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September 30, 2026

VIA ELECTRONIC FILING

Matthew L. Homsher, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building, 2nd Floor
400 North Street
Harrisburg, PA 17120

**Re: Duquesne Light Company's Energy Efficiency and Conservation
Phase IV Plan Preliminary Annual Report - Program Year 17
Docket No. M-2020-3020818**

Dear Secretary Homsher:

Enclosed for filing, please find the Final Annual Report for Program Year 17 of Duquesne Light Company's Energy Efficiency and Conservation Phase IV Plan.

Should you have any questions, please do not hesitate to contact me or Dave Defide, Senior Manager of Customer Programs, at 412-393-6107.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "Aron J. Beatty".

Aron J. Beatty, Esquire

PA ID #86625

Enclosures

CC: Certificate of Service

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing has been served upon the following persons, in the manner indicated, in accordance with the requirements of 52 Pa. Code § 1.54 (relating to service by a participant):

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Dated: September 30, 2026

Respectfully Submitted,



Aron J. Beatty, Esquire

PA ID #86625



Final Annual Report to the Pennsylvania Public Utility Commission Phase IV of Act 129

**Program Year 17
(June 1, 2025-May 31, 2026)**

**For Pennsylvania Act 129 of 2008
Energy Efficiency and Conservation Plan**

Prepared for:



Duquesne Light Company

Submitted by:

Guidehouse Inc.
1676 International Drive, Suite 800
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September 30, 2026

[guidehouse.com](https://www.guidehouse.com)

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Acronyms

AHRI	Air Conditioning, Heating, and Refrigeration Institute
C&I	Commercial and Industrial
CDD	Cooling Degree Day
CHP	Combined Heat and Power
CSP	Conservation Service Provider or Curtailment Service Provider
CV	Coefficient of Variation
DLC	Direct Load Control
DDR	Dispatchable Demand Response
EAP	Energy Association of Pennsylvania
EDC	Electric Distribution Company
EDT	Eastern Daylight Time
EE&C	Energy Efficiency and Conservation
EFLH	Equivalent Full Load Hours
EM&V	Evaluation, Measurement, and Verification
ER	Early Replacement
EUL	Effective Useful Life
FCM	Forward Capacity Market
FE	FirstEnergy
GNI	Government, Nonprofit, Institutional
HDD	Heating Degree Day
HER	Home Energy Report
HIM	High-Impact Measure
HOU	Hours of Use
HPWH	Heat Pump Water Heater
HVAC	Heating, Ventilating, and Air Conditioning
ICSP	Implementation Conservation Service Provider
IDI	In-Depth Interview
IMP	Interim Measure Protocol
kW	Kilowatt
kWh	Kilowatt-hour
LBS	Large Business Solutions
LBVCx	Large Business Virtual Commissioning
LED	Light-Emitting Diode
LI	Low-Income
LI-BEEP	Low-Income Behavioral Energy Efficiency Program
LIEEP	Low-Income Energy Efficiency Program
LLF	Line Loss Factor
MW	Megawatt
MW/yr	Megawatt per year
MWh	Megawatt-hour
MWh/yr	Megawatt-hour per year
NPV	Net Present Value
NTG	Net-to-Gross
NTGR	Net-to-Gross Ratio
O&M	Operation and Maintenance
P4TD	Phase IV to Date
PA PUC	Pennsylvania Public Utility Commission
PJM	Pennsylvania-Jersey-Maryland Interconnection LLC

PMRS	Program Management and Reporting System (Duquesne's Tracking Database)
POP	Point-of-Purchase
PSA	Phase IV to Date Preliminary Savings Achieved; equal to VTD + PYRTD
PSA+CO	PSA Savings Plus Carryover from Phase III
PY	Program Year (e.g., PY13, from June 1, 2021, to May 31, 2022)
PYRTD	Program Year Reported to Date
PYVTD	Program Year Verified to Date
R-BEEP	Residential Behavioral Energy Efficiency Program
RCT	Randomized Control Trial
RDIP	Residential Downstream Incentives Program
ROB	Replace on Burnout
RPM	Reliability Pricing Model
RTD	Phase IV to Date Reported Gross Savings
RTO	Regional Transmission Organization
RUL	Remaining Useful Life
SBDI	Small Business Direct Install
SBS	Small Business Solutions
SBVCx	Small Business Virtual Commissioning
SO	Spillover
SWE	Statewide Evaluator
TA	Trade Ally
TRC	Total Resource Cost
TRM	Technical Reference Manual
VTD	Phase IV to Date Verified Gross Savings
WACC	Weighted Average Cost of Capital

Types of Savings

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

Net Savings: The total change in energy consumption 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 electric distribution company (EDC) or its program implementation conservation service providers (ICSPs) and stored in the program tracking system.

Unverified Reported Gross: The Phase IV Evaluation Framework allows EDCs and the evaluation contractors the flexibility to not evaluate each program every year. If an EE&C program is being evaluated over a multi-year cycle, the reported savings for a program year where evaluated results are not available are characterized as unverified reported gross until the impact evaluation is completed and verified savings can be calculated and reported.

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 measurement and verification 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 (NTGR).

Annual Savings: Energy and demand savings expressed on an annual basis, or the amount of energy 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/yr or MW/yr. The Pennsylvania technical reference manual (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 or behavior change.

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 (EUL). The Total Resource Cost (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. Program Year to Date (PYTD) values for energy efficiency will always be reported gross savings in a semiannual 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 as determined by the impact evaluation findings of the independent evaluation contractor.

Phase IV to Date (P4TD): The energy and peak demand savings achieved by an EE&C program or portfolio within Phase IV of Act 129. Reported in several permutations described below.

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

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

Phase IV to Date Preliminary Savings Achieved (PSA): The sum of the verified gross savings (VTD) from previous program years in Phase IV where the impact evaluation is complete plus the reported gross savings from the current program year.

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

Phase IV to Date Verified + Carryover (VTD + CO): The sum of the verified gross savings recorded to date in Phase IV plus any verified gross carryover savings from Phase III of Act 129.



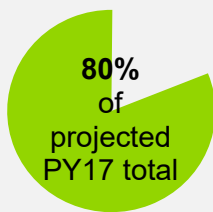
PORTFOLIO

Duquesne Light offers 17 energy efficiency programs to nonresidential, residential, and low-income customers

Reported Energy Savings

Phase IV
has so far been
reported to save
396,672 MWh
(VTD+CO)

114%
of
compliance
target

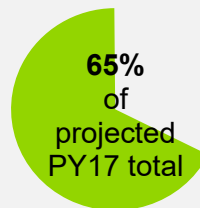


PY17 saved
56,797 MWh/yr

Reported Demand Savings

Phase IV
has so far been
reported to save
69.87 MW (VTD)

113%
of
compliance
target



PY17 saved
10.91 MW/yr

PY17 Participation

A total of **261,200** participants:



58,913 Low Income



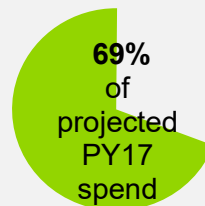
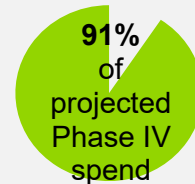
202,070 Residential



217 Nonresidential

Actual Expenditures (\$1,000)

Phase IV
expenditures:
\$87,578



PY17
expenditures:
\$12,482

1. 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 Phases I (2008 through 2013), II (2013 through 2016), and III (2016 through 2021). In late 2020, each EDC filed a new energy efficiency and conservation (EE&C) plan with the Pennsylvania Public Utility Commission (PA PUC) detailing the proposed design of its portfolio for Phase IV. These plans were updated based on stakeholder input and subsequently approved by the PUC in 2021.

Implementation of Phase IV of the Act 129 programs began on June 1, 2021. This report documents the progress and effectiveness of the Phase IV EE&C accomplishments for Duquesne Light Company (Duquesne Light) in program year 17 (PY17), as well as the cumulative accomplishments of the Phase IV programs since inception. This report additionally documents the energy savings carried over from Phase III. The Phase III carryover savings count toward EDC savings compliance targets for Phase IV.

This report details the participation, spending, reported gross, verified gross energy (MWh) and peak demand (MW), and verified net impacts of the energy efficiency programs in PY17. Compliance with Act 129 savings goals are ultimately based on verified gross savings. This report also includes estimates of cost-effectiveness accorded to the Total Resource Cost (TRC) Test.¹ Duquesne Light has retained Guidehouse Inc. (Guidehouse) as an independent evaluation contractor for Phase IV of Act 129. Guidehouse is responsible for the measurement and verification of the savings and calculation of gross verified and net verified savings.

Guidehouse also performed a process evaluation to examine the design, administration, implementation, and market response to the EE&C program. This report presents the key findings and recommendations identified by the process evaluation and documents any changes to EE&C program delivery considered based on the recommendations.

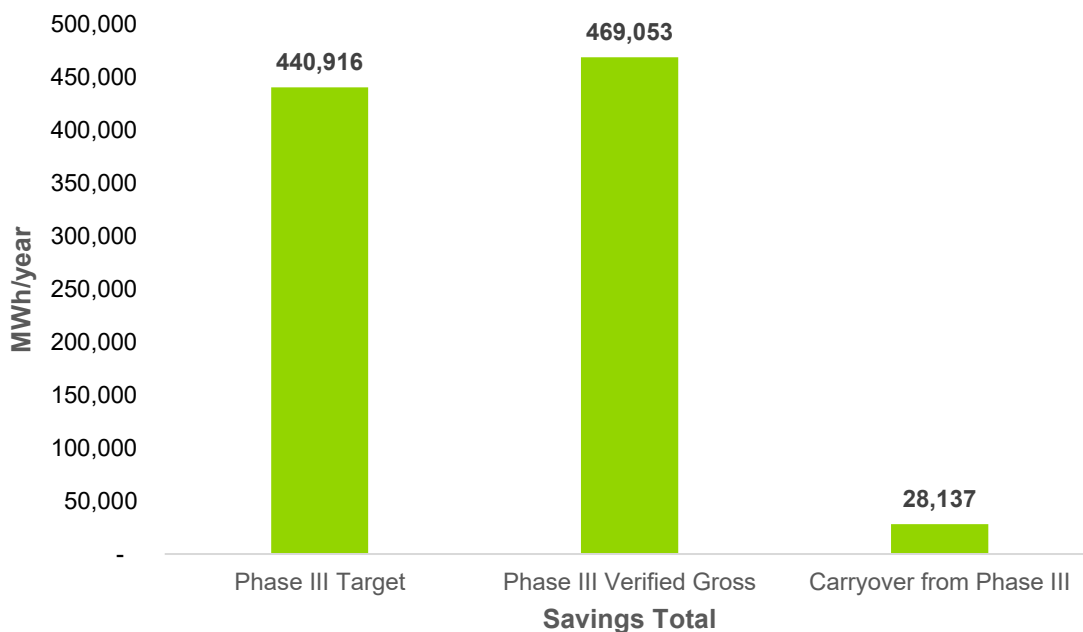
¹ The Pennsylvania TRC Test for Phase I was adopted by PUC Order at Docket No. M-2009-2108601 on June 23, 2009 (*2009 PA TRC Test Order*). The TRC Test Order for Phase I later was refined in the same docket on August 2, 2011 (*2011 PA TRC Test Order*). The 2013 TRC Order for Phase II of Act 129 was issued on August 30, 2012. The 2016 TRC Test Order for Phase III of Act 129 was adopted by PUC Order at Docket No. M-2015-2468992 on June 11, 2015. The 2021 TRC Test Order for Phase IV of Act 129 was adopted by PUC Order at Docket No. M-2019-3006868 on December 19, 2019.

2. Summary of Achievements

2.1 Carryover Savings from Phase III of Act 129

Duquesne Light has a total of 28,137 MWh/yr of portfolio-level carryover savings from Phase III. Figure 2-1 compares Duquesne Light's Phase III verified gross savings total with the Phase III compliance target to illustrate the carryover calculation.

Figure 2-1: Carryover Savings from Phase III of Act 129



Source: SWE Phase III Report²

The Commission's Phase IV Implementation Order³ also allowed EDCs to carry over savings in excess of the Phase III low-income (LI) savings goal.⁴ With the carrying over of 3,266 MWh/yr of Phase II LI savings, Duquesne Light achieved the Phase III compliance target. However, with 23,128 MWh/yr of VTD LI energy savings achieved during Phase III, Duquesne Light does not have LI carryover energy savings from Phase III to Phase IV. Figure 2-2 shows the calculation of carryover savings for the LI customer segment.

² Pennsylvania Statewide Evaluator, *SWE Annual Report Act 129 Phase III and Program Year 12*, March 31, 2022, <https://www.puc.pa.gov/pcdocs/1746475.pdf>.

³ Pennsylvania Public Utility Commission, *Energy Efficiency and Conservation Program Implementation Order* at Docket No. M-2020-3015228 (*Phase IV Implementation Order*), entered June 18, 2020.

⁴ Proportionate to those savings achieved by dedicated LI programs in Phase III.

Figure 2-2: LI Carryover from Phase III



Source: SWE Phase III Report⁵

2.2 Phase IV Energy Efficiency Achievements to Date

Phase IV energy savings targets (MWh) were established at the meter level and peak demand reduction targets (MW) were set at the system level. Accordingly, the MWh totals in this report are presented at the meter level, while peak demand savings are adjusted for transmission and distribution losses to reflect system-level savings. Since the beginning of PY17 on June 1, 2024, Duquesne Light has claimed:

- 55,070 MWh/yr of reported gross electric energy savings (PYRTD)
- 10.38 MW/yr of reported gross peak demand savings (PYRTD)
- 56,797 MWh/yr of verified gross electric energy savings (PYVTD)
- 10.91 MW/yr of verified gross peak demand savings (PYVTD)

Since the beginning of Phase IV of Act 129 on June 1, 2021, Duquesne Light has achieved:

- 347,946 MWh/yr of reported gross electric energy savings (RTD)
- 64.95 MW/yr of reported gross peak demand savings (RTD)
- 368,535 MWh/yr of verified gross electric energy savings (VTD)
- 69.87 MW/yr of verified gross peak demand savings (VTD)
 - This represents 113% of the May 31, 2026, peak demand savings compliance target of 62 MW/yr

⁵ Pennsylvania Statewide Evaluator, *SWE Annual Report Act 129 Phase III and Program Year 12*, March 31, 2022, <https://www.puc.pa.gov/pdocs/1746475.pdf>.

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

- 396,672 MWh/yr of VTD + portfolio-level carryover energy savings
 - This represents 114% of the May 31, 2026, energy savings compliance target of 348,126 MWh/yr.

Looking ahead to Phase V:

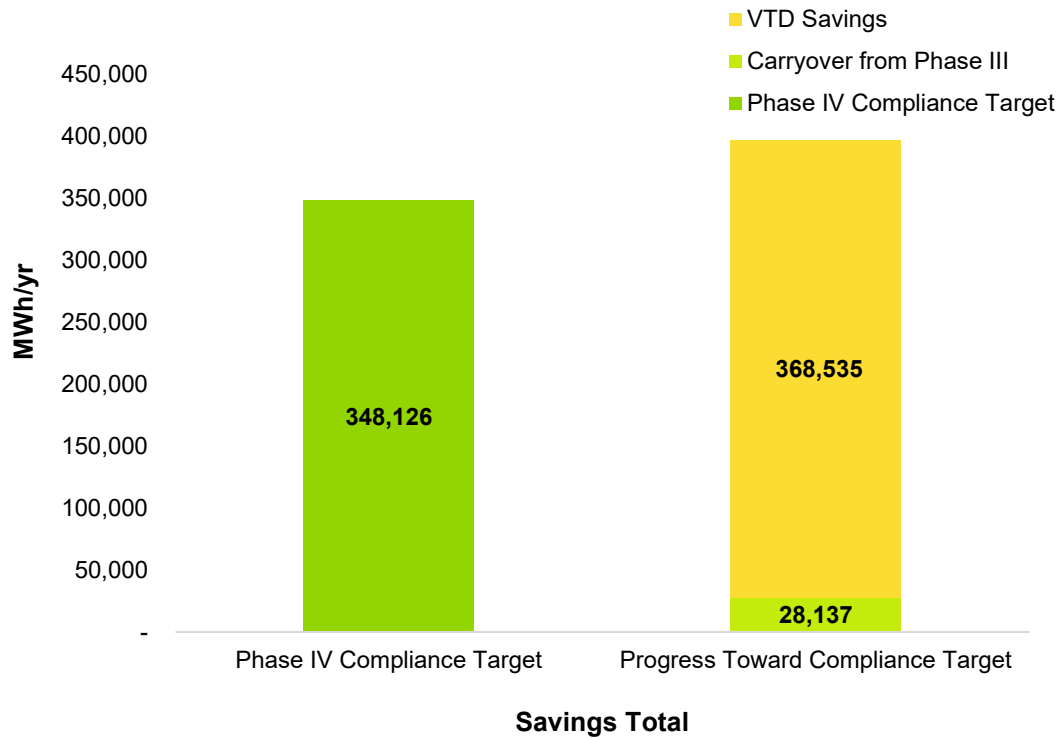
- With 368,535 MWh/yr of VTD energy savings achieved during Phase IV, Duquesne Light has achieved an estimated 20,409 MWh/yr of carryover energy savings from Phase IV to Phase V.⁶ This represents 7.5% of the Phase V portfolio energy savings target.
- With 69.87 MW/yr of VTD peak savings achieved during Phase IV, Duquesne Light has achieved an estimated 3.94 MW/yr of carryover energy savings from Phase IV to Phase V.⁷ This represents 8.3% of the Phase V portfolio peak demand savings target.

Figure 2-3 summarizes Duquesne Light's progress toward the Phase IV MWh portfolio compliance target, and Figure 2-4 summarizes progress toward the Phase IV MW portfolio compliance target.

⁶ Carryover of Phase IV MWh is capped at a maximum of 20% of the respective portfolio and low-income consumption reduction targets. See Pennsylvania Public Utility Commission, Energy Efficiency and Conservation Program Implementation Order, at Docket No. M-2025-3052826, (Phase V Implementation Order), entered June 18, 2025. <https://www.puc.pa.gov/pcdocs/1883669.pdf>

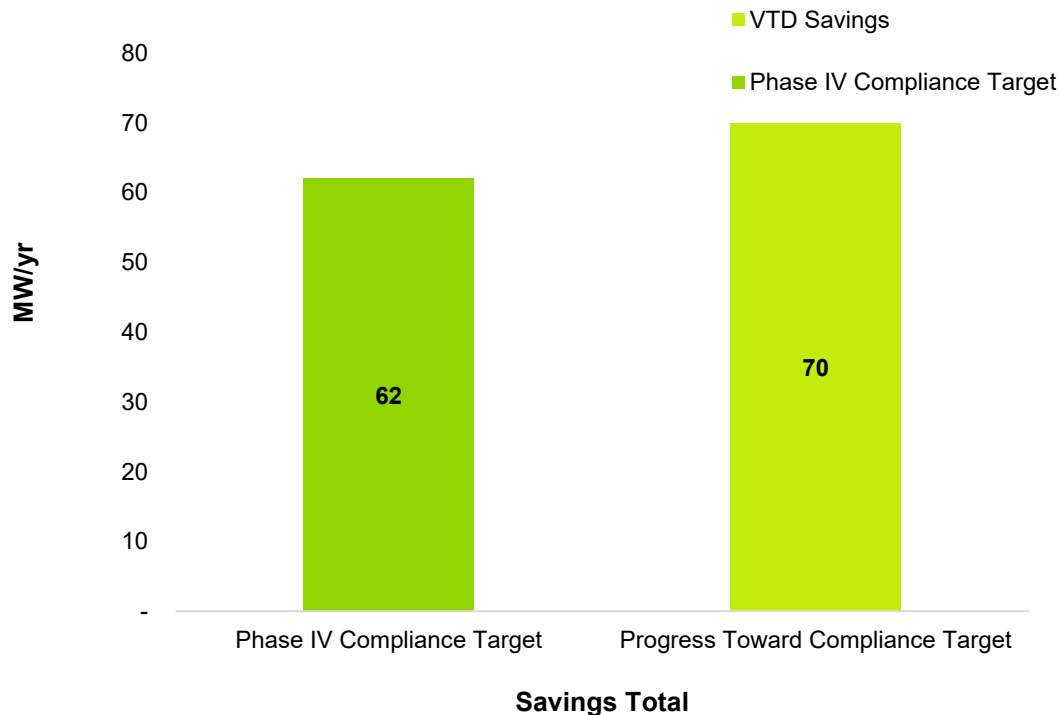
⁷ Carryover of Phase IV MW is capped at a is capped at 50% of the excess peak demand savings acquired in Phase IV. See Pennsylvania Public Utility Commission, Energy Efficiency and Conservation Program Implementation Order, at Docket No. M-2025-3052826, (Phase V Implementation Order), entered June 18, 2025. <https://www.puc.pa.gov/pcdocs/1883669.pdf>

Figure 2-3: EE&C Plan Performance Toward Phase IV Portfolio Compliance Target



Source: Guidehouse analysis

Figure 2-4: EE&C Plan Performance Toward Phase IV Portfolio Compliance Target



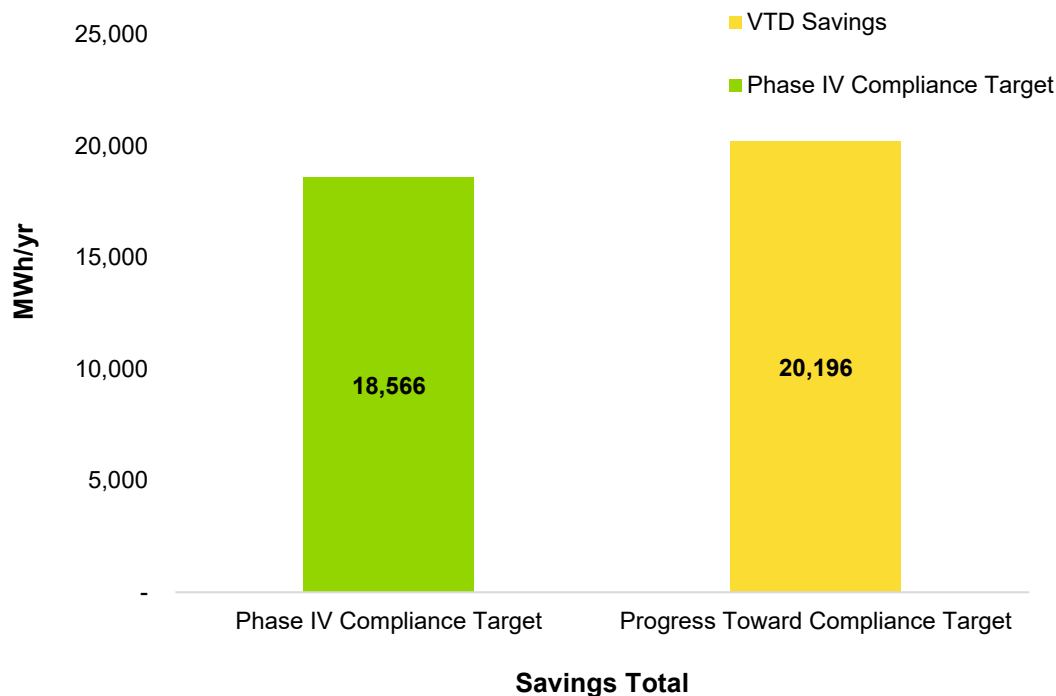
Source: Guidehouse analysis

The Phase IV Implementation Order directed EDCs to offer conservation measures to the LI customer segment based on the proportion of electric sales attributable to LI households. The proportionate number of measures targeted for Duquesne Light is 8.4%. Duquesne Light offers a total of 100 EE&C measures to its residential and nonresidential customer classes. There are 40 measures available to the LI customer segment at no cost to the customer. This represents 40% of the total measures offered in the EE&C plan and exceeds the proportionate number of measures target.

The PA PUC also established an LI energy savings target of 5.3% of the portfolio savings goal. The LI savings target for Duquesne Light is 18,566 MWh/yr and is based on verified gross savings. Figure 2-5 compares the VTD performance for the LI customer segment with the Phase IV savings target. Based on the latest available information, Duquesne Light has achieved 109% of the Phase IV LI energy savings target.

Looking ahead to Phase V, with 20,196 MWh/yr of VTD low-income energy savings achieved during Phase IV, Duquesne Light has achieved an estimated 1,630 MWh/yr of low-income carryover energy savings from Phase IV to Phase V.⁸ This represents 8.6% of the Phase IV low-income carveout savings target.

Figure 2-5: EE&C Plan Performance Toward Phase IV LI Compliance Target



⁸ Carryover of Phase IV MWh is capped at a maximum of 20% of the respective portfolio and low-income consumption reduction targets. See Pennsylvania Public Utility Commission, Energy Efficiency and Conservation Program Implementation Order, at Docket No. M-2025-3052826, (Phase V Implementation Order), entered June 18, 2025. <https://www.puc.pa.gov/pcdocs/1883669.pdf>

Source: Guidehouse analysis

2.2.1 Phase IV Performance, Multifamily Housing

Duquesne Light has achieved 274 MWh/yr of verified gross electric energy savings (PYVTD) from multifamily housing, including 242 MWh/yr of verified gross electric energy savings (PYVTD) from LI households. For Phase IV, Duquesne Light has achieved 2,751 MWh/yr of verified gross electric energy savings (VTD) for multifamily housing, including 2,080 MWh/yr of verified gross electric energy savings (VTD) from LI households. These savings are reported under the Small Business Direct Install (SBDI) program and Large Business Solutions – Commercial program. The LI household savings are also reported under the Residential LI sector.

2.3 Phase IV Performance by Customer Segment

Table 2-1 presents the participation, savings, and spending by customer sector for PY17. The residential, small commercial and industrial (C&I), and large C&I sectors are defined by EDC tariff, and the residential LI and governmental/educational/nonprofit sector were defined by statute (66 Pa. C.S. § 2806.1). The residential LI segment is a subset of the residential customer class and the government, nonprofit, institutional (GNI) segment includes customers who are part of the small C&I or large C&I rate classes. The savings, spending, and participation values for the LI segments have been removed from the parent sectors in Table 2-1. Pursuant to the Commission's Implementation Order for Phase IV, Duquesne Light will not offer a specialized program but will report the savings associated with the GNI customers participating in the nonresidential programs. Table 2-1 shows the savings, spending, and participation values for the GNI segment.

Table 2-1: PY17 Summary Statistics by Customer Segment

Parameter	Residential (Non-LI)	LI*	Small C&I	Large C&I	GNI	Total
Number of participants**	202,070	58,915	1	110	104	261,200
PYVTD MWh/yr	8,683	6,082	32	16,133	25,868	56,797
PYVTD MW/yr	1.79	0.60	0.00	3.33	5.19	10.91
Incentives (\$1,000)	\$285	\$34	\$63	\$1,548	\$3,023	\$4,954

* The low income segment is reporting savings from residential, small commercial, and large commercial programs.

**See Section 2.4 for the per program definition of a participant.

Source: Guidehouse analysis

Table 2-2 summarizes plan performance by sector since the beginning of Phase IV.

Table 2-2: Phase IV Summary Statistics by Customer Segment

Parameter	Residential (Non-LI)	LI*	Small C&I	Large C&I	GNI	Total
Number of Participants**	1,076,526	182,089	3,372	1,198	997	1,264,182
VTD MWh/yr***	71,311	20,197	84,179	110,482	82,364	368,535
VTD MW/yr ***	12.47	2.25	19.09	19.70	16.35	69.87
Incentives (\$1,000)	\$4,362	\$420	\$12,252	\$8,570	\$10,220	\$35,826

* The low income segment is reporting savings from residential, small commercial, and large commercial programs.

**See Section 2.4 for the per program definition of a participant.

*** Total Phase IV VTD savings by Segment may not equal total due to rounding.

Source: Guidehouse analysis

2.4 Summary of Participation by Program

Participation is defined differently for certain programs and program components 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 the following bullets. Table 2-3 provides the current participation totals for PY17 and Phase IV:

- For customers participating in the Rebate and Audit component of the Residential Downstream Incentives Program (RDIP), it is the number of distinct account numbers in the program tracking data within a given program year. For the Kits component of RDIP, it is the number of kits distributed within a given program year.
- For the Residential Midstream Incentives Program (RMIP), it is the number of distinct account numbers in the program tracking data within a given program year.
- For the Residential Upstream Incentives Program (RUIP), participation cannot be accurately collected due to the nature of the program and therefore are not counted.
- For the Residential Appliance Recycling Program (RARP), it is the number of distinct measures in the program tracking data within a given program year.
- For the Low-Income Energy Efficiency Program (LIEEP), customers participating in the Audit component, it is the number of distinct account numbers in the tracking data within a given program year. For the Kits component of LIEEP, it is the number of kits distributed within a given program year. For the Giveaway component of LIEEP, it is the number of measures distributed within a given year.
- For the Residential and LI Behavior program, it is the number of distinct account numbers in the tracking data within a given program year.
- For SBDI, it is the number of unique participants (defined as unique account numbers).
- For the Small Business Solutions (SBS) and Large Business Solutions (LBS) programs, including industrial, it is the number of unique participants (defined as unique account numbers).

