Act 129 Statewide Evaluator Quarterly Report

2nd Quarter, Program Year 3

Presented to:

Pennsylvania Public Utility Commission

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Prepared by The Statewide Evaluation Team:

GDS Associates, Inc., Nexant, and Mondre Energy

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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 the following Electric Distribution Company's (EDC) respective Energy Efficiency and Conservation (EE&C) Plan[1]:

- West Penn Power Company formerly Allegheny Power (West Penn or West Penn Power);[2]
- Duquesne Light Company (Duquesne);
- the FirstEnergy companies –
    - Metropolitan Edison Company (Met-Ed),
    - Pennsylvania Electric Company (Penelec), and
    - Pennsylvania Power Company (Penn Power);
- PECO Energy Company (PECO), and
- PPL Electric Utilities (PPL).

This report covers the second quarter of Program Year 3 (PY3Q2) and 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, 2011 and November 30, 2011. Impacts reported as Cumulative Program Inception to Date (CPITD) include savings since the implementation of Act 129 programs (June 1, 2009) through November 30, 2011.

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.

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

[2] While West Penn Power has since merged with the FirstEnergy Companies, it will be referred to as a separate company for purposes of this report.

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 2-1 presents the seven EDCs' aggregated reported, as well as aggregated interim verified[3], PYTD reported gross MWh and MW impacts.

Interim or preliminary verified savings reported in this report reflect verified savings for measures that did not yet have approved savings protocols in PY3 or for additional evaluation, measurement and verification (EM&V) activities that have occurred during this current program year. Table 2-1 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 PY3 (PY3Q2). This quarter ended on November 30, 2011.

[3] 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.

Table 2-1: Summary of EDC Quarterly Report Impacts – Program Year 3, 2nd Quarter

	PYTD Reported Gross Impact	Interim PYTD Verified Impact [a]	Interim PYTD Net Impact [b]
Total Energy Savings (MWh)	519,819	196,295	196,295
Total Demand Reduction (MW)	84.09	26.92	26.92
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)	421,053	159,999	159,999

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 3.
[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 quarterly reports.
[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 required in annual reports only.
[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 PY3.

The SWE has reviewed the EDC Quarterly Reports for PY3Q2 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[4] 81 programs have been implemented and are generating savings across the state.

[4] Currently as of November 2010.

- Approximately 29 additional programs are expected to be implemented and generate savings after PY3Q2.
- Progress towards 2013 MWh savings targets ranges from 37.1% - 76.0%.
- Progress towards 2013 MW reduction targets ranges from 16.6% - 42.4%.

Key SWE team activities during the PY3Q2 included the following:

- Residential program desk audits.
- Low-Income program desk audits.
- Non-residential program desk audits and on-site inspections.
- Participation in TWG meetings.
- Development of Audit Plan updates.
- Baseline study surveys and analyses for residential, commercial and industrial sectors.
- Development of statewide energy efficiency potential study methodology.

3 EDC Impact Summaries

The following tables summarize the current savings for each EDC; each table includes a column that presents the reported impacts as a percentage of the 2013 total EDC savings target during PY3Q2.[5]

3.1 Statewide Summary

The following table contains a summary of the energy and demand savings impacts of each EDC during PY3.

Table 3-1: Summary of EDC Energy and Demand Savings

	Statewide	Duquesne	PECO	PPL	Met-Ed	Penelec	Penn Power	West Penn
PYTD Reported Gross[6] Energy Savings (MWh)	**519,819**	44,318	103,606	246,428	44,913	65,065	15,489	142,420
PYTD Interim Verified[7] Energy Savings (MWh)	**196,295**	0	24,870	45,958	44,913	65,065	15,489	142,420
CPITD Reported Gross[8] Energy Savings (MWh)	**2,552,938**	216,751	992,023	767,225	230,629	261,542	84,768	238,586
CPITD Interim Verified[9] Energy Savings (MWh)	**2,166,447**	168,336	898,062	542,011	226,594	249,325	82,119	232,940
% of 2013 Energy Savings Target Achieved	**57%**	**39.8%**	**76.0%**	**47.3%**	**50.8%**	**57.7%**	**57.4%**	**37.1%**
PYTD Reported Gross Demand Reduction (MW)	**84.09**	3.38	15.6	43.51	7.69	11.55	2.36	13.4
PYTD Interim Verified Demand Reduction (MW)	**26.92**	0	1.4	3.92	7.69	11.55	2.36	13.4
CPITD Reported Gross Demand Reduction (MW)	**371.5**	22.18	166.7	107.85	30.31	34.67	9.79	27.7
CPITD Interim Verified Demand Reduction (MW)	**314.12**	19.5	150.6	69.64	31.19	33.6	9.59	26.1
% of 2013 Demand Reduction Target	**30%**	**17.3%**	**42.4%**	**23.4%**	**26.2%**	**31.1%**	**21.8%**	**16.6%**

Cumulative Portfolio Energy Impacts

- The CPITD reported gross energy savings is 2,552,938 MWh.
- The CPITD interim verified energy savings is 2,166,447 MWh.

[5] 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.

[6] 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.

[7] 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.

[8] 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.

[9] 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.

Portfolio Demand Reduction[10]

- The CPITD reported gross demand reduction is 371.5 MW.
- The CPITD interim verified demand reduction is 314.12 MW.

Low Income Sector

- The number of measures offered to the Low-Income Sector comprises approximately 30% of the total number of measures offered through all programs.
- The CPITD reported gross energy savings for low-income sector programs is 238,693 MWh.
- The CPITD interim verified energy savings for low-income sector programs is 222,333 MWh.

Government and Non-Profit Sector

- The CPITD reported gross energy savings for government and non-profit sector programs is 267,789 MWh.
- The CPITD interim verified energy savings for government and non-profit sector programs is 205,922 MWh.

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

- The PYTD reported gross energy savings is 519,819 MWh.
- The PYTD interim verified energy savings is 196,295 MWh.
- The PYTD reported gross demand reduction is 84.09 MW.
- The PYTD interim verified demand reduction is 26.92 MW.
- The PYTD reported participation is 569,495 participants.[11]

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

[11] 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 Duquesne Light

Table 3-2: Summary of Duquesne Quarterly Report Impacts

	PYTD Reported Gross Impact	Interim PYTD Verified Impact[a]	Interim PYTD Net Impact[b]	Savings Achieved as % of 2013 Targets[f]
Total Energy Savings (MWh)	44,318	0	0	39.8%
Total Demand Reduction (MW)	3.38	0	0	17.3%
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)	35,898	0	0	Not Applicable

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 3.

[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 PY3Q2 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 PY3Q2 quarterly report.

[f] 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).

Duquesne has reported PY3 gross energy savings for 13 programs. The following table provides a breakdown of the contribution of each program's gross energy savings towards the PY3 portfolio savings.

Table 3-3: Summary of Program Impacts on Gross Reported Portfolio Savings – Duquesne

Program:	Percent of PYTD Gross MWh Savings Portfolio
Office Building - Large - EE	31.6%
Mixed Industrial EE	23.8%
Residential: EE Program (REEP): Rebate Program	13.2%
Commercial Sector Umbrella EE	6.9%
Primary Metals EE	5.1%
Residential: Appliance Recycling	4.2%
Retail Stores - Small EE	3.8%
Healthcare EE	3.1%
Office Building - Small - EE	2.1%
Public Agency/Non-Profit	2.1%
Residential: Low Income EE	2.0%
Chemical Products EE	1.4%
Retail Stores - Large EE	0.5%

3.3 PECO Energy Company

Table 3-1: Summary of PECO Quarterly Report Impacts

	PYTD Reported Gross Impact	Interim PYTD Verified Impact[a]	Interim PYTD Net Impact[b]	Savings Achieved as % of 2013 Targets[f]
Total Energy Savings (MWh)	103,606	24,870	24,870	76.0%
Total Demand Reduction (MW)	15.6	1.4	1.4	42.4%
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)	89,921	20,145	20,145	Not Applicable

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 3.

[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 PY3Q2 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 PY3Q2 quarterly report

[f] 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).

PECO has reported PY3 gross energy savings for 9 programs. The following table provides a breakdown of the contribution of each program's gross energy savings towards the PY3 portfolio savings.

Table 3-2: Summary of Program Impacts on Gross Reported Portfolio Savings – PECO

Program:	Percent of PYTD Gross MWh Savings Portfolio
Smart Equipment Incentives - C&I	25.4%
Smart Lighting Discounts Program	24.0%
Smart Home Rebates Program	14.1%
Smart Equipment Incentives - Government/Nonprofit	11.1%
Low-Income Energy Efficiency Program	10.2%
Smart Appliance Recycling Program	9.7%
Smart Construction Incentives	5.4%
Smart Equipment Incentives - C&I Multi-Tenant	0.1%
Smart Equipment Incentives - Government/Nonprofit Multi- Tenant	< 0.1%

3.4 PPL Electric Utilities

Table 3-3: Summary of PPL Quarterly Report Impacts

	PYTD Reported Gross Impact	Interim PYTD Verified Impact[a]	Interim PYTD Net Impact[b]	Savings Achieved as % of 2013 Targets[f]
Total Energy Savings (MWh)	246,428	45,958	45,948	47.3%
Total Demand Reduction (MW)	43.51	3.92	3.92	23.4%
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)	199,607	37,226	37,226	Not Applicable

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 3.

[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 PY3Q2 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 PY3Q2 quarterly report.

[f] 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).

PPL has reported PY3 gross energy savings for 11 programs. The following table provides a breakdown of the contribution of each program's gross energy savings towards the PY3 portfolio savings.

Table 3-4: Summary of Program Impacts on Gross Reported Portfolio Savings – PPL

Program:	Percent of PYTD Gross MWh Savings Portfolio
Efficient Equipment Incentive Program (C&I lighting)	52.4%
Residential Lighting Program	21.4%
Custom Incentive Program	12.4%
Energy Efficiency Behavior & Education Program	4.7%
Appliance Recycling Program	4.7%
Efficient Equipment Incentive Program (non-lighting measures)	2.7%
Low-Income WRAP	0.7%
HVAC Tune-Up Program	0.3%
E-Power Wise Program	0.3%
Renewable Energy Program	0.1%
Residential Energy Assessment and Weatherization Program	0.1%

3.5 FirstEnergy Companies

3.5.1 Metropolitan Edison Company

Table 3-5: 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 2013 Targets[f]
Total Energy Savings (MWh)	44,913	44,913	44,913	50.8%
Total Demand Reduction (MW)	7.69	7.69	7.69	26.2%
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)	36,380	36,380	36,380	Not Applicable

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 3.

[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 PY3Q2 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 PY3Q2 quarterly report.

[f] 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).

Met-Ed has reported PY3 gross energy savings for 13 programs. The following table provides a breakdown of the contribution of each program's gross energy savings towards the PY3 portfolio savings.

Table 3-6: Summary of Program Impacts on Gross Reported Portfolio Savings – Met-Ed

Program:	Percent of PYTD Gross MWh Savings Portfolio
EE Products	39.2%
Appliance Turn-In	17.2%
Home Energy Audits	13.5%
Energy Audit, Assessment and Equipment Rebate	8.8%
EE HVAC	7.7%
Remaining Government/Nonprofit	3.7%
C&I Performance Contracting/Equipment	2.9%
WARM Programs	1.9%
Streetlighting	1.7%
Industrial Motors and VSD	1.5%
New Construction	1.5%
Whole Building	0.2%
Nonprofit	< 0.1%

3.5.2 Pennsylvania Power Company

Table 3-7: Summary of Penn Power Quarterly Report Impacts

	PYTD Reported Gross Impact	Interim PYTD Verified Impact[a]	Interim PYTD Net Impact[b]	Savings Achieved as % of 2013 Targets[f]
Total Energy Savings (MWh)	15,489	15,489	15,489	57.4%
Total Demand Reduction (MW)	2.36	2.36	2.36	21.8%
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)	12,546	12,546	12,546	Not Applicable

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 3.

