

Preliminary Annual Report to the Pennsylvania Public Utility Commission

Phase III of Act 129

Program Year 10

(June 1, 2018 – May 31, 2019)

For Pennsylvania Act 129 of 2008

Energy Efficiency and Conservation Plan

Prepared by Navigant

For

Duquesne Light Company

July 15, 2019

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1. Acronyms

BDR	Behavioral Demand Response
C&I	Commercial and Industrial
CFL	Compact Fluorescent Lamp
CSP	Conservation Service Provider or Curtailment Service Provider
DLC	Direct Load Control
DR	Demand Response
EDC	Electric Distribution Company
EDT	Eastern Daylight Time
EE&C	Energy Efficiency and Conservation
EM&V	Evaluation, Measurement, and Verification
EUL	Effective Useful Life
GNI	Government, Non-Profit, Institutional
HVAC	Heating, Ventilating, and Air Conditioning
ICSP	Implementation Conservation Service Provider
kW	Kilowatt
kWh	Kilowatt-hour
LED	Light-Emitting Diode
LIURP	Low-income Usage Reduction Program
M&V	Measurement and Verification
MW	Megawatt
MWh	Megawatt-hour
NTG	Net-to-Gross
P3TD	Phase III to Date
PA PUC	Pennsylvania Public Utility Commission
PSA	Phase III to Date Preliminary Savings Achieved; equal to VTD + PYTD
PSA+CO	PSA savings plus Carryover from Phase II
PY	Program Year: e.g. PY8, from June 1, 2016, to May 31, 2017
PYRTD	Program Year Reported to Date
PYVTD	Program Year Verified to Date
RTD	Phase III to Date Reported Gross Savings
SWE	Statewide Evaluator
TRC	Total Resource Cost
TRM	Technical Reference Manual
VTD	Phase III to Date Verified Gross Savings

2. Types of Savings

Gross Savings: The change in energy consumption and/or peak demand that results directly from program-related actions taken by participants in an EE&C program, regardless of why they participated.

Net Savings: The total change in energy consumption and/or peak demand that is attributable to an EE&C program. Depending on the program delivery model and evaluation methodology, the net savings estimates may differ from the gross savings estimate due to adjustments for the effects of free riders, changes in codes and standards, market effects, participant and nonparticipant spillover, and other causes of changes in energy consumption or demand not directly attributable to the EE&C program.

Reported Gross: Also referred to as *ex ante* (Latin for “beforehand”) savings. The energy and peak demand savings values calculated by the EDC or its program Implementation Conservation Service Providers (ICSP) and stored in the program tracking system.

Verified Gross: Also referred to as *ex post* (Latin for “from something done afterward”) gross savings. The energy and peak demand savings estimates reported by the independent evaluation contractor after the gross impact evaluation and associated M&V efforts have been completed.

Verified Net: Also referred to as *ex post* net savings. The energy and peak demand savings estimates reported by the independent evaluation contractor after application of the results of the net impact evaluation. Typically calculated by multiplying the verified gross savings by a net-to-gross (NTG) ratio.

Annual Savings: Energy and demand savings expressed on an annual basis, or the amount of energy and/or peak demand an EE&C measure or program can be expected to save over the course of a typical year. Annualized savings are noted as MWh/year or MW/year. The Pennsylvania TRM provides algorithms and assumptions to calculate annual savings, and Act 129 compliance targets for consumption reduction are based on the sum of the annual savings estimates of installed measures.

Lifetime Savings: Energy and demand savings expressed in terms of the total expected savings over the useful life of the measure. Typically calculated by multiplying the annual savings of a measure by its effective useful life. The TRC Test uses savings from the full lifetime of a measure to calculate the cost-effectiveness of EE&C programs.

Program Year Reported to Date (PYRTD): The reported gross energy and peak demand savings achieved by an EE&C program or portfolio within the current program year. PYTD values for energy efficiency will always be reported gross savings in a semi-annual or preliminary annual report.

Program Year Verified to Date (PYVTD): The verified gross energy and peak demand savings achieved by an EE&C program or portfolio within the current program year.

Phase III to Date (P3TD): The energy and peak demand savings achieved by an EE&C program or portfolio within Phase III of Act 129. Reported in several permutations described below.

Phase III to Date Reported (RTD): The sum of the reported gross savings recorded to date in Phase III of Act 129 for an EE&C program or portfolio.

Phase III to Date Verified (VTD): The sum of the verified gross savings recorded to date in Phase III of Act 129 for an EE&C program or portfolio, as determined by the impact evaluation finding of the independent evaluation contractor.

Phase III to Date Preliminary Savings Achieved (PSA): The sum of the verified gross savings (VTD) from previous program years in Phase III where the impact evaluation is complete plus the reported gross savings from the current program year (PYTD). For PY8, the PSA savings will always equal the PYTD savings because PY8 is the first program year of the phase (no savings will be verified until the PY8 final annual report).

Phase III to Date Preliminary Savings Achieved + Carryover (PSA+CO): The sum of the verified gross savings from previous program years in Phase III plus the reported gross savings from the current program year plus any verified gross carryover savings from Phase II of Act 129. This is the best estimate of an EDC’s progress toward the Phase III compliance targets.

Table 1 lists savings values for a hypothetical EDC as of the PY10 semi-annual report, when the first six months of PY10 reported savings are available. The calculations below are then used to illustrate the differences between various savings values.

Table 1: P3TD Savings Calculation Example

Program Period	Reported Gross (MWh/year)	Verified Gross (MWh/year)
Phase II (Carryover)	N/A	400
PY8	800	700
PY9	900	850
PY10 (Q1+Q2)	500	N/A

PYRTD (PY10) = 500 MWh/year

RTD = 800 + 900 + 500 = 2,200 MWh/year

VTD = 700 + 850 = 1,550 MWh / year

PSA = 1,550 + 500 = 2,050 MWh/year

PSA + CO = 2,050 + 400 = 2,450 MWh/year

3. Introduction

Pennsylvania Act 129 of 2008, signed on October 15, 2008, mandated energy savings and demand reduction goals for the largest electric distribution companies (EDCs) in Pennsylvania for Phase I (2008 through 2013). Phase II of Act 129 began in 2013 and concluded in 2016. In late 2015, each EDC filed a new energy efficiency and conservation (EE&C) plan with the PA PUC detailing the proposed design of its portfolio for Phase III. These plans were updated based on stakeholder input and subsequently approved by the PUC in 2016.

Implementation of Phase III of the Act 129 programs began on June 1, 2016. This report documents the progress and effectiveness of the Phase III EE&C accomplishments for Duquesne Light in Program Year 10 (PY10), as well as the cumulative accomplishments of the Phase III programs since inception. This report additionally documents the energy savings carried over from Phase II. The Phase II carryover savings count towards EDC savings compliance targets for Phase III.

This report details the participation, spending, and reported gross impacts of the energy efficiency programs in PY10. Compliance with Act 129 savings goals is ultimately based on verified gross savings. Duquesne Light has retained Navigant as an independent evaluation contractor for Phase III of Act 129. Navigant is responsible for the measurement and verification of the savings and calculation of verified gross savings. The verified gross savings for PY10 energy efficiency programs will be reported in the final annual report, to be filed on November 15, 2019.

Phase III of Act 129 includes a demand response goal for Duquesne Light. Demand response events are limited to the months of June through September, which are the first four months of the Act 129 program year. Because the demand response season is completed early in the program year, it is possible to complete the independent evaluation of verified gross savings for demand response sooner than is possible for energy efficiency programs. Section 8.2 of this report includes the verified gross demand response impacts for PY10 as well as the cumulative demand response performance of the EE&C program to date for Phase III of Act 129.

4. Summary of Achievements

4.1. CARRYOVER SAVINGS FROM PHASE II OF ACT 129

Duquesne Light has a total of 100,467 MWh/year of carryover savings from Phase II. Figure 1 compares Duquesne Light’s Phase II verified gross savings total to the Phase II compliance target to illustrate the carryover calculation.