- For the Small Business Midstream Solutions (SBMS) and Large Business Midstream Solutions (LBMS) programs, including industrial, it is the number of unique participants (defined as unique account numbers).
- For the Small Business Virtual Commissioning (SBVCx) and Large Business Virtual Commissioning (LBVCx) programs, it is the number of unique participants (defined as unique account numbers).

Table 2-3: EE&C Portfolio Participation by Program

Program	PY17 Participation	P4TD Participation
Downstream Incentives	3,177	112,614
Midstream Incentives	0	3
Upstream Incentives	N/A	N/A
Appliance Recycling	1,975	9,711
Residential Total	5,152	122,328
LI Total	30,563	62,182
Residential Behavior Total	196,918	954,198
LI Behavior Total	28,350	119,899
Small Business Direct Install	3	422
Small Business Solutions	1	694
Small Business Midstream Solutions	0	2,801
Small Business Virtual Commissioning	1	50
Commercial - Large Business Solutions	74	245
Industrial - Large Business Solutions	13	50
Commercial - Large Business Midstream Solutions	117	1,039
Industrial - Large Business Midstream Solutions	7	261
Large Business Virtual Commissioning	1	13
Nonresidential Total	217	5,575
Portfolio Total	261,200	1,264,182

Source: Guidehouse analysis

2.5 Summary of Impact Evaluation Results

During PY17, Guidehouse completed impact evaluations for several program components in the portfolio. Table 2-4 summarizes the realization rates and net-to-gross (NTG) ratios (NTGRs) by evaluation component.

Table 2-4: Impact Evaluation Results Summary

Program and Initiative	Energy Realization Rate	Demand Realization Rate	NTGR
Downstream Incentives	116%	84%	86%
Appliance Recycling	101%	108%	72%
Residential Total	96%	83%	94%
LI Total	100%	101%	100%
Residential Behavior Total	89%	71%	100%
LI Behavior Total	168%	129%	100%
Small Business Direct Install	50%	44%	93%
Small Business Solutions	119%	103%	66%
Small Business Virtual Commissioning	80%	34%	94%
Commercial - Large Business Solutions	96%	107%	90%
Industrial – Large Business Solutions	102%	94%	90%
Commercial - Large Business Midstream Solutions	187%	191%	88%
Industrial - Large Business Midstream Solutions	155%	141%	88%
Large Business Virtual Commissioning	81%	105%	94%
Nonresidential Total	106%	114%	89%
Portfolio Total	103%	105%	91%

Source: Guidehouse analysis

2.6 Summary of Energy Impacts by Program

Act 129 compliance targets are based on annualized savings estimates (MWh/yr). Each program year, the annual savings achieved by EE&C program activity are recorded as incremental annual, or first-year, savings and added to an EDC's progress toward compliance. Incremental annual savings estimates are presented in Section 2.6.1. Lifetime energy savings incorporate the effective useful life (EUL) of installed measures and estimate the total energy savings associated with EE&C program activity. Lifetime savings are used in the TRC Test by program participants when assessing the economics of upgrades and by the SWE when calculating the emissions benefits of Act 129 programs. Section 2.6.2 presents the lifetime energy savings by program.

2.6.1 Incremental Annual Energy Savings by Program

Table 2-5 presents a summary of the PY17 and Phase IV to date (P4TD) energy savings by program. The energy impacts in this report are presented at the meter level and do not reflect adjustments for transmission and distribution losses. The verified gross savings are adjusted by

the energy recent realization rate and the verified net savings are adjusted by both the realization rate and the NTGR.

Table 2-5: Incremental Annual Energy Savings by Program (MWh/yr)

Program	PYRTD (MWh/yr)	PYVTD Gross (MWh/yr)	PYVTD Net (MWh/yr)	RTD (MWh/yr)	VTD Gross (MWh/yr)	VTD Net (MWh/yr)
Residential Downstream Incentives	1,117	1,293	1,110	23,280	23,480	18,966
Residential Midstream Incentives	-	-	-	7	7	7
Residential Upstream Incentives	-	-	-	6,756	7,456	5,108
Residential Appliance Recycling	1,293	1,306	936	6,324	6,650	4,103
Low-Income Energy Efficiency	5,389	5,373	5,373	15,311	14,797	14,797
Residential Behavioral Savings	6,810	6,084	6,084	34,958	33,719	33,719
Low-Income Residential Behavioral	278	466	466	2,817	3,319	3,319
Small Business Direct Install	547	274	255	11,759	10,702	10,044
Small Business Solutions	177	211	139	28,344	29,856	20,703
Small Business Midstream Solutions	-	-	-	52,861	57,431	39,383
Small Business Virtual Commissioning	59	47	44	2,919	2,851	2,701
Commercial Large Business Solutions	30,643	29,534	26,538	81,138	80,177	61,984
Industrial Large Business Solutions	4,748	4,828	4,338	34,086	34,583	18,687
Large Business Midstream Solutions – Commercial	3,788	7,083	6,233	26,351	38,578	31,668
Large Business Midstream Solutions – Industrial	162	251	221	16,811	20,831	14,699
Large Business Virtual Commissioning	59	48	45	4,224	4,099	3,994
Portfolio Total	55,070	56,797	51,782	347,946	368,535	283,882

Source: Guidehouse analysis

The previously reported VTD savings from prior years, for the following programs, have changed since the PY13 final annual report was submitted:

- RARP: SWE audit activities recommended an adjustment to the PY13 gross/net verified savings because of the use of the incorrect cooling degree days (CDDs) and heating degree days (HDDs) in the evaluation of savings. This caused a negligible effect on energy savings but was incorporated into future evaluations for this program. These verified gross savings are attributed to the Residential (Non-LI) sector VTD savings in Table 2-2.
- SBMS: In the PY13 final annual report, 3,238 MWh/yr of savings were reported but not verified. Those savings have since been verified with an energy realization rate of 114% and an NTGR of 67%, which yields an additional 3,708 MWh/yr of gross verified energy savings and an additional 2,485 MWh/yr of net verified energy savings. These verified gross savings are attributed to the Small C&I sector VTD savings in Table 2-2.
- LBMS: In the PY13 final annual report, 569 MWh/yr of savings were reported but not verified. Those savings have since been verified with an energy realization rate of 23% and an NTGR of 67%, which yields an additional 109 MWh/yr of gross verified energy savings and an additional 73 MWh/yr of net verified energy savings. These verified gross savings are attributed to the Large C&I sector VTD savings in Table 2-2

2.6.2 Lifetime Energy Savings by Program

Table 2-6 presents the PYTD and P4TD lifetime energy savings by program. Lifetime energy savings are calculated by multiplying the annual energy savings by the EUL. Per the PA 2016 TRC Order, the measure EUL does not exceed 15 years for any measure in the portfolio. Early replacement (ER) measures are subject to a dual baseline calculation, leading to modified lifetime savings. For these measures, savings relative to the in-place baseline equipment are used for the remaining useful life (RUL) of the base equipment. After the RUL, savings related to code equipment are used for the remainder of the efficient measure's EUL.

Table 2-6: Lifetime Energy Savings by Program (MWh)

Program Name	PYVTD Gross Lifetime (MWh)	PYVTD Net (MWh)	VTD Gross Lifetime (MWh)	VTD Net Lifetime (MWh)
Residential Downstream Incentives	15,233	13,077	250,405	202,227
Residential Midstream Incentives	-	-	104	104
Residential Upstream Incentives	-	-	83,981	56,308
Residential Appliance Recycling	6,101	4,372	31,391	19,356
Low-Income Energy Efficiency	57,376	57,376	120,395	120,395
Residential Behavioral Savings	12,168	12,168	64,920	64,920
Low-Income Residential Behavioral	933	933	6,146	6,146
Small Business Direct Install	2,876	2,675	159,183	149,082
Small Business Solutions	3,159	2,085	439,634	305,240
Small Business Midstream Solutions	-	-	861,370	590,677
Small Business Virtual Commissioning	329	309	41,692	39,513
Commercial Large Business Solutions	377,673	339,359	1,125,616	864,321
Industrial Large Business Solutions	65,526	58,879	511,215	273,812
Large Business Midstream Solutions - Commercial	105,497	92,837	577,892	474,352
Large Business Midstream Solutions - Industrial	4,516	3,974	313,214	221,138
Large Business Virtual Commissioning	335	315	59,429	57,998
Portfolio Total	651,721	588,357	4,646,587	3,445,590

Source: Guidehouse analysis

The previously reported VTD lifetime savings from prior years, for the following programs, have changed since the PY13 final annual report was submitted:

- No changes have been made since the PY13 annual report was submitted.

2.7 Summary of Peak Demand Reduction Impacts by Program

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. Peak demand impacts from energy efficiency in this report are presented at the system level, meaning they have been adjusted to account for transmission and distribution losses. Duquesne Light uses the following line loss percentages/multipliers by sector:

- Residential = 1.0741
- Small and Large C&I = 1.0741
- Large C&I High Voltage = 1.0081

Table 2-7 presents a summary of the peak demand impacts by energy efficiency program through the current reporting period.

Table 2-7: Peak Demand Savings by Energy Efficiency Program (MW/yr)

Program Name	PYRTD (MW/yr)	PYVTD Gross (MW/yr)	PYVTD Net (MW/yr)	RTD (MW/yr)	VTD Gross (MW/yr)	VTD Net (MW/yr)
Residential Downstream Incentives	0.22	0.18	0.15	3.92	3.45	2.74
Residential Midstream Incentives	-	-	-	0.00	0.00	0.00
Residential Upstream Incentives	-	-	-	0.97	1.40	1.02
Residential Appliance Recycling	0.37	0.40	0.28	1.57	1.68	1.05
Low-Income Energy Efficiency	0.47	0.48	0.48	1.43	1.40	1.40
Residential Behavioral Savings	1.70	1.21	1.21	7.18	5.93	5.93
Low-Income Residential Behavioral	0.07	0.09	0.09	0.33	0.51	0.51
Small Business Direct Install	0.07	0.03	0.03	1.96	2.01	1.88
Small Business Solutions	0.02	0.02	0.01	6.08	7.13	5.01
Small Business Midstream Solutions	-	-	-	11.39	12.78	8.78
Small Business Virtual Commissioning	0.04	0.01	0.01	0.53	0.55	0.52
Commercial Large Business Solutions	5.74	6.15	5.53	16.04	16.68	13.04
Industrial Large Business Solutions	0.86	0.81	0.73	3.97	3.94	2.27
Large Business Midstream Solutions – Commercial	0.75	1.42	1.25	5.13	7.71	6.39
Large Business Midstream Solutions – Industrial	0.04	0.06	0.05	3.99	4.05	2.91
Large Business Virtual Commissioning	0.04	0.04	0.04	0.47	0.63	0.62
Portfolio Total	10.38	10.91	9.88	64.95	69.87	54.08

Source: Guidehouse analysis

The previously reported VTD savings from prior years, for the following programs, have changed since the PY13 final annual report was submitted:

- RARP: SWE audit activities recommended an adjustment to the PY13 gross/net verified savings because of the use of the wrong CDDs and HDDs in the evaluation of savings. This caused a negligible effect to demand savings but was incorporated into future evaluations

for this program. These verified gross savings are attributed to the Residential (Non-LI) sector VTD savings in Table 2-2.

- SBMS: In the PY13 final annual report, 0.61 MW/yr of savings were reported but not verified. Those savings have since been verified with a demand realization rate of 154% and an NTGR of 67%, which yields an additional 0.95 MW/yr of gross verified demand savings and an additional 0.63 MW/yr of net verified demand savings. These verified gross savings are attributed to the Small C&I sector VTD savings in Table 2-2.
- LBMS: In the PY13 final annual report, 0.10 MW/yr of savings were reported but not verified. Those savings have since been verified with a demand realization rate of 37% and an NTGR of 67%, which yields an additional 0.036 MW/yr of gross verified demand savings and an additional 0.024 MW/yr of net verified demand savings. These verified gross savings are attributed to the Large C&I sector VTD savings in Table 2-2.

2.7.1 Peak Demand Savings Nominated to PJM Forward Capacity Market

The Approved EE&C Plan called for Duquesne Light to nominate up to 2 MW of capacity in the PJM Reliability Pricing System (RPS) Base Residual Auction (BRA) for the 2025/2026 delivery year. Federal Energy Regulatory Commission (FERC) postponed this auction from June 14, 2023 to July 17, 2024 (Y16 Q1). The PY15 Annual Report (on pdf page 20) describes this.⁹

The Capacity Resource: Energy Efficiency Capacity Resource Commercial Aggregation (timeline)

- Initial Measurement and Verification Plan submitted PJM June 17, 2024
- PJM Market Monitor's (Monitoring Analytics) 9-Questions June 21, 2024
- Response to Monitoring Analytics June 26, 2025
- The 2025/2026 BRA was held July 17-23, 2024
- Post-Installation Measurement and Verification Report submitted 9/11/2024

DLC did not participate in the PJM FCM in PY17.

2.8 Summary of Fuel Switching Impacts

Act 129 allows EDCs to achieve electric savings by converting electric equipment to non-electric equipment. Table 2-8 summarizes key fuel switching metrics in PY17 and to date in Phase IV.

Table 2-8: Fuel Switching Summary

Metric	PY17
Fuel Switching Measures Offered	None
Fuel Switching Measures Implemented	0

⁹ The 2025/2026 BRA, originally scheduled to open 6/14/2023 was delayed until 7/17/2024. Duquesne Light met with PJM on 5/9/24, PJM provided revised energy efficiency acceptable Installation Periods for the 2025/2026 BRA. DLC filled its Initial M&V Plan with PJM on 6/17/2024, this was accepted by PJM on 6/28/2024. Duquesne Light's 2025/2026 BRA nomination was submitted during the auction window 7/17/24 to 7/23/24 and was accepted. DLC reported the PJM BRA nomination that occurred during the Act 129 PY16 when the activity occurred in its PY16 annual report.

VTD Energy Savings Achieved via Fuel Switching (MWh/yr)	N/A
P4TD Increased Fossil Fuel Consumption Due to Fuel Switching Measures (MMBTU/yr)	N/A
P4TD Incentive Payments for Fuel Switching Measures (\$1,000)	N/A

Source: Guidehouse analysis

2.9 Summary of Renewable Energy Impacts

Act 129 allows EDCs to incentivize behind-the-meter solar photovoltaics and other renewable energy generation measures that offset the need for electricity from the grid. Table 2-9 summarizes the energy savings, peak demand reduction, and incentive totals for renewable energy measures in PY17 and Phase IV to date.

Table 2-9: Renewables Summary

Metric	PY17	P4TD
Renewable Energy Measures Implemented	11	27
VTD Residential Energy Savings Achieved via Renewables (MWh/yr)	-	-
VTD Residential Peak Demand Savings Achieved via Renewables (MW/yr)	-	-
Incentive Payments for Residential Renewable Energy Measures (\$1,000)	\$0	\$0
VTD Non-Residential Energy Savings Achieved via Renewables (MWh/yr)	3,321	10,440
VTD Non-Residential Peak Demand Savings Achieved via Renewables (MW/yr)	1.09	3.22
Incentive Payments for Non-Residential Renewable Energy Measures (\$1,000)	\$456	\$1,036

Source: Guidehouse analysis

2.10 Summary of Cost-Effectiveness Results

Table 2-10 presents a detailed breakdown of portfolio finances and cost-effectiveness. TRC benefits in Table 2-10 were calculated using gross verified impacts. Net present value (NPV) PY17 costs and benefits are expressed in 2025 dollars. NPV costs and benefits for P4TD financials are expressed in 2021 dollars.

Table 2-10: Summary of Portfolio Finances – Gross Verified

Row	Cost Category*	PYTD (\$1,000)	P4TD (\$1,000)
1	Incremental Measure Costs (IMCs)	\$11,714	\$57,518
2	Rebates to Participants and Trade Allies	\$3,003	\$20,558
3	Upstream/Midstream Incentives	\$1,910	\$10,811
4	Material Cost for Self-Install Programs (EE&C Kits)	\$629	\$1,304

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
5	Direct Installation Program Materials and Labor	\$338		\$6,793	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$5,834		\$18,052	
		EDC	CSP	EDC	CSP
7	Program Design	\$322	\$598	\$423	\$593
8	Administration and Management	\$21	\$226	\$1,889	\$3,854
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$309	\$4,637	\$708	\$28,549
11	EDC Evaluation Costs	\$489		\$2,217	
12	SWE Audit Costs	\$396		\$1,441	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$6,998		\$39,674	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$18,712		\$97,192	
15	Total NPV Lifetime Electric Energy Benefits	\$21,550		\$126,091	
16	Total NPV Lifetime Electric Capacity Benefits	\$9,480		\$58,633	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$1,347		\$9,426	
18	Total NPV Lifetime Fossil Fuel Impacts	\$(2,556)		\$(14,291)	
19	Total NPV Lifetime Water Impacts	\$80		\$2,744	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$29,901		\$182,603	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	1.60		1.88	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

TRC benefit-cost ratios are calculated by comparing the total NPV TRC benefits and the total NPV TRC costs. It is important to note that TRC costs are materially different from the EDC spending and rate recovery tables presented later in the report. TRC costs include estimates of the full cost incurred by program participants to install efficient equipment, not just the portion covered by the EDC rebate. Appendix D shows the TRC ratios by program and for the portfolio.

2.11 Comparison of Performance with Approved EE&C Plan

Table 2-11 presents PY17 expenditures compared with the budget estimates set forth in the EE&C plan for PY17 and P4TD. PY17 values are presented in 2025 dollars and P4TD values are presented in 2021 dollars. Program-level comparisons of expenditures to plans are presented in Appendix D.

Table 2-11: Comparison of Expenditures with Phase IV EE&C Plan (\$1,000)

Expenditures	Budget from EE&C Plan	Actual Expenditures	Ratio (Actual/Plan)
PY17 Portfolio	\$17,988	\$12,482	0.69
P4TD	\$95,775	\$87,578	0.91

Source: Guidehouse analysis

Table 2-12 compares PY17 and P4TD verified gross program savings with the energy savings projections set forth in the EE&C plan.

Table 2-12: Comparison of Actual Program Savings with EE&C Plan Projections

Savings	EE&C Plan Projections	VTD Gross MWh Savings	Ratio (Actual/Plan)
PY17 Portfolio MWh	70,639	56,797	0.80
P4TD MWh	361,036	368,535	1.02
PY17 Portfolio MW	16.90	10.91	0.65
P4TD MW	75.57	69.87	0.92

Source: Guidehouse analysis

The following list highlights key reasons programs exceeded or fell short of projected gross energy savings in PY17:

- The targets listed in the EE&C plan were greater than the targets set by the PA PUC. Duquesne Light intended to give themselves a buffer and carryover any remaining savings that exceeded the PUC targets. As the Phase progressed, certain programs, such as Residential Midstream Incentives or Larger Industrial VCx, failed to gain traction. Therefore, resources were diverted to more successful program components; however, this left gaps in their savings forecast.

2.12 Findings and Recommendations

The impact and process evaluation activities completed by Guidehouse led to specific recommendations for program improvement. Table 2-13 provides the section number for the findings and recommendations of each program. Guidehouse makes no overarching program recommendations in PY17.

Table 2-13: Findings and Recommendations Sections by Program

Program	Findings and Recommendations Section
Residential Downstream Incentives	3.1.7
Residential Midstream Incentives	3.2.7
Residential Upstream Incentives	3.3.7
Residential Appliance Recycling	3.4.7
Residential Low-Income Energy Efficiency	3.5.7

Program	Findings and Recommendations Section
Residential Behavioral	3.6.7
Low-Income Behavioral	3.7.7
Small Business Direct Install	3.8.7
Small Business Solutions	3.9.7
Small Business Midstream Solutions	3.10.7
Small Business Virtual Commissioning	3.11.7
Large Business Solutions	3.12.7
Large Business Midstream Solutions	3.13.7
Large Business Virtual Commissioning	3.14.7

Source: Guidehouse analysis

3. Evaluation Results by Program

This section documents the gross impact, net impact, and process evaluation activities conducted in PY17 along with the outcomes of those activities. Not every program receives an evaluation every year. Table 3-1 provides an impact evaluation overview for Phase IV. Each row indicates how savings from the individual component will be presented in that year's final annual report, where:

V = verified using the results of the impact evaluation completed that year

H = verified using realization rate values from the most recent evaluation activities based on previous years

U = unverified until the results of the impact evaluation are available

Table 3-1: Proposed Gross Impact Overview

Component	PY13	PY14	PY15	PY16	PY17
Residential					
Downstream Incentives	V	H	V	H ¹⁰	H
Midstream Incentives	H	H	H	H	H ¹¹
Upstream Incentives	V	V	V	V	H
Appliance Recycling	V	H	V	H	H
Low-Income Energy Efficiency	H	V	H	V	H ¹²
Residential Behavioral	V	V	V	V	V
Low-Income Behavioral	V	V	V	V	V
Small/Medium C&I					
Small Business Direct Install	V ¹³ (2-year rolling sample)		V	H	V
Small Business Solutions	Uses a 2-year rolling sample approach				
Small Business Midstream	V	V	H	V	H

¹⁰ In PY16, Guidehouse evaluated the new RDIP customer kit, given the significant amount of savings associated with the component.

¹¹ RMIP saw limited activity in Phase IV. Therefore, the program was not verified as originally scheduled.

¹² In PY17, Guidehouse evaluated the new LIEEP customer kit, given the significant amount of savings associated with the component.

¹³ SBDI showed low participation in the first three quarters of PY13. Guidehouse verified several projects for PY13 and completed a rolling 2-year evaluation of this program in PY14.

Component	PY13	PY14	PY15	PY16	PY17
Small Business Virtual Commissioning	U	V	V	H	V
Large C&I					
Large Business Solutions	Uses a 2-year rolling sample approach				
Large Business Midstream Solutions	V	V	H	V	H
Large Business Virtual Commissioning	U	V	V	H	V

Source: Guidehouse analysis

3.1 Residential Downstream Incentives

RDIP includes incentives for a wide variety of energy efficiency products, including ENERGY STAR appliances; high efficiency heating, cooling, and water heating equipment; and other products. There are three components of the program: customers who received rebates for purchasing and installing energy efficient equipment either at the point-of-purchase (PoP) or following an application (Rebate), customers who received a comprehensive energy efficiency audit (Audit), and customers who received or purchased a kit including energy efficient equipment (Kits).

The CSP for RDIP is CLEAResult. CLEAResult processes the rebate applications as well as performs marketing, verification, and calculation of energy savings for the three components.

For customers participating in the Rebate component of the program, participation is equal to the number of distinct account numbers in the program tracking data within a given program year. Participating customers fill out and submit applications for rebates for qualifying products online or by mail. RDIP also offers PoP rebates through the online marketplace.

Customers participating in the Audit component of the program are counted based on the number of distinct account numbers in the program tracking data within a given year. This component provides comprehensive in-home audits, which, when applicable, directly install measures such as LED bulbs, advanced power strips (APS), faucet aerators, and nightlights. The in-home audits also provide incentives for air sealing; basement, exterior wall, floor, and attic insulation; and additional water heating measures. In lieu of the in-person audit, the program offers an online home energy audit, which allows customers to first obtain instant results by answering questions regarding their home energy use. Customers receive educational materials, and a menu of approved measures and rebate amounts to reduce the cost of replacing inefficient equipment. The online home energy audit simplifies the in-person audit process, should the customer choose to continue in the program. In addition to direct-install measures, which are provided at no cost, the program provides up to a \$250 home energy credit for installation of audit-recommended measures.

Finally, the program provides a Kits component in which participation is counted by distinct project numbers. The Kits component includes an education element for elementary, middle, and high school students and teachers that offers educational materials, kits, presentations with

hands-on activities, poster contests, and a data collection and tracking process. The data collection and tracking process is used to compile, analyze, and report energy savings. The Education component of the program influences and reinforces the energy efficiency behavioral changes geared toward students, their families, and teachers.¹⁴ The Kits component also offers a Smart Home Kits to customers for purchase, and in PY16, Duquesne Light started offering a kit to new residential customers. These kits include equipment to help make customer homes more efficient, such as smart thermostats, APS, and outlet gaskets.

3.1.1 Participation and Reported Savings by Customer Segment

Table 3-2 presents the participation counts, reported energy and demand savings, and incentive payments for RDIP in PY17 by customer segment.

Table 3-2: RDIP Participation and Reported Impacts

Parameter	Residential (Non-LI)	Total
PY17 # of Participants	3,177	3,177
PYRTD MWh/yr	1,117	1,117
PYRTD MW/yr	0.22	0.22
PY17 Incentives (\$1,000)	\$190	\$190

Source: Guidehouse analysis

3.1.2 Gross Impact Evaluation

Per the PY17 Guidehouse Evaluation Plan, Guidehouse did not conduct a gross impact evaluation for RDIP in PY17 and applied the historic realization rates for the different stratum. Table 3-3 shows the reported energy savings in PY17, and Table 3-4 shows the reported demand savings in PY17.

¹⁴ Guidehouse does not report any behavioral savings for the Kits component.

Table 3-3: RDIP Gross Impact Results for Energy

Component	PYRTD MWh/yr	Energy Realization Rate	Sample C _v or Error Ratio	Relative Precision at 85% C.L.
Audits	162	90%	0.21	3%
Kits	120	108%	-	0%
New Customer Kit – Furnace Whistles	6	1%	6.16	147%
New Customer Kit – LEDs	152	80%	0.40	9%
New Customer Kit – Nightlights	17	274%	0.92	21%
New Customer Kit – Outlet Gaskets	14	23%	1.95	45%
Rebates	646	131%	1.00	14%
Program Total	1,117	116%		4%

Source: Guidehouse analysis

Table 3-4: RDIP Gross Impact Results for Demand

Component	PYRTD MW/yr	Demand Realization Rate	Sample C _v or Error Ratio	Relative Precision at 85% C.L.
Audits	0.02	90%	0.22	4%
Kits	0.03	99%	-	0%
New Customer Kit – Furnace Whistles	0.00	0%	-	0%
New Customer Kit – LEDs	0.02	76%	0.37	8%
New Customer Kit – Nightlights	-	-	-	0%
New Customer Kit – Outlet Gaskets	0.00	36%	1.95	45%
Rebates	0.15	82%	0.47	6%
Program Total	0.22	84%		4%

Source: Guidehouse analysis

3.1.3 Net Impact Evaluation

Per the PY17 Guidehouse Evaluation Plan, Guidehouse did not conduct a net impact evaluation for RDIP in PY17. Table 2-4 shows the NTGR applied to RDIP projects that were carried over from the PY15 NTG evaluation.

3.1.3.1 High-Impact Measure Research

Guidehouse did not conduct high-impact measure (HIM) research for RDIP in PY17.

3.1.4 Verified Savings Estimates

In Table 3-5, the realization rates and NTGRs determined by Guidehouse are applied to the reported energy and demand savings estimates to calculate the verified savings estimates for RDIP in PY17. These totals are added to the verified savings achieved in previous program years to calculate the P4TD program impacts.

Table 3-5: Residential Downstream Initiatives PY17 and P4TD Savings Summary

Savings Type	Energy (MWh/yr)	Demand (MW/yr)
PYRTD	1,117	0.22
PYVTD Gross	1,293	0.18
PYVTD Net	1,110	0.15
RTD	23,280	3.92
VTD Gross	23,480	3.45
VTD Net	18,966	2.74

Source: Guidehouse analysis

3.1.5 Process Evaluation

Guidehouse did not conduct process evaluation research for RDIP in PY17.

3.1.6 Program Finances and Cost-Effectiveness Reporting

Table 3-6 presents a detailed breakdown of program finances and cost-effectiveness. TRC benefits in Table 3-6 were calculated using gross verified impacts. NPV PY17 costs and benefits are expressed in 2025 dollars. NPV costs and benefits for P4TD financials are expressed in 2021 dollars.