[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 PY3Q2 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 PY3Q2 quarterly report.

[f] 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).

Penn Power has reported PY3 gross energy savings for 11 programs. The following table provides a breakdown of the contribution of each program's gross energy savings towards the PY3 portfolio savings.

Table 3-8: Summary of Program Impacts on Gross Reported Portfolio Savings – Penn Power

Program:	Percent of PYTD Gross MWh Savings Portfolio
EE Products	52.8%
Appliance Turn-In	11.9%
Energy Audit, Assessment & Equipment Rebate	10.2%
Home Energy Audits	9.0%
EE HVAC	4.8%
New Construction	3.5%
C&I Performance Contracting/Equipment	2.9%
Remaining Government/Nonprofit	2.0%
WARM Programs	1.7%
Industrial Motors and VSD	1.0%
Whole Building	0.1%

3.5.3 Pennsylvania Electric Company

Table 3-9: Summary of Penelec Quarterly Report Impacts

	PYTD Reported Gross Impact	Interim PYTD Verified Impact[a]	Interim PYTD Net Impact[b]	Savings Achieved as % of 2013 Targets [f]
Total Energy Savings (MWh)	65,065	65,065	65,065	57.7%
Total Demand Reduction (MW)	11.55	11.55	11.55	31.1%
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)	52,703	52,703	52,703	Not Applicable

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 3.

[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 PY3Q2 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 PY3Q2 quarterly report.

[f] 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).

Penelec has reported PY3 gross energy savings for 13 programs. The following table provides a breakdown of the contribution of each program's gross energy savings towards the PY3 portfolio savings.

Table 3-10: Summary of Program Impacts on Gross Reported Portfolio Savings – Penelec

Program:	Percent of PYTD Gross MWh Savings Portfolio
EE Products	28.3%
Energy Audit, Assessment & Equipment Rebates	18.2%
Remaining Government/Nonprofit	15.9%
Appliance Turn-In	11.4%
C&I Performance Contracting/Equipment	10.0%
Home Energy Audits	9.9%
EE HVAC	2.3%
WARM Programs	1.5%
Industrial Motors and VSD	1.1%
New Construction	0.8%
Nonprofit	0.4%
Streetlighting	0.2%
Whole Building	0.1%

3.5.4 West Penn Power

Table 3-11: Summary of West Penn Power Quarterly Report Impacts

	PYTD Reported Gross Impact	Interim PYTD Verified Impact[a]	Interim PYTD Net Impact[b]	Savings Achieved as % of 2013 Targets[f]
Total Energy Savings (MWh)	142,420	142,420	142,420	37.1%
Total Demand Reduction (MW)	13.4	13.4	13.4	16.6%
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)	115,360	115,360	115,360	Not Applicable

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 3.

[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 PY3Q2 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 PY3Q2 quarterly report.

[f] 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).

West Penn has reported PY3 gross energy savings for 11 programs. The following table provides a breakdown of the contribution of each program's gross energy savings towards the PY3 portfolio savings.

Table 3-12: Summary of Program Impacts on Gross Reported Portfolio Savings – West Penn

Program:	Percent of PYTD Gross MWh Savings Portfolio
Residential Home Performance Program	61.1%
Custom Applications Program	13.4%
Compact Fluorescent Lighting (CFL) Rewards Program	7.9%
Residential Energy Star and High Efficiency Appliance Program	4.2%
Commercial Products Efficiency Program (previously Commercial Lighting Efficiency Program)	4.1%
Residential Low Income Home Performance Check-Up Audit & Appliance Replacement Program	3.2%
Governmental/Nonprofit Lighting Efficiency Program	2.9%
Custom Technology Applications Program	2.4%
Residential Whole Home Appliance Efficiency Program (previously Residential HVAC Efficiency Program)	0.6%
Residential Low Income Joint Utility Usage Management Program	< 0.1%
Commercial HVAC Efficiency Program	< 0.1%

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 PY3, 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 4-1: Summary of Programs Implemented to Date by Duquesne

Programs Reporting PY3 Gross Savings:

• Residential: Energy Efficiency (EE) Program (REEP): Rebate Program
• Residential: EE Program (Upstream Lighting)
• Residential: Appliance Recycling
• Residential: Low Income EE
• Residential: Low Income EE (Upstream Lighting)
• Commercial Sector Umbrella EE
  o Retail Stores – Small – EE
  o Retail Stores – Large – EE
  o Office Building – Large – EE
  o Office Building – Small – EE
  o Government & Non-Profit EE
  o Healthcare EE
• Chemical Products EE
• Mixed Industrial EE
• Primary Metals EE

Programs to be Implemented or with No Reported PY3 Savings:
• Residential: School Energy Pledge • Industrial Sector Umbrella EE • Demand Response Programs

Table 4-2: Summary of Programs Implemented to Date by PECO

Programs Reporting PY3 Gross Savings:
• Smart Equipment Incentives – Commercial & Industrial • Smart Lighting Discounts Program • Smart Home Rebates Program • Smart Equipment Incentives – Government/Nonprofit • Low-Income Energy Efficiency Program • Smart Appliance Recycling Program • Smart Construction Incentives • Smart Equipment Incentives – Commercial & Industrial Multi-Tennant • Smart Equipment Incentives – Government/Nonprofit Multi-Tennant
Programs to be Implemented or with No PY3 Reported Savings:
• Conservation Voltage Reduction • Residential Direct Load Control • Commercial Direct Load Control • Residential New Construction • Demand Response Aggregator Contracts • Distributed Resources • Residential Whole Home Performance • Permanent Load Reduction

Table 4-3: Summary of Programs Implemented to Date by PPL

Programs Reporting PY3 Gross Savings:
• Appliance Recycling Program • Compact Fluorescent Lighting Campaign • Custom Incentive Program • Energy Efficiency Behavior & Education Program • Efficiency Equipment Incentive Program   o Efficiency Equipment Incentive Program (C&I Lighting) • E-Power Wise Program • Low-Income WRAP • Renewable Energy Program • HVAC Tune-Up Program • Home Assessment & Weatherization Program
Programs to be Implemented or with No PY3 Reported Savings:
• New Home Program • Time-of-Use (TOU) Program • Direct Load Control Program • Load Curtailment Program

Table 4-4: Summary of Programs Implemented to Date by FirstEnergy - Met-Ed, Penelec, PennPower

Programs Reporting PY3 Gross 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 • Industrial Motors and VSD • Street Lighting • Non-Profit • Remaining Government/Non-Profit
Programs to be Implemented or with No PY3 Reported Savings:
• Multiple Family • Demand Reduction • PJM Demand Response

Table 4-5: Summary of Programs Implemented to Date by FirstEnergy – West Penn Power

Programs Reporting PY3 Gross Savings:
• Compact Fluorescent Lighting (CFL) Rewards Program • Residential Energy Star and High Efficiency Appliance Program • Residential Home Performance Program • Residential Whole Home Appliance Efficiency Program • Residential Low Income Home Performance Check-Up Audit & Appliance Replacement Program • Residential Low Income Joint Utility Usage Management Program • Governmental/Non-Profit Lighting Efficiency Program • Commercial HVAC Efficiency Program • Commercial and Industrial Drives Program • Commercial Products Efficiency Program • Custom Technology Applications Program • Custom Applications Program
Programs to be Implemented or with No PY3 Reported Savings:
• Critical Peak Rebate (CPR) Rate • Customer Resources Demand Response Program • Distributed Generation Program • Time of Use (TOU) with Critical Peak Pricing Rebate • Customer Load Response Program

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[12];
- 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 PY3Q2.

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 Duquesne

For the plan year up to and including Q2, no verification work or process evaluation work has been completed.

5.2.2 PECO

According the PECO's PY3Q2 Report, the status of PECO's impact and process evaluation is as follows:

Impact Evaluation

- **Smart Lighting Discounts Program**: The M&V completed for Q2 consisted of reviewing the Q2 tracking data a well as reviewing all of the manufacturer invoices received and approved by PECO and Ecos through the end of November 2011. The data used to estimate the PY3Q2 savings was based on the manufacturer invoices.
- **Low-Income Energy Efficiency Program**: The LEEP billing analysis is beginning in PY3 and will be completed by the fourth quarter.
- **Smart Appliance Recycling Program**: A phone survey of 125 Q1 and Q2 participants will be conducted in February 2012 and will be repeated in mid-to-late July 2012.
- **Smart Home Rebates Program**: No activity as of the PY3Q2 report due date.

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

- **Commercial and Industrial Smart Equipment Incentives Program**: The first impact sample was pulled in January 2012 and included Q1 and Q2 projects.
- **Government and Nonprofit Smart Equipment Incentives Program**: The first impact sample was pulled in January 2012 and included Q1 and Q2 projects.
- **Direct Load Control:** PECO began calling tests and system-wide load control events in PY3. Data from 100 M&V meters on residential participant homes will be used in the impact analysis of the residential direct load control program. M&V meters have yet to be installed at the C&I customer sites and no impacts for the C&I DLC program will be reported in PY3. On-site verification of installations were completed during PY3Q2.

Process Evaluation

- **Smart Lighting Discounts Program**: The process evaluation plan has not yet been finalized for PY3.
- **Low-Income Energy Efficiency Program**: Telephone surveys with implementation staff will be conducted at the end of PY3.
- **Smart Appliance Recycling Program**: A phone survey of 125 Q1 and Q2 participants will be conducted in February 2012 and will be repeated in mid-to-late July 2012.
- **Smart Home Rebates Program**: No activity as of the PY3Q2 report due date.
- **Commercial and Industrial Smart Equipment Incentives Program**: No process evaluation progress has been reported as of the PY3Q2 report due date.
- **Government and Nonprofit Smart Equipment Incentives Program**: No process evaluation progress has been reported as of the PY3Q2 report due date.
- **Direct Load Control:** In PY3Q1, the process evaluation began with a post control event survey of residential direct load participants. In PY3Q2, interviews began with a sample of residential and commercial participants. A total of 70 residential program participants will be interviewed for this study on a number of topics including reasons for participating in the program, marketing issues, and satisfaction with the Residential A/C Saver Program, program improvements, air conditioning hours of use and thermostat control, acceptance of alternative incentive structures, participation in other smart saver programs, and firmographics description of program participants. In PY3, the surveys focus additionally on customer satisfaction with the direct load control program and satisfaction and comfort during load control events. In depth interviews with implementers and program staff were also conducted in PY3Q2.
- **Smart Construction Incentives:** To start the evaluation, Navigant conducted in-depth interviews with program managers from both PECO and KEMA. Navigant is drafting survey instruments for both trade allies and participants. The first wave of these surveys will begin in early 2012.

5.2.3 PPL

Impact Evaluation

- **Appliance Recycling Program:** A census of records from PPL's database will be compared to a census of application records from the Appliance Recycling service provider database in PY3Q3.

The quantity and size of each unit collected will be verified. A random sample of participant surveys will also be conducted in PY3Q4 to determine the percent of appliance replaced versus recycled through the program.

