	27,897
E	**Participant Costs**	439,889
	Total TRC Costs[1]	617,554
F	**Annualized Avoided Supply Costs**[2]	Not Computed
G	**Lifetime Avoided Supply Costs**[3]	784,996
	Total Lifetime Economic Benefits	784,996
	Program NPV	167,442
	Portfolio Benefit-to-Cost Ratio	1.3

[1]TRC Test does not include incentives, which are treated as a transfer from the EDC to the participants.
[2]Included in *Lifetime Avoided Supply Costs* through the use of PV tables or Excel NPV calculations applied at the measure level.
[3]Present value of avoided supply costs.

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4.6 Industrial Sector Programs

4.6.1 Industrial Sector Overview

The Industrial Sector includes an overall umbrella program and three specialized programs that address the following market segments: primary metals, chemical products and mixed industrials. Under the overarching umbrella program, specialized programs are designed to promote specific technologies or target specific market segments while incorporating the umbrella program savings impacts and incentive levels. In this manner, all industrial programs present a consistent and common offering.

The industrial programs are intended to provide a comprehensive approach to energy savings and permanent demand reduction, and address a full range of efficiency opportunities from low cost improvements to entire system upgrades. Each program provides the following services:

- Targeted and comprehensive on-site walk-through assessments and professional grade audits to identify energy savings opportunities.
- Efficiency studies/reports that detail process and equipment upgrades that present the greatest potential for energy/cost savings.
- Support to access rebates and incentives available across electric measures designed to help defray upfront costs of installing the equipment.
- Coordination with local chapters of key industry associations to promote energy efficiency improvements through trusted sources and encourage market-transforming practices among equipment vendors and purchasers

Duquesne Light has chosen the following Conservation Service Providers (CSPs) to implement industrial sector programs:

- Primary Metals Program: Roth Bros, Inc. and Enerlogics Networks, Inc.
- Chemical Products: Global Energy Partners, LLC
- Mixed Industrial: Global Energy Partners, LLC

4.6.2 Program Logic

Program Theories, Logic Models & Performance Indicators are provided in the EM&V Plan at Section 1.2.5. Program logic diagrams are provided in EM&V Plan Appendix E.

4.6.3 Program EM&V Methodology

The program's M&V approach is laid out above in section 1.4 Sampling Plan.

4.6.4 Industrial Sector Evaluation Group Impact Evaluation

As related in the previous section, per the utility's EM&V Plan, for the purpose of conducting cost-effective EM&V, certain industrial and commercial programs are grouped based on shared characteristics. Industrial sector umbrella, primary metals, chemical products and mixed industrial product energy efficiency programs are similar enough in structure to be treated as one evaluation group.

The impact evaluation for Q1 and Q2 participants has been reported in earlier quarterly reports. Industrial Evaluation Group PY2-Q3/Q4 measures completed between 12/1/2010 and 2/28/2011, and between 3/1/2011 and 5/31/2011, were extracted from Duquesne Light's program tracking system and broken into strata based on project kWh savings by applying the following strata boundaries:

Table 4-28: PY2-Q3 Industrial Strata Boundaries

Strata	Strata Boundaries	N	n
1	kWh < 150,000	5	1
2	kWh >= 150,000	4	4

Table 4-29: PY2-Q4 Industrial Strata Boundaries

Strata	Strata Boundaries	N	n
1	kWh >= 3,000,000	3	3
2	449,000 <= kWh < 3,000,000	9	3
3	75,000 <= kWh < 449,000	32	3
4	kWh < 75,000	241	3

Random samples were drawn from each stratum as described in Section 1.4. Verification levels of rigor, either basic or enhanced, were assigned to sampled projects consistent with Duquesne Light's EM&V Plan[36]. Claimed project savings were assessed utilizing verification activities that included desk audit of project files, telephone interviews, on-site verification audits, and additional secondary research. The following table summarizes verification findings:

Table 4-30: PY2-Q3 Industrial Sector Evaluation Group Results

Strata	Sample Quota	Program	Measures	Verification Rigor	Claimed		Verified	
					kWh	kW	kWh	kW
1	1	Mixed Industrial	6000504229.23.01	Telephone	3,979	0.20	3,979	0.20
2	4	Mixed Industrial	6000006355.23.01	Onsite	317,142	71.14	231,659	44.88
		Primary Metals	3000620347.24.01	Onsite	231,561	27.34	154,856	22.74
		Mixed Industrial	5000009007.23.02	Onsite	212,960	31.28	208,116	30.56
		Mixed Industrial	3000437350.23.01	Onsite	156,452	27.79	152,769	26.07

[36] Ibid footnote 5

Table 4-31: PY2-Q4 Industrial Sector Evaluation Group Results

Strata	Sample Quota	Program	Project	Verification Rigor	Claimed		Verified	
					kWh	kW	kWh	kW
1	3	Chemical Products	2000616547.25.01	Onsite	12,112,009	1,477.00	12,113,488	1,640.25
		Primary Metals	7000009088.24.16	Onsite	6,003,111	798.00	6,143,621	741.98
		Primary Metals	7000009088.24.06	Onsite	5,838,000	510.99	4,150,725	513.29
2	3	Primary Metals	7000009088.24.24	Onsite	2,111,375	201.51	1,637,375	186.92
		Chemical Products	6000006420.25.01	Onsite	998,081	194.18	513,752	49.73
		Primary Metals	7000009088.24.04	Onsite	473,040	54.00	428,256	48.94
3	3	Primary Metals	7000009088.24.24	Onsite	2,111,375	201.51	1,637,375	186.92
		Mixed Industrial	4000007634.23.01	Onsite	195,523	22.32	208,138	23.76
		Primary Metals	7000009088.24.02	Onsite	204,738	25.02	120,914	9.77
4	3	Chemical Products	3000586247.25.01	Onsite	457,542	19.36	465,590	21.35
		Primary Metals	3000008069.24.01	Telephone	358,235	61.63	21,282	7.62
		Mixed Industrial	7000008505.23.05	Telephone	178,880	36.27	719	0.12

As reflected in Duquesne Light's EM&V Plan and Section 1.4 of this report, the industrial sector PY2-Q3 and Q4 claimed savings impacts were evaluated through application of stratified sampling of industrial sector projects implemented between 12/1/2010 and 5/31/2011. The sampling approach resulted in on-site enhanced verification for most of the PY2-Q3 and Q4 industrial sector projects. The Q3 and Q4 verification results were combined with the results reported in the Q1 and Q2 quarterly reports. The following table summarizes verification findings for the industrial sector programs:

Table 4-32: PY2 Industrial Sector Evaluation Group Results

Programs	Projects	Reported		Verified		Realization (%)	
		kW	kWh	kW	kWh	kW	kWh
Primary Metals	**8**	1,880	17,331,435	1,718	14,294,405	91%	82%
Chemical Products	**6**	1,752	14,043,601	1,772	13,557,020	101%	97%
Mixed Industrial	**7**	260	1,463,685	196	1,204,129	76%	82%
Industrial Umbrella	**1**	79	436,663	49	463,942	63%	106%
Totals	**22**	**3,970**	**33,275,384**	**3,735**	**29,519,495**	**94%**	**89%**

The weight averaged verification rates described above are applied to the claimed savings of the population of projects in strata from which the sampled projects were drawn. The following table presents the PY2 Industrial Sector Evaluation Group verified savings and realization rates.

Table 4-33: PY2 Industrial Sector Evaluation Group Verified Savings

Industrial Program Savings and Precision					
Savings Type	**Claimed Savings**	**Verified Savings**	**Realization Rate**	**Std Error on Verified Savings**	**Relative Precision @ 90% Confidence:**
kWh	44,135,517	42,943,461	97%	1,070,982	4.10%
kW	5,343	5,258	98%	204	6.38%

4.6.5 Process Evaluation

The process evaluation for the industrial program was conducted as described in Section 1.4.2 above.

The process evaluation found the following:

- The overall program group and each of the individual CSP-administered industrial programs are significantly exceeding their goals, while the overarching umbrella program is only about 25% of goal.

