Act 129 Statewide Evaluator Quarterly Report

2nd Quarter, Program Year 2

Presented to:

Pennsylvania Public Utility Commission

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1 Introduction

As part of the *Audit Plan* the Statewide Evaluation team (SWE or SWE team) is required to submit quarterly reports to the Pennsylvania Public Utility Commission (PUC or Commission) with updates on energy (MWh) and demand (MW) savings, impact evaluations, cost-effectiveness, and process evaluations related to the programs implemented under PA Act 129 and detailed in each Electric Distribution Company's (EDC) respective Energy Efficiency and Conservation (EE&C) Plan.[1] These reports are intended to identify progress towards the attainment of Act 129 savings targets, best practices exhibited, areas for improvements, and any necessary recommendations based on the current findings and data reported to date.

This report details the Act 129 program activities occurring in both the current program year and since the implementation of energy savings programs per the EDC EE&C plans. Thus, impacts reported as Program Year to Date (PYTD) include impacts occurring between June 1, 2010 and November 30, 2010. Impacts reported as Cumulative Program Inception to Date (CPITD) include savings since the implementation of Act 129 programs (June 1, 2009) through November 30, 2010.

The findings, conclusions, and recommendations contained in the Statewide Evaluator's Quarterly Report are the findings, conclusions, and recommendations of the Statewide Evaluator only and, as such, are not necessarily agreed to by the EDCs or the Commission. The Commission, while not adopting the findings, conclusions, and recommendations contained in the Statewide Evaluator's Quarterly Report, may consider and adopt some or all of them at a later date in appropriate proceedings, such as the annual Technical Reference Manual update, Total Resource Cost Test Manual update, and individual EDC Energy Efficiency and Conservation Plan revision proceedings.

2 Quarterly Report Summary

The following sections present a summary of the EDC program impacts and SWE activities completed to date.

2.1 Aggregated EDC Portfolio Impact Summary

Table 1 presents the seven EDCs' aggregated reported, as well as aggregated interim verified[2], PYTD reported gross MWh and MW impacts.

Program benefits and costs have been waived for this report until resolution on key issues pertaining to the Total Resource Cost (TRC) Test are decided through the issuance of a Commission Final Order updating the TRC test. The SWE team is working with the Commission staff to draft a tentative TRC

[1] See Statewide Evaluation Team, *Audit Plan and Evaluation Framework for Pennsylvania*, December 1 2009, page 138.

[2] Interim or preliminary verified savings refer to the energy or demand savings verified through partial evaluations. The evaluations will not be complete until the close of the current program year, and the verified savings will not be verified to the required levels of confidence and precision until the measurement and verification activities have been conducted on a statistically significant sample of the complete program year population.

Update Order for comment to be released April 2011. Interim or preliminary verified savings reported in this report reflect verified savings for measures that did not yet have approved savings protocols in program year 2 (PY2) or for additional evaluation, measurement and verification (EM&V) activities that have occurred during this current program year. Table 1 below presents available data on PYTD gross, verified and net MWh and MW savings and reductions in CO_2 emissions through the end of the second quarter for PY2 (PY2Q2). This quarter ended on November 30, 2010.

Table 1: Summary of EDC Quarterly Report Impacts – Program Year 2, 2nd Quarter

	PYTD Reported Gross Impact	Interim PYTD Verified Impact [a]	Interim PYTD Net Impact [b]
Total Energy Savings (MWh)	706,584	529,851	529,851
Total Demand Reduction (MW)	76.99	42.68	42.68
TRC Benefits ($) [c]	Not Reported	Not Reported	Not Reported
TRC Costs ($) [d]	Not Reported	Not Reported	Not Reported
TRC Benefit-Cost Ratio	Not Reported	Not Reported	Not Reported
CO_2 Emissions Reduction [f] (Tons)	572,333	429,179	429,179

NOTES FOR TABLE 1:
[a] Adjusted by applying realization rate determined by independent EM&V contractor to the Portfolio PYTD Reported Gross Impact, which is calculated by aggregating Program PYTD Verified Impacts. Program PYTD Verified Impacts are calculated by multiplying Program PYTD Reported Gross Impacts by program realization rates. Interim realization rates for the Program Year and impacts are to be used for quarterly reports, i.e., realization rates are to be calculated with available data. Interim realization rates are used to calculate Interim PYTD Verified Impacts. Interim realization rates are based on realization rate calculations from a portion of the sample anticipated over the entire Program Year.
[b] Adjusted by applying net-to-gross ratio to the Portfolio PYTD Verified Impact, which is calculated by aggregating Program Net Impacts. Program Net Impacts are calculated by multiplying Program PYTD Verified Impacts by program Net-to-Gross ratios. Interim net-to-gross ratios for the Program Year are to be used for quarterly reports, i.e., net-to-gross ratios are to be calculated with available data. Net-to-Gross ratio is 1.0 for Program Year 2.
[c] Avoided supply costs, including the reduction in costs of electric energy, generation, transmission, and distribution capacity, and natural gas valued at marginal cost for periods when there is a load reduction. Subject to TRC Order. TRC Benefits reporting requirement is waived for the PY2Q2 quarterly report.
[d] Costs paid by the program administrator and participants plus the increase in supply costs for any period when load is increased. Subject to TRC Order.
[e] Subject to TRC Order. TRC Benefit-Cost Ratio reporting requirement is waived for the PY2Q2 quarterly report.
[f] 8.1x10-4 metric tons of CO_2 per kWh (EPC's eGRID2007 Version 1.1, RFCE Region annual non-baseload CO_2 output emissions rate, year 2005 data).

2.2 Statewide Evaluator Summary

Below is a summary of the activities undertaken by the SWE team during the second quarter of PY2.

2.2.1 Review of EDC Quarterly Reports

The SWE has reviewed the EDC Quarterly Reports for completeness against the requirements of the SWE *Audit Plan*. The SWE reviewed the available PYTD gross impacts, interim verified impacts and

interim net impacts for each EDC. The SWE team audit activities and findings related to the savings reported in the EDCs' quarterly reports can be found in Section 6 of this report.

A summary of the SWE team findings includes:

- Currently[3] 76 programs have been implemented across the state; of the 76, 59 programs are currently being evaluated by the EDCs.
- Approximately 43 additional programs are expected to be implemented after PY2Q2.
- Progress towards 2011 MWh savings targets ranges from 1.4%-113.0%.
- Progress towards 2013 MWh savings targets ranges from 0.5%-38.0%.
- Progress towards 2013 MW reduction targets ranges from 0.3%-10.0%.

2.2.2 Interim Technical Reference Manual (TRM) Measures

Through the TWG, 17 commercial interim measure protocols were developed. In addition, modifications were made to 32 lighting measures to account for varying fixture types. For residential programs 49 interim measures protocols were developed.

Upon approval of these interim measure protocols by the TWG, EDCs used these protocols to verify savings. By developing these protocols that were not in the 2010 TRM, EDCs were able to more efficiently determine savings while also eliminating the requirement for physical measurement of savings.

2.2.3 TRM Update

During the quarter, the SWE began the process of integrating the Interim Measure Protocols into the update 2011 version of the TRM. In addition, the SWE, through recommendations of the TWG, modified hours of use tables for whole building lighting projects and area lighting projects.

The SWE also began the process of reviewing and updating the TRM to ensure consistency of terms used to define values in the protocols.

2.2.4 Demand Response

The EDCs are now mobilizing Demand Response Programs for implementation in the 2011 program year. Uncertainties regarding the methods that would be acceptable under Act 129 for quantifying savings resulted in delays in finalizing contracts with venders by the EDCs. With the demand response Secretarial Letter dated January 12, 2011, this uncertainty has been removed.[4] PJM economic protocols[5] will be utilized to quantify demand impacts during the Act 129 peak 100 hours.

[3] Currently as of November 2010.
[4] *See Energy Efficiency and Conservation Program* Secretarial Letter at Docket No. M-2008-2069887, issued January 12, 2011.
[5] This manual can be found at http://ftp.pjm.com/~/media/documents/manuals/m19.ashx.

No savings have been reported by the EDCs for Demand Response Programs or Direct Load Control Programs to date. In the current Quarterly Reports filed by the EDCs, only PECO and FirstEnergy reported that Direct Load Control Programs are in place for the 2011 Summer Capability time period.

2.2.5 Review of EM&V Plans

No new EM&V Plans were submitted in PY2Q2 for SWE review.

2.2.6 EDC Site Visits

No site visits to EDC headquarters were conducted in PY2Q2.

2.2.7 Project Site Inspections

As part of its audit activities, the SWE performs site inspections to verify information provided via interviews or documentation. A summary of inspections is detailed in the following sections for residential, low-income, and non-residential programs. For a detailed discussion regarding site inspections, please see Section 6.3.

2.2.7.1 Residential Programs

Currently, no project site visits have been scheduled for residential programs. The audit of these programs is done as a desktop audit in which the SWE team reviews the supporting data behind the summaries reported in each EDC's respective PY2Q2 reports. The audit of residential programs for this quarter includes a desktop review in which the SWE team verifies the savings calculations and database quality. This review is done by verifying that the per unit savings for each measure offered through a particular residential program agree with the TRM or interim TRM measure protocols. The database quality review includes checking a random selection of invoices, rebate applications and work orders against database entries for accuracy.

During the second quarter, the following residential programs were audited by the SWE team: Efficient Equipment Programs, CFL Lighting Programs, and Appliance Recycling Programs.

For more information on the outcome of these reviews, please see Section 6.2.1 of this report. On a going forward basis, the SWE team plans to conduct additional on-site inspections for residential geothermal heat pump installations.

2.2.7.2 Low-Income Programs

No site visits were conducted for Low-Income Programs in PY2Q2. The SWE team has conducted low-income site visits in previous quarterly audits and will continue to do so in future quarters as needed.

2.2.7.3 Non-Residential Programs

A total of 106 site inspections are planned for non-residential programs during Program Year 2. As of the end of the PY2Q2, the SWE has conducted a total of 17 inspections: 6 for PPL, 6 for Duquesne, and 5 for Allegheny. The majority of these inspections have been ride-along inspections with the EDC evaluator to audit the quality of the evaluation site inspection and to review the EDC evaluator's engineering analysis. In order to perform ride-along inspections, the SWE must coordinate with the EDC evaluation teams and accompany them during their inspection visits. At the time of this report, Duquesne was the

only utility to have completed their on-site inspections for PY2Q2 projects. PECO and FirstEnergy's evaluators have made plans to commence inspections during the month of March. PPL's evaluators have indicated that they will combine the Q2 and Q3 batches. Allegheny's evaluators have just completed inspections for Q1 projects and have not begun planning for the Q2 projects.

For independent inspections, the SWE will commence inspections in April 2011 after EDC evaluators complete their sample design and on-site inspections for Q2. These inspections will be completed without the EDC evaluator and will be focused on determining the actualized energy savings for each project. Approximately half of all SWE inspections will be dedicated to independent inspections.

For more detail on the findings from the site inspections, please see Section 6.3.3.

3 EDC Impact Summaries

The following tables present the reported PYTD gross impacts, interim verified impacts and interim net impacts for each EDC. In addition, each EDC impact summary table includes a column that presents the reported impacts as a percentage of the 2011 total EDC savings target.[6]

Program benefits and costs have been waived for this report until resolution of TRC issues is reached during upcoming TWG meetings.

[6] Note: The "Savings Achieved as a % of 2011 Targets" are based on interim verified savings. Thus, this achievement is subject to change pending results of final impact evaluation activities.

3.1 Statewide Summary

	Statewide	Allegheny	Duquesne	Met-Ed	Penelec	PennPower	PECO	PPL
PYTD Reported Gross[7] Energy Savings (MWh)	**706,584**	30,106	34,607	40,448	51,793	15,786	336,607	197,237
PYTD Interim Verified[8] Energy Savings (MWh)	**529,851**	0	28,023	38,408	50,270	15,361	245,995	151,794
CPITD Reported Gross[9] Energy Savings (MWh)	**1,029,456**	36,012	38,249	55,095	65,369	21,977	534,060	278,694
CPITD Interim Verified[10] Energy Savings (MWh)	**850,932**	2,952	31,576	50,668	63,135	20,954	446,050	235,597
% of 2011 Energy Savings Target Achieved	**N/A**	1.4%	22.4%	37.1%	45.4%	46.0%	113.0%	62.0%
% of 2013 Energy Savings Target Achieved	**N/A**	0.5%	7.5%	12.4%	15.1%	15.3%	38.0%	21.0%
PYTD Reported Gross Demand Reduction (MW)	**76.99**	11.4	3.1	4.73	6.18	1.57	22.4	27.61
PYTD Interim Verified Demand Reduction (MW)	**42.68**	0	2.5	4.57	6.06	1.54	4.5	23.51
CPITD Reported Gross Demand Reduction (MW)	**99.22**	12.4	3.3	6.09	7.62	2.01	34.1	33.7
CPITD Interim Verified Demand Reduction (MW)	**65.06**	0.5	2.6	5.78	7.3	1.95	16.1	30.83
% of 2013 Demand Reduction Target	**N/A**	0.3%	2.3%	5.1%	7.1%	4.6%	4.5%	10.0%

Cumulative Portfolio Energy Impacts

- The CPITD reported gross energy savings is 1,029,456 MWh.
- The CPITD interim verified energy savings is 850,932 MWh.