Figure 1: Carryover Savings from Phase II of Act 129

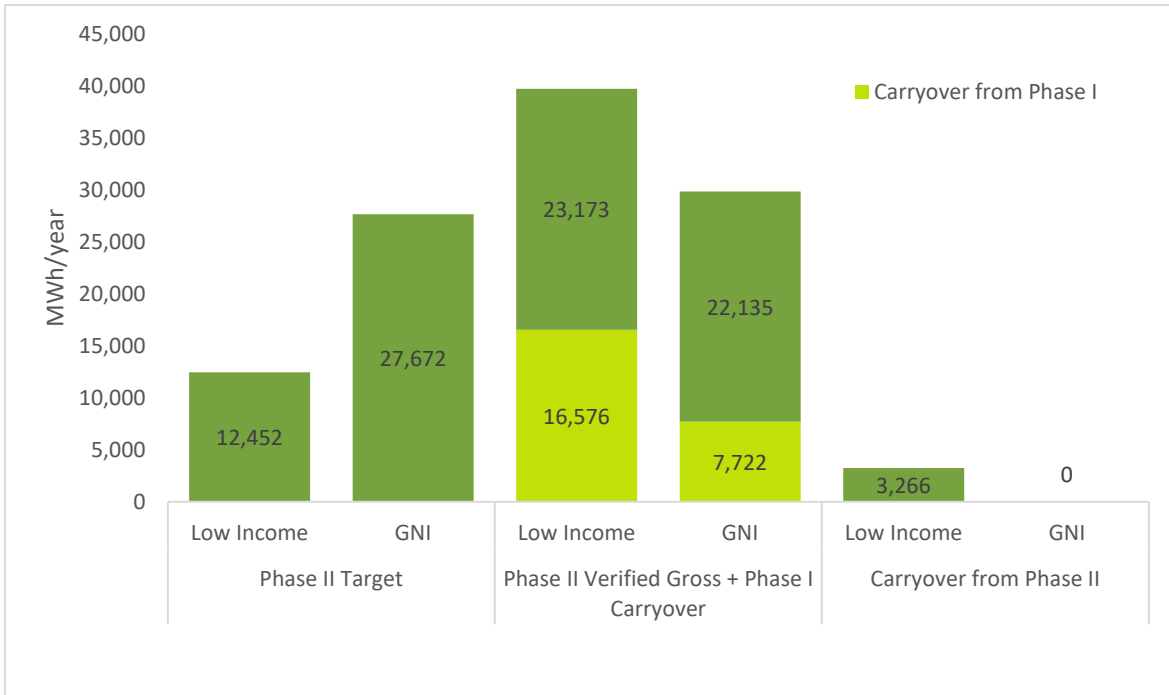


The Commission’s Phase III Implementation Order¹ also allowed EDCs to carry over savings in excess of the Phase II Government, Non-Profit, and Institutional (GNI) savings goal and excess savings from the low-income customer segment.² Figure 2 shows the calculation of carryover savings for the low-income and GNI targets.

¹ Pennsylvania Public Utility Commission, *Energy Efficiency and Conservation Program Implementation Order*, at Docket No. M-2014-2424864, (*Phase III Implementation Order*), entered June 11, 2015.

² Proportionate to those savings achieved by dedicated low-income programs in Phase III.

Figure 2: Customer Segment-Specific Carryover from Phase II



4.2. PHASE III ENERGY EFFICIENCY ACHIEVEMENTS TO DATE

Since the beginning of Program Year 10 on June 1, 2018, Duquesne Light has claimed:

- 88,155 MWh/yr of reported gross electric energy savings (PYRTD)
- 11.44 MW/yr of reported gross peak demand savings (PYRTD) from energy efficiency programs
- 52.65 MW/yr of verified gross peak demand savings (PYVTD) from demand response programs

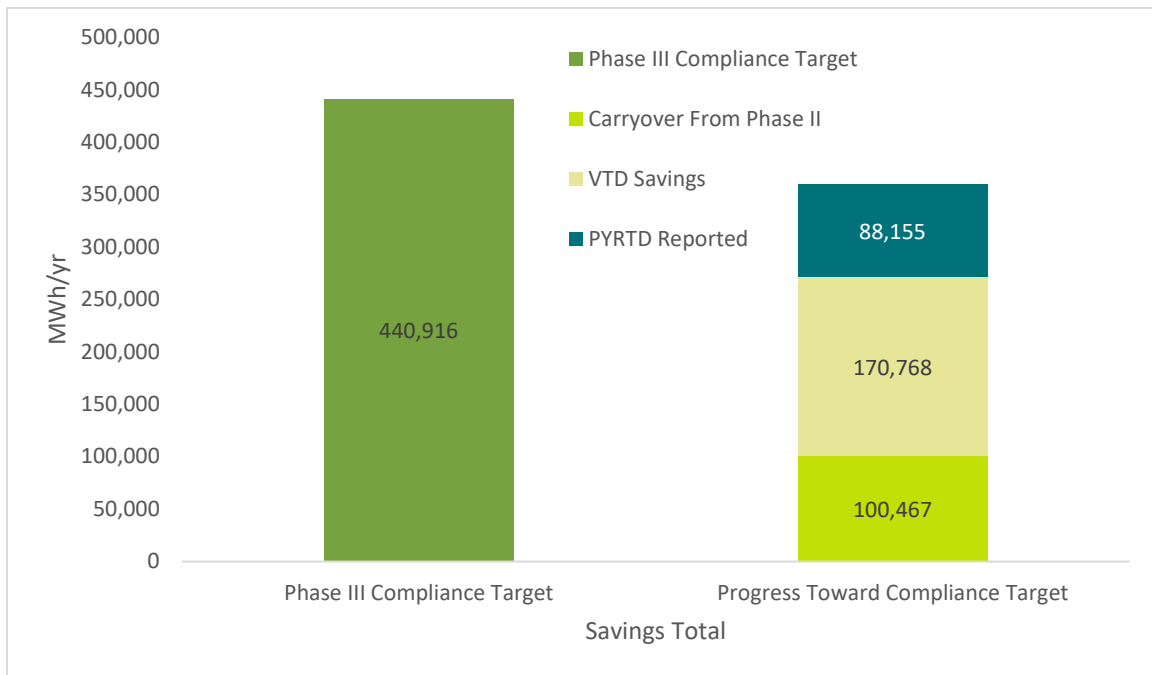
Since the beginning of Phase III of Act 129 on June 1, 2016, Duquesne Light has achieved:

- 254,714 MWh/yr of reported gross electric energy savings (RTD)
- 30.16 MW/yr of reported gross peak demand savings (RTD) from energy efficiency programs
- 258,924 MWh/yr of gross electric energy savings (PSA). This total includes verified gross savings from previous Phase III program years and the PYTD reported gross savings from PY10.
- 31.05 MW/yr of gross peak demand savings (PSA) from energy efficiency programs

Including carryover savings from Phase II, Duquesne Light has achieved:

- 359,390 MWh/yr of PSA+CO energy savings recorded to date in Phase III
 - This represents 82% percent of the May 31, 2021, energy savings compliance target of 440,916 MWh/yr.

Figure 3: EE&C Plan Performance Toward Phase III Portfolio Compliance Target³



The Phase III Implementation Order directed EDCs to offer conservation measures to the low-income customer segment based on the proportion of electric sales attributable to low-income households. The proportionate number of measures target for Duquesne Light is 8.4%. Duquesne Light offers a total of 101 EE&C measures to its residential and non-residential customer classes. There are 20 measures available to the low-income customer segment at no

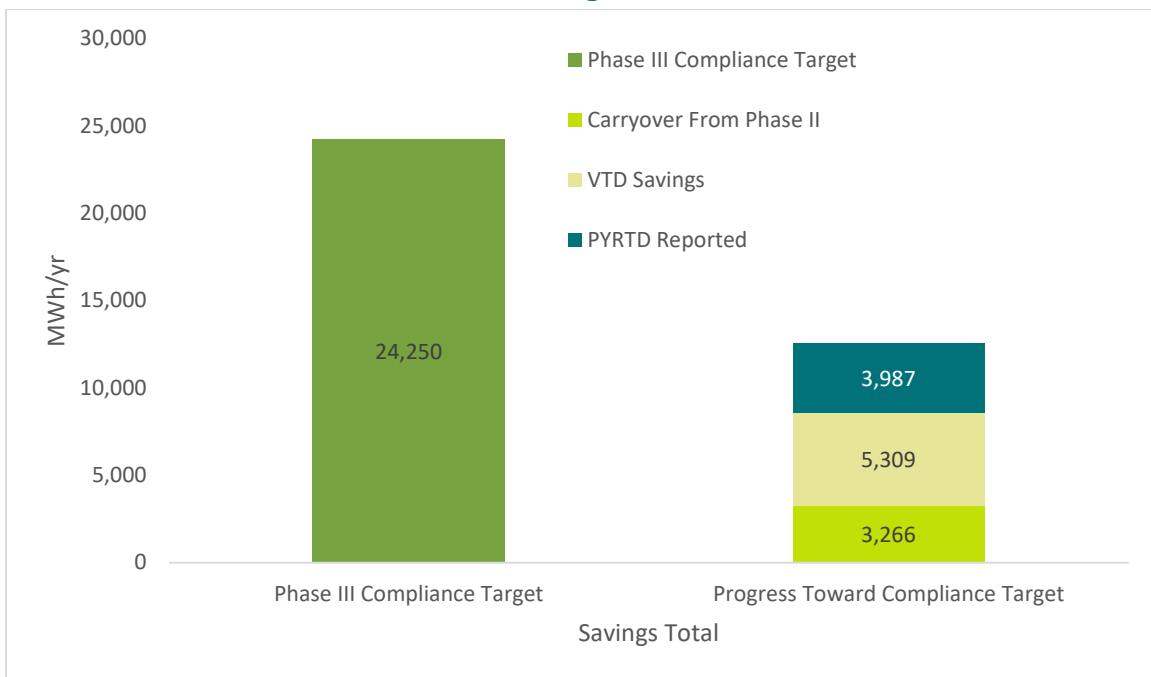
³ Following the filing of the PY9 Annual Report, the SWE determined that verified savings related to REEP: Residential Energy Efficiency (Upstream Lighting) and Express Efficiency (via cross-sector sales) were greater than originally reported. The following summarizes the increases made to certain values from the PY9 report. These updates are reflected within this report throughout the various permutations of achievements.