Table 3-6: Summary of Program Finances – Gross Verified

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$763		\$4,949	
2	Rebates to Participants and Trade Allies	\$ -		\$2,713	
3	Upstream/Midstream Incentives	\$177		\$136	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$157		\$943	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$429		\$1,157	
		EDC	CSP	EDC	CSP
7	Program Design	\$ -	\$ -	\$10	\$8
8	Administration and Management	\$ -	\$ -	\$160	\$201
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$ -	\$1,256	\$41	\$4,096
11	EDC Evaluation Costs	\$16		\$124	
12	SWE Audit Costs	\$ -		\$65	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$1,272		\$4,705	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$2,035		\$9,654	
15	Total NPV Lifetime Electric Energy Benefits	\$522		\$6,817	
16	Total NPV Lifetime Electric Capacity Benefits	\$179		\$2,387	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$ -		\$ -	
18	Total NPV Lifetime Fossil Fuel Impacts	\$(6)		\$(83)	
19	Total NPV Lifetime Water Impacts	\$1		\$2,144	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$697		\$11,265	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	0.34		1.17	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

Table 3-7 presents program financials and cost-effectiveness on a net savings basis. The NTGR applied to the audits component of the program in PY17 comes from the PY15 Net

Impact Evaluation (Section 3.1.3). The NTGR applied to other program components in PY17 comes from PY13 Net Impact Evaluation.

Table 3-7: Summary of Program Finances – Net Verified

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$655		\$4,024	
2	Rebates to Participants and Trade Allies	\$ -		\$2,209	
3	Upstream/Midstream Incentives	\$152		\$116	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$135		\$768	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$368		\$931	
		EDC	CSP	EDC	CSP
7	Program Design	\$ -	\$ -	\$10	\$8
8	Administration and Management	\$ -	\$ -	\$160	\$201
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$ -	\$1,078	\$41	\$3,960
11	EDC Evaluation Costs	\$14		\$122	
12	SWE Audit Costs	\$ -		\$65	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$1,092		\$4,567	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$1,747		\$8,591	
15	Total NPV Lifetime Electric Energy Benefits	\$448		\$5,499	
16	Total NPV Lifetime Electric Capacity Benefits	\$154		\$1,916	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$ -		\$ -	
18	Total NPV Lifetime Fossil Fuel Impacts	\$(5)		\$(67)	
19	Total NPV Lifetime Water Impacts	\$1		\$1,737	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$598		\$9,086	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	0.34		1.06	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

3.1.7 Status of Recommendations

There were no impact- or process-related findings for this program in PY17.

3.2 Residential Midstream Incentives

RMIP includes rebates for select HVAC, hot water, and auxiliary equipment for residential Duquesne Light customers paid directly to program participating distributors. This program eliminates the burden of customers filling out rebate applications, reducing program participation barriers for customers. For RMIP, participation is equal to the number of distinct account numbers in the program tracking data, within a given program year. There was no activity in RMIP in PY17.

3.2.1 Participation and Reported Savings by Customer Segment

Table 3-8 presents the participation counts, reported energy and demand savings, and incentive payments for RMIP in PY17 by customer segment.

Table 3-8: RMIP Participation and Reported Impacts

Parameter	Residential (Non-LI)	Total
PY17 # Participants	0	0
PYRTD MWh/yr	-	-
PYRTD MW/yr	-	-
PY17 Incentives (\$1,000)	\$0	\$0

Source: Guidehouse analysis

3.2.2 Gross Impact Evaluation

Due to limited program activity, Guidehouse did not conduct a gross impact evaluation for RMIP in PY17.

3.2.3 Net Impact Evaluation

Guidehouse did not conduct net impact evaluation research for RMIP in PY17 due to low program participation in Phase IV.

3.2.3.1 HIM Research

Guidehouse did not conduct HIM research for the RMIP in PY17.

3.2.4 Verified Savings Estimates

In Table 3-9, the realization rates and NTGRs determined by Guidehouse are applied to the reported energy and demand savings estimates to calculate the verified savings estimates for RMIP in PY17. These totals are added to the verified savings achieved in previous program years to calculate the P4TD program impacts.

Table 3-9: RMIP PY17 and P4TD Savings Summary

Savings Type	Energy (MWh/yr)	Demand (MW/yr)
PYRTD	-	-
PYVTD Gross	-	-
PYVTD Net	-	-
RTD	7	0.00
VTD Gross	7	0.00
VTD Net	7	0.00

Source: Guidehouse analysis

3.2.5 Process Evaluation

Guidehouse did not conduct process evaluation research for RMIP in PY17 due to low program participation in Phase IV.

3.2.6 Program Finances and Cost-Effectiveness Reporting

Table 3-10 presents a detailed breakdown of program finances and cost-effectiveness. TRC benefits in Table 3-10 were calculated using gross verified impacts. NPV PY17 costs and benefits are expressed in 2025 dollars. NPV costs and benefits for P4TD financials are expressed in 2021 dollars.

Table 3-10: Summary of Program Finances – Gross Verified

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$ -		\$17	
2	Rebates to Participants and Trade Allies	\$ -		\$ -	
3	Upstream/Midstream Incentives	\$ -		\$1	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$ -		\$16	
		EDC	CSP	EDC	CSP
7	Program Design	\$ -	\$ -	\$ -	\$1
8	Administration and Management	\$ -	\$ -	\$41	\$1
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$ -	\$ -	\$ -	\$61
11	EDC Evaluation Costs	\$ -		\$2	
12	SWE Audit Costs	\$ -		\$2	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$ -		\$108	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$ -		\$125	
15	Total NPV Lifetime Electric Energy Benefits	\$ -		\$3	
16	Total NPV Lifetime Electric Capacity Benefits	\$ -		\$3	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$ -		\$ -	
18	Total NPV Lifetime Fossil Fuel Impacts	\$ -		\$ -	
19	Total NPV Lifetime Water Impacts	\$ -		\$ -	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$ -		\$6	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	0.00		0.05	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

Table 3-11 presents program financials and cost-effectiveness on a net savings basis. Since this program was not included in Phase III and NTG research has not been conducted yet for this program in Phase IV, the NTGR is assumed to be 1.0.

Table 3-11: Summary of Program Finances – Net Verified

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$ -		\$17	
2	Rebates to Participants and Trade Allies	\$ -		\$ -	
3	Upstream/Midstream Incentives	\$ -		\$1	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$ -		\$16	
		EDC	CSP	EDC	CSP
7	Program Design	\$ -	\$ -	\$ -	\$1
8	Administration and Management	\$ -	\$ -	\$41	\$1
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$ -	\$ -	\$ -	\$61
11	EDC Evaluation Costs	\$ -		\$2	
12	SWE Audit Costs	\$ -		\$2	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$ -		\$108	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$ -		\$125	
15	Total NPV Lifetime Electric Energy Benefits	\$ -		\$3	
16	Total NPV Lifetime Electric Capacity Benefits	\$ -		\$3	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$ -		\$ -	
18	Total NPV Lifetime Fossil Fuel Impacts	\$ -		\$ -	
19	Total NPV Lifetime Water Impacts	\$ -		\$ -	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$ -		\$6	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	0.00		0.05	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

3.2.7 Status of Recommendations

There were no impact- or process-related findings for this program in PY17.

3.3 Residential Upstream Incentives

RUIP offers point-of-sale incentives for qualified energy efficient lighting and appliances¹⁵ to Duquesne Light's residential customers, which are paid directly to manufacturers. Customers purchase discounted products at participating retailers without having to complete rebate applications. This program eliminates the burden of customers filling out rebate applications, leading to reduced program participation barriers for customers. RUIP fosters a partnership among the CSP, manufacturers, and retailers through the CSP's delivery team that supports retailers and manufacturers throughout the product promotion and rebate processing journey. The CSP for this program is CLEAResult. There was no activity in RUIP in PY17.

3.3.1 Participation and Reported Savings by Customer Segment

Table 3-12 presents the participation counts, reported energy and demand savings, and incentive payments for RUIP in PY17 by customer segment.

Table 3-12: RUIP Participation and Reported Impacts

Parameter	Residential (Non-LI)	Total
PY17 # Participants	N/A	N/A
PYRTD MWh/yr	-	-
PYRTD MW/yr	-	-
PY17 Incentives (\$1,000)	\$0	\$0

Source: Guidehouse analysis

3.3.2 Gross Impact Evaluation

Due to no program activity, Guidehouse did not conduct a gross impact evaluation for RUIP in PY17.

3.3.3 Net Impact Evaluation

Per the PY17 Guidehouse Evaluation Plan, Guidehouse did not conduct a net impact evaluation for RUIP in PY17. Table 2-4 shows the NTGR applied to RUIP projects that was carried over from the PY14 NTG evaluation.

3.3.3.1 HIM Research

Guidehouse did not conduct HIM research for RUIP in PY17.

3.3.4 Verified Savings Estimates

In Table 3-13, the realization rates and NTGRs determined by Guidehouse are applied to the reported energy and demand savings estimates to calculate the verified savings estimates for

¹⁵ Non-lighting upstream measures may include heat pump water heaters, ENERGY STAR dehumidifiers, advanced power strips, and ENERGY STAR room air conditioners.

RUIP in PY17. These totals are added to the verified savings achieved in previous program years to calculate the P4TD program impacts.

Table 3-13: RUIP PY17 and P4TD Savings Summary

Savings Type	Energy (MWh/yr)	Demand (MW/yr)
PYRTD	-	-
PYVTD Gross	-	-
PYVTD Net	-	-
RTD	6,756	0.97
VTD Gross	7,456	1.40
VTD Net	5,108	1.02

Source: Guidehouse analysis

3.3.5 Process Evaluation

Guidehouse did not conduct process evaluation research for RUIP in PY17.

3.3.6 Program Finances and Cost-Effectiveness Reporting

Table 3-14 presents a detailed breakdown of program finances and cost-effectiveness. TRC benefits in Table 3-14 were calculated using gross verified impacts. NPV PY17 costs and benefits are expressed in 2025 dollars. NPV costs and benefits for P4TD financials are expressed in 2021 dollars.

Table 3-14: Summary of Program Finances – Gross Verified

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$ -		\$1,868	
2	Rebates to Participants and Trade Allies	\$ -		\$178	
3	Upstream/Midstream Incentives	\$ -		\$483	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$ -		\$1,207	
		EDC	CSP	EDC	CSP
7	Program Design	\$ -	\$ -	\$7	\$5
8	Administration and Management	\$ -	\$ -	\$92	\$130
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$ -	\$ -	\$14	\$1,518
11	EDC Evaluation Costs	\$ -		\$72	
12	SWE Audit Costs	\$ -		\$45	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$ -		\$1,884	

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$ -		\$3,752	
15	Total NPV Lifetime Electric Energy Benefits	\$ -		\$2,350	
16	Total NPV Lifetime Electric Capacity Benefits	\$ -		\$1,094	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$ -		\$ -	
18	Total NPV Lifetime Fossil Fuel Impacts	\$ -		\$(280)	
19	Total NPV Lifetime Water Impacts	\$ -		\$ -	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$ -		\$3,164	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	0.00		0.84	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

Table 3-15 presents program financials and cost-effectiveness on a net savings basis. The NTGR applied in PY17 comes from the PY14 Net Impact Evaluation.

Table 3-15: Summary of Program Finances – Net Verified

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$ -		\$1,262	
2	Rebates to Participants and Trade Allies	\$ -		\$116	
3	Upstream/Midstream Incentives	\$ -		\$319	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$ -		\$826	
		EDC	CSP	EDC	CSP
7	Program Design	\$ -	\$ -	\$7	\$5
8	Administration and Management	\$ -	\$ -	\$92	\$130
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$ -	\$ -	\$14	\$1,518
11	EDC Evaluation Costs	\$ -		\$72	
12	SWE Audit Costs	\$ -		\$45	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$ -		\$1,884	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$ -		\$3,146	
15	Total NPV Lifetime Electric Energy Benefits	\$ -		\$1,574	
16	Total NPV Lifetime Electric Capacity Benefits	\$ -		\$740	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$ -		\$ -	

Row	Cost Category*	PYTD (\$1,000)	P4TD (\$1,000)
18	Total NPV Lifetime Fossil Fuel Impacts	\$ -	\$(185)
19	Total NPV Lifetime Water Impacts	\$ -	\$ -
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$ -	\$2,129
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	0.00	0.68

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

3.3.7 Status of Recommendations

There were no impact- or process-related findings for this program in PY17.

3.4 Residential Appliance Recycling

RARP helps customers become more energy efficient by educating them about the amount of energy consumed by and the costs associated with operating inefficient refrigerators, freezers, dehumidifiers, and room air conditioners. It then provides access to a no-cost service that removes and recycles the operational but inefficient appliance. Customer motivation is enhanced by providing a cash incentive for program participation. For RARP, participation is equal to the number of distinct measures in the program tracking data within a given program year.

3.4.1 Participation and Reported Savings by Customer Segment

Table 3-16 presents the participation counts, reported energy and demand savings, and incentive payments for RARP in PY17 by customer segment.

Table 3-16: RARP Participation and Reported Impacts

Parameter	Residential (Non-LI)	Total
PY17 # Participants	1,975	1,975
PYRTD MWh/yr	1,293	1,293
PYRTD MW/yr	0.37	0.37
PY17 Incentives (\$1,000)	\$95	\$95

Source: Guidehouse analysis

3.4.2 Gross Impact Evaluation

Per the PY17 Guidehouse Evaluation Plan, Guidehouse did not conduct a gross impact evaluation for RARP in PY17 and applied the historic realization rates from PY15 for the different stratum. Table 3-17 shows the reported energy savings in PY17, and Table 3-18 shows the reported demand savings in PY17.

Table 3-17: RARP Gross Impact Results for Energy

Component	PYRTD MWh/yr	Energy Realization Rate	Sample C _v or Error Ratio	Relative Precision at 85% C.L.
Freezers	139	91%	0.75	22%
Other	224	105%	0.15	5%
Refrigerators	930	102%	0.49	10%
Program Total	1,293	101%		7%

Source: Guidehouse analysis

Table 3-18: RARP Gross Impact Results for Demand

Component	PYRTD MW/yr	Demand Realization Rate	Sample C _v or Error Ratio	Relative Precision at 85% C.L.
Freezers	0.02	91%	0.75	22%
Other	0.18	116%	0.56	20%
Refrigerators	0.16	102%	0.49	10%
Program Total	0.37	108%		11%

Source: Guidehouse analysis

3.4.3 Net Impact Evaluation

Per the PY17 Guidehouse Evaluation Plan, Guidehouse did not conduct a net impact evaluation for RARP in PY17. Table 2-4 shows the NTGR applied to RARP projects that was carried over from the PY15 NTG evaluation.

3.4.3.1 HIM Research

Guidehouse did not conduct HIM research for RARP in PY17.

3.4.4 Verified Savings Estimates

In Table 3-19, the realization rates and NTGRs determined by Guidehouse are applied to the reported energy and demand savings estimates to calculate the verified savings for RARP in PY17. These totals are added to the verified savings achieved in previous program years to calculate the P4TD program impacts.

Table 3-19: RARP PY17 and P4TD Savings Summary

Savings Type	Energy (MWh/yr)	Demand (MW/yr)
PYRTD	1,293	0.37
PYVTD Gross	1,306	0.40
PYVTD Net	936	0.28
RTD	6,324	1.57
VTD Gross	6,650	1.68
VTD Net	4,103	1.05

Source: Guidehouse analysis

3.4.5 Process Evaluation

Guidehouse did not conduct process evaluation research for RARP in PY17.

3.4.6 Program Finances and Cost-Effectiveness Reporting

Table 3-20 presents a detailed breakdown of program finances and cost-effectiveness. TRC benefits in Table 3-20 were calculated using gross verified impacts. NPV PY17 costs and

benefits are expressed in 2025 dollars. NPV costs and benefits for P4TD financials are expressed in 2021 dollars.

Table 3-20: Summary of Program Finances – Gross Verified

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$95		\$392	
2	Rebates to Participants and Trade Allies	\$ -		\$310	
3	Upstream/Midstream Incentives	\$ -		\$ -	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$95		\$82	
		EDC	CSP	EDC	CSP
7	Program Design	\$19	\$ -	\$20	\$3
8	Administration and Management	\$ -	\$9	\$109	\$108
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$37	\$555	\$57	\$1,819
11	EDC Evaluation Costs	\$16		\$63	
12	SWE Audit Costs	\$15		\$43	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$651		\$2,222	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$746		\$2,614	
15	Total NPV Lifetime Electric Energy Benefits	\$201		\$838	
16	Total NPV Lifetime Electric Capacity Benefits	\$142		\$530	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$ -		\$ -	
18	Total NPV Lifetime Fossil Fuel Impacts	\$ -		\$ -	
19	Total NPV Lifetime Water Impacts	\$ -		\$ -	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$343		\$1,368	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	0.46		0.52	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

Table 3-21 presents program financials and cost-effectiveness on a net savings basis. The NTGR applied in PY17 comes from the PY15 Net Impact Evaluation.

Table 3-21: Summary of Program Finances – Net Verified

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$68		\$242	
2	Rebates to Participants and Trade Allies	\$ -		\$176	
3	Upstream/Midstream Incentives	\$ -		\$ -	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$68		\$66	
		EDC	CSP	EDC	CSP
7	Program Design	\$14	\$ -	\$15	\$3
8	Administration and Management	\$ -	\$6	\$109	\$106
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$27	\$398	\$49	\$1,699
11	EDC Evaluation Costs	\$11		\$60	
12	SWE Audit Costs	\$11		\$40	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$467		\$2,080	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$535		\$2,322	
15	Total NPV Lifetime Electric Energy Benefits	\$144		\$513	
16	Total NPV Lifetime Electric Capacity Benefits	\$101		\$327	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$ -		\$ -	
18	Total NPV Lifetime Fossil Fuel Impacts	\$ -		\$ -	
19	Total NPV Lifetime Water Impacts	\$ -		\$ -	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$246		\$839	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	0.46		0.36	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

3.4.7 Status of Recommendations

There were no impact- or process-related findings for this program in PY17.

3.5 Residential Low-Income Energy Efficiency

The Residential LIEEP is a direct-install program that includes walkthrough and comprehensive audits, provides energy efficiency education, and installs energy efficient products and equipment at no cost to the participant. Additionally, the program mailed out energy efficient kits to prospective participants and distributed a number of giveaway measures at local events. The program provides these services to residential households at or below 150% of the federal poverty income guidelines who reside in single-family or multifamily housing.

Under LIEEP, income-qualified residential customers will be scheduled for a virtual assessment or in-home energy audit that will include direct-install measures and energy education. For the virtual assessment, the direct-install measures will be drop-shipped to the customer in the form of a customized energy efficiency kit and customers may be referred for installation of eligible HVAC, water heat, health and safety, and insulation or air sealing measures. Participation in this program is equal to the number of distinct account numbers in the tracking data within a given program year.

Multifamily facilities are eligible for cost-share common area lighting and management-owned appliance recycling or replacement measures. The upgrade cost-share and savings are based on the percentage of LI occupants dwelling in the multifamily facility.

3.5.1 Participation and Reported Savings by Customer Segment

Table 3-22 presents the participation counts, reported energy and demand savings, and incentive payments for LIEEP in PY17 by customer segment.

Table 3-22: LIEEP and Reported Impacts

Parameter	Residential LI	Total
PY17 # Participants	30,563	30,563
PYRTD MWh/yr	5,389	5,389
PYRTD MW/yr	0.47	0.47
PY17 Incentives (\$1,000)	\$0	\$0

Source: Guidehouse analysis

3.5.2 Gross Impact Evaluation

Despite not being scheduled to evaluate LIEEP in PY17, Guidehouse, in consultation with the SWE, conducted an engineering desk review of the Low-Income Customer Kit component. They determined the need for an evaluation given this is the first year the kit is being offered and there are significant savings associated with the offering. Guidehouse applied historic realization rates to the other stratum within the program. Table 3-23 shows the reported energy savings in PY17, and Table 3-24 shows the reported demand savings in PY17.

Table 3-23: LIEEP Gross Impact Results for Energy

Component	PYRTD MWh/yr	Energy Realization Rate	Sample C _v or Error Ratio	Relative Precision at 85% C.L.
Audit – Aerators	229	95%	0.16	8%
Audit – Appliances	397	100%	-	0%
Audit – LEDs	451	95%	0.19	4%
Audit – Night Lights	548	92%	0.25	5%
Audit – Smart Strips	846	101%	0.19	4%
Kits	2,706	100%	0.00	0%
Appliance Recycling	211	124%	0.26	35%
Program Total	5,389	100%		2%

Source: Guidehouse analysis

Table 3-24: LIEEP Gross Impact Results for Demand

Component	PYRTD MW/yr	Demand Realization Rate	Sample C _v or Error Ratio	Relative Precision at 85% C.L.
Audit – Aerators	0.03	94%	0.19	9%
Audit – Appliances	0.01	100%	-	0%
Audit – LEDs	0.05	96%	0.16	4%
Audit – Night Lights	-	-	-	0%
Audit – Smart Strips	0.09	99%	0.24	5%
Kits	0.26	100%	0.00	0%
Appliance Recycling	0.04	124%	0.26	34%
Program Total	0.47	101%		3%

Source: Guidehouse analysis

3.5.3 Net Impact Evaluation

Per the PY17 Guidehouse Evaluation Plan, Guidehouse did not conduct a net impact evaluation for Residential LIEEP in PY17. Guidehouse does not plan to conduct an NTG assessment during Phase IV for the LIEEP. Per SWE's Phase IV Evaluation Framework Section 3.4 guidance, Guidehouse will assume and assign an NTGR of 1.0 for LI programs because free ridership and spillover are not anticipated among LI participants due to income constraints.

3.5.3.1 HIM Research

Guidehouse did not conduct HIM research for LIEEP in PY17.

3.5.4 Verified Savings Estimates

In Table 3-25, the realization rates and NTGRs determined by Guidehouse are applied to the reported energy and demand savings estimates to calculate the verified savings estimates for LIEEP in PY17. These totals are added to the verified savings achieved in previous program years to calculate the P4TD program impacts.

Table 3-25: LIEEP PY17 and P4TD Savings Summary

Savings Type	Energy (MWh/yr)	Demand (MW/yr)
PYRTD	5,389	0.47
PYVTD Gross	5,373	0.48
PYVTD Net	5,373	0.48
RTD	15,311	1.43
VTD Gross	14,797	1.40
VTD Net	14,797	1.40

Source: Guidehouse analysis

3.5.5 Process Evaluation

Guidehouse did not conduct process evaluation research for LIEEP in PY17.

3.5.6 Program Finances and Cost-Effectiveness Reporting

Table 3-26 presents a detailed breakdown of program finances and cost-effectiveness. TRC benefits in Table 3-26 were calculated using gross verified impacts. NPV PY17 costs and benefits are expressed in 2025 dollars. NPV costs and benefits for P4TD financials are expressed in 2021 dollars.

Table 3-26: Summary of Program Finances – Gross Verified

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$158		\$161	
2	Rebates to Participants and Trade Allies	\$695		\$2,965	
3	Upstream/Midstream Incentives	\$ -		\$ -	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$472		\$361	
5	Direct Installation Program Materials and Labor	\$338		\$3,216	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$(1,347)		\$(6,382)	
		EDC	CSP	EDC	CSP
7	Program Design	\$78	\$234	\$92	\$196
8	Administration and Management	\$ -	\$44	\$213	\$619
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$38	\$236	\$86	\$1,667
11	EDC Evaluation Costs	\$96		\$362	
12	SWE Audit Costs	\$78		\$239	

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$804		\$3,474	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$962		\$3,635	
15	Total NPV Lifetime Electric Energy Benefits	\$1,921		\$3,226	
16	Total NPV Lifetime Electric Capacity Benefits	\$391		\$717	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$ -		\$ -	
18	Total NPV Lifetime Fossil Fuel Impacts	\$(261)		\$(357)	
19	Total NPV Lifetime Water Impacts	\$79		\$600	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$2,130		\$4,186	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	2.22		1.15	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

Table 3-27 presents program financials and cost-effectiveness on a net savings basis. Per the SWE's guidance, NTGR for LI programs will be a deemed value of 1.0 due to the assumption that there is no free ridership or spillover due to cost constraints.

Table 3-27: Summary of Program Finances – Net Verified

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$158		\$161	
2	Rebates to Participants and Trade Allies	\$695		\$2,965	
3	Upstream/Midstream Incentives	\$ -		\$ -	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$472		\$361	
5	Direct Installation Program Materials and Labor	\$338		\$3,216	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$(1,347)		\$(6,382)	
		EDC	CSP	EDC	CSP
7	Program Design	\$78	\$234	\$92	\$196
8	Administration and Management	\$ -	\$44	\$213	\$619
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$38	\$236	\$86	\$1,667
11	EDC Evaluation Costs	\$96		\$362	
12	SWE Audit Costs	\$78		\$239	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$804		\$3,474	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$962		\$3,635	

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
15	Total NPV Lifetime Electric Energy Benefits	\$1,921		\$3,226	
16	Total NPV Lifetime Electric Capacity Benefits	\$391		\$717	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$ -		\$ -	
18	Total NPV Lifetime Fossil Fuel Impacts	\$(261)		\$(357)	
19	Total NPV Lifetime Water Impacts	\$79		\$600	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$2,130		\$4,186	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	2.22		1.15	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

3.5.7 Status of Recommendations

There were no impact- or process-related findings for this program in PY17.

3.6 Residential Behavioral

The Residential Behavioral Energy Efficiency Program (R-BEEP) influences behavior changes in customers by providing information via personalized HERs to participants. The program provides these HERs to participants via mail, email, and access through the Duquesne Light web account portal. These reports provide participants information about their recent and historic energy use and compare it with electricity use of similar homes. The reports also provide participants with energy-saving tips, some of which are tailored to participants' home characteristics if they filled out the Home Energy Analysis survey with Duquesne Light. Furthermore, these reports provide information on other Duquesne Light energy efficiency programs, which helps increase awareness of those programs among Duquesne Light's customers.

Duquesne Light launched the R-BEEP in PY4 to target high use residential customers. The current program participation levels include:

- 10,663 customers from the 2012 MR wave
- 27,292 customers from the 2015 MR wave
- 47,158 customers from the 2021 digital wave
- 49,113 customers from the 2021 non-digital wave
- 11,630 customers from the 2023 LI wave
- 21,598 customers from the 2024 digital 1 wave
- 12,272 customers from the 2024 digital 2 wave
- 28,822 customers from the 2025 MR wave
- 16,720 customers from the 2025 LI wave (based on PY16 monthly averages)

The 2021 and 2024 digital and non-digital waves are all market rate (MR) waves. Savings for the 2023 and 2025 LI waves are reported and verified under the LI Behavioral Energy Efficiency Program (LI-BEEP). The administration, implementation, and evaluation for those LI participants is similar to their MR participant counterparts. Section 3.7 details the LI evaluation results.

Ahead of PY17, five waves were re-randomized into new treatment and control groups, including the 2023 digital and non-digital market rate waves and the 2015, 2018, and 2021 LI waves. Many customers from these treatment and control groups were subsequently included in the two waves launched in June 2025.

A participant is defined as a customer who received HERs during the program year (i.e., PY17). The participant count represents the average number of unique participants who received HERs across each month of PY17. The program is an opt-out program in which the CSP, Oracle, enrolls participants in the program based on a randomized control trial (RCT) program design. Enrolled customers can opt out of the program by calling or emailing the program implementer. To preserve the RCT design, opt-out customers are included in the analysis.

In the RCT design, eligible customers are randomly assigned to treatment and control groups. Due to random assignment, any difference in usage between treatment customers (i.e., the program participants) and control customers is a result of participation in the program.

3.6.1 Participation and Reported Savings by Customer Segment

Table 3-28 presents the participation counts, reported energy and demand savings, and incentive payments for HERs in PY17 by customer segment for the MR waves. LI-BEEP participant results are reflected in LI-BEEP, as Section 3.7 shows.

Table 3-28: R-BEEP Participation and Reported Impacts

Parameter	Residential (Non-LI)	Total
PY17 # Participants	196,918	196,918
PYRTD MWh/yr	6,810	6,810
PYRTD MW/yr	1.70	1.70
PY17 Incentives (\$1,000)	\$0	\$0

Source: Guidehouse analysis

3.6.2 Gross Impact Evaluation

The main methodological issue for the impact evaluation is to estimate the counterfactual energy use by households participating in R-BEEP. In other words, the impact evaluation compares actual energy usage against the estimated energy that participating households would have used in the absence of the program. The program used an RCT experimental design, meaning that households were randomly allocated to the control and treatment groups. This eliminated the selection bias that complicates the evaluation of many behavioral programs. The random assignment of households to the treatment and control groups means the control group should serve as a robust baseline against which the energy use of the treatment households can be compared to estimate savings from enrollment in R-BEEP.