Portfolio Demand Reduction[11]

- The CPITD reported gross demand reduction is 99.22MW.
- The CPITD interim verified demand reduction is 65.06MW.

Low Income Sector

[7] Gross savings represent change in energy consumption and/or demand that results directly from program-related actions taken by participants in an efficiency program, regardless of why they participated.

[8] Verified gross impact is calculated by applying the realization rate to reported gross impacts. Realization rate is a term used in several contexts in the development of reported program savings. The primary applications include the ratio of project tracking system savings data (e.g. initial estimates of project savings) to savings (a) adjusted for data errors and (b) that incorporate evaluated or verified results of the tracked savings.

[9] Gross savings represent change in energy consumption and/or demand that results directly from program-related actions taken by participants in an efficiency program, regardless of why they participated.

[10] Verified gross impact is calculated by applying the realization rate to reported gross impacts. Realization rate is a term used in several contexts in the development of reported program savings. The primary applications include the ratio of project tracking system savings data (e.g. initial estimates of project savings) to savings (a) adjusted for data errors and (b) that incorporate evaluated or verified results of the tracked savings.

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

- There are 80,958 measures offered to the Low-Income Sector, comprising 27.5% of the total measures offered.
- The CPITD reported gross energy savings for low-income sector programs is 52,008 MWh.
- The CPITD interim verified energy savings for low-income sector programs is 34,995 MWh.

Government and Non-Profit Sector

- The CPITD reported gross energy savings for government and non-profit sector programs is 42,124 MWh.
- The CPITD interim verified energy savings for government and non-profit sector programs is 19,560 MWh.

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

- The PYTD reported gross energy savings is 706,584 MWh.
- The PYTD interim verified energy savings is 529,851 MWh.
- The PYTD reported gross demand reduction is 76.99MW.
- The PYTD interim verified demand reduction is 42.68MW.
- The PYTD reported participation is 404,099 participants.[12]

[12] Statewide participants are based upon the participant numbers reported by each EDC. Most EDCs excluded the number of CFL bulbs distributed from these numbers; other EDCs estimated the number of bulbs per participant and included that estimate in their totals.

3.2 Allegheny Power

Table 2: Summary of Allegheny Power Quarterly Report Impacts WEST PENN POWER COMPANY d/b/a ALLEGHENY POWER

	PYTD Reported Gross Impact	Interim PYTD Verified Impact[a]	Interim PYTD Net Impact[b]	Savings Achieved as % of 2011 Targets[f]
Total Energy Savings (MWh)	30,106	0	0	1.4%
Total Demand Reduction (MW)	11.4	0	0	0.3%
TRC Benefits ($) [c]	Not Reported	Not Reported	Not Reported	Not Reported
TRC Costs ($) [d]	Not Reported	Not Reported	Not Reported	Not Reported
TRC Benefit-Cost Ratio	Not Reported	Not Reported	Not Reported	Not Reported
CO_2 Emissions Reduction[g] (Tons)	24,386	0	0	N/A

NOTES:

[a] Adjusted by applying realization rate determined by independent EM&V contractor to the Portfolio PYTD Reported Gross Impact, which is calculated by aggregating Program PYTD Verified Impacts. Program PYTD Verified Impacts are calculated by multiplying Program PYTD Reported Gross Impacts by program realization rates. Interim realization rates for the Program Year and impacts are to be used for quarterly reports, i.e., realization rates are to be calculated with available data. Interim realization rates are used to calculate Interim PYTD Verified Impacts. Interim realization rates are based on realization rate calculations from a portion of the sample anticipated over the entire Program Year.

[b] Adjusted by applying net-to-gross ratio to the Portfolio PYTD Verified Impact, which is calculated by aggregating Program Net Impacts. Program Net Impacts are calculated by multiplying Program PYTD Verified Impacts by program Net-to-Gross ratios. Interim net-to-gross ratios for the Program Year are to be used for quarterly reports, i.e., net-to-gross ratios are to be calculated with available data. Net-to-Gross ratio is 1.0 for Program Year 2.

[c] Avoided supply costs, including the reduction in costs of electric energy, generation, transmission, and distribution capacity, and natural gas valued at marginal cost for periods when there is a load reduction. Subject to TRC Order. TRC Benefits reporting requirement is waived for the PY2Q2 quarterly report.

[d] Costs paid by the program administrator and participants plus the increase in supply costs for any period when load is increased. Subject to TRC Order.

[e] Subject to TRC Order. TRC Benefit-Cost Ratio reporting requirement is waived for the PY2Q2 quarterly report.

[f] MWh targets for 2011. MW targets for 2013. Savings based on CPITD.

[g] 8.1x10-4 metric tons of CO2 per kWh (EPC's eGRID2007 Version 1.1, RFCE Region annual non-baseload CO2 output emissions rate, year 2005 data).

3.3 Metropolitan Edison Company

Table 3: Summary of Met-Ed Quarterly Report Impacts

	PYTD Reported Gross Impact	Interim PYTD Verified Impact[a]	Interim PYTD Net Impact[b]	Savings Achieved as % of 2011 Targets[f]
Total Energy Savings (MWh)	40,448	38,408	38,408	37.1%
Total Demand Reduction (MW)	4.73	4.57	4.57	5.1%
TRC Benefits ($) [c]	Not Reported	Not Reported	Not Reported	Not Reported
TRC Costs ($) [d]	Not Reported	Not Reported	Not Reported	Not Reported
TRC Benefit-Cost Ratio	Not Reported	Not Reported	Not Reported	Not Reported
CO_2 Emissions Reduction[g] (Tons)	32,763	31,110	31,110	N/A

NOTES:

[a] Adjusted by applying realization rate determined by independent EM&V contractor to the Portfolio PYTD Reported Gross Impact, which is calculated by aggregating Program PYTD Verified Impacts. Program PYTD Verified Impacts are calculated by multiplying Program PYTD Reported Gross Impacts by program realization rates. Interim realization rates for the Program Year and impacts are to be used for quarterly reports, i.e., realization rates are to be calculated with available data. Interim realization rates are used to calculate Interim PYTD Verified Impacts. Interim realization rates are based on realization rate calculations from a portion of the sample anticipated over the entire Program Year.

[b] Adjusted by applying net-to-gross ratio to the Portfolio PYTD Verified Impact, which is calculated by aggregating Program Net Impacts. Program Net Impacts are calculated by multiplying Program PYTD Verified Impacts by program Net-to-Gross ratios. Interim net-to-gross ratios for the Program Year are to be used for quarterly reports, i.e., net-to-gross ratios are to be calculated with available data. Net-to-Gross ratio is 1.0 for Program Year 2.

[c] Avoided supply costs, including the reduction in costs of electric energy, generation, transmission, and distribution capacity, and natural gas valued at marginal cost for periods when there is a load reduction. Subject to TRC Order. TRC Benefits reporting requirement is waived for the PY2Q2 quarterly report.

[d] Costs paid by the program administrator and participants plus the increase in supply costs for any period when load is increased. Subject to TRC Order.

[e] Subject to TRC Order. TRC Benefit-Cost Ratio reporting requirement is waived for the PY2Q2 quarterly report.

[f] MWh targets for 2011. MW targets for 2013. Savings based on CPITD.

[g] 8.1x10-4 metric tons of CO2 per kWh (EPC's eGRID2007 Version 1.1, RFCE Region annual non-baseload CO2 output emissions rate, year 2005 data).

3.4 Pennsylvania Power Company

Table 4: Summary of PennPower Quarterly Report Impacts

	PYTD Reported Gross Impact	Interim PYTD Verified Impact[a]	Interim PYTD Net Impact[b]	Savings Achieved as % of 2011 Targets[f]
Total Energy Savings (MWh)	15,786	15,361	15,361	46.0%
Total Demand Reduction (MW)	1.57	1.54	1.54	15.3%
TRC Benefits ($) [c]	Not Reported	Not Reported	Not Reported	Not Reported
TRC Costs ($) [d]	Not Reported	Not Reported	Not Reported	Not Reported
TRC Benefit-Cost Ratio	Not Reported	Not Reported	Not Reported	Not Reported
CO_2 Emissions Reduction[g] (Tons)	12,787	12,442	12,442	N/A

NOTES:

[a] Adjusted by applying realization rate determined by independent EM&V contractor to the Portfolio PYTD Reported Gross Impact, which is calculated by aggregating Program PYTD Verified Impacts. Program PYTD Verified Impacts are calculated by multiplying Program PYTD Reported Gross Impacts by program realization rates. Interim realization rates for the Program Year and impacts are to be used for quarterly reports, i.e., realization rates are to be calculated with available data. Interim realization rates are used to calculate Interim PYTD Verified Impacts. Interim realization rates are based on realization rate calculations from a portion of the sample anticipated over the entire Program Year.

[b] Adjusted by applying net-to-gross ratio to the Portfolio PYTD Verified Impact, which is calculated by aggregating Program Net Impacts. Program Net Impacts are calculated by multiplying Program PYTD Verified Impacts by program Net-to-Gross ratios. Interim net-to-gross ratios for the Program Year are to be used for quarterly reports, i.e., net-to-gross ratios are to be calculated with available data. Net-to-Gross ratio is 1.0 for Program Year 2.

[c] Avoided supply costs, including the reduction in costs of electric energy, generation, transmission, and distribution capacity, and natural gas valued at marginal cost for periods when there is a load reduction. Subject to TRC Order. TRC Benefits reporting requirement is waived for the PY2Q2 quarterly report.

[d] Costs paid by the program administrator and participants plus the increase in supply costs for any period when load is increased. Subject to TRC Order.

[e] Subject to TRC Order. TRC Benefit-Cost Ratio reporting requirement is waived for the PY2Q2 quarterly report.

[f] MWh targets for 2011. MW targets for 2013. Savings based on CPITD.

[g] 8.1x10-4 metric tons of CO2 per kWh (EPC's eGRID2007 Version 1.1, RFCE Region annual non-baseload CO2 output emissions rate, year 2005 data).

3.5 Pennsylvania Electric Company

Table 5: Summary of Penelec Quarterly Report Impacts

	PYTD Reported Gross Impact	Interim PYTD Verified Impact[a]	Interim PYTD Net Impact[b]	Savings Achieved as % of 2011 Targets [f]
Total Energy Savings (MWh)	51,793	50,270	50,270	45.4%
Total Demand Reduction (MW)	6.18	6.06	6.06	15.1%
TRC Benefits ($) [c]	Not Reported	Not Reported	Not Reported	Not Reported
TRC Costs ($) [d]	Not Reported	Not Reported	Not Reported	Not Reported
TRC Benefit-Cost Ratio	Not Reported	Not Reported	Not Reported	Not Reported
CO_2 Emissions Reduction[g] (Tons)	41,952	40,719	40,719	NA

NOTES:

[a] Adjusted by applying realization rate determined by independent EM&V contractor to the Portfolio PYTD Reported Gross Impact, which is calculated by aggregating Program PYTD Verified Impacts. Program PYTD Verified Impacts are calculated by multiplying Program PYTD Reported Gross Impacts by program realization rates. Interim realization rates for the Program Year and impacts are to be used for quarterly reports, i.e., realization rates are to be calculated with available data. Interim realization rates are used to calculate Interim PYTD Verified Impacts. Interim realization rates are based on realization rate calculations from a portion of the sample anticipated over the entire Program Year.

[b] Adjusted by applying net-to-gross ratio to the Portfolio PYTD Verified Impact, which is calculated by aggregating Program Net Impacts. Program Net Impacts are calculated by multiplying Program PYTD Verified Impacts by program Net-to-Gross ratios. Interim net-to-gross ratios for the Program Year are to be used for quarterly reports, i.e., net-to-gross ratios are to be calculated with available data. Net-to-Gross ratio is 1.0 for Program Year 2.