- **Residential Lighting Program:** PPL conducted a records review for a random sample. The customer telephone survey for the Residential Lighting Program evaluation sample frame was developed from PPL Electric's customer database and, to ensure the telephone survey will provide useful results for both CFL/LED purchasers and non-purchasers while staying within a reasonable budget, the survey was conducted using the maximum and minimum target number of completed interviews.
- **Custom Incentive Program:** The EM&V CSP will conduct EM&V reviews for the stratum of all large projects. The small projects will be divided into two strata, one populated with projects that have anticipated savings less than or equal to 500,000 kWh/year but greater than 250,000 kWh/year (stratum one), and one populated with projects that have anticipated savings equal to or less than 250,000 kWh/year. PPL has begun the stratification process for projects completed as of PY3Q2.
- **Efficient Equipment Incentive Program:** In PY3Q1 and PY3Q2, a sampling plan for PY3 measures was designed and a sample of PY3Q1 commercial lighting projects was drawn. The sample size of 92 for commercial lighting projects is based on the PY2 0.55 coefficient of variation, and was designed to achieve estimates that are statistically valid within 90/10. Sampling procedures in PY3Q2 followed those described for PY3Q1. PY3Q1 and Q2 site visits and verification activities will be conducted in PY3Q2 and Q3. Each quarter, the sample will be defined and selected from the participants reported in PPL's database.
- **E-Power Wise Program:** PPL will conduct a QA/QC review of a random sample of 70 participant enrollment forms in PY3Q3, sampling across the first three program quarters. PPL will also conduct quarterly records reviews comparing the census of the CSP's electronic database with the census of PPL's E-Power Wise Program records, as described in the program EM&V methodology.
- **Low-Income WRAP:** The PY3 savings are reported using stipulated savings by job type approved by the PA PUC for 2009 installations. EM&V efforts include reviewing and verifying a random sample of contractor reports, database records, and PPL data. During PY3Q2, PPL selected a stratified random sample of 11 PY3Q1 accounts for the records review. Copies of all supporting documents for each of the sampled participants, including contractor reports, invoices, and PPL Electric's WRAP summary reports was compared with values recorded in PPL's tracking database.
- **Renewable Energy Program:** PPL Electric is in the process of evaluating savings for PY3Q2, and will report results in the next quarterly report.
- **HVAC Tune-Up Program:** The results of the verification effort will be applied to PY3 reported savings as a placeholder, until the PY3 sample of measures is verified.

- **Residential Energy Assessment & Weatherization Program:** Participant surveys are scheduled for PY3Q4. All preliminary realization rates reported in the PY3Q2 report are based on database reviews only.
- **Energy Efficiency Behavior & Education Program:** PPL will review the savings calculations assumptions, check the quality of PY3Q1 and Q2 billing data used in the calculation, and verify that implementation is following the experimental design of the program. The PY3 savings realization rate will be estimated as the ratio of *ex post* verified savings to *ex ante* savings. This will be completed after PPL verifies the program savings using a billing analysis at the end of PY3. The results will be reported in the PY3 final Annual Report.

Process Evaluation

PPL conducted a thorough process evaluation in PY2 and reported in *PPL Electric Implementation of Ac 129 Energy Efficiency & Conservation Plan, Program Year Two Process Evaluation Report*. A PY3 process evaluation will be delivered with the PY2 Annual Report in November 2012.

5.2.4 FirstEnergy – Met-Ed, Penelec, Penn Power

Impact Evaluation

Currently no samples have been drawn for PY3 program participants as of the PY3Q2 report due date. FirstEnergy has assumed a preliminary realization rate of 100% until results of the impact evaluation are available.

Process Evaluation

As of the PY3Q2 report, most programs are online and actively adding participants. FirstEnergy's EM&V CSP completed interviews with program managers, program CSPs, program participants and non-participants to evaluate the process. FirstEnergy personnel are currently reviewing these reports for several important programs.

5.2.5 West Penn Power

Impact Evaluation

No PY3 savings have been verified at the publication time of West Penn Power's PY3Q2 report.

Process Evaluation

No process evaluation activities have begun; however, because comprehensive process evaluations were conducted in PY2, PY3 process evaluation activities will be more targeted to key issues for each program.

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 PY3. 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 TWG Meetings

The technical working group meetings are attended by representative from the following:

- Technical Utility Services (TUS) Staff
- SWE team
- EDCs
- EDC Evaluation, Measurement and Verification (EM&V) contractors and
- Pennsylvania Energy Association

The SWE team held the following Technical Working Group (TWG) meetings during PY3Q2.

- September 1, 2011
- October 11, 2011
- November 16, 2011

The focus of each TWG meeting varied depending on the interests and needs of the parties in attendance. The following topics were discussed at one or more TWG meetings:

- Residential Baseline Studies,
- Commercial and Industrial Baseline Studies,
- Methodology for the Statewide Energy Efficiency Potential Study,
- Determine Savings for Demand Response Programs,
- Net to Gross Issues and White Paper, and
- Audit Activity Findings and Updates.

6.2 EDC Meetings

The SWE team held bi-weekly teleconferences with each of the EDCs during PY3 to discuss on-going and/or emerging issues. Some of the topics discussed during these bi-weekly teleconferences included:

- Interim measures and proposed deemed savings values;
- Proper use of TRM deemed savings values for such measures as refrigerator recycling;
- Sample sizes for statistically significant evaluations by program type and projected impact;
- TRC calculations and assumptions;
- Demand response programs and audit activities;
- NTG studies and results;

- Process evaluation findings;
- Development of random samples for the SWE residential and commercial baseline studies; and
- Methodology to be used for the statewide energy efficiency potential study.

6.3 Audit Plan Update

The Audit Plan was developed by the SWE team pursuant to the evaluation requirements under Act 129 and the EE&C Program Implementation Order. Included in the Audit Plan are guidelines and expectations for the seven Pennsylvania EDCs whose program plans were approved by the PA PUC to promote the goals and objectives of Act 129. It serves as an evaluation framework that outlines the expected metrics, methodologies and guidelines for measuring performance by detailing the processes that should be used to evaluate the programs sponsored by the EDCs throughout the state of Pennsylvania.

The Audit Plan is considered to be a living document that can be revised on a regular basis throughout the contract term. The SWE team issued updates to the Audit Plan on July 13th, 2011 and November 4th, 2011. Major changes in the July 13th, 2011 update include:

- Reorganized sections to group topics under implementation, evaluation, and audit categories.
- Created new sections, including "Research Objectives", "Guidance on Calculating Claimed Savings", "Calculating Verified Gross Savings", "Calculating Verified Net Savings", "Interim Measure Protocols", "Custom Measure Protocols", "Reporting Savings", "Dynamic Sampling Methodology", "Pennsylvania Act 129 SharePoint Site", and "Public Accessible Website Data Requirements" sections.
- Updated program summaries based on most recent EE&C plans filed with the Commission.
- Clarified Section 3 and 4 of the Audit Plan to distinguish between responsibilities of the program administrator (EDC, EDC Conservation Service Providers, and/or EDC Implementer) and the EDC evaluator.
- Provided framework for interim protocol approval process.
- Provided framework for custom measure protocols.
- Updated sampling and uncertainty methodology.
- Updated expected deadlines for key deliverables.

Major changes in the November 4th, 2011 update include:

- Changed all references to CEEP to BTUS (Bureau of Technical Utility Services).
- Changed all references to Allegheny Power to West Penn Power.
- Added new section to discuss guidance memos.
- Updated TRC-related issues according to the 2011 TRC Order, including clarifying the use of NTG ratios for planning purposes and modifying the definition of free-ridership and spillover.
- Corrected due dates of SWE quarterly and annual reports.
- Added a clarification that impact evaluation results, as they are made available, will be used to update the TRM during the annual TRM update process.

6.4 Status of TRM Update

The tentative schedule of the 2013 TRM update is as follows:

- March – June 2012: SWE conducts T WG conference calls and meetings to discuss new and revised protocols and other TRM issues.
- July 2012: SWE drafts 2013 TRM.
- September 13, 2012: 2013 TRM and TRM Tentative Order at Public Meeting.
- September 29, 2012: 2013 TRM and TRM Tentative Order notice published in *Pennsylvania Bulletin*.
- October 29, 2012: Initial comments due.
- November 8, 2012: Reply comments due.
- December 20, 2012: 2013 TRM and TRM Final Order at Public Meeting.

6.5 Demand Response

The SWE team has begun work with the EDCs to prepare for the demand response study scheduled for the summer of 2012. The SWE team is also working to finalize audit checklists for the review of demand response programs and evaluations slated for the summer of 2012.

6.6 Net to Gross Issues

The SWE team completed the first draft of a white paper that summarized methodologies for estimating net-to-gross ratios (NTGRs) for determining net savings of energy efficiency and conservation (EE&C) programs. The Commission ordered that EDCs develop NTGRs for the purpose of directing design and implementation of future EE&C programs and not for determining compliance with energy and demand reduction targets. The SWE team examined the most prevalent NTGR estimation methods used in states with large ratepayer funded energy efficiency programs and for which there was substantial published research, and based thereon, proposed guideline recommendations for which NTGR methodologies to use for each EDCs' active programs. The draft of the white paper was sent to TUS staff for comment during this quarter.

7 Statewide Evaluator Program and Evaluation Support Activities

7.1 Residential Programs

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

The residential program audits typically consist of a desktop audit which includes a review of: 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 PY3Q2 reports. An update on these audits, by program type and EDC, is provided in the following sections.

7.1.1 Efficient Equipment Programs

7.1.1.1 Duquesne

The SWE is currently engaged in the audit activities for Duquesne and plans to have the check completed by final version of this report.

7.1.1.2 PECO

For PY3Q2, the SWE requested that each EDC upload their database for each residential program. The SWE then chose a random sample of 10 customers from this database and requested that the EDC upload those customer's corresponding invoices to the SWE SharePoint website. PECO uploaded all rebate applications, envelopes and receipts submitted for this sample. In the random sample the SWE found no QC errors between the customer applications and PECO's database. Two customers in the sample pulled failed to upload or mail in receipts with their rebate application. PECO followed up with these customers and paid the rebates once the receipts were submitted via mail. In this sample of ten rebate applications there were three refrigerators, two dishwashers, one clothes washer, one dehumidifier, one central air conditioning system, one heat pump and one freezer.

7.1.1.3 PPL

For PY3 Q1, the SWE requested that each EDC upload their database for each residential program. The SWE then chose a random sample of 10 customers from this database and requested that the EDC upload those customer's corresponding invoices to the SWE SharePoint website. PPL uploaded all rebate applications, envelopes and receipts submitted for this sample. In the random sample the SWE found no QC errors between the customer applications and PPL's database.

7.1.1.4 West Penn Power

In quarter one of program year three, the Statewide Evaluation Team inadvertently checked sample documents from West Penn Power that did not occur in quarter one of Program Year Three. Therefore, the SWE checked a sample of twenty rebate applications from West Penn Power for the second quarter of program year three. In the random sample the SWE found no QC errors between the customer applications and WPP's database.

7.1.1.5 FirstEnergy

The SWE is currently engaged in the audit activities for FirstEnergy and plans to have the check completed by final version of this report.

7.1.2 Appliance Recycling Program

7.1.2.1 Duquesne

The SWE is currently engaged in the audit activities for Duquesne and plans to have the check completed by final version of this report. In the review of DLC's quarterly report, the SWE found that DLC is using a value of 1,728 kWh for deemed savings of recycled appliances and 1,588 kWh for ex ante MWh savings.

