



Philadelphia Gas Works  
Case Name: R-2020 BRC Rate Case TBA  
Docket No(s): BRC 2020 Rate Case

Response to Discovery Request: CAC-01-CAC-01-1  
Date of Response: 6/10/2020  
Response Provided By: Sarah C. Stoner

Question:

Please provide all discovery responses provided to all other parties in this proceeding.

Attachments: 0

Response:

PGW is using ShareFile to share discovery responses with the parties in this proceeding. On June 1, 2020, PGW provided counsel for Clean Air Council access to the ShareFile site.

Philadelphia Gas Works  
Case Name: R-2020 BRC Rate Case TBA  
Docket No(s): BRC 2020 Rate Case

Response to Discovery Request: CAC-01-CAC-01-2  
Date of Response: 6/10/2020  
Response Provided By: Denise Adamucci

Question:

Please provide all materials filed by PGW with the Pennsylvania Public Utility Commission concerning PGW's EnergySense Program and any other PGW energy efficiency programs since January 1, 2015.

Attachments: 8

CAC-01-2 Attachment A - LIURP 2015 Billing Analysis Report.pdf  
CAC-01-2 Attachment B - LIURP 2016 Billing Analysis Report.pdf  
CAC-01-2 Attachment C - LIURP 2016 Spend-Participation Report.pdf  
CAC-01-2 Attachment D - LIURP 2017 Billing Analysis Report.pdf  
CAC-01-2 Attachment E - LIURP 2017 Spend-Participation Report.pdf  
CAC-01-2 Attachment F - LIURP 2018 Billing Analysis Report.pdf  
CAC-01-2 Attachment G - LIURP 2018 Spend-Participation Report.pdf  
CAC-01-2 Attachment H - LIURP 2019 Spend-Participation Report.pdf

Response:

The requested materials about the PGW EnergySense program and PGW's other energy efficiency programs can be accessed at the following dockets: R-2009-2139884; P-2009-2097639; M-2013-2366301; P-2014-2459362; M-2016-2542415 and P-2020-3018867.

Attached are the following reports filed with the PUC about PGW's LIURP:

- LIURP Spend-Participation Report: This report provides the total spend, participation, and average job costs. It is filed annually with the PUC about jobs that were completed in the preceding year.
- LIURP Billing Analysis Report: This report provides an analysis of usage and billing in the year following the LIURP treatment. It is filed annually with the PUC about jobs that were completed two years prior.

## PUC LIURP ANNUAL REPORT

### TABLE 1a and Table 1b

The data reported in Table 1 now is separated into two tables: Table 1a applies to LIURP jobs only. Table 1b applies to coordinated jobs only. These are jobs coordinated with Act 129, WAP, LIHEAP Crisis and other resources, and/or jobs coordinated with another LIURP program. Separate tables are provided for reporting all costs associated with pilot programs.

The data reported in each table serves two purposes. First, each table captures program costs associated with field support, administration, post-installation inspections, no measures installed, health and safety, and coordination. Total program costs are obtained when these expenses are added to weatherization measures and education costs that are defined in the LIURP Codebook and reported in CSIS.

Secondly, the total costs associated for each pilot program, if any, are reported separately from the tables for LIURP and coordinated jobs. Pilot program costs include all the cost categories listed in the above table, as well as the measures and education expenses. (See explanation at LIURP Codebook, Weatherization Measure Variables.) It is necessary to report all pilot program costs separately in order to subtract this category from the overall LIURP base cost. The LIURP base cost is used to calculate the 15% administrative expense limit as agreed to by the Bureau of Consumer Services.

### Table 1a

Field Support Expenses are associated with non-central office functions related to the provision of direct program services. Field support functions include solicitation, intake, eligibility verification, field supervision and field data collection. Field support expenses may include insurance, field training, educational material production, and equipment costs. Equipment costs can include the purchase of an audit package that includes hardware, software and technical support. Field support expense excludes post-installation inspections that are reported separately.

Administrative Expenses are associated with utility *central office functions* such as program design, planning, budgeting, direction, control and evaluation. Administrative expenses should include utility central office personnel and equipment costs associated with program and fiscal management, data entry, recordkeeping and tracking, as well as filing and reporting to the PUC.

Post-Installation Inspection Expenses are associated with in-home inspections completed after LIURP measures are installed. These include inspections completed by utility staff, sub-contractors or third-party inspectors.

No Measures Installed Expenses are costs related to cases with no measures installed and no services provided beyond the first visit (pre-audit, audit, etc.). These cases are excluded from the data set in CSIS though are reported in Table 1a and Table 1b. *NOTE: If it is not possible to report these costs separately in Table 1a and Table 1b, include these cases in the data set.* Note that it is possible to report this cost in Table 1a and Table 1b, *and* include the cases in the LIURP data set.

*Be sure to inform the BCS in a cover letter of the option chosen.*

Reference: LIURP Codebook, Appendix D, Coding Addendum for Jobs Beginning January 1, 1994, #1.