[c] Avoided supply costs, including the reduction in costs of electric energy, generation, transmission, and distribution capacity, and natural gas valued at marginal cost for periods when there is a load reduction. Subject to TRC Order. TRC Benefits reporting requirement is waived for the PY2Q2 quarterly report.

[d] Costs paid by the program administrator and participants plus the increase in supply costs for any period when load is increased. Subject to TRC Order.

[e] Subject to TRC Order. TRC Benefit-Cost Ratio reporting requirement is waived for the PY2Q2 quarterly report.

[f] MWh targets for 2011. MW targets for 2013. Savings based on CPITD.

[g] 8.1x10-4 metric tons of CO2 per kWh (EPC's eGRID2007 Version 1.1, RFCE Region annual non-baseload CO2 output emissions rate, year 2005 data).

3.6 PECO Energy Company

Table 6: Summary of PECO Quarterly Report Impacts

	PYTD Reported Gross Impact	Interim PYTD Verified Impact[a]	Interim PYTD Net Impact[b]	Savings Achieved as % of 2011 Targets[f]
Total Energy Savings (MWh)	336,607	245,995	245,995	113.0%
Total Demand Reduction (MW)	22.4	4.5	4.5	4.5%
TRC Benefits ($) [c]	Not Reported	Not Reported	Not Reported	Not Reported
TRC Costs ($) [d]	Not Reported	Not Reported	Not Reported	Not Reported
TRC Benefit-Cost Ratio	Not Reported	Not Reported	Not Reported	Not Reported
CO_2 Emissions Reduction[g] (Tons)	272,652	199,256	199,256	N/A

NOTES:

[a] Adjusted by applying realization rate determined by independent EM&V contractor to the Portfolio PYTD Reported Gross Impact, which is calculated by aggregating Program PYTD Verified Impacts. Program PYTD Verified Impacts are calculated by multiplying Program PYTD Reported Gross Impacts by program realization rates. Interim realization rates for the Program Year and impacts are to be used for quarterly reports, i.e., realization rates are to be calculated with available data. Interim realization rates are used to calculate Interim PYTD Verified Impacts. Interim realization rates are based on realization rate calculations from a portion of the sample anticipated over the entire Program Year.

[b] Adjusted by applying net-to-gross ratio to the Portfolio PYTD Verified Impact, which is calculated by aggregating Program Net Impacts. Program Net Impacts are calculated by multiplying Program PYTD Verified Impacts by program Net-to-Gross ratios. Interim net-to-gross ratios for the Program Year are to be used for quarterly reports, i.e., net-to-gross ratios are to be calculated with available data. Net-to-Gross ratio is 1.0 for Program Year 2.

[c] Avoided supply costs, including the reduction in costs of electric energy, generation, transmission, and distribution capacity, and natural gas valued at marginal cost for periods when there is a load reduction. Subject to TRC Order. TRC Benefits reporting requirement is waived for the PY2Q2 quarterly report.

[d] Costs paid by the program administrator and participants plus the increase in supply costs for any period when load is increased. Subject to TRC Order.

[e] Subject to TRC Order. TRC Benefit-Cost Ratio reporting requirement is waived for the PY2Q2 quarterly report

[f] MWh targets for 2011. MW targets for 2013. Savings based on CPITD.

[g] 8.1x10-4 metric tons of CO2 per kWh (EPC's eGRID2007 Version 1.1, RFCE Region annual non-baseload CO2 output emissions rate, year 2005 data).

3.7 PPL Electric Utilities

Table 7: Summary of PPL Quarterly Report Impacts

	PYTD Reported Gross Impact	Interim PYTD Verified Impact[a]	Interim PYTD Net Impact[b]	Savings Achieved as % of 2011 Targets[f]
Total Energy Savings (MWh)	197,237	151,794	151,794	62.0%
Total Demand Reduction (MW)	27.61	23.51	23.51	10.0%
TRC Benefits ($) [c]	Not Reported	Not Reported	Not Reported	Not Reported
TRC Costs ($) [d]	Not Reported	Not Reported	Not Reported	Not Reported
TRC Benefit-Cost Ratio	Not Reported	Not Reported	Not Reported	Not Reported
CO_2 Emissions Reduction[g] (Tons)	159,762	122,953	122,953	N/A

NOTES:

[a] Adjusted by applying realization rate determined by independent EM&V contractor to the Portfolio PYTD Reported Gross Impact, which is calculated by aggregating Program PYTD Verified Impacts. Program PYTD Verified Impacts are calculated by multiplying Program PYTD Reported Gross Impacts by program realization rates. Interim realization rates for the Program Year and impacts are to be used for quarterly reports, i.e., realization rates are to be calculated with available data. Interim realization rates are used to calculate Interim PYTD Verified Impacts. Interim realization rates are based on realization rate calculations from a portion of the sample anticipated over the entire Program Year.

[b] Adjusted by applying net-to-gross ratio to the Portfolio PYTD Verified Impact, which is calculated by aggregating Program Net Impacts. Program Net Impacts are calculated by multiplying Program PYTD Verified Impacts by program Net-to-Gross ratios. Interim net-to-gross ratios for the Program Year are to be used for quarterly reports, i.e., net-to-gross ratios are to be calculated with available data. Net-to-Gross ratio is 1.0 for Program Year 2.

[c] Avoided supply costs, including the reduction in costs of electric energy, generation, transmission, and distribution capacity, and natural gas valued at marginal cost for periods when there is a load reduction. Subject to TRC Order. TRC Benefits reporting requirement is waived for the PY2Q2 quarterly report.

[d] Costs paid by the program administrator and participants plus the increase in supply costs for any period when load is increased. Subject to TRC Order.

[e] Subject to TRC Order. TRC Benefit-Cost Ratio reporting requirement is waived for the PY2Q2 quarterly report.

[f] MWh targets for 2011. MW targets for 2013. Savings based on CPITD.

[g] 8.1x10-4 metric tons of CO2 per kWh (EPC's eGRID2007 Version 1.1, RFCE Region annual non-baseload CO2 output emissions rate, year 2005 data).

3.8 Duquesne Light

Table 8: Summary of Duquesne Quarterly Report Impacts

	PYTD Reported Gross Impact	Interim PYTD Verified Impact[a]	Interim PYTD Net Impact[b]	Savings Achieved as % of 2011 Targets[f]
Total Energy Savings (MWh)	34,607	28,023	28,023	22.4%
Total Demand Reduction (MW)	3.1	2.5	2.5	2.3%
TRC Benefits ($) [c]	Not Reported	Not Reported	Not Reported	Not Reported
TRC Costs ($) [d]	Not Reported	Not Reported	Not Reported	Not Reported
TRC Benefit-Cost Ratio	Not Reported	Not Reported	Not Reported	Not Reported
CO_2 Emissions Reduction[g] (Tons)	28,032	22,699	22,699	N/A

NOTES

[a] Adjusted by applying realization rate determined by independent EM&V contractor to the Portfolio PYTD Reported Gross Impact, which is calculated by aggregating Program PYTD Verified Impacts. Program PYTD Verified Impacts are calculated by multiplying Program PYTD Reported Gross Impacts by program realization rates. Interim realization rates for the Program Year and impacts are to be used for quarterly reports, i.e., realization rates are to be calculated with available data. Interim realization rates are used to calculate Interim PYTD Verified Impacts. Interim realization rates are based on realization rate calculations from a portion of the sample anticipated over the entire Program Year.

[b] Adjusted by applying net-to-gross ratio to the Portfolio PYTD Verified Impact, which is calculated by aggregating Program Net Impacts. Program Net Impacts are calculated by multiplying Program PYTD Verified Impacts by program Net-to-Gross ratios. Interim net-to-gross ratios for the Program Year are to be used for quarterly reports, i.e., net-to-gross ratios are to be calculated with available data. Net-to-Gross ratio is 1.0 for Program Year 2.

[c] Avoided supply costs, including the reduction in costs of electric energy, generation, transmission, and distribution capacity, and natural gas valued at marginal cost for periods when there is a load reduction. Subject to TRC Order. TRC Benefits reporting requirement is waived for the PY2Q2 quarterly report.

[d] Costs paid by the program administrator and participants plus the increase in supply costs for any period when load is increased. Subject to TRC Order.

[e] Subject to TRC Order. TRC Benefit-Cost Ratio reporting requirement is waived for the PY2Q2 quarterly report.

[f] MWh targets for 2011. MW targets for 2013. Savings based on CPITD.

[g] 8.1x10-4 metric tons of CO2 per kWh (EPC's eGRID2007 Version 1.1, RFCE Region annual non-baseload CO2 output emissions rate, year 2005 data).

4 Program Implementation and Evaluation Summary by EDC

The following table contains a summary of programs reporting participation and savings to-date, programs evaluated in PY2, and programs to be implemented or with no reported savings by each EDC. Programs "implemented" include only those programs with reported gross impacts; "evaluated" programs include programs with preliminary verified impacts.

Table 9: Summary of Programs Implemented to Date by Each EDC

Allegheny
Programs Implemented and Reporting Savings:
• Compact Fluorescent Lighting (CFL) Rewards Program • Residential ENERGY STAR and High Efficiency Appliance Program • Residential Home Performance Program • Residential HVAC Efficiency Program • Residential Low Income Home Performance Check-Up Audit & Appliance Replacement Program • Residential Low Income Joint Utility Usage Management Program • Government/Non-Profit Lighting Efficiency Program • Commercial HVAC Efficiency Program • Commercial Lighting Efficiency Program • Custom Technology Applications Program • Custom Applications Program • Commercial and Industrial Drives Program
Programs Evaluated:
• None reported.
Programs to be Implemented or with No Reported Savings:
• Critical Peak Rebate (CPR) Rate • Programmable Controllable Thermostat (PCT) Program • Residential Efficiency Rewards Rate • Residential Low Income Room Air Conditioner Replacement Program • Customer Resources Demand Response Program • Distributed Generation Program • Time of Use (TOU) with Critical Peak Pricing Rate • Hourly Pricing Option (HPO) Rate • Customer Load Response Program • Pay Ahead (Smart) Service Rate • Residential Home Performance Program – Check-up and Comprehensive Measures • Critical Peak Rebate Program • Time of Use (TOU) with Critical Peak Pricing Rebate • Customer Load Response Program • Customer Resources Demand Response Program • Distributed Generation Program
Duquesne
Programs Implemented and Reporting Savings:
• Residential: Energy Efficiency (EE) Program (REEP): Rebate Program

- Residential: EE Program (Upstream Lighting)
- Residential: School Energy Pledge
- Residential: Refrigerator Recycling
- Residential: Low Income EE
- Commercial Sector Umbrella EE
- Healthcare EE
- Industrial Sector Umbrella EE
- Mixed Industrial EE
- Office Buildings – Large EE
- Office Buildings – Small EE
- Primary Metals EE
- Public Agency, Non-Profit EE (& Education)
- Retail Stores, Small EE
- Retail Stores, Large EE

Programs Evaluated:

- Residential: EE Programs (REEP): Rebate Program
- Residential: Appliance Recycling
- Residential: Low Income EE
- Commercial Sector Umbrella EE
- Healthcare EE
- Office Buildings – Small EE
- Office Buildings – Large EE
- Retail Stores EE
- Mixed Industrial EE
- Primary Metals EE
- Public Agency, Non-Profit EE (& Education)
- Upstream CFL Program

Programs to be Implemented or with No Reported Savings:

- Chemical Products EE

PECO

Programs Implemented and Reporting Savings:

- Low-Income Energy Efficiency Program
- Smart Lighting Discounts Program
- Smart Appliance Recycling Program
- Smart Home Rebates Program
- Smart Equipment Incentives – C&I
- Smart Equipment Incentives – Government/Nonprofit
- Conservation Voltage Reduction (CVR)

Programs Evaluated:

- PECO Smart Lighting Discounts
- Low-Income Energy Efficiency Program (LEEP)
- PECO Smart Appliance Recycling
- PECO Smart Home Rebates
- PECO Smart Equipment Incentives – Commercial and Industrial (C&I)
- PECO Smart Equipment Incentives – Government & Nonprofit

- Conservation Voltage Reduction
- Residential Direct Load Control
- C&I Direct Load Control

Programs to be Implemented or with No Reported Savings:

- Residential Direct Load Control
- Commercial Direct Load Control C&I New Construction
- Residential New Construction
- Demand-Response Aggregator Contracts
- Distributed Resources
- C&I Permanent Load Reduction

PPL

Programs Implemented and Reporting Savings:

- Appliance Recycling Program (ARP)
- Efficient Equipment Incentive Program
- Custom Incentive Program
- CFL Distribution Program
- Renewables Program
- Low-Income Winter Relief Assistance Program (WRAP)
- E-Power Wise
- HVAC Tune-up Program
- Residential Energy Assessment & Weatherization

Programs Evaluated:

- Appliance Recycling
- CFL Campaign
- Custom Incentives Program
- Efficiency Equipment Incentive Program
- Efficiency Equipment Incentive Program – Commercial & Industrial Lighting
- E-Power Wise
- Low-Income WRAP
- Renewable Energy Program
- HVAC Tune-up Program
- Residential Energy Assessment and Weatherization Program

Programs to be Implemented or with No Reported Savings:

- Energy Efficiency Behavior & Education
- Residential New Construction Program
- Direct Load Control Program
- Load Curtailment Program
- Time of Use Program

Met-Ed

Programs Implemented and Reporting Savings:

- Home Energy Audits
- Appliance Turn-In
- EE HVAC
- EE Products
- WARM Programs

- Energy Audit, Assessment and Equipment Rebate
- C/I Performance Contracting/Equipment
- Streetlighting
- Non-Profit
- Remaining Government/Non-Profit

Programs Evaluated:

- Home Energy Audits
- Appliance Turn-In
- EE HVAC
- EE Products
- WARM Programs
- Energy Audit, Assessment and Equipment Rebate
- C/I Performance Contracting/Equipment

Programs to be Implemented or with No Reported Savings:

- Demand Reduction
- New Construction
- Whole Building
- Multiple Family
- Industrial Motors and Variable Speed Drives (VSD)
- PJM Demand Response

Penelec

Programs Implemented and Reporting Savings:

- Home Energy Audits
- Appliance Turn-In
- EE HVAC
- EE Products
- WARM Programs
- Energy Audit, Assessment and Equipment Rebate
- C/I Performance Contracting/Equipment
- Industrial Motors and VSD
- Streetlighting
- Non-Profit
- Remaining Government/Non-Profit

Programs Evaluated:

- Home Energy Audits
- Appliance Turn-In
- EE HVAC
- EE Products
- WARM Programs
- Energy Audit, Assessment and Equipment Rebate
- C/I Performance Contracting/Equipment
- Industrial Motors and VSD
- Streetlighting
- Non-Profit
- Remaining Government/Non-Profit

Programs to be Implemented or with No Reported Savings:
• Demand Reduction • New Construction • Whole Building • Multiple Family • PJM Demand Response
PennPower
Programs Implemented and Reporting Savings:
• Home Energy Audits • Appliance Turn-In • EE HVAC • EE Products • New Construction • Whole Building • WARM Programs • Energy Audit, Assessment and Equipment Rebate • C/I Performance Contracting/Equipment • Streetlighting • Non-Profit • Remaining Government/Non-Profit
Programs Evaluated:
• Home Energy Audits • Appliance Turn-In • EE HVAC • EE Products • WARM Programs • Energy Audit, Assessment and Equipment Rebate • C/I Performance Contracting/Equipment • Streetlighting • Non-Profit • Remaining Government/Non-Profit
Programs to be Implemented or with No Reported Savings:
• Demand Reduction • Multiple Family • Industrial Motors and VSD • PJM Demand Response

5 Status of EDC EM&V Activities

This section briefly addresses the activities undertaken by the EDCs in terms of developing and implementing EM&V plans and protocols.

5.1 Status of EM&V Plans

As per the guidelines outlined in the *Audit Plan,* the SWE team has reviewed EM&V Plans submitted by the EDCs to verify that the plans comply with the TRM and TRC Orders and meet the minimum evaluation requirements set forth in the *Audit Plan*. The *Audit Plan* provided an outline for the evaluation framework expectations and guidelines necessary to address the following research objectives:

- Determine Realization Rates for Gross Savings;
- Determine Net to Gross (NTG) Ratios[13];
- Determine Method for Calculating Savings; and
- Set acceptable levels of Rigor, Precision and Bias for M&V activities.

No revised EM&V Plans were submitted for SWE review in PY2Q2.

5.2 Status of EDC M&V Activities

The following sections provide a summary of M&V activities by EDC based upon the details provided in each EDC's quarterly report and from information gathered through SWE data requests and audits.

5.2.1 Allegheny

Allegheny's evaluation team has completed the following activities to-date in PY2.

- **Finalized PY2 Evaluation Plan**: 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 PY2. The evaluation plan was finalized in September 2010.
- **Pulled Participant Sample**: TetraTech, Allegheny's EM&V contractor, has been pulling quarterly dynamic batchwise samples for the programs requiring on-site verifications. EM&V samples were pulled for all PY2 programs in preparation for EM&V primary data collection.
- **Complete Commercial baseline survey effort**: The EM&V team completed telephone baseline surveys with 240 customers. The survey collected a range of information on customers' facilities, decision-making processes, and awareness of EE&C programs.
- **Conducted Program Design and Delivery Staff Interviews**: The evaluation team conducted a second round of interviews with Allegheny Power Marketing Managers, as well as implementers as relevant for programs. The interviews updated the EM&V team's understanding of how programs are operating, discussed future possible changes in the programs, and collected information for the upcoming market actor interviews and participant surveys.
- **Updated Program Logic Models**: TetraTech updated the logic models for each program to capture changes in the programs' design and implementation in PY2. The models were updated from program documentation and marketing manager interviews. TetraTech will continue to update the program logic models each year.

[13] Note: Currently, the NTG Ratio is set at 1.0 until further direction by the Commission.

- **Developed C&I Process Flow Maps**: The EM&V team developed detailed process flow maps for the C&I programs. The process flow maps detail information flows and responsibilities among Allegheny Power, the third-party implementation M&V contractor, the EM&V contractor, the SWE, and the customer.
- **Participated in Technical Working Group sessions, biweekly SWE calls and on-site visits**: TetraTech participated with Allegheny Power in several TWG sessions with the SWEs as well as biweekly calls with the SWE. In addition, TetraTech and R.W. Beck attended an on-site visit at Allegheny Power with the SWE in December 2010. This on-site visit included a desk audit of PY2Q2 results and a discussion of planned PY2 EM&V activities.
- **Verified Savings**: The Residential Home Performance Program – Online Energy Audit Measure and Government/School/non-Profit Portfolio Program were sufficiently established in PY1 for cost-effective EM&V efforts. The results of these evaluations were presented in detail in the PY1 Annual Report. TetraTech will verify savings for all programs in PY2.

5.2.2 Duquesne

For savings impact evaluation purposes, on December 2, 2010, an evaluation dataset was downloaded directly from PMRS, Duquesne's internal database and tracking system, that contained record of 2,808 customer actions taken to implement energy efficiency measures termed "projects" completed by Duquesne Light's EE&C Programs during PY2Q2. Data supporting verification of program results for PY2Q2 were recorded within the three month reporting period ending November 30, 2010.

PY2Q2 EM&V was performed for the following segments consistent with the Duquesne Light's EM&V Plan.

- Residential: EE Programs (REEP): Rebate Program
- Residential: Appliance Recycling
- Residential: Low Income EE
- Commercial Sector Umbrella EE
- Healthcare EE
- Office Buildings – Small EE
- Office Buildings – Large EE
- Retail Stores EE
- Mixed Industrial EE
- Primary Metals EE
- Public Agency, Non-Profit EE (& Education)
- Upstream CFL Program

For most programs, PY2Q2 EM&V was completed in a manner to render quarterly verification rates. Verification activities are on-going for certain large projects with custom M&V protocols. The upstream lighting program (point-of-purchase, instant rebates) began operating in PY2Q2 and is achieving significant market penetration. Going forward, as related in Duquesne's EM&V Plan (Section 2.7), Duquesne Light's EM&V contractor will work with the program implementer to address relevant issues

such as program leakage or the purchase and installation of discounted lighting products by non-customers.

5.2.3 PECO

As reported in PECO's PY2Q2 Report, a summary of PECO's evaluation activities are copied below.

- **Smart Lighting Discounts**. The M&V completed for the 2nd quarter report consisted of reviewing the Q2 tracking data provided to the evaluation team by PECO lighting staff, as well as reviewing all of the manufacturer invoices received and approved by PECO and Ecos, the Smart Lighting program implementer, through the end of November 2010.
- **Low-Income Energy Efficiency Program**. Participant surveys provide information on installation rates, which are used to adjust savings. These surveys are conducted annually with a random sample of participants in each program component. The program has several components, including an audit component and three compact fluorescent lamp (CFL) bulb components. The Navigant team, PECO's evaluator, uses deemed savings for the CFL components and the approved protocol for home energy audits, which is based on billing analyses of previous participants in PECO's Low Income Usage Reduction Program.
- **Smart Appliance Recycling Program**. Phone surveys will be conducted quarterly or semi-annually to gather data to support the impact element of the Smart Appliance Recycling Program evaluation. Information from the phone survey will be used to calculate a part-use factor which will then be applied to a gross savings estimate. The phone survey of a sample of Q1 and Q2 participants will be conducted in early January 2011. In addition, a phone survey of nonparticipants will be completed during the summer of 2011.
- **Smart Home Rebates Program**. As in PY1, the impact evaluation will include participant-survey-based verification. Additionally, a limited number of site visits will be conducted to verify and confirm appropriate installation of and function of shell measures and white roofs, which had limited introduction last year and are expected to have increases in participation in PY2. Additional site visits to participants who have received fuel switching incentives will be conducted, as well, to confirm whether gas appliances actually replaced electric appliances.
- **Commercial and Industrial Smart Equipment Incentives Program**. Currently, the PY2 impact evaluation is focused on data analysis of first and second quarter program results. A secondary activity is reviewing findings from PY1 to inform PY2 evaluation efforts. As with PY1, site visits are planned, with more extensive data collection in PY2 beginning in January 2011. A review of PECO's current tracking system and quality control and savings verification procedures has been ongoing to update PY1 findings, following up on changes triggered by TRM updates, SWE audit findings, and new procedures implemented by the program implementer.
- **Government and Nonprofit Smart Equipment Incentives Program**. Currently, the PY2 evaluation is focused on planning for PY2, including data analysis of first and second quarter program results. A secondary activity is reviewing findings from PY1 to inform PY2 evaluation efforts. As with PY1, site visits are planned, with more extensive data collection in PY2.

- **Direct Load Control**. No control events were called for this program in the first half of PY2 so there are no impacts to report. Preparations were made for on-site verification of installations since installations have started. The on-site verifications will be conducted in the third quarter of PY2.

5.2.4 PPL

As stated in PPL's PY2Q2 Report, the EM&V team calculated realization rates to adjust reported savings based on statistically significant verified savings measured by independent evaluators. The realization rate is defined as the percentage of reported savings that is achieved, as determined through the independent evaluation review. A realization rate of 1 (or 100%) indicates no difference between the reported and achieved savings. Realization rates were determined by certain attributes relative to one of three protocol types:

1. Fully deemed TRM measure realization rates are driven by differences in the number of installed measures.
2. Partially deemed TRM measure realization rates are driven by (a) differences in the number of installed measures and (b) differences in the variables.
3. Custom measure realization rates are driven by differences in the energy savings determined by approved protocols. The protocol type determines the data type that is sampled.

5.2.5 Met-Ed

The Companies (Met-Ed, Penelec, PennPower) have selected ADM Associates, Inc. (ADM) as the M&V contractor. ADM concluded the impact evaluation for all programs that were implemented by August 31, 2010. ADM's methods of evaluation include physical inspection, on-site data gathering, and monitoring.

The current program year (PY2), beginning June 1, 2010, will be the first year of full-scale portfolio implementation. ADM has drafted revised evaluation plans for Met-Ed's portfolio for the current program year. The main changes to the evaluation plan include:

- Consolidation of certain non-residential programs that share the same management, Conservation Service Providers (CSP), and rebated measures; and
- The separation of the categories of rebates into two categories: custom measures or prescriptive measures.

At the time of Met-Ed's PY2Q2 report, ADM has completed 104 surveys and site inspections out of an anticipated sample of 636 for PY2.

5.2.6 Penelec

The Companies M&V Contractor, ADM, concluded the impact evaluation for all programs that were implemented by August 31, 2010. ADM's methods of evaluation include physical inspection, on-site data gathering, and monitoring. The M&V efforts for the various measures in Penelec's portfolio are described below.