7.1.2.2 PECO

For PY3 Q1, the SWE requested that each EDC upload their database for each residential program. The SWE then chose a random sample of 10 customers from this database and requested that the EDC upload those customer's corresponding invoices to the SWE SharePoint website. PECO uploaded all rebate applications submitted by 10 customers. In the random sample the SWE found no QC errors between the customer invoices and PECO's database. Out of the sample of ten appliances recycled, nine denoted that the appliance would be not replaced, resulting in full savings for that measure. For the one appliance that was indicated to be replaced by the customer, PECO will used a reduced savings value of 1205 kWh as stipulated in the TRM.

7.1.2.3 PPL

For PY3 Q1, the SWE requested that each EDC upload their database for each residential program. The SWE then chose a random sample of 10 customers from this database and requested that the EDC upload those customer's corresponding invoices to the SWE SharePoint website. PPL uploaded all rebate applications submitted by 10 customers. In the random sample the SWE found no QC errors between the customer invoices and PPL's database. Out of the sample of appliances recycled, seven denoted that the appliance would be not replaced, resulting in full savings for that measure. Three customers indicated they would be replacing the recycled appliance. For these appliances, PPL used a reduced savings value of 1205 kWh as stipulated in the TRM.

7.1.2.4 West Penn Power

In quarter one of program year three, the Statewide Evaluation Team inadvertently checked sample documents from West Penn Power that did not occur in quarter one of Program Year Three. Therefore, the SWE checked a sample of twenty JACO invoices from West Penn Power for the second quarter of program year three. In the random sample the SWE found no QC errors between the customer applications and WPP's database.

7.1.2.5 FirstEnergy – Met-Ed, Penelec, Penn Power

The SWE is currently engaged in the audit activities for FirstEnergy and plans to have the check completed by final version of this report.

7.1.3 Residential New Construction

Audit activities have not yet been conducted for PY3Q2 projects. All audit activities for Residential New Construction programs will be performed for the entire program year after its completion.

7.1.4 Lighting Programs

Lighting programs include programs which either:

(a) Buy-down the cost of CFLs,
(b) Give-away CFLs, or
(c) Offer rebates for the purchase of CFLs.

All of the eligible measures for these programs have deemed savings values. The SWE team reviewed the program databases to verify the accuracy of a sample of measures rebated against invoices, verified total measure counts as reported in the EDCs' respective annual report, and verified measures savings assumptions per TRM deemed savings values. No on-site inspections were conducted as the lighting programs are primarily upstream programs, which means that actual customer accounts cannot be associated with the bulbs purchased. Additionally, the savings algorithm inputs used to estimate CFL savings, including installation rates, are stipulated in the TRM. The findings from the SWE team audit of each EDC's respective lighting program are presented in the following sections.

The following table contains a summary of the program year-to-date savings impacts from each EDC's respective residential CFL lighting program:

Table 7-1: PYTD Gross and Verified MWh and MW Savings – Residential CFL Lighting Programs

EDC	Program	PY3 Gross Energy Savings (MWh)	% of PY3 Portfolio Gross Energy Savings	PY3 Gross Demand Reduction (MW)	% of PY3 Portfolio Gross Demand Reduction
Duquesne	Upstream Lighting	21,508	49%	0.99	29%
PECO	Smart Lighting	24,807	24%	1.40	9%
PPL	CFL Campaign	52,786	21%	2.50	6%
Met-Ed	EE Products[13]	17,595	40%	1.14	15%
Penelec	EE Products[14]	18,418	28%	1.10	10%
Penn Power	EE Products[15]	8,176	53%	0.48	20%
West Penn Power	CFL Rewards Program	11,316	8%	0.50	4%

[13] 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.
[14] 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.
[15] 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.

To audit these programs, the SWE team conducted the following activities:

- Verified the number of bulbs reported;
- Verified the savings protocol utilized to report kWh and kW savings;
- Verified the baseline assumptions utilized to calculate savings; and
- Verified the bulbs tracked against invoices received.

To verify each of these aspects, the SWE team reviewed those values reported in the PY2 Annual Reports to the data tracked in each EDC's database and tracking system. The findings from these activities are presented in the following sections.

7.1.4.1 Duquesne

The following table contains a summary of the SWE team audit findings and recommendations:

Table 7-2: Summary of CFL Program Audit - Duquesne

Category:	PY3Q2 Report:	Database Verification:	Notes:
No. Bulbs	IQ: 275,999	√	This represents the number of bulbs reimbursed through the upstream CFL program administered through Ecos.
Gross Energy Savings	IQ: 13,102 MWh	√	This represents the savings from bulbs sold through the upstream CFL program administered through Ecos.
Gross Demand Reduction	IQ: 0.608 MW	√	This represents the savings from bulbs sold through the upstream CFL program administered through Ecos.
Use of TRM Protocols	Not Applicable	√	All savings calculated in accordance with the TRM protocols.
Baseline Assumptions	Not Applicable	√	All baseline assumptions valid.
Invoice Review	Not Applicable	√	A total of 5 individual invoices were reviewed for bulbs sold during PY3Q2. Bulb counts and total dollars reimbursed were verified.

7.1.4.2 PECO

The following table contains a summary of the SWE team audit findings and recommendations:

Table 7-3: Summary of CFL Program Audit - PECO

Category:	PY3Q2 Report:	Database Verification:	Notes:
No. Bulbs	IQ: 39,820	√	This represents the number of bulbs reimbursed and given-away through the Smart Lighting Program in PY3Q2.
Gross Energy Savings	IQ: 2,127 MWh	√	This represents the savings from bulbs reimbursed and given-away through the Smart Lighting Program in PY3Q2.
Gross Demand Reduction	IQ: 0.1 MW	√	This represents the savings from of bulbs reimbursed and given-away through the Smart Lighting Program in PY3Q2.
Use of TRM Protocols	Not Applicable	√	All savings calculated in accordance with the TRM protocols.
Baseline Assumptions	Not Applicable	√	All baseline assumptions valid.
Invoice Review	Not Applicable	√	A total of 5 individual invoices were reviewed for bulbs sold and distributed during PY3Q2. Bulb counts and total dollars reimbursed were verified.

7.1.4.3 PPL

The following table contains a summary of the SWE team audit findings and recommendations:

Table 7-4: Summary of CFL Program Audit - PPL

Category:	PY3Q2 Report:	Database Verification:	Notes:
No. Bulbs	IQ: 622,957	√	This represents the number of bulbs reimbursed and given-away through the Residential Lighting Program and entered in PPL's database in PY3Q2.
Gross Energy Savings	IQ: 29,853 MWh	√	This represents the savings from bulbs reimbursed and given-away through the Residential Lighting Program and entered in PPL's database in PY3Q2.
Gross Demand Reduction	IQ: 1.37 MW	√	This represents the savings from bulbs reimbursed and given-away through the Residential Lighting Program and entered in PPL's database in PY3Q2.
Use of TRM Protocols	Not Applicable	√	All savings calculated in accordance with the TRM protocols.
Baseline Assumptions	Not Applicable	√	All baseline assumptions valid.
Invoice Review	Not Applicable	√	A total of 3 individual invoices were reviewed for bulbs sold and distributed during PY3Q2. Bulb counts and total dollars reimbursed were verified.

7.1.4.4 FirstEnergy Companies – Met-Ed, Penelec, PennPower

The following table contains a summary of the SWE team audit findings and recommendations:

Table 7-5: Summary of CFL Program Audit – Met-Ed

Category:	PY3Q2 Report:	Database Verification:	Notes:
No. Bulbs	IQ: 47,798	IQ: 47,395	This represents the number of bulbs reimbursed through the upstream CFL program. There is a difference of 403 bulbs; the SWE team requests that Met-Ed clarify this variance.
Gross Energy Savings	Not Reported	IQ: 7,729 MWh	Met-Ed does not report CFL savings separately in their reports.
Gross Demand Reduction	Not Reported	IQ: 0.44 MW	Met-Ed does not report CFL savings separately in their reports.
Use of TRM Protocols	Not Applicable	√	All savings calculated in accordance with the TRM protocols.
Baseline Assumptions	Not Applicable	√	All baseline assumptions valid.
Invoice Review	Not Applicable	√	A total of 4 individual invoices were reviewed in PY3Q2.

The following table contains a summary of the SWE team audit findings and recommendations:

Table 7-6: Summary of CFL Program Audit – Penelec

Category:	PY3Q2 Report:	Database Verification:	Notes:
No. Bulbs	IQ: 57,693	IQ: 57,569	This represents the number of bulbs reimbursed through the upstream CFL program. There is a difference of 124 bulbs; the SWE team requests that Penelec clarify this variance.
Gross Energy Savings	Not Reported	IQ: 9, 028 MWh	Penelec does not report CFL savings separately in their reports.
Gross Demand Reduction	Not Reported	IQ: 0.49 MW	Penelec does not report CFL savings separately in their reports.
Use of TRM Protocols	Not Applicable	√	All savings calculated in accordance with the TRM protocols.
Baseline Assumptions	Not Applicable	√	All baseline assumptions valid.
Invoice Review	Not Applicable	√	A total of 4 individual invoices were reviewed in PY3Q2.

The following table contains a summary of the SWE team audit findings and recommendations:

Table 7-7: Summary of CFL Program Audit – PennPower

Category:	PY3Q2 Report:	Database Verification:	Notes:
No. Bulbs	IQ: 21,087	IQ: 21,050	This represents the number of bulbs reimbursed through the upstream CFL program. There is a difference of 37 bulbs; the SWE team requests that PennPower clarify this variance.
Gross Energy Savings	Not Reported	IQ: 3,518 MWh	PennPower does not report CFL savings separately in their reports.
Gross Demand Reduction	Not Reported	IQ: 0.21 MW	PennPower does not report CFL savings separately in their reports.
Use of TRM Protocols	Not Applicable	√	All savings calculated in accordance with the TRM protocols.
Baseline Assumptions	Not Applicable	√	All baseline assumptions valid.
Invoice Review	Not Applicable	√	A total of 4 individual invoices were reviewed in PY3Q2.

7.1.4.5 West Penn Power

The following table contains a summary of the SWE team audit findings and recommendations:

Table 7-8: Summary of CFL Program Audit – West Penn Power

Category:	PY3Q2 Report:	Database Verification:	Notes:
No. Bulbs	CPITD: 229,647	√	This represents the number of bulb packages reimbursed and given-away through the Residential Lighting Program and entered since the program's inception.
Gross Energy Savings	CPITD: 40,248 MWh	√	This represents the savings from bulbs reimbursed and given-away through the Residential Lighting Program and entered since the program's inception.
Gross Demand Reduction	CPITD: 2.1 MW	√	This represents the savings from bulbs reimbursed and given-away through the Residential Lighting Program and entered since the program's inception.
Use of TRM Protocols	Not Applicable	√	All savings calculated in accordance with the TRM protocols.
Baseline Assumptions	Not Applicable	√	All baseline assumptions valid.
Invoice Review	Not Applicable	√	A total of 5 individual invoices were reviewed for bulbs sold and distributed during PY3Q2. Bulb counts and total dollars reimbursed were verified.

7.2 Low-Income Programs

The SWE did not conduct desktop audits of residential low-income programs in PY3Q2. The SWE is planning to conduct desktop audits of all EDC low-income programs in future quarters of PY3.

The SWE requested that each EDC provide all spreadsheets and supporting calculations detailing the measures installed, total participants, and energy and demand savings for each low-income program. To audit these programs, the SWE team conducted the following activities:

- Verified that all TRM assumptions and calculations for all prescriptive measures were consistent with the 2011 TRM
- For EDCs that utilized a custom, billing-analysis approach to deem savings by "job-type," the SWE team verified that EDCs were using savings values consistent with submitted custom measure protocols

The findings from the SWE PY3Q2 low-income desktop audit activities are presented in the following sections.