Guidehouse estimated program savings by adhering to the SWE's guidance described by the Framework.¹⁶ The evaluation team used a monthly lagged dependent variable (LDV) model. This model uses only post-enrollment program observations and replaces the household fixed-effect with the household's energy use in the same calendar month of the pre-program year to account for household-level variation in energy use. The model takes the form Equation 1 shows.

Equation 1: LDV Model Specification

$$kWh_{im} = \sum_{m=1}^{12} \beta_{1m} yrmo_m + \sum_{m=1}^{12} \beta_{2m} yrmo_m \cdot kWh_{im-12} + \sum_{m=1}^{12} \beta_{3m} yrmo_m \cdot treatment_{im} + \varepsilon_{im}$$

Where:

kWh_{im} is customer i 's average daily energy usage in bill m .
 β_{1m} is the coefficient on the bill year-month m .
 $yrmo_m$ is the indicator variable equal to 1 for each year-month in the analysis.

¹⁶ SWE Framework, https://www.puc.pa.gov/media/1584/swe-phaseiv_evaluation_framework071621.pdf.

β_{2m}	is the coefficient on the home-specific pre-program usage term, which is interacted with bill month.
kWh_{im-12}	is customer i 's average daily energy usage from the 12-month period prior to the program launch.
β_{3m}	is the estimated treatment effect in kilowatt-hours per day per customer. This is the main parameter of interest. Estimated separately for each month and year.
$treatment_{im}$	is the treatment indicator variable. Equal to 1 when the treatment is in effect for the treatment group and 0 otherwise.
ε_{im}	is the error term, clustered by customer.

The LDV model is the preferred model used for reporting savings. As a check on the robustness of the savings estimates, Guidehouse also ran a linear fixed-effects regression (LFER) model. Due to the experimental design of the program, the two models should generate similar results. In the LFER model, average daily consumption by participant and nonparticipant i in billing period m is denoted by kWh_{im} . This is referred to as a fixed-effects model because it includes a household-specific fixed-effects term. Equation 2 presents the equation for this model.

Equation 2: Fixed-Effects Regression Model

$$kWh_{im} = \beta_i + \sum_{m=1}^{12} \beta_{1m} yrmo_m + \sum_{m=1}^{12} \beta_{2m} yrmo_m \cdot treatment_{im} + \varepsilon_{im}$$

Where:

β_i	is the household-specific fixed-effect that implicitly captures all customer-specific effects on electricity use that do not change over time. The calculation of the fixed-effect term does not require knowledge of which characteristics at each household are unchanged.
β_{1m}	is the coefficient on the bill year-month m .
β_{2m}	is the estimated treatment effect in kilowatt-hours per day. This is the main parameter of interest. Estimated separately for each month and year.

All other variables are defined above.

An advantage of the LFER model is that the time-invariant characteristics (observed and unobserved) are excluded from the model through the household fixed-effect term. The model's drawback is that it is less precise because the household-level fixed-effect term relies exclusively on within-customer variation. The explanatory powers of time-invariant characteristics are lost because those terms are eliminated from the model. Guidehouse found the LFER model generally corroborated the savings found from the LDV model, though some differences in the magnitude of savings existed for smaller waves.¹⁷

The evaluation team deployed specific data management methodologies to prepare billing data for the regressions. These methodologies are informed by Section 6.1.4 of the Phase IV Evaluation Framework and feedback Guidehouse received from the SWE during evaluations in Phase III. Before calendarization, Guidehouse removed accounts with an inactive date prior to the PY17 evaluation period. A small number of accounts had multiple inactive dates.

¹⁷ The LDV and LFER treatment coefficient estimates differ by approximately 60% for the 2018 LI wave, on average. None of these estimates are statistically different from zero.

Guidehouse corrected for this by taking the maximum of inactive dates per account, consistent with the approach used in Phase III. Monthly billing data were calendarized by expanding the billing periods (which follow variable meter read schedules) to daily data and then collapsing them into a common calendar basis. Each month of usage data represents an aggregation of the usage data from the bills that contain data for that month. Estimated reads, which are infrequent for Duquesne Light, were handled by summing the consecutive estimated reads with the first actual read that followed and dividing that aggregated use across the number of days since the previous actual read. Participants and nonparticipants who moved out of Duquesne Light territory during PY17 were included in the regression analysis until move-out occurred and monthly billing data ceased. There is a monotonically decreasing number of participants per month for each cohort.

Guidehouse calculated participant counts following a standard approach where the last available month of billing data is calculated for each account and the household is assumed to be active for all months prior. This participant counting approach is used to obtain an average participant count across all months of the program year. A customer is considered a participant through their latest bill in PY17 so long as their account was still active.

Table 3-29 summarizes the sampling strategy for the PY17 evaluation. Both regression models use billing data from all treatment and control households enrolled in R-BEEP. The sampling strategy is a census approach where data from all households are used in the analysis.

Table 3-29: R-BEEP Gross Impact Sample Design for PY17

Stratum	Population Size	Achieved Sample Size	Evaluation Activity
R-BEEP	196,918	196,918	Regression analysis
Program Total	196,918	196,918	

Source: Guidehouse analysis

The verified ex post energy savings for R-BEEP in PY17 were 6,084 MWh, after accounting for double-counted savings with other Duquesne Light energy efficiency programs and persistence from prior years. Guidehouse calculated the peak demand savings by dividing the total energy savings for the year (in megawatt-hours) by 8,760 hours, then multiplying by the peak demand multiplier. After applying the line loss factor (LLF), this yields 1.21 MW of peak demand savings. Table 3-30 and Table 3-31 summarize ex ante R-BEEP energy and demand savings, respectively. Appendix B provides additional details.

Table 3-30: R-BEEP Gross Impact Results for Energy

Component	PYRTD MWh/yr	Energy Realization Rate	Sample C _v or Error Ratio	Relative Precision at 85% C.L.
R-BEEP	6,810	89%	-	0.0%
Program Total	6,810	89%	-	0.0%

Source: Guidehouse analysis

Table 3-31: R-BEEP Gross Impact Results for Demand

Component	PYRTD MW/yr	Demand Realization Rate	Sample C _v or Error Ratio	Relative Precision at 85% C.L.
R-BEEP	1.70	71%	-	0.0%
Program Total	1.70	71%	-	0.0%

Source: Guidehouse analysis

Energy savings per participant home were verified similar to the CSP's reported estimate. Demand savings were verified slightly lower than the CSP's reported estimate. The following factors led to variation between the reported and verified savings and to the observed realization rates:

- The CSP did not complete a detailed double-counted savings analysis. Instead, they made assumptions based on Phase III evaluations. Double-counted savings made up 17% of measured savings from the regression analysis.
- The CSP peak demand savings methodology considers only the summer months and applies a slightly different peak demand multiplier than the Guidehouse approach. Energy savings in summer months often differ considerably from average savings for the year, particularly for new waves. This contributes to differences in the reported and verified demand savings estimates.
- The CSP uses a different model specification than the preferred model described in the Framework.¹⁸ For waves with statistically insignificant savings in some months, different model specifications may deliver very different point estimates, despite the confidence bounds of both estimates overlapping. All but one of the MR waves had statistically insignificant savings in at least one month in PY17.

Based on SWE guidance, Guidehouse counts verified savings regardless of statistical significance. Confidence intervals are large relative to the magnitude of verified savings, which can result in high or low realization rates despite no statistically significant difference between the CSP's reported estimate and Guidehouse's verified estimate.

Behavioral Program and Component Absolute Precision

Guidehouse calculated the absolute precision results for the R-BEEP waves. Section 6.1.1.1 of the Phase IV Evaluation Framework requires the program-level verification for these behavioral programs to achieve an absolute precision of $\pm 0.5\%$ at the 95% confidence level (two-tailed), while individual waves may have a wider margin of error. Appendix B provides regression details, precisions, and error estimates.

Table 3-30 and Table 3-31 do not reflect the standard errors from the regression analysis. Instead, those tables reflect the uncertainty associated with the sampling (i.e., relative precision at the 85% confidence level). Guidehouse analyzed all R-BEEP data via a census approach and did not use sampling. There is no sampling uncertainty.

¹⁸ SWE Framework, https://www.puc.pa.gov/media/1584/swe-phaseiv_evaluation_framework071621.pdf.

3.6.3 Net Impact Evaluation

Per the PY17 Guidehouse Evaluation Plan, Guidehouse did not conduct a net impact evaluation for R-BEEP in PY17. Guidehouse does not plan to conduct an NTG assessment during Phase IV for this program.

Free ridership and participant spillover are incorporated in the results of the regression analysis due to the RCT design of R-BEEP. Section 2.2.2 of the SEE Action protocol states the following:

RCTs eliminate this free-rider concern during the study period because the treatment and control groups each contain the same number of free riders through the process of random assignment to the treatment or control groups. When the two groups are compared, the energy savings from the free riders in the control group cancel out the energy savings from the free riders in the treatment group, and the resulting estimate of program energy savings is an unbiased estimate of the savings caused by the program (the true program savings).

[Participant spillover], in which participants engage in additional energy efficiency actions outside of the program as a result of the program, is also automatically captured by an RCT design for energy use that is measured within a household.

However, the RCT design does not account for nonparticipant spillover. Section 2.2.2 of the SEE Action protocol continues as follows:

[Nonparticipant spillover] issues in which a program influences the energy use of non-program participants are not addressed by RCTs. In these cases in which nonparticipant spillover exists, an evaluation that relies on RCT design could underestimate the total program-influenced savings.

Free ridership and spillover are incorporated into the results of the R-BEEP regression analysis based on customer billing records. Nonparticipant spillover is not included in the regression analysis, but the industry standard approach is to assume that nonparticipant spillover is small for this type of program. It would be primarily driven by conversations participants may have with nonparticipant Duquesne Light customers, which are expected to have a relatively small impact on nonparticipant energy savings. The conservative approach used by Guidehouse assumes that nonparticipant spillover is 0% and the NTGR for R-BEEP is 100%. As a result, the net and gross savings estimates are the same for R-BEEP. There is no NTG sample for R-BEEP.

The team did not consider a sample for the net impact analysis, and net impacts equal the gross impacts. The NTGR is assumed to be 100%.

3.6.3.1 HIM Research

Guidehouse did not conduct HIM research for R-BEEP in PY17.

3.6.4 Verified Savings Estimates

In Table 3-32, the realization rates and NTGRs determined by Guidehouse are applied to the reported energy and demand savings estimates to calculate the verified savings estimates for

R-BEEP in PY17. These totals are added to the verified savings achieved in previous program years to calculate the P4TD program impacts.

Table 3-32: R-BEEP PY17 and P4TD Savings Summary

Savings Type	Energy (MWh/yr)	Demand (MW/yr)
PYRTD	6,810	1.70
PYVTD Gross	6,084	1.21
PYVTD Net	6,084	1.21
RTD	34,958	7.18
VTD Gross	33,719	5.93
VTD Net	33,719	5.93

Source: Guidehouse analysis

3.6.5 Process Evaluation

Guidehouse did not conduct process evaluation research for R-BEEP (i.e., HERs) in PY17.

3.6.6 Program Finances and Cost-Effectiveness Reporting

A detailed breakdown of program finances and cost-effectiveness is presented in Table 3-33. TRC benefits in Table 3-33 were calculated using gross verified impacts. NPV PY17 costs and benefits are expressed in 2025 dollars. NPV costs and benefits for P4TD financials are expressed in 2021 dollars.

Table 3-33: Summary of Program Finances – Gross Verified

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$ -		\$ -	
2	Rebates to Participants and Trade Allies	\$ -		\$ -	
3	Upstream/Midstream Incentives	\$ -		\$ -	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$ -		\$ -	
		EDC	CSP	EDC	CSP
7	Program Design	\$65	\$ -	\$56	\$5
8	Administration and Management	\$ -	\$9	\$165	\$139
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$91	\$798	\$141	\$2,687
11	EDC Evaluation Costs	\$19		\$79	
12	SWE Audit Costs	\$14		\$51	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$996		\$3,323	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$996		\$3,323	
15	Total NPV Lifetime Electric Energy Benefits	\$402		\$1,764	
16	Total NPV Lifetime Electric Capacity Benefits	\$221		\$918	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$ -		\$ -	
18	Total NPV Lifetime Fossil Fuel Impacts	\$ -		\$ -	
19	Total NPV Lifetime Water Impacts	\$ -		\$ -	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$623		\$2,683	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	0.63		0.81	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

Table 3-34 presents program financials and cost-effectiveness on a net savings basis. The NTGR applied in PY17 comes from the PY14 Net Impact Evaluation.

Table 3-34: Summary of Program Finances – Net Verified

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$ -		\$ -	
2	Rebates to Participants and Trade Allies	\$ -		\$ -	
3	Upstream/Midstream Incentives	\$ -		\$ -	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$ -		\$ -	
		EDC	CSP	EDC	CSP
7	Program Design	\$65	\$ -	\$56	\$5
8	Administration and Management	\$ -	\$9	\$165	\$139
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$91	\$798	\$141	\$2,687
11	EDC Evaluation Costs	\$19		\$79	
12	SWE Audit Costs	\$14		\$51	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$996		\$3,323	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$996		\$3,323	
15	Total NPV Lifetime Electric Energy Benefits	\$402		\$1,764	
16	Total NPV Lifetime Electric Capacity Benefits	\$221		\$918	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$ -		\$ -	
18	Total NPV Lifetime Fossil Fuel Impacts	\$ -		\$ -	
19	Total NPV Lifetime Water Impacts	\$ -		\$ -	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$623		\$2,683	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	0.63		0.81	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

3.6.7 Status of Recommendations

The impact evaluation activities in PY17 led to the following findings and recommendations from Guidehouse to Duquesne Light. Table 3-35 summarizes the findings with a response from Duquesne Light and their plans to address the recommendation in program delivery.

Table 3-35: Residential Behavioral Findings and Recommendations

Findings	Recommendations
Reported Savings	
Two legacy waves, the 2012 and 2015 Market Rate waves, are expected to be re-randomized in Phase V. Together, these waves account for 21% of first-year energy savings in PY17. As savings from newer waves, such as the 2025 Market Rate wave, increase and additional waves are introduced, these savings are expected to offset (or partially offset) the reduction resulting from the re-randomization of the legacy waves.	Guidehouse recommends that Oracle and Duquesne Light coordinate closely to ensure energy and demand forecasts remain up to date and account for potential variability associated with the re-randomization of key legacy waves in Phase V, which could affect Duquesne Light's ability to meet its savings targets.
Duquesne Light Response: Duquesne Light acknowledges the recommendation and will take it under advisement.	

Source: Guidehouse analysis

3.7 Low-Income Behavioral

The Low-Income Behavioral (LI-BEEP) program targets qualified LI customers, whose household is at or below 150% of federal poverty income guidelines. For LI-BEEP, verified savings attributable to the LI sector are reflected in Duquesne Light's progress toward the Phase IV LI carveout goal.

In the same manner as the MR R-BEEP, LI-BEEP influences behavior changes in customers by providing information via HERs to participants. The administration, implementation, and evaluation for LI participants is similar to their MR participant counterparts. Section 0 details the MR evaluation results.

LI-BEEP participation is defined as a customer under the LI rate class and receiving HERs during the program year. The participant count represents the average number of unique participants who received HERs across each month of PY17. Current program participation levels include 7,207 customers from the 2023 LI wave, and 13,551 customers from the 2025 LI wave (based on PY17 monthly averages).

3.7.1 Participation and Reported Savings by Customer Segment

Table 3-36 presents the participation counts, reported energy and demand savings, and incentive payments for LI-BEEP in PY17 by customer segment.

Table 3-36: LI-BEEP Participation and Reported Impacts

Parameter	Residential LI	Total
PY17 # Participants	28,350	28,350
PYRTD MWh/yr	278	278
PYRTD MW/yr	0.07	0.07
PY17 Incentives (\$1,000)	\$0	\$0

Source: Guidehouse Analysis

3.7.2 Gross Impact Evaluation

Guidehouse completed LI-BEEP activities in coordination with the R-BEEP MR program and applied the same methodologies Section 3.6 details.

The verified ex post energy savings for LI-BEEP in PY17 were 466 MWh, after accounting for double-counted savings with other Duquesne Light energy efficiency programs and persistence from prior years. Guidehouse calculated the peak demand savings by dividing the total energy savings for the year (in megawatt-hours) by 8,760 hours, then multiplying by the peak demand multiplier. After applying the LLF, this yields 0.09 MW of peak demand savings. Table 3-37 and Table 3-38 summarize ex ante LI behavioral energy efficiency and demand savings, respectively. Appendix B provides additional details.

Table 3-37: LI-BEEP Gross Impact Results for Energy

Component	PYRTD MWh/yr	Energy Realization Rate	Sample C _v or Error Ratio	Relative Precision at 85% C.L.
LI-BEEP	278	168%	-	0.0%
Program Total	278	168%	-	0.0%

Source: Guidehouse analysis

Table 3-38: LI-BEEP Gross Impact Results for Demand

Component	PYRTD MW/yr	Demand Realization Rate	Sample C _v or Error Ratio	Relative Precision at 85% C.L.
LI HER	0.07	129%	-	0.0%
Program Total	0.07	129%	-	0.0%

Source: Guidehouse analysis

Energy and demand savings per participant home were verified higher than the CSP's reported estimates. The following factors led to variation between the reported and verified savings and to the observed realization rates:

- The CSP did not complete a detailed double-counted savings analysis. Instead, they made assumptions based on Phase III evaluations. Double-counted savings made up 5% of measured savings from the regression analysis.
- The CSP peak demand savings methodology considers only the summer months and applies a slightly different peak demand multiplier than the Guidehouse approach. Energy savings in summer months often differ considerably from average savings for the year, particularly for new waves. This contributes to differences in the reported and verified demand savings estimates.
- The CSP uses a different model specification than the preferred model described in the Framework.¹⁹ For waves with statistically insignificant savings in some months, different model specifications may deliver very different point estimates, despite the confidence bounds of both estimates overlapping. Both LI waves had statistically insignificant savings in at least one month in PY17.

Based on SWE guidance, Guidehouse counts verified savings regardless of statistical significance. Confidence intervals are large relative to the magnitude of verified savings, contributing to a high realization rate despite no statistical difference between the CSP and Guidehouse estimates.

Behavioral Program and Component Absolute Precision

Guidehouse calculated the absolute precision results for the LI behavioral energy efficiency waves. Section 6.1.1.1.1 of the Phase IV Evaluation Framework requires the program-level

¹⁹ SWE Framework, https://www.puc.pa.gov/media/1584/swe-phaseiv_evaluation_framework071621.pdf.

verification for these behavioral programs to achieve an absolute precision of $\pm 0.5\%$ at the 95% confidence level (two-tailed), while individual waves may have a wider margin of error. Appendix B provides regression details, precisions, and error estimates.

Table 3-37 and Table 3-38 do not reflect errors. Instead, those tables reflect the uncertainty associated with the sampling (i.e., relative precision at the 85% confidence level). Guidehouse analyzed all LI-BEEP data via its census approach and did not use sampling. There is no sampling uncertainty to report.

3.7.3 Net Impact Evaluation

Per the PY17 Guidehouse Evaluation Plan, Guidehouse did not conduct net impact evaluation for LI-BEEP in PY17. Guidehouse does not plan to conduct NTG assessment during Phase IV for this program. Consistent with SWE's guidance, Guidehouse assumes NTGRs to be 100% for this program due to the nature of the RCT approach (see Section 0).

3.7.3.1 HIM Research

Guidehouse did not conduct HIM research for LI-BEEP in PY17.

3.7.4 Verified Savings Estimates

In Table 3-39 the realization rates and NTGRs determined by Guidehouse are applied to the reported energy and demand savings estimates to calculate the verified savings estimates for LI behavioral energy efficiency in PY17. These totals are added to the verified savings achieved in previous program years to calculate the P4TD program impacts.

Table 3-39: PY17 and P4TD Savings Summary

Savings Type	Energy (MWh/yr)	Demand (MW/yr)
PYRTD	278	0.07
PYVTD Gross	466	0.09
PYVTD Net	466	0.09
RTD	2,817	0.33
VTD Gross	3,319	0.51
VTD Net	3,319	0.51

Source: Guidehouse analysis

3.7.5 Process Evaluation

Guidehouse did not conduct process evaluation research for LI-BEEP (i.e., HERs) in PY17.

3.7.6 Program Finances and Cost-Effectiveness Reporting

A detailed breakdown of program finances and cost-effectiveness is presented in Table 3-40. TRC benefits in Table 3-40 were calculated using gross verified impacts. NPV PY17 costs and benefits are expressed in 2025 dollars. NPV costs and benefits for P4TD financials are expressed in 2021 dollars.

Table 3-40: Summary of Program Finances – Gross Verified

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$ -		\$ -	
2	Rebates to Participants and Trade Allies	\$ -		\$ -	
3	Upstream/Midstream Incentives	\$ -		\$ -	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$ -		\$ -	
		EDC	CSP	EDC	CSP
7	Program Design	\$ -	\$ -	\$1	\$1
8	Administration and Management	\$ -	\$ -	\$164	\$24
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$ -	\$ -	\$24	\$619
11	EDC Evaluation Costs	\$ -		\$14	
12	SWE Audit Costs	\$ -		\$9	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$ -		\$856	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$ -		\$856	
15	Total NPV Lifetime Electric Energy Benefits	\$31		\$168	
16	Total NPV Lifetime Electric Capacity Benefits	\$17		\$81	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$ -		\$ -	
18	Total NPV Lifetime Fossil Fuel Impacts	\$ -		\$ -	
19	Total NPV Lifetime Water Impacts	\$ -		\$ -	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$48		\$249	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	0.00		0.29	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

Table 3-41 presents program financials and cost-effectiveness on a net savings basis. Per the SWE's guidance, NTGR for LI programs will be a deemed value of 1.0 due to the assumption that there is no free ridership or spillover due to cost constraints.

Table 3-41: Summary of Program Finances – Net Verified

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$ -		\$ -	
2	Rebates to Participants and Trade Allies	\$ -		\$ -	
3	Upstream/Midstream Incentives	\$ -		\$ -	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$ -		\$ -	
		EDC	CSP	EDC	CSP
7	Program Design	\$ -	\$ -	\$1	\$1
8	Administration and Management	\$ -	\$ -	\$164	\$24
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$ -	\$ -	\$24	\$619
11	EDC Evaluation Costs	\$ -		\$14	
12	SWE Audit Costs	\$ -		\$9	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$ -		\$856	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$ -		\$856	
15	Total NPV Lifetime Electric Energy Benefits	\$31		\$168	
16	Total NPV Lifetime Electric Capacity Benefits	\$17		\$81	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$ -		\$ -	
18	Total NPV Lifetime Fossil Fuel Impacts	\$ -		\$ -	
19	Total NPV Lifetime Water Impacts	\$ -		\$ -	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$48		\$249	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	0.00		0.29	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

3.7.7 Status of Recommendations

The impact evaluation activities in PY17 led to the following findings and recommendations from Guidehouse to Duquesne Light. Table 3-42 presents a summary of the findings with a response from Duquesne Light and their plans to address the recommendation in program delivery.

Table 3-42: LI Behavioral Findings and Recommendations

Findings	Recommendations
Reported Savings	
Persistence for the Low Income HER waves accounts for 5% of net savings in PY17. First-year savings are divided between one legacy wave and one new wave, with 63% attributable to the 2023 LI wave and 37% attributable to the 2025 LI wave. Only the 2023 wave accrued persistence in PY17, as the 2025 wave was in its first year of exposure to HER messaging. Per-participant savings for the 2025 wave were relatively low in PY17 but are expected to increase in Phase V.	Guidehouse recommends that Oracle and Duquesne Light continue monitoring wave performance and ensure that energy and demand savings forecasts account for the expected ramp-up in savings from the 2025 LI wave.
Duquesne Light Response: Duquesne Light acknowledges the recommendation and will take it under advisement.	

Source: Guidehouse analysis

3.8 Small Business Direct Install

The SBDI program targets Duquesne Light C&I customers and municipalities with monthly demand less than 300 kW. The SBDI program is designed to address sector-specific barriers to small and medium C&I customers and municipalities. Barriers to program participation included limited capital resources, high cost of capital (interest rates), lack of expertise, communication barriers, and conflicting priorities. Customers in these segments are often subject to split incentives, where electric bill-paying customers are tenants but not the owners of the properties at which they conduct their businesses. Owners do not pay the electric bills, so they are not motivated to upgrade energy-using equipment to save on electric bills; electric bill-paying tenants are not motivated to upgrade properties they do not own. Participating customers will receive a no-cost energy assessment and incentives that cover up to 80% of the resulting equipment and installation costs.²⁰ A limited quantity of energy savings products may be provided at the time of assessment at no cost.

During Phase IV, this program emphasizes very small businesses (micro-businesses), such as small local bakeries or hardware stores. This program works with cities and towns through community and economic development offices, and with local chambers of commerce and business associations to encourage customers to take part in the SBDI program. Third-party contractors then survey a customer's site, obtain written approval from the customer, and install energy efficiency equipment at their site. Used equipment is properly disposed of according to all relevant state, local, and federal regulations. Duquesne Light conducts random inspections of completed sites. This program is projected to account for approximately 6% of nonresidential program savings during Phase IV.

In addition to the SBDI program, Guidehouse is reporting the common area portion of the Small Multifamily Housing Retrofit Program (SMHR) under SBDI. This program consists of cost-share measures, including lighting, ventilation, and whole-building measures, installed in the common area portions of small multifamily buildings. In PY17, 88% of these savings were reported as part of the LI carveout.

3.8.1 Participation and Reported Savings by Customer Segment

Table 3-43 presents the participation counts, reported energy and demand savings, and incentive payments for SBDI in PY17 by customer segment.

²⁰ Measures include lighting, VFDs, and a variety of refrigeration measures. A full list of measures is available at <https://www.duenergyefficiency.com/sbdi>.

Table 3-43: SBDI Participation and Reported Impacts

Parameter	LI	Small C&I*	GNI	Total
PY17 # Participants	2	1	0	3
PYRTD MWh/yr	484	63	-	547
PYRTD MW/yr	0.06	0.01	-	0.07
PY17 Incentives (\$1,000)	\$34	\$63	\$0	\$97

Source: Guidehouse analysis

3.8.2 Gross Impact Evaluation

Within the SBDI program, Guidehouse evaluates both the Multifamily Housing Retrofit Program as well as any other projects aligning under the SBDI initiative. In PY17, there are only Multifamily projects reported. Table 3-44 presents the gross impact results for energy, and Table 3-45 provides the gross impact results for demand from this PY.

Table 3-44: SBDI Gross Impact Results for Energy

Component	PYRTD MWh/yr	Energy Realization Rate	Sample C _v or Error Ratio	Relative Precision at 85% C.L.
Multifamily	547	50%	-	0%
Program Total	547	50%	-	0%

Source: Guidehouse analysis

Table 3-45: SBDI Gross Impact Results for Demand

Component	PYRTD MW/yr	Demand Realization Rate	Sample C _v or Error Ratio	Relative Precision at 85% C.L.
Multifamily	0.07	43%	-	0%
Program Total	0.07	43%	-	0%

Source: Guidehouse analysis

Of the three Small Business Direct Install projects evaluated in PY17, one project reported realization rates below the acceptable range while two projects reported realization rates above 110%. The lower realization rate was driven by revisions to baseline assumptions identified during verification, which reduced the calculated savings relative to the reported values. The two projects with realization rates above 110% were attributable to differences between the expected and verified lighting control strategies, resulting in greater verified energy and demand savings than originally estimated. Overall, the observed differences highlight the importance of documenting accurately both baseline conditions and lighting control operation when developing project savings estimates.

3.8.3 Net Impact Evaluation

Per the PY17 Guidehouse Evaluation Plan, Guidehouse did not conduct a net impact evaluation for SBDI in PY17. Table 2-4 shows the NTGR applied to SBDI projects, which was carried over from the PY14 NTG evaluation.

3.8.3.1 HIM Research

Guidehouse did not conduct HIM research for SBDI in PY17.

3.8.4 Verified Savings Estimates

In Table 3-46, the realization rates and NTGRs determined by Guidehouse are applied to the reported energy and demand savings estimates to calculate the verified savings estimates for SBDI in PY17. These totals are added to the verified savings achieved in previous program years to calculate the P4TD program impacts.