- REEP: Residential Energy Efficiency (Upstream Lighting), gross energy: 655 MWh
- REEP: Residential Energy Efficiency (Upstream Lighting), gross demand: 0.066 MW
- REEP: Residential Energy Efficiency (Upstream Lighting), net energy: 281 MWh
- REEP: Residential Energy Efficiency (Upstream Lighting), net demand: 0.028 MW
- Express Efficiency, gross energy: 100 MWh
- Express Efficiency, gross demand: 0.014 MW
- Express Efficiency, net energy: 43 MWh
- Express Efficiency, net demand: 0.006 MW

cost to the customer. This represents 19.8% of the total measures offered in the EE&C plan and exceeds the proportionate number of measures target.

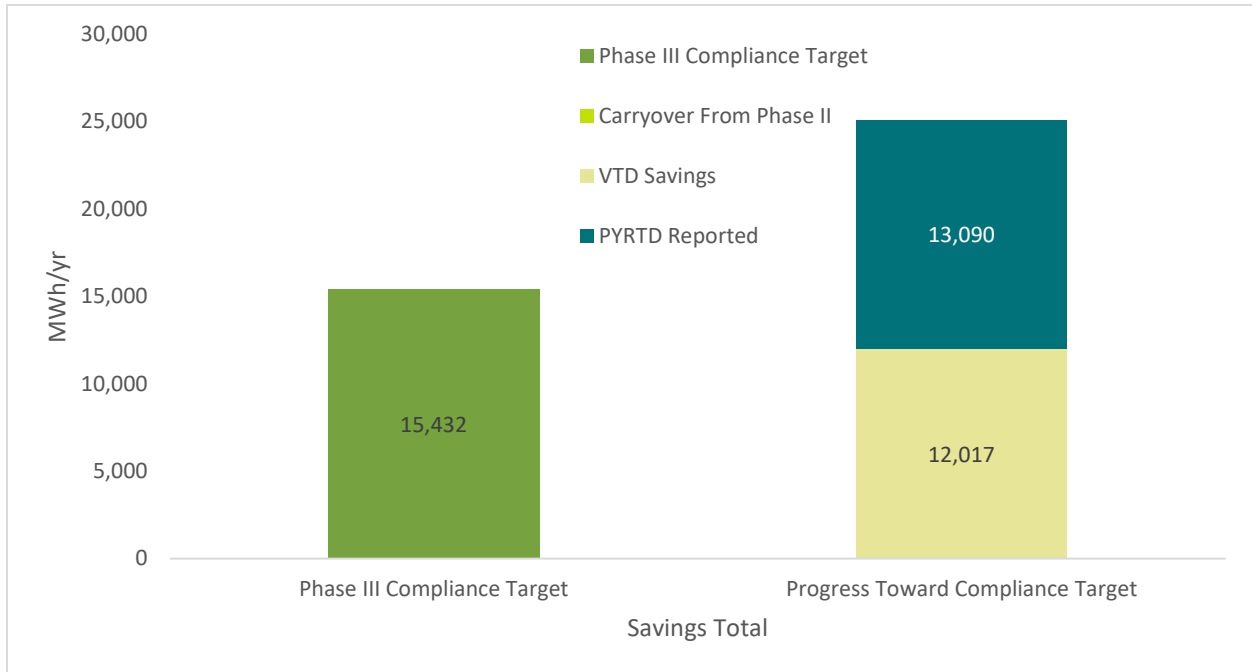
The PA PUC also established a low-income energy savings target of 5.5% of the portfolio savings goal. The low-income savings target for Duquesne Light is 24,250 MWh/yr and is based on verified gross savings. Figure 4 compares the PSA+CO performance to date for the low-income customer segment to the Phase III savings target. Based on the latest available information, Duquesne Light has achieved 51.8% of the Phase III low-income energy savings target.

Figure 4: EE&C Plan Performance Toward Phase III Low-Income Compliance Target



The Phase III Implementation Order established a government, non-profit, and institutional energy savings target of 3.5% of the portfolio savings goal. The GNI savings target for Duquesne Light is 15,432 MWh/yr and is based on verified gross savings. Figure 5 compares the PSA+CO performance to date for the GNI customer segment to the Phase III savings target. Based on the latest available information, Duquesne Light has achieved 163% of the Phase III GNI energy savings target.

Figure 5: EE&C Plan Performance Against Phase III GNI Compliance Target



4.3. PHASE III DEMAND RESPONSE ACHIEVEMENTS TO DATE

The Phase III demand response performance target for Duquesne Light is 42 MW. Compliance targets for demand response programs are based on average performance across events and were established at the system level, which means the load reductions measured at the customer meter must be escalated to reflect transmission and distribution losses.

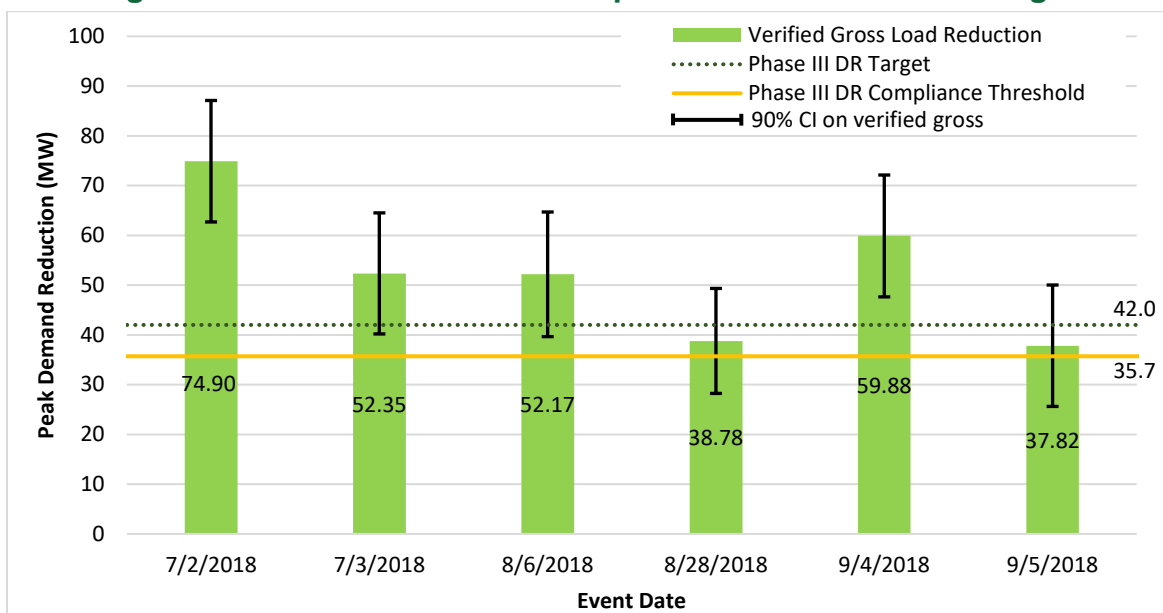
Act 129 demand response events are triggered by PJM’s day-ahead load forecast. When the day-ahead forecast is above 96% of the peak load forecast for the year, a demand response event is initiated for the following day. For PY10 and Phase III to date, Table 2 lists the days that DR events were called along with the verified gross demand reductions achieved by each program and the average DR performance for the program year and the phase. In PY10 there were six demand response events called. Duquesne’s average DR performance to date is above the Phase III compliance reduction target by 30% (performance–goal/goal).