7.2.1 Duquesne

Duquesne uploaded their PY3Q2 LIEEP participant database to the SWE SharePoint site. The SWE chose a random sample of 15 participants to audit energy and demand savings calculations and assumptions for all measures received by the sampled participants. All energy and demand savings are based on TRM algorithms and deemed values. No errors were found with the energy savings calculations for any of the measures. The SWE did find that Duquesne mistakenly omitted the in-service rate in the demand savings calculations. Duquesne has been alerted of this omission and is working to take corrective action.

7.2.2 PECO

PECO uploaded their PY3Q2 LEEP participant database to the SWE SharePoint site. The SWE chose a random sample of 15 participants to audit energy and demand savings calculations and assumptions for all measures received by the sampled participants. All energy and demand savings values by "job-type" were consistent with the appproved custom measure protocol submitted by PECO. Additional CFLs installed in excess of LIURP were evaluated using 2011 TRM algorithms. The SWE team found no discrepancies with the energy or demand savings calculations for these measures.

7.2.3 PPL

PPL has two low-income programs; E-Power Wise and WRAP. PPL uploaded total participant and per-kit energy savings information for E-Power Wise. For WRAP, PPL uploaded all participants to the SWE SharePoint site as part of the quarterly data request.

E-Power Wise is a distributed kits program and educational program that is evaluated using both a custom (educational portion) and prescriptive (kit contents) approach. The SWE verified per kit energy and demand savings and found no discrepancies.

WRAP is evaluated using a custom, billing-analysis approach. 15 participants were randomly selected for the audit. The SWE is awaiting confirmation of the latest billing analysis results used by PPL to complete the audit of this program.

7.2.4 West Penn Power

West Penn Power has two low-income programs; the Home Check-Up Audit Program (HCU) and the Joint Utility Usage Management Program (JUUMP). West Penn Power uploaded participant information for each program. Energy and demand savings were not given on a per-participant basis. The data was submitted in aggregated form, along with supporting underlying assumptions. The SWE verified all assumptions and calculations and found no discrepancies with the 2011 TRM.

7.2.5 FirstEnergy

FirstEnergy provided the PY3Q2 low-income participant data for Met-Ed, Penelec, and Penn Power. The databases included itemized measures by participant and associated energy and demand savings. The

WARM Plus program, which is an extension of WARM, is evaluated using a custom, billing-analysis approach. WARM Extra Measures, which is an extension of WARM that provides additional energy saving measures to low-income customers such as additional CFLs, LED night lights, and smart power strips, is evaluated using the 2011 TRM. 15 participants were randomly selected between the two programs for the audit. The SWE is awaiting confirmation of the latest CFL mapping and realization rate assumptions in order to verify calculations. The values and calculations for all other measures are consistent with the 2011 TRM and the approved WARM Plus custom measure protocol.

7.3 Non-Residential Programs

The following sections detail audit findings for non-residential programs. Each quarter, the SWE audits each of the non-residential programs run by the EDCs. Whereas residential programs are typically separated into discrete programs, most EDCs combine their non-residential programs into meta-programs for reporting and evaluation purposes. For example, a lighting program and an HVAC program may be combined into one efficient equipment program. The SWE audit of non-residential programs typically aligns with evaluation groups developed by EDC evaluators such that SWE audit findings and recommendations would be relevant and directly applicable to each EDC. One drawback to this approach is that program groupings are not always consistent between EDCs. For example, one EDC may group all prescriptive and custom projects into one program, whereas another will evaluate those two programs separately. In addition, there may be situations where one EDC uses different criteria to define their programs (e.g., building type vs. measure type). The SWE believes that auditing programs based on EDC program groupings produce the best and most relevant review.

The SWE audit activities vary from quarter to quarter based on what was accomplished by the EDCs and the EDC evaluators. The reviews generally target the following categories:

- Tracking Database and Reporting
- Reported kWh and kW Savings
- Sampling Plan
- Verified kWh and kW Savings
- TRC Calculations

For the PY3Q2 report, the SWE performed the following activities.

- **Review of Tracking Database & Reporting:** The SWE reviewed quarterly databases submitted by EDCS to verify proper recording and transfer of information from databases to quarterly reports. This review included a comparison of reported kWh, reported kW, and incentive values between the database and the quarterly report. Because evaluators have not completed their evaluation activities to date, verified numbers were not reported.
- **Review of Sampling Plan:** The SWE reviewed sampling plans submitted by EDC evaluators to verify that methodologies used to select a representative sample for the evaluation met the requirements outlined in the Audit Plan. The general guidelines presented by the Audit Plan are:
    - 90/10 Confidence and Precision requirement for Non-Residential Portfolio

  - 85/15 Confidence and Precision requirement for each Program within each Portfolio
  - Government/Non Profit and Low Income sector populations should be treated as independent program populations and sampled at 85/15 if their contribution to the respective sector level portfolios is >20%
  - All Confidence and Precision levels are minimum levels. EDC evaluators are encouraged to exceed minimum requirements
- **On-site Inspections:** The SWE performed a number of on-site inspections. There are two major types of inspections that the SWE conducts; ride-along and independent inspections. The purpose of these inspections is to review evaluation work of the EDC evaluators, verify that the appropriate savings protocols are being applied correctly and review realization rates calculations.

Several important acronyms for this section are:

- SCI: Small Commercial and Industrial Sector
- LCI: Large Commercial and Industrial Sector
- GNP: Government, Non-Profit, and Institutional Sector

7.3.1 Duquesne

Duquesne lists eleven programs under the non-residential umbrella, which includes the SCI, LCI, and GNP sectors. Of these eleven programs, ten programs achieved energy and demand savings during PY3Q2. The Industrial Sector Umbrella EE program had no new participants in Q2 and achieved no savings. The gross reported energy savings of these programs was 14,855 MWh and the gross reported demand savings was 1.672 MW during PY3Q2. Table 7-9 provides the reported number of participants, energy savings, demand savings and incentives paid from PY3Q2. The two Retail EE programs are presented together because Duquesne did not report the incentives paid to the Small and Large program separately.

Table 7-9: Duquesne Non-Residential Programs Quarterly Summary

Program	Participants	MWh	MW	Incentives
CSUP Commercial Umbrella	9	1,275	0.131	$71,232
Public Agency / Non-Profit	9	387	0.083	$55,057
HEEP (Health Care)	3	575	0.058	$34,486
Office Buildings - Small	15	392	0.068	$39,840
Office Buildings-Large	14	5,830	0.477	$287,001
Retail Stores	48	800	0.126	$88,694
Chemical Products	2	265	0.030	$13,176
Mixed Industrial	27	4,391	0.594	$298,887
Primary Metals	7	940	0.105	$77,988
Totals	**134**	**14,855**	**1.672**	**$966,361**

7.3.1.1 Review of Savings Database

Duquesne provided a database of all PY3Q2 activity to the SWE team for review, which complied with the revised SWE non-residential data request. Table 7-10 provides the participant count, energy impact, demand impact and total incentives paid by program according to the Duquesne database extract. As with the previous section, the two retail programs (small and large) are presented together.

Table 7-10: Duquesne Non-Residential Programs Savings Database Summary

Program	Participants	MWh	MW	Incentives
CSUP Commercial Umbrella	9	1,275	0.131	$71,232
Public Agency / Non-Profit	9	387	0.083	$24,967
HEEP (Health Care)	3	575	0.058	$34,486
Office Buildings - Small	15	392	0.068	$35,082
Office Buildings-Large	14	5,830	0.477	$284,439
Retail Stores	48	800	0.126	$61,628
Chemical Products	2	265	0.030	$13,530
Mixed Industrial	27	4,391	0.594	$256,117
Primary Metals	7	940	0.105	$65,802
Totals	**134**	**14,854**	**1.673**	**$847,282**

In Table 7-11, the discrepancies between the reported figures and the information contained in the database are presented. All discrepancies are reported as:

$$\boldsymbol{Reported\ Figure\ -\ Database\ Summary = Discrepancy}$$

Table 7-11: Duquesne Non-Residential Program Discrepancies

Program	Participants	MWh	MW	Incentives
CSUP Commercial Umbrella	0	0	0.000	$0
Public Agency / Non-Profit	0	0	0.000	$30,090
HEEP (Health Care)	0	0	0.000	$0
Office Buildings - Small	0	0	0.000	$4,758
Office Buildings-Large	0	0	0.000	$2,562
Retail Stores	0	0	0.000	$27,066
Chemical Products	0	0	0.000	-$354
Mixed Industrial	0	0	0.000	$42,770
Primary Metals	0	0	0.000	$12,186
Totals	**0**	**0**	**0.000**	**$119,079**

The participant counts, energy savings and demand savings in the Duquesne project database match the reported figures exactly. The reported incentives are significantly larger than the sum of the incentives as seen in the project database. Many of the incentives paid during PY3Q2 were for projects actually completed in PY3 Q1. Incentives follow projects, i.e. incentives paid for projects reporting savings in PY3 Q1 should be reported in PY3 Q1, not PY3Q2.

7.3.1.2 Review of Sample Design

Duquesne's sample design will be reviewed for the PY3 Q3 report.

7.3.1.3 On-site Inspections

Since Duquesne's evaluators have not conducted any inspections to-date, the SWE has not had the opportunity to conduct any ride-along inspections for PY3. Navigant selected a sample of projects completed in Q1 and Q2 and plans visits to these sites in late March. The SWE plans to accompany Navigant on a subset of these visits.

7.3.2 PECO

PECO reported savings impacts from three non-residential programs in PY3Q2: Smart Equipment Incentives C&I, Smart Equipment Incentives Government\Non-Profit and Smart Construction Incentives. The participation, energy and demand impacts of the multi-tenant components of the Smart Equipment Incentives programs were reported separately for PY3Q2. Incentives paid to multi-tenant participants were not reported separately. There were no savings associated with the Conservation Voltage Reduction program[16]. The gross reported energy savings of these programs was 22,502 MWh and the gross reported demand savings was 3.8 MW. Table 7-12 provides the reported number of participants,

[16] This is not to say that the program is inactive, only that no additional annual savings above what was achieved in PY2 is being reported. This is consistent with other measure types, such as lighting, where savings are reported in the year it was installed. The next year, that lighting measure still achieves savings, but not additional annual savings beyond what was already reported.

energy savings, demand savings and incentives paid from PY3Q2. Demand impact figures were adjusted to reflect a line loss factor of 7.1% prior to reporting.

Table 7-12: PECO Non-Residential Programs Quarterly Summary

Program	Participants	MWh	MW	Incentives
Smart Equipment Incentives – C&I	176	11,920	2.4	$1,013,000
Smart Equipment Incentives – C&I Multi-tenant	142	44	0.0	
Smart Equipment Incentives – GNP	51	8,476	1.1	$942,000
Smart Equipment Incentives – GNP Multi-tenant	30	3	0.0	
Smart Construction Incentives	14	2,059	0.3	$223,000
Totals	**413**	**22,502**	**3.8**	**$2,178,000**

7.3.2.1 Review of Savings Database

PECO provided a report capturing all PY3Q2 project activity to the SWE team for review which complied with the revised SWE non-residential data request. Table 7-13 provides the participant count, energy impact, demand impact and total incentives paid by program according to the PECO database extract. The SWE applied a line loss factor of 7.1% to demand impacts and rounded incentive amounts to the nearest $1,000 to facilitate a comparison with reported figures.