Table 3-46: SBDI PY17 and P4TD Savings Summary

Savings Type	Energy (MWh/yr)	Demand (MW/yr)
PYRTD	547	0.07
PYVTD Gross	274	0.03
PYVTD Net	255	0.03
RTD	11,759	1.96
VTD Gross	10,702	2.01
VTD Net	10,044	1.88

Source: Guidehouse analysis²¹

3.8.5 Process Evaluation

Guidehouse did not conduct process evaluation research for the SBDI program in PY17.

3.8.6 Program Finances and Cost-Effectiveness Reporting

A detailed breakdown of program finances and cost-effectiveness is presented in Table 3-47. TRC benefits in Table 3-47 were calculated using gross verified impacts. NPV PY17 costs and benefits are expressed in 2025 dollars. NPV costs and benefits for P4TD financials are expressed in 2021 dollars.

²¹ In the PY15 Annual Report, Guidehouse inadvertently removed the PY14 low-income multifamily savings, 295 MWh and 0.03 MW, from the phase to date savings. Guidehouse has fixed the error in the PY16 report.

Table 3-47: Summary of Program Finances – Gross Verified

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$544		\$3,228	
2	Rebates to Participants and Trade Allies	\$ -		\$1,492	
3	Upstream/Midstream Incentives	\$ -		\$ -	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$3,577	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$544		\$ (1,840)	
		EDC	CSP	EDC	CSP
7	Program Design	\$ -	\$ -	\$17	\$15
8	Administration and Management	\$ -	\$ -	\$68	\$336
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$ -	\$ -	\$11	\$561
11	EDC Evaluation Costs	\$ -		\$186	
12	SWE Audit Costs	\$ -		\$114	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$ -		\$1,309	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$544		\$4,537	
15	Total NPV Lifetime Electric Energy Benefits	\$95		\$4,315	
16	Total NPV Lifetime Electric Capacity Benefits	\$26		\$1,978	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$7		\$608	
18	Total NPV Lifetime Fossil Fuel Impacts	\$(6)		\$ (473)	
19	Total NPV Lifetime Water Impacts	\$ -		\$ -	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$122		\$6,428	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	0.22		1.42	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

Table 3-48 presents program financials and cost-effectiveness on a net savings basis. The NTGR applied in PY17 comes from the PY14 Net Impact Evaluation.

Table 3-48: Summary of Program Finances – Net Verified

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$506		\$3,015	
2	Rebates to Participants and Trade Allies	\$ -		\$1,405	
3	Upstream/Midstream Incentives	\$ -		\$ -	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$3,322	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$506		\$(1,712)	
		EDC	CSP	EDC	CSP
7	Program Design	\$ -	\$ -	\$17	\$15
8	Administration and Management	\$ -	\$ -	\$68	\$336
9	Marketing	\$ -	\$ -	\$-	\$ -
10	Program Delivery	\$ -	\$ -	\$11	\$561
11	EDC Evaluation Costs	\$ -		\$186	
12	SWE Audit Costs	\$ -		\$114	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$ -		\$1,309	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$506		\$4,324	
15	Total NPV Lifetime Electric Energy Benefits	\$88		\$4,043	
16	Total NPV Lifetime Electric Capacity Benefits	\$24		\$1,852	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$6		\$569	
18	Total NPV Lifetime Fossil Fuel Impacts	\$(5)		\$(442)	
19	Total NPV Lifetime Water Impacts	\$ -		\$ -	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$113		\$6,022	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	0.22		1.39	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

3.8.7 Status of Recommendations

There were no impact- or process-related findings for this program in PY17.

3.9 Small Business Solutions

The SBS program offers rebates to offset the higher cost of high efficiency equipment compared to standard efficiency equipment. Program incentives promote customer indifference to the higher cost of high efficiency equipment and increase customer adoption of high efficiency equipment. The program's primary objective is to provide C&I customers an expedited, quantifiable, and simple-to-understand incentive offering that helps them save energy and money.

The SBS program targets C&I customers having annual demand less than 300 kW, and customer engagement channels to assist customers to overcome unique, segment specific barriers to energy efficiency program participation. The program offers two core participation tracks: prescriptive and custom. The prescriptive track offers a simplified method on predefined measures without requiring complex analysis and will generally include deemed and partially deemed measures²² from the TRM. The custom track makes it possible to include more complex, site-specific measures and projects in the programs. Custom projects must be able to show specific and verifiable energy savings and costs using TRM protocols.

3.9.1 Participation and Reported Savings by Customer Segment

Table 3-49 presents the participation counts, reported energy and demand savings, and incentive payments for SBS in PY17 by customer segment.

Table 3-49: SBS Participation and Reported Impacts

Parameter	Small C&I	GNI	Total
PY17 # Participants	0	1	1
PYRTD MWh/yr	-	177	177
PYRTD MW/yr	-	0.02	0.02
PY17 Incentives (\$1,000)	\$0	\$27	\$27

Source: Guidehouse analysis

3.9.2 Gross Impact Evaluation

The Business Solutions programs (SBS/LBS) are projected to account for approximately 57% of all Duquesne Light's Phase IV savings (residential and nonresidential). To date, the SBS and LBS programs have achieved a slightly lower percentage of the portfolio savings than anticipated, due in large part to the overperformance of the midstream programs.

As with other nonresidential programs, Guidehouse is evaluating the SBS program on a specified schedule. As detailed in the evaluation plan approved by the SWE, Guidehouse combined both the PY16 and PY17 SBS populations when determining the PY17 evaluation sample and included the realization rates of the sites sampled in PY16 in determining the rolling 2-year realization rate. Because of the size of this initiative, Guidehouse is targeting an 85/15 confidence/precision level for the small and large programs individually over a 2-year period.

²² A list of measures considered prescriptive is available at <https://www.dugenergyefficiency.com/business-solutions>.

Table 3-50 presents the gross impact results for energy, and Table 3-51 presents the gross impact results for demand.

Table 3-50: SBS Gross Impact Results for Energy

Component	PYRTD MWh/yr	Energy Realization Rate	Sample C _v or Error Ratio	Relative Precision at 85% C.L.
Large	-	-	-	-
Medium	177	119%	-	0%
Small	-	-	-	-
Program Total	177	119%	-	0%

Source: Guidehouse analysis

Table 3-51: SBS Gross Impact Results for Demand

Component	PYRTD MW/yr	Demand Realization Rate	Sample C _v or Error Ratio	Relative Precision at 85% C.L.
Large	-	-	-	-
Medium	0.02	103%	-	0%
Small	-	-	-	-
Program Total	0.02	103%	-	0%

Source: Guidehouse analysis

In PY17, SBS only claimed one project, which Guidehouse sampled for evaluation. This site had realization rate above 100% for both energy and demand after the evaluation identified a post-retrofit lighting control strategy that differed from the expected condition.

3.9.3 Net Impact Evaluation

Per the PY17 Guidehouse Evaluation Plan, Guidehouse did not conduct a net impact evaluation for SBS in PY17. Table 2-4 shows the NTGR applied to SBS projects, which was carried over from the PY14 NTG evaluation.

3.9.3.1 HIM Research

Guidehouse did not conduct HIM research for SBS in PY17.

3.9.4 Verified Savings Estimates

In Table 3-52, the realization rates and NTGRs determined by Guidehouse are applied to the reported energy and demand savings estimates to calculate the verified savings estimates for

SBS in PY17. These totals are added to the verified savings achieved in previous program years to calculate the P4TD program impacts.

Table 3-52: SBS PY17 and P4TD Savings Summary

Savings Type	Energy (MWh/yr)	Demand (MW/yr)
PYRTD	177	0.02
PYVTD Gross	210	0.02
PYVTD Net	139	0.01
RTD	28,344	6.08
VTD Gross	29,856	7.13
VTD Net	20,703	5.01

Source: Guidehouse analysis²³

3.9.5 Process Evaluation

Guidehouse did not conduct process evaluation research for SBS in PY17.

3.9.6 Program Finances and Cost-Effectiveness Reporting

A detailed breakdown of program finances and cost-effectiveness is presented in Table 3-53. TRC benefits in Table 3-53 were calculated using gross verified impacts. NPV PY17 costs and benefits are expressed in 2025 dollars. NPV costs and benefits for P4TD financials are expressed in 2021 dollars.

Table 3-53: Summary of Program Finances – Gross Verified

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$72		\$4,493	
2	Rebates to Participants and Trade Allies	\$(17)		\$1,742	
3	Upstream/Midstream Incentives	\$27		\$21	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$62		\$2,730	
		EDC	CSP	EDC	CSP
7	Program Design	\$64	\$ -	\$63	\$15
8	Administration and Management	\$ -	\$40	\$176	\$612
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$38	\$(18)	\$101	\$1,735
11	EDC Evaluation Costs	\$114		\$335	
12	SWE Audit Costs	\$65		\$208	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$303		\$3,246	

²³ In the PY15 Annual Report, Guidehouse inadvertently removed the PY15 SBS LED savings, 26 MWh and 0.01 MW, from the VTD Net savings. Guidehouse has fixed the error in the PY16 report.

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$375		\$7,739	
15	Total NPV Lifetime Electric Energy Benefits	\$97		\$12,291	
16	Total NPV Lifetime Electric Capacity Benefits	\$26		\$7,102	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$15		\$1,185	
18	Total NPV Lifetime Fossil Fuel Impacts	\$ -		\$(1,555)	
19	Total NPV Lifetime Water Impacts	\$ -		\$ -	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$137		\$19,022	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	0.37		2.46	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

Table 3-54 presents program financials and cost-effectiveness on a net savings basis. The NTGR applied in PY17 comes from the PY14 Net Impact Evaluation.

Table 3-54: Summary of Program Finances – Net Verified

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$47		\$3,084	
2	Rebates to Participants and Trade Allies	\$(11)		\$1,205	
3	Upstream/Midstream Incentives	\$18		\$14	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$41		\$1,865	
		EDC	CSP	EDC	CSP
7	Program Design	\$42	\$ -	\$46	\$15
8	Administration and Management	\$ -	\$26	\$176	\$602
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$25	\$(12)	\$91	\$1,739
11	EDC Evaluation Costs	\$75		\$306	
12	SWE Audit Costs	\$43		\$192	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$200		\$3,167	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$247		\$6,251	
15	Total NPV Lifetime Electric Energy Benefits	\$64		\$8,572	
16	Total NPV Lifetime Electric Capacity Benefits	\$17		\$5,025	

Row	Cost Category*	PYTD (\$1,000)	P4TD (\$1,000)
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$10	\$823
18	Total NPV Lifetime Fossil Fuel Impacts	\$ -	\$(1,074)
19	Total NPV Lifetime Water Impacts	\$ -	\$ -
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$91	\$13,345
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	0.37	2.13

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

3.9.7 Status of Recommendations

The impact evaluation activities in PY17 led to the following findings and recommendations from Guidehouse to Duquesne Light. Table 3-55 provides a summary of findings, along with Duquesne Light's plans to address program recommendations.

Table 3-55: SBS Findings and Recommendations

Findings	Recommendations
Reported Savings	
The reviewed Small Business Solutions project had energy and demand realization rates of 154% after verification identified a post-retrofit lighting control strategy that differed from the expected condition. Because only one project was reviewed, this is a material project-level issue rather than a demonstrated program-wide trend	Guidehouse recommends that the CSP should consider documenting new or modified lighting-control sequences and confirm how switching, dimming, daylight response, or scheduled operation is represented in the savings calculation. Targeted review should be applied where the verified control strategy could shift energy or demand savings by more than 10%.
Duquesne Light Response: Duquesne Light acknowledges the recommendation and will work with the Phase V CSPs to address this issue.	

Source: Guidehouse analysis

3.10 Small Business Midstream Solutions

The Nonresidential Midstream Lighting program delivers incentives to end-use customers via C&I product distributors or manufacturers. End-use customers, property/facility managers, and installation contractors acting on behalf of C&I end-use customers purchase qualified products from a participating distributor. The program shows the impact of a midstream delivery method of energy efficient lighting using a buy-down pricing strategy. The participating distributors discount targeted product wholesale prices at the POS and in turn receive an incentive payment. The program design removes barriers to participation by providing a streamlined, simple solution for C&I customers and their contractors to receive the incented price for qualifying products with no additional effort on their part. This program is filed as two programs in Duquesne Light's Phase IV—one as a small C&I program and one as a large C&I program. However, from the perspective of the customer and distributor, there is only one program.

End-use customers installing the discounted equipment were identified by the participating distributors (based on self-reports from the buyers) to enable evaluation at the customer level. However, some of the end-use customers are not cognizant of their participation in a program and the normal level of cooperation with the evaluation's verification may be challenging. Further, customers may or may not keep track of where they have installed specific equipment that was obtained from the individual purchase selected for verification by the evaluation team. In Phase III, this has led to more difficulty in contacting and verifying midstream customers. Guidehouse addresses this issue by oversampling this program to ensure that statistical targets are met and working directly with the CSP and Duquesne Light to identify points of contact for this program.

3.10.1 Participation and Reported Savings by Customer Segment

Table 3-56 presents the participation counts, reported energy and demand savings, and incentive payments for SBMS in PY17 by customer segment. As shown below, there was no participation for SBMS in PY17.

Table 3-56: SBMS Participation and Reported Impacts

Parameter	Small C&I	GNI	Total
PY17 # Participants	0	0	0
PYRTD MWh/yr	-	-	-
PYRTD MW/yr	-	-	-
PY17 Incentives (\$1,000)	\$0	\$0	\$0

Source: Guidehouse analysis

3.10.2 Gross Impact Evaluation

Given there was no participation in PY17, SBMS was not evaluated for gross impact.

3.10.3 Net Impact Evaluation

Given there was no participation in PY17, SBMS was not evaluated for net impact.

3.10.3.1 HIM Research

Guidehouse did not conduct HIM research for SBMS or LBMS in PY17.

3.10.4 Verified Savings Estimates

Due to program design, distributors serve customers of all sizes regardless of which program customers participate.

3.10.5 Process Evaluation

Guidehouse did not conduct process evaluation research for SMBS or LBMS in PY17.

3.10.6 Program Finances and Cost-Effectiveness Reporting

A detailed breakdown of program finances and cost-effectiveness is presented in Table 3-57. TRC benefits in Table 3-57 were calculated using gross verified impacts. NPV PY17 costs and benefits are expressed in 2025 dollars. NPV costs and benefits for P4TD financials are expressed in 2021 dollars.

Table 3-57: Summary of Program Finances – Gross Verified

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$ -		\$13,654	
2	Rebates to Participants and Trade Allies	\$ -		\$1,502	
3	Upstream/Midstream Incentives	\$ -		\$6,246	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$ -		\$5,907	
		EDC	CSP	EDC	CSP
7	Program Design	\$ -	\$ -	\$12	\$9
8	Administration and Management	\$ -	\$ -	\$44	\$75
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$ -	\$ -	\$ -	\$3,855
11	EDC Evaluation Costs	\$ -		\$53	
12	SWE Audit Costs	\$ -		\$31	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$ -		\$4,079	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$ -		\$17,734	
15	Total NPV Lifetime Electric Energy Benefits	\$ -		\$24,317	
16	Total NPV Lifetime Electric Capacity Benefits	\$ -		\$13,055	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$ -		\$2,878	
18	Total NPV Lifetime Fossil Fuel Impacts	\$ -		\$(3,720)	

Row	Cost Category*	PYTD (\$1,000)	P4TD (\$1,000)
19	Total NPV Lifetime Water Impacts	\$ -	\$ -
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$ -	\$36,530
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	0.00	2.06

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

Table 3-58 presents program financials and cost-effectiveness on a net savings basis. The NTGR applied in PY17 comes from the PY14 Net Impact Evaluation.

Table 3-58: Summary of Program Finances – Net Verified

Row	Cost Category*	PYTD (\$1,000)	P4TD (\$1,000)
1	Incremental Measure Costs (IMCs)	\$ -	\$9,363
2	Rebates to Participants and Trade Allies	\$ -	\$1,081
3	Upstream/Midstream Incentives	\$ -	\$4,240
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -	\$ -
5	Direct Installation Program Materials and Labor	\$ -	\$ -
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$ -	\$4,042
		EDC	CSP
7	Program Design	\$ -	\$ -
8	Administration and Management	\$ -	\$ -
9	Marketing	\$ -	\$ -
10	Program Delivery	\$ -	\$ -
11	EDC Evaluation Costs	\$ -	\$53
12	SWE Audit Costs	\$ -	\$31
13	Program Overhead Costs (Sum of rows 7 through 12)	\$ -	\$4,079
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$ -	\$13,443
15	Total NPV Lifetime Electric Energy Benefits	\$ -	\$16,674
16	Total NPV Lifetime Electric Capacity Benefits	\$ -	\$8,968
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$ -	\$1,979
18	Total NPV Lifetime Fossil Fuel Impacts	\$ -	\$(2,547)
19	Total NPV Lifetime Water Impacts	\$ -	\$ -
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$ -	\$25,074
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	0.00	1.87

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

3.10.7 Status of Recommendations

There were no impact- or process-related findings for this program in PY17.

3.11 Small Business Virtual Commissioning

The VCx programs use a turnkey approach that targets system-based no- to low-cost operational savings for commercial customers and public facilities. These 100% pay-for-performance programs do not fit a traditional model that uses trade allies, mass marketing, or standardized prescriptive retrofits; rather, they provide a targeted, data-driven approach to energy efficiency engagement that effectively eliminates the need for enrollment forms, incentives, or administrative costs. This program is filed as two programs in Duquesne Light's Phase IV plan—one as a small C&I program and one as a large C&I program. However, for the customer and implementer there is only one program.

The SBVCx program targets customers having annual maximum demand less than 300kW. The CSP for this program is Franklin Energy, which subcontracts to a VCx specialist, Power TakeOff. The program used advanced metering infrastructure (AMI) data analytics to identify and qualify customers with significant potential for energy savings. The identification process uses data modeling techniques to selectively pinpoint individual meters with significant potential for operational energy savings. Customers are then contacted by the CSP to help them understand their energy usage and provide them with personalized recommendations for low- to no-cost energy savings opportunities. Facilities that are confirmed to have implemented changes based on their recommendations are continuously monitored after participation to ensure savings persistence, and if a pre-determined level of savings drift is detected, the customer is re-engaged.

3.11.1 Participation and Reported Savings by Customer Segment

Table 3-59 presents the participation counts, reported energy and demand savings, and incentive payments for SBVCx in PY17 by customer segment.

Table 3-59: SBVCx Participation and Reported Impacts

Parameter	Small C&I	GNI	Total
PY17 # Participants	0	1	1
PYRTD MWh/yr	-	59	59
PYRTD MW/yr	-	0.04	0.04
PY17 Incentives (\$1,000)	\$0	\$10	\$10

Source: Guidehouse analysis

3.11.2 Gross Impact Evaluation

Consistent with the updated evaluation plan, as approved by the SWE, Guidehouse conducted a full impact evaluation of PY17 SBVCx projects. SBVCx reported savings for one project in PY17. Table 3-60 and Table 3-61 show the realized verified energy and demand savings, respectively, for the program.

Table 3-60: SBVCx Gross Impact Results for Energy

Component	PYRTD MWh/yr	Energy Realization Rate	Sample C _v or Error Ratio	Relative Precision at 85% C.L.
VCx – Small	59	80%	-	0%
Program Total	59	80%	-	0%

Source: Guidehouse analysis

Table 3-61: SBVCx Gross Impact Results for Demand

Component	PYRTD MW/yr	Demand Realization Rate	Sample C _v or Error Ratio	Relative Precision at 85% C.L.
VCx – Small	0.04	34%	-	0%
Program Total	0.04	34%	-	0%

Source: Guidehouse analysis

3.11.3 Net Impact Evaluation

Per the PY17 Guidehouse Evaluation Plan, Guidehouse did not conduct a net impact evaluation for SBVCx or LBVCx in PY17. Table 2-4 shows the NTGR applied to SBVCx and LBVCx projects, which was carried over from the PY15 NTG evaluation.

3.11.3.1 HIM Research

Guidehouse did not conduct HIM research for SBVCx or LBVCx in PY17.

3.11.4 Verified Savings Estimates

In Table 3-62, the realization rates determined by Guidehouse are applied to the reported energy and demand savings estimates to calculate the verified savings estimates for SBVCx in PY17.

Table 3-62: SBVCx PY17 and P4TD Savings Summary

Savings Type	Energy (MWh/yr)	Demand (MW/yr)
PYRTD	59	0.04
PYVTD Gross	47	0.01
PYVTD Net	44	0.01
RTD	2,919	0.53
VTD Gross	2,851	0.55
VTD Net	2,701	0.52

Source: Guidehouse analysis

3.11.5 Process Evaluation

Guidehouse did not conduct process evaluation research for SBVCx or LBVCx in PY17.

3.11.6 Program Finances and Cost-Effectiveness Reporting

A detailed breakdown of program finances and cost-effectiveness is presented in Table 3-63. TRC benefits in PY17 were calculated using gross verified impacts. NPV PY16 costs and benefits are expressed in 2025 dollars. NPV costs and benefits for P4TD financials are expressed in 2021 dollars.

Table 3-63: Summary of Program Finances – Gross Verified

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$ -		\$ -	
2	Rebates to Participants and Trade Allies	\$ -		\$279	
3	Upstream/Midstream Incentives	\$7		\$5	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$(7)		\$(284)	
		EDC	CSP	EDC	CSP
7	Program Design	\$ -	\$ -	\$1	\$4
8	Administration and Management	\$ -	\$ -	\$67	\$55
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$ -	\$2	\$11	\$104
11	EDC Evaluation Costs	\$ -		\$30	
12	SWE Audit Costs	\$ -		\$15	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$2		\$288	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$2		\$288	
15	Total NPV Lifetime Electric Energy Benefits	\$11		\$1,125	
16	Total NPV Lifetime Electric Capacity Benefits	\$8		\$527	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$ -		\$ -	
18	Total NPV Lifetime Fossil Fuel Impacts	\$ -		\$ -	
19	Total NPV Lifetime Water Impacts	\$ -		\$ -	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$19		\$1,652	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	9.50		5.74	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

Table 3-64 presents program financials and cost-effectiveness on a net savings basis. The NTGR applied in PY17 comes from the PY15 Net Impact Evaluation.

Table 3-64: Summary of Program Finances – Net Verified

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$ -		\$ -	
2	Rebates to Participants and Trade Allies	\$ -		\$267	
3	Upstream/Midstream Incentives	\$7		\$5	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$(7)		\$(272)	
		EDC	CSP	EDC	CSP
7	Program Design	\$ -	\$ -	\$1	\$4
8	Administration and Management	\$ -	\$ -	\$67	\$55
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$ -	\$2	\$11	\$104
11	EDC Evaluation Costs	\$ -		\$30	
12	SWE Audit Costs	\$ -		\$15	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$2		\$288	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$2		\$288	
15	Total NPV Lifetime Electric Energy Benefits	\$11		\$1,067	
16	Total NPV Lifetime Electric Capacity Benefits	\$7		\$501	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$ -		\$ -	
18	Total NPV Lifetime Fossil Fuel Impacts	\$ -		\$ -	
19	Total NPV Lifetime Water Impacts	\$ -		\$ -	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$18		\$1,568	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	9.50		5.45	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

3.11.7 Status of Recommendations

There were no impact- or process-related findings for this program in PY17.

3.12 Large Business Solutions

The LBS program offers rebates to offset the higher cost of high efficiency equipment compared to standard efficiency equipment. Program incentives promote customer indifference to the higher cost of high efficiency equipment and increase customer adoption of high efficiency equipment. The programs' primary objective is to provide C&I customers an expedited, quantifiable, and simple-to-understand incentive offering that helps them save energy and money. This program is filed as two programs in Duquesne Light's Phase IV—one as a small C&I program and one as a large C&I program. However, from the perspective of the customer, there is only one program.

The LBS program targets C&I customers having annual demand savings greater than or equal to 300 kW. The LBS program will employ targeted customer engagement channels to assist customers to overcome unique, segment specific barriers to energy efficiency program participation. The program offers two core participation tracks: prescriptive and custom. The prescriptive track offers a simplified method on predefined measures without requiring complex analysis and will generally include deemed and partially deemed measures²⁴ from the TRM. The custom track makes it possible to include more complex, site-specific measures and projects in the programs. Custom projects must be able to show specific and verifiable energy savings and costs using TRM protocols.

3.12.1 Participation and Reported Savings by Customer Segment

Table 3-65 and Table 3-66 present the participation counts, reported energy and demand savings, and incentive payments for LBS Commercial and LBS Industrial, respectively, in PY17 by customer segment.

Table 3-65: LBS Participation and Reported Impacts (Commercial)

Parameter	Large C&I*	GNI	Total
PY17 # Participants	34	40	74
PYRTD MWh/yr	8,666	21,977	30,643
PYRTD MW/yr	1.70	4.03	5.74
PY17 Incentives (\$1,000)	\$999	\$2,463	\$3,462

*LBS has a Multifamily component associated with it, which a percentage of savings can be claimed under Residential LI. In PY17, this component reported 0 MWh/yr of LI savings.

Source: Guidehouse analysis

²⁴ A list of measures considered prescriptive is available at <https://www.dugenergyefficiency.com/business-solutions>.

Table 3-66: LBS Participation and Reported Impacts (Industrial)

Parameter	Large C&I	GNI	Total
PY17 # Participants	13	0	13
PYRTD MWh/yr	4,748	-	4,748
PYRTD MW/yr	0.86	-	0.86
PY17 Incentives (\$1,000)	\$316	\$0	\$316

SSource: Guidehouse analysis

3.12.2 Gross Impact Evaluation

In alignment with the SBS program, the LBS program is also evaluated on a rolling-basis, combining multiple years to determine program realization rates. Per the Phase IV evaluation plan, Guidehouse combined both the PY16 and PY17 LBS populations when determining the PY17 evaluation sample. To calculate realization rates, the realization rates of the sites sampled in PY16 and PY17 were then used to determine the rolling 2-year realization rate.

Because of the size of this initiative, the evaluation team is targeting an 85/15 confidence/precision level for the small and large programs individually over the 2-year periods. Table 3-67 presents the gross impact results for energy, and Table 3-68 presents the gross impact results for demand.

Table 3-67: LBS Gross Impact Results for Energy

Component	PYRTD MWh/yr	Energy Realization Rate	Sample C _v or Error Ratio	Relative Precision at 85% C.L.
Commercial - Certainty	2,578	111%	-	0%
Commercial - Large	14,659	96%	0.07	4%
Commercial - Medium	11,392	93%	0.15	8%
Commercial - Small	2,013	97%	0.14	11%
Industrial - Large	2,797	107%	0.14	18%
Industrial - Medium	1,821	93%	0.14	8%
Industrial - Small	130	97%	0.14	11%
Program Total*	35,390	97%	0.05	3%

* Values may not add up to Program Total due to rounding

Source: Guidehouse analysis

Table 3-68: LBS Gross Impact Results for Demand

Component	PYRTD MW/yr	Demand Realization Rate	Sample C _v or Error Ratio	Relative Precision at 85% C.L.
Commercial - Certainty	0.37	129%	-	0%
Commercial - Large	2.51	111%	0.24	14%
Commercial - Medium	2.47	102%	0.13	7%
Commercial - Small	0.39	100%	0.28	22%
Industrial - Large	0.52	90%	0.15	20%
Industrial - Medium	0.32	102%	0.13	7%
Industrial - Small	0.03	100%	0.27	22%
Program Total*	6.60	106%	0.11	6%

* Values may not add up to Program Total due to rounding

Source: Guidehouse analysis

The majority of Large Business Solutions projects evaluated in PY17 achieved realization rates within 10% of claimed savings, indicating that savings were generally reported accurately for the program. Several projects fell outside the acceptable realization rate range due to differences between ex ante assumptions and verified conditions. Projects with realization rates below 90% were primarily driven by changes in installed equipment quantities, equipment operating status, and lighting control strategies that reduced verified savings relative to reported values. In several cases, adjustments to coincidence factors based on verified control sequences and facility operation also reduced demand savings.

Projects with realization rates above 110% were primarily attributable to differences between expected and verified lighting control strategies and demand-period operation. These adjustments increased verified savings relative to reported values and resulted in demand realization rates both below and above the acceptable range. Overall, variations in controls, installed conditions, and operating assumptions were the primary drivers of differences between claimed and verified savings in PY17.

3.12.3 Net Impact Evaluation

Per the PY17 Guidehouse Evaluation Plan, Guidehouse did not conduct a net impact evaluation for LBS in PY17. Table 2-4 shows the NTGR applied to LBS projects, which was carried over from the PY16 NTG evaluation.