Deemed Measures (measures that have deemed savings in the PA TRM or interim TRM) are subject to the following verifications in order to be included in Penelec's energy savings and demand reduction calculations:

1. Verification that the energy savings are being claimed correctly, using the appropriate protocols in the TRM; and
2. On-site, physical verification that the measures are actually installed and commercially operable, except for the following acceptable alternatives:
    a. For upstream CFLs, review of invoices and verification of shipment to participating retailers
    b. For recycled refrigerators/freezers and room ACs, verification of pick-up through customer interviews.
    c. For the low-income weatherization program, statistical analysis of customer billing data. The on-site verification is conducted for quality assurance purposes rather than for impact evaluation.

Deemed measures implemented by Penelec include refrigerator retirement, low-income weatherization, electric water heaters, and upstream rebates on CFLs.

Partially Deemed Measures (measures that have partially deemed savings in the PA TRM or interim TRM) are subject to the following verifications in order to be included in Penelec's energy savings and demand reduction calculations:

1. Verification that the energy savings are being claimed correctly, using the appropriate protocols in the TRM;
2. Verification that the measures are actually installed and commercially operable;
3. Data gathering to support the values of variable parameters, such as "in-service rates" for items that are not directly installed, or nameplate capacities and efficiencies of appliances; and
4. Verification of baseline equipment or conditions, either by a pre-retrofit inspection or by review of documentation of pre-retrofit conditions.

Partially deemed measures implemented by Penelec include rebated dehumidifiers, room air conditioners, heat pumps, and refrigerators; conservation kits sent to participants of online audits; and commercial lighting upgrades.

Custom measures are subject to the following verifications in order to be included in Penelec's energy savings and demand reduction calculations:

1. Drafting and receiving the PA Statewide Evaluator's approval on a custom measure protocol used to estimate ex-ante and ex-post energy impacts.[14]

[14] *Ex ante* savings are also known as "claimed savings" and result directly from completed program-related actions taken by participants. *Ex post* savings are also known as "verified savings" and are based on an independent assessment of the reliability of the *ex ante* savings.

2. Verification that the parameters and data used to design the protocol are accurate and well founded.
3. Some protocols will require both pre-installation and post-installation monitoring.
4. Verification that the data derived from monitoring or on-site inspections is being used appropriately in the protocols.

5.2.7 PennPower

The Companies M&V Contractor, ADM, concluded the impact evaluation for all programs that were implemented by August 31, 2010. ADM's methods of evaluation include physical inspection, on-site data gathering, and monitoring. The M&V efforts for the various measures in PennPower's portfolio are described below.

Deemed Measures (measures that have deemed savings in the PA TRM or interim TRM) are subject to the following verifications in order to be included in PennPower's energy savings and demand reduction calculations:

1. Verification that the energy savings are being claimed correctly, using the appropriate protocols in the TRM; and
2. On-site, physical verification that the measures are actually installed and commercially operable, except for the following acceptable alternatives:
    a. For upstream CFLs, review of invoices and verification of shipment to participating retailers
    b. For recycled refrigerators and room ACs, verification of pick-up through customer interviews.
    c. For the low-income weatherization program, statistical analysis of customer billing data. The on-site verification is conducted for quality assurance purposes rather than for impact evaluation.

Deemed measures implemented by PennPower include refrigerator retirement, low-income weatherization, electric water heaters, and upstream rebates on CFLs.

Partially Deemed Measures (measures that have partially deemed savings in the PA TRM or interim TRM) are subject to the following verifications in order to be included in PennPower's energy savings and demand reduction calculations:

1. Verification that the energy savings are being claimed correctly, using the appropriate protocols in the TRM;
2. Verification that the measures are actually installed and commercially operable;
3. Data gathering to support the values of variable parameters, such as "in-service rates" for items that are not directly installed, or nameplate capacities and efficiencies of appliances; and
4. Verification of baseline equipment or conditions, either by a pre-retrofit inspection or by review of documentation of pre-retrofit conditions.

Partially deemed measures implemented by PennPower include rebated dehumidifiers, room air conditioners, heat pumps, and refrigerators; conservation kits sent to participants of online audits; and commercial lighting upgrades.

Custom measures are subject to the following verifications in order to be included in PennPower's energy savings and demand reduction calculations:

1. Drafting and receiving the PA Statewide Evaluator's approval on a custom measure protocol used to estimate ex-ante and ex-post energy impacts.
2. Verification that the parameters and data used to design the protocol are accurate and well founded.
3. Some protocols will require both pre-installation and post-installation monitoring.
4. Verification that the data derived from monitoring or on-site inspections is being used appropriately in the protocols.

6 Statewide Evaluator Audit Activities

As part of the SWE audit activities, the members of the SWE team will meet with each EDC to review current program implementation and evaluation activities and to address any pressing issues. Currently, the SWE team holds bi-weekly teleconferences with each EDC to discuss current and planned M&V activities, to schedule upcoming site visits and audit activities, and to address any unresolved questions or issues that may arise throughout the evaluation process. During the current program year, the SWE team will travel to each EDC and to specific project sites to conduct on-site audits of the various programs implemented in PY2. Additionally, the SWE team is in the process of conducting desktop audits for various programs. An update on each of these activities is provided in the following sections.

6.1 EDC Meetings

No meetings were held at EDC headquarters this quarter.

6.2 Desktop Audits

The desktop audit of PY2Q2 programs typically includes a review of the following: program kWh and kW savings calculations and database quality. The information required to conduct these reviews was provided by the EDCs in conjunction with their respective PY2Q2 reports. An update on these audits, by customer sector, is provided in the following sections.

6.2.1 Residential Programs

A summary of the residential audit activities is presented the following sections.

6.2.1.1 Efficient Equipment Programs

6.2.1.1.1 Allegheny

For PY2Q2, the SWE requested 10 rebate applications and the corresponding data entries for those applications from Allegheny's Efficient Equipment Program. The SWE then checked for consistency

between the rebate applications and submitted receipts, invoices and EnergyGuides and also against the entries for the rebate applications in Allegheny's database. In this check, the SWE did not find any quality control (QC) errors in consistency across each of the mediums.

6.2.1.1.2 FirstEnergy

For PY2Q2, the SWE requested 10 rebate applications and the corresponding data entries for those applications from each of the FirstEnergy Utilities' Efficient Equipment Programs. The SWE received 10 rebate applications from the whole of FirstEnergy. Three of these applications came from Med-Ed, 4 from Penelec and 2 from Penn Power. One rebate application did not designate which utility it belonged. The SWE was unable to check these applications against the uploaded database as the database did not show individual account numbers to match against the applications. The SWE however was able to check for consistency between the rebate applications and submitted receipts and invoices. In this check, the SWE found that one of the original rebate applications was rejected and then resubmitted by the customer as it was missing the sales receipt. FirstEnergy sent a letter back to this customer, the customer resubmitted the application with the required receipt and FirstEnergy then rebated the customer.

6.2.1.1.3 PECO

For PY2Q2, the SWE requested 10 rebate applications and the corresponding data entries for those applications from PECO's Efficient Equipment Program. The SWE then checked for consistency between the rebate applications and submitted receipts and invoices and also against the entries for the rebate applications in PECO's database. In this check, the SWE found that a few of the original rebate applications were rejected and then resubmitted by customers as they were missing pertinent information, such as signatures or receipts. PECO sent letters back to each of these customers, the customers resubmitted the application with the required information and PECO then rebated the customers. In this check, there were also 2 customers that submitted receipts from the installation of EE measures and did not submit a rebate application. These customers showed up in the PECO database as having submitted an adequate application and their measures have been rebated.

6.2.1.1.4 PPL

For PY2Q2, the SWE requested 10 rebate applications and the corresponding data entries for those applications from PPL's Efficient Equipment Program. The SWE then checked for consistency between the rebate applications and submitted receipts and invoices and also against the entries for the rebate applications in PPL''s database. In this check the SWE found no QC errors between the database and the submitted rebate applications and receipts.

6.2.1.1.5 Duquesne

For PY2Q2, the SWE requested 10 rebate applications and the corresponding data entries for those applications from Duquesne's Efficient Equipment Program. The SWE then checked for consistency between the rebate applications and submitted receipts and invoices and also against the entries for the rebate applications in Duquesne's database. In this check, the SWE found one customer with two appliances (refrigerator and dehumidifier) on his rebate application but a corresponding receipt for only

one of these appliances (the refrigerator). Duquesne only has a record of the refrigerator in the Duquesne database.

6.2.1.2 Appliance Recycling Programs

The SWE team reviewed the estimates of program kWh and kW savings reported by each EDC for their appliance recycling programs. The SWE team found that all of the EDCs did correctly use the annual deemed savings value of 1,728 kWh for each refrigerator or freezer removed. None of the EDCs however, made any adjustments to unit kWh savings for the high percentage of removed appliances that were subsequently replaced with a new unit. According to data supplied by the EDCs for PY2Q2, about 30 percent[15] of removed appliances were subsequently replaced with new units. The SWE team recommends that the annual kWh savings for these specific units be lowered to a value of 1,205 kWh annually. If savings are not adjusted to reflect actual savings when a removed appliance is replaced, savings for this program will be grossly overstated.

6.2.1.2.1 Allegheny

In response to the SWE's data request, Allegheny uploaded a sample of 10 random JACO work orders from PY2Q2. The SWE checked the information presented on these work orders against the Allegheny Appliance Recycling database. There were 8 refrigerators and 2 freezers in this sample. The SWE found no QC issues or inconsistencies between the JACO orders sampled and the Allegheny database.

6.2.1.2.2 Met-Ed

In response to the SWE's data request, Met-Ed uploaded a sample of 10 random JACO work orders from PY2Q2. The SWE checked the information presented on these work orders against the Met-Ed Appliance Recycling database. There were 7 refrigerators, 4 freezers and 6 room air conditioners in this sample. The SWE found no QC issues or inconsistencies between the JACO orders sampled and the Met-Ed database.

6.2.1.2.3 PennPower

In response to the SWE's data request, Penn Power uploaded a sample of 10 random JACO work orders from PY2Q2. The SWE checked the information presented on these work orders against the Penn Power Appliance Recycling database. There were 7 refrigerators and 4 freezers in this sample. The SWE found no QC issues or inconsistencies between the JACO orders sampled and the Penn Power database.

6.2.1.2.4 Penelec

In response to the SWE's data request, Penelec uploaded a sample of 10 random JACO work orders from PY2Q2. The SWE checked the information presented on these work orders against the Penelec Appliance Recycling database. There were 8 refrigerators and 3 freezers in this sample. The SWE found no QC issues or inconsistencies between the JACO orders sampled and the Penelec database.

[15] Does not include PPL data, which was not available at the time of this report.

6.2.1.2.5 PECO

In response to the SWE's data request, PECO uploaded a sample of 10 random JACO work orders from PY2Q2. The SWE checked the information presented on these work orders against the PECO Appliance Recycling database. There were 10 refrigerators and 3 room air conditioners in this sample. The SWE found no QC issues or inconsistencies between the JACO orders sampled and the PECO database.

6.2.1.2.6 PPL

In response to the SWE's data request, PPL uploaded a sample of 10 random JACO work orders from PY2Q2. The SWE checked the information presented on these work orders against the PPL Appliance Recycling database. The SWE found no QC issues or inconsistencies between the JACO orders sampled and the PPL database.

6.2.1.2.7 Duquesne

In response to the SWE's data request, Duquesne uploaded a sample of 10 random JACO work orders from PY2Q2. The SWE checked the information presented on these work orders against the Duquesne Appliance Recycling database. There were 8 refrigerators and 4 freezers in this sample. The SWE found no QC issues or inconsistencies between the JACO orders sampled and the Duquesne database.

6.2.1.3 Lighting Programs

The SWE team has reviewed the savings calculations and has conducted a quality review of the database entries for PY2Q2 lighting projects. The EDCs have provided complete databases for their respective CFL lighting programs – rebates programs, give-away events, and buy-down programs. Additionally, invoices for all PY2Q2 CFLs distributed were provided.

Below is a summary of the savings reported for each EDC's residential lighting program. The tables include the gross and verified savings, where applicable, as well as the percent of PY2 savings attributed to the program. As indicated in the tables below, the savings associated with the residential lighting programs in PY2 constitute a large portion of the reported PY2 savings.

