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VIA FEDEX NEXT DAY

September 15, 2010

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street
Harrisburg, PA 17120

Re: Petition of West Penn Power Company d/b/a Allegheny Power for Approval of its Energy Efficiency and Conservation Plan, Approval of Recovery of Costs through a Reconcilable Adjustment Clause and Approval of Matters Relating to the Energy Efficiency and Conservation Plan; Docket No. M-2009-2093218

Dear Secretary Chiavetta:

Enclosed for filing with the Pennsylvania Public Utility Commission, please find four copies of the Plan Year 2009 Annual Report of West Penn Power Company d/b/a Allegheny Power of the Company's Energy Efficiency and Conservation Program for the period June 1, 2009 to May 31, 2010.

The Pennsylvania Statewide Evaluator, GDS Associates, and Wayne Williams, Director, Bureau of CEEP, will receive copies today via email.

This filing is made by express delivery and is deemed filed today pursuant to 52 Pa. Code § 1.11.

Respectfully submitted,

John L. Munsch
Attorney

JLM:sac

Enclosures

Annual Report to the Pennsylvania Public Utility Commission

For the period
June 1, 2009 to May 31, 2010
Program Year 1, Annual Report

For Act 129 of 2008
Energy Efficiency and Conservation Program

Prepared by West Penn Power Company d/b/a Allegheny Energy
September 15th 2010

Table of Contents

Abbreviations (see Glossary for definitions)

CPITD	Cumulative Program/Portfolio Inception to Date
EDC	Electric Distribution Company
EE&C	Energy Efficiency and Conservation
EM&V	Evaluation Measurement and Verification
IQ	Incremental Quarter
kW	Kilowatt
kWh	Kilowatt-hour
LDDA	Local Development District Associations
M&V	Measurement and Verification
MW	Megawatt
MWh	Megawatt-hour
NTG	Net-to-Gross
PY	Program Year
PYTD	Program/Portfolio Year to Date
SWE	Statewide Evaluator
TRC	Total Resource Cost
TRM	Technical Reference Manual
TWG	Technical Working Group

1 Overview of Portfolio

Act 129, signed October 15, 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 West Penn Power Company (d/b/a Allegheny Power) through the end of Program Year (PY) 1 (or PY 2009), Quarter 4.

Compliance goal progress as of the end of the reporting period[1]:

Cumulative Portfolio Energy Impacts

- The CPITD reported gross energy savings is 5,906 MWh.
- The CPITD preliminary verified energy savings is 2,952 MWh.
- Achieved 1.4% of the 209,387 MWh May 31st, 2011 energy savings compliance target.[2]
- Achieved 0.5% of the 628,160 MWh May 31st, 2013 energy savings compliance target.[3]

Portfolio Demand Reduction[4]

- The CPITD reported gross demand reduction is 1.0 MW.
- The CPITD preliminary verified demand reduction is 0.5 MW.
- Achieved 0.3% of the 157.3 MW May 31st, 2013 demand reduction compliance target.

Low Income Sector

- There are 49 measures offered to the low-income sector, comprising 87.5% of the total measures offered.
- The CPITD reported gross energy savings for low-income sector programs is 844 MWh.
- The CPITD preliminary verified energy savings for low-income sector programs is 0 MWh.[5]

Government and Non-Profit Sector

- The CPITD reported gross energy savings for government and non-profit sector programs is 3,023 MWh.
- The CPITD preliminary verified energy savings for government and non-profit sector programs is 2,267 MWh.
- Achieved 3.5% of the 63,997 MWh May 31st, 2013 energy savings compliance target.

[1] Percentage of compliance target achieved calculated using verified Cumulative Program/Portfolio Inception to Date values (or Preliminary verified value, if not available) divided by compliance target value.

[2] Percent goal attainment based on verified programs only. Programs not verified in PY 2009 will be verified in PY 2010 and added to PY 2010 cumulative verified savings.

[3] Percent goal attainment based on verified programs only. Programs not verified in PY 2009 will be verified in PY 2010 and added to PY 2010 cumulative verified savings.

[4] Demand reduction to include both the demand savings from the installation of energy efficiency measures and the demand reduction associated with demand response programs.

[5] Participation in Low Income Programs in PY 2009 did not warrant M&V Expense to produce verified energy savings. Programs completed in PY 2009 will be verified in PY 2010 and added to PY 2010 cumulative verified savings.

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

- The PYTD reported gross energy savings is 5,906 MWh.
- The PYTD preliminary verified energy savings is 2,952 MWh.
- The PYTD reported gross demand reduction is 1.0 MW.
- The PYTD preliminary verified demand reduction is 0.5 MW.
- The PYTD reported participation is 7,310 participants (260 participants in CFL Rewards Program).[6]

Portfolio implementation status, highlights, risks, changes, and other key issues:

- The Company's amended EE&C Plan filed on April 29, 2010 was approved by written Order on June 23, 2010. Data and information presented in this report is based on the EE&C Plan filed April 29, 2010.
- Allegheny Power soft-launched[7] the following programs in the PY 2009 Third Quarter:
    - Residential CFL Rewards Program
    - Residential Energy Star and High Efficiency Appliance Program
    - *Residential HVAC Program*
    - Low Income Home Performance Check-Up & Appliance Replacement Program
    - Low Income Joint Utility Usage Management Program
    - Low Income Room Air Conditioner Replacement Program
    - Commercial HVAC Efficiency Program
    - Commercial Lighting Efficiency Program
    - Commercial and Industrial Drives Program
- In PY 2009 Fourth Quarter, the Company launched:
    - Residential Home Performance Program – Online Energy Audit Measure
    - Custom Technology Applications Program
    - Custom Application Program
    - Government/School/non-Profit Portfolio Program
- The Company will launch the remaining programs during the PY 2010.
- The Company had 7,310 reported participants in PY 2009. The focus in the first year was on:
    - Program process design improvement: Allegheny worked with its EM&V contractor and *leveraged experience in another jurisdiction to identify program process changes. The* most notable change was moving to the Residential CFL point-of-sale design. This is discussed more in Section 4.1.
    - EE&C tracking and reporting database: Allegheny Power designed and developed an internal tracking and reporting database as an interim solution as the Company transitions to a longer term vendor solution. The Company expects to have a final solution in place in time for PY 2010 Annual report.
- The Company is increasing current EE&C Plan support staffing by approximately 20% and expects to be fully staffed by mid-PY 2010.
- Allegheny Power actively participated in the SWE and PUC Staff lead technical working groups throughout PY 2009 and will continue to actively participate through PY 2012.

[6] For reporting participants, please report CFL participants separately from other program participant numbers.

[7] *The soft-launch made programs available to customers on the Allegheny Power Watt Watchers website and to* those inquiring, but no active marketing began in Third Quarter.

Portfolio M&V Status

Allegheny Power contracted with an independent Evaluation, Measurement and Verification Team (led by Tetra Tech and supported by RW Beck and ADM Associates) to evaluate its EE&C programs portfolio for PY 2009-2012. The evaluation team was selected in February 2010, just as Allegheny Power was launching programs. The primary objectives for the PY 2009 program evaluation efforts were to obtain an understanding of the programs as they are being implemented and to establish the structure necessary for robust process and impact evaluations starting in PY 2010.

The evaluation team completed the following activities in PY 2009:

- **Developed Evaluation Plans:** The evaluation plan both presents the general approach to the overall portfolio evaluation as well as detailed evaluation plans for each of the programs through the end of PY 2010. The evaluation team met with Allegheny Power on-site in February 2010 to discuss the EM&V approach. This initial kick-off meeting was followed by program manager interviews and development of logic models, included in this annual report in program-specific sections. Following these activities, Tetra Tech developed and submitted a detailed evaluation plan to Allegheny Power and the Statewide Evaluator (SWE) in April 2010. SWE comments were received in May 2010. Allegheny Power, Tetra Tech and the SWE met on-site at Allegheny Power in June 2010 to discuss evaluation plan revisions. A revised evaluation plan was submitted in July 2010 based on these meetings. A second round of SWE comments was received, which Allegheny Power and Tetra Tech discussed with the SWE. The evaluation plan is now finalized.

- **Designed Survey Instruments:** Tetra Tech designed and submitted for SWE review in April and May 2010 survey instruments for the residential and commercial programs EM&V efforts as well as the commercial baseline survey effort.

- **Conducted Program Manager Interviews:** The evaluation team conducted interviews with Allegheny Power Program Managers. The interviews' short-term objectives were to obtain background information and to develop an understanding of how programs were operating, to inform evaluation plan development, to aid in program logic model development, and to identify programmatic issues for further exploration in the process and impact evaluations.

- **Developed Program Logic Models:** Tetra Tech created a logic model for each program implemented in PY 2009. The models were first created from program documentation and then reviewed with program managers during interviews. Tetra Tech will update the program logic models each year to capture changes in the programs' design.

- **Reviewed Rebate Applications and Tracking Databases:** Tetra Tech worked closely with Allegheny Power to review program rebate applications and program tracking systems to make sure that information needed for the EM&V effort was being collected and captured.

- ***Participated in Technical Working Group (TWG) sessions:*** Tetra Tech participated with Allegheny Power in several TWG sessions with the SWE. These included updates to the Technical Reference Manual (TRM), reporting and data requirements, demand response, dynamic sampling discussions and other ad-hoc meetings.

Verified Savings: Two programs, the Residential Home Performance Program – Online Energy Audit Measure and the Government/School/non-Profit Portfolio Program, were sufficiently established in PY 2009 for cost-effective EM&V efforts. The results of these evaluations are presented in detail in the

relevant sections of this report. Tetra Tech will verify savings for all programs in PY 2010 as well as implement process, market and impact evaluation activities.

Summary of Portfolio Impacts

A summary of the portfolio reported impacts is presented in Table 1-1.

Table 1-1: EDC Reported Portfolio Impacts through the Fourth Quarter, Program Year 1

Table 1-1: EDC Reported Portfolio Impacts through the 4th Quarter, Program Year 1

Impact Type	Total Energy Savings (MWh)	Total Demand Reduction (MW)
Reported Gross Impact: Incremental Quarterly	5,906	1.0
Reported Gross Impact: Program Year to Date	5,906	1.0
Reported Gross Impact: Cumulative Portfolio Inception to Date	5,906	1.0
Unverified Ex Post Savings	0	0.0
Estimated Impact: Projects in Progress	2,416	0.5
Estimated Impact: PYTD Total Committed	8,322	1.5
Preliminary PYTD Verified Impact[a]	2,952	0.5
Preliminary PYTD Net Impact[b]	2,952	0.5

NOTES:

[a] Portfolio Verified Impact calculated by aggregating Program PYTD Verified Impacts. Program PYTD Verified Impacts are calculated by multiplying Program PYTD Reported Gross Impacts by program realization rates.

[b] Portfolio Net Impact calculated by aggregating Program Net Impacts. Program Net Impacts are calculated by multiplying Program PYTD Verified Impacts by program Net-to-Gross ratios.

A summary of total evaluation adjusted impacts for the portfolio is presented in Table 1-2.

Due to early plan implementation activities late in PY2009, cost effectiveness testing will not be completed for PY 2009 as communicated by the PUC Staff and the SWE.

Table 1-2: Verified Preliminary Portfolio Total Evaluation Adjusted Impacts through the End of the Fourth Quarter,Program Year 1

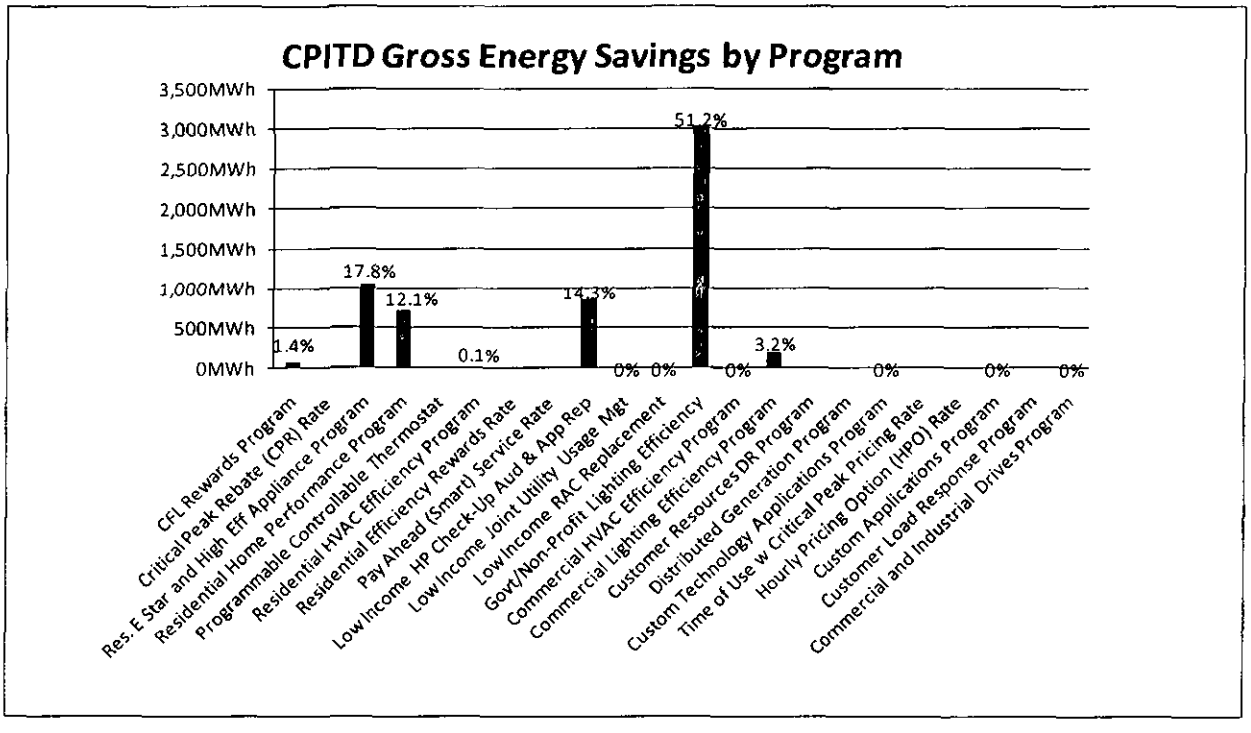
TRC Category	IQ[a]	PYTD[b]	CPITD
TRC Benefits ($)			
TRC Costs ($)			
TRC Benefit-Cost Ratio			

NOTES:
[a] Based on reported gross savings.
[b] Based on reported gross savings.

1.1 Summary of Energy Impacts by Program

A summary of the reported energy savings by program is presented in Figure 1-1.[8]

Figure 1-1: CPITD Reported Gross Energy Savings by Program through the Fourth Quarter, Program Year 1



[8] Absence of data indicates program has not been launched.

A summary of energy impacts by program through the Fourth Quarter, Program Year 1 is presented in Table 1-3 and Table 1-4.

Table 1-3: EDC Reported Participation and Gross Energy Savings by Program through the Fourth Quarter, Program Year 1

Program	Participants			Reported Gross Impact (MWh)		
	IQ	PYTD	CPITD	IQ	PYTD	CPITD
Compact Fluorescent Lighting (CFL) Rewards Program	260	260	260	82	82	82
Critical Peak Rebate (CPR) Rate						
Residential Energy Star and High Efficiency Appliance Program	2,507	2,507	2,507	1,052	1,052	1,052
Residential Home Performance Program	3,970	3,970	3,970	714	714	714
Programmable Controllable Thermostat (PCT) Program						
Residential HVAC Efficiency Program	3	3	3	3	3	3
Residential Efficiency Rewards Rate						
Pay Ahead (Smart) Service Rate						
Residential Low Income Home Performance Check-Up Audit & Appliance Replacement Program	243	243	243	844	844	844
Residential Low Income Joint Utility Usage Management Program	0	0	0	0	0	0
Residential Low Income Room Air Conditioner Replacement Program	0	0	0	0	0	0
Governmental/Non-Profit Lighting Efficiency Program	324	324	324	3,023	3,023	3,023
Commercial HVAC Efficiency Program	0	0	0	0	0	0
Commercial Lighting Efficiency Program	3	3	3	188	188	188
Customer Resources Demand Response Program						
Distributed Generation Program						
Custom Technology Applications Program	0	0	0	0	0	0
Time of Use (TOU) with Critical Peak Pricing Rate						
Hourly Pricing Option (HPO) Rate						
Custom Applications Program	0	0	0	0	0	0
Customer Load Response Program						
Commercial and Industrial Drives Program	0	0	0	0	0	0
TOTAL PORTFOLIO	7,310	7,310	7,310	5,906	5,906	5,906

NOTES: Absence of data indicates program has not been launched.

Table 1-4: EDC Reported Gross Energy Savings by Program through the Fourth Quarter, Program Year 1

Program	Projects In Progress (MWh)	Unverified Ex Post Savings (MWh)	PYTD Total Committed (MWh)	EE&C Plan Estimate for Program Year (MWh)	Percent of Estimate Committed (%)
Compact Fluorescent Lighting (CFL) Rewards Program	24	0	106	7,375	1.4%
Critical Peak Rebate (CPR) Rate					
Residential Energy Star and High Efficiency Appliance Program	271	0	1323	4,503	29.4%
Residential Home Performance Program	0	0	714	2,025	35.3%
Programmable Controllable Thermostat (PCT) Program					
Residential HVAC Efficiency Program	8	0	11	124	8.9%
Residential Efficiency Rewards Rate					
Pay Ahead (Smart) Service Rate					
Residential Low Income Home Performance Check-Up Audit & Appliance Replacement Program	0	0	844	368	229.3%
Residential Low Income Joint Utility Usage Management Program	0	0	0	589	0.0%
Residential Low Income Room Air Conditioner Replacement *Program*	0	0	0	22	0.0%
Governmental/Non-Profit Lighting Efficiency Program	9	0	3032	2,842	106.7%
Commercial HVAC Efficiency Program	1	0	1	142	0.7%
Commercial Lighting Efficiency Program	1,245	0	1433	8,166	17.5%
Customer Resources Demand Response Program					
Distributed Generation Program					
Custom Technology Applications Program	0	0	0	0	0.0%
Time of Use (TOU) with Critical Peak Pricing Rate					
Hourly Pricing Option (HPO) Rate					
Custom Applications Program	741	0	741	0	741.0%
Customer Load Response Program					
Commercial and Industrial Drives Program	857	0	857	399	214.8%
Total	3,156	0	9,062	26,555	34.1%

NOTES: (1) "Unverified Ex Post Savings" are unverified savings pending approval of TRM or Custom Measure Protocol by the
(2) Absence of data indicates that program has not been launched.

A summary of evaluation verified energy impacts by program is presented in Table 1-5.

Table 1-5: Preliminary Energy Savings by Program through the Fourth Quarter, Program Year 1

Table 1-5: Preliminary Energy Savings by Program through the 4th Quarter, Program Year 1

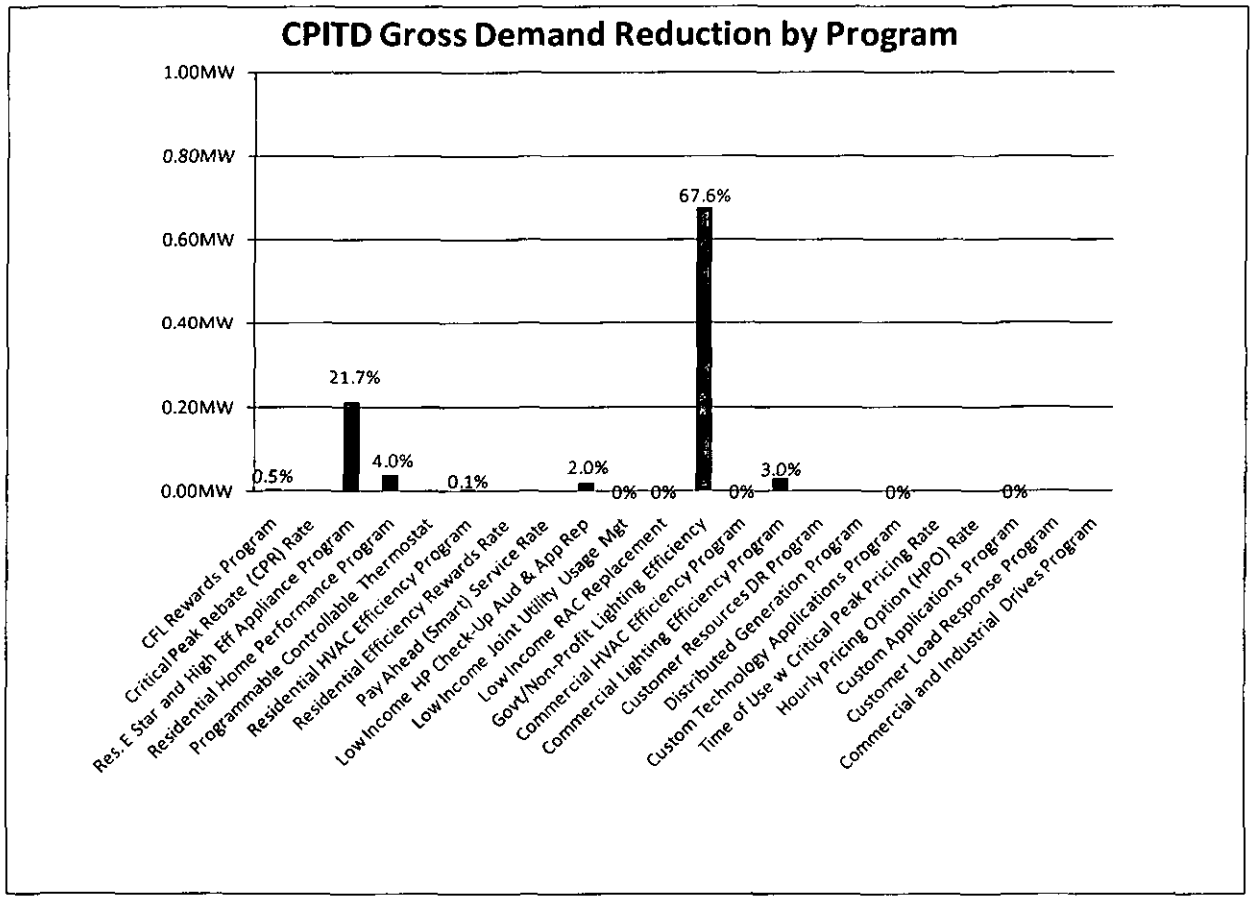
Program	PYTD Reported Gross Impact (MWh)	Preliminary Realization Rate	Preliminary PYTD Verified Impact (MWh)	Net-to-Gross Ratio	PYTD Net Impact (MWh)
Compact Fluorescent Lighting (CFL) Rewards Program	82				
Critical Peak Rebate (CPR) Rate					
Residential Energy Star and High Efficiency Appliance Program	1,052				
Residential Home Performance Program	714	0.96	685	1	685
Programmable Controllable Thermostat (PCT) Program					
Residential HVAC Efficiency Program	3				
Residential Efficiency Rewards Rate					
Pay Ahead (Smart) Service Rate					
Residential Low Income Home Performance Check-Up Audit & Appliance Replacement Program	844				
Residential Low Income Joint Utility Usage Management Program	0				
Residential Low Income Room Air Conditioner Replacement Program	0				
Governmental/Non-Profit Lighting Efficiency Program	3,023	0.75	2,267	1	2,267
Commercial HVAC Efficiency Program	0				
Commercial Lighting Efficiency Program	188				
Customer Resources Demand Response Program					
Distributed Generation Program					
Custom Technology Applications Program	0				
Time of Use (TOU) with Critical Peak Pricing Rate					
Hourly Pricing Option (HPO) Rate					
Custom Applications Program	0				
Customer Load Response Program					
Commercial and Industrial Drives Program	0				
Total	**5,906**		**2,952**		**2,952**

NOTES: (1) Participation was sufficient in the Home Performance and Government & Non-Profit Lighting Efficiency programs to warrant M&V Expense. Programs not verified in PY 2009 will be verified in PY 2010.
(2) Absence of data in PYTD Reported Gross Impact (MWh) column indicates program has not been launched.

1.2 Summary of Demand Impacts by Program

A summary of the reported demand reduction by program is presented in Figure 1-2.[9]

Figure 1-2: Reported Demand Reduction by Program through the 4th Quarter, Program Year 1



[9] Absence of data indicates program has not been launched.

A summary of demand reduction impacts by program through the Fourth Quarter, Program Year 1 is presented in

Table 1-6 and Table 1-7.

Table 1-6: Participation and Reported Gross Demand Reduction by Program through the Fourth Quarter, Program Year 1

Table 1-6: Participation and Reported Gross Demand Reduction by Program through the 4th Quarter, Program Year 1

Program	Participants			Reported Gross Impact (MW)		
	IQ	PYTD	CPITD	IQ	PYTD	CPITD
Compact Fluorescent Lighting (CFL) Rewards Program	260	260	260	0.0	0.0	0.0
Critical Peak Rebate (CPR) Rate						
Residential Energy Star and High Efficiency Appliance Program	2,507	2,507	2,507	0.2	0.2	0.2
Residential Home Performance Program	3,970	3,970	3,970	0.0	0.0	0.0
Programmable Controllable Thermostat (PCT) Program						
Residential HVAC Efficiency Program	3	3	3	0.0	0.0	0.0
Residential Efficiency Rewards Rate						
Pay Ahead (Smart) Service Rate						
Residential Low Income Home Performance Check-Up Audit & Appliance Replacement Program	243	243	243	0.0	0.0	0.0
Residential Low Income Joint Utility Usage Management Program	0	0	0	0.0	0.0	0.0
Residential Low Income Room Air Conditioner Replacement Program	0	0	0	0.0	0.0	0.0
Governmental/Non-Profit Lighting Efficiency Program	324	324	324	0.7	0.7	0.7
Commercial HVAC Efficiency Program	0	0	0	0.0	0.0	0.0
Commercial Lighting Efficiency Program	3	3	3	0.0	0.0	0.0
Customer Resources Demand Response Program						
Distributed Generation Program						
Custom Technology Applications Program	0	0	0	0.0	0.0	0.0
Time of Use (TOU) with Critical Peak Pricing Rate						
Hourly Pricing Option (HPO) Rate						
Custom Applications Program	0	0	0	0.0	0.0	0.0
Customer Load Response Program						
Commercial and Industrial Drives Program	0	0	0	0.0	0.0	0.0
TOTAL PORTFOLIO	7,310	7,310	7,310	1.0	1.0	1.0

NOTES: (1) Absence of data indicates program has not been launched.
(2) MW total differs from sum of individual components due to rounding.