Table 7-13: PECO Non-Residential Programs Savings Database Summary

Program	Participants	MWh	MW	Incentives
Smart Equipment Incentives - C&I	176	11,920	2.4	$1,013,000
Smart Equipment Incentives - C&I Multi-tenant	142	44	0.0	
Smart Equipment Incentives - GNP	51	8,476	1.1	$942,000
Smart Equipment Incentives - GNP Multi-tenant	30	3	0.0	
Smart Construction Incentives	14	2,059	0.3	$223,000
Totals	**413**	**22,502**	**3.8**	**$2,178,000**

In Table 7-14, the discrepancies between the reported figures and the information contained in the database are presented. All discrepancies are reported as:

$$\boldsymbol{Reported\ Figure\ -\ Database\ Summary = Discrepancy}$$

Table 7-14: PECO Non-Residential Program Discrepancies

Program	Participants	MWh	MW	Incentives
Smart Equipment Incentives - C&I	0	0	0.0	$0.00
Smart Equipment Incentives - C&I Multi-tenant	0	0	0.0	
Smart Equipment Incentives - GNP	0	0	0.0	$0.00
Smart Equipment Incentives - GNP Multi-tenant	0	0	0.0	
Smart Construction Incentives	0	0	0.0	$0.00
Totals	**0**	**0**	**0.0**	**$0.00**

The participation counts, energy savings, demand savings and incentive amounts in the project databases match the reported numbers perfectly. PECO has imposed consistent definitions of participation across programs at the request of the SWE since PY3 Q1 and this has eliminated any inconsistencies found in previous quarters.

7.3.2.2 Review of Sample Design

In accordance with the SWE data request, Navigant, PECO's evaluator, submitted their sample designs to the SWE for review. PECO also described the sample design for each program in their quarterly report. The sampling designs listed projected populations and samples for three programs (Smart Equipment Incentives – Commercial & Industrial (C&I), Smart Equipment Incentives – Government/Non-Profit (GNP) and Smart Construction Incentives Programs). Sample design also included target confidence and precision levels, assumed coefficient of variation, and stratification criteria. The SWE team conducted a detailed review of PECO's population distribution and generated impact evaluation samples and determined that the stratification methodology used is appropriate and in alignment with the Audit Plan.

For PY3, the sampling methodology will follow a dynamic sampling approach, with quarterly batches where appropriate. Due to the population size and to improve evaluation efficiencies, Navigant combined Q1 and Q2 sampling. The sampling design used stratified ratio estimation; projects were stratified based on the estimated site-specific gross savings (kWh). The annual sample size for the non-residential programs was based on PY3 Q1/Q2 completed data and project projections for PY3. Navigant described that the sample size may be adjusted to incorporate sample points from each quarter in case the project population differs significantly from the projections made. This will ensure that the required confidence and precision targets are achieved for defined sampling groups on an annual basis. The sampling design described below for PECO's non-residential programs is sufficient to meet or exceed the precision and confidence targets of 85/15 at the program level and 90/10 at the nonresidential sector level.

1. For the *Smart Equipment Incentives – C&I Program*, the required PY3 sample size for a program population of 583 projects with 85/10 confidence and precision with a coefficient of variation at 0.4 is 25 projects. The population was divided into small, medium and large size projects. The

stratification by project size is reasonable. For small and medium strata, two alternate projects were selected in the event that a chosen site does not participate. The PECO evaluators selected a census of the projects in the large strata.

2. For the *Smart Equipment Incentives – GNP Program*, the required PY3 sample size for a program population of 253 projects with 85/15 confidence and precision with a coefficient of variation at 0.4 is 19 projects. The population was divided into small, medium and large size projects comprising of GNP projects and a fourth stratum containing only municipal lighting projects. The stratification by project size is reasonable. For all strata except large strata, two alternate projects were selected in the event that a chosen site does not participate. Because only one project was completed for large strata in Q1/Q2, there are no alternatives.
3. For the *Smart Construction Incentive Program*, the required sample size for a program population of 77 projects with 85/10 confidence and precision with a coefficient of variation at 0.5 is 16 projects. The population was divided into small, medium and large size projects. The stratification by project size is reasonable. PECO described in their quarterly reports that all samples sites will be desk reviewed, and on-site verifications will be conducted for all medium and large strata projects. There were four projects completed in PY2Q4 which were included in the PY3 Q1/Q2 sample frame because no impact evaluation was conducted in PY2 which is reasonable.

7.3.2.3 On-site Inspections

Since PECO's evaluators have not conducted any inspections to-date, the SWE has not had the opportunity to conduct any ride-along inspections for PY3. Navigant has selected a sample of projects completed in Q1 and Q2 but the site visits have been postponed until the April-August period. The SWE plans to accompany Navigant on a subset of these visits.

7.3.3 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 PY3Q2, however the Renewable Energy program only had one participant. 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 reported gross energy savings of 88,912 MWh and gross demand savings of 23.06 MW during PY3Q2. Key figures for PY3Q2 for each program, by sector, are shown in Table 7-15. PPL reports incentives paid across these programs so Table 7-15 does not contain the reported incentives paid in the quarter.

Table 7-15: PPL Non-Residential Programs Quarterly Summary

Sector	Program	Participants	MWh	MW
Small C&I	Appliance Recycling	98	183	0.030
Small C&I	C&I Lighting	586	30,869	13.950
Small C&I	Custom Incentives	17	1,704	0.250
Small C&I	EE Non-Lighting	208	1,067	0.230
Small C&I	HVAC Tune-Up Program	246	408	0.170
Large C&I	C&I Lighting	74	21,747	3.150
Large C&I	Custom Incentives	12	15,322	1.450
Large C&I	EE Non-Lighting	10	701	0.160
Large C&I	HVAC Tune-Up Program	4	0	0.000
Gov't/Non-Profit	C&I Lighting	272	13,243	3.140
Gov't/Non-Profit	Custom Incentives	4	1,599	0.150
Gov't/Non-Profit	EE Non-Lighting	75	1,790	0.220
Gov't/Non-Profit	Renewable Energy Program	1	279	0.160
Totals		**1,607**	**88912**	**23.060**

7.3.3.1 Review of Savings Database

PPL provided a series of databases capturing all PY3Q2 measures activity to the SWE team for review which complied with the revised SWE non-residential data request. Table 7-16 provides the participant count, energy savings and demand savings, by program and sector, according to the PPL database extracts.

Table 7-16: PPL Non-Residential Programs Savings Database Summary

Sector	Program	Participants	MWh	MW
Small C&I	Appliance Recycling	98	183	0.030
Small C&I	C&I Lighting	586	30,869	13.950
Small C&I	Custom Incentives	28	1704	0.250
Small C&I	EE Non-Lighting	211	1023	0.170
Small C&I	HVAC Tune-Up Program	246	408	0.170
Large C&I	C&I Lighting	74	21,747	3.030
Large C&I	Custom Incentives	12	15,322	1.450
Large C&I	EE Non-Lighting	10	677	0.130
Large C&I	HVAC Tune-Up Program	4	0	0.000
Gov't/Non-Profit	C&I Lighting	272	13,243	3.140
Gov't/Non-Profit	Custom Incentives	4	1,599	0.150
Gov't/Non-Profit	EE Non-Lighting	79	1,820	0.200
Gov't/Non-Profit	Renewable Energy Program	1	279	0.160
Totals		**1,625**	**88,873**	**22.840**

In Table 7-17, the discrepancies between the reported figures and the information contained in the database are presented. All discrepancies are reported as:

$$\textit{Reported Figure} - \textit{Database Summary} = \textit{Discrepancy}$$

Table 7-17: PPL Non-Residential Program Discrepancies

Sector	Program	Participants	MWh	MW
Small C&I	Appliance Recycling	0	0	0.000
Small C&I	C&I Lighting	0	0	0.000
Small C&I	Custom Incentives	-11	0	0.000
Small C&I	EE Non-Lighting	-3	44	0.060
Small C&I	HVAC Tune-Up Program	0	0	0.000
Large C&I	C&I Lighting	0	0	0.120
Large C&I	Custom Incentives	0	0	0.000
Large C&I	EE Non-Lighting	0	24	0.030
Large C&I	HVAC Tune-Up Program	0	0	0.000
Gov't/Non-Profit	C&I Lighting	0	0	0.000
Gov't/Non-Profit	Custom Incentives	0	0	0.000
Gov't/Non-Profit	EE Non-Lighting	-4	-30	0.020
Gov't/Non-Profit	Renewable Energy Program	0	0	0.000
Totals		**-18**	**39**	**0.220**

There were some minor differences in the number of participants, energy savings and peak demand savings in both the Custom Incentives and the Efficient Equipment Incentive Non-Lighting Program. The reported peak demand impacts are approximately 1% higher than the impacts contained in the tracking database. Since PPL's tracking database adjusts for transmission and distribution losses, there should be no variance due to line loss adjustment. The SWE suggests PPL investigate this variance in peak demand impacts. No major systematic issues were identified.

7.3.3.2 Review of Sample Design

PPL's Evaluator, Cadmus submitted sample designs for the programs that are available to PPL's Commercial & Industrial and Government/Non-Profit customers in PY3. These sampling designs were provided in the response to the SWE's quarterly data request for the Custom Incentive, Renewable Energy, Efficient Equipment Commercial Lighting, Efficient Equipment Commercial Non-Lighting, and Efficient Equipment Direct Discount Programs. EM&V sampling is conducted at the program level using the selected confidence and precisions levels stated in the Audit Plan. Projects were stratified based on the estimated gross energy savings (kWh) for programs where stratification sampling was applied.

While reviewing the sample designs, the SWE team found that the participants and sampling were defined differently by program, as described in PPLs quarterly reports[17]. For purposes of defining sample sizes, each sector was considered first, and each program within the sector considered second. Assuming similar populations in the remaining quarters, the sample sizes selected by Cadmus are adequate to achieve the confidence and precision levels of 85/15 at the program level and 90/10 at the nonresidential sector required by the Audit Plan. PPL described in their response to SWE's data request that the sample size will be reviewed and adjusted based on the findings with each quarter's sample, as appropriate for the program and sector. The SWE team's review on program sampling methods for PPLs non-residential programs are discussed in detail below[18].

7.3.3.2.1 Custom Incentive Program

According to the Quarterly report/data request response submitted by PPL/Cadmus, 19 custom projects were completed in PY3 Q1 and 32 projects completed in PY3Q2.

Cadmus defined each custom project as either large or small for verification purposes. The projects are divided into three strata and have different levels of rigor applied. Large projects (those with anticipated savings of 500,000 kWh/year or greater) have the greatest amount of rigor with almost all of the projects in that stratum included in the impact evaluation sample. Small projects (those with less than 500,000 kWh/year savings anticipated) are randomly sampled by the evaluator. The smaller projects stratum is further divided into two groups, one populated with projects that have anticipated savings less than or equal to 500,000 kWh/year but greater than 250,000 kWh/year (stratum one), and one populated with projects that have anticipated savings equal to or less than 250,000 kWh/year (stratum two). This approach further weights the EM&V research towards the larger projects. Projects between 250,000 and 500,000kWh/year are sampled at a rate of every third project. For projects less than 250,000kWh/year, every ninth project is selected for the sample[19]. PPL noted that the savings thresholds will be periodically re-evaluated based on the distribution of projects.

7.3.3.2.2 Efficient Equipment Incentive Program

PPL's sampling design for both Commercial Lighting and Non-Lighting Efficient Equipment Programs used stratified ratio estimation approach; projects were stratified based on the estimated site-specific gross savings (kWh). Sample design describes the target confidence and precision levels, assumed coefficient of variation, and stratification criteria. The PY3 sampling plan is based on projected participation. The sample size of 92 for commercial lighting projects is based on the PY2 coefficient of variation at 0.55, and was designed to achieve estimates that are statistically valid within 90/10. The sampling design for commercial non-lighting projects is based on the PY2 coefficient of variation at 0.5,

[17] For some programs, there is one job identification number (CSP Job Number) per customer, defined by their billing account number. For other programs, each rebate form processed received a CSP Job Number. Each rebate form can include one measure or multiple measures. In addition, each rebate form and CSP Job Number could report one or more than one installation of the same measure.