Table 2: Demand Response PYVTD and VTD Performance by Event (MW)

Event Date	Start Hour (Hour Ending)	End Hour (Hour Ending)	Small CI Load Curtailment	Large CI Load Curtailment	Residential DLC	BDR	Average Portfolio MW Impact
2017-06-13	15	18	0.47	61.51	NA	NA	61.99
2017-07-20	15	18	0.43	63.37	NA	NA	63.81
2017-07-21	15	18	0.39	50.98	NA	NA	51.38
2018-07-02	15	18	1.63	73.28	NA	NA	74.90
2018-07-03	15	18	0.59	51.76	NA	NA	52.35
2018-08-06	15	18	2.15	50.03	NA	NA	52.17
2018-08-28	15	18	1.32	37.46	NA	NA	38.78
2018-09-04	15	18	1.52	58.36	NA	NA	59.88
2018-09-05	15	18	0.75	37.08	NA	NA	37.82
PYVTD - Average PY10 DR Event Performance							52.65
VTD - Average Phase III DR Event Performance							54.79

The Commission’s Phase III Implementation Order also established a requirement that EDCs achieve at least 85% of the Phase III compliance reduction target in each DR event. For Duquesne Light, this translates to a 35.7 MW minimum for each DR event. Figure 6 compares the performance of each of the DR events in PY10 to the event-specific minimum and average targets.

Figure 6: Event Performance Compared to 85% Per-Event Target



4.4. PHASE III PERFORMANCE BY CUSTOMER SEGMENT

Table 3 presents the participation, savings, and spending by customer sector for PY10. The residential, small C&I, and large C&I sectors are defined by EDC tariff, and the residential low-income and governmental/educational/non-profit sectors were defined by statute (66 Pa. C.S. § 2806.1). The residential low-income segment is a subset of the residential customer class and the GNI segment will include customers who are part of the Small C&I or Large C&I rate classes. The savings, spending, and participation values for the LI and GNI segments have been removed from the parent sectors in Table 3.

Table 3: PY10 Summary Statistics by Customer Segment

Parameter	Residential (Non-LI)	Residential LI	Small C&I (Non-GNI)	Large C&I (Non-GNI)	GNI
# participants	23,574	6,794	515	278	176
PYRTD MWh/yr	32,549	3,987	13,195	25,335	13,090
PYRTD MW/yr (Energy Efficiency)	3.54	0.37	1.94	3.45	2.13
PYVTD MW (Demand Response)	0.00	0.00	0.91	48.81	2.93
Incentives (\$1000)	\$1,205	\$633	\$1,214	\$2,309	\$1,079

Table 4 summarizes plan performance by sector since the beginning of Phase III.

Table 4: Phase III Summary Statistics by Customer Segment

Parameter	Residential (Non-LI)	Residential LI	Small C&I (Non-GNI)	Large C&I (Non-GNI)	GNI
# participants	165,620	47,304	1,369	574	334
PSA MWh/yr	118,202	9,100	44,070	62,444	25,107
PSA MW (Energy Efficiency)	12.88	0.91	6.49	7.35	3.42
Phase III MW (Demand Response)	0.00	0.00	0.74	48.66	5.39
Incentives (\$1000)	\$4,307	\$633	\$2,269	\$4,512	\$1,845

5. Updates and Findings

5.1. IMPLEMENTATION UPDATES AND FINDINGS

As reported previously, Duquesne Light has made no substantive changes to its Phase III EE&C Plan portfolio during PY10.⁴ Nearly all programs in the portfolio have operated consistently across PY8 through PY10. One exception includes the Whole House Retrofit Program that launched during PY9 and then had a change in CSPs during PY10. However, the program's offerings and implementation remain largely unchanged from PY9. Additionally, savings originating from the new CSP have not yet been reported for Phase III, as of the fourth quarter of PY10.

The Commercial Midstream Lighting Program (Small/Medium Midstream Lighting and Large Midstream Lighting Programs) relies on the Interim Measure Protocol (IMP) titled "Lighting Improvements for Midstream Delivery Programs" (which was updated in January 2019, with changes to the baseline for Highbay Lighting, and the addition of baseline information for 8 foot LED lamps, which were previously not included in the IMP).⁵ The SWE subsequently updated the IMP in May 2019 with additional data for fixture control type based on verified projects from Pennsylvania EDCs. These changes made in May take effect for projects starting in PY11.

The CSP updated their protocol for the Commercial Midstream Lighting Program to account for measures installed in "interior," "exterior," or "24/7" space types. This differs from the previous protocols that called only for individual building types to be specified. With protocols now accommodating exterior and 24/7 space types, Navigant anticipates that reported savings will align closer with verified savings.

The Small Commercial Direct Install program has greatly over-achieved planned savings, as reported in the PY9 Final Annual Report and will no longer be offered during Phase III. Only the first quarter of PY10 included savings from eight projects. No savings were reported in subsequent quarters.

The Large Curtailable Load Demand Response program was offered for the first time in Phase III during PY9 and there has been a total of nine events through PY10 (three in PY9, six in PY10). PY11 events are anticipated for the summer of 2019 and will be reported first in the January PY11 Semi-Annual Report.

⁴ However, please note that Duquesne Light made *minor* modifications to its plan during PY10. Modifications include removing or modifying measures, adding residential connected thermostats as a measure, and making minor plan document clerical revisions. Details can be found in the filing titled *Duquesne Light Company – Phase III Energy Efficiency and Conservation Plan Petition for Minor Modification Docket No. M-2015-2515375*, filed on December 17, 2018 and approved on January 23, 2019.

⁵ Interim Measure Protocols (IMPs) are stored on the SWE's PA PUC Evaluation Common Site, a SharePoint site.

5.2. EVALUATION UPDATES AND FINDINGS

Duquesne Light's progress on the Phase III evaluation effort is summarized below. Navigant submitted and the SWE approved an evaluation plan for the PY10 program portfolio. This plan included an update to the evaluations for the Commercial Midstream Lighting Program, the Residential Appliance Recycling Program (RARP), and the Whole House Retrofit Program (WHRP), as described below. Navigant is currently conducting evaluation research for a number of programs active in PY10, also described below. Results of these activities, including realization rates and verification results, will be conveyed in the Final Annual Report.

- **REEP: Residential Energy Efficiency:**
 - REEP Rebates: Navigant sampled 75 PY10 project application files for engineering desk reviews. These reviews check files for completeness of mandatory documents (i.e., is the rebate application filled out, is a copy of the customer utility bill included, is there a purchase receipt or invoice included?). The reviews also confirm that TRM algorithms are appropriately applied and savings are correctly calculated based on the appliance or equipment described in receipts or invoicing. Any adjustments from the desk review that differ from the EDC's reported savings are reflected in the realization rates.
 - REEP Upstream Lighting: Navigant is compiling all PY10 lamp-level details from the CSP to confirm the appropriate application of TRM savings algorithms. The team is confirming baseline assumptions, confirming that lamps are Energy Star-certified, and recalculating all savings. Any adjustments made to calculations are reflected in the realization rate. Also, the team is allocating a portion of savings to non-residential sockets based on the cross-sector sales research completed during PY9. Those savings allocations will also be reflected in the Annual Report within the Express Efficiency program.
 - Process Evaluations: The team is also planning to conduct process evaluations for REEP during PY10 with interviews of market channel and retailer partners. Sampling plans and interview guides are being created and will be shared with the SWE prior to fielding.
- **RARP:** The TRM details regression equations and coefficients to estimate savings for recycled refrigerators and freezers. Coefficients can be applied to TRM defaults or equipment-specific characteristics. Historically, Navigant's verification has used TRM defaults. However, for PY10, the team will use equipment-specific characteristics compiled and provided by the CSP. These characteristics have been applied to the TRM algorithms in lieu of the TRM's "default values," providing a more accurate assessment of energy savings for each recycled appliance reported. These verified savings are calculated for all PY10 recycled units.
- **WHRP:** Navigant is compiling all CSP details to confirm and document the PY10 activities reported in Duquesne Light's program tracking database. Additionally, the team is reviewing project activities so it can refine evaluation activities, develop sampling

plans, and create research tools (e.g., survey instruments and interview guides). Details and documents will be shared with the SWE for review and approval.