Table 1-7: Reported Gross Demand Reduction by Program through the Fourth Quarter, Program Year 1

Program	Projects In Progress (MW)	Unverified Ex Post Savings (MW)	PYTD Total Committed (MW)	EE&C Plan Estimate for Program Year (MW)	Percent of Estimate Committed (%)
Compact Fluorescent Lighting (CFL) Rewards Program	0.0	0.0	0.0	0.4	1.1%
Critical Peak Rebate (CPR) Rate					
Residential Energy Star and High Efficiency Appliance Program	0.1	0.0	0.3	0.7	42.2%
Residential Home Performance Program	0.0	0.0	0.0	2.9	1.4%
Programmable Controllable Thermostat (PCT) Program					
Residential HVAC Efficiency Program	0.0	0.0	0.0	0.1	0.8%
Residential Efficiency Rewards Rate					
Pay Ahead (Smart) Service Rate					
Residential Low Income Home Performance Check-Up Audit & Appliance Replacement Program	0.0	0.0	0.0	0.1	19.7%
Residential Low Income Joint Utility Usage Management Program	0.0	0.0	0.0	0.1	0.0%
Residential Low Income Room Air Conditioner Replacement Program	0.0	0.0	0.0	0.0	0.0%
Governmental/Non-Profit Lighting Efficiency Program	0.0	0.0	0.7	0.8	81.8%
Commercial HVAC Efficiency Program	0.0	0.0	0.0	0.1	0.0%
Commercial Lighting Efficiency Program	0.2	0.0	0.2	1.7	13.1%
Customer Resources Demand Response Program					
Distributed Generation Program					
Custom Technology Applications Program	0.0	0.0	0.0	0.0	0.0%
Time of Use (TOU) with Critical Peak Pricing Rate					
Hourly Pricing Option (HPO) Rate					
Custom Applications Program	0.0	0.0	0.0	0.0	0.0%
Customer Load Response Program					
Commercial and Industrial Drives Program	0.1	0.0	0.1	0.1	0.0%
Total	**0.4**	**0.0**	**1.4**	**7.0**	**20%**

NOTES: (1) "Unverified Ex Post Savings" are unverified savings pending approval of TRM or Custom Measure Protocol by the Commission.
(2) Absence of data indicates that program has not been launched.
(3) MW total differs from sum of individual components due to rounding.

A summary of evaluation adjusted demand impacts by program is presented in Table 1-8.

Table 1-8: Verified Demand Reduction by Program through the Fourth Quarter, Program Year 1

Program	PYTD Reported Gross Impact (MW)	Preliminary Realization Rate	Preliminary PYTD Verified Impact (MW)	Net-to-Gross Ratio	PYTD Net Impact (MW)
Compact Fluorescent Lighting (CFL) Rewards Program	0.0				
Critical Peak Rebate (CPR) Rate					
Residential Energy Star and High Efficiency Appliance Program	0.2				
Residential Home Performance Program	0.0	0.96	0.0	1	0.0
Programmable Controllable Thermostat (PCT) Program					
Residential HVAC Efficiency Program	0.0				
Residential Efficiency Rewards Rate					
Pay Ahead (Smart) Service Rate					
Residential Low Income Home Performance Check-Up Audit & Appliance Replacement Program	0.0				
Residential Low Income Joint Utility Usage Management Program	0.0				
Residential Low Income Room Air Conditioner Replacement Program	0.0				
Governmental/Non-Profit Lighting Efficiency Program	0.7	0.75	0.5	1	0.5
Commercial HVAC Efficiency Program	0.0				
Commercial Lighting Efficiency Program	0.0				
Customer Resources Demand Response Program					
Distributed Generation Program					
Custom Technology Applications Program	0.0				
Time of Use (TOU) with Critical Peak Pricing Rate					
Hourly Pricing Option (HPO) Rate					
Custom Applications Program	0.0				
Customer Load Response Program					
Commercial and Industrial Drives Program	0.0				
Total	**1.0**		**0.5**		**0.5**

NOTES: (1) Participation was sufficient in the Home Performance and Government & Non-Profit Lighting Efficiency programs to warrant M&V Expense. Programs not verified in PY 2009 will be verified in PY 2010.
(2) Absence of data in PYTD Reported Gross Impact (MWh) column indicates program has not been launched.
(3) MW total differs from sum of individual components due to rounding.

1.3 Summary of Evaluation

To ensure that best practices for evaluation and that statewide protocols are followed to measure and verify claimed savings, Allegheny Power contracted with an independent EM&V Team (led by Tetra Tech, and supported by RW Beck and ADM) to evaluate its Residential and Nonresidential Programs for the years 2010–2013.

The evaluation's goals are to:

- Design and document a comprehensive and complete EM&V strategy for each of the programs identified in Allegheny Power's Pennsylvania Act 129 EE&C Plan, and
- Implement the EM&V strategy and provide all data, analyses, and information to Allegheny Power to support the evaluation of and the reporting as required by the SWE and the Pennsylvania Public Utility Commission.

Realization rates are calculated to adjust reported savings based on statistically significant verified savings measured by the EM&V team. 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[10] 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 determined by approved EM&V protocols. The protocol type determines the data type that is sampled. The EM&V team will calculate realization rates based on the best engineering estimate for each program savings as identified through the EM&V effort. The methodology used to calculate the program realization rate based on the best engineering estimate will vary by program as described in detail in Allegheny Power's evaluation plan.

1.3.1 Impact Evaluation

As overviewed above, the *Audit Plan and Evaluation Framework for Pennsylvania Act 129 Energy Efficiency and Conservation Programs* dated December 1, 2009 provided by the SWE (hereafter referred to as the "Audit Plan"), recognizes that the TRM Deemed Savings include two levels—TRM Deemed and TRM Partially Deemed—in addition to Custom Measures. The difference is that the TRM Deemed Savings Measures are fairly straightforward in calculations and stipulated inputs to the algorithms. The Deemed Savings measures only require verification of installation to develop realization rates. An example is residential CFLs, where the quantity of lights by wattage is needed while the hours of use based on secondary data are stipulated at three hours per day.

In addition to verification of installation, the TRM Partially Deemed Measures require measurement or quantification of some key inputs to the algorithms used to calculate energy savings. An example is Residential Electric HVAC, where the algorithms or calculations are fairly straightforward but key inputs such as Equivalent Full Load Hours must be collected.

[10] TRM measures with stipulated values and variables.

Any new measures or existing measures not included in the TRM are treated as Custom Measures. Tetra Tech and Allegheny Power are working with the SWE to develop M&V Plans that address Custom Measures. These Plans will be approved and coordinated for consistency and future reference by the SWE who will also maintain a catalog of M&V Protocols for Custom Measures.

The next level of rigor is described in the Audit Plan for measurement techniques. Many of the TRM Deemed Savings and TRM Partially Deemed Savings will require Basic Measurement approaches such as verification of installations and simple engineering measures such as spot metering of motor loads. The next level, Enhanced Measurement, will require more rigorous measurement for TRM Partially Deemed Savings—particularly for larger, complex projects that will involve metering of multiple parameters or short-term or long-term metering. For example, commercial applications such as motors, drives and chillers will require an enhanced level of rigor. Finally, Custom Measurement will require techniques such as statistical billing analysis and engineering simulation modeling for projects that may include multiple measures or interactive effectives. Tetra Tech's impact evaluation approaches for Allegheny Power attempts to be consistent with the level of rigor required by the Audit Plan dated December 1, 2009 and the TRM! dated June 2010, however; budget allocations are a limiting factor for some programs.

The Company's EM&V Plan will be implemented in PY2010 second quarter as it is expected there will be enough participation to warrant cost effective evaluation, measurement and verification at that time. Two PY09 programs, the *Residential Home Performance Program – Online Energy Audit Measure* and the *Government/School/non-Profit Portfolio Program*, were sufficiently established in PY 2009 for cost-effective EM&V efforts. The realization rates for these two programs are presented below in Table 1-9.

The realization rates for each program verified in PY2009 are presented in Table 1-9.

Table 1-9: Summary of Realization Rates and Confidence Intervals (CI) for kWh

Program	PYTD Sample Participants	Program Year Sample Participant Target	Preliminary Realization Rate for kWh	Confidence and Precision For kWh	Preliminary Realization Rate for kW	Confidence and Precision for kW
Compact Fluorescent Lighting (CFL) Rewards Program						
Critical Peak Rebate (CPR) Rate						
Residential Energy Star and High Efficiency Appliance Program						
Residential Home Performance Program	400	120	0.96	90%/±10	0.96	90%/±
Programmable Controllable Thermostat (PCT) Program						
Residential HVAC Efficiency Program						
Residential Efficiency Rewards Rate						
Pay Ahead (Smart) Service Rate						
Residential Low Income Home Performance Check-Up Audit & Appliance Replacement Program						
Residential Low Income Joint Utility Usage Management *Program*						
Residential Low Income Room Air Conditioner Replacement Program						
Governmental/Non-Profit Lighting Efficiency Program	186	115	0.75	90%/±10	0.75	90%/±10
Commercial HVAC Efficiency Program						
Commercial Lighting Efficiency Program						
Customer Resources Demand Response Program						
Distributed Generation Program						
Custom Technology Applications Program						
Time of Use (TOU) with Critical Peak Pricing Rate						
Hourly Pricing Option (HPO) Rate						
Custom Applications Program						
Customer Load Response Program						
Commercial and Industrial Drives Program						
Total	**586**	**235**				

NOTES: (1) The Residential Home Performance Program realization rate calculated by number online audit customers verifying their receipt of four no cost CFLs through the mail. The Government, Schools, and Non-Profit Lighting Program realization rate calculated by customer reported level of verification and installation (and planned installation within six months of survey implementation) across CFL and LED exit sign measures.

(2) Programs not verified in PY 2009 will be verified in PY 2010 and added to PY 2010 verified savings. Absence of data indicates program was not verified.

1.3.2 Process Evaluation

The process evaluation activities are designed to provide a comprehensive and systematic assessment of program operations from the planning background to implementation to participant experiences. As stated in the Audit Plan, the process evaluation's primary objective is to help program designers and managers structure their programs to achieve cost-effective savings while maintaining high levels of market penetration, customer satisfaction and program efficiency and effectiveness. A well-designed and implemented process evaluation serves as a basis for recommendations to Allegheny Power and program managers involved in program design and implementation. The process evaluation will also identify best practices that Allegheny Power may choose to implement going forward.

Detailed process evaluation results are presented in program sections below for the two programs evaluated in PY 2009. For all other programs, process evaluation activities were limited in PY 2009 to interviews with program managers to identify key researchable issues going forward and provide preliminary feedback. PY 2010 process evaluation activities will include additional program staff interviews, participant surveys, trade ally interviews and other methods as appropriate (e.g., mystery shopping), which are summarized in each program's EM&V methodology section of this report.

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 1-10.

Table 1-10: Summary of Portfolio Finances: TRC Test[11]

	Category	IQ	PYTD	CPITD
A.1	EDC Incentives to Participants	$ 135,393	$ 135,393	$ 135,393
A.2	EDC Incentives to Trade Allies	$ -	$ -	$ -
A	**Subtotal EDC Incentive Costs**	$ 135,393	$ 135,393	$ 135,393
B.1	Design & Development	$ 198,063	$ 1,550,887	$ 1,550,887
B.2	Administration	$ 286,963	$ 725,763	$ 725,763
B.3	Management	$ -	$ -	$ -
B.4	Marketing	$ 832,843	$ 882,488	$ 882,488
B.5	Technical Assistance	$ (106,740)	$ 1,256,760	$ 1,256,760
B	**Subtotal EDC Implementation Costs**	$ 1,211,129	$ 4,415,898	$ 4,415,898
C	**EDC Evaluation Costs**	$ 138,056	$ 138,056	$ 138,056
D	**SWE Audit Costs**	$ 294,034	$ 294,034	$ 294,034
E	**Participant Costs**			
	Total Costs	$ 1,778,612	$ 4,983,381	$ 4,983,381
F	**Annualized Avoided Supply Costs**			
G	**Lifetime Avoided Supply Costs**			
	Total Lifetime Economic Benefits			
	Portfolio Benefit-to-Cost Ratio			

NOTES: *Analysis associated with Benefit-to-Cost calculations on hold pending TRC Technical Work Group output (this includes items E, F, and* G, as well as, the Portfolio Benefit-to-Cost Ratio).

[11] Definitions for terms in following table are subject to TRC Order. Various cost and benefit categories are subject to change pending the outcome of TRC Technical Working Group discussions.

The TRC for each program is presented in Table 1-11.

Table 1-11: Summary of Portfolio Budget by Program

Program	TRC Benefits ($)	TRC Costs ($)	TRC Benefit-Cost Ratio 3
Compact Fluorescent Lighting (CFL) Rewards Program	$ 59,843,634	$ 5,605,151	10.7
Critical Peak Rebate (CPR) Rate 2	$ 581,585	$ 361,780	1.6
Residential Energy Star and High Efficiency Appliance Program	$ 47,928,030	$ 15,638,302	3.1
Residential Home Performance Program	$ 48,465,639	$ 20,624,013	2.3
Programmable Controllable Thermostat (PCT) Program 2	$ 581,585	$ 755,302	0.8
Residential HVAC Efficiency Program	$ 8,360,467	$ 5,137,000	1.6
Residential Efficiency Rewards Rate 2	$ 580,026	$ 253,246	2.3
Pay Ahead (Smart) Service Rate 2	$ 248,583	$ 108,534	2.3
Residential Low Income Home Performance Check-Up Audit & Appliance Replacement Program	$ 3,582,852	$ 1,026,504	3.5
Residential Low Income Joint Utility Usage Management Program	$ 10,494,152	$ 6,362,561	1.6
Residential Low Income Room Air Conditioner Replacement Program	$ 478,050	$ 580,312	0.8
Governmental/Non-Profit Lighting Efficiency Program	$ 114,497,301	$ 9,362,393	12.2
Commercial HVAC Efficiency Program	$ 5,833,129	$ 3,359,649	1.7
Commercial Lighting Efficiency Program	$ 634,666,350	$ 60,073,127	10.6
Customer Resources Demand Response Program	$ 4,551,628	$ 2,812,693	1.6
Distributed Generation Program	$ 757,680	$ 909,963	0.8
Custom Technology Applications Program 1	$ 11,422,726	$ 1,355,898	8.4
Time of Use (TOU) with Critical Peak Pricing Rate 2	$ 1,150,179	$ 437,898	2.6
Hourly Pricing Option (HPO) Rate 2	$ 202,973	$ 77,276	2.6
Custom Applications Program 1	$ 67,814,602	$ 1,030,660	65.8
Customer Load Response Program	$ 3,072,351	$ 2,506,831	1.2
Commercial and Industrial Drives Program	$ 14,571,794	$ 8,362,762	1.7
Total for Plan	**$ 1,039,685,316**	**$ 146,741,855**	**7.1**

NOTES:

1. Excludes customer costs due to variability of eligible customer projects. Customer costs are evaluated during project selection process.
2. Dynamic rate offerings are enabled by Smart Metering Infrastructure
3. Represents total benefits to total costs ratio over lifetime of all measures installed in the 2009-2012 Plan years.

2 Portfolio Results by Sector

The EE&C Implementation Order issued on January 15, 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:

1. Residential EE (excluding Low-Income)
2. Residential Low-Income EE
3. Small Commercial & Industrial EE
4. Large Commercial & Industrial EE
5. 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

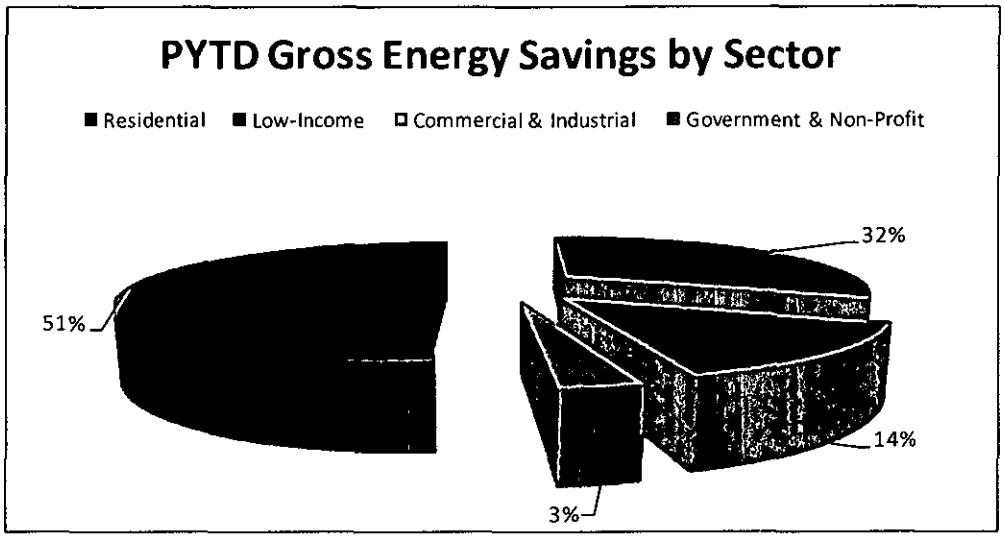
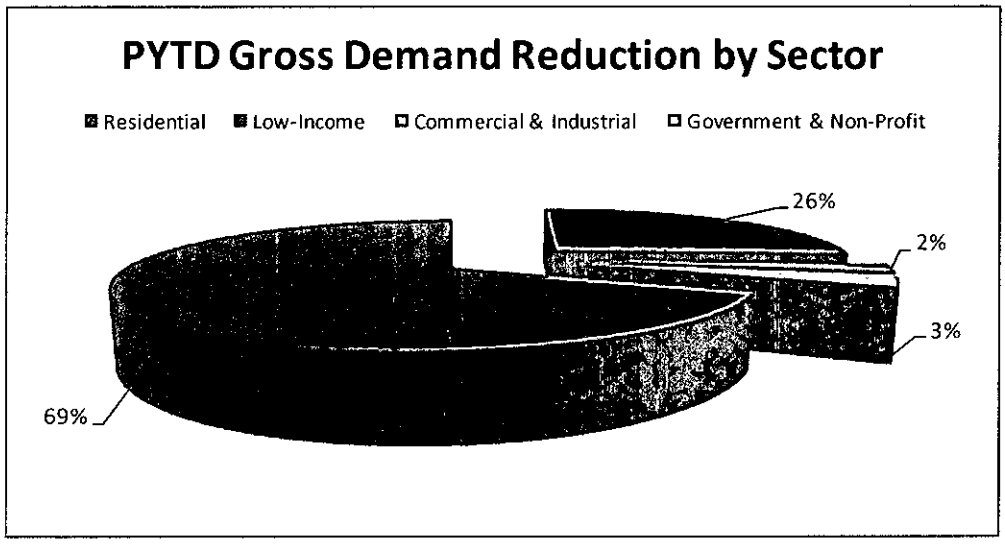


Figure 2-2: PYTD Reported Gross Demand Reduction by Sector



A portfolio summary of results by sector is presented in Table 2-1 and Table 2-2.

Table 2-1: Reported Gross Energy Savings by Sector through the Fourth Quarter, Program Year 1

Market Sector	Reported Gross Impact (MWh)			Projects in Progress	Total Committed	Unverified Ex Post Savings
	IQ	PYTD	CPITD			
Residential EE	1,851	1,851	1,851	303	2,154	0
Residential Low-Income EE	844	844	844	0	844	0
Small Commercial & Industrial EE	188	188	188	1,246	1,434	0
Large Commercial & Industrial EE	0	0	0	857	857	0
Government & Non-Profit EE	3,023	3,023	3,023	9	3,032	0
TOTAL PORTFOLIO	5,906	5,906	5,906	2,415	8,321	0

NOTES: (1) "Unverified Ex Post Savings" are unverified savings pending approval of TRM or Custom Measure Protocol by the Commission.

(2) Absence of data indicates that program has not been launched.

Table 2-2: Reported Gross Demand Reduction by Sector through the Fourth Quarter, Program Year 1

Market Sector	Reported Gross Impact (MW)			Projects in Progress	Total Committed	Unverified Ex Post Savings
	IQ	PYTD	CPITD			
Residential EE	0.3	0.3	0.3	0.1	0.4	0.0
Residential Low-Income EE	0.0	0.0	0.0	0.0	0.0	0.0
Small Commercial & Industrial EE	0.0	0.0	0.0	0.2	0.2	0.0
Large Commercial & Industrial EE	0.0	0.0	0.0	0.1	0.1	0.0
Government & Non-Profit EE	0.7	0.7	0.7	0.0	0.7	0.0
TOTAL PORTFOLIO	1.0	1.0	1.0	0.4	1.4	0.0

NOTES: (1) "Unverified Ex Post Savings" are unverified savings pending approval of TRM or Custom Measure Protocol by the Commission.
(2) Absence of data indicates that program has not been launched.

2.1 Residential EE Sector

The sector target for annual energy savings is 4,018 MWh and the sector target for annual peak demand reduction is 0.6 MW based on the latest filing dated September 10, 2010.

A sector summary of results by program is presented in Table 2-3 and Table 2-4.

Table 2-3: Summary of Residential EE Sector Incremental Impacts by Program through the Fourth Quarter, Program Year 1

Residential EE Sector	IQ Participants	IQ Reported Gross Energy Savings (MWh)	IQ Reported Gross Demand Reduction (MW)
Compact Fluorescent Lighting (CFL) Rewards Program	260	82	0.0
Critical Peak Rebate (CPR) Rate			
Residential Energy Star and High Efficiency Appliance Program	2,507	1,052	0.2
Residential Home Performance Program	3,970	714	0.0
Programmable Controllable Thermostat (PCT) Program			
Residential HVAC Efficiency Program	3	3	0.0
Residential Efficiency Rewards Rate			
Pay Ahead (Smart) Service Rate			
Total for Residential Programs	6,740	1,851	0.3

NOTES: (1) Absence of data indicates program has not been launched.
(2) MW total differs from sum of individual components due to rounding.

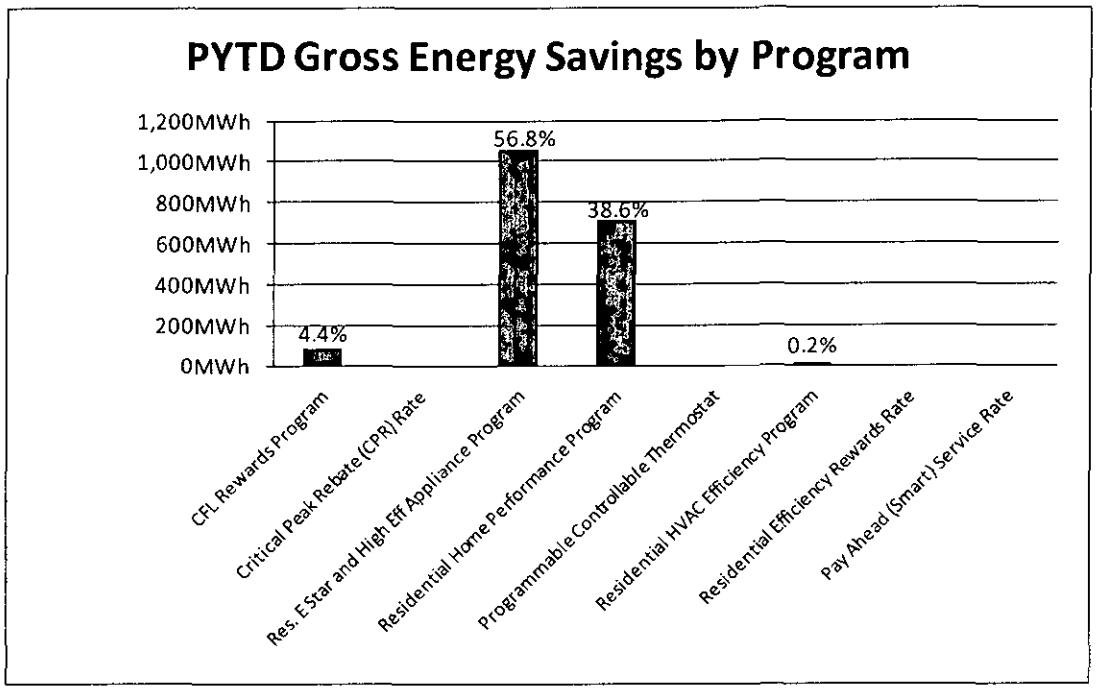
Table 2-4: Summary of Residential EE Sector PYTD Impacts by Program through the Fourth Quarter, Program Year 1

Residential EE Sector	PYTD Participants	PYTD Reported Gross Energy Savings (MWh)	PYTD Reported Gross Demand Reduction (MW)
Compact Fluorescent Lighting (CFL) Rewards Program	260	82	0.0
Critical Peak Rebate (CPR) Rate			
Residential Energy Star and High Efficiency Appliance Program	2,507	1,052	0.2
Residential Home Performance Program	3,970	714	0.0
Programmable Controllable Thermostat (PCT) Program			
Residential HVAC Efficiency Program	3	3	0.0
Residential Efficiency Rewards Rate			
Pay Ahead (Smart) Service Rate			
Total for Residential Programs	*6,740*	*1,851*	*0.3*

NOTES: (1) Absence of data indicates program has not been launched.
(2) MW total differs from sum of individual components due to rounding.