3.12.3.1 HIM Research

Guidehouse did not conduct HIM research for LBS in PY17.

3.12.4 Verified Savings Estimates

In Table 3-69 and Table 3-70, the realization rates and NTGRs determined by Guidehouse are applied to the reported energy and demand savings estimates to calculate the verified savings estimates for LBS Commercial and LBS Industrial, respectively, in PY17. These totals are added to the verified savings achieved in previous program years to calculate the P4TD program impacts.

Table 3-69: LBS (Commercial) PY17 and P4TD Savings Summary

Savings Type	Energy (MWh/yr)	Demand (MW/yr)
PYRTD	30,643	5.74
PYVTD Gross	29,534	6.15
PYVTD Net	26,538	5.53
RTD	81,138	16.04
VTD Gross	80,177	16.68
VTD Net	61,984	13.04

Source: Guidehouse analysis²⁵

Table 3-70: LBS (Industrial) PY17 and P4TD Savings Summary

Savings Type	Energy (MWh/yr)	Demand (MW/yr)
PYRTD	4,748	0.86
PYVTD Gross	4,828	0.81
PYVTD Net	4,338	0.73
RTD	34,086	3.97
VTD Gross	34,583	3.94
VTD Net	18,687	2.27

Source: Guidehouse analysis

3.12.5 Process Evaluation

Guidehouse did not conduct process evaluation research for LBS in PY17.

3.12.6 Program Finances and Cost-Effectiveness Reporting

A detailed breakdown of program finances and cost-effectiveness is presented in Table 3-71 and Table 3-72 for LBS Commercial and LBS Industrial, respectively. TRC benefits in Table 3-71 and Table 3-72 were calculated using gross verified impacts. NPV PY17 costs and benefits are expressed in 2025 dollars. NPV costs and benefits for P4TD financials are expressed in 2021 dollars.

Table 3-71: Summary of Program Finances – Gross Verified (LBS Commercial)

Row	Cost Category*	PYTD (\$1,000)	P4TD (\$1,000)
1	Incremental Measure Costs (IMCs)	\$8,106	\$16,744

²⁵ In the PY15 Annual Report, Guidehouse inadvertently removed the PY15 low-income multifamily savings from the PYVTD Net savings, 95 MWh and 0.01 MW. Guidehouse has fixed the error in the PY16 report.

2	Rebates to Participants and Trade Allies	\$2,010		\$5,275	
3	Upstream/Midstream Incentives	\$998		\$764	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$5,098		\$10,705	
		EDC	CSP	EDC	CSP
7	Program Design	\$48	\$182	\$82	\$157
8	Administration and Management	\$ -	\$81	\$153	\$845
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$21	\$1,304	\$64	\$4,564
11	EDC Evaluation Costs	\$145		\$483	
12	SWE Audit Costs	\$130		\$333	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$1,911		\$6,682	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$10,017		\$23,426	
15	Total NPV Lifetime Electric Energy Benefits	\$12,433		\$29,863	
16	Total NPV Lifetime Electric Capacity Benefits	\$5,904		\$14,642	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$754		\$2,145	
18	Total NPV Lifetime Fossil Fuel Impacts	\$(1,433)		\$(3,288)	
19	Total NPV Lifetime Water Impacts	\$ -		\$ -	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$17,657		\$43,363	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	1.76		1.85	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

Table 3-72: Summary of Program Finances – Gross Verified (LBS Industrial)

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$530		\$4,538	
2	Rebates to Participants and Trade Allies	\$258		\$1,852	
3	Upstream/Midstream Incentives	\$5		\$4	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$267		\$2,683	
		EDC	CSP	EDC	CSP
7	Program Design	\$48	\$182	\$52	\$153
8	Administration and Management	\$ -	\$34	\$152	\$371
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$21	\$212	\$64	\$2,138
11	EDC Evaluation Costs	\$63		\$214	
12	SWE Audit Costs	\$54		\$147	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$614		\$3,291	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$1,144		\$7,829	
15	Total NPV Lifetime Electric Energy Benefits	\$2,236		\$13,159	
16	Total NPV Lifetime Electric Capacity Benefits	\$861		\$3,604	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$88		\$213	
18	Total NPV Lifetime Fossil Fuel Impacts	\$(355)		\$(1,088)	
19	Total NPV Lifetime Water Impacts	\$ -		\$ -	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$2,831		\$15,888	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	2.47		2.03	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

Table 3-73 and Table 3-74 present program financials and cost-effectiveness on a net savings basis for LBS Commercial and LBS Industrial, respectively. Guidehouse applied NTGR from our PY16 Net Impact Evaluation.

Table 3-73: Summary of Program Finances – Net Verified (LBS Commercial)

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$7,284		\$12,954	
2	Rebates to Participants and Trade Allies	\$1,806		\$4,025	
3	Upstream/Midstream Incentives	\$897		\$687	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$4,581		\$8,243	
		EDC	CSP	EDC	CSP
7	Program Design	\$43	\$164	\$78	\$143
8	Administration and Management	\$ -	\$73	\$153	\$839
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$19	\$1,172	\$62	\$4,463
11	EDC Evaluation Costs	\$130		\$472	
12	SWE Audit Costs	\$117		\$323	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$1,717		\$6,533	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$9,001		\$19,487	
15	Total NPV Lifetime Electric Energy Benefits	\$11,171		\$22,757	
16	Total NPV Lifetime Electric Capacity Benefits	\$5,305		\$11,235	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$677		\$1,629	
18	Total NPV Lifetime Fossil Fuel Impacts	\$(1288)		\$(2,526)	
19	Total NPV Lifetime Water Impacts	\$ -		\$ -	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$15,866		\$33,095	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	1.76		1.70	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

Table 3-74: Summary of Program Finances – Net Verified (LBS Industrial)

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$477		\$2,268	
2	Rebates to Participants and Trade Allies	\$232		\$960	
3	Upstream/Midstream Incentives	\$4		\$3	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$240		\$1,304	
		EDC	CSP	EDC	CSP
7	Program Design	\$43	\$164	\$48	\$139
8	Administration and Management	\$ -	\$31	\$152	\$368
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$19	\$190	\$62	\$2,122
11	EDC Evaluation Costs	\$57		\$209	
12	SWE Audit Costs	\$49		\$143	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$552		\$3,243	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$1,028		\$5,511	
15	Total NPV Lifetime Electric Energy Benefits	\$2,009		\$7,086	
16	Total NPV Lifetime Electric Capacity Benefits	\$774		\$2,045	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$79		\$138	
18	Total NPV Lifetime Fossil Fuel Impacts	\$(319)		\$(652)	
19	Total NPV Lifetime Water Impacts	\$ -		\$ -	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$2,544		\$8,617	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	2.47		1.56	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

3.12.7 Status of Recommendations

The impact and process evaluation activities in PY17 led to the following findings and recommendations from Guidehouse to Duquesne Light. Table 3-75 provides a summary of findings, along with Duquesne Light’s plans to address the recommendation in program delivery.

Table 3-75: LBS Findings and Recommendations

Findings	Recommendations
Reported Savings	
Differences in expected and verified lighting controls and coincidence factors produced several PY17 demand realization rates outside the 90% to 110% range, including 71%, 72%, 76%, and 332%. The direction of the adjustment depended on whether the original calculation overstated or understated measure operation during the peak demand period.	Guidehouse recommends that the CSP verify pre- and post-retrofit control types and confirm that coincidence factors are consistent with the verified control sequence and peak-period operation. Projects with exterior lighting, scheduled controls, daylight-responsive controls, or a calculated coincidence factor of zero should receive targeted review before savings are finalized.
Duquesne Light Response: Duquesne Light acknowledges the recommendation and will work with the Phase V CSPs to address this issue.	
Reported Savings	
Differences in final installed quantities and equipment operating status contributed to realization rates below 90%. PY17 examples included energy and demand realization rates of 86% and 84% where redundant equipment was removed from savings, and a demand realization rate of 71% where reported lighting had not been installed.	Guidehouse recommends that the CSP reconcile final equipment and fixture quantities and operating status to the savings calculation before project closeout. Uninstalled, stored, redundant, substituted, or non-operating equipment should be identified in closeout documentation and appropriately excluded or adjusted in reported savings.
Duquesne Light Response: Duquesne Light acknowledges the recommendation and will work with the Phase V CSPs to address this issue.	

Source: Guidehouse analysis

3.13 Large Business Midstream Solutions

The LBMS program delivers incentives to end-use customers via C&I product distributors or manufacturers. End-use customers, property/facility managers, and installation contractors acting on behalf of C&I end-use customers purchase qualified products from a participating distributor. The participating distributors discount targeted product wholesale prices at the POS and in turn receive an incentive payment. The program design removes barriers to participation by providing a streamlined, simple solution for C&I customers and their contractors to receive the incented price for qualifying products with no additional effort on their part. This program is filed as two programs in Duquesne Light's Phase IV—one as a small C&I program and one as a large C&I program. However, from the perspective of the customer and distributor, there is only one program.

End-use customers installing the discounted equipment are identified by the participating distributors (based on self-reports from the buyers) to enable evaluation at the customer level. However, some of the end-use customers may not be cognizant of their participation in a program and the normal level of cooperation with the evaluation's verification may be challenging. Further, customers may or may not keep track of where they have installed specific equipment that was obtained from the individual purchase selected for verification by the evaluation team. In the past, this has led to more difficulty in contacting and verifying midstream customers. Guidehouse has addressed this issue by oversampling this program to ensure that statistical targets are met and working directly with the CSP and Duquesne Light to identify points of contact for this program.

3.13.1 Participation and Reported Savings by Customer Segment

Table 3-76 and Table 3-77 present the participation counts, reported energy and demand savings, and incentive payments for LBMS Commercial and LBMS Industrial, respectively, in PY17 by customer segment.

Table 3-76: LBMS Participation and Reported Impacts (Commercial)

Parameter	Large C&I	GNI	Total
PY17 # Participants	56	61	117
PYRTD MWh/yr	1,429	2,359	3,788
PYRTD MW/yr	0.33	0.42	0.75
PY17 Incentives (\$1,000)	\$208	\$512	\$721

*Large C&I are the total savings associated with their respective sectors, including projects that fall under GNI. GNI values have been provided for informational purposes only and are presented as ex ante savings (PYRTD).

Source: Guidehouse analysis

Table 3-77: LBMS Participation and Reported Impacts (Industrial)

Parameter	Large C&I	GNI	Total
PY17 # Participants	7	0	7
PYRTD MWh/yr	162	-	162
PYRTD MW/yr	0.04	-	0.04
PY17 Incentives (\$1,000)	\$25	\$0	\$25

*Large C&I are the total savings associated with their respective sectors, including projects that fall under GNI. GNI values have been provided for informational purposes only and are presented as ex ante savings (PYRTD).

Source: Guidehouse analysis

3.13.2 Gross Impact Evaluation

Consistent with the updated evaluation plan, as approved by the SWE, Guidehouse did not conduct an evaluation of LBMS in PY17. Guidehouse assigned each project to various strata based on that project's energy savings. The large stratum includes projects in the upper portion of the Midstream program component's energy savings; the medium stratum includes projects in the middle portion of the Midstream energy savings; and the small stratum represents the bottom portion of the Midstream energy savings.

Table 3-78 presents the gross impact results for energy, and Table 3-79 presents the gross impact results for demand. Although C&I LBMS savings are reported separately, they were evaluated as one initiative, with realization rates calculated at the stratum level (Large, Medium, and Small) but not separated between C&I.

Table 3-78: LBMS Gross Impact Results for Energy

Component	PYRTD MWh/yr	Energy Realization Rate	Sample C _v or Error Ratio	Relative Precision at 85% C.L.
LBMS – Large (Commercial)	1,321	155%	0.09	12%
LBMS – Medium (Commercial)	1,731	159%	0.40	39%
LBMS – Small (Commercial)	736	310%	0.21	42%
LBMS – Large (Industrial)	-	-	-	-
LBMS – Medium (Industrial)	135	159%	0.40	39%
LBMS – Small (Industrial)	28	135%	-	-
Program Total*	3,950	186%	0.17	20%

*Program Total includes both SBMS and LBMS, as they are evaluated as a single initiative.

Source: Guidehouse analysis

Table 3-79: LBMS Gross Impact Results for Demand

Component	PYRTD MW/yr	Demand Realization Rate	Sample C _v or Error Ratio	Relative Precision at 85% C.L.
LBMS – Large (Commercial)	0.26	203%	0.11	16%
LBMS – Medium (Commercial)	0.34	147%	0.81	78%
LBMS – Small (Commercial)	0.15	271%	0.26	53%
LBMS – Large (Industrial)	-	-	-	-
LBMS – Medium (Industrial)	0.03	147%	0.81	78%
LBMS – Small (Industrial)	0.01	111%	-	-
Program Total*	0.79	188%	0.29	31%

*Program Total includes both SBMS and LBMS, as they are evaluated as a single initiative.

Source: Guidehouse analysis

3.13.3 Net Impact Evaluation

Per the PY17 Guidehouse Evaluation Plan, Guidehouse did not conduct a net impact evaluation for SBMS or LBMS in PY17. Table 2-4 shows the NTGR applied to SBMS and LBMS projects, which was carried over from the PY15 NTG evaluation.

3.13.3.1 HIM Research

Guidehouse did not conduct HIM research for SBMS or LBMS in PY17.

3.13.4 Verified Savings Estimates

Due to program design, distributors serve customers of all sizes regardless of which program customers participate. Therefore, Guidehouse applied realization rates and NTGRs to the energy and demand savings for both Large and Small Midstream Solutions to calculate verified savings estimates. Table 3-80 presents the verified savings estimates for LBMS in PY17. These totals are added to the verified savings achieved in previous program years to calculate the P4TD program impacts.

Table 3-80: LBMS PY17 and P4TD Savings Summary

Savings Type	Energy (MWh/yr)	Demand (MW/yr)
PYRTD	3,950	0.79
PYVTD Gross	7,334	1.48
PYVTD Net	6,454	1.30
RTD	43,162	9.12
VTD Gross	59,409	11.76
VTD Net	46,367	9.30

**Savings include both SBMS and LBMS, as they are evaluated as a single initiative.*

Source: Guidehouse analysis

3.13.5 Process Evaluation

Guidehouse did not conduct process evaluation research for SMBS or LBMS in PY17.

3.13.6 Program Finances and Cost-Effectiveness Reporting

A detailed breakdown of program finances and cost-effectiveness is presented in Table 3-81 and Table 3-82 for LBMS Commercial and LBMS Industrial, respectively. TRC benefits in Table 3-81 and Table 3-82 were calculated using gross verified impacts. NPV PY17 costs and benefits are expressed in 2025 dollars. NPV costs and benefits for P4TD financials are expressed in 2021 dollars.

Table 3-81: Summary of Program Finances – Gross Verified (LBMS Commercial)

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$1,404		\$5,007	
2	Rebates to Participants and Trade Allies	\$57		\$1,202	
3	Upstream/Midstream Incentives	\$663		\$1,716	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$684		\$2,089	
		EDC	CSP	EDC	CSP
7	Program Design	\$ -	\$ -	\$7	\$12
8	Administration and Management	\$21	\$ -	\$85	\$204
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$21	\$246	\$28	\$1,777
11	EDC Evaluation Costs	\$13		\$124	
12	SWE Audit Costs	\$25		\$88	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$326		\$2,325	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$1,730		\$7,332	
15	Total NPV Lifetime Electric Energy Benefits	\$3,437		\$15,298	
16	Total NPV Lifetime Electric Capacity Benefits	\$1,597		\$7,262	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$468		\$1,976	
18	Total NPV Lifetime Fossil Fuel Impacts	\$(470)		\$(1,910)	
19	Total NPV Lifetime Water Impacts	\$ -		\$ -	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$5,031		\$22,626	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	2.91		3.09	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

Table 3-82: Summary of Program Finances – Gross Verified (LBMS Industrial)

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$42		\$2,465	
2	Rebates to Participants and Trade Allies	\$ -		\$438	
3	Upstream/Midstream Incentives	\$25		\$1,429	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$17		\$598	
		EDC	CSP	EDC	CSP
7	Program Design	\$ -	\$ -	\$3	\$5
8	Administration and Management	\$ -	\$6	\$67	\$88
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$21	\$8	\$28	\$1,148
11	EDC Evaluation Costs	\$5		\$51	
12	SWE Audit Costs	\$11		\$37	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$51		\$1,426	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$93		\$3,892	
15	Total NPV Lifetime Electric Energy Benefits	\$154		\$8,928	
16	Total NPV Lifetime Electric Capacity Benefits	\$86		\$4,126	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$16		\$421	
18	Total NPV Lifetime Fossil Fuel Impacts	\$(26)		\$(1,536)	
19	Total NPV Lifetime Water Impacts	\$ -		\$ -	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$229		\$11,939	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	2.46		3.07	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

Table 3-83 and Table 3-84 present program financials and cost-effectiveness on a net savings basis for LBMS Commercial and LBMS Industrial, respectively. The NTGR applied in PY17 comes from the PY15 Net Impact Evaluation.

Table 3-83: Summary of Program Finances – Net Verified (LBMS Commercial)

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$1,236		\$4,016	
2	Rebates to Participants and Trade Allies	\$50		\$988	
3	Upstream/Midstream Incentives	\$583		\$1,334	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$602		\$1,694	
		EDC	CSP	EDC	CSP
7	Program Design	\$ -	\$ -	\$7	\$12
8	Administration and Management	\$18	\$ -	\$83	\$204
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$18	\$216	\$26	\$1,754
11	EDC Evaluation Costs	\$11		\$123	
12	SWE Audit Costs	\$22		\$86	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$287		\$2,295	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$1,522		\$6,311	
15	Total NPV Lifetime Electric Energy Benefits	\$3,024		\$12,500	
16	Total NPV Lifetime Electric Capacity Benefits	\$1,405		\$5,981	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$412		\$1,610	
18	Total NPV Lifetime Fossil Fuel Impacts	\$(414)		\$(1,555)	
19	Total NPV Lifetime Water Impacts	\$ -		\$ -	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$4,427		\$18,536	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	2.91		2.94	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

Table 3-84: Summary of Program Finances – Net Verified (LBMS Industrial)

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$37		\$1,737	
2	Rebates to Participants and Trade Allies	\$ -		\$326	
3	Upstream/Midstream Incentives	\$22		\$971	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$15		\$440	
		EDC	CSP	EDC	CSP
7	Program Design	\$ -	\$ -	\$3	\$5
8	Administration and Management	\$ -	\$5	\$67	\$87
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$18	\$7	\$26	\$1,147
11	EDC Evaluation Costs	\$4		\$51	
12	SWE Audit Costs	\$10		\$36	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$45		\$1,422	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$82		\$3,159	
15	Total NPV Lifetime Electric Energy Benefits	\$135		\$6,296	
16	Total NPV Lifetime Electric Capacity Benefits	\$75		\$2,946	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$14		\$304	
18	Total NPV Lifetime Fossil Fuel Impacts	\$(23)		\$(1,082)	
19	Total NPV Lifetime Water Impacts	\$ -		\$ -	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$202		\$8,464	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	2.46		2.68	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

3.13.7 Status of Recommendations

There were no impact- or process-related findings for this program in PY17.

3.14 Large Business Virtual Commissioning

The VCx programs use a turnkey approach that targets system-based no- to low-cost operational savings for commercial customers and public facilities. These 100% pay-for-performance programs do not fit a traditional model that uses trade allies, mass marketing, or standardized prescriptive retrofits; rather, they provide a targeted, data-driven approach to energy efficiency engagement that effectively eliminates the need for enrollment forms, incentives, or administrative costs. This program is filed as two programs in Duquesne Light's Phase IV plan—one as a small C&I program and one as a large C&I program. However, from the perspective of the customer and implementer, there will be only one program.

The LBVCx program targets customers having annual maximum demand equal to or greater than 300 kW. As with the SBVCx program, the CSP is Franklin Energy, which subcontracts to a VCx specialist, Power TakeOff. The programs use AMI data analytics to identify and qualify customers with significant potential for energy savings. The identification process uses data modeling techniques to selectively pinpoint individual meters with significant potential for operational energy savings. Customers are then contacted by the CSP to help them understand their energy usage and provide them with personalized recommendations for low- to no-cost energy savings opportunities. Facilities that are confirmed to have implemented changes based on their recommendations are continuously monitored after participation to ensure savings persistence, and if a pre-determined level of savings drift is detected, the customer is re-engaged.

3.14.1 Participation and Reported Savings by Customer Segment

Table 3-85 presents the participation counts, reported energy and demand savings, and incentive payments for LBVCx in PY17 by customer segment.

Table 3-85: LBVCx Participation and Reported Impacts

Parameter	Large C&I	GNI	Total
PY17 # Participants	0	1	1
PYRTD MWh/yr	-	59	59
PYRTD MW/yr	-	0.04	0.04
PY17 Incentives (\$1,000)	\$0	\$10	\$10

Source: Guidehouse analysis

3.14.2 Gross Impact Evaluation

Consistent with the updated evaluation plan, as approved by the SWE, Guidehouse conducted a full impact evaluation of PY17 LBVCx projects. LBVCx reported savings for one project in PY17. Table 3-86 and Table 3-87 show the resulting verified energy and demand savings, respectively, for the program.

Table 3-86: LBVCx Gross Impact Results for Energy

Component	PYRTD MWh/yr	Energy Realization Rate	Sample C _v or Error Ratio	Relative Precision at 85% C.L.
VCx - Large	59	81%	-	0%
Program Total	59	81%	-	0%

Source: Guidehouse analysis

Table 3-87: LBVCx Gross Impact Results for Demand

Component	PYRTD MW/yr	Demand Realization Rate	Sample C _v or Error Ratio	Relative Precision at 85% C.L.
VCx - Large	0.04	105%	-	0%
Program Total	0.04	105%	-	0%

Source: Guidehouse analysis

3.14.3 Net Impact Evaluation

Per the PY17 Guidehouse Evaluation Plan, Guidehouse did not conduct a net impact evaluation for SBVCx or LBVCx in PY17. Table 2-4 shows the NTGR applied to SBVCx and LBVCx projects, which was carried over from the PY15 NTG evaluation.

3.14.3.1 HIM Research

Guidehouse did not conduct HIM research for SBVCx or LBVCx in PY17.

3.14.4 Verified Savings Estimates

In Table 3-88, the realization rates determined by Guidehouse are applied to the reported energy and demand savings estimates to calculate the verified savings estimates for LBVCx in PY17.

Table 3-88: LBVCx PY17 and P4TD Savings Summary

Savings Type	Energy (MWh/yr)	Demand (MW/yr)
PYRTD	59	0.04
PYVTD Gross	48	0.04
PYVTD Net	45	0.04
RTD	4,224	0.47
VTD Gross	4,099	0.63
VTD Net	3,994	0.62

Source: Guidehouse analysis

3.14.5 Process Evaluation

Guidehouse did not conduct process evaluation research for SBVCx or LBVCx in PY17.

3.14.6 Program Finances and Cost-Effectiveness Reporting

A detailed breakdown of program finances and cost-effectiveness are presented in Table 3-89 and Table 3-90 for LBVCx Commercial and LBVCx Industrial, respectively. TRC benefits in Table 3-89 and Table 3-90 were calculated using gross verified impacts. NPV PY17 costs and benefits are expressed in 2025 dollars. NPV costs and benefits for P4TD financials are expressed in 2021 dollars.

Table 3-89: Summary of Program Finances – Gross Verified (LBVCx Commercial)

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$ -		\$ -	
2	Rebates to Participants and Trade Allies	\$ -		\$606	
3	Upstream/Midstream Incentives	\$7		\$5	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$(7)		\$(612)	
		EDC	CSP	EDC	CSP
7	Program Design	\$ -	\$ -	\$1	\$2
8	Administration and Management	\$ -	\$2	\$67	\$32
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$21	\$38	\$28	\$190
11	EDC Evaluation Costs	\$2		\$17	
12	SWE Audit Costs	\$4		\$11	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$67		\$347	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$67		\$347	
15	Total NPV Lifetime Electric Energy Benefits	\$11		\$1,628	
16	Total NPV Lifetime Electric Capacity Benefits	\$24		\$607	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$ -		\$ -	
18	Total NPV Lifetime Fossil Fuel Impacts	\$ -		\$ -	
19	Total NPV Lifetime Water Impacts	\$ -		\$ -	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$35		\$2,235	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	0.53		6.44	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

Table 3-90: Summary of Program Finances – Gross Verified (LBVCx Industrial)

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$ -		\$ -	
2	Rebates to Participants and Trade Allies	\$ -		\$4	
3	Upstream/Midstream Incentives	\$1		\$1	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$(1)		\$(5)	
		EDC	CSP	EDC	CSP
7	Program Design	\$ -	\$ -	\$ -	\$1
8	Administration and Management	\$ -	\$1	\$65	\$14
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$ -	\$ -	\$11	\$10
11	EDC Evaluation Costs	\$ -		\$6	
12	SWE Audit Costs	\$ -		\$2	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$1		\$110	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$1		\$110	
15	Total NPV Lifetime Electric Energy Benefits	\$ -		\$ -	
16	Total NPV Lifetime Electric Capacity Benefits	\$ -		\$ -	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$ -		\$ -	
18	Total NPV Lifetime Fossil Fuel Impacts	\$ -		\$ -	
19	Total NPV Lifetime Water Impacts	\$ -		\$ -	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$ -		\$ -	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	0.00		0.00	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

Table 3-91 and Table 3-92 present program financials and cost-effectiveness on a net savings basis for LBVCx Commercial and LBVCx Industrial, respectively. The NTGR applied in PY17 comes from the PY15 Net Impact Evaluation.

Table 3-91: Summary of Program Finances – Net Verified (LBVCx Commercial)

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$ -		\$ -	
2	Rebates to Participants and Trade Allies	\$ -		\$596	
3	Upstream/Midstream Incentives	\$7		\$5	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$(7)		\$(601)	
		EDC	CSP	EDC	CSP
7	Program Design	\$ -	\$ -	\$1	\$2
8	Administration and Management	\$ -	\$2	\$67	\$32
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$20	\$36	\$27	\$188
11	EDC Evaluation Costs	\$2		\$17	
12	SWE Audit Costs	\$4		\$11	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$63		\$344	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$63		\$344	
15	Total NPV Lifetime Electric Energy Benefits	\$11		\$1,590	
16	Total NPV Lifetime Electric Capacity Benefits	\$22		\$597	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$ -		\$ -	
18	Total NPV Lifetime Fossil Fuel Impacts	\$ -		\$ -	
19	Total NPV Lifetime Water Impacts	\$ -		\$ -	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$33		\$2,186	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	0.53		6.36	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

Table 3-92: Summary of Program Finances – Net Verified (LBVCx Industrial)

Row	Cost Category*	PYTD (\$1,000)		P4TD (\$1,000)	
1	Incremental Measure Costs (IMCs)	\$ -		\$ -	
2	Rebates to Participants and Trade Allies	\$ -		\$4	
3	Upstream/Midstream Incentives	\$1		\$1	
4	Material Cost for Self-Install Programs (EE&C Kits)	\$ -		\$ -	
5	Direct Installation Program Materials and Labor	\$ -		\$ -	
6	Participant Costs (Row 1 minus the sum of Rows 2 through 5)	\$(1)		\$(5)	
		EDC	CSP	EDC	CSP
7	Program Design	\$ -	\$ -	\$ -	\$1
8	Administration and Management	\$ -	\$1	\$65	\$14
9	Marketing	\$ -	\$ -	\$ -	\$ -
10	Program Delivery	\$ -	\$ -	\$11	\$10
11	EDC Evaluation Costs	\$ -		\$6	
12	SWE Audit Costs	\$ -		\$2	
13	Program Overhead Costs (Sum of rows 7 through 12)	\$1		\$110	
14	Total NPV TRC Costs (Sum of rows 1 and 13)	\$1		\$110	
15	Total NPV Lifetime Electric Energy Benefits	\$ -		\$ -	
16	Total NPV Lifetime Electric Capacity Benefits	\$ -		\$ -	
17	Total NPV Lifetime Operation and Maintenance (O&M) Benefits	\$ -		\$ -	
18	Total NPV Lifetime Fossil Fuel Impacts	\$ -		\$ -	
19	Total NPV Lifetime Water Impacts	\$ -		\$ -	
20	Total NPV TRC Benefits (Sum of rows 15 through 19)	\$ -		\$ -	
21	TRC Benefit-Cost Ratio (Row 20 divided by Row 14)	0.00		0.00	

* Rows 1-13 are presented in nominal dollars (PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025); P4TD = \$2021

Source: Guidehouse analysis

3.14.7 Status of Recommendations

There were no impact- or process-related findings for this program in PY17.