- **Other Residential Programs:** In addition to the previously-described activities, Navigant conducted in-depth interviews with program managers to identify program updates and notable market activities. The team is also reviewing other reported savings against the TRM and gathering data for other analyses (e.g., Residential Behavioral Savings Program).
- **Commercial Midstream Lighting:** Navigant is conducting onsite field verifications for a sample of projects. However, as specified in the Evaluation Plan (revised for PY10), a portion of PY10 projects will have the PY9 realization rate applied and the balance of projects will be reported as unverified in the PY10 Annual Report. The sample of onsite verifications currently underway will be combined with a PY11 sample of projects. The results of that combined sample will then be reported during PY11 and unverified savings will become verified. The team is also conducting process evaluations for this program. The team created survey instruments, interview guides, and sample plans. Details and documents were shared with the SWE for review and approval.
- **Public Agency Partnership Program:** Navigant is conducting process evaluations for PAPP. The team created interview guides to conduct research with non-participating agencies as well as the largest participating agencies. A sample plan and interview guides were shared with the SWE prior to the start of field interviews.
- **Other C&I Programs:** In addition to the previously-described activities, Navigant conducted in-depth interviews with program managers to identify program updates and notable market activities. The team is also conducting impact verification activities which include onsite inspections of measure installations for a sample of PY10 projects taken from the range of C&I programs (in addition to the previously-mentioned Midstream Lighting work, all C&I programs excluding Multifamily Housing Retrofits and Small Commercial Direct Install which do not have verification efforts occurring this year).
- **DR Program:** As previously noted in the January 2019 Semi-Annual Report, Navigant conducted an analysis of the results of Duquesne Light's Summer 2018 Demand Response program. Analysis approaches reflect evaluation plan changes from the PY9 activities. Namely, Navigant analyzed a larger set of regression results as part of the evaluation. Results appear in Section 8.2 of this document. Navigant anticipates also reporting these results in the November 2019 Annual Report. Note that the savings were accepted by the SWE with no revisions required.

6. Summary of Participation by Program

Participation is defined differently for different programs depending on the program delivery channel and data tracking practices. The nuances of the participant definition vary by program and are summarized by program in Table 5, and Table 6 provides the current participation totals for PY10 and Phase III.

Table 5: Program Participation Definitions

Programs	Component	Definition
REEP: Residential Energy Efficiency	Downstream/ Midstream Rebates or Kits	A participant is a customer participating in the given program within a given reporting period (e.g., Q1 through Q4 for PY10), represented by a unique participant account number. The counts appearing in Table 6, below, represent the summations of the unique customer participant account numbers in the tracking system for the given program in each of the periods represented (i.e., PYRTD or P3TD). Customers participating in a program more than once within a reporting period (e.g., PYRTD) are counted once; customers participating more than once but in different annual periods or programs are counted more than once (once in each period and/or program).
Low-income Energy Efficiency		
Residential Appliance Recycling		
Express Efficiency		
Small/Medium Midstream Lighting		
Small Commercial Direct Install		
Multifamily Housing Retrofits		
Commercial Efficiency		
Community Education Energy Efficiency		
Large Midstream Lighting		
Industrial Efficiency		
Public Agency Partnership		
Large Curtailable Load Program	Demand Response Curtailment	A participant is a customer participating in the program within the program event period for the program year (e.g., June-September 2018), represented by a unique participant account number. The count appearing in Table 6, below, represents the summation of the unique customer participant account numbers in the tracking system for the program year. The P3TD count is not cumulative but instead represent the maximum number of annual participants during the phase.
Residential Behavioral Savings	Home Energy Reports	A participant is a customer that is a member of the program's treatment group whose energy consumption is analyzed at the end of the program year, represented by a unique account number.
REEP: Residential Energy Efficiency (Upstream Lighting)	Upstream rebates for lamp sales	Participation cannot be counted because reported program data comprises lamp sales activities and not individual participating customer activities.

Programs	Component	Definition
REEP: Residential Energy Efficiency	Giveaways	A portion of REEP program savings result from giveaways during events in which the utility has participated (event giveaways). Duquesne Light tracks events and the measures given away and not the individual participants who receive the measures.
Low-income Energy Efficiency	Giveaways	A portion of program savings results from low-income-specific events during which the utility provides free kits to attendees. Duquesne Light tracks events and the measures given away and not the individual participants who receive the measures.
Residential Whole House Retrofit	Direct Installs and Audits	Defined similarly to the Downstream/Midstream Rebates or Kits Component. Additionally, Whole House Retrofits also occur in multifamily buildings where a mix of market rate and low-income audits occur. The income status of individual participants is not known, but the known building-level proportion of tenants that are low-income is used to split the total count of participants between the market rate and low-income programs. Also, Whole House Retrofit program activities in some multifamily buildings engage landlords and building managers and not individual tenants. In either case, a participant is defined as a rate-paying customer who received any efficiency measures from the program.
Low-income Whole House Retrofit		

Table 6: EE&C Plan Participation by Program

Program	PYTD Participation	P3TD Participation
REEP: Residential Energy Efficiency	21,106	42,684
REEP: Residential Energy Efficiency (Upstream Lighting)	N/A	N/A
Residential Appliance Recycling	2,416	6,046
Residential Behavioral Savings*	0	116,564
Residential Whole House Retrofit	52	326
Low-income Energy Efficiency*	6,794	47,304
Express Efficiency	308	700
Small/Medium Midstream Lighting	164	487
Small Commercial Direct Install	8	140
Multifamily Housing Retrofit	18	25
Commercial Efficiency	77	136
Large Midstream Lighting	95	296
Industrial Efficiency	30	66
Public Agency Partnership	107	219
Community Education	44	90
Large Curtailable Load Demand Response	118	118**
Portfolio Total	31,337	215,275

*Participation for this program (and its low income component) are reported only annually with the compliance report submitted in November.

**P3TD participation counts for the DR program are not cumulative but instead represent the maximum number of annual participants during the phase.

7. Summary of Energy Impacts by Program

Figure 7 presents a summary of the PYTD reported gross energy savings by program for Program Year 10. The energy impacts in this report are presented at the meter level and do not reflect adjustments for transmission and distribution losses.