- DLC has had to ramp up a major energy efficiency initiative in a very short time span, and should be congratulated for the success it has had to date. The program experienced typical start-up problems with misinterpretations of program rules and requirements and relationships between DLC and contractors. Recommendations from the process evaluation are as follows:

- **Segmentation.** Segmentation in the industrial programs appears to work well and should be continued. Navigant recommends that DLC consider transitioning the umbrella industrial segment to CSPs. DLC has a very small program staff and its time might be better spent administering the program and in oversight, especially ensuring quality control is maintained.

- **Promotion.** DLC should consider cooperative advertising involving CSPs and trade allies. Currently CSP market own segments. Cooperative advertising can serve to build the Watt Choices' brand, especially if logos, signage, message reach down to the trade ally level. Participants indicated that the best way to reach potential industrial program participants is through contacts by Duquesne account representatives, and Duquesne should try to leverage the use of these representatives to the fullest extent it can. Acceptable measure payback times range from 1-2 years, with one year as the most frequently reported time frame. The program group's web pages are effective and easy to use.

- **Satisfaction.** Participant satisfaction with the program and the equipment installed is high, with the appeal of improved equipment performance and the program's incentives as the two most frequently reported drivers of participation. However, several participants said that the program is too complicated, and more than half said they had to wait for their rebate longer than eight weeks (with some saying it took 3-6 months).

- **Awareness.** Awareness of the program is most often stemming from interactions with Duquesne staff and with the customer's contractors.

- **Account Executive Roles.** Account Executive (AE) participation in developing leads and projects should be strengthened. Adding an energy efficiency component to compensation packages is a very good motivator. AEs generally have the best knowledge of customers and their facilities and can advise on short term and long term efficiency improvement paths. A close relationship among AEs and CSPs also shows customers the depth of DLC's buy-in to energy efficiency and assure them these efforts will continue and can be integrated into capital planning over more than one cycle.

- **Customer Listing Files Provided to CSPs**. Improvements are needed:
    - Owner information should be in place and up to date. It is often missing or inaccurate.
    - NAIC codes should replace SIC codes (can be transitioned with new CIS activation). Customers are coded by SIC codes, which are often inaccurate. NAIC codes are current and better descriptors.

- **Project documentation.** Program staff interviews and on-site verification surveys uncovered a number of issues that need to be addressed:
    - Improve savings estimates by (1) taking more care to review and document all savings variables, (2) making use of spot measurements, when appropriate, and (3) accounting for seasonal changes in consumption/hours of use. In the projects verified on site, CSPs and Duquesne estimates often tended to be quite conservative, so that this issue did not result in overstatement of savings but rather understatement. In this sense it contributed to a higher realization rate when savings were verified on site. However, the opposite could be true in the future. While such differences between claimed and verified energy savings are likely to be identified and addressed through the verification process, better savings estimates would provide a more accurate ongoing picture of program performance for program management.
    - Facilitate verification of savings claims by providing better documentation of measure locations, types and counts. This is important so that savings can be verified easily and so that savings from implemented measures will not be decreased simply because the measures could not be found on site (e.g., if the customer has staff turnover and no one can identify where measures were installed).

4.6.6 Program Partners and Trade Allies

Duquesne Light continues to work through local government partnerships with the City of Pittsburgh, Allegheny and Beaver Counties as well as major universities and healthcare providers to coordinate delivery of its Act 129 program services.

4.6.7 Program Finances

A summary of the project finances is presented in Tables 4-34 to 4-37.

Table 4-34: Summary of Program Finances: TRC Test (Industrial Umbrella, Small and Large))

	Category	PY2
A.1	EDC Incentives to Participants	$46,084
A.2	EDC Incentives to Trade Allies	0
A	**Subtotal EDC Incentive Costs**	46,084
B.1	Design & Development	9,133
B.2	Administration	0
B.3	Management	33,300
B.4	Marketing	9,193
B.5	Technical Assistance	0
B	**Subtotal EDC Implementation Costs**	51,626
C	**EDC Evaluation Costs**	6,038
D	**SWE Audit Costs**	8,452
E	**Participant Costs**	90,016
	Total TRC Costs[1]	156,132
F	**Annualized Avoided Supply Costs**[2]	Not Computed
G	**Lifetime Avoided Supply Costs**[3]	506,099
	Total Lifetime Economic Benefits	506,099
	Program NPV	349,967
	Portfolio Benefit-to-Cost Ratio	3.2

[3]TRC Test does not include incentives, which are treated as a transfer from the EDC to the participants.
[4]Included in *Lifetime Avoided Supply Costs* through the use of PV tables or Excel NPV calculations applied at the measure level.
[5]Present value of avoided supply costs.