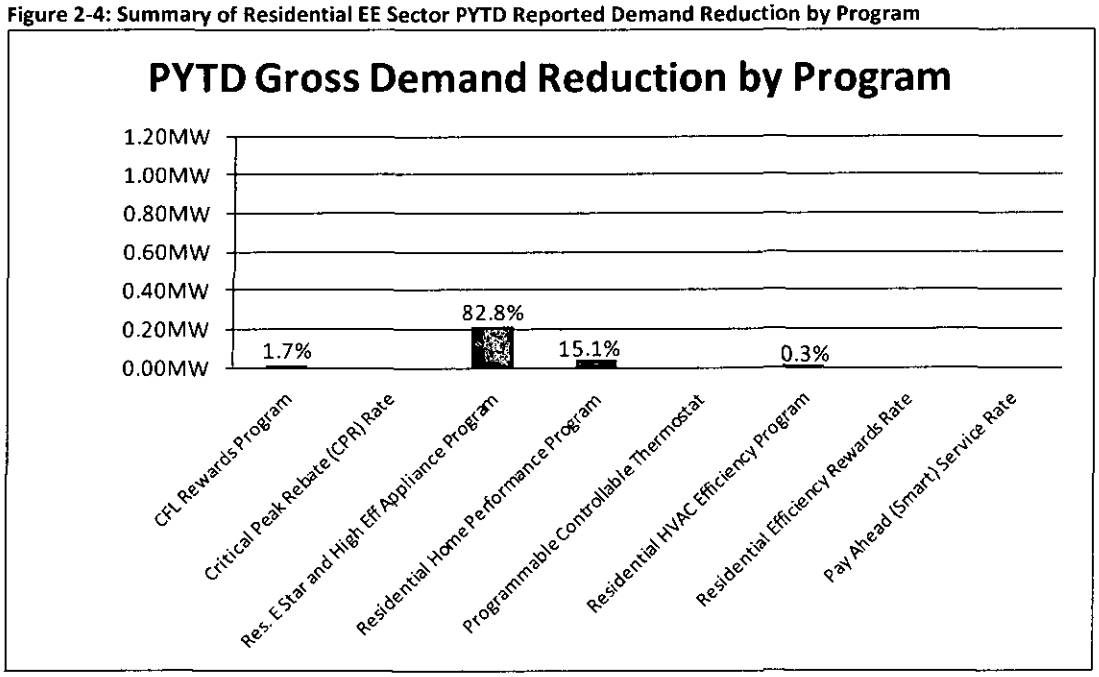
A summary of the sector energy savings by program is presented in Figure 2-3. [12]

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. [13]

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



[12] Absence of data indicates program has not been launched.
[13] Absence of data indicates program has not been launched.

2.2 Residential Low-Income EE Sector

The sector target for annual energy savings is 754 MWh and the sector target for annual peak demand *reduction is 0.2 MW based on the latest filing dated September 10, 2010.*

A sector summary of results by program is presented in Table 2-5 and Table 2-6.

Table 2-5: Summary of Residential Low-Income EE Sector Incremental Impacts by Program through the Fourth Quarter, Program Year 1

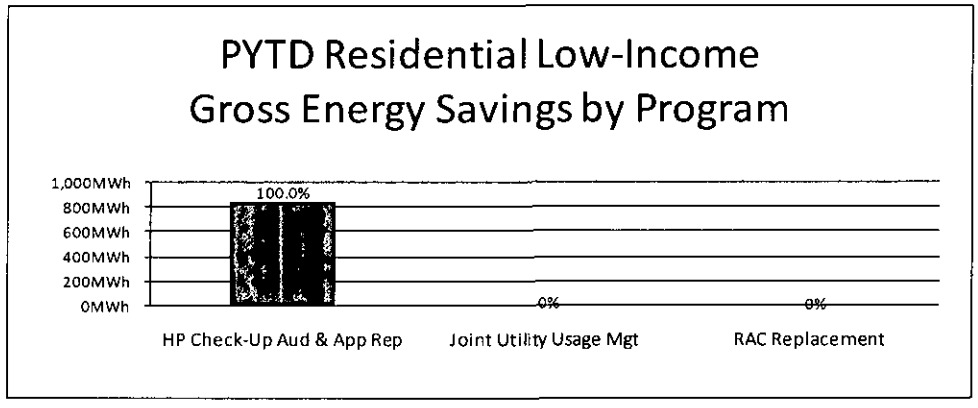
Residential Low Income EE Sector	IQ Participants	IQ Reported Gross Energy Savings (MWh)	IQ Reported Gross Demand Reduction (MW)
Residential Low Income Home Performance Check-Up Audit & Appliance Replacement Program	243	844	0.0
Residential Low Income Joint Utility Usage Management Program	0	0	0.0
Residential Low Income Room Air Conditioner Replacement Measure	0	0	0.0
Total for Low Income Sector	243	844	0.0

Table 2-6: Summary of Residential Low-Income EE Sector PYTD Impacts by Program through the Fourth Quarter, Program Year 1

Residential Low Income EE Sector	PYTD Participants	PYTD Reported Gross Energy Savings (MWh)	PYTD Reported Gross Demand Reduction (MW)
Residential Low Income Home Performance Check-Up Audit & Appliance Replacement Program	243	844	0.0
Residential Low Income Joint Utility Usage Management Program	0	0	0.0
Residential Low Income Room Air Conditioner Replacement Measure	0	0	0.0
Total for Low Income Sector	243	844	0.0

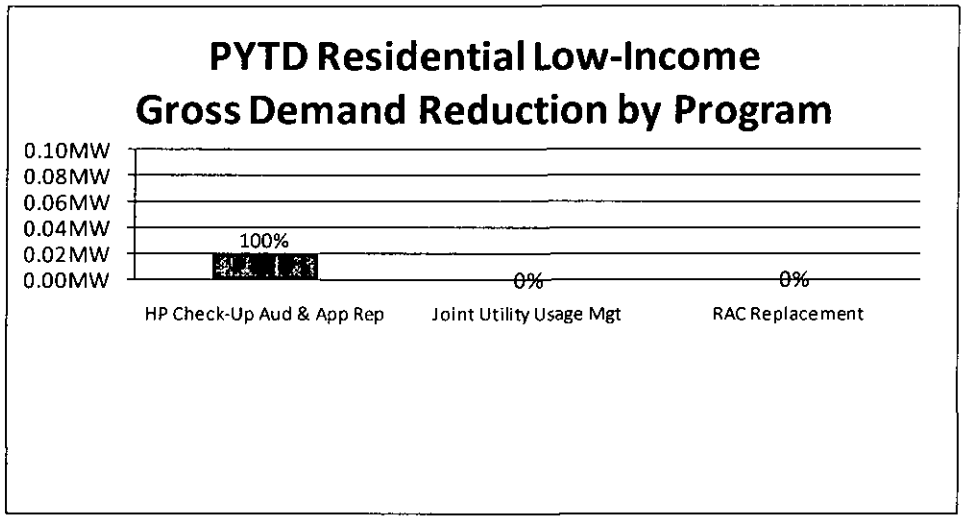
A summary of the sector energy savings by program is presented in Figure 2-5.

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 sector target for annual energy savings is 5,973 MWh and the sector target for annual peak demand reduction is 1.2 MW based on the latest filing dated September 10, 2010.

A sector summary of results by program is presented in Table 2-7 and Table 2-8.

Table 2-7: Summary of Small Commercial & Industrial EE Sector Incremental Impacts by Program through the Fourth Quarter, Program Year 1

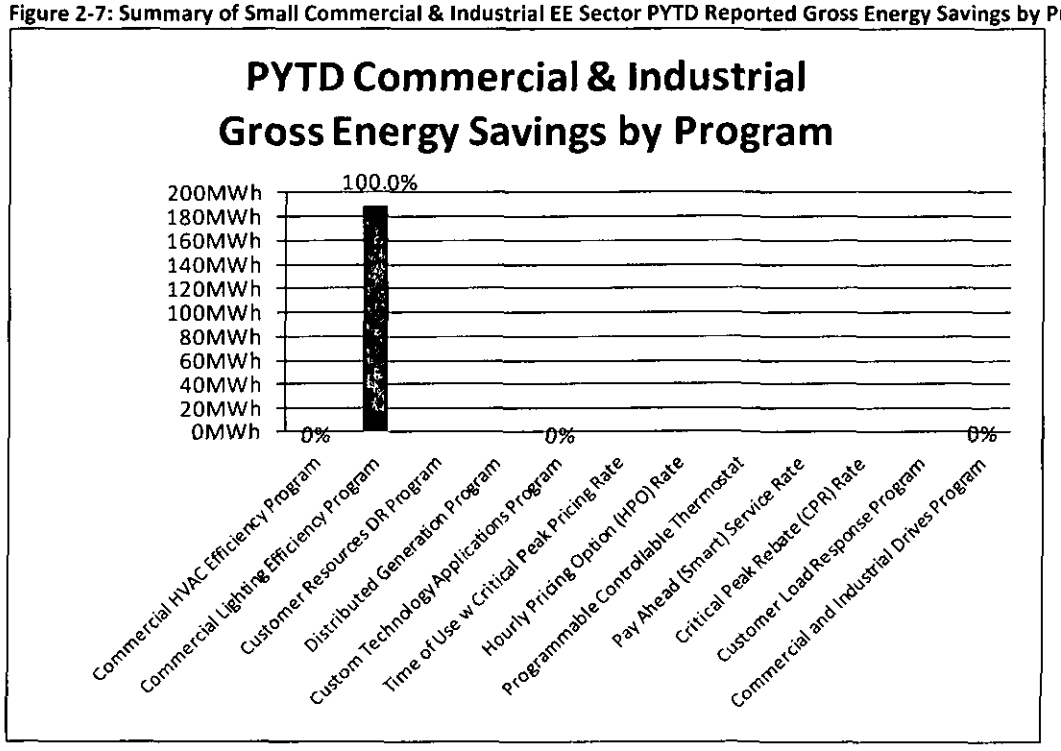
Small Commercial & Industrial EE Sector	IQ Participants	IQ Reported Gross Energy Savings (MWh)	IQ Reported Gross Demand Reduction (MW)
Commercial HVAC Efficiency Program	0	0	0.0
Commercial Lighting Efficiency Program	3	188	0.0
Customer Resources Demand Response Program			
Custom Technology Applications Program	0	0	0.0
Time of Use (TOU) with Critical Peak Pricing Rate			
Hourly Pricing Option (HPO) Rate			
Total for Small Commercial & Industrial	3	188	0.0
NOTES: Absence of data indicates program has not been launched.			

Table 2-8: Summary of Small Commercial & Industrial EE Sector PYTD Impacts by Program through the Fourth Quarter, Program Year 1

Small Commercial & Industrial EE Sector	PYTD Participants	PYTD Reported Gross Energy Savings (MWh)	PYTD Reported Gross Demand Reduction (MW)
Commercial HVAC Efficiency Program	0	0	0.0
Commercial Lighting Efficiency Program	3	188	0.0
Customer Resources Demand Response Program			
Custom Technology Applications Program	0	0	0.0
Time of Use (TOU) with Critical Peak Pricing Rate			
Hourly Pricing Option (HPO) Rate			
Total for Small Commercial & Industrial	3	188	0.0
NOTES: Absence of data indicates program has not been launched.			

A summary of the sector energy savings by program is presented in Figure 2-7. [14]

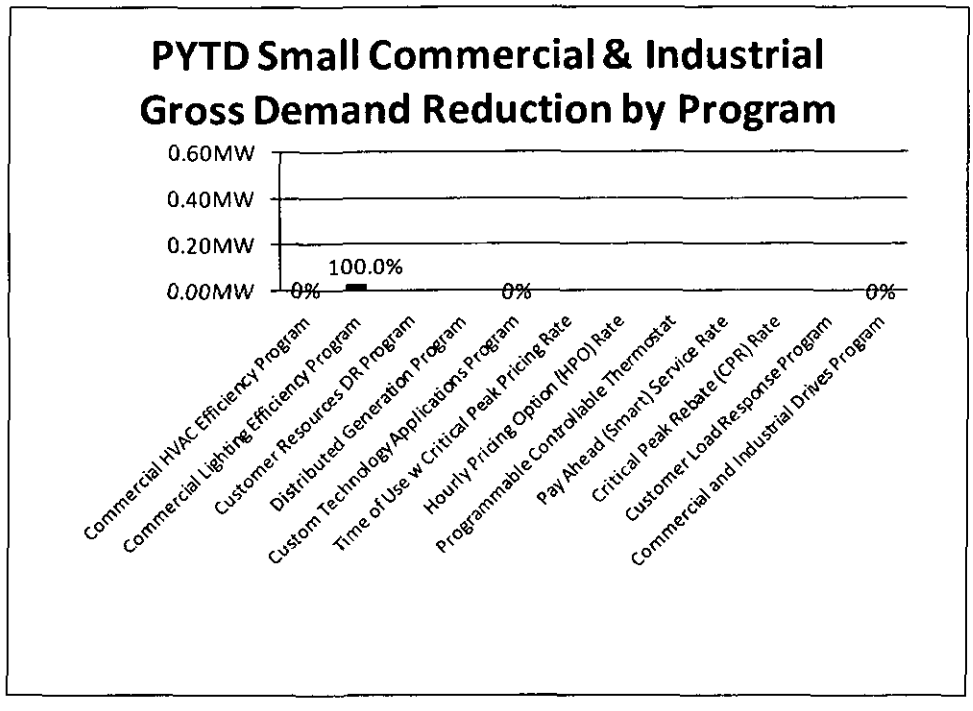
Figure 2-7: Summary of Small Commercial & Industrial EE Sector PYTD Reported Gross Energy Savings by Program



[14] Absence of data indicates program has not been launched.

A summary of the sector demand reduction by program is presented in Figure 2-8. [15]

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



[15] Absence of data indicates program has not been launched.

2.4 Large Commercial & Industrial EE Sector

The sector target for annual energy savings is 0 MWh and the sector target for annual peak demand reduction 0.0 MW based on the latest filing dated September 10, 2010.

A sector summary of results by program is presented in Table 2-9 and Table 2-10.

Table 2-9: Summary of Large Commercial & Industrial EE Sector Incremental Impacts by Program through the Fourth Quarter, Program Year 1

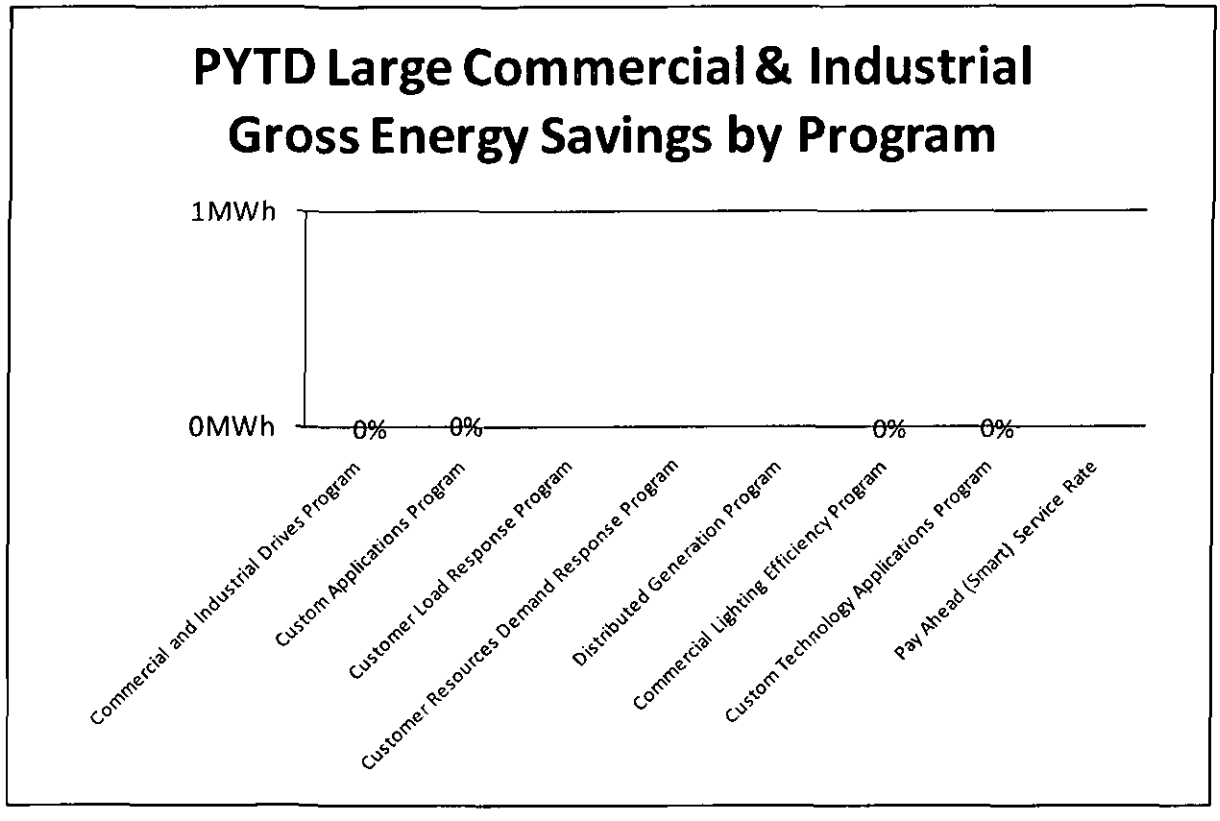
Large Commercial & Industrial EE Sector	IQ Participants	IQ Reported Gross Energy Savings (MWh)	IQ Reported Gross Demand Reduction (MW)
Custom Applications Program	0	0	0.0
Customer Load Response Program			
Distributed Generation Program			
Commercial and Industrial Drives Program	0	0	0.0
Total for Large Commercial & Industrial Sector	0	0	0.0
NOTES: Absence of data indicates program has not been launched.			

Table 2-10: Summary of Large Commercial & Industrial EE Sector PYTD Impacts by Program through the Fourth Quarter, Program Year 1

Large Commercial & Industrial EE Sector	PYTD Participants	PYTD Reported Gross Energy Savings (MWh)	PYTD Reported Gross Demand Reduction (MW)
Custom Applications Program	0	0	0.0
Customer Load Response Program			
Distributed Generation Program			
Commercial and Industrial Drives Program	0	0	0.0
Total for Large Commercial & Industrial Sector	0	0	0.0
NOTES: Absence of data indicates program has not been launched.			

A summary of the sector energy savings by program is presented in Figure 2-9.[16]

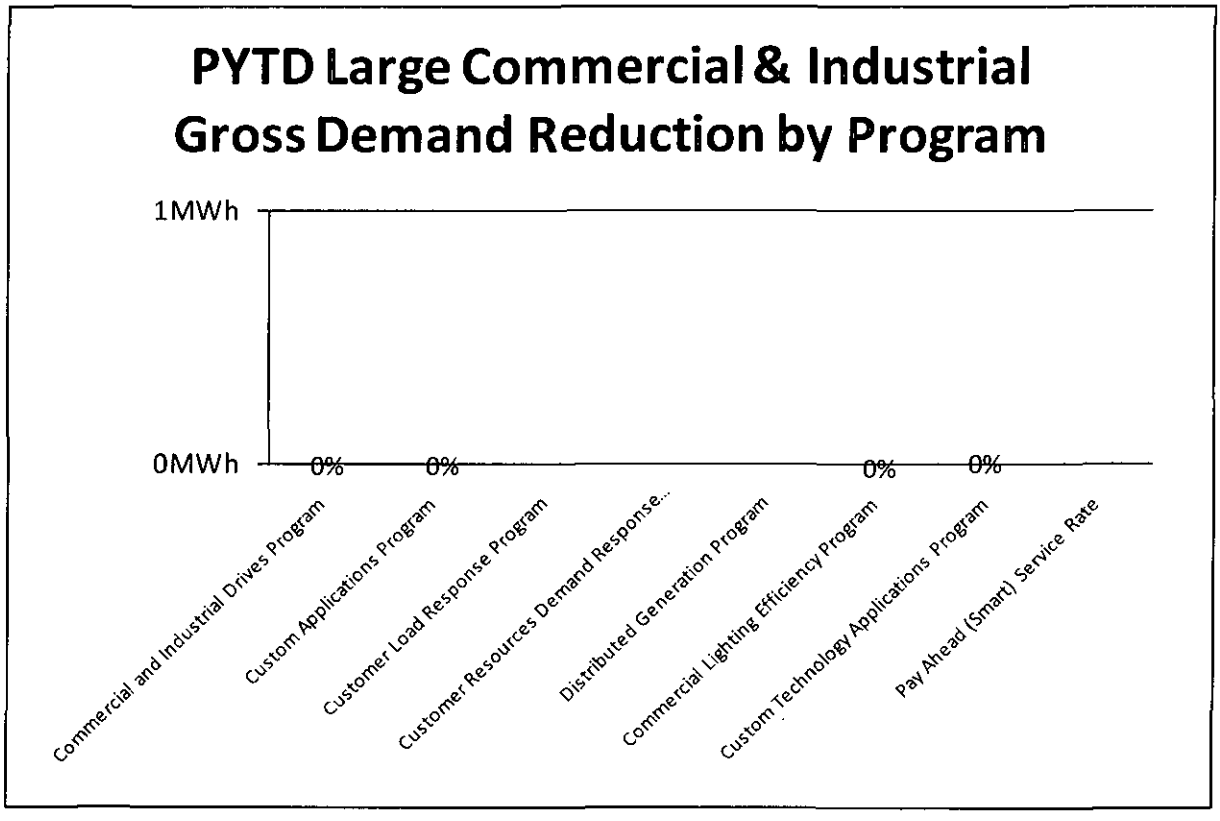
Figure 2-9: Summary of Large Commercial & Industrial EE Sector PYTD Reported Gross Energy Savings by Program



[16] *Absence of data indicates program has not been launched.*

A summary of the sector demand reduction by program is presented in Figure 2-10.[17]

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



[17] Absence of data indicates program has not been launched.

2.5 Government & Non-Profit EE Sector

The sector target for annual energy savings is 2,195 MWh and the sector target for annual peak demand reduction is 0.5 MW based on the latest filing dated September 10, 2010.

A sector summary of results by program is presented in Table 2-11 and Table 2-12.

Table 2-11: Summary of Government & Non-Profit EE Sector Incremental Impacts by Program through the Fourth Quarter, Program Year 1

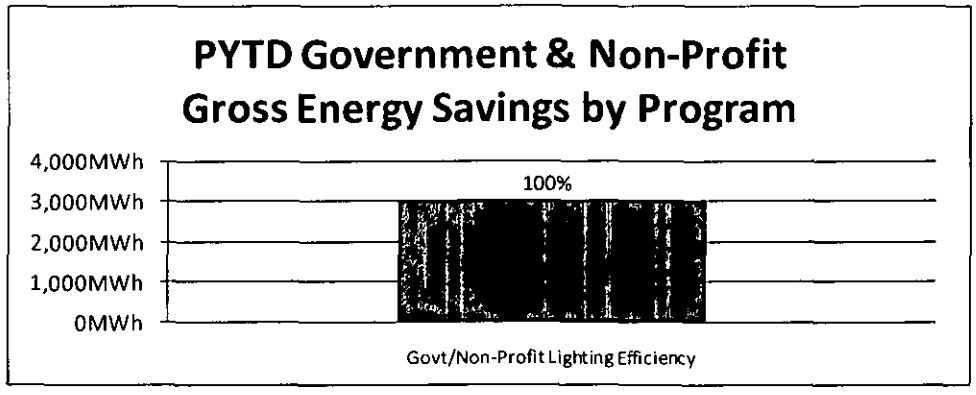
Gov't. & Non-Profit EE Sector	IQ Participants	IQ Reported Gross Energy Savings (MWh)	IQ Reported Gross Demand Reduction (MW)
Governmental/ Non-Profit Lighting Efficiency Program	324	3,023	0.7

Table 2-12: Summary of Government & Non-Profit EE Sector PYTD Impacts by Program through the Fourth Quarter, Program Year 1

Gov't. & Non-Profit EE Sector	PYTD Participants	PYTD Reported Gross Energy Savings (MWh)	PYTD Reported Gross Demand Reduction (MW)
Governmental/ Non-Profit Portfilio Program	324	3,023	0.7

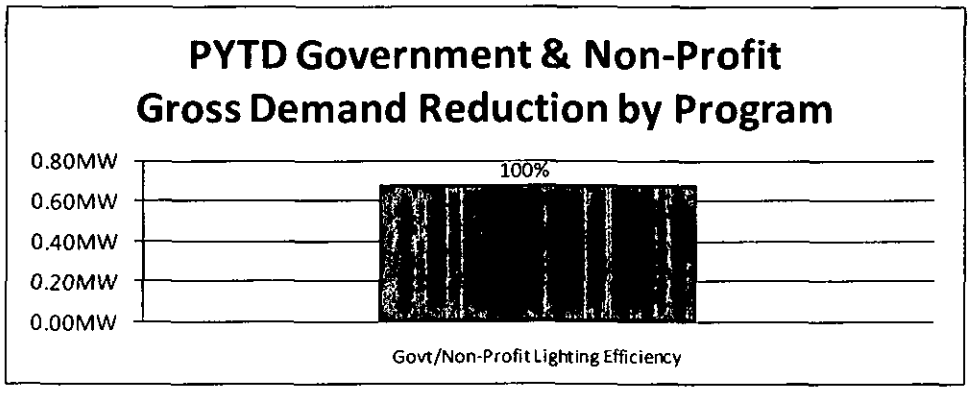
A summary of the sector energy savings by program is presented in Figure 2-11.