Figure 7: PYTD Reported Gross Energy Savings by Program

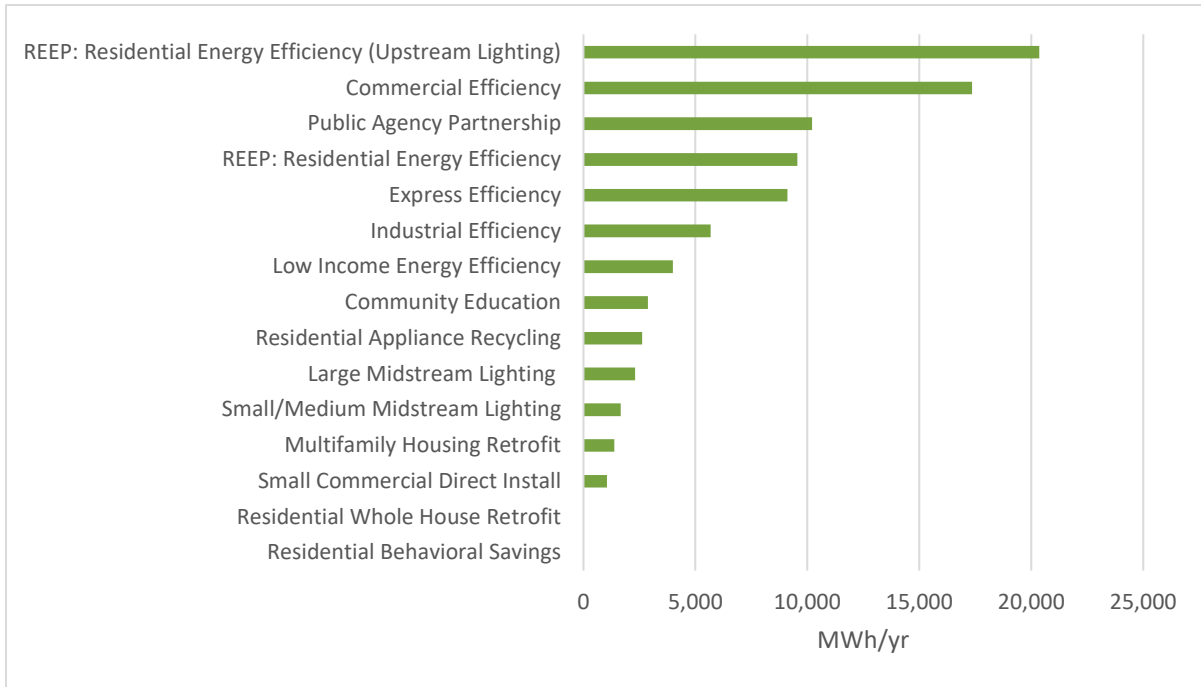
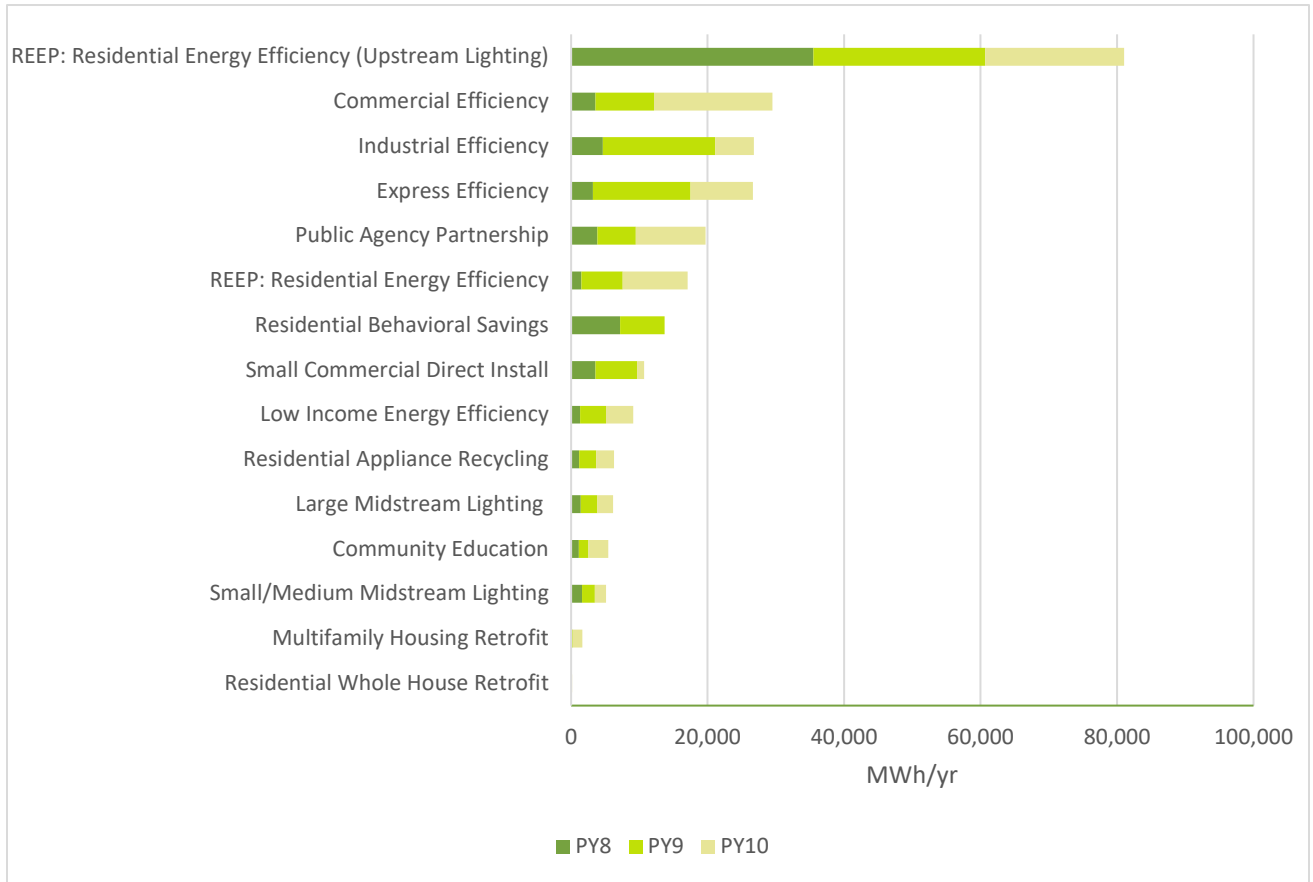


Figure 8 presents a summary of the PSA gross energy savings by program for Phase III of Act 129. PSA savings include verified gross savings from previous program years and the PYTD savings from the current program year.

Figure 8: PSA Energy Savings by Program for Phase III



A summary of energy impacts by program through the current reporting period is presented in Table 7.

Table 7: Energy Savings by Program (MWh/Year)

Program	PYRTD	RTD	VTD	PSA
REEP: Residential Energy Efficiency	9,554	19,424	7,533	17,087
REEP: Residential Energy Efficiency (Upstream Lighting)	20,357	80,013	60,674	81,031
Residential Appliance Recycling	2,622	6,587	3,660	6,283
Residential Behavioral Savings*	0	13,912	13,686	13,686
Residential Whole House Retrofit	16	134	99	115
Low-income Energy Efficiency	3,987	9,552	5,113	9,100
Express Efficiency	9,110	23,167	17,512	26,622
Small/Medium Midstream Lighting	1,665	4,018	3,456	5,121
Small Commercial Direct Install	1,045	10,934	9,655	10,700
Multifamily Housing Retrofit	1,376	1,641	252	1,628
Commercial Efficiency	17,349	29,645	12,144	29,494
Large Midstream Lighting	2,303	4,366	3,847	6,150
Industrial Efficiency	5,682	26,383	21,118	26,800
Public Agency Partnership	10,207	19,600	9,476	19,684
Community Education	2,883	5,338	2,541	5,424
Portfolio Total	88,155	254,714	170,768	258,924

*Savings for this program are reported only annually with the compliance report submitted in November.

8. Summary of Demand Impacts by Program

Duquesne Light's Phase III EE&C programs achieve peak demand reductions in two primary ways. The first is through coincident reductions from energy efficiency measures and the second is through dedicated demand response offerings that exclusively target temporary demand reductions on peak days. Energy efficiency reductions coincident with system peak hours are reported and used in the calculation of benefits in the TRC Test, but do not contribute to Phase III peak demand reduction compliance goals. Phase III peak demand reduction targets are exclusive to demand response programs.

The two types of peak demand reduction savings are also treated differently for reporting purposes. Peak demand reductions from energy efficiency are generally additive across program years, meaning that the P3TD savings reflect the sum of the first-year savings in each program year. Conversely, demand response goals are based on average portfolio impacts across all events so cumulative DR performance is expressed as the *average* performance of each of the DR events called in Phase III to date. Because of these differences, demand impacts from energy efficiency and demand response are reported separately in the following sub-sections.

8.1. ENERGY EFFICIENCY

Act 129 defines peak demand savings from energy efficiency as the average expected reduction in electric demand from 2:00 p.m. to 6:00 p.m. EDT on non-holiday weekdays from June through August. The peak demand impacts from energy efficiency in this report are presented at the meter level and do not reflect adjustments for transmission and distribution losses. Figure 9 presents a summary of the PYRTD reported gross peak demand savings by energy efficiency program for Program Year 10.