4. Portfolio Finances and Cost Recovery

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

4.1 Program Finances

Table 4-1 shows program-specific and portfolio total finances for PY17. The columns in Table 4-1 and Table 4-2 are adapted from the Direct Program Cost categories in the Commission's EE&C Plan template²⁶ for Phase IV. Non-incentives include EDC materials, labor, and administration costs (including costs associated with an EDC's employees) as well as implementation conservation service provider (ICSP) materials, labor, and administration costs (including both the program implementation contractor and the costs of any other outside vendors the EDC employs to support program delivery). The dollar figures in Table 4-1 and Table 4-2 are based on EDC tracking of expenditures with no adjustments to account for inflation..²⁷

Table 4-1: PY17 Program and Portfolio Total Finances

Program	Incentives	Non-Incentives	Total Cost
Res Downstream Incentives	\$334	\$1,272	\$1,606
Res Midstream Incentives	\$0	\$0	\$0
Residential Upstream Lighting	\$0	\$0	\$0
Appliance Recycling	\$0	\$636	\$636
Low-Income Energy Efficiency	\$1,505	\$726	\$2,231
Res Behavioral EE	\$0	\$982	\$982
Low-Income Behavioral EE	\$0	\$0	\$0
Small Business Direct Install	\$0	\$0	\$0
Small Business Downstream	\$10	\$238	\$248
Small Business Midstream	\$0	\$0	\$0
Small Business VCx	\$7	\$2	\$9
Large Commercial Downstream	\$3,008	\$1,781	\$4,789
Large Commercial Midstream	\$720	\$301	\$1,021
Large Commercial VCx	\$7	\$63	\$70
Large Industrial Downstream	\$263	\$560	\$823
Large Industrial Midstream	\$25	\$40	\$65
Large Industrial VCx	\$1	\$1	\$2
Common Portfolio Costs ^{16F28}			N/A
Portfolio Total	\$5,880	\$6,602	\$12,482

²⁶ Pennsylvania Public Utility Commission, Implementation of Act 129 of 2008—Phase IV, Energy Efficiency and Conservation Plan Template (Docket No. M-2020-3015228), <https://www.puc.pa.gov/pcdocs/1676672.docx>.

²⁷ The cost recovery of program expenses through riders generally happens promptly so that costs are being recovered from ratepayers in the same dollars that they are incurred.

²⁸ Common Portfolio costs could include costs associated with the tracking system, legal resources, and IT systems.

Program	Incentives	Non-Incentives	Total Cost
SWE Costs ^{17F29}	N/A	N/A	\$396
Total	\$5,880	\$6,602	\$12,878

Source: Guidehouse analysis

Table 4-2 shows program-specific and portfolio total finances since the inception of Phase IV.

Table 4-2: P4TD Program and Portfolio Total Finances

Program	Incentives	Non-Incentives	Total Cost
Res Downstream Incentives	\$4,528	\$5,326	\$9,854
Res Midstream Incentives	\$1	\$108	\$109
Residential Upstream Lighting	\$698	\$1,988	\$2,686
Appliance Recycling	\$345	\$2,422	\$2,767
Low-Income Energy Efficiency	\$7,588	\$3,619	\$11,207
Residential Behavioral Energy Efficiency	\$0	\$3,798	\$3,798
LI Behavioral Energy Efficiency	\$0	\$943	\$943
Small Business Direct Install	\$5,593	\$1,308	\$6,901
Small Business Downstream	\$1,959	\$3,408	\$5,367
Small Business Midstream	\$8,198	\$4,296	\$12,494
Small Business VCx	\$319	\$300	\$619
Large Commercial Downstream	\$7,282	\$7,382	\$14,664
Large Commercial Midstream	\$3,357	\$2,536	\$5,893
Large Commercial VCx	\$671	\$380	\$1,051
Large Industrial Downstream	\$2,077	\$3,537	\$5,614
Large Industrial Midstream	\$1,989	\$1,497	\$3,486
Large Industrial VCx	\$6	\$118	\$124
Common Portfolio Costs ^{18F30}			N/A
Portfolio Total	\$44,611	\$42,966	\$87,578
SWE Costs ^{19F31}	N/A	N/A	\$1,652
Total	\$44,611	\$42,966	\$89,230

Source: Guidehouse analysis

4.2 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 four customer sectors to ensure that the electric rate classes that finance the programs are the rate classes that receive the direct energy conservation benefits. Cost recovery is governed by tariffed rate

²⁹ SWE costs are outside of the 2% spending cap for the program year.

³⁰ Common Portfolio costs could include costs associated with the tracking system, legal resources, and IT systems.

³¹ Statewide Evaluation costs are within the 2% spending cap for the Phase.

class, so it is necessarily tied to the way customers are metered and charged for electric service. Readers should be mindful of the differences between Table 4-3 and Section 2.3. For example, the LI customer segment is a subset of Duquesne Light's residential tariff(s) and therefore not listed in Table 4-3.

Table 4-3: EE&C Plan Expenditures by Cost-Recovery Category³² (\$1,000)

Cost Recovery Sector	Rate Classes Included	PY17 Spending	P4TD Spending
Residential	RS, RH, RA	\$5,566	\$31,875
Small/Medium C&I	GS, GM, GMH	\$321	\$25,798
Large Commercial	GL, GLH, L	\$6,013	\$22,225
Large Industrial	GL, GLH, L, HVPS	\$978	\$9,332
Portfolio Total		\$12,878	\$89,231

* The portfolio total includes the SWE costs.

Source: Guidehouse analysis

For Phase IV of Act 129, Duquesne Light nominated a portion of peak demand reduction acquired via EE&C programs into the PJM FCM. Proceeds from resources that clear in the FCM flow back to the rate class that generated the savings to offset cost recovery. Table 4-4 shows the proceeds received in PY17 and P4TD net of CSP fees and other administrative costs.

Table 4-4: FCM Proceeds from Recognized Peak Demand Reductions (\$1,000)

Cost Recovery Sector	Rate Classes Included	PY17 Proceeds	P4TD PJM Proceeds
Portfolio Total		\$0.00	\$0.270

Source: Guidehouse analysis

Beginning in the 2026/2027 delivery year, peak demand reduction from energy efficiency is no longer an eligible resource so Phase V cost recovery will be unaffected by proceeds from Phase IV peak demand reductions.

³² Includes SWE costs.

Appendix A. Site Inspection Summary

Table A-1: PY17 Site Visit Summary

Program	Inspection Firm	Number of Inspections Conducted	Number of Sites with Discrepancies from Reported Values	Summary of Common Discrepancies and Explanation of Discrepancy
SBS	Karpinski	1	1	Lighting Control Strategy (reported vs. verified)
LBS	Karpinski	13	4	Lighting Control Strategy (reported vs. verified), Coincidence Factors, Equipment Quantities and Operating Status, Facility Operation and Demand-Period Assumptions
SBDI	Karpinski	3	3	Baseline Assumptions and Model Documentation, Lighting Control Strategy (reported vs. verified), Hours of Use, Coincidence Factor, Post-Retrofit Fixture Wattage, Post-Retrofit Fixture Quantities
TOTAL		17	8	

Source: Guidehouse analysis

Appendix B. Behavioral Energy Efficiency Program Impact Evaluation Detail

B.1 Data Preparation and Participant Counts

The evaluation team deployed specific data management methodologies to prepare billing data for the regressions, consistent with the steps outlined in Section 6.1.4 of the Phase IV Evaluation Framework. These methodologies are partially informed by feedback Guidehouse received from the SWE during previous evaluations. Based on an issue of multiple inactive dates for some accounts identified in PY12, Guidehouse removed accounts with a maximum inactive date prior to the start of the evaluation period. Monthly billing data were calendarized by expanding the billing periods (which follow variable meter read schedules) to daily data and then collapsing them into a common calendar basis. Each month of usage data represents an aggregation of the usage data from the bills that contain data for that month. Estimated reads, which are infrequent for Duquesne Light, were handled by summing the consecutive estimated reads with the first actual read that followed and dividing that aggregated use across the number of days since the previous actual read. Participants and nonparticipants who moved out of Duquesne Light territory during PY17 were included in the regression analysis until move-out occurred and monthly billing data ceased. There is a monotonically decreasing number of participants per month for each cohort.

Guidehouse calculated participant counts following a standard approach where the last available month of billing data is calculated for each account and the household is assumed to be active for all months prior. This participant counting approach is used to obtain an average participant count across all months of the program year. Table B-1 shows the number of treatment group homes by cohort and month.

Table B-1: Active Participant Counts by Wave

Month	2012 Market Rate	2015 Market Rate	2021 Digital	2021 Non-Digital	2024 Digital 1	2024 Digital 2	2025 MR	2023 Low-Income	2025 Low-Income
Jun 2025	10,860	27,878	48,903	50,746	23,690	13,474	30,944	12,463	17,837
Jul 2025	10,814	27,769	48,542	50,404	23,208	13,212	30,552	12,292	17,612
Aug 2025	10,782	27,668	48,113	50,044	22,593	12,820	29,920	12,092	17,356
Sep 2025	10,740	27,535	47,725	49,690	22,074	12,524	29,400	11,917	17,125
Oct 2025	10,705	27,417	47,419	49,407	21,728	12,323	29,042	11,734	16,934
Nov 2025	10,663	27,292	47,126	49,112	21,438	12,171	28,707	11,606	16,719
Dec 2025	10,639	27,195	46,898	48,890	21,249	12,060	28,478	11,514	16,570
Jan 2026	10,609	27,107	46,652	48,639	21,000	11,942	28,242	11,385	16,412

Month	2012 Market Rate	2015 Market Rate	2021 Digital	2021 Non- Digital	2024 Digital 1	2024 Digital 2	2025 MR	2023 Low- Income	2025 Low- Income
Feb 2026	10,578	27,026	46,461	48,457	20,846	11,860	28,056	11,308	16,279
Mar 2026	10,545	26,957	46,268	48,273	20,683	11,767	27,847	11,221	16,153
Apr 2026	10,524	26,876	46,031	47,995	20,471	11,627	27,518	11,101	15,957
May 2026	10,492	26,786	45,753	47,696	20,198	11,485	27,161	10,929	15,680
Average	10,663	27,292	47,158	49,113	21,598	12,272	28,822	11,630	16,720

Source: Guidehouse analysis

B.2 Regression Output

The following tables in Appendix B show the regression results for the seven waves that compose R-BEEP and the two waves that compose LI-BEEP.

Table B-2: Residential Behavioral Wave Regression Savings Details, 2012 – 2021 Waves

Month	2012 MR		2015 MR		2021 D		2021 ND	
	Treatment Coefficient	Cluster Robust Standard Error	Treatment Coefficient	Cluster Robust Standard Error	Treatment Coefficient	Cluster Robust Standard Error	Treatment Coefficient	Cluster Robust Standard Error
Jun 2025	-0.76	0.17	-0.46	0.16	-0.25	0.11	-0.29	0.09
Jul 2025	-0.72	0.21	-0.45	0.19	-0.17	0.13	-0.38	0.11
Aug 2025	-0.63	0.18	-0.40	0.17	-0.18	0.11	-0.34	0.09
Sep 2025	-0.58	0.15	-0.34	0.14	-0.16	0.10	-0.28	0.08
Oct 2025	-0.48	0.12	-0.26	0.11	-0.22	0.08	-0.17	0.07
Nov 2025	-0.51	0.15	-0.27	0.12	-0.28	0.10	-0.19	0.08
Dec 2025	-0.71	0.19	-0.23	0.15	-0.40	0.12	-0.18	0.10
Jan 2026	-0.82	0.22	-0.27	0.17	-0.45	0.13	-0.14	0.11
Feb 2026	-0.78	0.21	-0.30	0.16	-0.41	0.12	-0.13	0.10
Mar 2026	-0.56	0.14	-0.30	0.12	-0.18	0.09	-0.14	0.07
Apr 2026	-0.47	0.13	-0.36	0.12	-0.25	0.09	-0.12	0.07
May 2026	-0.53	0.14	-0.43	0.13	-0.24	0.10	-0.13	0.08

Source: Guidehouse analysis

Table B-3: Residential Behavioral Wave Regression Savings Details, 2024 - 2025 Waves

Month	2024 D1		2024 D2		2025 MR	
	Treatment Coefficient	Cluster Robust Standard Error	Treatment Coefficient	Cluster Robust Standard Error	Treatment Coefficient	Cluster Robust Standard Error
Jun 2025	-0.16	0.13	0.13	0.15	-0.06	0.08
Jul 2025	-0.12	0.14	-0.03	0.17	-0.16	0.09
Aug 2025	-0.18	0.12	-0.16	0.14	-0.21	0.07
Sep 2025	-0.11	0.10	-0.17	0.12	-0.20	0.06
Oct 2025	-0.08	0.09	0.00	0.10	-0.02	0.06
Nov 2025	-0.04	0.10	0.13	0.12	0.00	0.07
Dec 2025	-0.15	0.12	0.05	0.15	-0.09	0.09
Jan 2026	-0.15	0.14	-0.06	0.17	-0.17	0.10
Feb 2026	-0.08	0.13	-0.16	0.16	-0.17	0.09
Mar 2026	-0.09	0.09	-0.02	0.11	-0.14	0.07
Apr 2026	-0.08	0.09	0.02	0.10	-0.10	0.06
May 2026	-0.01	0.10	-0.02	0.11	-0.14	0.06

Source: Guidehouse analysis

Table B-4: LI-BEEP Wave Regression Savings Details

Month	2023 LI		2025 LI	
	Treatment Coefficient	Cluster Robust Standard Error	Treatment Coefficient	Cluster Robust Standard Error
Jun 2025	-0.22	0.15	-0.06	0.09
Jul 2025	-0.20	0.20	0.05	0.11
Aug 2025	-0.24	0.18	0.02	0.10
Sep 2025	-0.20	0.14	-0.02	0.08
Oct 2025	-0.13	0.13	0.00	0.08
Nov 2025	0.03	0.18	0.04	0.11
Dec 2025	-0.25	0.21	-0.07	0.13
Jan 2026	-0.25	0.23	0.08	0.15
Feb 2026	-0.29	0.22	-0.06	0.14
Mar 2026	-0.11	0.15	-0.17	0.10
Apr 2026	0.00	0.13	-0.12	0.08
May 2026	-0.02	0.13	-0.06	0.08

Source: Guidehouse analysis

Table B-5: Residential Behavioral Wave Regression Savings Percentage Details, 2012 – 2021 Waves

Month	2012 MR		2015 MR		2021 D		2021 ND	
	Treatment Coefficient	Absolute Precision	Treatment Coefficient	Absolute Precision	Treatment Coefficient	Absolute Precision	Treatment Coefficient	Absolute Precision
Jun 2025	2.13%	0.95%	1.58%	1.09%	0.87%	0.77%	1.21%	0.74%
Jul 2025	1.59%	0.90%	1.22%	1.01%	0.49%	0.71%	1.23%	0.68%
Aug 2025	1.68%	0.96%	1.33%	1.08%	0.60%	0.75%	1.35%	0.72%
Sep 2025	2.21%	1.09%	1.56%	1.23%	0.75%	0.89%	1.60%	0.85%
Oct 2025	2.13%	1.04%	1.44%	1.19%	1.27%	0.93%	1.13%	0.87%
Nov 2025	1.95%	1.11%	1.31%	1.20%	1.45%	0.97%	1.17%	0.93%
Dec 2025	2.24%	1.18%	0.97%	1.25%	1.73%	1.00%	0.92%	0.96%
Jan 2026	2.39%	1.25%	1.03%	1.29%	1.86%	1.05%	0.67%	1.00%
Feb 2026	2.48%	1.29%	1.29%	1.31%	1.81%	1.07%	0.69%	1.01%
Mar 2026	2.41%	1.18%	1.67%	1.33%	1.04%	1.01%	0.93%	0.96%
Apr 2026	2.20%	1.22%	2.12%	1.41%	1.48%	1.07%	0.88%	1.01%
May 2026	2.24%	1.20%	2.26%	1.36%	1.27%	1.01%	0.86%	0.98%

Source: Guidehouse analysis

Table B-6: Residential Behavioral Wave Regression Savings Percentage Details, 2024 – 2025 Waves

Month	2024 D1		2024 D2		2025 MR	
	Treatment Coefficient	Absolute Precision	Treatment Coefficient	Absolute Precision	Treatment Coefficient	Absolute Precision
Jun 2025	0.54%	0.85%	-0.46%	1.00%	0.23%	0.57%
Jul 2025	0.32%	0.77%	0.08%	0.90%	0.47%	0.53%
Aug 2025	0.60%	0.80%	0.52%	0.93%	0.76%	0.53%
Sep 2025	0.50%	0.89%	0.75%	1.04%	1.02%	0.62%
Oct 2025	0.42%	0.90%	-0.01%	1.06%	0.09%	0.65%
Nov 2025	0.19%	0.99%	-0.64%	1.16%	0.02%	0.77%
Dec 2025	0.64%	1.00%	-0.22%	1.19%	0.38%	0.78%
Jan 2026	0.55%	1.03%	0.22%	1.22%	0.72%	0.79%
Feb 2026	0.35%	1.07%	0.66%	1.29%	0.78%	0.82%
Mar 2026	0.50%	0.96%	0.12%	1.15%	0.79%	0.74%
Apr 2026	0.45%	0.98%	-0.14%	1.13%	0.59%	0.72%
May 2026	0.04%	0.96%	0.10%	1.10%	0.78%	0.69%

Source: Guidehouse analysis

Table B-7: LI-BEEP Wave Regression Savings Percentage Details

Month	2023 LI		2025 LI	
	Treatment Coefficient	Absolute Precision	Treatment Coefficient	Absolute Precision
Jun 2025	0.97%	1.33%	0.21%	0.68%
Jul 2025	0.71%	1.45%	-0.15%	0.64%
Aug 2025	1.01%	1.47%	-0.08%	0.66%
Sep 2025	1.14%	1.61%	0.10%	0.76%
Oct 2025	0.81%	1.64%	0.02%	0.80%
Nov 2025	-0.16%	1.87%	-0.16%	0.97%
Dec 2025	1.17%	1.88%	0.27%	0.98%
Jan 2026	1.05%	1.95%	-0.27%	0.98%
Feb 2026	1.30%	1.96%	0.24%	1.02%
Mar 2026	0.64%	1.78%	0.82%	0.92%
Apr 2026	-0.02%	1.72%	0.64%	0.88%
May 2026	0.15%	1.66%	0.33%	0.84%

Source: Guidehouse analysis

Table B-8: Behavioral Wave Monthly Regression Savings (MWh/yr)*

Month	2012 MR	2015 MR	2021 Digital	2021 Non-Digital	2024 Digital 1	2024 Digital 2	2025 MR	2023 LI	2025 LI
Jun 2025	249	385	362	439	113	-53	56	80	31
Jul 2025	242	388	263	593	84	11	147	75	-27
Aug 2025	211	345	267	533	127	62	193	88	-13
Sep 2025	188	280	225	420	73	63	181	70	11
Oct 2025	160	223	326	254	52	-1	14	47	2
Nov 2025	162	219	395	284	25	-48	4	-10	-18
Dec 2025	235	195	580	272	101	-20	75	91	37
Jan 2026	269	224	658	207	94	22	153	88	-40
Feb 2026	231	229	536	178	49	54	137	91	29
Mar 2026	184	253	261	209	60	9	119	37	83
Apr 2026	149	290	344	178	49	-9	79	-1	56
May 2026	172	359	334	196	5	7	118	8	31

*Savings are prior to any overlap or persistence adjustments.

Source: Guidehouse analysis

Table B-9: Behavioral Wave Average Daily Use

Wave	Average Daily Use (kWh)
2012 Market Rate	29.4
2015 Market Rate	23.3
2021 Digital	22.6
2021 Non-Digital	19.2
2024 Digital 1	24.0
2024 Digital 2	24.0
2025 Market Rate	21.7
2023 Low-Income	19.8
2025 Low-Income	24.2

Source: Guidehouse analysis

B.3 Overlap Analysis Detail

To the extent that the behavioral energy efficiency waves increase participation in other programs, some savings from the evaluation’s regression analysis could be double-counted if appropriate adjustments are not made. Double-counting can be avoided for downstream programs that track participation at the customer level by generating estimates of uplift—that is, the increase in participation in a given program among R-BEEP and LI-BEEP participants. This is also known as the overlap savings.

To estimate uplift, Guidehouse followed the Phase IV Evaluation Framework guidance on completing dual participation analyses. The Phase IV Evaluation Framework conveys that exposure to the HER messaging often motivates participants to take advantage of other Duquesne Light program offerings that might be promoted through HER promotional materials. This exposure creates a situation where households in the treatment groups tend to participate in other programs at a higher rate than households in the control groups. The Phase IV Evaluation Framework methodology calls for program-specific uplift calculations, and the SWE requests those values be reported.

The evaluation team estimated aggregate uplift across residential programs. From a theoretical standpoint, the program uplift, which is associated with suggestions provided in the HERs, may be allocated to either R-BEEP (or LI-BEEP for the LI behavioral energy efficiency waves) or the other program involved in its realization because the savings would not have occurred in the absence of either program. However, the industry standard approach is to subtract the amount of the overlap savings from the Behavioral Program savings; the team followed this approach. This approach is also consistent with the detailed methodology described in Section 6.1.8.1 of the Phase IV Evaluation Framework.

Guidehouse calculated downstream overlap savings using reported values from other Duquesne Light energy efficiency programs. If those savings exceeded 5% of gross verified HER savings, the evaluation team examined downstream overlap savings at the program and measure level. If a single program, initiative, or measure exceeded 20% of total downstream double-counted savings and the realization rate for the applicable measure(s) was outside the range of 90% to 110%, the team used the verified savings values (rather than reported savings values) for the applicable measure(s) in the downstream overlap savings calculation. No

measures installed in PY17 met these criteria. Verified savings values were applied for energy efficiency kits installed in PY9 and PY10.

Guidehouse's overlap analysis also accounts for upstream programs, in particular the upstream lighting component of the R-BEEP. Calculating overlap savings from upstream programs is complicated by the fact that participation is not tracked at the customer level and the approaches described previously for specific homes are infeasible. Per Section 6.1.8.2 of the Phase IV Evaluation Framework, the team used the Framework's assumed upstream reduction factor dependent on the number of years of activity for the given wave. That reduction factor was subtracted from the estimate of energy savings for each wave after downstream overlap savings had been removed.

Table B-10 shows the upstream reduction factors. Based on feedback from the SWE, Guidehouse adjusted the upstream adjustment factors in PY16 such that factors are capped for newer waves based on their inception date relative to the end of upstream lighting programs in October 2023. Waves beginning after October 2023 are not subject to any upstream adjustments. Table B-11 shows how adjustments are applied to the regression results to arrive at the final verified savings values. Table B-11 also separates incremental first-year savings from persistent savings from prior years, as described in Section 0, in addition to incremental peak demand impacts.

Table B-10: Upstream Adjustment Factors

Years Since Cohort Inception*	Default Upstream Reduction Factor	Waves
<0.5	0.38%	2023 LI
1	0.75%	
2	1.50%	2021 D, 2021 ND
3	2.25%	
4 and beyond	3.00%	2012 MR, 2015 MR

*Years since cohort inception, prior to the end of upstream lighting programs in October 2023.

Source: Phase IV Evaluation Framework

Table B-11: Savings Adjustments and Final Savings

Wave	Regression Savings (MWh/yr)	Downstream Dual Participation Savings (MWh/yr)	Upstream Dual Participation Savings (MWh/yr)	Persistence (MWh/yr)	Incremental Savings (MWh/yr)	Incremental Peak Demand Savings* (MW/yr)
2012 Market Rate	2,452.41	-453.07	-59.98	-1501.31	438.05	0.22
2015 Market Rate	3,389.45	-1276.95	-63.38	-1180.92	868.21	0.23
2021 Digital	4,549.96	-508.90	-60.62	-2601.02	1,379.42	0.45
2021 Non-Digital	3,763.40	-206.70	-53.35	-2274.19	1,229.15	0.40
2024 Digital 1	833.64	-7.79	0.00	0.00	825.85	0.09
2024 Digital 2	97.58	-23.94	0.00	0.00	73.65	0.01
2025 Market Rate	1,274.08	-4.27	0.00	0.00	1,269.81	0.14
2023 Low-Income	663.68	-28.30	-2.38	-338.67	294.32	0.07
2025 Low-Income	181.91	-9.93	0.00	0.00	171.98	0.02
2012 Market Rate	2,452.41	-453.07	-59.98	-1501.31	438.05	0.22
2015 Market Rate	3,389.45	-1276.95	-63.38	-1180.92	868.21	0.23

* Column 7 represents incremental peak demand savings after adjusting for transmission and distribution losses.

Source: Guidehouse analysis

B.4 Peak Demand Analysis

To estimate peak demand savings, Guidehouse used an energy-to-demand factor derived from historical load shapes, as described in Section 6.1.6.1 of the Phase IV Evaluation Framework. Guidehouse obtained the historical 8760 reference load shape averaged across all residential customers in the Duquesne Light service territory for the five calendar years including 2017 to 2021. Guidehouse then calculated the reference load shape as total usage for all residential customers divided by the total number of residential customers for each hour of the year. Oracle calculates the reference load shape using customer AMI data provided by Duquesne Light.^{33, 34}

From the reference load shape, the peak demand multiplier is calculated by first calculating the average annual load (kW), during all hours and days in the year. Then, average summer peak load (kW), during the TRM-defined peak period of non-holiday weekdays from 2:00 p.m. to 6:00 p.m. in June, July, and August is calculated. Finally, the peak demand multiplier is calculated as the ratio of the average summer peak load to average annual load.

Guidehouse calculated the peak demand multiplier individually for each calendar year, then calculated the 5-year simple average of the peak demand multipliers.

³³ The reference load shape data is calculated from the customer AMI data provided to Oracle by Duquesne Light to be consistent with the data used for selecting tips that appear in the HERs and the billing data used for the energy impact evaluation. Publicly available data, such as that available at <https://www.duquesnedsp.com/Documents/LoadandOtherData.aspx>, may undergo a different data cleaning process.

³⁴ The reference load shape data was 99.7% complete. Missing observations tended to occur in groups by day (e.g., all 24 hours of a day were missing). Guidehouse identified eight observations with an abnormally high customer count and 89 observations with an abnormally low customer count, representing 0.2% of all observations. Guidehouse did not remove these observations from the calculation.

Values for average annual load, average summer peak load, and peak demand multiplier from 2017 to 2021 are presented in Table B-12.

Table B-12: Peak Demand Multiplier, 2017 to 2021

Year	Average Annual Load (kW)	Average Summer Peak Load (kW)	Peak Demand Multiplier
2017	0.88	1.37	1.57
2018	0.93	1.40	1.50
2019	0.89	1.39	1.57
2020	0.91	1.67	1.83
2021	0.92	1.54	1.67
5-Year Average	0.91	1.48	1.63

Source: Guidehouse analysis

Because the methodology uses the same reference load shape for all R-BEEP and LI-BEEP cohorts, the peak demand multiplier will be identical for all cohorts throughout Phase IV. The Phase IV Duquesne Light peak demand multiplier is 1.63.

Appendix C. PY17 and P4TD Summary by Customer Segment and LI Carveout

Table C-1 presents a summary of the programs, components/initiatives, and customer segments that contribute to the LI carveout in PY17 and P4TD.

Table C-1: Summary of LI Carveout Energy Savings (MWh/yr)

Program	Customer Segment	PYVTD Gross (MWh/yr)	VTD Gross (MWh/yr)
LIEEP	LI	5,373	14,796
LI-BEEP	LI	466	3,319
SBDI*	Small Business Multifamily	242	1,859
LBS- Commercial	Large Business Multifamily	0	221
Total	-	6,082	20,196

* It was discovered that the PY14 Annual Report was underreporting the LI savings for Small Business Multifamily by 10 MWh. Those savings have been added to the VTD Gross savings in this table.

Source: Guidehouse analysis

Appendix D. Summary of Program-Level Impacts, Cost-Effectiveness and HIM NTG

D.1 Program and Component-Level Impacts Summary

A summary of energy impacts by program and component through PY17 are presented in Table D.1Table D-1.