Figure 2-11: Summary of Government & Non-Profit EE Sector PYTD Reported Gross Energy Savings by Program



A summary of the sector demand reduction by program is presented in Figure 2-12.

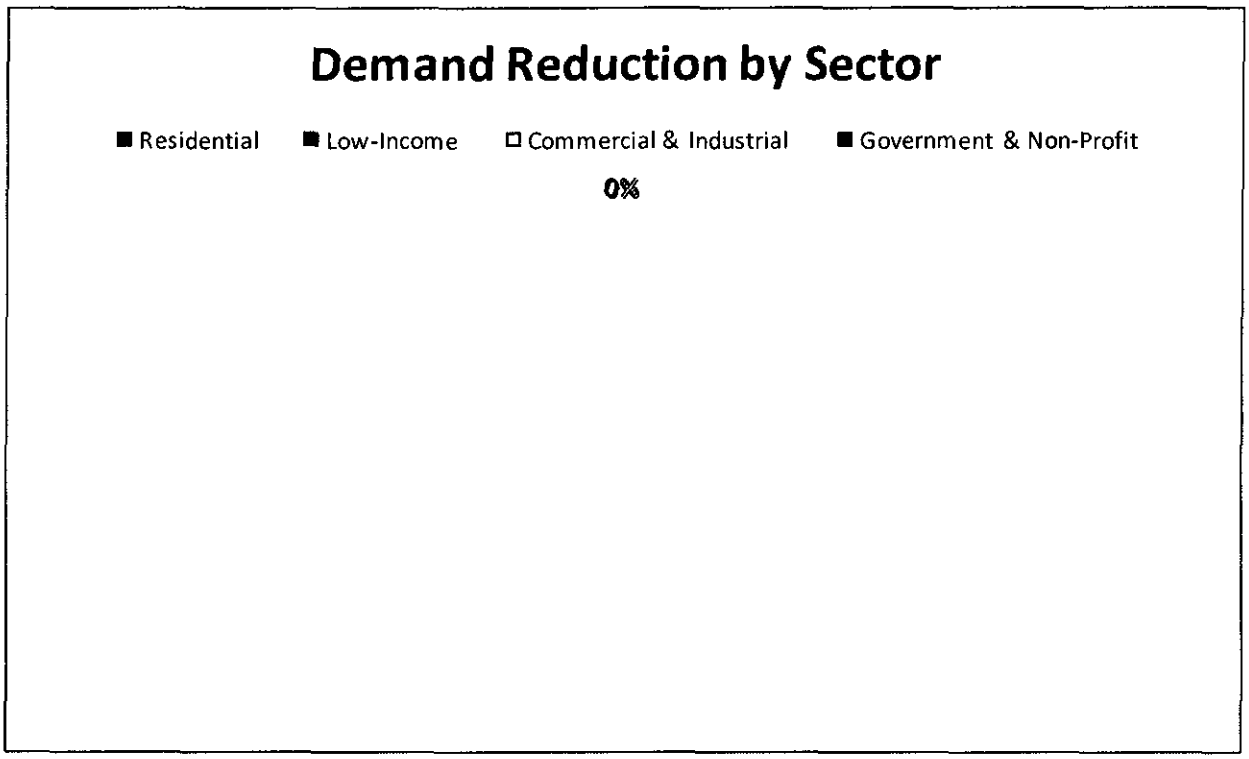
Figure 2-12: Summary of Government & Non-Profit EE Sector PYTD Reported Demand Reduction by Program



3 Demand Response

Demand response programs specifically target the reduction of peak demand through various demand-side management strategies. A summary of demand response by sector is presented in Figure 3-1. *Not applicable at this time.*

Demand Response programs will launch in PY 2010 and therefore, participation, energy savings, and demand reduction will be reported beginning in PY 2010. All data in this section is intentionally left blank.



3.1 Residential DR Sector

A sector summary of results by program is presented in Table 3-1 and Table 3-2. *Not applicable at this time.*

Table 3-1: Summary of Residential DR Sector Quarterly Impacts by Program through the Fourth Quarter, Program Year 1

Residential DR Sector	IQ Participants	IQ Reported Gross Energy Savings (MWh)	IQ Reported Gross Demand Reduction (MW)
Critical Peak Rebate Program			
Programmable Controllable Thermostat (PCT) Program			
Time of Use with Critical Peak Pricing Rate			
Hourly Pricing Option Rate			
Sector Total			
NOTES:			

Table 3-2: Summary of Residential DR Sector PYTD Impacts by Program through the Fourth Quarter, Program Year 1

Residential DR Sector	PYTD Participants	PYTD Reported Gross Energy Savings (MWh)	PYTD Reported Gross Demand Reduction (MW)
Critical Peak Rebate Program			
Programmable Controllable Thermostat (PCT) Program			
Time of Use with Critical Peak Pricing Rate			
Hourly Pricing Option Rate			
Sector Total			
NOTES:			

3.2 Residential Low-Income DR Sector

A sector summary of results by program is presented in Table 3-3 and Table 3-4. *Not applicable at this time.*

Table 3-3: Summary of Residential Low-Income DR Sector Quarterly Impacts by Program through the Fourth Quarter, Program Year 1

Residential Low-Income DR Sector	IQ Participants	IQ Reported Gross Energy Savings (MWh)	IQ Reported Gross Demand Reduction (MW)
Critical Peak Rebate Program			
Programmable Controllable Thermostat (PCT) Program			
Time of Use with Critical Peak Pricing Rate			
Hourly Pricing Option Rate			
Sector Total			
NOTES:			

Table 3-4: Summary of Residential Low-Income DR Sector PYTD Impacts by Program through the Fourth Quarter, Program Year 1

Residential Low-Income DR Sector	PYTD Participants	PYTD Reported Gross Energy Savings (MWh)	PYTD Reported Gross Demand Reduction (MW)
Critical Peak Rebate Program			
Programmable Controllable Thermostat (PCT) Program			
Time of Use with Critical Peak Pricing Rate			
Hourly Pricing Option Rate			
Sector Total			
NOTES:			

3.3 Small Commercial & Industrial DR Sector

A sector summary of results by program is presented in Table 3-5 and Table 3-6. *Not applicable at this time.*

Table 3-5: Summary of Small Commercial & Industrial DR Sector Quarterly Impacts by Program through the Fourth Quarter, Program Year 1

Small Commercial & Industrial DR Sector	IQ Participants	IQ Reported Gross Energy Savings (MWh)	IQ Reported Gross Demand Reduction (MW)
Customer Load Response Program			
Customer Resources Demand Response Program			
Programmable Controllable Thermostat (PCT) Program			
Time of Use with Critical Peak Pricing Rate			
Hourly Pricing Option Rate			
Critical Peak Rebate Rate			
Sector Total			
NOTES:			

Table 3-6: Summary of Small Commercial & Industrial DR Sector PYTD Impacts by Program through the Fourth Quarter, Program Year 1

Small Commercial & Industrial DR Sector	PYTD Participants	PYTD Reported Gross Energy Savings (MWh)	PYTD Reported Gross Demand Reduction (MW)
Customer Load Response Program			
Customer Resources Demand Response Program			
Programmable Controllable Thermostat (PCT) Program			
Time of Use with Critical Peak Pricing Rate			
Hourly Pricing Option Rate			
Critical Peak Rebate Rate			
Sector Total			
NOTES:			

3.4 Large Commercial & Industrial DR Sector

A sector summary of results by program is presented in Table 3-7 and Table 3-8. *Not applicable at this time.*

Table 3-7: Summary of Large Commercial & Industrial DR Sector Quarterly Impacts by Program through the Fourth Quarter, Program Year 1

Large Commercial & Industrial DR Sector	IQ Participants	IQ Reported Gross Energy Savings (MWh)	IQ Reported Gross Demand Reduction (MW)
Customer Load Response Program			
Customer Resources Demand Response Program			
Sector Total			
NOTES:			

Table 3-8: Summary of Large Commercial & Industrial DR Sector PYTD Impacts by Program through the Fourth Quarter, Program Year 1

Large Commercial & Industrial DR Sector	PYTD Participants	PYTD Reported Gross Energy Savings (MWh)	PYTD Reported Gross Demand Reduction (MW)
Customer Load Response Program			
Customer Resources Demand Response Program			
Sector Total			
NOTES:			

3.5 Government & Non-Profit DR Sector

A sector summary of results by program is presented in Table 3-9 and Table 3-10. *Not applicable at this time.*

Table 3-9: Summary of Government & Non-Profit DR Sector Quarterly Impacts by Program through the Fourth Quarter, Program Year 1

Government & Non-Profit DR Sector	IQ Participants	IQ Reported Gross Energy Savings (MWh)	IQ Reported Gross Demand Reduction (MW)
Customer Load Response Program			
Customer Resources Demand Response Program			
Programmable Controllable Thermostat (PCT) Program			
Time of Use with Critical Peak Pricing Rate			
Hourly Pricing Option Rate			
Critical Peak Rebate Rate			
Sector Total			
NOTES:			

Table 3-10: Summary of Government & Non-Profit DR Sector PYTD Impacts by Program through the Fourth Quarter, Program Year 1

Government & Non-Profit DR Sector	PYTD Participants	PYTD Reported Gross Energy Savings (MWh)	PYTD Reported Gross Demand Reduction (MW)
Customer Load Response Program			
Customer Resources Demand Response Program			
Programmable Controllable Thermostat (PCT) Program			
Time of Use with Critical Peak Pricing Rate			
Hourly Pricing Option Rate			
Critical Peak Rebate Rate			
Sector Total			
NOTES:			

4 Portfolio Results by Program

4.1 Compact Fluorescent Lighting (CFL) Rewards Program

The CFL Rebate Program encourages customers to purchase CFLs instead of incandescent bulbs. To encourage participation and to overcome cost barriers, this program provides mail-in and retailer point-of-sale rebates. The Company is evaluating manufacturer markdowns in parts of West Penn Power's service territory.

The CFL rebate design launched in January 2010 and the point-of-sale launched in August, 2010.

4.1.1 Program Logic

A program logic model is a visual representation of the program's theory that illustrates a set of interrelated program activities that combine to produce a variety of outputs that lead to key short-, mid- and long-term outcomes. Below is the PY 2009 Program Logic Model. Tetra Tech will update logic models annually to capture changes in the programs as they develop.

Residential Compact Fluorescent Lighting Rewards Program Logic Model

Inputs/ Resources	Sufficient budget is allocated to cover rebate and administration costs	Marketing collateral (Garrison & Hughes), program website	CFL rebate coupons
	Allegheny Power program staff	Allegheny Power program staff	Rebate processing contractors
	Outside technical resources	Implementation Contractors	Allegheny Power program staff

Activities	**Develop Program Infrastructure** →	**Communicate with Customers** →	**CFL Purchase**
Outputs	The Compact Flourescent Lighting Rewards Program launched Jan 1, 2010.	Coupon distribution in print media and on website	Purchase of CFLs
	Program measures, forms, rebate and marketing strategy, Technical Resource Manual developed, refined and documented.	Dissemination of messages about the benefits of energy savings through purchase of CFLs	Processing of rebate forms including validation, approval, and rejection
	Program website and tracking system developed (appropriate information is requested, captured and entered into the system)		Payment of program incentives
Short to medium term outcomes	Allegheny Power tracking system supports evaluation	Customers are aware of CFL rebates	Enroll 217,893 program participants and 1,034,992 CFLs installed by the end of 2012
	Program administrative functions ready for launch	Customers are aware of benefits of energy savings through purchase of CFLs	124,859 MWh and 0.3 MW savings by the end of 2012
	Allegheny Power staff knowledgeable about the program and its resources	Customers purchase CFLs submit rebate forms	Summary reports for Allegheny Power program staff
Long term outcomes	Energy saving goals of the Compact Flourescent Lighting Rewards program are achieved within budgetary constraints	Energy efficiency becomes a consideration in all lighting purchases	Increased penetration of energy efficient lighting among Allegheny Power's residential customers
			Increased customer satisfaction because of energy savings
Risks			Low participation
			New technologies unavailable
			Changing federal standards

4.1.2 Program M&V Methodology and Program Sampling

The CFL Rewards Program will be evaluated in PY 2010. The below table summarizes planned activities and program sampling.

Summary of Evaluation Activities for the Residential
Compact Fluorescent Lighting Rewards Program

Action	Impact	Process	Details
Management and implementation staff interviews (3-5)		√	Gather insight into program design, delivery, and interactions with other stakeholders.
Vendor interviews and mystery shopping		√	Gather process-related data from vendors to identify role in customer participation.
Intercept and follow-up customer surveys (70)	√	√	Collect information from a random sample of program participants. Intercept surveys will be conducted as a result of the point of purchase coupon approach. Intercept surveys will collect key information such as who the customer's electric utility provider is and the intended use of the CFL *(residential or business).*
Engineering Review	√		Review engineering assumptions, calculations, models used to estimate TRM Deemed Savings (2010-2012).
Peak demand savings analysis	√		Use hourly load profiles (% energy used by hour) for designated 100 peak hours developed from end-use load shapes for lighting for census of participants

4.1.3 Program Sampling

Refer to Section 4.1.2 above.

4.1.4 Process Evaluation

Due to limited uptake of the downstream rebate program approach in PY 2009, Allegheny Power has shifted program design to an upstream point of purchase discount in PY 2010. Evaluators discussed program changes in-depth with program managers. Tetra Tech will evaluate the effectiveness of the program design change in PY 2010 through a second round of program manager interviews, retailer interviews, mystery shopping and customer intercept surveys.

4.1.5 Program Partners and Trade Allies

Customers will receive an instant rebate when they purchase a single or multi pack of CFL light bulbs at various retailers associated with the Allegheny Power Point of Sale agreements. The partnership may be with the manufacturer, supplier, or retailer.

- Allegheny Power has initiated a Point Of Sale Partnership with GE Lighting. The retailers associated with this partnership at this time are Wal-Mart and Sam's Club.
- Allegheny Power has a partnership agreement with Philips Lighting. The retailer associated with this partnership is Home Depot.
- Allegheny Power also has an agreement with Lowe's

4.1.6 Program Finances

A summary of the project finances are presented in Table 4-1.

Table 4-1: Summary of Compact Fluorescent Lighting (CFL) Rewards Program Finances: TRC Test[18]

	Category	IQ	PYTD	CPITD
A.1	EDC Incentives to Participants	$ -	$ -	$ -
A.2	EDC Incentives to Trade Allies	$ -	$ -	$ -
A	**Subtotal EDC Incentive Costs**	$ -	$ -	$ -
B.1	Design & Development	$ 6,197	$ 114,761	$ 114,761
B.2	Administration	$ 12,926	$ 37,052	$ 37,052
B.3	Management			
B.4	Marketing	$ 57,301	$ 60,513	$ 60,513
B.5	Technical Assistance	$ (9,655)	$ 92,588	$ 92,588
B	**Subtotal EDC Implementation Costs**	$ 66,769	$ 304,914	$ 304,914
C	**EDC Evaluation Costs**	$ 4,852	$ 4,852	$ 4,852
D	**SWE Audit Costs**			
E	**Participant Costs**			
	Total Costs	$ 71,621	$ 309,766	$ 309,766
F	**Annualized Avoided Supply Costs**			
G	**Lifetime Avoided Supply Costs**			
	Total Lifetime Economic Benefits			
	Portfolio Benefit-to-Cost Ratio			

NOTES: (1) Analysis associated with Benefit-to-Cost calculations on hold pending TRC Technical Work Group output.
(2) EDC Evaluation Costs include costs incurred during PY1 not paid until PY2.
(3) Costs categorization in Technical Assistance incorrect in third quarter, correction reflected in 4th quarter (IQ).

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

4.2 Critical Peak Rebate Program

The Critical Peak Rebate Program (CPR) demand response program encourages customers to lower their demand during peak load hours by offering a rate discount/rebate based on actual demand reduction. The reduction can occur during predefined or notified peak hours. CPR relies on the installation of a smart meter to measure the customer's demand during peak hours. The addition of an in-home/in-facility display improves customer notification and communication of peak periods.

This Program is planned for launch in 2011.

4.2.1 Program Logic

Program Logic will be provided in PY 2010.

4.2.2 Program M&V Methodology

Program M&V Methodology will be determined in PY 2010.

4.2.3 Program Sampling

Program Sampling will be determined in PY 2010.

4.2.4 Process Evaluation

Process Evaluation will be determined in PY 2010.

4.2.5 Program Partners and Trade Allies

Program Partners and Trade Allies are to be determined.

4.2.6 Program Finances

A summary of the project finances are presented in Table 4-2. *Not applicable at this time.*

Table 4-2: Summary of Critical Peak Rebate Program Finances: TRC Test[19]

	Category	IQ	PYTD	CPITD
A.1	*EDC Incentives to Participants*			
A.2	EDC Incentives to Trade Allies			
A	**Subtotal EDC Incentive Costs**			
B.1	Design & Development			
B.2	Administration			
B.3	Management			
B.4	Marketing			
B.5	Technical Assistance			
B	**Subtotal EDC Implementation Costs**			
C	**EDC Evaluation Costs**			
D	**SWE Audit Costs**			
E	**Participant Costs**			
	Total Costs			
F	**Annualized Avoided Supply Costs**			
G	**Lifetime Avoided Supply Costs**			
	Total Lifetime Economic Benefits			
	Portfolio Benefit-to-Cost Ratio			
NOTES: Analysis associated with Benefit-to-Cost calculations on hold pending TRC Technical Work Group output.				

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

4.3 Residential Energy Star and High Efficiency Appliance Program

The Energy Star and High Efficiency Appliance Program encourages customers to purchase the most energy-efficient appliances available. To encourage participation and to overcome cost barriers, this program provides rebates (equal to about 50% of the appliance's incremental cost in most cases) for the purchase of appliances that meet or exceed Energy Star or other energy efficiency ratings.

Mail-in rebates will be offered for clothes washers, clothes dryers, dishwashers, refrigerators (with turn-in), freezers (with turn-in), programmable thermostats, and room air conditioners.

This Program launched in January, 2010.

4.3.1 Program Logic

A program logic model is a visual representation of the program's theory that illustrates a set of interrelated program activities that combine to produce a variety of outputs that lead to key short-, mid- and long-term outcomes. Below is the PY 2009 Program Logic Model. Tetra Tech will update logic models annually to capture changes in the programs as they develop.

Residential ENERGY STAR and High Efficiency Appliance Program Logic Model

Inputs/ Resources	Sufficient budget is allocated to cover rebate and administration *costs*	Marketing collateral (Garrison & Hughes), program website	Appliance rebate coupons	Allegheny Power program staff
	Allegheny Power program staff	Allegheny Power program staff	Rebate processing and recycling contractors	Evaluation reports
	Outside technical resources		Allegheny Power program staff	Appliance efficiency standards
Activities	**Develop Program Infrastructure** →	**Communicate with Customers** →	**Appliance Purchase/Recycling** →	**Adjust Program Over Time**
Outputs	The ENERGY STAR and High Efficiency Appliances Program launched Jan 1, 2010.	Coupon distribution in print media and on website	Purchase of efficient appliances	Program budget reallocation (if necessary)
	Program measures, forms and *marketing strategy; Technical* Resource Manual developed, refined and documented.	Dissemination of messages about the benefits of energy savings through purchase of efficient appliances (General Awareness)	Processing of rebate forms including validation, approval, and rejection	New list of rebated appliances
	Rebate levels developed (50% of incremental cost)	Targeted marketing of measures to residential customers (print, radio, email, newsletters)	Recycling of inefficient appliances	New marketing collateral
	Program website and tracking system developed (appropriate information is requested, captured and entered into the system)		Payment of program incentives	
Short to medium term outcomes	Allegheny Power tracking system supports evaluation	Customers are aware of appliance rebates	Enroll 63,777 program participants by the end of 2012	New energy savings goals
	Program administrative functions ready for launch	Customers are aware of benefits of energy savings through purchase of efficient appliances	59,101 MWh and 19.9 MW savings by the end of 2012	Customers aware of exact *rebate amount before* installation
	Allegheny Power staff knowledgeable about the program and its resources	Customers purchase efficient appliances and submit rebate forms	Summary reports for Allegheny Power program staff	
Long term outcomes	Energy-saving goals of the ENERGY STAR and High Efficiency Appliances program are achieved within budgetary constraints	Energy efficiency becomes a consideration in all appliance purchases	Increased penetration of energy efficient equipment among Allegheny Power's residential customers Increased customer satisfaction because of energy savings	Avoid market saturation by adapting program to new standards
Risks			Low participation Changing federal standards	

4.3.2 Program M&V Methodology and Program Sampling

The ENERGY STAR and High Efficiency Appliance Program will be evaluated in PY 2010. The below table summarizes planned activities and program sampling.

Summary of Evaluation Activities for the Residential Energy Star and High Efficiency Appliance Program

Action	Impact	Process	Details
Management and implementation staff interviews (3-5)		√	Gather insight into program design, delivery, and interactions with other stakeholders.
Vendor interviews and mystery shopping	√	√	Gather process-related data from vendors to identify role in customer participation and baseline equipment and market effects of the program for impact evaluation.
Participant surveys (420)	√	√	Collect information from a random sample of program participants for each of the appliance types
Engineering Review	√		Review Allegheny claimed savings and savings calculator
Peak demand savings analysis	√		Using hourly load profiles (% energy used by hour) *for designated 100 peak hours developed from end-*use load shapes for base usage (appliances)

4.3.3 Program Sampling

Refer to Section 4.3.2 above.

4.3.4 Process Evaluation

To increase program uptake, Allegheny Power has entered into promotional partnerships with retailers in PY 2010. Evaluators discussed program changes in-depth with program managers. Tetra Tech will evaluate the effectiveness of the program design change in PY 2010 through a second round of program manager interviews, vendor interviews, mystery shopping and participant surveys.

4.3.5 Program Partners and Trade Allies

The company is evaluating partnerships with retailers.

4.3.6 Program Finances

A summary of the project finances are presented in Table 4-3.

Table 4-3: Summary of Residential Energy Star and High Efficiency Appliance Program Finances: TRC Test[20]

	Category	IQ	PYTD	CPITD
A.1	EDC Incentives to Participants	$ 24,135	$ 24,135	$ 24,135
A.2	EDC Incentives to Trade Allies	$ -	$ -	$ -
A	**Subtotal EDC Incentive Costs**	$ 24,135	$ 24,135	$ 24,135
B.1	Design & Development	$ 17,302	$ 114,761	$ 114,761
B.2	Administration	$ 36,089	$ 71,321	$ 71,321
B.3	Management			
B.4	Marketing	$ 342,899	$ 348,309	$ 348,309
B.5	Technical Assistance	$ 4,301	$ 106,545	$ 106,545
B	**Subtotal EDC Implementation Costs**	$ 400,591	$ 640,936	$ 640,936
C	**EDC Evaluation Costs**	$ 41,952	$ 41,952	$ 41,952
D	**SWE Audit Costs**			
E	**Participant Costs**			
	Total Costs	$ 466,678	$ 707,023	$ 707,023
F	**Annualized Avoided Supply Costs**			
G	**Lifetime Avoided Supply Costs**			
	Total Lifetime Economic Benefits			
	Portfolio Benefit-to-Cost Ratio			

NOTES: (1) Analysis associated with Benefit-to-Cost calculations on hold pending TRC Technical Work Group output.
(2) EDC Evaluation Costs include costs incurred during PY-1 not paid until PY2.

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

4.4 Residential Home Performance Program

The Residential Home Performance Program provides a holistic approach to educating customers on energy efficiency and conservation, and to improve overall home performance, by providing customers with a choice of three energy audit measures including an On-line Audit, a Check-Up Audit and a Comprehensive Audit. Customers receive a $50 incentive for the Check-Up Audit and Comprehensive Audit. The customer is eligible to receive an additional incentive for the installation of measures recommended by the audit up to the balance of the audit cost.

The measures directly available through this program for electric heat customers are attic insulation and home sealing via the comprehensive audit and attic insulation via the Check-Up audit. Home sealing is not offered to the Check-Up Audit customer due to the concern of reducing air exchanges in the home to a level which may produce poor air quality from, for example, carbon monoxide, moisture and mold.

The measures directly supported by this program and available to all audit participants are:

- Residential Energy Star and High Efficiency Appliance Program;
- Residential CFL Rewards Program;
- Residential HVAC Efficiency Program

The Online Audit measure was launched in March, 2010.

The Check-up and Comprehensive Audit measure is planned for launch in Plan Year 2010 second and third quarters.