Figure 9: PYRTD Gross Demand Savings by Energy Efficiency Program

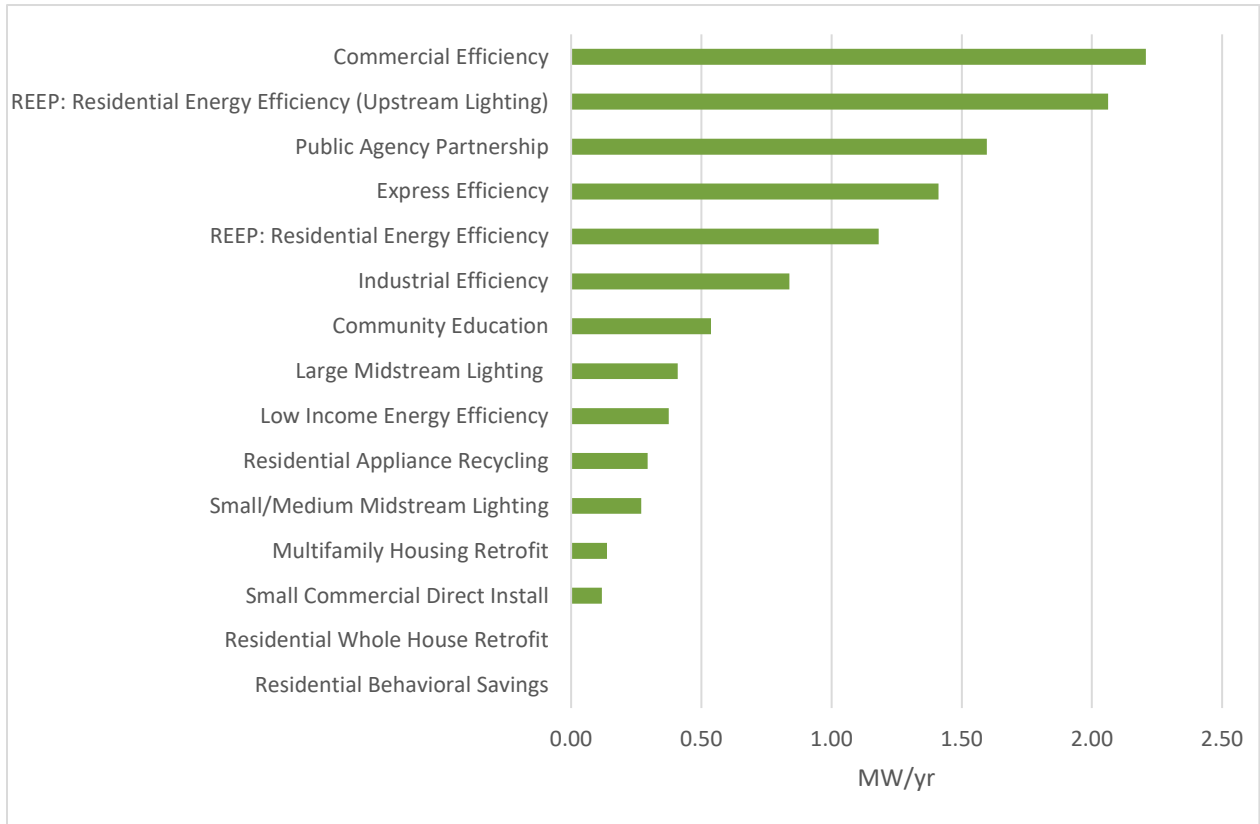
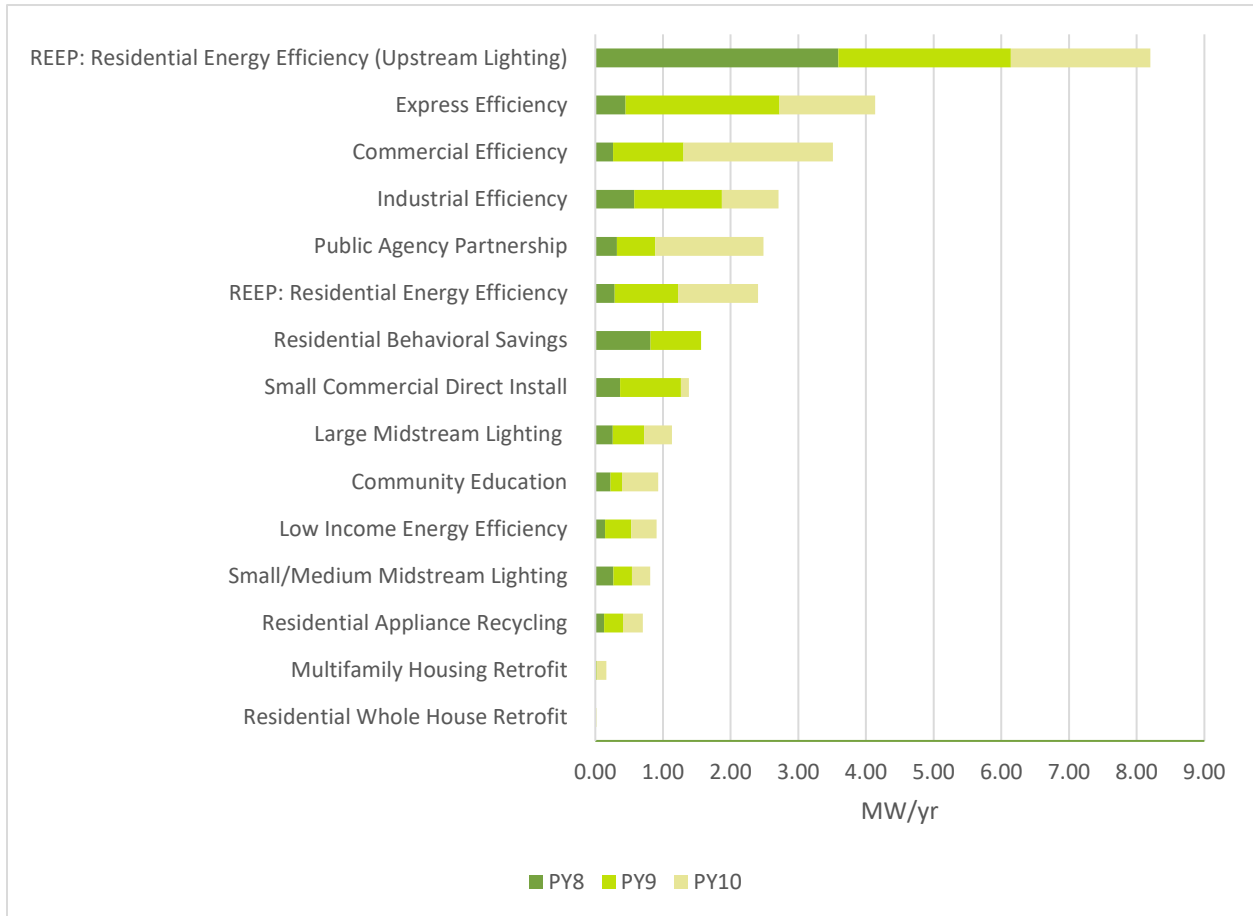


Figure 10 presents a summary of the PSA gross demand savings by energy efficiency program for Phase III of Act 129.

Figure 10: PSA Demand Savings by Energy Efficiency Program for Phase III



A summary of the peak demand impacts by energy efficiency program through the current reporting period are presented in Table 8.

Table 8: Peak Demand Savings by Program (MW/Year)

Program	PYRTD	RTD	VTD	PSA
REEP: Residential Energy Efficiency	1.18	2.61	1.22	2.40
REEP: Residential Energy Efficiency (Upstream Lighting)	2.06	8.10	6.14	8.20
Residential Appliance Recycling	0.29	0.74	0.41	0.70
Residential Behavioral Savings*	0.00	1.59	1.56	1.56
Residential Whole House Retrofit	0.00	0.01	0.01	0.01
Low-Income Energy Efficiency	0.37	0.94	0.53	0.91
Express Efficiency	1.41	3.58	2.72	4.13
Small/Medium Midstream Lighting	0.27	0.66	0.54	0.81
Small Commercial Direct Install	0.12	1.36	1.27	1.38
Multifamily Housing Retrofit	0.14	0.17	0.03	0.16
Commercial Efficiency	2.21	3.47	1.30	3.51
Large Midstream Lighting	0.41	0.78	0.72	1.13
Industrial Efficiency	0.84	2.59	1.87	2.71
Public Agency Partnership	1.60	2.61	0.89	2.48
Community Education	0.54	0.94	0.39	0.93
Portfolio Total	11.44	30.16	19.61	31.05

*Savings for this program are reported only annually with the compliance report submitted in November.

8.2. DEMAND RESPONSE

Act 129 defines peak demand savings from demand response as the average reduction in electric demand during the hours when a demand response event is initiated. Phase III DR events are initiated according to the following guidelines:

- 1) Curtailment events shall be limited to the months of June through September.
- 2) Curtailment events shall be called for the first six days of each program year (starting in PY9) in which the peak hour of PJM’s day-ahead forecast for the PJM RTO is greater than 96% of the PJM RTO summer peak demand forecast for the months of June through September.
- 3) Each curtailment event shall last four hours.
- 4) Each curtailment event shall be called such that it will occur during the day’s forecasted peak hour(s) above 96% of PJM’s RTO summer peak demand forecast.
- 5) Once six curtailment events have been called in a program year, the peak demand reduction program shall be suspended for that program year.

The peak demand impacts from demand response in this report are presented at the system level and reflect adjustments to account for transmission and distribution losses. Duquesne Light uses the following line loss percentages/multipliers by sector, consistent with Table 1-4 of the 2016 PA Technical Reference Manual.