Health and Safety Expenses can be code-related, non-weatherization improvements that allow for the installation of LIURP weatherization measures. These differ from incidental repairs (needed for installation and/or proper function of energy efficiency measures) and do not produce energy savings. Health and safety can include items such as carbon monoxide detectors or smoke alarms.

Pilot Program Expenses apply to designated pilot program plans filed with the PUC in the company's Universal Service plan, or in a subsequent filing. Report the total, non- categorized expenses for each pilot. Attach a detailed description of each pilot program.

### Table 1b

Inter-Utility Coordination are LIURP expenses incurred by the reporting company for jobs coordinated with another company's LIURP program.

Other Coordinated Jobs are LIURP-only expenses incurred for jobs that are coordinated with other programs such as Act 129, WAP, LIHEAP Crisis and other available programs.

## LIURP COST INFORMATION

TABLE 1a

NON-COORDINATED LIURP JOBS                      TOTAL ANNUAL COST

EXCLUDE COORDINATED JOBS REPORTED AT TABLE 1b BELOW.

Field Support	\$1,504,046
Administrative <sup>1</sup>	\$763,532
Post-Installation Inspections	\$58,191
No Measures Installed	
Health and Safety	\$115,907

TABLE 1b

COORDINATED JOBS                      TOTAL ANNUAL COST

Inter-Utility (LIURP-to-LIURP)	
Other Coordinated Jobs*	\$6,786

\*with Act 129, WAP, LIHEAP Crisis, etc.

PILOT PROGRAMS                      TOTAL ANNUAL COST

Pilot Program #1	
Pilot Program #2	
Pilot Program #3	
Pilot Program #4	

<sup>1</sup> In 2015 the PGW administrative costs allocated to the LIURP were allocated through the demand side management portfolio cost allocation model and reported on with the demand side management portfolio. These costs were not previously included in PGW's LIURP reports.

## PUC LIURP ANNUAL REPORT

### Table 2

The following questions pertain to LIURP program evaluation and comply with § 58.15(2). Using these questions as a guide, please present an analysis and discussion of your utility's Low Income Usage Reduction Program(s).

1. Beginning with the start of the pre-weatherization and through the close of the post-weatherization period, describe how usage changed among households that received program services. What are the energy savings for each job type?

We analyzed the gas usage data for the 3,707 customers<sup>2</sup> completed during 2015. We were able to produce reliable weather-normalized savings results for 3,192 of these customers. The average pre-treatment weather-normalized usage was 1,537 ccf/yr and the post treatment usage averaged 1,457 ccf/yr, yielding an average usage reduction of 81 ccf/yr. equal to 5.2% of pre-treatment usage (gross savings). Results from the impact evaluation indicate that a comparison group composed of 2016 participants experienced an increase in gas use (40 ccf, 2.6%), implying that net savings are greater than the gross savings indicate.

Overall, the average savings decreased from the 144 ccf/yr found in 2014. Compared to 2014, a higher proportion of jobs completed in 2015 received only limited treatments instead of comprehensive treatments (61% in 2015 compared to 43% in 2014). This rise was attributed to an increased focus by Conservation Service Providers on seeking greater cost-effectiveness by installing only core measures when the price of comprehensive weatherization was cost ineffective due to health, safety or structural issues complicating weatherization or low pre-treatment usage. The average savings differed by job type. For the 1,212 comprehensively closed jobs that received substantial measures, the average pre-treatment weather-normalized usage was 1,608 ccf/yr and the post treatment usage averaged 1,435 ccf/yr, yielding an average usage reduction of 173 ccf/yr. equal to 10.8% of pre-treatment usage (gross savings). For the 1,980 limited jobs that received minor measures, the average pre-treatment weather-normalized usage was 1,494 ccf/yr and the post treatment usage averaged 1,470 ccf/yr, yielding an average usage reduction of 24 ccf/yr. equal to 1.6% of pre-treatment usage (gross savings).

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<sup>2</sup> This analysis includes nine cases that were initially closed in 2015 and reopened for additional measures or follow-up repairs in 2016, totaling \$22,130.

2. How does this compare to the changes in total energy use including any supplemental sources of heat? How have health and safety measures contributed to the effectiveness of weatherization measures?

Supplemental heat is relatively rare among PGW customers and was not accounted for in the analysis. PGW recognizes that health and safety measures contribute to the effectiveness of weatherization measures, though has not fully quantified their effect. In its Universal Services Plan, PGW has proposed a health and safety pilot program that will enable PGW to better track the weatherization measures that can be performed as a result of health and safety improvements.

3. Electric utilities: Upon assessment, what is the impact of LIURP on patterns of usage? Where applicable, examine and describe shifts in usage during periods when service is more expensive compared with times when service is less expensive. Identify any financial impacts.

Not Applicable.

4. How has customer payment behavior changed? Have post-installation arrearage trends changed compared to pre-installation trends? To what extent have customers paid more consistently following weatherization?