4.4.1 Program Logic

A program logic model is a visual representation of the program's theory that illustrates a set of interrelated program activities that combine to produce a variety of outputs that lead to key short-, mid- and long-term outcomes. Below is the PY 2009 Program Logic Model. Tetra Tech will update logic *models annually to capture changes in the programs as they develop.*

Residential Home Performance Program Logic Model

Allegheny Power - Residential Home Performance Program for PA

Inputs/ Resources	Sufficient budget is allocated	Marketing materials	Audit and rebate forms	Audit recommendations
	Program Team*	Program website	Technical assistance through PA Home Energy BPI certified service provider	Rebate applications
Activities	**Develop Program Infrastructure** →	**Direct marketing** →	**Perform Audits** →	**Rebate Measures**
Outputs	Three audit options (comprehensive, check-up, online) are made available to customers in 2010	Target direct communications to residential customers and other outreach such as bill inserts, direct mail, radio, and inbound call center	Approximately 19,000 online participants, 6,100 check-up audits, and 1,500 comprehensive audits	Approximately 200 rebates resulting from check-up audits and 50 to 100 rebates resulting from comprehensive audits
	Program measures, rebates, marketing strategy and technical assumptions developed, refined and documented.	General Awareness Campaign	Service providers are knowledgeable about available rebates and program guidelines.	Implementer validates XX% of customer applications and processes rebates
	Tracking system developed and appropriate information is requested, captured and entered	Snippets from Energy At Home DVD on AP website	Service providers refer homeowners to other program rebates	Implementer conducts quality control, Utility implements quality assurance
Short to medium term outcomes	Improved energy efficiency program awareness and participation	Customer interest is stimulated by marketing the availability and benefits of audit options	Customer interest in additional energy saving measures is generated by audit recommendations	kW, kWh and therm savings are identified
	Resources are available to provide services to customers	AP Call center receives program inquiries	Customers apply for rebates for recommended measure	
Long term outcomes	Energy saving goals of the program are achieved within budgetary constraints	Residential customers' awareness of and participation in the program increases	The interest in insulation and water saving devices increases	Increased penetration of energy efficiency equipment among residential customers

4.4.2 Program M&V Methodology and Program Sampling

The online audit component of the Residential Home Performance program is the only PY 2009 program activity to claim savings. Tetra Tech used participant survey methods to (1) verify customer receipt of four no cost CFLs; and (2) evaluate program processes by review of customer experience with the online analyzer, energy saving outcomes, and initial assessment of free riders. The preliminary realization rate was calculated through the survey by the percent of customers reporting receipt of the four no cost CFLs.

In agreement with Allegheny Power, Tetra Tech opted to implement a web-based survey as opposed to using telephone or mail modes. We made this decision in part because of the known Internet savvy of the participants (who had already successfully used the online analyzer, and mitigating selection bias), and the availability of email addresses for the entirety of the Program Year 1 participant list.

We randomly sampled 400 customers[21] from a sample frame of 2,364 Program Year 1 participants[22] completing the Online Home Energy Analyzer." Upon completion, all participants requested and subsequently received a no cost package of four CFLs as part of the program's CFL Giveaway. On July 28, 2010, the sample group was sent an email inviting them to access and complete the web survey. Response was quick; we collected approximately 50 percent of completed surveys within the first two days. A week later on August 4, 2010 we emailed a survey reminder to those who had not yet *completed the surveys. On August 6, 2010 we closed the web survey.*

We expected to collect at minimum, 70 completed surveys, to achieve a minimum confidence level of 90 percent +/- 10 %. However, we yielded 120 completed web surveys, equating to a 31 percent response rate. Our conservative sampling strategy was intended to account for an unknown level of undeliverable email invitations. However, email addresses were highly reliable, with only 14 returned as undeliverable.

4.4.3 Program Sampling

Refer to Section 4.4.2 above.

4.4.4 Process Evaluation

PY 2009 process evaluation activities were limited to the on-line audit since the other components of this program will not be implemented until PY 2010. The following are process key findings based on the online analyzer web-based survey.

The EM&V team's verification efforts for the deemed CFLs found a 0.96 savings realization rate. That is, 96 percent of customers requesting the four pack of no cost CFLs could verify they received them as reported in Table 1-9 above.

Use of radio advertisements and energy bill inserts has been the most effective marketing tool. Slightly over one-third of customers report hearing about the availability of the online analyzer via radio advertising. And slightly over a quarter report hearing through the energy bill inserts. This suggests

[21] Performed in SPSS, where each record was assigned a random integer value between a minimum and maximum parameter, and records 1 to 400 were selected as sample.

22 Allegheny Power marketed the online analyzer internally. The sample of 400 contained 14 participants employed by Allegheny Power (identified by email address). Other staff using home or other non-work email addresses may also been included in the sample.

Allegheny Power may want to continue to use this venue for the online analyzer, and other residential programs as well.

In addition, the EM&V team suggests gearing questions in future surveys to address customer motivations in using the online analyzer. This will inform marketing efforts regarding the extent customers are attracted to the online analyzer via the marketing of four no cost CFLs. And inform the question: What are the implications on its use when the CFL giveaway ends?

Satisfaction levels are high with CFLs, varied for online analyzer. Results show high satisfaction of the CFLs received, lukewarm levels of satisfaction across various aspects of the online analyzer, and lower satisfaction with regard to the length of time it took to complete.

Approximately 61 percent report learning about Watt Watchers programs through use of the online analyzer. Primarily, customers report learning about the ENERGY STAR & High Efficiency Appliance and the CFL Rewards programs. This indicates the online analyzer is an effective outreach tool and funnel to Allegheny Power's other programs. In addition, rates of the Watt Watchers High Efficiency HVAC rebate program are lagging in comparison. This program may not be promoted as much through the online analyzer as the other two programs. Or possibly, customers may not be differentiating between the appliance and HVAC programs.

Participating customers report acting on recommendations. Over two-thirds of customers (68 percent) report engaging in a multitude of household energy savings activities as a result of the recommendations provided by the online analyzer. These activities range from closing doors and blinds to high efficiency appliance and HVAC purchases. Many of these customers report engaging in multiple actions. An area of further review may be examination of the types of energy saving actions of customers on their own, outside of any Watt Watchers program offerings.

Over one-third of all customers responding to the web survey took actions based on the online analyzer's recommendations, and did so through a Watt Watchers program. This is an indication that the online analyzer is not only raising awareness of the Watt Watchers program, but is effective at getting a good percentage to participate in other Watt Watchers programs. Again because these early users may be more energy savvy, this percentage may not continue, but it is a good guideline.

Online analyzer user demographic distributions differ from the Allegheny Power PA customer base. In general, participating customers report being younger with higher levels of education, and have higher 2009 household incomes than is seen in Allegheny Power's customer base at large. This finding supports the hypothesis stated previously that the early users at least, may be more energy savvy.

4.4.5 Program Partners and Trade Allies

The company is negotiating a contract with a vendor to provide administrative services and an auditor network for this program.

4.4.6 Program Finances

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

Table 4-4: Summary of Residential Home Performance Program Finances: TRC Test[23]

	Category	IQ	PYTD	CPITD
A.1	EDC Incentives to Participants	$ 37,301	$ 37,301	$ 37,301
A.2	EDC Incentives to Trade Allies	$ -	$ -	$ -
A	**Subtotal EDC Incentive Costs**	$ 37,301	$ 37,301	$ 37,301
B.1	Design & Development	$ 8,066	$ 114,761	$ 114,761
B.2	Administration	$ 16,823	$ 42,819	$ 42,819
B.3	Management			
B.4	Marketing	$ 398,862	$ 401,601	$ 401,601
B.5	Technical Assistance	$ (9,661)	$ 92,583	$ 92,583
B	**Subtotal EDC Implementation Costs**	$ 414,090	$ 651,764	$ 651,764
C	**EDC Evaluation Costs**	$ 21,472	$ 21,472	$ 21,472
D	**SWE Audit Costs**			
E	**Participant Costs**			
	Total Costs	$ 472,863	$ 710,537	$ 710,537
F	**Annualized Avoided Supply Costs**			
G	**Lifetime Avoided Supply Costs**			
	Total Lifetime Economic Benefits			
	Portfolio Benefit-to-Cost Ratio			

NOTES: (1) Analysis associated with Benefit-to-Cost calculations on hold pending TRC Technical Work Group output.
(2) EDC Evaluation Costs include costs incurred during PY1 not paid until PY2.
(3) Costs categorization in Technical Assistance incorrect in third quarter, correction reflected in 4th quarter (IQ).

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

4.5 Programmable Controllable Thermostat (PCT) Program

A Programmable Controllable Thermostat coupled with smart metering infrastructure will provide energy consumption and price information to the customer to enable them to control their monthly energy consumption and electric bills. An automated demand response will be accomplished by directly controlling the air conditioning system via the thermostat in the residential home. Participating customers will receive a professionally installed Programmable Controllable Thermostat that will have the following capabilities:

- **Pricing Signals**
  Customer will receive price signals and/or notices of peak-period events from West Penn Power.

- **Programmable Set-Points to Reduce Energy Consumption**
  By using pre-programmed set-points, the customer can conserve energy. According to the U.S. Department of Energy, an Energy Star programmable thermostat compared to a non-programmable thermostat can reduce energy usage by as much as 16%.

This Program is planned for launch in PY 2010.

4.5.1 Program Logic

Program Logic will be provided in PY 2010.

4.5.2 Program M&V Methodology

Program M&V Methodology to be provided in the PY 2010.

4.5.3 Program Sampling

Program Sampling to be provided in the P 2010.

4.5.4 Process Evaluation

Process Evaluation to be provided in the PY 2010.

4.5.5 Program Partners and Trade Allies

Program Partners and Trade Allies are to be determined.

4.5.6 Program Finances

A summary of the project finances are presented in Table 4-5. *Not applicable at this time.*

Table 4-5: Summary of Programmable Controllable Thermostat (PCT) Program Finances: TRC Test[24]

	Category	IQ	PYTD	CPITD
A.1	EDC Incentives to Participants			
A.2	EDC Incentives to Trade Allies			
A	**Subtotal EDC Incentive Costs**			
B.1	Design & Development			
B.2	Administration			
B.3	Management			
B.4	Marketing			
B.5	Technical Assistance			
B	**Subtotal EDC Implementation Costs**			
C	**EDC Evaluation Costs**			
D	**SWE Audit Costs**			
E	**Participant Costs**			
	Total Costs			
F	**Annualized Avoided Supply Costs**			
G	**Lifetime Avoided Supply Costs**			
	Total Lifetime Economic Benefits			
	Portfolio Benefit-to-Cost Ratio			
NOTES: Analysis associated with Benefit-to-Cost calculations on hold pending TRC Technical Work Group output.				

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

4.6 Residential HVAC Efficiency Program

The Residential HVAC Efficiency Program encourages customers to purchase a high efficiency central air conditioner or heat pump (SEER ratings of 14.5 or greater). To encourage participation and to overcome cost barriers, this program provides rebates (equal to about 50% of the appliance's incremental cost in most cases) for the purchase of units that exceed the federal energy efficient standard (SEER ratings of 13). To qualify for these rebates under this program, the work must be completed by a certified contractor and a programmable thermostat must be installed.

This Program launched in January, 2010.

4.6.1 Program Logic

A program logic model is a visual representation of the program's theory that illustrates a set of interrelated program activities that combine to produce a variety of outputs that lead to key short-, mid- and long-term outcomes. Below is the PY09 Program Logic Model. Tetra Tech will update logic models annually to capture changes in the programs as they develop.

Residential HVAC Efficiency Program Logic Model

Inputs/ Resources	Sufficient budget is allocated	Marketing collateral, program website	Marketing materials and campaign, program website	Allegheny Power program staff	Program infrastructure
	Allegheny Power program staff	Allegheny Power program staff	Rebate coupon packet	Rebate contractor (PFC)	Rebates
	Outside technical resources	Technical Resource Manual			Project invoices and documentation
Activities	**Develop Program Infrastructure** →	**Outreach to Trade Allies** →	**Customer Communications** →	**Rebate Application approval** →	**Rebate Measures**
Outputs	The Residential HVAC Efficiency Program launched Jan 1, 2010.	Provide program information, sales training, and marketing support to contractors and other providers of HVAC equipment	Trade allies market program to customers	PFC enters customer application into system	Customers participate in program
	Program measures, forms, rebates and marketing strategy, Technical Resource Manual developed, refined and documented.	Participate in events of local chapters of HVAC associations and market to their members, energy efficiency fairs	Targeted direct communications to residential customers and other outreach such as email, newsletters, energy efficiency fairs	PFC validates customer applications, and alerts customer if rebate is rejected	PFC mails rebate check within six weeks of receipt
	Program website and Allegheny Power tracking system developed (appropriate information is requested, captured and entered into the system)	Involve trade ally feedback to refine program offerings	Print and radio advertisement on Residential HVAC Efficiency Programs		Quality control conducted, Allegheny Power or contractor conducts quality assurance
Short to medium term outcomes	Allegheny Power tracking system supports evaluation	Trade allies are knowledgeable about the rebate structure and program guidelines	Program offering is meaningful, clear, and valuable to customers	Customers install HVAC equipment that has a higher efficiency than federal standards require	5,107 MWh and 5.5 MW savings by the end of 2012
	Program administrative functions ready for launch	Trade allies provide necessary rebate form information to customer	Residential customer's awareness of and participation in the program increases significantly	Customers aware of exact rebate amount before installation	Enroll 4,964 participants by the end of 2012
	Allegheny Power staff knowledgeable about the program and its resources	Trade allies regularly communicate the program to customers and include rebate with bids			Summary reports for Allegheny Power program staff
Long term outcomes	Energy saving goals of the Residential HVAC Efficiency Program are achieved within budgetary constraints	Increased trade ally stocking and sales of HVAC equipment with higher efficiency than required by federal standard	Increased residential customer awareness of, and demand for energy efficiency equipment	Ensure that all rebated equipment meets program requirements	Increased penetration of energy efficiency equipment among Allegheny Power's residential customers
		The majority of trade ally population participate and/or recommend energy efficient equipment		Increased customer satisfaction with rebate completion process	
		Increased participation of customers in the program			

4.6.2 Program M&V Methodology and Program Sampling

The Residential HVAC Program will be evaluated in PY 2010. The below table summarizes planned activities and program sampling.

Evaluation Tasks

Action	Impact	Process	Details
Program Staff Interviews		√	Provide insight into program design and delivery.
Vendor Survey	√	√	Review process-related issues, including program awareness and customers' adoption level of program-qualifying HVAC equipment. Inform the impact evaluation by identifying changes in the HVAC market resulting from program offerings.
Participant Survey (140 customers)	√	√	Gather process-related data, including program awareness, utility and program satisfaction, and initial barriers to technology adoption. Include a free-ridership and spillover battery.
Engineering Review	√		Review engineering assumptions, calculations, models used to estimate measure claimed savings.
Peak Demand Savings Analysis	√		Use of hourly load profiles for designated 100 peak hours

4.6.3 Program Sampling

Refer to Section 4.6.2 above.

4.6.4 Process Evaluation

PY 2009 program uptake was extremely limited. Evaluators discussed with program managers the need to actively engage HVAC contractors to promote this program.

4.6.5 Program Partners and Trade Allies

The company is developing a trade ally network. The network will be used as the primary advertising and deliver channel for this program.

4.6.6 Program Finances

A summary of the project finances are presented in Table 4-6.

Table 4-6: Summary of Residential HVAC Efficiency Program Finances: TRC Test[25]

	Category	IQ	PY-TD	CP-ITD
A.1	EDC Incentives to Participants	$ -	$ -	$ -
A.2	EDC Incentives to Trade Allies	$ -	$ -	$ -
A	**Subtotal EDC Incentive Costs**	$ -	$ -	$ -
B.1	Design & Development	$ 6,217	$ 114,761	$ 114,761
B.2	Administration	$ 12,967	$ 37,114	$ 37,114
B.3	Management			
B.4	Marketing	$ 3,072	$ 6,108	$ 6,108
B.5	Technical Assistance	$ (9,468)	$ 92,776	$ 92,776
B	**Subtotal EDC Implementation Costs**	$ 12,788	$ 250,759	$ 250,759
C	**EDC Evaluation Costs**	$ 14,787	$ 14,787	$ 14,787
D	**SWE Audit Costs**			
E	**Participant Costs**			
	Total Costs	$ 27,575	$ 265,546	$ 265,546
F	**Annualized Avoided Supply Costs**			
G	**Lifetime Avoided Supply Costs**			
	Total Lifetime Economic Benefits			
	Portfolio Benefit-to-Cost Ratio			

NOTES: (1) Analysis associated with Benefit-to-Cost calculations on hold pending TRC Technical Work Group output.
(2) EDC Evaluation Costs include costs incurred during PY1 not paid until PY2.
(3) Costs categorization in Technical Assistance incorrect in third quarter, correction reflected in 4th quarter (IQ).

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

4.7 Residential Efficiency Rewards Rate

This rate offering encourages the reduction in energy consumption by providing bill credits to customers based on the amount of reduction in their electricity consumption from historical consumption levels. Coupled with the smart metering infrastructure, customers will have access to energy consumption and price information enabling them to control their monthly energy consumption and electric bills. Studies show that customers become more efficient by virtue of receiving direct feedback regarding their energy usage.

This rate offering will be offered to customers on a voluntary basis. If the customer achieves the energy savings goal they will receive a bill credit based on the amount of their reduction.

This Program is planned for launch in 2011.

4.7.1 Program Logic

Program Logic will be determined in PY 2010.

4.7.2 Program M&V Methodology

Program M&V Methodology will be determined in PY 2010.

4.7.3 Program Sampling

Program Sampling will be determined in PY 2010.

4.7.4 Process Evaluation

Process Evaluation will be determined in PY 2010.

4.7.5 Program Partners and Trade Allies

Program Partners and Trade Allies are to be determined.

4.7.6 Program Finances

A summary of the project finances are presented in Table 4-7. *Not applicable at this time.*

Table 4-7: Summary of Residential Efficiency Rewards Rate Program Finances: TRC Test[26]

	Category	IQ	PYTD	CPITD
A.1	EDC Incentives to Participants			
A.2	EDC Incentives to Trade Allies			
A	**Subtotal EDC Incentive Costs**			
B.1	Design & Development			
B.2	Administration			
B.3	Management			
B.4	Marketing			
B.5	Technical Assistance			
B	**Subtotal EDC Implementation Costs**			
C	**EDC Evaluation Costs**			
D	**SWE Audit Costs**			
E	**Participant Costs**			
	Total Costs			
F	**Annualized Avoided Supply Costs**			
G	**Lifetime Avoided Supply Costs**			
	Total Lifetime Economic Benefits			
	Portfolio Benefit-to-Cost Ratio			
NOTES: Analysis associated with Benefit-to-Cost calculations on hold pending TRC Technical Work Group output.				

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

4.8 Pay Ahead (Smart) Service Rate

Participants will prepay for electric consumption and will receive a monthly report mailed with their bill depicting their electricity consumption for the month. Each of the participants will also be offered a thermostat/in-home display device that can provide customer messages including energy usage information and pricing.

This Program is planned for launch in 2011.

4.8.1 Program Logic

Program Logic will be determined in PY 2010.

4.8.2 Program M&V Methodology

Program M&V Methodology will be determined in PY 2010.

4.8.3 Program Sampling

Program Sampling will be determined in PY 2010.

4.8.4 Process Evaluation

Process Evaluation will be determined in PY 2010.

4.8.5 Program Partners and Trade Allies

Program Partners and Trade Allies are to be determined.

4.8.6 Program Finances

A summary of the project finances are presented in Table 4-8. *Not applicable at this time.*

Table 4-8: Summary of Pay Ahead (Smart) Service Rate Program Finances: TRC Test[27]

	Category	IQ	PYTD	CPITD
A.1	EDC Incentives to Participants			
A.2	EDC Incentives to Trade Allies			
A	**Subtotal EDC Incentive Costs**			
B.1	Design & Development			
B.2	Administration			
B.3	Management			
B.4	Marketing			
B.5	Technical Assistance			
B	**Subtotal EDC Implementation Costs**			
C	**EDC Evaluation Costs**			
D	**SWE Audit Costs**			
E	**Participant Costs**			
	Total Costs			
F	**Annualized Avoided Supply Costs**			
G	**Lifetime Avoided Supply Costs**			
	Total Lifetime Economic Benefits			
	Portfolio Benefit-to-Cost Ratio			
NOTES: Analysis associated with Benefit-to-Cost calculations on hold pending TRC Technical Work Group output.				

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

4.9 Residential Low Income Home Performance Check-Up Audit & Appliance Replacement Program

Program consists of a Home Check-Up Audit along with standard installed measures. The auditors will provide and install standard EE&C measures, with the customer's consent. The installed measures are as follows:

- Non Electric Hot Water heating customers – up to 6 CFLs
- Electric Hot Water heating customers – 6 CFLs, up to 3 Faucet Aerators, and 1 Low Flow Shower Head.

Under the Appliance Replacement component, the refrigerator and/or room air conditioner may qualify for replacement.

- Refrigerator – The auditor will determine if the customer's existing refrigerator is eligible for replacement based on the age and operational effectiveness. If eligible, the refrigerator will be replaced with a like-size Energy Star model. In addition, should the customer also have an older, inefficient freezer in use, the customer will be provided the opportunity to replace both the refrigerator and freezer with a larger, more efficient refrigerator, so that the freezer may be removed.
- Room Air Conditioner - The auditor will determine if the customer's existing room air conditioner is eligible for replacement based on the age and operational effectiveness.

This Program launched in January 2010.

4.9.1 Program Logic

A program logic model is a visual representation of the program's theory that illustrates a set of interrelated program activities that combine to produce a variety of outputs that lead to key short-, mid- and long-term outcomes. Below is the PY 2009 Program Logic Model. Tetra Tech will update logic models annually to capture changes in the programs as they develop

Residential Low Income Home Performance Check-Up Audit & Appliance Replacement Program Logic Model

Inputs/ Resources	Sufficient budget is allocated Allegheny Power program staff Dollar Energy (PA)	Allegheny Power / Dollar Energy Thirteen community action agencies and Dollar Energy	Community action agencies (contractors) Lowes	Allegheny Power Dollar Energy / community action agencies
Activities	**Develop Program Infrastructure** →	**Refer and Enroll Customers** →	**Perform Home Performance Check-up** →	**Process Invoices**
Outputs	The Low Income Home Performance Check-up Audit and Appliance Replacement Program launched January 1, 2010. Program measures, forms, marketing strategy, Technical Resource Manual developed, refined and documented. Inform contractors and Allegheny of program requirements and procedures. Centralized on-line tracking system developed and available by program launch date (Dollar Energy)	Identify potentially eligible customers via Allegheny call center. Customers referred to partnering community action agencies associated with customers' location (by county). Collect household data to confirm eligibility (e.g., rental status, household income at or below 150% FPL) Identify renters in need and obtain approval from landlords. Allegheny develops the "Governor's List" of LIHEAP recipients to identify potential LIURP participants based on usage (high is priority). Dollar Energy conducts outbound outreach calls.	Contractor direct installs up to 6 CFLs, 3 faucet aerators, and 1 low flow showerhead. Prioritize high usage faucets/sockets. Identify equipment and service needs in the home that can be funded through LIURP and/or DOE funds. Complete 30 minute walk-through interactive education with customer. Provide and discuss energy usage analysis. Work orders created, documenting measures to be installed and services to be provided through Dollar Energy's online system by contractors. Specifically identify the need for refrigerator replacement (up to 1) and/or room air conditioning replacement (up to 2).	Process invoices for direct installation measures, refrigerators and room air conditioners, and audit services. Receive documentation for all measures that are installed in the home and source of funding for the installation regardless of funding Enter recipient and measure information into Dollar Energy's program database. Date of weatherization is entered into Allegheny's CIS system for the premise. SAP may in the future include fields for reporting and tracking.
Short to medium term outcomes	Program serves low income customers within annual budget not to exceed $5,381M through 2012. Program administrative functions ready for launch Allegheny Power staff knowledgeable about the program and its resources	Up to 5,085 customers that are in financial need are identified and served through the program through program year 2012 Strong communication and referral mechanisms are maintained between Allegheny and the community action agencies. The program serves multi-family buildings not served through the comprehensive LIURP program.	Allegheny claims the savings resulting from the audit and direct installation Room air conditioners and refrigerators are property recycled (Allegheny contracting with Lowes) Capture energy savings from the multi-unit sector.	6,071 MWh and 1.2 MW savings by the end of 2012 LIURP and/or the federal program are able to serve a greater number of households.
Long term outcomes	Energy saving goals of the program are achieved within budgetary constraints	The program serves a higher percentage of low income customers through active identification and enrollment.	Ensure that as many customers as possible receive comprehensive weatherization services. Reduce energy usage and improve customer bill payment behaviors. Customers make behavioral changes based on education provided and reinforced by savings.	Increased penetration of energy efficiency equipment among Allegheny Power's low income residential customers
	COMMENTS:	COMMENTS	COMMENTS: Dollar Energy could be an input in the future. They are licensed to do audits in the state but that is not happening yet.	COMMENTS:

4.9.2 Program M&V Methodology and Program Sampling

The Residential Low Income Home Performance Check-Up Audit & Appliance Replacement Program will be evaluated in PY 2010. The below table summarizes planned activities and program sampling.

Summary of Evaluation Activities for Residential Low Income Home Performance Check-up and Appliance Replacement Program

Action	Impact	Process	Details
Program manager and implementation staff interviews* (3-5)		√	Gather insight into program design, delivery, and interactions with other stakeholders.
Community action agency interviews* (census)		√	Gather process-related data from participating community action agencies. These interviews will address all three low-income programs offered by Allegheny.
Auditor interviews* (15 including installation contractors)		√	Identify information provided to participants through the audit process, direct install process, and methods for identifying equipment replacement. Up to 15 interviews are planned for Program Year 2.
Installation contractor interviews*		√	Investigate process related issues such as training, resource constraints for weatherizing homes, other program barriers, etc.
Participant surveys (70)	√	√	Collect information from a random sample of program participants stratified by services received (audit only and direct install only, audit and refrigerator replacement, audit and room air conditioner replacement, audit, refrigerator and room air conditioner replacement). Seventy interviews are planned for Program Year 2.
Engineering Review*	√		Review engineering assumptions, calculations used to estimate equipment/measure savings in PY 2010. A billing analysis will be conducted in PY 2011 once 12 months post-participation data is available if it is determined this enhanced level of rigor is needed.