[18] A complete discussion of the Sampling methodology can be found in PPLs PY3 quarterly reports.

[19] Additional details can be found in the Custom Incentive Program EM&V Plan.

and was designed to achieve estimates that are statistically valid within 85/15. For both these programs, the project population was divided into small, medium and large size projects. The projects are distributed into strata such that the large stratum consists of the projects with the top 50% of reported ex ante savings, the medium stratum includes projects with the next 30% of savings, and the small stratum includes projects with the last 20% of savings. To adjust for anticipated non-respondents and program drop outs, an additional 13 projects were included in the sample. The SWE team conducted a detailed review of PPLs population distribution and generated impact evaluation samples and determined that the stratification methodology (stratification by project size) used is appropriate. PPL noted that the sample size may be adjusted based on findings with each quarter's sample.

Similar to Efficient Equipment Lighting and Efficient Equipment Non-Lighting Programs, PPL also submitted sample size selected for Efficient Equipment – Direct Discount Program, which is a subprogram of Efficient Equipment Program introduced in PY3Q2 and is offered to small commercial customers. The sampling design used similar stratified ratio estimation approach; projects were stratified based on the estimated site-specific gross savings (kWh). The sample size of 25 projects was developed assuming a coefficient of variation at 0.5, based on PY2 results for the Efficient Equipment Program with target confidence/precision of 85/15.

As described in PPL's quarterly report, participation in the Government and Non-Profit participants will be monitored to determine whether it meets 20% of the program's total program savings. If they do meet 20% by the close of PY3, PPL will consider them an independent sector in this program. This is in accordance with the Audit Plan.

7.3.3.2.3 Renewable Energy Program

In PY3, among institutional customers, two projects were completed in Q1/Q2. Both these sites were included in the evaluation sample. The sampling rates are designed to meet 85/15 confidence and precision targets at the program level and sector level. PPL described that the verification activities will occur in Q4 in order to draw the sample from the largest population.

7.3.3.2.4 Other Non-Residential Programs

The verification sample has not been selected for HVAC Tune-up, Direct Load Control and Load Curtailment Programs[20]. This is because for direct load control and load curtailment programs, PPL is in the process of recruiting participants for PY3 and no incentives have been claimed yet.

7.3.3.3 On-site Inspections

The SWE has conducted seven ride-along site visits for PPL's Year 3 projects. The installed measures included lighting, VFDs, refrigeration equipment, and air conditioning. The SWE will issue ride-along site inspection reports as the evaluator's reports are received.

[20] This is based on Cadmus response to SWE's data request.

7.3.4 Met-Ed

Metropolitan Edison lists seven programs in its non-residential portfolio. The only program that did not have any participants in PY3Q2 was the PJM Demand Response Program. The reported gross energy savings from non-residential programs in PY3Q2 was 1,266 MWh and the reported gross demand savings was 0.24 MW. Table 7-18 summarizes the key figures reported by Met-Ed for PY3Q2.

Table 7-18: Met-Ed Non-Residential Programs Quarterly Summary

Program	Participants	MWh	MW
Energy Audit, Assessment and Equipment Rebate	20	692	0.150
C/I Performance Contracting/Equipment	0	0	0.000
Industrial Motors and VSD	3	314	0.020
Streetlighting	3	7	0.000
Non-Profit	0	0	0.000
Remaining Government /Non-Profit	23	253	0.070
Totals	**49**	**1,266**	**0.240**

7.3.4.1 Review of Savings Database

FirstEnergy provided the SWE team a database of project activity for each of its operating companies. Table 7-19 contains the total participant counts, energy savings and demand savings by program, from Met-Ed non-residential projects in the FirstEnergy savings database. Incentive amounts were not included in the FirstEnergy extract for non-residential projects and are omitted from Table 7-19.

Table 7-19: Met-Ed Non-Residential Programs Savings Database Summary

Program	Participants	MWh	MW
Energy Audit, Assessment and Equipment Rebate	20	692	0.150
C/I Performance Contracting/Equipment	0	0	0.000
Industrial Motors and VSD	3	314	0.020
Streetlighting	12	101	0.010
Non-Profit	0	0	0.000
Remaining Government /Non-Profit	14	160	0.060
Totals	**49**	**1,267**	**0.240**

In Table 7-20, the discrepancies between the reported figures and the information contained in the database are presented. All discrepancies are reported as:

$$\boldsymbol{Reported\ Figure\ -\ Database\ Summary = Discrepancy}$$

Table 7-20: Met-Ed Non-Residential Program Discrepancies

Program	Participants	MWh	MW
Energy Audit, Assessment and Equipment Rebate	0	0	0.000
C/I Performance Contracting/Equipment	0	0	0.000
Industrial Motors and VSD	0	0	0.000
Streetlighting	-9	-94	-0.010
Non-Profit	0	0	0.000
Remaining Government /Non-Profit	9	93	0.010
Totals	**0**	**-1**	**0.000**

The total participant counts, energy savings and demand savings contained in the Met-Ed project database match the reported figures except for rounding error. In certain cases the SWE was unable to determine which program a project belonged in based on the information provided. Met-Ed's quarterly tracking database included 12 projects for which the Program Name field was equal to "SALTS – Street lighting, outdoor Area Lighting, and/or Traffic Signals." For quarterly reporting purposes, 3 of these projects were assigned to the Streetlighting program and 9 were assigned to the Remaining Government/Non-Profit profit program. The SWE was unable to make this distinction based on the tracking data provided and had no choice but to assign all 12 projects to the Streetlighting program. The result is that the database summary has 9 more Streelighting participants than the Met-Ed PY3Q2 report. The same discrepancy shows up in the opposite direction for the Remaining Government/Non-Profit program. The SWE has discussed the issue with FirstEnergy's evaluator and requested a program classification map based on implementer tracking data to help assign each project to the proper program.

7.3.4.2 Review of Sample Design

FirstEnergy's evaluator, ADM Associates submitted quarterly sample designs along with the quarterly reports to the SWE for review. Because the sampling designs were identical between Met-Ed, Penelec, and Penn Power, they are treated as a single portfolio for discussing SWE's sampling design review. FirstEnergy implements dedicated programs for the Small C&I, Large C&I and Government/Non Profit sectors. For purposes of defining sample sizes, each sector was considered first, and each program within the sector considered second. Sample design also included target confidence and precision levels, assumed coefficient of variation, and stratification criteria. Review of the sampling design shows that sampling for all three FirstEnergy's companies were accomplished using stratified sampling approach; projects were stratified based on the estimated site-specific gross savings (kWh). The SWE team conducted a detailed review of FirstEnergy's population distribution and generated impact evaluation samples and determined that the stratification methodology used is appropriate.

FirstEnergy's sampling designs listed populations and samples for all its non-residential programs (Nonstandard Lighting for Business (NSL), Standard Lighting for Business (SLB), HVAC, Motors & Drives, Specialty Equipment, and Street Lighting) categorized into three main customer segments; Large C&I,

Small C&I and Government/Non-Profit sectors. This additional stratification by sector type ensures homogeneity of the population and the sample pool.

FirstEnergy evaluators have combined four non-residential programs into a single population to classify and group measures by Prescriptive (HVAC and Specialty Equipment Programs) and Custom (Custom Incentive and Motors & Drives Programs) measure types. ADM uses dynamic batch-wise stratified sampling methodology for the C&I and Government/Non-Profit Programs as recommended by the SWE team. The sample design used for FirstEnergy's non-residential programs is sufficient to meet or exceed the precision and confidence targets of 85/15 at the program level and 90/10 at the nonresidential sector level in accordance with the Audit Plan. FE described in their quarterly reports that the government/non-profit sectors will be treated as independent programs with 85/15 confidence/precision if their savings comprise at least 20% of the sector-level savings which is in accordance with the Audit Plan.

7.3.4.3 On-site Inspections

Since FirstEnergy's evaluators have not conducted any inspections to-date, the SWE has not had the opportunity to conduct any ride-along inspections for PY3. ADM has selected a sample of projects completed in Q1 and Q2 but the site visits have not been scheduled. The SWE plans to accompany ADM on a subset of these visits.

7.3.5 Penn Power

Penn Power lists seven programs under its non-residential umbrella, which includes the SCI, LCI, and GNP sectors. Only three of these programs reported savings during PY3Q2. The reported number of participants, energy savings and demand savings are presented for these three programs in Table 7-21. The gross reported energy savings of these programs was 816 MWh and the gross reported demand savings was 0.15 MW. Incentive amounts were not included in the tracking database for non-residential customers, so these figures are not included in Table 7-21.

Table 7-21: Penn Power Non-Residential Programs Quarterly Summary

Program	Participants	MWh	MW
Small C&I Audit, Assessment and Equipment	8	633	0.110
C&I Performance Contracting/Equipment	2	170	0.030
Remaining Government/Non-Profit	1	13	0.010
Totals	**11**	**816**	**0.150**

7.3.5.1 Review of Savings Database

FirstEnergy provided the SWE team a database of project activity for each of its operating companies. Table 7-22 contains the total participant counts, energy savings and demand savings, by program, from Penn Power non-residential projects in the FirstEnergy savings database.

Table 7-22: Penn Power Non-Residential Programs Savings Database Summary

Program	Participants	MWh	MW
Small C&I Audit, Assessment and Equipment	8	633	0.110
C&I Performance Contracting/Equipment	2	170	0.030
Remaining Government/Non-Profit	1	13	0.010
Totals	**11**	**816**	**0.150**

In Table 7-23, the discrepancies between the reported figures and the information contained in the database are presented. All discrepancies are reported as:

$$\boldsymbol{Reported\ Figure\ -\ Database\ Summary = Discrepancy}$$

Table 7-23: Penn Power Non-Residential Program Discrepancies

Program	Participants	MWh	MW
Small C&I Audit, Assessment and Equipment	0	0	0.000
C&I Performance Contracting/Equipment	0	0	0.000
Remaining Government/Non-Profit	0	0	0.000
Totals	**0**	**0**	**0.000**

The participant counts, energy savings and demand savings contained in the Penn Power project database are each identical to the reported figures. Incentives paid to participants were not included in the tracking database, so these figures could not be compared. The SWE requests that rebate amounts be included in future extracts, if possible.

7.3.5.2 Review of Sample Design

FirstEnergy's evaluator, ADM Associates submitted quarterly sample designs along with the quarterly reports to the SWE for review. Because the sampling designs were identical between Met-Ed, Penelec, and Penn Power, they are treated as a single portfolio for discussing SWE's sampling design review. FirstEnergy implements dedicated programs for the Small C&I, Large C&I and Government/Non Profit sectors. For purposes of defining sample sizes, each sector was considered first, and each program within the sector considered second. Sample design also included target confidence and precision levels, assumed coefficient of variation, and stratification criteria. Review of the sampling design shows that sampling for all three FirstEnergy's companies were accomplished using stratified sampling approach; projects were stratified based on the estimated site-specific gross savings (kWh). The SWE team conducted a detailed review of FirstEnergy's population distribution and generated impact evaluation samples and determined that the stratification methodology used is appropriate.