Table 6-1: PYTD Gross and Verified MWh Savings

EDC	Program	PYTD Reported Gross Impacts (MWh)	Realization Rate	Preliminary PYTD Verified Impact (MWh)	% of PY2 Verified MWh Savings
Allegheny	CFL Rewards Program	10,473	--	--	--
Duquesne	Residential: EE Program (Upstream Lighting)	16,878	1.0	16,878	60.2%
PECO	Smart Lighting Discounts Program	82,215	1.0	82,215	33.4%
PPL	CFL Campaign	71,807	1.0	71,807	47.3%
Met-Ed	EE Product Program[16]	9,389	1.0	9,389	24.4%
Penelec	EE Product Program[17]	10,818	1.0	10,818	21.5%
PennPower	EE Product Program[18]	6,762	1.0	6,762	40.0%

[16] CFL measures and savings are included as part of the EE Products Program. The data presented in this table pertains to the EE Products Program in its entirety and is not specific to the CFL portion.
[17] *Ibid.*
[18] *Ibid.*

Table 6-2: PYTD Gross and Verified MW Savings

EDC	Program	PYTD Reported Gross Impacts (MW)	Realization Rate	Preliminary PYTD Verified Impact (MW)	% of PY2 Verified MW Savings
Allegheny	CFL Rewards Program	0.6	--	--	--
Duquesne	Residential: EE Program (Upstream Lighting)	0.91	1.0	0.9053	36.8%
PECO	Smart Lighting Discounts Program	4.52	1.0	4.52	100.0%
PPL	CFL Campaign	4.28	1.0	4.28	18.2%
Met-Ed	EE Product Program[19]	0.58	1.0	0.58	12.7%
Penelec	EE Product Program[20]	0.63	1.0	0.63	10.4%
PennPower	EE Product Program[21]	0.39	1.0	0.39	25.3%

6.2.1.3.1 Allegheny

- Total Participants Reported in PY2Q2 Report: Allegheny reported 67,702 CPITD participants in PY2Q2.
    - The CPITD participant total reported by Allegheny in PY2Q2 is supported by the database counts for rebate and buy-down participants.
- Total Savings Reported in PY2Q2 Report: Allegheny reported 8,981 MWh IQ and 10,473 MWh PYTD in PY2Q2.
    - Allegheny's Energy Savings Calculator reports 10,554 MWh savings for rebated and POS[22] bulbs. The SWE team requests that Allegheny address this discrepancy.
    - Allegheny's Energy Savings Calculator reports POS rebates of 9,659.9 MWh; the source of the data used to report these savings is unclear as the POS rebates for PY2Q2 total 8563.2 MWh. The SWE team recommends that Allegheny address this issue and correct the reported savings as appropriate.
- Use of 2010 TRM Savings Protocols: All savings were calculated in accordance with the TRM protocols.
- Baseline Assumptions:
    - 3-way Bulbs: It is unclear how Allegheny estimates the efficient and baseline conditions for 3-way bulbs. The SWE team requests that Allegheny provide the assumptions used to estimate the savings of these bulbs.
- Invoice Review:
    - Allegheny provided a sample of 20 applications for those customers participating in Allegheny's lighting program through mail-in rebates. As part of our audit, the SWE team reviewed 5 rebate forms against Allegheny's database. Our review identified that Allegheny's rebates are not consistently filled out by program participants. Typically, the bulb counts by type and totals are not properly recorded by the participant. As such,

[19] *Ibid.*
[20] *Ibid.*
[21] *Ibid.*
[22] POS refers to bulbs that are discounted at the time of purchase or "point-of-sale."

Allegheny must make assumptions as to the number of bulbs purchased by each participant. The SWE team supports this corrective action taken by Allegheny

- Allegheny provided 12 invoices for their lighting buy-down program. No issues were identified during the SWE audit.

6.2.1.3.2 Duquesne

- Total Participants Reported in PY2Q2 Report: Duquesne reported 255,744 PY2Q2 participants. Duquesne's PY2Q2 Interim Quarterly (IQ) participants totaled 96,589. The PYTD participant total – 352,333 – matches the total SKUs tracked in Duquesne's database.
- Total Savings Reported in PY2Q2 Report: Duquesne reported 12,329.53 MWh IQ and 16,877.6 MWh PYTD savings in PY2Q2.
    - The SWE audit of Duquesne upstream lighting database confirmed the 16,878 MWh savings reported in Duquesne's PY2Q2 report.
- Use of 2010 TRM Savings Protocols:
    - All savings have been "hardcoded" in Duquesne's database. The SWE team calculated the savings for 10 entries as a "check" against Duquesne's reported values. In all 10 instances, the SWE team calculations were greater than or equal to Duquesne's reported values. These discrepancies, however, are likely the result of rounding errors and no corrective action is required at this time.
- Baseline Assumptions: The SWE team reviewed 10 database entries to verify the baseline assumptions utilized by Duquesne when calculating CFL savings. The baseline assumptions were compared to the ENERGY STAR equivalency table. Of the 10 entries reviewed, 3 bulbs required further investigation.
    - 2 bulbs described as "100W Twist BW 1-pack" had an assumed CFL equivalency of 22W; the actual specifications for this bulb are 23W.
    - 1 bulb described as "60W Twist 4-Pack" had an assumed CFL equivalency of 12W; the actual specifications for this bulb are 13W.
    - In both instances, the SWE team recommends that Duquesne correct the baseline assumptions for these entries in future reports; however, no amendments to the PY2Q2 savings are required as the actual impacts are minimal.
- Invoice Review: Duquesne provided four invoices for review.
    - Invoice 6553: No issues identified.
    - Invoice 6554: No issues identified.
    - Invoice 6555: The database does not match the invoice in this case. The database includes entries for TCP-brand bulbs distributed through a giveaway event, which are not invoiced. Additionally, the invoice contains TCP-brand bulbs ($2,000.20) that are not included in the database. The SWE team recommends that Duquesne clarify this discrepancy and adjust their total savings if appropriate.
    - Invoice 6556: No issues identified.

6.2.1.3.3 PECO

- Total Participants Reported in PY2Q2 Report: PECO reported 949,793 IQ lamp sales; PECO's database tracked 949,793 bulbs in PY2Q2; no issues were identified.
- Total Savings Reported in PY2Q2 Report: PECO reports 45,264 MWh (IQ). Their database calculates savings at 45,264 MWh. There is no difference between the reported savings and savings tracked in the database.
- Use of 2010 TRM Savings Protocols:
    - Energy Savings: The database reported savings entries fall within 5% of the SWE calculated savings. The actual discrepancies amount to a -0.03% difference between total kWh reported and total kWh SWE calculated.
    - Demand Savings: The database reported savings entries fall within 5% of the SWE calculated savings. The actual discrepancies amount to a 1.13% difference between total kW reported and total kW SWE calculated.
    - Note: The discrepancies are likely the result of rounding errors as the values compared were for total lamp sales of each particular database line.
- Baseline Assumptions:
    - A sample of 10 bulbs was selected for review. The CFL wattages of each bulb were mapped to an ENERGY STAR incandescent equivalency map to verify that the PECO assumed base fell within the recommended range. Two bulbs did not fall within the ENERGY STAR equivalency estimates; however, upon further review, PECO's assumptions fell within the recommended manufacturers equivalency ranges for each bulb.
- Invoice Review: Five invoices were compared to PECO's database for a quality review.
    - Invoice 5505: No issues were identified.
    - Invoice 5507: No issues were identified.
    - Invoice 5508: No issues were identified.
    - Invoice 5509: No issues were identified.
    - Invoice 5510: No issues were identified.

6.2.1.3.4 PPL

- Total Participants Reported in PY2Q2 Report: PPL reported 102,425 participations or 988,915 bulbs in PY2Q2. The IQ participant and bulb counts match the entries tracked in PPL's database for PY2Q2.
- Total Savings Reported in PY2Q2 Report: PPL reported 46,977 MWh in PY2Q2. This savings value matches the total savings tracked in PPL's database for PY2Q2.
- Use of 2010 TRM Savings Protocols: All savings have been "hardcoded" in PPL's database. The SWE team calculated the savings for 10 entries as a "check" against PPL's reported values. In all 10 instances, the SWE team calculations were equal to those values reported in the database.
- Baseline Assumptions: The SWE team reviewed 10 database entries to verify the baseline assumptions utilized by PPL when calculating CFL savings. The baseline assumptions were compared to the ENERGY STAR equivalency table, and no issues were identified.

- Invoice Review: PPL provided three work packages; the SWE team audited a sample of 6 invoices. No issues were identified.

6.2.1.3.5 FirstEnergy

Note: FirstEnergy's CFL program is reported as part of its Energy Efficient Equipment Program.

- Total Participants Reported in PY2Q2 Report:
  - The FirstEnergy companies reported participant counts in Table 1-3 of their respective quarterly reports.
  - IQ participant counts reported in the Companies' respective PY2Q2 reports matched the IQ counts tracked in the database.
- Total Savings Reported in PY2Q2 Report:
  - FirstEnergy reports savings of CFL bulbs as part of their EE Products Program.
- Use of 2010 TRM Savings Protocols: No issues were identified. The FirstEnergy Companies utilized the appropriate savings algorithms per the TRM protocols.
- Baseline Assumptions: The SWE team reviewed the baseline assumption data provided by FirstEnergy. All the baseline assumptions fell with the ENERGY STAR Equivalency range estimates and no errors were identified.
- Invoice Review:
  - The SWE team reviewed five invoices, no issues were identified.

6.2.2 Low-Income Programs

No audit work was conducted on the Low-Income Program in PY2Q2. The SWE team has audited these programs in previous quarters with desktop review and on-site visits. The SWE team will continue audit work on low-income programs in future quarters.

6.2.3 Non-Residential Programs

The following sections detail findings of the desktop audits for non-residential programs.

6.2.3.1 Allegheny

Allegheny listed eleven programs under the non-residential umbrella, which includes the small commercial and industrial (SCI), large commercial and industrial (LCI), and government & non-profit (GNP) sectors. Of these eleven programs, four programs achieved energy and demand savings during PY2Q2, two programs did not achieved any savings, and five demand response programs had not been launched. The programs achieved a gross reported energy savings of 3,835 MWh during PY2Q2, 8,493 MWh during PY2, and 11,704 MWh cumulative to date. Key figures for PY2Q2 for each individual program are shown in Table 6-3.

Table 6-3: Allegheny Non-Residential Programs Quarterly Summary

Program	Participants	MWh	MW
Government & Non-Profit Lighting Efficiency	65	1,221	0.80
Commercial Lighting Efficiency	34	1,668	0.30
Custom Technology Applications	1	272	0.00
Custom Applications	1	674	0.10
Commercial HVAC Efficiency	0	0	0.00
Commercial Drives	0	0	0.00
Customer Resources Demand Response	Inactive	N/A	N/A
Distributed Generation	Inactive	N/A	N/A
Time of Use with Critical Peak Pricing Rate	Inactive	N/A	N/A
Hourly Pricing Option	Inactive	N/A	N/A
Customer Load Response	Inactive	N/A	N/A
TOTAL	**101**	**3,835**	**1.20**

6.2.3.1.1 Review of Savings Database

Allegheny provided a series of spreadsheet databases that list the projects that achieved savings under each program during PY2Q2. The savings recorded in this spreadsheet were compared to the values recorded in the quarterly report to verify accuracy in the reporting process and to ensure that savings were actually achieved by the programs.

Savings attributed to lighting measures were broken down into three categories, where the two Government & Non-Profit categories combine to make up the Government & Non-Profit Lighting Efficiency Program. The numbers can be compared in Table 6-4.

Table 6-4: Allegheny Lighting Programs Energy Savings Comparison

Category	Q2 Savings per Spreadsheet[23]	Combined by Program	Q2 Savings per Report
Government & Non-Profit Free Lighting	630 MWh	1,616 MWh	1,221 MWh
Government & Non-Profit Rebate Lighting	986 MWh		
Commercial & Industrial Rebate Lighting	1,460 MWh	1,460 MWh	1,668 MWh
Total	**3,078 MWh**	**3,078 MWh**	**2,889 MWh**

It was observed that the savings figures for the incremental quarter were different, whereas the cumulative savings figures were consistent. This discrepancy was also found in the previous quarterly report and noted for Allegheny to document. Although this error does not affect the cumulative values,

[23] Savings calculated by summing "claimed savings kWh" for all projects that had a "lock down rebate date" or "completed date" (for free lighting) of 9/1/2010 or later.

consistent errors in quarterly reporting cause concern for inadequate reporting procedures. Specifically, it may indicate that ex-ante savings are being changed for projects already completed and reported in previous reports. The SWE recommends that Allegheny ensure consistency in the quarterly figures as well as the cumulative figures.