Table D-1: Incremental Annual Energy Savings by Program & Component (MWh/yr)

Program	Component	PYRTD (MWh/yr)	PYVTD Gross (MWh/yr)	PYVTD Net (MWh/yr)	RTD (MWh/yr)	VTD Gross (MWh/yr)	VTD Net (MWh/yr)
Residential Downstream Incentives	Rebates	646	848	695	3,316	4,132	3,388
Residential Downstream Incentives	Audits	162	145	175	1,191	1,134	1,254
Residential Downstream Incentives	Kits	120	129	103	12,544	12,534	9,780
Residential Downstream Incentives	Spray Foam	-	-	-	300	324	260
Residential Downstream Incentives	New Customer Kits - Outlet Gasket	14	3	3	439	102	83
Residential Downstream Incentives	New Customer Kits - Furnace Whistle	6	0	0	193	2	2
Residential Downstream Incentives	New Customer Kit - Nightlights	17	46	37	526	1,441	1,153
Residential Downstream Incentives	New Customer Kits - LEDs	152	121	97	4,770	3,808	3,047
Residential Midstream Incentives		-	-	-	7	7	7
Residential Upstream Incentives	Appliances	-	-	-	3,819	4,532	3,561
Residential Upstream Incentives	LEDs	-	-	-	2,937	2,924	1,547
Residential Appliance Recycling	Freezers	139	127	91	760	704	428

Program	Component	PYRTD (MWh/yr)	PYVTD Gross (MWh/yr)	PYVTD Net (MWh/yr)	RTD (MWh/yr)	VTD Gross (MWh/yr)	VTD Net (MWh/yr)
Residential Appliance Recycling	Refrigerators	930	945	677	4,753	5,107	3,131
Residential Appliance Recycling	Other	224	234	168	811	838	545
Residential Low Income Energy Efficiency	Audits	2,471	2,404	2,404	10,526	9,910	9,910
Residential Low Income Energy Efficiency	Kits	2,706	2,707	2,707	3,629	3,621	3,621
Residential Low Income Energy Efficiency	Giveaways	-	-	-	90	90	90
Residential Low Income Energy Efficiency	Appliance Recycling	211	263	263	1,065	1,177	1,177
Residential Behavioral		6,810	6,084	6,084	34,958	33,719	33,719
Low Income Behavioral		278	466	466	2,817	3,319	3,319
Small Business Direct Install	Large	-	-	-	6,374	5,748	5,349
Small Business Direct Install	Medium	-	-	-	1,236	1,013	937
Small Business Direct Install	Small	-	-	-	1,285	1,300	1,235
Small Business Direct Install	MF	63	32	29	706	671	661
Small Business Direct Install	MF LI	484	242	226	2,063	1,859	1,750
Small Business Direct Install	PAPP	-	-	-	96	111	110
Small Business Solutions	Large	-	-	-	840	773	510
Small Business Solutions	Medium	177	211	139	12,615	12,064	8,121
Small Business Solutions	Small	-	-	-	14,364	16,495	11,795
Small Business Solutions	Upstream Lighting-CCS	-	-	-	524	523	276
Small Business Midstream Solutions	Large	-	-	-	16,634	19,148	13,019
Small Business Midstream Solutions	Medium	-	-	-	30,418	33,202	22,826

Program	Component	PYRTD (MWh/yr)	PYVTD Gross (MWh/yr)	PYVTD Net (MWh/yr)	RTD (MWh/yr)	VTD Gross (MWh/yr)	VTD Net (MWh/yr)
Small Business Midstream Solutions	Small	-	-	-	5,809	5,082	3,538
Small Business Virtual Commissioning		59	47	44	2,919	2,851	2,702
Large Business Solutions	Commercial - Certainty	2,578	2,854	2,565	13,413	13,457	8,581
Large Business Solutions	Commercial - Large	14,659	14,116	12,684	34,152	33,539	28,045
Large Business Solutions	Commercial - Medium	11,392	10,619	9,542	27,805	26,966	20,914
Large Business Solutions	Commercial - Small	2,013	1,945	1,748	5,593	5,993	4,350
Large Business Solutions	Commercial - MF LI	-	-	-	175	221	95
Large Business Solutions	Industrial - Certainty	-	-	-	21,310	21,821	9,383
Large Business Solutions	Industrial - Large	2,797	3,005	2,700	7,240	7,580	5,757
Large Business Solutions	Industrial - Medium	1,821	1,697	1,525	4,765	4,428	3,017
Large Business Solutions	Industrial - Small	130	125	113	771	753	531
Large Business Midstream Solutions	Commercial - Large	1,321	2,049	1,803	10,842	15,865	12,955
Large Business Midstream Solutions	Commercial - Medium	1,731	2,753	2,422	11,521	14,346	11,668
Large Business Midstream Solutions	Commercial - Small	736	2,281	2,008	3,988	8,367	7,045
Large Business Midstream Solutions	Industrial - Large	-	-	-	11,800	15,034	10,333
Large Business Midstream Solutions	Industrial - Medium	134	214	188	4,352	4,895	3,681
Large Business Midstream Solutions	Industrial - Small	28	37	33	658	902	685
Large Business Virtual Commissioning		59	48	45	4,224	4,099	3,995
Portfolio Total*		55,070	56,797	51,782	347,946	368,535	283,882

*Totals might not match other tables in this report due to rounding

Source: Guidehouse analysis

A summary of the peak demand impacts by energy efficiency program and Component through the current reporting period are presented in Table D-2.

Table D-2: Peak Demand Savings by Energy Efficiency Program & Component (MW/yr)

Program	Component	PYRTD (MW/yr)	PYVTD Gross (MW/yr)	PYVTD Net (MW/yr)	RTD (MW/yr)	VTD Gross (MW/yr)	VTD Net (MW/yr)
Residential Downstream Incentives	Rebates	0.15	0.12	0.10	1.17	0.96	0.79
Residential Downstream Incentives	Audits	0.02	0.01	0.02	0.11	0.10	0.12
Residential Downstream Incentives	Kits	0.03	0.03	0.03	2.01	1.98	1.52
Residential Downstream Incentives	Spray Foam	-	-	-	0.00	0.00	0.00
Residential Downstream Incentives	New Customer Kits - Outlet Gasket	0.00	0.00	0.00	0.00	0.00	0.00
Residential Downstream Incentives	New Customer Kits - Furnace Whistle	0.00	-	-	0.10	-	-
Residential Downstream Incentives	New Customer Kit - Nightlights	-	-	-	-	-	-
Residential Downstream Incentives	New Customer Kits - LEDs	0.02	0.01	0.01	0.52	0.39	0.32
Residential Midstream Incentives		-	-	-	0.00	0.00	0.00
Residential Upstream Incentives	Appliances	-	-	-	0.64	1.07	0.85
Residential Upstream Incentives	LEDs	-	-	-	0.33	0.33	0.17
Residential Appliance Recycling	Freezers	0.02	0.02	0.02	0.13	0.12	0.07
Residential Appliance Recycling	Refrigerators	0.16	0.16	0.12	0.82	0.89	0.55
Residential Appliance Recycling	Other	0.18	0.21	0.15	0.61	0.67	0.43
Residential Low Income Energy Efficiency	Audits	0.17	0.17	0.17	0.90	0.85	0.85

Program	Component	PYRTD (MW/yr)	PYVTD Gross (MW/yr)	PYVTD Net (MW/yr)	RTD (MW/yr)	VTD Gross (MW/yr)	VTD Net (MW/yr)
Residential Low Income Energy Efficiency	Kits	0.26	0.26	0.26	0.34	0.34	0.34
Residential Low Income Energy Efficiency	Giveaways	-	-	-	0.00	0.00	0.00
Residential Low Income Energy Efficiency	Appliance Recycling	0.04	0.05	0.05	0.19	0.21	0.21
Residential Behavioral		1.70	1.21	1.21	7.18	5.93	5.93
Low Income Behavioral		0.07	0.09	0.09	0.33	0.50	0.50
Small Business Direct Install	Large	-	-	-	1.04	1.04	0.96
Small Business Direct Install	Medium	-	-	-	0.19	0.19	0.17
Small Business Direct Install	Small	-	-	-	0.21	0.22	0.21
Small Business Direct Install	MF	0.01	0.00	0.00	0.21	0.23	0.22
Small Business Direct Install	MF LI	0.06	0.03	0.03	0.28	0.31	0.29
Small Business Direct Install	PAPP	-	-	-	0.02	0.03	0.03
Small Business Solutions	Large	-	-	-	0.11	0.09	0.06
Small Business Solutions	Medium	0.02	0.02	0.01	2.70	2.49	1.67
Small Business Solutions	Small	-	-	-	3.11	4.40	3.20
Small Business Solutions	Upstream Lighting-CCS	-	-	-	0.15	0.16	0.08
Small Business Midstream Solutions	Large	-	-	-	3.82	3.63	2.47
Small Business Midstream Solutions	Medium	-	-	-	6.45	8.05	5.55
Small Business Midstream Solutions	Small	-	-	-	1.12	1.09	0.77
Small Business Virtual Commissioning		0.04	0.01	0.01	0.53	0.55	0.52
Large Business Solutions	Commercial - Certainty	0.37	0.47	0.42	2.94	2.69	1.78
Large Business Solutions	Commercial - Large	2.51	2.78	2.50	6.34	6.80	5.61

Program	Component	PYRTD (MW/yr)	PYVTD Gross (MW/yr)	PYVTD Net (MW/yr)	RTD (MW/yr)	VTD Gross (MW/yr)	VTD Net (MW/yr)
Large Business Solutions	Commercial - Medium	2.47	2.52	2.26	5.69	5.87	4.66
Large Business Solutions	Commercial - Small	0.39	0.39	0.35	1.05	1.30	0.98
Large Business Solutions	Commercial - MF LI	-	-	-	0.02	0.03	0.01
Large Business Solutions	Industrial - Certainty	-	-	-	1.94	1.99	0.85
Large Business Solutions	Industrial - Large	0.52	0.46	0.42	1.02	0.92	0.71
Large Business Solutions	Industrial - Medium	0.32	0.33	0.29	0.84	0.86	0.58
Large Business Solutions	Industrial - Small	0.03	0.03	0.02	0.18	0.18	0.12
Large Business Midstream Solutions	Commercial - Large	0.26	0.52	0.46	2.15	3.43	2.88
Large Business Midstream Solutions	Commercial - Medium	0.34	0.50	0.44	2.15	2.77	2.25
Large Business Midstream Solutions	Commercial - Small	0.15	0.39	0.35	0.83	1.50	1.27
Large Business Midstream Solutions	Industrial - Large	-	-	-	2.78	2.60	1.80
Large Business Midstream Solutions	Industrial - Medium	0.03	0.05	0.04	1.07	1.30	0.98
Large Business Midstream Solutions	Industrial - Small	0.01	0.01	0.01	0.14	0.16	0.13
Large Business Virtual Commissioning		0.04	0.04	0.04	0.47	0.63	0.62
Portfolio Total*		10.38	10.91	9.88	64.95	69.87	54.08

*Totals might not match other tables in this report due to rounding

Source: Guidehouse analysis

D.2 Program-Level Cost-Effectiveness Summary

Table D-3 shows the TRC ratios by program and for the portfolio. The benefits in Table D-3 were calculated using gross verified impacts. Costs and benefits are expressed in 2025 dollars.

Table D-3: PY17 Gross TRC Ratios by Program (\$1,000)¹

Program	TRC NPV Benefits	TRC NPV Costs	TRC Ratio	TRC Net Benefits (Benefits – Costs)
Res Downstream Incentives	\$697	\$2,035	0.34	(\$1,339)
Res Midstream Incentives	\$0	\$0	0.00	\$0
Res Upstream Lighting	\$0	\$0	0.00	\$0
Appliance Recycling	\$343	\$746	0.46	(\$404)
Low-Income Energy Efficiency	\$2,130	\$962	2.22	\$1,169
Res Behavioral EE	\$623	\$996	0.63	(\$373)
Low-Income Behavioral EE	\$48	\$0	0.00	\$48
Residential Subtotal	\$3,840	\$4,739	0.81	(\$899)
Small Business Direct Install	\$122	\$544	0.22	(\$422)
Small Business Downstream	\$137	\$375	0.37	(\$237)
Small Business Midstream	\$0	\$0	0.00	\$0
Small Business VCx	\$19	\$2	9.50	\$17
Large Commercial Downstream	\$17,657	\$10,017	1.76	\$7,640
Large Commercial Midstream	\$5,031	\$1,730	2.91	\$3,301
Large Commercial VCx	\$35	\$67	0.53	(\$32)
Large Industrial Downstream	\$2,831	\$1,144	2.47	\$1,686
Large Industrial Midstream	\$229	\$93	2.46	\$136
Large Industrial VCx	\$0	\$1	0.00	(\$1)
Nonresidential Subtotal	\$26,061	\$13,973	1.87	\$12,088
Portfolio Total	\$29,901	\$18,712	1.60	\$11,189

¹ Costs and benefits are expressed as follows PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025

Source: Guidehouse analysis

Table D-4 presents PY17 cost-effectiveness using net verified savings to calculate benefits.

Table D-4: PY17 Net TRC Ratios by Program (\$1,000)¹

Program	TRC NPV Benefits	TRC NPV Costs	TRC Ratio	TRC Net Benefits (Benefits – Costs)
Res Downstream Incentives	\$598	\$1,747	0.34	(\$1,149)
Res Midstream Incentives	\$0	\$0	0.00	\$0
Res Upstream Lighting	\$0	\$0	0.00	\$0
Appliance Recycling	\$246	\$535	0.46	(\$289)
Low-Income Energy Efficiency	\$2,130	\$962	2.22	\$1,169
Res Behavioral Energy Efficiency	\$623	\$996	0.63	(\$373)
Low-Income Behavioral Energy Efficiency	\$48	\$0	0.00	\$48
Residential Subtotal	\$3,644	\$4,240	0.86	(\$595)
Small Business Direct Install	\$113	\$506	0.22	(\$393)
Small Business Downstream	\$91	\$247	0.37	(\$157)
Small Business Midstream	\$0	\$0	0.00	\$0
Small Business VCx	\$18	\$2	9.50	\$16
Large Commercial Downstream	\$15,866	\$9,001	1.76	\$6,865
Large Commercial Midstream	\$4,427	\$1,522	2.91	\$2,905
Large Commercial VCx	\$33	\$63	0.53	(\$30)
Large Industrial Downstream	\$2,544	\$1,028	2.47	\$1,515
Large Industrial Midstream	\$202	\$82	2.46	\$120
Large Industrial VCx	\$0	\$1	0.00	(\$1)
Nonresidential Subtotal	\$23,293	\$12,452	1.87	\$10,841
Portfolio Total	\$26,937	\$16,692	1.61	\$10,245

¹ Costs and benefits are expressed as follows PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025

Source: Guidehouse analysis

Table D-5 summarizes cost-effectiveness by program for Phase IV of Act 129. Cost and benefits are expressed in 2021 dollars.

Table D-5: P4TD Gross TRC Ratios by Program (\$1,000)¹

Program	TRC NPV Benefits	TRC NPV Costs	TRC Ratio	TRC Net Benefits (Benefits – Costs)
Res Downstream Incentives	\$11,265	\$9,654	1.17	\$1,611
Res Midstream Incentives	\$6	\$125	0.05	(\$119)
Res Upstream Lighting	\$3,164	\$3,752	0.84	(\$588)
Appliance Recycling	\$1,368	\$2,614	0.52	(\$1,246)
Low-Income Energy Efficiency	\$4,186	\$3,635	1.15	\$551
Res Behavioral Energy Efficiency	\$2,683	\$3,323	0.81	(\$640)
Low-Income Behavioral Energy Efficiency	\$249	\$856	0.29	(\$607)
Residential Subtotal	\$22,920	\$23,959	0.96	(\$1,038)
Small Business Direct Install	\$6,428	\$4,537	1.42	\$1,891
Small Business Downstream	\$19,022	\$7,739	2.46	\$11,283
Small Business Midstream	\$36,530	\$17,734	2.06	\$18,796
Small Business VCx	\$1,652	\$288	5.74	\$1,365
Large Commercial Downstream	\$43,363	\$23,426	1.85	\$19,937
Large Commercial Midstream	\$22,626	\$7,332	3.09	\$15,294
Large Commercial VCx	\$2,235	\$347	6.44	\$1,888
Large Industrial Downstream	\$15,888	\$7,829	2.03	\$8,059
Large Industrial Midstream	\$11,939	\$3,892	3.07	\$8,047
Large Industrial VCx	\$0	\$110	0.00	(\$110)
Nonresidential Subtotal	\$159,683	\$73,233	2.18	\$86,450
Portfolio Total	\$182,603	\$97,192	1.88	\$85,412

¹ Costs and benefits are expressed as follows PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025

Source: Guidehouse analysis

Table D-6 presents P4TD cost-effectiveness results using net verified savings to calculate benefits. Cost and benefits are expressed in 2021 dollars.

Table D-6: P4TD Net TRC Ratios by Program (\$1,000)¹

Program	TRC NPV Benefits	TRC NPV Costs	TRC Ratio	TRC Net Benefits (Benefits – Costs)
Res Downstream Incentives	\$9,086	\$8,591	1.06	\$495
Res Midstream Incentives	\$6	\$125	0.05	(\$119)
Res Upstream Lighting	\$2,129	\$3,146	0.68	(\$1,017)
Appliance Recycling	\$839	\$2,322	0.36	(\$1,483)
Low-Income Energy Efficiency	\$4,186	\$3,635	1.15	\$551
Res Behavioral Energy Efficiency	\$2,683	\$3,323	0.81	(\$640)
Low-Income Behavioral Energy Efficiency	\$249	\$856	0.29	(\$607)
Residential Subtotal	\$19,178	\$21,998	0.87	(\$2,820)
Small Business Direct Install	\$6,022	\$4,324	1.39	\$1,698
Small Business Downstream	\$13,345	\$6,251	2.13	\$7,094
Small Business Midstream	\$25,074	\$13,443	1.87	\$11,631
Small Business VCx	\$1,568	\$288	5.45	\$1,280
Large Commercial Downstream	\$33,095	\$19,487	1.70	\$13,608
Large Commercial Midstream	\$18,536	\$6,311	2.94	\$12,225
Large Commercial VCx	\$2,186	\$344	6.36	\$1,842
Large Industrial Downstream	\$8,617	\$5,511	1.56	\$3,107
Large Industrial Midstream	\$8,464	\$3,159	2.68	\$5,305
Large Industrial VCx	\$0	\$110	0.00	(\$110)
Nonresidential Subtotal	\$116,908	\$59,227	1.97	\$57,681
Portfolio Total	\$136,086	\$81,225	1.68	\$54,861

¹ Costs and benefits are expressed as follows PY13 = 2021, PY14 = 2022, PY15 = 2023, PY16 = 2024, PY17 = 2025

Source: Guidehouse analysis

D.3 HIM NTG

Findings from NTG research are not used to adjust compliance savings in Pennsylvania. Instead, NTG research provides directional information for program planning purposes. HIMs research was not conducted in PY17.³⁵

D.4 Program-Level Comparison of Performance to Approved EE&C Plan

Table D-7 presents PY17 expenditures, by program, compared with the budget estimates set forth in the EE&C plan for PY17. All the dollars in Table D-7 are presented in 2025 dollars.

Table D-7: Comparison of PY17 Expenditures to Phase IV EE&C Plan (\$1,000)

Program	PY17 Budget from EE&C Plan	PY17 Actual Expenditures	Ratio (Actual/Plan)
Res Downstream Incentives	\$2,126	\$1,606	0.76
Res Midstream Incentives	\$57	\$0	0.00
Res Upstream Lighting	\$334	\$0	0.00
Appliance Recycling	\$701	\$636	0.91
Low-Income Energy Efficiency	\$3,534	\$2,231	0.63
Res Behavioral Energy Efficiency	\$724	\$982	1.36
Low-Income Behavioral Energy Efficiency	\$129	\$0	0.00
Small Business Direct Install	\$640	\$0	0.00
Small Business Downstream	\$1,923	\$248	0.13
Small Business Midstream	\$240	\$0	0.00
Small Business VCx	\$24	\$9	0.38
Large Commercial Downstream	\$5,447	\$4,789	0.88
Large Commercial Midstream	\$867	\$1,021	1.18
Large Commercial VCx	\$28	\$70	2.52
Large Industrial Downstream	\$940	\$823	0.88
Large Industrial Midstream	\$140	\$65	0.46
Large Industrial VCx	\$134	\$2	0.01
TOTAL	\$17,988	\$12,482	0.69

Source: Guidehouse analysis

³⁵ The [Phase IV Evaluation Framework](#) provides guidance to the EDCs to oversample measure categories (technologies) of high importance, called HIMs, to help program planners make decisions concerning those measures. The SWE suggests that for each program year, each EDC identify three to five HIMs for study based on energy impact, level of uncertainty, prospective value, funding, or other parameters. The intent is to prioritize measure-level NTGRs for HIMs, but the EDCs are encouraged to also provide program-level NTG information (i.e., to oversample HIMs), but they may also include non-HIMs in the research, as appropriate.

Table D-8 presents P4TD expenditures, by program, compared with the budget estimates set forth in the EE&C plan through PY17. All the dollars in Table D-8 are presented in nominal dollars.

Table D-8: Comparison of P4TD Expenditures to Phase IV EE&C Plan (\$1,000)

Program	Phase IV Budget from EE&C Plan through PY17	P4TD Actual Expenditures	Ratio (Actual/Plan)
Res Downstream Incentives	\$7,654	\$9,854	1.29
Res Midstream Incentives	\$214	\$109	0.51
Res Upstream Lighting	\$2,731	\$2,686	0.98
Appliance Recycling	\$2,589	\$2,767	1.07
Low-Income Energy Efficiency	\$13,980	\$11,207	0.80
Res Behavioral Energy Efficiency	\$3,336	\$3,798	1.14
Low-Income Behavioral Energy Efficiency	\$692	\$943	1.36
Small Business Direct Install	\$4,881	\$6,705	1.37
Small Business Downstream	\$9,409	\$5,563	0.59
Small Business Midstream	\$12,043	\$12,494	1.04
Small Business VCx	\$625	\$619	0.99
Large Commercial Downstream	\$19,466	\$14,664	0.75
Large Commercial Midstream	\$5,810	\$5,893	1.01
Large Commercial VCx	\$943	\$1,051	1.11
Large Industrial Downstream	\$6,249	\$5,614	0.90
Large Industrial Midstream	\$4,753	\$3,486	0.73
Large Industrial VCx	\$401	\$124	0.31
TOTAL	\$95,775	\$87,578	0.91

Source: Guidehouse analysis

Table D-9 compares PY17 verified gross program savings compared with the energy savings projections set forth in the EE&C plan.

Table D-9: Comparison of PY17 Actual Program Savings to EE&C Plan Projections for PY17

Program	EE&C Plan Projections for PY17	PY17 VTD Gross MWh Savings	Ratio (Actual/Plan)
Res Downstream Incentives	8,391	1,293	0.15
Res Midstream Incentives	143	0	0.00
Res Upstream Lighting	539	0	0.00
Appliance Recycling	1,903	1,306	0.69
Low-Income Energy Efficiency	4,193	5,373	1.28
Res Behavioral Energy Efficiency	8,643	6,084	0.70
Low-Income Behavioral Energy Efficiency	865	466	0.54
Small Business Direct Install	694	274	0.40
Small Business Downstream	8,481	211	0.02
Small Business Midstream	897	0	0.00
Small Business VCx	63	47	0.74
Large Commercial Downstream	27,264	29,534	1.08
Large Commercial Midstream	2,768	7,033	2.54
Large Commercial VCx	112	48	0.43
Large Industrial Downstream	4,658	4,828	1.04
Large Industrial Midstream	496	301	0.61
Large Industrial VCx	532	0	0.00
TOTAL	70,639	56,797	0.80

Source: Guidehouse analysis

Table D-10 compares Phase IV verified gross program savings with the energy savings projections set forth in the EE&C plan.

Table D-10: Comparison of Phase IV Actual Program Savings to EE&C Plan Projections for Phase IV

Program	EE&C Plan Through PY17	VTD Gross MWh Savings	Ratio (Actual/Plan)
Res Downstream Incentives	25,496	23,480	0.92
Res Midstream Incentives	384	7	0.02
Res Upstream Lighting	4,408	7,456	1.69
Appliance Recycling	7,192	6,650	0.92
Low-Income Energy Efficiency	16,587	14,797	0.89
Res Behavioral Energy Efficiency	39,797	33,719	0.85
Low-Income Behavioral Energy Efficiency	4,655	3,319	0.71
Small Business Direct Install	5,287	10,702	2.02
Small Business Downstream	41,494	29,856	0.72

Program	EE&C Plan Through PY17	VTD Gross MWh Savings	Ratio (Actual/Plan)
Small Business Midstream	44,943	57,431	1.28
Small Business VCx	1,665	2,851	1.71
Large Commercial Downstream	97,435	80,177	0.82
Large Commercial Midstream	18,560	38,528	2.08
Large Commercial VCx	3,791	4,099	1.08
Large Industrial Downstream	30,963	34,583	1.12
Large Industrial Midstream	16,784	20,881	1.24
Large Industrial VCx	1,595	0	0.00
TOTAL	361,036	368,535	1.02

Source: Guidehouse analysis

Appendix E. Evaluation Detail

E.1 Large and Small Business Solutions

Guidehouse evaluated the SBS and LBS (C&I) programs individually. Guidehouse calculated the minimum sample size needed to achieve at least 15% relative precision at 85% confidence level for calculating verified energy and demand savings. The population counts and sample sizes for the initiative are based on counts of unique projects identified by a unique Job ID (project) in the tracking database.

Guidehouse applied stratification based on total energy savings and assigned each project to various strata based on that project's energy savings. The large stratum includes projects in the upper portion of the program component's energy savings; the medium stratum includes projects in the middle portion of the energy savings; and the small stratum represents the bottom portion of the energy savings.

Table E-1: LBS and SBS Sample Design

Stratum	Stratum Boundaries	Population (Projects)	Historical CV (Energy)	Historical CV (Demand)	Sampled Projects (Inc PY16)
LBS - Certainty	MWh $\geq$ 1,000	1	-	-	2
LBS - Large	500 $\leq$ MWh < 1,000	21	0.11	0.19	9
LBS - Medium	100 $\leq$ MWh < 500	55	0.10	0.12	9
LBS - Small	MWh < 100	57	0.07	0.18	5
LBS Program Total		134			25
SBS - Large	MWh > 500	0	-	-	0
SBS - Medium	100 $\leq$ MWh < 500	1	0.08	0.15	1
SBS - Small	MWh < 100	0	-	-	0
SBS Program Total		1			1

Source: Guidehouse analysis

Table E-2: LBS and SBS Initiative Results (Energy)

Component	PYRTD MWh/yr	Energy Realization Rate	Sample C _v or Error Ratio	Relative Precision at 85% C.L.
SBS - Large	0	-	-	-
SBS - Medium	177	119%	-	0%
SBS - Small	0	-	-	-
SBS Program Total	177	118%	-	0%
LBS – Certainty (Commercial)	2,578	111%	-	0%
LBS – Large (Commercial)	14,659	96%	0.07	4%
LBS – Medium (Commercial)	11,392	93%	0.15	8%
LBS – Small (Commercial)	2,013	97%	0.14	11%
LBS – Certainty (Industrial)	-	-	-	-
LBS – Large (Industrial)	2,797	107%	0.14	18%
LBS – Medium (Industrial)	1,821	93%	0.14	8%
LBS – Small (Industrial)	130	97%	0.14	11%
LBS Program Total	35,390	97%	0.05	3%

Source: Guidehouse analysis

Table E-3: LBS and SBS Initiative Results (Demand)

Component	PYRTD MW/yr	Demand Realization Rate	Sample C _v or Error Ratio	Relative Precision at 85% C.L.
SBS - Large	0	-	-	-
SBS - Medium	0.02	103%	-	0%
SBS - Small	0	-	-	-
SBS Program Total	0.02	-	-	0%
LBS – Certainty (Commercial)	0.37	129%	-	0%
LBS – Large (Commercial)	2.51	111%	0.24	14%
LBS – Medium (Commercial)	2.47	102%	0.13	7%
LBS – Small (Commercial)	0.39	100%	0.28	22%
LBS – Large (Industrial)	0.52	90%	0.15	20%
LBS – Medium (Industrial)	0.32	102%	0.13	7%
LBS – Small (Industrial)	0.03	100%	0.27	22%
LBS Program Total	6.60	106%	0.11	6%

Source: Guidehouse analysis

[guidehouse.com](https://www.guidehouse.com)