FirstEnergy's sampling designs listed populations and samples for all its non-residential programs (Nonstandard Lighting for Business (NSL), Standard Lighting for Business (SLB), HVAC, Motors & Drives, Specialty Equipment, and Street Lighting) categorized into three main customer segments; Large C&I,

Small C&I and Government/Non-Profit sectors. This additional stratification by sector type ensures homogeneity of the population and the sample pool.

FirstEnergy evaluators have combined four non-residential programs into a single population to classify and group measures by Prescriptive (HVAC and Specialty Equipment Programs) and Custom (Custom Incentive and Motors & Drives Programs) measure types. ADM uses dynamic batch-wise stratified sampling methodology for the C&I and Government/Non-Profit Programs as recommended by the SWE team. The sample design used for FirstEnergy's non-residential programs is sufficient to meet or exceed the precision and confidence targets of 85/15 at the program level and 90/10 at the nonresidential sector level in accordance with the Audit Plan. FE described in their quarterly reports that the government/non-profit sectors will be treated as independent programs with 85/15 confidence/precision if their savings comprise at least 20% of the sector-level savings which is in accordance with the Audit Plan.

7.3.5.3 On-site Inspections

Since FirstEnergy's evaluators have not conducted any inspections to-date, the SWE has not had the opportunity to conduct any ride-along inspections for PY3. ADM has selected a sample of projects completed in Q1 and Q2 but the site visits have not been scheduled. The SWE plans to accompany ADM on a subset of these visits.

7.3.6 Penelec

Penelec lists seven programs under its non-residential umbrella. The only programs without any reported activity in PY3Q2 was PJM Demand Response and Industrial Motors and VSD. Table 7-24 contains the reported participant counts, energy savings and demand savings. A reported total of 185 non-residential customers participated in Penelec program offerings in PY3Q2. The reported gross energy savings is 8,457 MWh and the reported gross demand savings is 2.10 MW.

Table 7-24: Penelec Non-Residential Programs Quarterly Summary

Program	Participants	MWh	MW
Small C&I Audit Assessment and Equipment Rebate	64	2,089	0.660
C&I Performance Contracting/Equipment	2	998	0.020
Streetlighting	16	108	0.000
Non-Profit	5	29	0.010
Remaining Government/Non-Profit	98	5,233	1.410
Totals	**185**	**8,457**	**2.100**

7.3.6.1 Review of Savings Database

FirstEnergy provided the SWE team a database of project activity for each of its operating companies. Table 7-25 contains the total participant counts, energy savings and demand savings, by program, from Penelec non-residential projects in the FirstEnergy savings database. Incentive amounts were not included in the PY3Q2 tracking data. Notice that the SWE did not assign any participants to the Non-

Profit program. This is because the tracking data did not provide enough information to distinguish between the Non-Profit program and the Remaining Government/Non-Profit program.

Table 7-25: Penelec Non-Residential Programs Savings Database Summary

Program	Participants	MWh	MW
Small C&I Audit Assessment and Equipment Rebate	63	2,020	0.640
C&I Performance Contracting/Equipment	2	998	0.020
Streetlighting	16	108	0.000
Non-Profit	0	0	0.000
Remaining Government/Non-Profit	100	5,262	1.410
Totals	**181**	**8,388**	**2.070**

In Table 7-26, the discrepancies between the reported figures and the information contained in the database are presented. All discrepancies are reported as:

$$\boldsymbol{Reported\ Figure\ -\ Database\ Summary = Discrepancy}$$

Table 7-26: Penelec Non-Residential Program Discrepancies

Program	Participants	MWh	MW
Small C&I Audit Assessment and Equipment Rebate	1	69	0.020
C&I Performance Contracting/Equipment	0	0	0.000
Streetlighting	0	0	0.000
Non-Profit	5	29	0.010
Remaining Government/Non-Profit	-2	-29	0.000
Totals	**4**	**69**	**0.030**

Table 7-26 shows discrepancies in the total number of non-residential participants, total energy impact and total demand impact. However, discrepancies are small and do not seem to indicate any systematic issues. The SWE was unable to distinguish which projects were assigned to the Non-Profit program and which ones were assigned to the Remaining Government/Non-Profit program. This is the primary source of the discrepancies shown for these two programs in Table 7-26. SWE team has discussed the difficulty in assignment of customers to the correct program based on tracking data with FirstEnergy's evaluator and this issued should be resolved by PY3 Q3.

7.3.6.2 Review of Sample Design

FirstEnergy's evaluator, ADM Associates submitted quarterly sample designs along with the quarterly reports to the SWE for review. Because the sampling designs were identical between Met-Ed, Penelec, and Penn Power, they are treated as a single portfolio for discussing SWE's sampling design review. FirstEnergy implements dedicated programs for the Small C&I, Large C&I and Government/Non Profit sectors. For purposes of defining sample sizes, each sector was considered first, and each program

within the sector considered second. Sample design also included target confidence and precision levels, assumed coefficient of variation, and stratification criteria. Review of the sampling design shows that sampling for all three FirstEnergy's companies were accomplished using stratified sampling approach; projects were stratified based on the estimated site-specific gross savings (kWh). The SWE team conducted a detailed review of FirstEnergy's population distribution and generated impact evaluation samples and determined that the stratification methodology used is appropriate.

FirstEnergy's sampling designs listed populations and samples for all its non-residential programs (Nonstandard Lighting for Business (NSL), Standard Lighting for Business (SLB), HVAC, Motors & Drives, Specialty Equipment, and Street Lighting) categorized into three main customer segments; Large C&I, Small C&I and Government/Non-Profit sectors. This additional stratification by sector type ensures homogeneity of the population and the sample pool.

FirstEnergy evaluators have combined four non-residential programs into a single population to classify and group measures by Prescriptive (HVAC and Specialty Equipment Programs) and Custom (Custom Incentive and Motors & Drives Programs) measure types. ADM uses dynamic batch-wise stratified sampling methodology for the C&I and Government/Non-Profit Programs as recommended by the SWE team. The sample design used for FirstEnergy's non-residential programs is sufficient to meet or exceed the precision and confidence targets of 85/15 at the program level and 90/10 at the nonresidential sector level in accordance with the Audit Plan. FE described in their quarterly reports that the government/non-profit sectors will be treated as independent programs with 85/15 confidence/precision if their savings comprise at least 20% of the sector-level savings which is in accordance with the Audit Plan.

7.3.6.3 On-site Inspections

Since FirstEnergy's evaluators have not conducted any inspections to-date, the SWE has not had the opportunity to conduct any ride-along inspections for PY3. ADM has selected a sample of projects completed in Q1 and Q2 but the site visits have not been scheduled. The SWE plans to accompany ADM on a subset of these visits.

7.3.7 West Penn

West Penn listed 11 programs under the non-residential umbrella, which includes the SCI, LCI, and GNP sectors. Of these eleven programs, five programs achieved energy and demand savings during PY3Q2. The programs achieved a reported gross energy savings of 19,644 MWh and reported gross demand savings of 3.7 MW during PY3Q2. Key figures for PY3Q2 for each individual program are shown in Table 7-27.

Table 7-27: West Penn Non-Residential Programs Quarterly Summary

Program	Participants	MWh	MW	Incentives
Custom Applications	14	12,543	2.300	$302,058
Custom Technology	9	2,102	0.300	$89,514
Commercial Products Efficiency	69	2,791	0.600	$132,167
Govt/Non-Profit Lighting Efficiency	55	2,206	0.600	$192,463
Commercial HVAC	2	2	0.000	$3,231
Totals	**149**	**19,644**	**3.700**	**$719,433**

7.3.7.1 Review of Savings Database

West Penn Power provided a series of databases to the SWE team detailing project activity during PY3Q2. Table 7-28 shows the participant counts, energy savings, demand savings and EDC incentives contained in each program database.

Table 7-28: West Penn Non-Residential Programs Savings Database Summary

Program	Participants	MWh	MW	Incentives
Custom Applications	14	12,543	2.300	$498,768
Custom Technology	9	2,102	0.300	$122,828
Commercial Products Efficiency	47	2,311	0.500	$97,236
Govt/Non-Profit Lighting Efficiency	72	2,686	0.600	$212,265
Commercial HVAC	2	2	0.000	$1,068
Totals	**144**	**19,644**	**3.700**	**$932,163**

In Table 7-29, the discrepancies between the reported figures and the information contained in the program databases are presented. All discrepancies are reported as:

$$\boldsymbol{Reported\ Figure\ -\ Database\ Summary = Discrepancy}$$

Table 7-29: Non-Residential Program Discrepancies

Program	Participants	MWh	MW	Incentives
Custom Applications	0	0	0.000	-$196,710
Custom Technology	0	0	0.000	-$33,314
Commercial Products Efficiency	22	480	0.100	$34,931
Govt/Non-Profit Lighting Efficiency	-17	-480	-0.100	-$19,802
Commercial HVAC	0	0	0.000	$2,164
Totals	**5**	**0**	**0.000**	**-$212,730**

In the Notes and Reconciliation tab of the *3.a CommGovtNonprof-Lighting thru 2011-11-30* spreadsheet provided to the SWE team, several participants in the Government/Non-Profit Lighting Efficiency

program are reclassified as members of the Commercial Products Efficiency program. This reclassification of participants explains why the differences in energy savings and demand savings cancel each other out. Incentive discrepancies can be attributed to the lag between project completion and payment of the rebate associated with that project. This means that PY3Q2 incentive payments included some projects which were completed in PY3 Q1.

7.3.7.2 Review of Sample Design

ADM/TetraTech, WPP's evaluator submitted samples for the non-residential programs. A quarterly batch process is used to select the sample of projects. Verification samples were submitted for four programs: CommCustApplic., CommCustTech., Lgt Rebated-C&I Cust and Lgt Rebated-GSNP Cust. programs. No samples were submitted for HVAC, PA Free CFL & Exit and HVAC-AC programs.

WPP clarified to the SWE team that there were only three HVAC projects in Q1/Q2; due to limited program uptake, no PY3 M&V is currently planned. Regarding the Free CFL & Exit Signs, ADM/TetraTech will start verification efforts after Q3 in order to allow additional sample points. WPP noted that majority of the free measures will be verified via phone surveys. On-site verifications for the free measures will only include those projects where non-deemed measures were also installed, therefore requiring their inclusion in the on-site batchwise sample. In addition, due to the merger, EM&V plans may be modified moving forward.

7.3.7.3 On-site Inspections

Since FirstEnergy's evaluators have not conducted any inspections to-date, the SWE has not had the opportunity to conduct any ride-along inspections for PY3. ADM has selected a sample of projects completed in Q1 and Q2 but the site visits have not been scheduled. The SWE plans to accompany ADM on a subset of these visits.

8 Summary and Recommendations

The SWE team, the PA PUC TUS 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 PY3Q2, the SWE team makes the following recommendations to the PA PUC relating to the Act 129 energy efficiency and demand response programs:

- The SWE team will complete a white paper that recommends a consistent framework that all EDCs can use to select methods of estimating net-to-gross ratios to support design of future EE&C programs.
- The SWE team would like to commend the EDCs for the accuracy of the tracking and reporting for their respective residential efficient equipment and appliance recycling programs. As a result, the SWE team recommends working with the EDCs going forward to streamline the audit of these programs.
- The SWE team requests that FirstEnergy clarify a variance in the number of bulbs reported versus the number tracked as part of Met-Ed's, Penelec's, and PennPower's upstream lighting portion of their Residential Energy Efficient Products Program.
- The SWE team recommends working with the EDCs to modify the quarterly data request for low-income programs to include unique underlying assumptions (e.g., installation rates) used by the EDCs that are not in the TRM in order to streamline the audit process and minimize the need to make subsequent data requests to the EDCs.