Allegheny also noted that adjustments were made for ten projects where savings were incorrectly attributed to the wrong program. For example, project PCLGT00000008 accounted for a total of 125 MWh through participation in the Government & Non-Profit Lighting Efficiency Program. However, Allegheny noted that 15 MWh should have been allocated to the Commercial & Industrial Program. These adjustments accounted for 192 MWh of change. Although the overall effect of this error is minimal, consistent reporting errors may cause concern for inadequate reporting procedures. Specifically, it may undermine the credibility of ex-ante savings figures and realization rates if the database cannot be reasonably reconciled with the reports. The SWE recommends that Allegheny investigate these cases and ensure consistency in the future.

Savings for the Custom Technology and Custom Technology Applications Programs provided through spreadsheet databases were reviewed. These values were consistent with the recorded values in the quarterly report.

Spreadsheet databases were also provided for the HVAC Efficiency and Drives Programs. No projects were recorded as completed during PY2Q2. This is consistent with the quarterly report.

6.2.3.1.2 Review of Project Files

Allegheny did not provide project files for PY2Q2 projects in time for this quarterly report. A sample of projects will be desk audited and reviewed during the next quarterly report.

6.2.3.1.3 Review of Report Consistency

Allegheny's reported values were found to be consistent with previous quarterly reports. No significant discrepancies were observed from the PY2 Q1 to the PY2Q2 reports.

6.2.3.2 PECO

PECO listed three programs under the non-residential umbrella, which includes the SCI, LCI, and GNP sectors. Of these three programs, two programs achieved energy and demand savings during PY2Q2 and one demand response program did not achieve any. The programs achieved a gross reported energy savings of 28,251 MWh during PY2Q2, 45,713 MWh during PY2, and 59,206 MWh cumulative to date. Key figures for PY2Q2 for each individual program are shown in Table 6-5.

In addition to these three programs, the CVR program also achieved savings in the non-residential sector. However, due to the nature of the program, segmentation between sectors was not possible. The CVR program achieved 72,639 MWh of savings across all sectors during PY2Q2.

Table 6-5: PECO Non-Residential Programs Quarterly Summary

Program	Participants	MWh	MW
Smart Equipment C&I	226	18,777	3.41
Smart Equipment GNP	50	9,474	1.95
Commercial Direct Load Control	7	N/A	N/A
TOTAL	**276**	**28,251**	**5.36**

6.2.3.2.1 Review of Savings Database

PECO provided a spreadsheet database extract that contained information for each measure, project, and customer participating in PECO programs during PY2Q2. The savings recorded in this spreadsheet were compared to values recorded in the quarterly report to verify accuracy in the reporting process and to ensure that savings were actually achieved by the programs.

After review of the CANDI spreadsheets dated December 17, 2010, it was observed that energy and demand savings were summed correctly. Projects claiming savings for PY2Q2 were determined by using the invoice date. Projects for which the invoice was sent by KEMA to PECO during PY2Q2 were included in PY2Q2 population. For the Smart Equipment C&I program, the spreadsheet showed a total of 226 participants achieving impacts of 18,776,677 kWh and 3,409 kW during PY2Q2. For the Smart Equipment GNP program, the spreadsheet showed a total of 50 participants achieving impacts of 9,473,747 kWh and 1,952 kW during PY2Q2. This also included 9 participants achieving 3,139,631 kWh and 1,196 kW for municipal lighting, which consists of traffic signals that are fully deemed in the TRM.

PECO noted that there were some discrepancies between the reporting values and the TRM calculated values for municipal lighting projects. The database committed an error where it did not properly process arrow lights and considered them as round lights, effectively overestimating savings. The savings discrepancy was noted to be 275,235 kWh. It is expected that Navigant will correct for this error during their evaluation processes. The SWE will check to ensure that this is performed.

6.2.3.2.2 Review of Project Files

PECO provided project files for a sample of projects selected by PECO's evaluator. These project files were provided by PECO's implementation CSP. Savings recorded in the databases were checked against actual project files to verify consistency in the reporting process and to identify potential opportunities for improvement. The SWE team reviewed five project files to verify that savings were consistently reported.

1. Very small discrepancies in impacts were observed for Project #313. The database reported savings of 307,944 kWh and 69.24 kW whereas the calculation sheets report savings of 307,996 kWh and 69.26 kW. This represents a 0.02% error in energy savings and 0.03% error in demand savings.
2. No discrepancies were observed for Project #567. The database reported savings of 264,246 kWh and 49.50 kW. This was consistent with the project files.

3. Very small discrepancies in impacts were observed for Project #144. The database reported savings of 32,358 kWh and -15.61 kW, whereas the calculation sheets report savings of 30,986 kWh and -15.70 kW. This represents a 4.24% error in energy savings and 0.58% error in demand savings.
4. No discrepancies were observed for Project #833. The database reported savings of 1,980 kWh and 0.59 kW. This is consistent with the project files.
5. Discrepancies in impacts were observed for Project #636. The database reported savings of 24,416 kWh and 5.23 kW, whereas the calculation sheets report savings of 12,510 kWh and 1.43 kW. This represents a 48.76% error in energy savings and 72.66% error in demand savings. This project was categorized as a municipal lighting project, which was identified as having issues. As mentioned above, the SWE recommends that the PECO evaluation contractor correct this error.

Although discrepancies observed in these five projects were very minor, inconsistencies suggest inadequate reporting procedures that could undermine the integrity of the ex-ante savings. In some cases, such errors could be typographical or clerical in nature. The SWE recommends that quality assurance/quality control (QA/QC) processes be improved to minimize these discrepancies.

6.2.3.2.3 Review of Report Consistency

PECO's reported values were found to be inconsistent with previous quarterly reports. The Smart Equipment C&I program reported 13,113 MWh and 2.28 MW for 143 participants in PY2Q1 Report, whereas the calculated Q1 impacts were 12,961 MWh and 2.31 MW for 177 participants in PY2Q2 Report. This small discrepancy, though not affecting cumulative values, suggests inadequacies in the reporting process and may undermine confidence in the ex-ante savings.

6.2.3.3 PPL

PPL listed six programs under the non-residential umbrella, which includes the SCI, LCI, and GNP sectors. All six programs achieved energy and demand savings during PY2Q2. PPL's programs are designed to be cross-cutting, allowing customers from all rate classes to participate in the programs. Therefore, total program impacts need to be segregated into the appropriate sector classification. For the non-residential umbrella, the programs achieved a gross reported energy savings of 71,128 MWh during PY2Q2 and 93,731 MWh during PY2. Key figures for PY2Q2 for each individual program are shown in Table 6-6.

Table 6-6: PPL Non-Residential Programs Quarterly Summary

Program	Participants	MWh	MW
Appliance Recycling	50	105	0.02
Custom Incentive	3	246	0.04
Efficient Equipment	711	3,456	0.64
Efficient Equipment C&I Lighting	694	66,085	13.98
Renewable Energy	25	1,183	0.15
HVAC Tune-Up	144	53	0.00
TOTAL	**1,627**	**71,128**	**14.83**

6.2.3.3.1 Review of Savings Database

PPL provided a spreadsheet database extract that contained information for each measure, project, and customer participating in PECO programs during PY2Q2. The savings recorded in this spreadsheet were compared to values recorded in the quarterly report to verify accuracy in the reporting process and to ensure that savings were actually achieved by the programs.

After review of the PY2Q2 Work package Extract spreadsheets, it was observed that energy and demand savings were summed correctly for five of the six programs. Projects claiming savings for PY2Q2 were determined by using the work package approval date. Projects for which the work package approval occurred during PY2Q2 were included in PY2Q2 population. For the Appliance Recycling program, the spreadsheet showed a total of 50 unique participants achieving impacts of 105,017 kWh and 21.11 kW. For the Custom Incentive Program, the spreadsheet showed a total of 3 unique participants achieving 246,181 kWh and 30.00 kW. For the Efficient Equipment Program, including the C&I lighting segment, the spreadsheet showed a total of 69,541,742 kWh and 13,641.91 kW of savings. For the Renewable Energy Program, the spreadsheet showed a total of 25 participants achieving impacts of 1,182,795 kWh and 136.69 kW. For the HVAC Tune-Up Program, the spreadsheet showed a total of 144 participants achieving impacts of 53,287 kWh and 1.75 kW.

The only discrepancy observed was due to the Efficient Equipment Program. A total demand savings of 14.62 MW was recorded in the quarterly report whereas the database showed 13.63 MW of demand savings. This discrepancy should be investigated by PPL.

6.2.3.3.2 Review of Project Files

PPL did not provide project files for PY2Q2 projects in time for this quarterly report. A sample of projects will be desk audited and reviewed during the next quarterly report. It is also noted that PPL's evaluator has elected to combine samples for the Q2 and Q3 batches. Therefore, it is anticipated that the sample selection will not occur until the Q3 population is closed.

6.2.3.3.3 Review of Report Consistency

PPL's reported values were found to be consistent with previous quarterly reports. No significant discrepancies were observed from the PY2Q1 to the PY2Q2 reports. A new "program" was added to

separate commercial lighting projects from other projects in the Efficient Equipment Program. This segregation did not lead to any reporting issues.

6.2.3.4 FirstEnergy

FirstEnergy listed seven programs under the non-residential umbrella, which includes the SCI, LCI, and GNP sectors. Of these seven programs, six programs achieved energy and demand savings during PY2Q2 and one demand response program had not been launched. These six programs achieved a gross reported energy savings of 21,418 MWh during PY2Q2, 42,888 MWh during PY2, and 49,987 MWh cumulative to date. Key figures for PY2Q2 for each individual program are shown in Table 6-7.

Table 6-7: FirstEnergy Non-Residential Programs Quarterly Summary

Program	Participants	MWh	MW
Energy Audit, Assessment and Equip Rebate	168	9,176	1.31
C/I Performance Contracting/Equipment	42	7,392	0.92
Industrial Motors and VSD	1	2,313	0.20
PJM Demand Response	Inactive	N/A	N/A
Streetlighting	67	302	0.00
Non-Profit	9	118	0.02
Remaining Government/Non-Profit	101	2,117	0.37
TOTAL	**388**	**21,418**	**2.82**

6.2.3.4.1 Review of Savings Database

FirstEnergy provided a series of spreadsheets that contained key information for projects completed during PY2Q2. The savings recorded in these spreadsheets were compared to values recorded in the quarterly report to verify accuracy in the reporting process and to ensure that savings were actually achieved by the programs.

After review of the PY2Q2 extract spreadsheets, it was observed that energy and demand savings were summed correctly for all programs. Projects claiming savings for PY2Q2 were determined by the evaluator and noted in their sample design. Projects consisting of experiment[24] #2 were included in PY2Q2 population. For the Energy Audit, Assessment and Equipment Rebate Program, which serves SCI customers, the spreadsheet showed 168 participants achieving impacts of 9,175,918 kWh and 1,312.73 kW. For the C/I Performance Contracting and Equipment Program, which serves LCI customers, the spreadsheet showed 42 participants achieving impacts of 7,392,119 kWh and 915.61 kW. For the Industrial Motors and VSD program, the spreadsheet showed 1 participant achieving impacts of 2,312,507 kWh and 204.03 kW. For the Streetlighting Program, the spreadsheet showed 67 participants achieving impacts of 302,097 kWh and 0 kW. For the Non-Profit Program, the spreadsheet showed 9

[24] Experiment #2 refers to ADM's, FirstEnergy's evaluation contractor, data extracts extracted for measurement and verification as part of the evaluation sample.

participants achieving impacts of 117,299 kWh and 21.48 kW. For the Remaining Government and Non-Profit Program, the spreadsheet showed 101 participants achieving 2,117,065 kWh and 369.66 kW.

6.2.3.4.2 Review of Project Files

FirstEnergy provided project files for a sample of projects selected by FirstEnergy's evaluator. These project files were provided by FirstEnergy's implementation CSP. Savings recorded in the databases were checked against actual project files to verify consistency in the reporting process and to identify potential opportunities for improvement. The SWE team reviewed five project files to verify that savings were consistently reported.

1. No discrepancies were observed for Project NSLB12800. The database reported savings of 214,713 kWh and 61.86 kW. This was consistent with the project files.
2. More information is needed for Project SLB9069. The database reported savings of 3,522 kWh and 0.77 kW. The project files provided did not explicitly state how savings were achieved.
3. More information is needed for Project SALTS8466. The database reported savings of 4,834 kWh and 0.55 kW. The project files provided did not explicitly state how savings were achieved.
4. More information is needed for Project SLB4150. The database reported savings of 9,659 kWh and 1.96 kW. The project files provided did not explicitly state how savings were achieved.
5. More information is needed for Project MD4311. The database reported savings of 2,312,507 kWh and 204.03 kW. The project files provided did not explicitly state how savings were achieved.