4.9.3 Program Sampling

Refer to Section 4.9.2 above.

4.9.4 Process Evaluation

Tetra Tech and Allegheny program managers met to discuss PY 2009 implementation and the results of the SWE on-site inspections. Several program processes were identified for improvement. Primarily, the program tracking system needs to identify individual measures as opposed to a weatherization kit to more accurately calculate claimed savings. In addition, direct installation of weatherization measures is

needed. Increased contract education is needed in regards to CFL installation in high-use fixtures and in delivery of energy education.

4.9.5 Program Partners and Trade Allies

Lowe's provides replacement and recycling of the Refrigerator and Room Air Conditioner component for this program.

4.9.6 Program Finances

A summary of the project finances are presented in Table 4-9.

Table 4-9: Summary of Residential Low Income Home Performance Check-Up Audit & Appliance Replacement Program Finances: TRC Test[28]

	Category	IQ	P.Y.T.D	C.P.I.T.D
A.1	EDC Incentives to Participants	$ 22,800	$ 22,800	$ 22,800
A.2	EDC Incentives to Trade Allies	$ -	$ -	$ -
A	**Subtotal EDC Incentive Costs**	$ 22,800	$ 22,800	$ 22,800
B.1	Design & Development	$ 7,905	$ 10,433	$ 10,433
B.2	Administration	$ 16,488	$ 42,322	$ 42,322
B.3	Management			
B.4	Marketing	$ 1,091	$ 3,893	$ 3,893
B.5	Technical Assistance	$ 31,739	$ 49,537	$ 49,537
B	**Subtotal EDC Implementation Costs**	$ 57,223	$ 106,185	$ 106,185
C	**EDC Evaluation Costs**	$ 5,897	$ 5,897	$ 5,897
D	**SWE Audit Costs**			
E	**Participant Costs**			
	Total Costs	$ 85,920	$ 134,882	$ 134,882
F	**Annualized Avoided Supply Costs**			
G	**Lifetime Avoided Supply Costs**			
	Total Lifetime Economic Benefits			
	Portfolio Benefit-to-Cost Ratio			

NOTES: (1) Analysis associated with Benefit-to-Cost calculations on hold pending TRC Technical Work Group output.
2) EDC Evaluation Costs include costs incurred during PY1 not paid until PY2.

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

4.10 Residential Low Income Joint Utility Usage Management Program

The program consists of a Home Check-Up Audit with Appliance Replacement and/or LIURP Program measures for gas and electric customers in conjunction with partnering gas utilities.

Under the Appliance Replacement component, the refrigerator and/or room air conditioner may qualify for replacement.

- Refrigerator – The auditor will determine if the customer's existing refrigerator is eligible for replacement based on the age and operational effectiveness. If eligible, the refrigerator will be replaced with a like-size Energy Star model. In addition, should the customer also have an older, inefficient freezer in use, the customer will be provided the opportunity to replace both the refrigerator and freezer with a larger, more efficient refrigerator, so that the second freezer may be removed.

- Room Air Conditioner - The auditor will determine if the customer's existing room air conditioner is eligible for replacement based on the age and operational effectiveness.

This Program launched in January 2010.

4.10.1 Program Logic

A program logic model is a visual representation of the program's theory that illustrates a set of interrelated program activities that combine to produce a variety of outputs that lead to key short-, mid- and long-term outcomes. Below is the PY09 Program Logic Model. Tetra Tech will update logic models annually to capture changes in the programs as they develop.

Residential Low Income Joint Utility Usage Management Program Logic Model

Inputs/ Resources	Sufficient budget is allocated Allegheny Power and Columbia Gas program staff Dollar Energy (PA)	Allegheny Power / Columbia Gas Thirteen community action agencies and Dollar Energy	Community action agencies (contractors) Lowes	Allegheny Power, Columbia Gas, and DCED funds Community action agencies	Allegheny Power, Columbia Gas, and community action agencies Dollar Energy / community action agencies
Activities	**Develop Program Infrastructure**	**Refer and Enroll Customers**	**Perform Home Performance Check-up**	**Weatherize Homes**	**Process Invoices**
Outputs	The Low Income Joint Utility Usage Mangement Program launched January 1, 2010.	Potentially eligible customers are identified via Allegheny or Columbia Gas call center. Customers referred to partnering community action agencies or utility.	Contractor direct installs up to 8 CFLs, 3 faucet aerators, and 1 low flow showerhead	Contractors follow work orders developed through the check-up and holistically weatherize home, addressing both cost-effective gas and electric measures	Process invoices for electric measures and audit services funded through Allegheny Power's JUUMP program.
	Establish relationship and procedures with gas utility (Columbia Gas)	Household data is collected and documented confirming eligibility (e.g., household income at or below 150% FPL, between 150% to 200% FPL, gas heating customer)	Identify equipment and service needs in the home including refrigerators and room air conditioners Identify both gas and electric opportunities.	DCED and LIURP (gas and electric utility) funding is leveraged where necessary to ensure holistic weatherization	Receive documentation for all measures that are installed in the home and source of funding for the installation regardless of funding
	Establish income requirements consistent with Columbia Gas' program eligibility (up to 200% FPL)	Referrals are communicated between Columbia Gas, Allegheny Power, Dollar Energy, and participating Community Action agency	Specifically identify the need for refrigerator replacement and/or room air conditioning replacement.	Seamless services are provided to customer; customer time is minimized by coordinating services.	Enter recipient and measure information into program database.
	Inform contractors, Allegheny staff, and gas utility staff of program requirements and procedures.	Allegheny develops the "Governor's List" of their LIHEAP recipients to identify potential LIURP participants based on usage (high is priority). Dollar Energy conducts outbound outreach calls.	Complete 30 minute walk-through interactive education with customer. Provide and discuss energy usage analysis.		Savings resulting from households with incomes between 150%-200% FPL are not counted toward low income portfolio goals but contribute to program goals
	Centralized on-line tracking system developed and available by program launch date (Dollar Energy)		Work orders created, documenting measures to be installed and services to be provided through Dollar Energy's online system by contractors.		Date of weatherization is entered into Allegheny's CIS system for the premise. SAP may in the future include fields for reporting and tracking.
Short to medium term outcomes	Program serves low income customers within annual budget not to exceed $6.363M through 2012.	Up to 11,937 customers that are in financial need are identified and served through the program through program year 2012	Allegheny claims the savings resulting from the audit and direct installation of electric measures	Services address the house as a system, improving overall household conditions	11,319 MWh and 1.2 MW savings by the end of 2012
	Program administrative functions ready for launch	Strong communication and referral mechanisms are maintained between Allegheny, Columbia Gas, and the community action agencies.	Room air conditioners and refrigerators are properly recycled (Allegheny contracting with Lowes)	Participants maintain high satisfaction in both Columbia Gas and Allegheny Power through the program's streamlined services	LIURP and/or the federal program are able to serve a greater number of households.
	Allegheny Power and gas utility staff establish procedures for processing invoices and serving participants	Households with higher income levels not eligible for Allegheny Power's low income programs (between 150% to 200% FPL) are served.	Appropriate measures and services are identified (cost-effective, health and safety, etc.)	Participant experiences non-energy benefits (e.g., improved comfort, home appearance).	Allegheny Power identifies the effectiveness of this program model and whether other partnerships should be formed
Long term outcomes	Energy saving goals are achieved within budgetary constraints	The program serves a higher percentage of low income customers through active identification and enrollment.	Ensure that as many customers as possible receive comprehensive weatherization services.	Holistic services provide sustainable saving and reduce households' overall energy burden	Increased penetration of energy efficiency equipment among Allegheny Power's and gas utility low income residential customers
	Procedures are transferrable to other gas utilities with whom Allegheny partners	The enrollment and referral mechanisms are effective, efficient, and transferrable should other partnerships be formed.	Customers make behavioral changes based on education provided and reinforced by savings.	Participants have an increased energy usage awareness and reduce energy use through behavioral changes	The programs, working in cohert with each other, provide comprehensive services to a high percentage of eligible low to modeate income customers

4.10.2 Program M&V Methodology and Program Sampling

The Residential Low Income Joint Utility Usage Management Program will be evaluated in PY 2010. The below table summarizes planned activities and program sampling.

Summary of Evaluation Activities for Residential Low Income Joint Utility Usage Management (JUUMP) Program

Action	Impact	Process	Details
Program manager and implementation staff interviews* (3-5)		√	Gather insight into program design, delivery, and interactions with other stakeholders. Gather process-related data from participating community action agencies. These interviews will address all three low-income programs offered by Allegheny.
Participant surveys (70)	√	√	Collect information from a random sample of program participants. 70 surveys are planned for Program Year 2.
Engineering Review*	√		Review engineering assumptions, calculations used to estimate equipment/measure savings in PY 2010. A billing analysis will be conducted in PY 2011 once 12 months post-participation data is available.

4.10.3 Program Sampling

Refer to Section 4.10.2 above.

4.10.4 Process Evaluation

Tetra Tech and Allegheny program managers met to discuss PY 2009 implementation and the results of the SWE on-site inspections. Several program processes were identified for improvement. Primarily, the program tracking system needs to identify individual measures as opposed to a weatherization kit to more accurately calculate claimed savings. In addition, direct installation of weatherization measures is needed. Increased contract education is needed in regards to CFL installation in high-use fixtures and in delivery of energy education.

4.10.5 Program Partners and Trade Allies

West Penn Power is currently partnering with Columbia Gas Company for the completion of the Home Check-Up Audit and the installation of full program measures. Lowe's provides replacement and recycling of the Refrigerator and Room Air Conditioner component for this program.

4.10.6 Program Finances

A summary of the project finances are presented in Table 4-10.

Table 4-10: Summary of Residential Low Income Joint Utility Usage Management Program Finances: TRC Test[29]

	Category	IQ	PYTD	CPITD
A.1	EDC Incentives to Participants	$ -	$ -	$ -
A.2	EDC Incentives to Trade Allies	$ -	$ -	$ -
A	**Subtotal EDC Incentive Costs**	$ -	$ -	$ -
B.1	Design & Development	$ 7,377	$ 10,433	$ 10,433
B.2	Administration	$ 15,387	$ 40,693	$ 40,693
B.3	Management			
B.4	Marketing	$ 1,091	$ 3,893	$ 3,893
B.5	Technical Assistance	$ (9,661)	$ 8,137	$ 8,137
B	**Subtotal EDC Implementation Costs**	$ 14,194	$ 63,156	$ 63,156
C	**EDC Evaluation Costs**	$ 6,979	$ 6,979	$ 6,979
D	**SWE Audit Costs**			
E	**Participant Costs**			
	Total Costs	$ 21,173	$ 70,135	$ 70,135
F	**Annualized Avoided Supply Costs**			
G	**Lifetime Avoided Supply Costs**			
	Total Lifetime Economic Benefits			
	Portfolio Benefit-to-Cost Ratio			

NOTES: (1) Analysis associated with Benefit-to-Cost calculations on hold pending TRC Technical Work Group output.
(2) EDC Evaluation Costs include costs incurred during PY1 not paid until PY2.
(3) Costs categorization in Technical Assistance incorrect in third quarter, correction reflected in 4th quarter (IQ).

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

4.11 Residential Low Income Room Air Conditioner Replacement Measure

The program consists of Room Air Conditioner replacement for customers who have received LIURP Program measures. Under the Appliance Replacement component, the room air conditioner may qualify for replacement. The auditor will determine if the customer's existing room air conditioner is eligible for replacement based on the age and operational effectiveness. This program requires recycling of the replaced unit.

This Program launched in January 2010.

4.11.1 Program Logic

A program logic model is a visual representation of the program's theory that illustrates a set of interrelated program activities that combine to produce a variety of outputs that lead to key short-, mid- and long-term outcomes. Below is the PY 2009 Program Logic Model. Tetra Tech will update logic models annually to capture changes in the programs as they develop.

Residential Low Income Room Air Conditioner Replacement Program Logic Model

Inputs/ Resources	Sufficient budget is allocated Allegheny Power program staff Dollar Energy (PA)	Allegheny Power / Dollar Energy Thirteen community action agencies and Dollar Energy	Allegheny Power Contractors (Dollar Energy / community action agencies / Lowes)
Activities	**Develop Program Infrastructure** →	**Refer and Enroll Customers** →	**Process Invoices**
Outputs	The Low Income Room Air Conditioner Replacement Program launched January 1, 2010.	Identify potentially eligible customers via Allegheny call center. Customers referred to partnering community action agencies associated with customers' location (by county).	Process invoices that fund 100% of room air conditioners as idenified by contractor.
	Program measures, forms, marketing strategy, Technical Resource Manual developed, refined and documented.	Allegheny develops the "Governor's List" of LIHEAP recipients to identify potential LIURP participants based on usage (high is priority). Dolllar Energy conducts outbound outreach calls.	Receive documentation for all measures that are installed in the home and source of funding for the installation regardless of funding
	Centralized on-line tracking system developed and available by program launch date (Dollar Energy)	Households are identified that may have received weatherization services within seven years but could be eligible to receive an efficient room air conditioner.	Enter recipient and measure information into Dollar Energy's program database.
	Inform contractors and Allegheny of program requirements and procedures.	Household data is collected to confirm eligibility (e.g., rental status, household income at or below 150% FPL). Dollar Energy primarily capturing the data.	Date of weatherization is entered into Allegheny's CIS system for the premise. SAP may in the future include fields for reporting and tracking.
Short to medium term outcomes	Program provides room air conditioners to low income customers within annual budgets not to exceed $1.792M through 2012	Up to 1,864 customers that are in financial need are identified and receive efficient room air coditioners through program year 2012	401 MWh and 0.4 MW savings by the end of 2012
	Program administrative functions ready for launch	Strong communication and referral mechanisms are maintained between Allegheny and the community action agencies.	Room air conditioners are property recycled (Allegheny contracting with Lowes)
	Allegheny Power staff knowledgeable about the program and its resources	Serve previously weatherized households with energy efficient options they may not have received.	Leverage takes place with funding.
Long term outcomes	Energy saving goals of the program are achieved within budgetary constraints	The program identifies and provides services to low income customers beyond the room air conditioner program.	Increased penetration of energy efficient room air conditioners among Allegheny Power's low income residential customers
		Reduce energy usage and improve customer bill payment behaviors.	
		Increased satisfaction amongst customers that may not have been eligible to receive any equipment	

4.11.2 Program M&V Methodology and Program Sampling

The Residential Low Income Room Air Conditioner Replacement Program will be evaluated in PY 2010. The below table summarizes planned activities and program sampling.

Summary of Evaluation Activities for Residential Low Income Room Air Conditioner Replacement Program

Action	Impact	Process	Details
Program manager and implementation staff interviews* (3-5)		√	Gather insight into program design, delivery, and interactions with other stakeholders. Gather process-related data from participating community action agencies. These interviews will address all three low-income programs offered by Allegheny.
Participant surveys (70)	√	√	Collect information from a random sample of program participants, verify installation. Seventy interviews are planned for Program Year 2.
Engineering Review*	√		Review engineering assumptions, calculations, models used to estimate equipment/measure savings.

4.11.3 *Program Sampling*

Refer to Section 4.11.2 above.

4.11.4 Process Evaluation

Tetra Tech interviewed Allegheny program managers to understand program delivery.

4.11.5 Program Partners and Trade Allies

Lowe's provides replacement and recycling of the Room Air Conditioner component for this program.

4.11.6 Program Finances

A summary of the project finances are presented in Table 4-11.

Table 4-11: Summary of Residential Low Income Room Air Conditioner Replacement Program Finances: TRC Test[30]

	Category	IQ	PYTD	CPITD
A.1	EDC Incentives to Participants	$ -	$ -	$ -
A.2	*EDC Incentives to Trade Allies*	$ -	$ -	$ -
A	**Subtotal EDC Incentive Costs**	$ -	$ -	$ -
B.1	Design & Development	$ 6,609	$ 10,433	$ 10,433
B.2	*Administration*	$ 13,784	$ 38,323	$ 38,323
B.3	Management			
B.4	Marketing	$ 1,215	$ 4,018	$ 4,018
B.5	Technical Assistance	$ (9,661)	$ 8,137	$ 8,137
B	***Subtotal EDC Implementation Costs***	$ 11,947	$ 60,911	$ 60,911
C	**EDC Evaluation Costs**	$ 6,118	$ 6,118	$ 6,118
D	**SWE Audit Costs**			
E	***Participant Costs***			
	Total Costs	$ 18,065	$ 67,029	$ 67,029
F	**Annualized Avoided Supply Costs**			
G	***Lifetime Avoided Supply Costs***			
	Total Lifetime Economic Benefits			
	Portfolio Benefit-to-Cost Ratio			

NOTES: (1) Analysis associated with Benefit-to-Cost calculations on hold pending TRC Technical Work Group output.
(2) EDC Evaluation Costs include costs incurred during PY1 not paid until PY2.
(3) Costs categorization in Technical Assistance incorrect in third quarter, correction reflected in 4th quarter (IQ).

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

4.12 Governmental/School/Non-Profit Portfolio Program

The program encourages government, school, and non-profit customers in Allegheny Power's Pennsylvania service territory to upgrade to state-of-the-art energy efficient lighting technologies. The program provides increased incentives and equipment to these customer classes, for installing:

- T8 lamps: Conversion from magnetic to electronic ballasts, and reducing the number of lamps per fixture by 1 to 2 fewer lamps or reducing wattage by 67 watts per fixture (increased rebate);
- LED Exit Signs: Replace or retrofit existing incandescent exit signs w/ LED (provided to the customer at no upfront cost);
- LED Traffic Signals: Retrofit LED packs into existing incandescent units ; and
- CFLs: Supply CFLs to this customer class via customer application (Provided to the customer at *no upfront cost*).

This Program launched in April 2010.

4.12.1 Program Logic

A program logic model is a visual representation of the program's theory that illustrates a set of *interrelated program activities that combine to produce a variety of outputs that lead to key short-, mid-* and long-term outcomes. Below is the PY 2009 Program Logic Model. Tetra Tech will update logic models annually to capture changes in the programs as they develop.

Government/Non-profit Lighting Efficiency Program Logic Model

Watt Watchers Commercial & Govt Lighting Program

Inputs/ Resources	Sufficient budget is allocated Allegheny Power program staff Statewide Technical Resoure Manual	Marketing plan and collateral, program website Allegheny Power program staff	Marketing materials and campaign, program website Lighting installation contractors POS Rebate packet	*Allegheny Power program staff;* Rebate processor Submitted (mail-in) rebate forms	*Program rebate processing* (vendor) Incentives budget; possible tax credits; other funding Sales receipt (UPC label)
Activities	**Develop Program Infrastructure** →	**Outreach to Trade Allies** →	**Customer Communications** →	**Rebate Application approval** →	**Rebate Measures**
Outputs	The Watt Watchers Comm/Govt Lighting Program launched 4th quarter 2009; Start Date January 2010 Program measures defined, forms, rebates and marketing strategy developed, refined and documented. Program website and tracking system developed	Work with the Local Development District Associations (LDDA) to market program to Govt/Non-profits Information to lighting contractors for leveraging federal/state funding (stimulus dollars, tax incentives, grants)	Key account managers and trade allies refer customers to the program Targeted direct communications to business and non-profit customers and other outreach such as trade shows, seminars AP website, business customer newsletter	Rebate forms reviewed for proper completion Monthly review of participation rates *by program manager* Project data entered into program tracking database	Allegheny Power validates customer rebate form and initiates payment Participants receive rebates in *timely manner* Necessary EM&V data collected
Short to medium term outcomes	Program administrative functions ready for launch Tracking system supports program processes, reporting requirements, and evaluation efforts Allegheny Power staff knowledgeable about the program and its resources	Trade allies are knowledgeable about the rebate structure and program guidelines Trade allies regularly communicate the program to customers and include rebate with lighting installation bids Increase participation of customers in the program	Program offering is meaningful and customers understand benefits/value Business customers' awareness of and participation in the program increases Customers plan for future program participation in their equipment purchase budget cycles	Customers install lighting equipment that has a higher efficiency than federal standards require Customers aware of exact rebate amount before installation Minimize customer dis-satisfaction with program by managing customer expectations	203,148 MWh and 42.7 MW savings by the end of 2012 (Commercial); 63,997 MWh and 8 MW (Govt/Non-profit) Provide rebates for 19,663 participants by end of 2012 (Commercial): 8,349 participants (Govt/Non-profit) Achieve cumulative TRC of 5.8 (Commercial); Achieve cumulative TRC of 7.1 (Govt/Non-profit) Summary reports for Allegheny Power program staff
Long term outcomes	Energy saving goals of the Watt Watchers program are achieved within budgetary constraints	Increased trade allies' stocking and sales of lighting equipment with higher efficiency than required by federal standard The majority of trade allies participate and/or recommend energy efficient *equipment*	Increased awareness of and demand for energy efficiency lighting in all business and govt/non-profit segments	Monitor participation and modify if necessary marketing, incentive levels, lighting measures offered	Increased penetration of energy efficiency lighting in all targeted business and govt/non profit segments

4.12.2 Program M&V Methodology and Program Sampling

The no cost CFL and LED exit sign promotion of the Government, Schools, and Non-Profit program is the only PY 2009 program activity to claim savings. Tetra Tech used participant survey methods to (1) inform program installation rates of no cost measures; and (2) evaluate program processes by review of customer experience with the program, and initial assessment of free riders and spillover.

Tetra Tech received the participant population, 281 participants, from Allegheny Power on July 23, 2010. Each record contained the name of the organization, contact information (i.e., name, address, and telephone number), building type, date shipped and quantities of each measure.

The table below outlines across record count and measure quantities our steps in deriving a Computer Assisted Telephone Interview (CATI) survey sample, and displays the final survey completion information.

Participant Sample Preparation and Aggregation

Program Sampling and Aggregation	Count	CFLs (Qty)	LED Exit Signs (Qty)
Sample Received from Allegheny Power	**281**	**14,902**	**2,482**
Removed - Customers Did Not Yet Receive Measures	46	0	0
Adjusted Allegheny Power Sample	**235**	**14,902**	**2,482**
Sample Aggregated for CATI (by company and building type)[31]	186	14,902	2,482
Removed - Measures Shipped After May 31st	26	1,222	435
Not Included - Sampling Mistake	4	47	8
CATI Telephone Interview Sample	156	13,633	2,039
Completed Surveys	115	9,264	1,298
Adjustment on Measure Quantity Received[32]	115	-658	-54
Completed Surveys (Adjusted)	**115**	**8,606**	**1,244**
Non-Completed Surveys	41	4,369	741

Tetra Tech received 281 participant records from Allegheny Power, representing 14,902 CFLs and 2,482 LED exit signs distributed at no cost to the participating customers. Of these records, 46 were removed because the organizations had not yet received their CFLs or LED exit signs. In further review of the records, it was necessary for Tetra Tech to aggregate them in situations where multiple records represented the same company name, building type, and had the same named contact. For these

[31] Some customers received measures for multiple locations. Information from these customers was aggregated so that the customer consisted on 1 record only.

[32] In reviewing the results, one organization contact disagreed with the quantities of measures listed in the sample and provided exact figures of measures received. The row entitled "Adjustment on Measure Quantity Received" reflects the reduction differences in measure totals.

situations we summed the quantities for CFLs and LED exit signs[33]. Therefore, the number of records reduced to 186; although they represented the same CFL and LED exit sign quantities. From this sample, 26 additional records were removed as the date shipped was in PY 2010 (post May 31, 2010), and four records were mistakenly removed out of the sample.

Our goal was to collect information on at least 70 buildings receiving CFLs and 70 buildings receiving LED exit signs. With many organizations receiving both measures, we estimated that we would achieve these levels by completing 100 CATI telephone surveys. We fielded the CATI survey on July 30, 2010 with 156 records. The participant response and level of completed surveys was excellent. Of the 156 records in our CATI telephone sample, we completed surveys with 115 participants, collecting information on 107 buildings receiving CFLs, and 73 buildings receiving LED exit signs.[34]

4.12.3 Program Sampling

Refer to Section 4.12.2 above.

4.12.4 Process Evaluation

PY09 process evaluation activities were limited to the no cost CFL and LED exit sign promotions, since other rebated measures associated with the program were not implemented until PY 2010. The following are a summary of process findings based on the CATI telephone participant survey.

Customers received the requested equipment. Overall, customers were shipped the CFLs and LED exit signs that they requested. If they received broken items, program staff was very accommodating and shipped new CFLs or LED exit signs within a couple days.

The overall installation rate was 75 percent for CFLs and 76 percent for LED exit signs. These installation rates take into account customers that confirm installation of the measures received, and customers that plan on measure installation within the next 6 months.

Direct mailings were an effective marketing tool. Customers primarily heard about the program through an Allegheny Power direct mailing. However, their preferred method to receive information about the programs is through an email newsletter (direct mailing was the second preferred method).

Customers experienced minimal barriers to participating in the program. Nearly all customers found no barriers with participating in the program. The most common change recommended to the program was to add additional lighting equipment, which has already been incorporated into the program for PY 2010.

Emphasize the CFLs and LED exit signs are provided at no cost ("free"). Several respondents mentioned that it was not clear to them if there would be a charge for receiving the CFLs and LED exit signs. There

[33] In the process of aggregating the records, seven cases for CFLs and five for LED exit signs represented an error of summed quantities during the CATI telephone interview. These were caught after survey implementation, and we made corrections for this analysis.