Table 4-35: Summary of Program Finances: TRC Test (Mixed Industrials)

	Category	PY2
A.1	EDC Incentives to Participants	$422,352
A.2	EDC Incentives to Trade Allies	0
A	**Subtotal EDC Incentive Costs**	422,352
B.1	Design & Development	19,351
B.2	Administration	0
B.3	Management	228,993
B.4	Marketing	18,868
B.5	Technical Assistance	0
B	**Subtotal EDC Implementation Costs**	267,212
C	**EDC Evaluation Costs**	12,993
D	**SWE Audit Costs**	18,368
E	**Participant Costs**	1,100,831
	Total TRC Costs[1]	1,399,404
F	**Annualized Avoided Supply Costs**[2]	Not Computed
G	**Lifetime Avoided Supply Costs**[3]	5,759,911
	Total Lifetime Economic Benefits	5,759,911
	Program NPV	4,360,508
	Portfolio Benefit-to-Cost Ratio	4.1

[1]TRC Test does not include incentives, which are treated as a transfer from the EDC to the participants.
[2]Included in *Lifetime Avoided Supply Costs* through the use of PV tables or Excel NPV calculations applied at the measure level.
[3]Present value of avoided supply costs.

Table 4-36: Summary of Program Finances: TRC Test (Chemical Products)

	Category	PY2
A.1	EDC Incentives to Participants	$657,317
A.2	EDC Incentives to Trade Allies	0
A	**Subtotal EDC Incentive Costs**	657,317
B.1	Design & Development	18,237
B.2	Administration	0
B.3	Management	851,282
B.4	Marketing	19,735
B.5	Technical Assistance	0
B	**Subtotal EDC Implementation Costs**	889,254
C	**EDC Evaluation Costs**	13,892
D	**SWE Audit Costs**	18,712
E	**Participant Costs**	2,306,118
	Total TRC Costs[1]	3,227,976
F	**Annualized Avoided Supply Costs**[2]	Not Computed
G	**Lifetime Avoided Supply Costs**[3]	9,123,607
	Total Lifetime Economic Benefits	9,123,607
	Program NPV	5,895,632
	Portfolio Benefit-to-Cost Ratio	2.8

[1]TRC Test does not include incentives, which are treated as a transfer from the EDC to the participants.
[2]Included in *Lifetime Avoided Supply Costs* through the use of PV tables or Excel NPV calculations applied at the measure level.
[3]Present value of avoided supply costs.

Table 4-37: Summary of Program Finances: TRC Test (Primary Metals)

	Category	PY2
A.1	EDC Incentives to Participants	$825,004
A.2	EDC Incentives to Trade Allies	0
A	**Subtotal EDC Incentive Costs**	825,004
B.1	Design & Development	59,641
B.2	Administration	0
B.3	Management	923,561
B.4	Marketing	57,059
B.5	Technical Assistance	0
B	**Subtotal EDC Implementation Costs**	1,040,261
C	**EDC Evaluation Costs**	39,665
D	**SWE Audit Costs**	56,285
E	**Participant Costs**	1,992,026
	Total TRC Costs[1]	3,128,237
F	**Annualized Avoided Supply Costs**[2]	Not Computed
G	**Lifetime Avoided Supply Costs**[3]	15,590,548
	Total Lifetime Economic Benefits	15,590,548
	Program NPV	12,462,311
	Portfolio Benefit-to-Cost Ratio	5.0

[1]TRC Test does not include incentives, which are treated as a transfer from the EDC to the participants.
[2]Included in *Lifetime Avoided Supply Costs* through the use of PV tables or Excel NPV calculations applied at the measure level.
[3]Present value of avoided supply costs.