For projects where more information is needed, it is assumed that FirstEnergy's implementation CSP uses calculations internal to the database to determine savings estimates. The SWE recommends that the implementation CSP provide savings calculation details for each project to establish a transparent audit trail. This will also ensure that ex-ante savings are consistently calculated and that savings are not inappropriately adjusted after the reporting period.

6.2.3.4.3 Review of Report Consistency

FirstEnergy's reported values were found to be consistent with previous quarterly reports. No significant discrepancies were observed from the PY2Q1 to the PY2Q2 reports.

However, FirstEnergy's evaluator showed discrepancies between Q1 impacts reported in the quarterly reports and Q1 impacts listed in their sample designs. For example, for the Energy Audit, Assessment and Equipment Rebate Program, FirstEnergy records 80 participants achieving impacts of 3,409 MWh and 0.60 MW, whereas the sample design shows 74 participants achieving impacts of 3,071 MWh and 0.54 MW. Likewise, for the C/I Performance Contracting and Equipment Program, FirstEnergy records 32 participants achieving impacts of 16,288 MWh and 2.07 MW, whereas the sample design shows 33 participants achieving impacts of 16,417 MWh and 2.09 MW. One possible explanation for this discrepancy is that FirstEnergy's evaluator removed several sites from the program population after desk review due to program requirements. The SWE recommends that FirstEnergy reviews these sites to ensure that proper care was taken to document these modifications.

6.2.3.5 Duquesne

Duquesne listed eleven programs under the non-residential umbrella, which includes the SCI, LCI, and GNP sectors. Of these eleven programs, nine programs achieved energy and demand savings during PY2Q2 and two programs did not achieve any savings. The programs achieved a gross reported energy savings of 11,839 MWh during PY2Q2, 13,119 MWh during PY2, and 13,119 MWh cumulative to date. Key figures for PY2Q2 for each individual program are shown in Table 6-8.

Table 6-8: Duquesne Non-Residential Programs Quarterly Summary

Program	Participants	MWh	MW
Commercial Umbrella	21	455	0.13
Healthcare	3	146	0.02
Industrial Umbrella	0	0	0.00
Chemical Products	0	0	0.00
Mixed Industrial	1	399	0.07
Office Building Large	12	3,431	0.43
Office Building Small	7	62	0.01
Primary Metals	4	6,314	0.57
Public Agency Non-Profit	14	587	0.10
Retail Stores Small	20	217	0.01
Retail Stores Large	18	229	0.01
TOTAL	**100**	**11,839**	**1.35**

6.2.3.5.1 Review of Savings Database

Duquesne provided a series of spreadsheets that contained key information for projects completed during PY2Q2. The savings recorded in these spreadsheets were compared to values recorded in the quarterly report to verify accuracy in the reporting process and to ensure that savings were actually achieved by the programs. The spreadsheet databases condensed Duquesne's programs into two major populations, commercial and industrial. The results using the PY2Q2 report are shown in Table 6-9.

Table 6-9: Duquesne Non-Residential Sectors Quarterly Summary

Sector	Participants	MWh	MW
Commercial	95	5,127	0.71
Industrial	5	6,713	0.64
TOTAL	**100**	**11,839**	**1.35**

After review of the PY2Q2 spreadsheets, it was observed that energy and demand savings were summed correctly for one of two populations. Projects claiming savings for PY2Q2 were determined by using the equipment installed date. Projects for which the equipment installation date occurred during PY2Q2 were included in PY2Q2 population. For all commercial programs, the spreadsheet showed a total of 95

participants achieving impacts of 5,125,824 kWh and 704.66 kW. For all industrial programs, the spreadsheet showed a total of 5 participants achieving impacts of 4,674,718 kWh and 481.97 kW.

The discrepancy observed for the industrial programs was isolated to the Primary Metals Program. Total impacts of 6,314 MWh and 0.57 MW were recorded in the quarterly report whereas the database showed impacts of 4,276 MWh and 0.41 MW. This discrepancy should be investigated by Duquesne.

6.2.3.5.2 Review of Project Files

Duquesne's PMRS system stores savings figures for all projects participating in their programs. Savings recorded in the databases were checked against actual project files to verify consistency in the reporting process and to identify potential opportunities for improvement. The SWE team reviewed three project files to verify that savings were consistently reported.

1. Some discrepancies were observed for Project 1000008064.24.01. The database reported savings of 120,960 kWh and 12 kW, whereas the project files report a number of different values. The Appendix D used for this project states impacts of 72,263 kWh and 9.68 kW, however the project files also state that a custom approach would be used to claim savings of 95,000 kWh and 8.00 kW. An earlier conversation also stated savings of 136,000 kWh.
2. Small discrepancies were observed for Project 9000467179.20.01. The database reported savings of 218,238 kWh and 75.71 kW, whereas the project files reported savings of 220,795 kWh and 76.59 kW. This represents a 1.17% error in energy savings and 1.16% error in demand savings.
3. No discrepancies were observed for Project 8000006568.17.0. The database reported savings of 5,871 kWh and 0.00 kW. This is consistent with the project files.

Consistency between PMRS and the database was found in all cases. Generally, savings were easily traceable and ample documentation was provided.

6.2.3.5.3 Review of Report Consistency

Duquesne's reported values were found to be inconsistent with previous quarterly reports. Major discrepancies were observed from the PY2Q1 to the PY2Q2 reports. However, from previous discussions, Duquesne had misinterpreted some of the tables and included projects that were in progress, therefore inflating participation numbers for completed projects. All errors can be traced to this misinterpretation. As a double check, residential numbers were found to be consistent with previous quarterly reports.

6.3 Site visits to Customer Facilities

The following sections provide an update on activities related to SWE team visits to customer facilities in PY2Q2.

6.3.1 Residential Programs

No site visits have been scheduled for the review of residential programs.

6.3.2 Low-Income Programs

No site visits for the low-income programs were conducted in PY2Q2.

6.3.3 Non-Residential Programs

The SWE completed five ride-along site visits in early February for Allegheny Power's Q1 projects. All were lighting retrofits and/or lighting control projects. SAIC, on behalf of Allegheny Power's evaluator, Tetra Tech, noted discrepancies between the project documentation and measures installed at each site, which will impact the project realization rates. In addition, SAIC collected power measurements from four of the sites. This data will be used to determine project savings and can potentially be used to confirm or modify the standard wattage values listed in Appendix C of the TRM.

Ride-along visits with EDC evaluators for PECO, PPL and FirstEnergy are planned in March, and independent site visits are planned for all EDCs. Following all visits, detailed findings and recommendations to address outstanding issues will be provided to the EDCs in inspection reports prepared by the SWE.

6.4 Interim protocols

Please refer to Section 2.2.2 for the status of interim protocols.

6.5 Custom Measures Protocols

As of the February 15, 2011 Technical Working Group meeting in Harrisburg, the Custom Measure Protocols (CMPs) process has been abolished. The SWE team and the EDCs are still discussing how to best utilize the existing CMPs that were approved through the process.

6.6 Demand Response Measures

On January 12, 2011, the PA PUC issued a Secretarial Letter stating that "the PJM measurement and verification (PJM M&V) protocols for the PJM economic demand response programs, in effect for the PJM delivery and planning year beginning in June 2012 through May 2013, will be used as a basis for the Act 129 Statewide Evaluator's measurement and verification for Act 129 load curtailment performance." For the summer capability period beginning June 2011 through May 2012, the rules and procedures then in effect by PJM will be used to validate performance.

The DR programs anticipated are of four general types. Key issues for each type of DR program are described below:

1. Direct Load Control. These are the only type of programs implemented as of the end of PY2Q2. For these programs, PJM requires an approved Load Research Study documenting the savings that will result from the signal sent by the EDC (or its vendor) to the potential participant. Loads controlled include air conditioning and electric hot waters. Alternately, Lawrence Berkley Lab's "Deemed Savings Estimates for Legacy Air Conditioning and Water Heating Direct Load Control Programs in PJM Region" can be used.

Due diligence required to confirm savings for these programs for Act 129 will include making sure that the Load Research Studies or use of the LBL Legacy Study reasonably conform to PJM procedures and reflect the savings claimed for the technology and market sectors to which they are applied.

2. PJM Economic Programs Aggregated by Curtailment Service Providers. These programs will be implemented by Curtailment Service Providers and measured using PJM approved Customer Baseline (CBL) protocols. Act 129 measurement and verification activities will follow and confirm PJM procedures and quality control processes.

   Due diligence will include confirming that PJM protocols and procedures have been properly applied and that the reconstruction of the peak 100 hours is reasonable. This will include validating the savings at participants using PJM approved Customer Base Line methods and confirming that the EDCs, CSPs and PJM have faithfully implemented procedures according to PJM policies.

3. Distributed Resources. These programs rely on distributed generation equipment to provide load reduction on the system.

   Metered net output is the preferred method of verification. If metering of net output is not available, PJM approved baseline protocols are to be used.

4. Rate Based Programs. These programs have been proposed by Allegheny Power. According to the Secretarial Letter dated January 12, 2011, an appropriate PJM protocol will need to be in place quantifying savings using PJM economic protocols for the Act 129 peak 100 hours. It is unclear how this will be accomplished.

5. The SWE intends to convene a Technical Working Group meeting with the EDCs to review DR programs and confirm the use of PJM protocols for EM&V of the DR programs.

6.7 Status of TRM Update

Please refer to Section 2.2.3 for the status of the TRM Update.

6.8 Net to Gross Issues

No new developments have been made with regards to net to gross issues.

6.9 TRC Issues

A TWG meeting was held in Harrisburg to discuss the TRC issues and proposed resolutions put forth by the SWE team. The following issues were discussed:

1) Demand Response (DR)
   a. Resolution on the application of TRC calculation to DR programs.
   b. Resolution of the treatment of payments to DR CSPs and treatment of customer incentives for DR measures.

   c. Direction on determining the measure life for DR programs, such as direct load control or load curtailment.

2) Net to Gross
   a. Direction on NTG adjustments applications and any adjustments to TRC ratios.
3) Fuel Switching
   a. Resolution on cost issues associated with fuel switching measures.
4) TRC Calculations
   a. Creation of a database for deemed customer costs or incremental measure costs as applicable.
   b. Clarity on the application on the Bureau of Labor Statistics (BLS) factor used to escalate energy and capacity rates associated with the avoided cost calculations.
   c. Clarity on the application of PJM Forwards and Base Residual Auctions (BRA).
   d. Resolution on the basis of TRC benefits – reported savings or verified savings.
   e. Resolution on basis of TRC costs – actual costs or committed costs.
   f. Resolution of the definition of incentives in TRC for energy efficiency measures (e.g., what constitutes and "incentive" and which payments to customers are treated as a "program cost" versus costs included in the "incremental cost" category).
   g. Resolution of the treatment of payments to DR CSPs and treatment of customer incentives for DR measures.
   h. Direction on the determinations of baseline equipment for setting incremental costs and custom rebates.
   i. Resolution on the requirement for annual updates of EDC avoided cost forecasts (15 years).
   j. Direction on the inclusion or exclusion of customer avoided operating and maintenance costs in the TRC calculations.
   k. Clarification on whether avoided costs used to create the benefit/cost ratios in the approved EE&C plans are the avoided costs that should be used in post program implementation benefit/cost analysis.
   l. Discuss if there are any opportunities/benefits related to improved consistency in economic assumptions across the seven EDCs (e.g., inflation rate, discount rate, avoided costs, line loss assumption).
5) TRC Reporting
   a. Clarity on the frequency of conducting cost-effectiveness evaluations and reporting results.
   b. Clarity on timing of TRC reports (e.g., when to freeze data and inputs).

7 Summary and Recommendations

The SWE team, the PA PUC CEEP Bureau staff, the EDCs and the EDC evaluation contractors have worked hard to develop a solid foundation for the EM&V of the Act 129 energy efficiency and demand response programs. The SWE team notes that improvements continue to be made to the SWE audit

processes and appreciates the support and responsiveness of the Energy Association, the Pennsylvania EDCs and their evaluation contractors.

Based on the findings from the SWE audit activities conducted in PY2Q2, the SWE team makes the following recommendations to the PA PUC relating to the Act 129 energy efficiency and demand response programs:

- The EDCs need to revise their kWh and kW savings estimates for their appliance removal programs to reduce savings (where appropriate) in those instances where a removed appliance is replaced with a new unit.
- The EDCs need to review the SWE team's comments and findings in this report and in the PY2Q1 report and provide clarifications and explanations where indicated by the SWE.