[34] Tetra Tech grouped records together in 20 situations that contained the same named contact across multiple records from the same company and different building types. We called and surveyed the named contact only once, but captured impact information individually across measure amounts and building types. In some situations, we also surveyed the same named contact across different organization names; for example if the same named contact applied for no cost measures representing different schools within a district.

was mention in the application of a rebate, which indicated to some customers that there was a cost involved.

Overall satisfaction with the program was high. Survey results indicate that participants were overall very satisfied with the program, with an average satisfaction rating of 9.2 on a 0 to 10 scale (where 0 is not at all satisfied and 10 is very satisfied). Several reasons for high satisfaction include: free equipment, reducing energy costs, and easy application process.

Government, nonprofit, and school buildings on average are at least 50 years old. The older buildings often have less efficient equipment, which needed to be upgraded. The CFLs and LED exit signs provided to customers at no cost was a low cost method to upgrade to high efficiency and introduce participants to Allegheny's EE&C programs.

4.12.5 Program Partners and Trade Allies

Allegheny Power will leverage the Local Development District Associations (LDDA) of Pennsylvania to market this program to this customer sector. These associations have established relationships with this target market. A pilot offering of CFL's and LED Exit Signs utilizing these LDDA's is underway as of April 12, 2010. In addition, Allegheny Power extended the pilot offering via a direct mail campaign to all municipal lighting accounts in May 2010. Participation rates have been encouraging and the "pilot" is now part of our standard offerings.

4.12.6 Program Finances

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

Table 4-12: Summary of Government/School/Non-Profit Measure Portfolio Program Finances: TRC Test[35]

	Category	IQ	PYTD	CPITD
A.1	EDC Incentives to Participants	$ 51,157	$ 51,157	$ 51,157
A.2	*EDC Incentives to Trade Allies*	$ -	$ -	$ -
A	**Subtotal EDC Incentive Costs**	$ 51,157	$ 51,157	$ 51,157
B.1	Design & Development	$ 17,759	$ 92,405	$ 92,405
B.2	*Administration*	$ 37,041	$ 84,085	$ 84,085
B.3	Management			
B.4	Marketing	$ 1,492	$ 5,966	$ 5,966
B.5	Technical Assistance	$ (15,779)	$ 74,292	$ 74,292
B	***Subtotal EDC Implementation Costs***	$ 40,513	$ 256,748	$ 256,748
C	**EDC Evaluation Costs**	$ 17,150	$ 17,150	$ 17,150
D	**SWE Audit Costs**			
E	***Participant Costs***			
	Total Costs	$ 108,820	$ 325,055	$ 325,055
F	**Annualized Avoided Supply Costs**			
G	***Lifetime Avoided Supply Costs***			
	Total Lifetime Economic Benefits			
	Portfolio Benefit-to-Cost Ratio			

NOTES: (1) Analysis associated with Benefit-to-Cost calculations on hold pending TRC Technical Work Group output.
(2) EDC Evaluation Costs include costs incurred during PY1 not paid until PY2.
(3) Costs categorization in Technical Assistance incorrect in third quarter, correction reflected in 4th quarter (IQ).

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

4.13 Commercial HVAC Efficiency Program

The commercial HVAC Efficiency Program encourages small and large commercial, industrial, and governmental/school/non-profit customers in to purchase unitary air conditioners and heat pumps that are more energy efficient than the federal energy efficiency standard requires. To encourage participation and to overcome cost barriers, this program provides a rebate for the customer to purchase a more energy-efficient unit.

This Program launched in February 2010.

4.13.1 Program Logic

A program logic model is a visual representation of the program's theory that illustrates a set of interrelated program activities that combine to produce a variety of outputs that lead to key short-, mid- and long-term outcomes. Below is the PY 2009 Program Logic Model. Tetra Tech will update logic models annually to capture changes in the programs as they develop.

Commercial HVAC Efficiency Program Logic Model

Inputs/ Resources	Sufficient budget is allocated	Marketing collateral (not yet developed), program website	Marketing materials and campaign (not yet developed), program website	Allegheny Power program staff	Program infrastructure
	Allegheny Power program staff	Allegheny Power program staff	Key account managers and trade allies	Submitted customer pre-qualification form and Project ID	Incentives budget; possible tax credits; other funding
	Statewide Technical Resource Manual		Rebate packet		Project invoices, receipts, and documentation
Activities	**Develop Program Infrastructure** →	**Outreach to Trade Allies** →	**Customer Communications** →	**Rebate Application Pre-approval** →	**Rebate Measures**
Outputs	The Watt Watchers Program launched Feb 8, 2010.	Participate in events sponsored by local HVAC association chapters and attend energy efficiency fairs	Account managers and trade allies refer customers to the program	Allegheny Power approves customer applications with dollar limit	Allegheny Power validates customer project and initiates payment
	Program measures defined, forms, rebates and marketing strategy developed, refined and documented.	Market to HVAC association members	Targeted direct communications to business customers and other outreach such as newsletters, energy efficiency fairs	Site visits at Program Manager's discretion	Participants receive rebates in timely manner
	Program website and tracking system developed		Print and radio advertisement on Watt Watchers Programs	Project data entered into program tracking database	Necessary EM&V data collected
Short to medium term outcomes	Program administrative functions ready for launch	Trade allies are knowledgeable about the rebate structure and program guidelines	Program offering is meaningful and customers understand benefits/value	Customers install HVAC equipment that has a higher efficiency than federal standards require	4,503 MWh and 2.5 MW savings by the end of 2012
	Tracking system supports program processes, reporting requirements, and evaluation efforts	Trade allies regularly communicate the program to customers and include rebate with bids	Business customers' awareness of and participation in the program increases	Customers aware of exact rebate amount before installation	Provide rebates for 4,631 participants by the end of 2012
	Allegheny Power staff knowledgeable about the program and its resources	Increase participation of customers in the program	Customers obtains Project ID from CSC and submits pre-qualification forms for approval	Minimize customer dissatisfaction with program by managing customer expectations	Rebate reduces the payback period for customers
			Educate customers on the availability of incentives from other sources		Summary reports for Allegheny Power program staff
Long term outcomes	Energy saving goals of the Watt Watchers program are achieved within budgetary constraints	The majority of trade allies participate and/or recommend energy efficient equipment	Increased awareness of and demand for energy efficiency equipment in all business segments	Insure that incentivized equipment meets program requirements	Increased penetration of energy efficiency equipment in all business segments

4.13.2 Program M&V Methodology and Program Sampling

The Commercial HVAC Efficiency Program will be evaluated in PY 2010. The below table summarizes planned activities and program sampling.

Evaluation Tasks

Action	Impact	Process	Details
Program Staff Interviews		√	Provides insight into program design and delivery.
Trade Ally Interviews	√	√	Uncover process-related issues, including program awareness and customers' adoption level of program-qualifying HVAC equipment. Inform the impact evaluation by identifying any changes in the HVAC market resulting from program offerings.
Participant Survey (TBD)	√	√	Gather process-related data, including program awareness, program satisfaction, and initial barriers to technology adoption. Include a free-ridership and spillover battery to understand program-associated free-ridership and spillover.
Baseline Non-participant Survey (130)	√	√	Establish baseline conditions for customers regarding HVAC equipment saturation, age, and other metrics. Examine reasons for not participating in the program if "true" non-participants can be identified.
Site Visits (site visits primarily for Custom projects and metered sites in both heating and cooling seasons if needed for heat pumps)	√		Baseline inspections will only be done on as needed basis for Custom projects. These would also include some projects where the Allegheny team has concern about the information provided by the customer. Projects selected for site inspections will submit the nameplate data from all replacement units, including digital images of the nameplate (to match with the submitted data) and images of the unit location (to match with the new units during the post-installation inspection).An estimated 40 sites would be visited each year for Custom projects with approximately 10 sites of the sites metered during the cooling season for central air conditioners and 10 sites metered during the heating and cooling seasons for heat pumps. These would be a subsample of the completed participant surveys and site visits and would be used to verify the calculated energy savings for the projects. Metered data collected either via a data logger or by EMS trend data (if available).
Program Database Review	√	√	To ensure appropriate data are being collected to inform the evaluation.
Engineering Model and Deemed Savings Reviews	√		Review engineering assumptions, calculations, models used to estimate equipment/measure savings (2010-2012) for an estimated 68 projects each year. The project file review would also be done for those projects scheduled for site visits.
Peak demand savings analysis	√		Using hourly load profiles (% energy used by hour) for designated 100 peak hours developed from end-use load shapes for heating and cooling for census of participants.

4.13.3 Program Sampling

Refer to Section 4.13.2 above.

4.13.4 Process Evaluation

Tetra Tech met with program managers to discuss the program design and implementation. The importance of actively engaging HVAC contractors to promote the program was discussed. The effective leveraging of the trade ally infrastructure will be explored in PY 2010. Commercial program process evaluation activities focused on program documentation review and program manager interviews to *understand the program's design and implementation, several tracking system review sessions to* ensure the correct data is tracked for EM&V efforts and interviews to coordinate the EM&V process to ensure a robust impact evaluation effort in PY 2010.

4.13.5 Program Partners and Trade Allies

Program Partners and Trade Allies are to be determined.

4.13.6 Program Finances

A summary *of the project finances* are presented in Table 4-13.

Table 4-13: Summary of Commercial HVAC Efficiency Program Finances: TRC Test[36]

	Category	IQ	PYTD	CPITD
A.1	EDC Incentives to Participants	$ -	$ -	$ -
A.2	EDC Incentives to Trade Allies	$ -	$ -	$ -
A	**Subtotal EDC Incentive Costs**	$ -	$ -	$ -
B.1	Design & Development	$ 10,533	$ 86,940	$ 86,940
B.2	Administration	$ 21,970	$ 61,788	$ 61,788
B.3	Management			
B.4	Marketing	$ 16,838	$ 21,310	$ 21,310
B.5	Technical Assistance	$ (15,779)	$ 69,869	$ 69,869
B	**Subtotal EDC Implementation Costs**	$ 33,562	$ 239,907	$ 239,907
C	***EDC Evaluation* Costs**	$ 7,178	$ 7,178	$ 7,178
D	**SWE Audit Costs**			
E	**Participant Costs**			
	Total Costs	$ 40,740	$ 247,085	$ 247,085
F	**Annualized Avoided Supply Costs**			
G	**Lifetime Avoided Supply Costs**			
	Total Lifetime Economic Benefits			
	Portfolio Benefit-to-Cost Ratio			

NOTES: (1) Analysis associated with Benefit-to-Cost calculations on hold pending TRC Technical Work Group output.
(2) EDC Evaluation Costs include costs incurred during PY1 not paid until PY2.
(3) Costs categorization in Technical Assistance incorrect in third quarter, correction reflected in 4th quarter (IQ).

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

4.14 Commercial Lighting Efficiency Program

The Commercial Lighting Efficiency Program encourages small and large, commercial, and industrial customers to upgrade to state-of-the-art energy efficient lighting technologies. The program provides rebates for installing:

- T8 lamps: Replace T12 lamps, reduction of 1 lamp or 67 watts per fixture and electronic ballasts required;
- T5 lights: Replace high-intensity discharge high bay style lights;
- Occupancy Sensors: Replace conventional switches with wall-plate style sensors;
- LED Exit Signs: Replace incandescent exit signs.

The Program launched in February 2010.

4.14.1 Program Logic

A program logic model is a visual representation of the program's theory that illustrates a set of interrelated program activities that combine to produce a variety of outputs that lead to key short-, mid- and long-term outcomes. Below is the PY09 Program Logic Model. Tetra Tech will update logic models annually to capture changes in the programs as they develop.

Commercial Lighting Efficiency Program Logic Model

Watt Watchers Commercial Lighting Program

Inputs/ Resources	Sufficient budget is allocated Allegheny Power program staff Statewide Technical Resoure Manual	Marketing plan and collateral, program website Allegheny Power program staff	Marketing materials and campaign, program website Lighting installation contractors POS Rebate packet	Allegheny Power program staff; Rebate processor Submitted (mail-in) rebate forms	Program rebate processing (vendor) Incentives budget; possible tax credits; other funding Sales receipt (UPC label)
Activities	**Develop Program Infrastructure**	**Outreach to Trade Allies**	**Customer Communications**	**Rebate Application approval**	**Rebate Measures**
Outputs	The Watt Watchers Commercial Lighting Program launched 4th quarter 2009; Start Date January 2010 Program measures defined, forms, rebates and marketing strategy developed, refined and documented. Program website and tracking system developed	Key account managers work with lighting installers to market program to eligible customers Information to lighting contractors for leveraging federal/state funding (stimulus dollars, tax incentives, grants)	Key account managers and trade allies refer customers to the program Targeted direct communications to business and non-profit customers and other outreach such as trade shows, seminars AP website, business customer newsletter	Program staff validates customer eligibility Monthly review of participation rates by program manager Project data entered into program tracking database	Allegheny Power validates customer rebate form and all checklist items completed; payment initiated Data tracking "opportunity" status to "complete," phase to "paid"; Participants receive rebates in timely manner Necessary EM&V data collected
Short to medium term outcomes	Program administrative functions ready for launch Tracking system supports program processes, reporting requirements, and evaluation efforts Allegheny Power staff knowledgeable about the program and its resources	Trade allies are knowledgeable about the rebate structure and program guidelines Trade allies regularly communicate the program to customers and include rebate with lighting installation bids Increase participation of customers in the program	Program offering is meaningful and customers understand benefits/value Business customers' awareness of and participation in the program increases Customers plan for future program participation in their equipment purchase budget cycles	Customers install lighting equipment that has a higher efficiency than federal standards require Customers aware of exact rebate amount before installation Minimize customer dis-satisfaction with program by managing customer expectations	203,148 MWh and 42.7 MW savings by the end of 2012 for Commercial Lighting Provide rebates for 19,663 participants by end of 2012 via Commercial Lighting Program Achieve cumulative TRC of 5.8 for Commercial Lighting Summary reports for Allegheny Power program staff
Long term outcomes	Energy saving goals of the Watt Watchers program are achieved within budgetary constraints	Increased trade allies' stocking and sales of lighting equipment with higher efficiency than required by federal standard The majority of trade allies participate and/or recommend energy efficient equipment	Increased awareness of and demand for energy efficiency lighting in all eligible business segments	Monitor participation and modify if necessary marketing, incentive levels, lighting measures offered	Increased penetration of energy efficiency lighting in all targeted business

4.14.2 Program M&V Methodology and Program Sampling

The Commercial Lighting Efficiency Program will be evaluated in PY 2010. The below table summarizes planned activities and program sampling.

Evaluation Tasks

Action	Impact	Process	Details
Program Staff Interviews		√	Provides insight into program design and delivery.
Market Channel Actor Interviews	√	√	Uncover process-related issues, including program awareness and customers' adoption level of program-qualifying lighting equipment. Inform the impact evaluation by identifying any changes in the lighting market resulting from program offerings.
Participant Survey (TBD)	√	√	Gather process-related data, including program awareness, program satisfaction, and initial barriers to technology adoption. Include a free-ridership and spillover battery to understand program-associated free-ridership and spillover.
Baseline Non-participant Survey (260)	√	√	Establish baseline conditions for customers regarding lighting equipment saturation, age, and other metrics. Examine reasons for not participating in the program if "true" non-participants can be identified.
Inventory Forms and Deemed Savings Reviews	√		Review engineering assumptions, inventory forms (when required), calculations, models used to estimate equipment/measure savings (2010-2012) for an estimated 80 projects each year. These would also be used for site visit sample.
Site Visits (with short-term metering for a smaller sample)	√		Approximately 68 projects would be visited each year with short-term metering at approximately 20 sites, depending on the number of to obtain hours of use information. Custom projects will include facility interviews, inventory of equipment by group use, and some logging to get hours of use. The sample size will depend on number and types of projects. Based on the 2010 TRM, sites with a greater than 50kW retrofit (roughly, offices in the 50kSF and manufacturing in the 35kSF or retrofit floor area) will have multiple meters installed to capture hours of use by area based on their lighting surveys and by Allegheny personnel during the site visit.
Program Database/Tracking Review	√		To ensure appropriate data are being collected to inform the evaluation. This has been the major emphasis to date.
Peak demand savings analysis	√		Use hourly load (% energy used by hour) for designated 100 peak hours developed from end-use load shapes for commercial lighting for census of participants.

4.14.3 Program Sampling

Refer to Section 4.14.2 above.

4.14.4 Process Evaluation

Commercial program process evaluation activities focused on program documentation review and program manager interviews to understand the program's design and implementation, several tracking system review sessions to ensure the correct data is tracked for EM&V efforts and interviews to coordinate the EM&V process to ensure a robust impact evaluation effort in PY 2010.

4.14.5 Program Partners and Trade Allies

Program Partners and Trade Allies are to be determined.

4.14.6 Program Finances

A summary of the project finances are presented in Table 4-14.

Table 4-14: Summary of Commercial Lighting Efficiency Program Finances: TRC Test[37]

	Category	IQ	PYTD	CPITD
A.1	EDC Incentives to Participants	$ -	$ -	$ -
A.2	EDC Incentives to Trade Allies	$ -	$ -	$ -
A	**Subtotal EDC Incentive Costs**	$ -	$ -	$ -
B.1	Design & Development	$ 14,775	$ 86,940	$ 86,940
B.2	Administration	$ 30,818	$ 74,878	$ 74,878
B.3	Management			
B.4	Marketing	$ 2,800	$ 7,274	$ 7,274
B.5	Technical Assistance	$ (15,779)	$ 69,869	$ 69,869
B	**Subtotal EDC Implementation Costs**	$ 32,614	$ 238,961	$ 238,961
C	**EDC Evaluation Costs**	$ 9,004	$ 9,004	$ 9,004
D	**SWE Audit Costs**			
E	**Participant Costs**			
	Total Costs	$ 41,618	$ 247,965	$ 247,965
F	**Annualized Avoided Supply Costs**			
G	**Lifetime Avoided Supply Costs**			
	Total Lifetime Economic Benefits			
	Portfolio Benefit-to-Cost Ratio			

NOTES: (1) Analysis associated with Benefit-to-Cost calculations on hold pending TRC Technical Work Group output.
(2) EDC Evaluation Costs include costs incurred during PY1 not paid until PY2.
(3) Costs categorization in Technical Assistance incorrect in third quarter, correction reflected in 4th quarter (IQ).

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

4.15 Custom Technology Applications Program

This program is targeted to improve the efficiency of customer operations through the application of custom measures that will result in energy usage reduction and improved operating efficiency.

The program encourages energy and demand reductions in small and large commercial and industrial, and governmental/non-profit customers. The program will focus on improving the energy efficiency for specific processes and applications, such as: lighting systems, compressed air, chillers, refrigeration, variable speed drives, motors, energy management systems, fan and pump systems, renewable energy, LED, and combined heat-power systems, for which there are no current prescriptive measures offered.

The Custom Technology Applications Program is focused on reducing energy use and demand in the small and large, commercial and industrial and governmental/non-profit customers with usage of 1 million to 2.5 million kWh / year. Customers are eligible for up to 25% of the capital investment, and up to $100,000 of the project cost to obtain the energy and demand savings.

The Program is capped the annual program incentive budget at $1 million. Projects will be awarded based on kWh savings.

This Program launched in March 2010.

4.15.1 Program Logic

A program logic model is a visual representation of the program's theory that illustrates a set of interrelated program activities that combine to produce a variety of outputs that lead to key short-, mid- and long-term outcomes. Below is the PY09 Program Logic Model. Tetra Tech will update logic models annually to capture changes in the programs as they develop.

Custom Technology Applications Program Logic Model

Inputs/ Resources	Sufficient budget is allocated .	Marketing materials and campaign, program website.	Allegheny Power program staff.	Program infrastructure.
	Allegheny Power program staff.	Key account managers.	Submitted pre-qualification form.	Incentives budget; possible tax credits; other funding.
	Statewide Technical Resource Manual.	Rebate packet.		Project invoices, receipts, and documentation.
Activities	**Develop Program Infrastructure** →	**Customer Communications** →	**Rebate Application Pre-approval** →	**Rebate Measures**
Outputs	The Custom Technology Apps Program launched March 1, 2010.	Account managers identify customers for the program and solicit applications.	Allegheny Power approves customer applications with dollar limit.	Allegheny Power validates customer project and initiates payment.
	Program measures defined, forms, rebates and marketing strategy developed, refined and documented.		Site visits at Program Manager's direction.	Participants receive rebates in timely manner.
	Rebate levels developed (25% of capital investment not to exceed $100,000).		Project data entered into program tracking database.	Necessary EM&V data collected.
	Program website and tracking system developed.			
Short to medium term outcomes	Program administrative functions ready for launch.	Program offering is meaningful and customers understand benefits/value.	Customer installs measures outlined in application.	8,526 MWh and 2.3 MW savings by the end of 2012.
	Tracking system supports program processes, reporting requirements, and evaluation efforts.	Business customers' awareness of and participation in the program increases.	Customers aware of exact rebate amount before installation.	Provide rebates for 57 participants by the end of 2012.
	Allegheny Power staff knowledgeable about the program and its resources.	Customers decides to participate and submits pre-qualification forms for approval.	Minimize customer dissatisfaction with program by managing customer expectations.	Rebate reduces the payback period for customers.
		Educate customers on the availability of incentives from other sources.		Summary reports for Allegheny Power program staff.
Long term outcomes	Energy saving goals of the Custom Tech Apps program are achieved within budgetary constraints.	Increased awareness of and demand for energy efficiency equipment in all business segments.	Insure that incentivized equipment meets program requirements.	Increased penetration of energy efficiency equipment in all business segments.

4.15.2 Program M&V Methodology and Program Sampling

The Custom Technology Applications Program will be evaluated in PY 2010. The below table summarizes planned activities and program sampling.

Summary of Evaluation Activities for Custom Technology Applications Program

Action	Impact	Process	Details
Market Channel Actor Surveys (including Design Team Members)		√	Gather process-related data from participating and nonparticipating market actors and identify spillover.
Participant Interviews (census)	√	√	Collect information from a census of program participants for process, free ridership and spillover.
Engineering Review (census)	√		Review engineering assumptions, calculations, models used to estimate equipment/measure savings for an estimated15 sites in 2010, and an estimated 21 sites annually in 2011-2012.
On-site Verification (census)	√		All sites will be visited with metering as needed to confirm savings. Each Custom project will have a project specific evaluation plan approved by the SWE.
On-site Data Collection and/or Metering (census)	√		Metering will be installed on an as needed basis. Ideally, data will be available from the energy management systems and/or advanced power meters in use at the sites.
Peak Demand Savings Analysis	√		Using hourly load profiles (% energy used by hour) for designated 100 peak hours developed from end-use load shapes for heating and cooling for census of participants.

4.15.3 Program Sampling

Refer to Section 4.15.2 above.

4.15.4 Process Evaluation

Commercial program process evaluation activities focused on program documentation review and program manager interviews to understand the program's design and implementation, several tracking system review sessions to ensure the correct data is tracked for EM&V efforts and interviews to coordinate the EM&V process to ensure a robust impact evaluation effort in PY 2010.

4.15.5 Program Partners and Trade Allies

Program Partners and Trade Allies are to be determined.

4.15.6 Program Finances

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

Table 4-15: Summary of Custom Technology Applications Program Finances: TRC Test[38]

	Category	IQ	PYTD	CPITD
A.1	EDC Incentives to Participants	$ -	$ -	$ -
A.2	EDC Incentives to Trade Allies	$ -	$ -	$ -
A	**Subtotal EDC Incentive Costs**	$ -	$ -	$ -
B.1	Design & Development	$ 11,578	$ 86,940	$ 86,940
B.2	Administration	$ 24,149	$ 65,012	$ 65,012
B.3	Management			
B.4	Marketing	$ 2,357	$ 6,830	$ 6,830
B.5	Technical Assistance	$ (15,779)	$ 69,869	$ 69,869
B	**Subtotal EDC Implementation Costs**	$ 22,305	$ 228,651	$ 228,651
C	**EDC Evaluation Costs**	$ 1,065	$ 1,065	$ 1,065
D	**SWE Audit Costs**			
E	**Participant Costs**			
	Total Costs	$ 23,370	$ 229,716	$ 229,716
F	**Annualized Avoided Supply Costs**			
G	***Lifetime Avoided Supply Costs***			
	Total Lifetime Economic Benefits			
	Portfolio Benefit-to-Cost Ratio			

NOTES: (1) Analysis associated with Benefit-to-Cost calculations on hold pending TRC Technical Work Group output.
(2) EDC Evaluation Costs include costs incurred during PY1 not paid until PY2.
(3) Costs categorization in Technical Assistance incorrect in third quarter, correction reflected in 4th quarter (IQ).

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

4.16 Time of Use (TOU) with Critical Peak Pricing Rate

TOU rates reflect the cost of serving customers during different time periods, but do not change as frequently as hourly. TOU encourages residential and commercial, industrial, government, school, and non-profit customers under 500 kW to lower their demand and energy consumption during on-peak periods by charging a higher price that reflects the higher cost of serving customers, and charging lower prices during off-peak periods that reflects the lower cost of serving customers. TOU also includes critical peak pricing that is designed to address the short-term need to reduce demand at the time of the system peak by charging prices significantly higher than on-peak periods. Critical peak pricing periods will vary in frequency and duration using predefined or notified peak hours, but will balance the need to keep the period as short as possible to effectively allow customers to reduce demand or shift usage to lower cost periods. TOU is voluntary and is only available to customers that are receiving utility-provided default service. TOU relies on a smart meter to measure the customer's demand and energy usage during the various TOU periods and the addition of an in-home/in-facility display improves customer notification/communication regarding peak periods.