- Residential = 6.9% or 1.0741
- Commercial = 6.9% or 1.0741
- Industrial = 0.8% or 1.0081

Table 9 summarizes the PYVTD and VTD demand reductions for each of the demand response programs in the EE&C plan and for the demand response portfolio as a whole. VTD demand reductions are the average performance across all Phase III demand response events independent of how many events occurred in a given program year. The relative precision columns in Table 9 indicate the margin of error (at the 90% confidence interval) around the PYVTD and VTD demand reductions.

Table 9: Verified Gross Demand Response Impacts by Program

Program	PYVTD Gross MW	Relative Precision (90%)	VTD Gross MW	Relative Precision (90%)
Large Curtailable Load	52.65	9.3%	54.79	7.4%
Portfolio Total	52.65	9.3%	54.79	7.4%

Impacts were estimated using either a CBL with an optional weather-sensitivity adjustment⁶ or a regression analysis. The set of regression models was expanded from PY9 to PY10 with the goal of improving the accuracy of the resulting baseline. The determination of which approach to use for each customer was based on which method provided the most accurate estimate of consumption when applied to a set of three hypothetical events in summer 2018 (the accuracy metric is described in Navigant’s Phase III evaluation plan). The WSA factors applied to the CBL were developed by Enerlogics, Duquesne Light’s DR Program CSP, and are included in the Data Request files provided to the SWE.

⁶ PJM, *Weather Sensitive Adjustment Using the WSA Factor Method*, accessed October 2018
<http://www.pjm.com/~media/markets-ops/demand-response/dsr-weather-sensitive-adjustment-using-wsa-factor-method.ashx>

9. Summary of Finances

Section 9 provides an overview of the expenditures associated with Duquesne Light's portfolio and the recovery of those costs from ratepayers.

9.1. PROGRAM FINANCIALS

Program-specific and portfolio total finances for PY10 are shown in Table 10. The columns in Table 10 and Table 11 are adapted from the 'Direct Program Cost' categories in the Commission's EE&V Plan template⁷ for Phase III. EDC Materials, Labor, and Administration includes costs associated with Duquesne Light's own employees. ICSP Materials, Labor, and Administration includes both the program implementation contractor and the costs of any other outside vendors employed by Duquesne Light to support program delivery.

⁷ <http://www.puc.pa.gov/pcdocs/1372426.doc>, Section 10

Table 10: Program Year to Date Financials

Program	Incentives to Participants and Trade Allies (\$1000)	EDC Materials, Labor, and Administration (\$1000)	ICSP Materials, Labor, and Administration (\$1000)	EM&V (\$1000)	Total Cost (\$1000)
REEP: Residential Energy Efficiency ⁸	\$1,115	\$98	\$2,322	\$161	\$3,696
Residential Appliance Recycling	\$90	\$31	\$353	\$13	\$487
Residential Behavioral Savings	\$0	\$36	\$41	\$20	\$97
Residential Whole House Retrofit	\$0	\$35	\$33	\$12	\$80
Low-income Energy Efficiency	\$633	\$40	\$735	\$62	\$1,470
Express Efficiency	\$780	\$37	\$624	\$81	\$1,522
Small/Medium Midstream Lighting	\$97	\$34	\$101	\$29	\$261
Small Commercial Direct Install	\$159	\$33	\$586	\$48	\$826
Multifamily Housing Retrofit	\$163	\$34	\$231	\$44	\$472
Commercial Efficiency	\$1,045	\$40	\$976	\$94	\$2,155
Large Midstream Lighting	\$129	\$38	\$91	\$69	\$327
Industrial Efficiency	\$238	\$46	\$1,001	\$156	\$1,441
Public Agency Partnership	\$769	\$37	\$734	\$86	\$1,626
Community Education	\$262	\$12	\$247	\$20	\$541
Large C&I Demand Response Curtailable	\$960	\$21	\$909	\$100	\$1,990
Common Portfolio Costs⁹					
Portfolio Total	\$6,440	\$572	\$8,984	\$995	\$16,991
SWE Costs¹⁰	N/A	N/A	N/A	N/A	\$400
Total	\$6,440	\$572	\$8,984	\$995	\$17,391

Program-specific and portfolio total finances since the inception of Phase III are shown in Table 11.

⁸ Duquesne Light combines financial related information here for the two program components 1) REEP: Residential Energy Efficiency and 2) REEP: Residential Energy Efficiency (Upstream Lighting) under REEP: Residential Energy Efficiency. Otherwise, energy and demand impacts are reported separately for these two programs.

⁹ Common Portfolio Costs include costs associated with program tracking data management, support (legal, IT), and portfolio level marketing.

¹⁰ Statewide Evaluation costs are outside of the 2% spending cap

Table 11: Phase III to Date Financials

Program	Incentives to Participants and Trade Allies (\$1000)	EDC Materials, Labor, and Administration (\$1000)	ICSP Materials, Labor, and Administration (\$1000)	EM&V (\$1000)	Total Cost (\$1000)
REEP: Residential Energy Efficiency ¹¹	\$4,086	\$461	\$7,528	\$340	\$12,415
Residential Appliance Recycling	\$221	\$99	\$892	\$30	\$1,242
Residential Behavioral Savings	\$0	\$116	\$515	\$44	\$675
Residential Whole House Retrofit	\$0	\$113	\$230	\$27	\$370
Low-income Energy Efficiency	\$633	\$182	\$2,028	\$137	\$2,980
Express Efficiency	\$1,589	\$589	\$1,692	\$207	\$4,076
Small/Medium Midstream Lighting	\$288	\$120	\$188	\$63	\$659
Small Commercial Direct Install	\$159	\$137	\$2,984	\$106	\$3,386
Multifamily Housing Retrofit	\$213	\$136	\$661	\$97	\$1,107
Commercial Efficiency	\$1,677	\$197	\$2,056	\$208	\$4,138
Large Midstream Lighting	\$356	\$168	\$627	\$151	\$1,302
Industrial Efficiency	\$1,152	\$271	\$2,146	\$344	\$3,913
Public Agency Partnership	\$1,154	\$183	\$1,924	\$190	\$3,451
Community Education	\$428	\$49	\$717	\$44	\$1,238
Large C&I Demand Response Curtailable	\$1,611	\$145	\$2,192	\$220	\$4,168
Common Portfolio Costs¹²					
Portfolio Total	\$13,567	\$2,966	\$26,380	\$2,208	\$45,121
SWE Costs¹³	N/A	N/A	N/A	N/A	\$1,505
Total	\$13,567	\$2,966	\$26,380	\$2,208	\$46,426

Cost-effectiveness testing for Act 129 EE&C programs is performed using the TRC Test. Benefit cost modeling is conducted annually using verified gross and verified net savings once the results of the independent impact evaluation are completed. TRC test results for PY10 will be

¹¹ Duquesne Light combines financial related information here for the two programs 1) REEP: Residential Energy Efficiency and 2) REEP: Residential Energy Efficiency (Upstream Lighting) under REEP: Residential Energy Efficiency. Otherwise, energy and demand impacts are reported separately for these two programs.

¹² Common Portfolio Costs include costs associated with program tracking data management, support (legal, IT), and portfolio level marketing.

¹³ Statewide Evaluation costs are outside of the 2% spending cap

presented in the final annual report to the PA PUC on November 15, 2019 along with a more granular breakdown of portfolio costs.

9.2. COST RECOVERY

Act 129 allows Pennsylvania EDCs to recover EE&C plan costs through a cost-recovery mechanism. Duquesne Light’s cost-recovery charges are organized separately by five customer sectors to ensure that the electric rate classes that finance the programs are the rate classes that receive the direct energy and conservation benefits. Cost-recovery is necessarily tied to the way customers are metered and charges for electric service. Readers should be mindful of the differences between Table 12 and Section 4.4. For example, the low-income customer segment is a subset of Duquesne Light’s residential tariff(s) and therefore not listed in Table 12.

Table 12: EE&C Plan Expenditures by Cost-Recovery Category¹⁴

Cost Recovery Sector	Rate Classes Included	PYTD Spending (\$1000)	P3TD Spending (\$1000)
Residential	RS, RH, RA	\$5,938	\$18,065
Small/Medium Commercial	GS, GM, GMH	\$3,192	\$9,546
Small/Medium Industrial	GM, GMH	\$519	\$1,299
Large Commercial	GL, GLH, L	\$4,110	\$8,853
Large Industrial	GL, GLH, L, HVPS	\$3,632	\$8,864
Portfolio Total		\$17,391	\$46,626

¹⁴ Includes SWE costs