This Program is planned for launch in 2011.

4.16.1 Program Logic

Program Logic will be determined in PY 2010.

4.16.2 Program M&V Methodology

Program M&V Methodology will be determined in PY 2010.

4.16.3 Program Sampling

Program Sampling will be determined in PY 2010.

4.16.4 Process Evaluation

Process Evaluation will be determined in PY 2010.

4.16.5 Program Partners and Trade Allies

Program Partners and Trade Allies are to be determined.

4.16.6 Program Finances

A summary of the project finances are presented in Table 4-16.

Costs associated with this program in PY 2009 reflect initial administrative cost.

Table 4-16: Summary of Time of Use (TOU) with Critical Peak Pricing Rate Program Finances: TRC Test[39]

	Category	IQ	PYTD	CRITD
A.1	EDC Incentives to Participants	$ -	$ -	$ -
A.2	EDC Incentives to Trade Allies	$ -	$ -	$ -
A	**Subtotal EDC Incentive Costs**	$ -	$ -	$ -
B.1	Design & Development	$ 273	$ 273	$ 273
B.2	Administration	$ -	$ -	$ -
B.3	Management	$ -	$ -	$ -
B.4	Marketing	$ -	$ -	$ -
B.5	Technical Assistance	$ -	$ -	$ -
B	**Subtotal EDC Implementation Costs**	$ 273	$ 273	$ 273
C	**EDC Evaluation Costs**	$ -	$ -	$ -
D	**SWE Audit Costs**			
E	**Participant Costs**			
	Total Costs	$ 273	$ 273	$ 273
F	**Annualized Avoided Supply Costs**			
G	**Lifetime Avoided Supply Costs**			
	Total Lifetime Economic Benefits			
	Portfolio Benefit-to-Cost Ratio			

NOTES: Analysis associated with Benefit-to-Cost calculations on hold pending TRC Technical Work Group output.

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

4.17 Hourly Pricing Option (HPO) Rate

The HPO reflects the different cost of energy during each hour and encourages residential and commercial, industrial, government, school, and non-profit customers under 500 kW to lower their demand and energy consumption during high priced periods and/or shift usage to low priced periods. Billing for the HPO is calculated from the PJM hourly market pricing for the AP Zone and includes the price of energy, capacity, ancillary services, alternative energy compliance, and any other Federal Energy Regulatory Commission and/or PJM charges directly related to the HPO, as adjusted for taxes. Participants can receive a daily updated approximation of their monthly bill, to date (since the prior bill), as well as an approximation of their electricity cost for the prior day. The HPO is voluntary and is only available to customers that are receiving utility-provided default service. The HPO relies on the installation of a smart meter to collect the customer's hourly energy consumption and the addition of an in-home/in-facility display improves customer communications regarding their energy consumption and billing.

This Program is planned for launch in 2011.

4.17.1 Program Logic

Program Logic will be determined in PY 2010.

4.17.2 Program M&V Methodology

Program M&V Methodology will be determined in PY 2010.

4.17.3 Program Sampling

Program Sampling will be determined in PY 2010.

4.17.4 Process Evaluation

Process Evaluation will be determined in PY 2010.

4.17.5 Program Partners and Trade Allies

Program Partners and Trade Allies are to be determined.

4.17.6 Program Finances

A summary of the project finances are presented in Table 4-17. *Not applicable at this time.*

Table 4-17: Summary of Hourly Pricing Option (HPO) Rate Program Finances: TRC Test[40]

	Category	IQ	PYTD	CPITD
A.1	EDC Incentives to Participants			
A.2	EDC Incentives to Trade Allies			
A	**Subtotal EDC Incentive Costs**			
B.1	Design & Development			
B.2	Administration			
B.3	Management			
B.4	Marketing			
B.5	Technical Assistance			
B	**Subtotal EDC Implementation Costs**			
C	**EDC Evaluation Costs**			
D	**SWE Audit Costs**			
E	**Participant Costs**			
	Total Costs			
F	**Annualized Avoided Supply Costs**			
G	***Lifetime* Avoided Supply Costs**			
	Total Lifetime Economic Benefits			
	Portfolio Benefit-to-Cost Ratio			

NOTES: Analysis associated with Benefit-to-Cost calculations on hold pending TRC Technical Work Group output.

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

4.18 Custom Applications Program

This program encourages energy and demand reductions for commercial and industrial customers by providing custom rewards for highly specialized processes and applications. The program will focus on improving the energy efficiency for specific processes and applications, such as: lighting systems, compressed air, chillers, refrigeration, variable speed drives, motors, energy management systems, fan and pump systems, combined heat-power systems, and other relevant measures, for which there are no current prescriptive measures offered.

The customer is eligible for up to 50% of the customer's total capital project cost, with a per project cap of $500,000.

Awards will be based on a review of kWh savings per project's cost.

This Program launched in March 2010.

4.18.1 Program Logic

Custom Applications Program Logic Model

Commercial & Industrial Custom Applications Program				
Inputs/ Resources	Sufficient budget is allocated . Allegheny Power program staff. Statewide Technical Resource Manual.	Marketing materials and campaign, program website. Key account managers. Rebate packet.	Allegheny Power program staff. Submitted pre-qualification form.	Program infrastructure. Incentives budget; possible tax credits; other funding. Project invoices, receipts, and documentation
Activities	**Develop Program Infrastructure** →	**Customer Communications** →	**Rebate Application Pre-approval** →	**Rebate Measures**
Outputs	The C&I Custom Apps Program launched March 1, 2010. Program measures defined, forms, rebates and marketing strategy developed, refined and documented. Program website and tracking system developed.	Account managers identify customers for the program and solicit bids. Pre-qualified customers receive a detailed audit from an ESCO.	Allegheny Power approves customer applications with dollar limit. Site visits at Program Manager's direction. Project data entered into program tracking database.	Allegheny Power validates customer project and initiates payment. Participants receive rebates in timely manner. Necessary EM&V data collected.
Short to medium term outcomes	Program administrative functions ready for launch. Tracking system supports program processes, reporting requirements, and evaluation efforts. Allegheny Power staff knowledgeable about the program and its resources.	Program offering is meaningful and customers understand benefits/value. Business customers' awareness of and participation in the program increases. Customers decides to participate and submits pre-qualification forms for approval. Educate customers on the availability of incentives from other sources.	Customer installs measures outlined in application. Customers aware of exact rebate amount before installation. Minimize customer dissatisfaction with program by managing customer expectations.	60,115 MWh and 11.7 MW savings by the end of 2012. Provide rebates for 21 participants by the end of 2012. Rebate reduces the payback period for customers. Summary reports for Allegheny Power program staff.
Long term outcomes	Energy saving goals of the C&I Custom Applications program are achieved within budgetary constraints.	Increased awareness of and demand for energy efficiency equipment in all business segments.	Insure that incentivized equipment meets program requirements.	Increased penetration of energy efficiency equipment in all business segments.

4.18.2 Program M&V Methodology and Program Sampling

The Custom Applications Program will be evaluated in PY 2010. The below table summarizes planned activities and program sampling.

Summary of Evaluation Activities for C&I Custom Applications Program

Action	Impact	Process	Details
Market Channel Actor Surveys (including Design Team Members)		√	Gather process-related data from participating and nonparticipating market actors and identify spillover.
Participant Surveys (census)	√	√	Collect information from a census of program participants for process, free ridership and spillover.
Engineering Review (census)	√		Review engineering assumptions, calculations, models used to estimate equipment/measure savings for an estimated 5 sites in 2010, and an estimated 8 sites annually in 2011-2012.
On-site Verification (census)	√		All sites will be visited with metering as needed to confirm savings. A project-specific evaluation plan will be developed for each project for approval by the SWE.
On-site Data Collection and/or Metering (as needed)	√		Metering will be installed on an as needed basis. Ideally, data will be available from the energy management systems and/or advanced power meters in use at the sites. The data collection and metering will be based on the project-specific evaluation plan approved by the SWE.
Peak Demand Savings Analysis	√		Using hourly load profiles (% energy used by hour) for designated 100 peak hours developed from project end-use load shapes

4.18.3 Program Sampling

Refer to Section 4.18.2 above.

4.18.4 Process Evaluation

Commercial program process evaluation activities focused on program documentation review and program manager interviews to understand the program's design and implementation, several tracking system review sessions to ensure the correct data is tracked for EM&V efforts and interviews to coordinate the EM&V process to ensure a robust impact evaluation effort in PY 2010.

4.18.5 Program Partners and Trade Allies

Program Partners and Trade Allies are to be determined.

4.18.6 Program Finances

A summary of the project finances are presented in Table 4-18.

Table 4-18 Summary of Custom Applications Program Finances: TRC Test[41]

	Category	IQ	PYTD	CPITD
A.1	EDC Incentives to Participants	$ -	$ -	$ -
A.2	EDC Incentives to Trade Allies	$ -	$ -	$ -
A	**Subtotal EDC Incentive Costs**	$ -	$ -	$ -
B.1	Design & Development	$ 13,117	$ 323,418	$ 323,418
B.2	Administration	$ 27,360	$ 69,765	$ 69,765
B.3	Management			
B.4	Marketing	$ 2,333	$ 6,807	$ 6,807
B.5	Technical Assistance	$ (15,779)	$ 261,279	$ 261,279
B	**Subtotal EDC Implementation Costs**	$ 27,031	$ 661,269	$ 661,269
C	**EDC Evaluation Costs**	$ 774	$ 774	$ 774
D	**SWE Audit Costs**			
E	**Participant Costs**			
	Total Costs	$ 27,805	$ 662,043	$ 662,043
F	**Annualized Avoided Supply Costs**			
G	**Lifetime Avoided Supply Costs**			
	Total Lifetime Economic Benefits			
	Portfolio Benefit-to-Cost Ratio			

NOTES: (1) Analysis associated with Benefit-to-Cost calculations on hold pending TRC Technical Work Group output.
(2) EDC Evaluation Costs include costs incurred during PY1 not paid until PY2.
(3) Costs categorization in Technical Assistance incorrect in third quarter, correction reflected in 4th quarter (IQ).

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

4.19 Customer Load Response Program

West Penn Power will assist customers by providing load management services by actively educating and providing assistance with the transition to market prices, load shaping, participation in PJM energy and capacity markets, and advanced metering technology. Contracting with customers for load reduction as well as assisting customers with entry into the real time energy markets will help control the demand during peak hours.

This Program is planned for launch in 2011.

4.19.1 Program Logic

Program Logic will be determined in PY 2010.

4.19.2 Program M&V Methodology

Program M&V Methodology will be determined in PY 2010.

4.19.3 Program Sampling

Program Sampling will be determined in PY 2010.

4.19.4 Process Evaluation

Process Evaluation will be determined in PY 2010.

4.19.5 Program Partners and Trade Allies

Program Partners and Trade Allies are to be determined.

4.19.6 Program Finances

A summary of the project finances are presented in Table 4-19. Charges incurred in PY 2009 reflect a market assessment study cost.

Table 4-19 Summary of Customer Load Response Program Finances: TRC Test[42]

	Category	IQ	PY(TD)	CP(TD)
A.1	EDC Incentives to Participants	$ -	$ -	$ -
A.2	EDC Incentives to Trade Allies	$ -	$ -	$ -
A	**Subtotal EDC Incentive Costs**	$ -	$ -	$ -
B.1	Design & Development	$ 60,210	$ 60,210	$ 60,210
B.2	Administration	$ -	$ -	$ -
B.3	Management	$ -	$ -	$ -
B.4	Marketing	$ -	$ -	$ -
B.5	Technical Assistance	$ -	$ -	$ -
B	**Subtotal EDC Implementation Costs**	$ 60,210	$ 60,210	$ 60,210
C	**EDC Evaluation Costs**	$ -	$ -	$ -
D	**SWE Audit Costs**			
E	**Participant Costs**			
	Total Costs	$ 60,210	$ 60,210	$ 60,210
F	***Annualized Avoided Supply Costs***			
G	**Lifetime Avoided Supply Costs**			
	Total Lifetime Economic Benefits			
	Portfolio Benefit-to-Cost Ratio			

NOTES: Analysis associated with Benefit-to-Cost calculations on hold pending TRC Technical Work Group output.

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

4.20 Customer Resources Demand Response Program

The Customer Resources Demand Response Program is focused on reducing kW demand by deploying customer load and generation resources. PJM CSPs will provide services to register and dispatch customer curtailable load during targeted hours of Allegheny Power's 100 hours of highest demand. Allegheny Power will contract with PJM CSPs to deliver an amount of curtailable load. The PJM CSPs will structure individual contracts with customers to respond to curtailment event notices issued by Allegheny Power to the customer's CSP. PJM CSPs and customers will have flexibility in selecting how many hours that they can participate with 50 hours being typical.

Allegheny Power will pay the PJM CSPs based on the actual load reduction that occurred during the curtailment events, based on the contracted rate established through the nomination process. A customer who participates in this program will be provided an incentive by their CSP according to the CSP's contract with the customer for each hour the customer's load is dispatched under this program. All payments to the customer will be from the customer's CSP. In order for the customer to realize the maximum benefits from participating in Allegheny Power's demand response programs, the customer's CSP must also register the customer's load in the available PJM load response programs. The customer can choose any registered CSP and Allegheny will provide potential customers with a list of the PJM CSPs that can register their load in the PJM markets. To assist with marketing and customer recruitment, Allegheny will provide a list of the customers that are eligible for this program to PJM CSPs.

The wholesale electricity market prices vary each hour as the supply and demand of energy changes. By controlling the demand for electricity during the highest demand periods, customer load resources can become and integral part of managing the overall delivery of energy on the system. In addition to the incentives paid under this program, a customer who participates in load management activities by curtailing load can also realize savings in the form of reduced capacity and energy costs.

This Program is planned for launch in 2011.

4.20.1 Program Logic

Program Logic will be determined in PY 2010.

4.20.2 Program M&V Methodology

Program M&V Methodology will be determined in PY 2010.

4.20.3 Program Sampling

Program Sampling will be determined in PY 2010.

4.20.4 Process Evaluation

Process Evaluation will be determined in PY 2010.

4.20.5 Program Partners and Trade Allies

Program Partners and Trade Allies are to be determined.

4.20.6 Program Finances

A summary of the project finances are presented in Table 4-20. *Not applicable at this time.*

Table 4-20 Summary of Customer Resources Demand Response Program Finances: TRC Test[43]

	Category	IQ	PYTD	CPITD
A.1	EDC Incentives to Participants			
A.2	EDC Incentives to Trade Allies			
A	**Subtotal EDC Incentive Costs**			
B.1	Design & Development			
B.2	Administration			
B.3	Management			
B.4	Marketing			
B.5	Technical Assistance			
B	**Subtotal EDC Implementation Costs**			
C	**EDC Evaluation Costs**			
D	**SWE Audit Costs**			
E	**Participant Costs**			
	Total Costs			
F	**Annualized Avoided Supply Costs**			
G	**Lifetime Avoided Supply Costs**			
	Total Lifetime Economic Benefits			
	Portfolio Benefit-to-Cost Ratio			
NOTES: Analysis associated with Benefit-to-Cost calculations on hold pending TRC Technical Work Group output.				

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

4.21 Commercial and Industrial Drives Program

The application of a variable frequency/adjustable speed drive will enhance the performance of the driven equipment using speed control, instead of the existing mechanical means (vane, throttling valves, etc.). These types of variable torque loads offer the best energy savings return with the application of a variable frequency drive. Other benefits realized from the use of variable frequency drives include less maintenance on mechanical parts, and ability to provide much finer speed control of the motor.

This program will be offered to industrial, manufacturing, water treatment, and commercial customers that have motor-driven fan and pump applications that presently utilize mechanical vanes or throttling valves to control fluid flow. According to the EPRI ASD Master User's Guide, the following applications can provide fair to good savings results.

- Adjustable Speed Drive (ASD) Application – Centrifugal Fans, Pumps, Compressors, Blowers
- Load Duty Cycle – Full range of operation from 20 – 100% of rated load
- Motor Size – Above 25 – 200 hp
- Annual Operating Hours – Over 2500 hours

The rebate strategy will be to provide 50% of the drive's cost before taxes. The rebate will be limited to the retrofit of an existing motor that drives a variable torque load that "fits" into the application criteria described above. New installations of drives for motors and maintenance or replacement of existing failed drive components are not included in the program.

This Program launched in February 2010.

4.21.1 Program Logic

A program logic model is a visual representation of the program's theory that illustrates a set of interrelated program activities that combine to produce a variety of outputs that lead to key short-, mid- and long-term outcomes. Below is the PY 2009 Program Logic Model. Tetra Tech will update logic models annually to capture changes in the programs as they develop.

Commercial and Industrial Drives Program Logic Model

Commercial & Industrial Drives Program

Inputs/ Resources	Sufficient budget is allocated . Allegheny Power program staff. Statewide Technical Resource Manual.	Marketing collateral, program website. Allegheny Power program staff.	Marketing materials and *campaign*, program website. Key account managers and trade allies. Rebate packet.	*Allegheny Power* program staff. Submitted pre-qualification form.	Program infrastructure. Incentives budget; possible tax credits; other funding. Project invoices, receipts, and documentation.
Activities	**Develop Program Infrastructure**	**Outreach to Trade Allies**	**Customer Communications**	**Rebate Application Pre-approval**	**Rebate Measures**
Outputs	The C&I Drives Program launched March 1. Program measures defined, forms, rebates and marketing strategy developed, refined and documented. Rebate levels developed (50% of incremental cost). Program website and tracking system developed.	Provide program information, sales training and marketing support to contractors and other providers of VFD equipment Develop flyers and email campaigns.	Account managers and trade allies refer customers to the program. Targeted direct communications to business customers and other outreach such as newsletters, energy efficiency fairs. Print and radio advertisement on C&I Drives Programs.	Allegheny Power approves customer applications with dollar limit. Site visits at Program Manager's discretion. Project data entered into program tracking database.	Allegheny Power validates customer project and initiates payment. Participants receive rebates in timely manner. Necessary EM&V data collected.
Short to medium term outcomes	Program administrative functions ready for launch. Tracking system supports program processes, reporting requirements, and evaluation efforts. Allegheny Power staff knowledgeable about the program and its resources.	Trade allies are knowledgeable about the rebate structure and program guidelines. Trade allies regularly communicate the program to customers and include rebate with bids . Increase participation of customers in the program.	Program offering is meaningful and customers understand benefits/value. Business customers' awareness of and participation in the program increases. Customers decides to participate and submits pre-qualification forms for approval. Educate customers on the availability of incentives from other sources	Customers installs VFD on motor. Customers aware of exact rebate amount before installation. Minimize customer dissatisfaction with program by managing customer expectations.	11,965 MWh and 2.3 MW savings by the end of 2012. Provide rebates for 705 participants by the end of 2012. Rebate reduces the payback period for customers. Summary reports for Allegheny Power program staff.
Long term outcomes	Energy saving goals of the C&I Drives program are achieved within budgetary constraints.	Increased trade allies' stocking and sales of VFDs . The majority of trade allies participate and/or recommend energy efficient equipment.	Increased awareness of and demand for energy efficiency equipment in all business segments	Insure that incentivized equipment meets program requirements.	Increased penetration of energy efficiency equipment in all business segments.

4.21.2 Program M&V Methodology and Program Sampling

The Commercial and Industrial Drives Program will be evaluated in PY 2010. The below table summarizes planned activities and program sampling.

Summary of Evaluation Activities for C&I Drives Program

Action	Impact	Process	Details
Market Channel Actor Surveys		√	Gather process-related data from participating and nonparticipating market actors and identify spillover.
Participant Surveys (70)	√	√	Collect information from a random sample of program participants for process, free ridership and spillover.
Engineering Review	√		Review engineering assumptions, calculations, models used to estimate equipment/measure savings for 40 sites in 2010, 20 sites annually in 2011-2012.
On-site Verification	√		30 sites annually for 2009-2010, 2011, and 2012 programs with onsite audits with major measure installations
On-site Data Collection and/or Metering	√		VFDs will be metered at 5% of program participants (15 sites annually). Sites will be selected as a subsample of the completed participant surveys.
Peak Demand Savings Analysis	√		Using hourly load profiles (% energy used by hour) for designated 100 peak hours developed from end-use load shapes for heating and cooling for census of participants.

4.21.3 Program Sampling

Refer to Section 4.21.2 above.

4.21.4 Process Evaluation

Commercial program process evaluation activities focused on program documentation review and program manager interviews to understand the program's design and implementation, several tracking system review sessions to ensure the correct data is tracked for EM&V efforts and interviews to coordinate the EM&V process to ensure a robust impact evaluation effort in PY 2010.

4.21.5 Program Partners and Trade Allies

Program Partners and Trade Allies are to be determined.

4.21.6 Program Finances

A summary of the project finances are presented in Table 4-21.

Table 4-21 Summary of Commercial & Industrial Drives Program Finances: TRC Test[44]

	Category	IQ	PYTD	CPITD
A.1	EDC Incentives to Participants	$ -	$ -	$ -
A.2	EDC Incentives to Trade Allies	$ -	$ -	$ -
A	**Subtotal EDC Incentive Costs**	$ -	$ -	$ -
B.1	Design & Development	$ 10,145	$ 323,418	$ 323,418
B.2	Administration	$ 21,161	$ 60,591	$ 60,591
B.3	Management	$ -	$ -	$ -
B.4	Marketing	$ 1,492	$ 5,966	$ 5,966
B.5	Technical Assistance	$ (15,779)	$ 261,279	$ 261,279
B	**Subtotal EDC Implementation Costs**	$ 17,019	$ 651,254	$ 651,254
C	**EDC Evaluation Costs**	$ 828	$ 828	$ 828
D	**SWE Audit Costs**			
E	**Participant Costs**			
	Total Costs	$ 17,847	$ 652,082	$ 652,082
F	**Annualized Avoided Supply Costs**			
G	**Lifetime Avoided Supply Costs**			
	Total Lifetime Economic Benefits			
	Portfolio Benefit-to-Cost Ratio			

NOTES: (1) Analysis associated with Benefit-to-Cost calculations on hold pending TRC Technical Work Group output.
(2) EDC Evaluation Costs include costs incurred during PY1 not paid until PY2.
(3) Costs categorization in Technical Assistance incorrect in third quarter, correction reflected in 4th quarter (IQ).

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

4.22 Distributed Generation Program

Customers will contract with a Distributed Generation Manager to provide the customer with operation and maintenance services on the customer's generator. The DG Manager will dispatch the generator up to 100 hours in response to curtailment event notices issued by Allegheny Power during the targeted hours of Allegheny Power's 100 hours of highest demand. A customer who participates in this program will be provided an incentive on a $/MWh basis for each hour that their generator is dispatched to target Allegheny Power's hours of highest demand.

In order for the customer to realize the maximum benefits from participating in Allegheny Power's demand response programs, the customer's Curtailment Service Provider (CSP) must also register the customer's load in the PJM load response programs. The customer can choose any registered CSP and Allegheny will provide potential customers with a list of the PJM CSPs that can register their load in the PJM markets. To assist with marketing and customer recruitment, Allegheny will provide a list of the potential customer generators to PJM CSPs.

Many electric customers own and maintain backup standby generators in order to meet the requirements of Section 701 of the National Electrical Code for "Legally Required Standby Systems" or Section 702 for "Optional Standby System." In Allegheny Power's Pennsylvania service territory, there is approximately 70 MW of existing standby generation larger than 300 kW. These sources are primarily in hospitals, banking, data center and high tech manufacturing facilities, and the generators range in size up to 2000 kW. This "non-utility" distributed generation fleet does not include co-generation facilities since these units are normally operated in parallel with the grid and are part of a combined heat/power scheme where the generation could not be readily changed to meet a peak demand situation.

The wholesale electricity market prices vary each hour as the supply and demand of energy changes. By controlling the demand for electricity during the highest demand periods, customer standby generation resources can become and integral part of managing the overall delivery of energy on the system. Distributed generation resources are uniquely situated to manage system loads since they are capable of performing at will and minimize the customer impacts associated with other demand response programs. In addition to the incentives paid under this program, a customer who participates in load management activities by utilizing standby generation can also realize savings in the form of reduced capacity and energy costs.

This program is planned for launch in 2011.

4.22.1 Program Logic

Program Logic will be determined in PY 2010.

4.22.2 Program M&V Methodology

Program M&V Methodology will be determined in PY 2010.

4.22.3 Program Sampling

Program Sampling will be determined in PY 2010.

4.22.4 Process Evaluation

Program Evaluation will be determined in PY 2010.

4.22.5 Program Partners and Trade Allies

Program Partners and Trade Allies are to be determined.

4.22.6 Program Finances

A summary of the project finances are presented in Table 4-22. *Not applicable at this time.*

Table 4-22 Summary of Distributed Generation Program Finances: TRC Test[45]

	Category	IQ	P,Y,TD	CP,ITD
A.1	EDC Incentives to Participants			
A.2	EDC Incentives to Trade Allies			
A	**Subtotal EDC Incentive Costs**			
B.1	Design & Development			
B.2	Administration			
B.3	Management			
B.4	Marketing			
B.5	Technical Assistance			
B	**Subtotal EDC Implementation Costs**			
C	**EDC Evaluation Costs**			
D	**SWE Audit Costs**			
E	**Participant Costs**			
	Total Costs			
F	**Annualized Avoided Supply Costs**			
G	**Lifetime Avoided Supply Costs**			
	Total Lifetime Economic Benefits			
	Portfolio Benefit-to-Cost Ratio			
NOTES: Analysis associated with Benefit-to-Cost calculations on hold pending TRC Technical Work Group output.				

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

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