CRP Home Comfort only serves customers enrolled in CRP. These customers pay a monthly amount based on a percent of their income, so we expect a limited relationship between LIURP treatments and bill payment behavior while customers are enrolled in CRP. Education provided about CRP may affect payment behavior, but observed changes for customers enrolled in CRP may also be due to changes in customer incomes or fuel assistance program details. However, since customers enter and exit the CRP over time, some 2015 LIURP participants exited the CRP in the year following LIURP service, while others remained in CRP. With these caveats in mind, the table below provides data on average bills, payments and arrearages for the 2,821 CRP Home Comfort customers with complete data, both those who left and who remained on the CRP.

	Year		Change
	Pre-Treatment	Post-Treatment	
Bill Amounts (asked-to-pay)	\$1,247	\$1,154	-\$92
Customer Payments	\$1,004	\$985	-\$19



Fuel Assistance	\$176	\$167	-\$9
Total Payments	\$1,180	\$1,152	-\$28
Arrearage start of year	\$956	\$892	
Arrearage: end of year	\$931	\$761	
Arrearage: change over year	-\$26	-\$131	-\$105

The table shows a significant overall decrease in natural gas bills in the year after LIURP treatment. Customer payments decreased slightly by \$19 and fuel assistance declined by \$9 yielding a net \$28 decrease in payments. Because the bills decreased more than the payments decreased during the post period, the level of arrearages also decreased during the post treatment.

5. Other than spending and production goals, what were the general and specific goals for LIURP during the reported year? Explain how these goals were or were not met?

CRP Home Comfort seeks to provide cost-effective energy savings to low-income customers who participate in PGW's Customer Responsibility Program (CRP). A secondary goal of the program is to reduce the overall long-term cost of the CRP as paid by all firm customers. We believe these goals were met as the program continued to produce significant energy savings.

6. Describe steps taken to modify and improve program effectiveness. How has the company's experience with LIURP contribute to modifying management of the program? How was technical information and data collection used to modify and improve LIURP?

PGW has utilized information from LIURP evaluations to modify CRP Home Comfort over time to improve effectiveness. PGW periodically conducts a thorough impact evaluation by an independent evaluator and uses the results of these evaluations to assess program success, compare performance among Conservation Service Providers (CSPs), and provide recommendations for program changes. PGW also employs a rigorous quality assurance inspection process to inspect individual projects, both targeted and at random, to evaluate the work quality of its CSPs. In addition, PGW conducts bi-annual evaluations of each CSP to assess performance on criteria including estimated gas savings and project work quality and allocates program funds based on the results of the review.

7. Describe how the company coordinates and manages LIURP with other weatherization programs such as Act 129, DCED's Weatherization Assistance Program (WAP) and LIHEAP Crisis.

Include coordination with available regional or temporary programs. Indicate the ability or inability to overcome any barriers to coordination.

PGW coordinates with Habitat for Humanity and the Philadelphia Department of Public Health's Healthy Homes Program to address specific health and safety needs required to be completed before PGW could proceed with weatherization. In order to make referrals to the programs, all CRP Home Comfort customers are asked to sign an authorization form stating that PGW is allowed to share customer information with specifically identified coordinating agencies. In cases identified for potential coordination, the CSP shares its audit report with the coordinating agency describing the health and safety measures that are preventing comprehensive weatherization. The coordinating agency reviews the improvements needed and, if it is able to, will address the issues. After the coordinating agencies' work on the house is completed, PGW's CSP will return to complete the comprehensive LIURP weatherization.

This process has produced benefits for a small number of houses each year. PGW has made progress with partnerships by streamlining the customer authorization process for referrals. However, the additional oversight and administrative time required prevent it from being easily scaled up to serve a large number of homes in the program. The different eligibility requirements of the programs also inhibit broader coordination.

## PUC LIURP ANNUAL REPORT

### TABLE 1a and Table 1b

The data reported in Table 1 now is separated into two tables: Table 1a applies to LIURP jobs only. Table 1b applies to coordinated jobs only. These are jobs coordinated with Act 129, WAP, LIHEAP Crisis and other resources, and/or jobs coordinated with another LIURP program. Separate tables are provided for reporting all costs associated with pilot programs.

The data reported in each table serves two purposes. First, each table captures program costs associated with field support, administration, post-installation inspections, no measures installed, health and safety, and coordination. Total program costs are obtained when these expenses are added to weatherization measures and education costs that are defined in the LIURP Codebook and reported in CSIS.

Secondly, the total costs associated for each pilot program, if any, are reported separately from the tables for LIURP and coordinated jobs. Pilot program costs include all the cost categories listed in the above table, as well as the measures and education expenses. (See explanation at LIURP Codebook, Weatherization Measure Variables.) It is necessary to report all pilot program costs separately in order to subtract this category from the overall LIURP base cost. The LIURP base cost is used to calculate the 15% administrative expense limit as agreed to by the Bureau of Consumer Services.

### Table 1a

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No Measures Installed Expenses are costs related to cases with no measures installed and no services provided beyond the first visit (pre-audit, audit, etc.). These cases are excluded from the data set in CSIS though are reported in Table 1a and Table 1b. *NOTE: If it is not possible to report these costs separately in Table 1a and Table 1b, include these cases in the data set.* Note that it is possible to report this cost in Table 1a and Table 1b, *and* include the cases in the LIURP data set.

*Be sure to inform the BCS in a cover letter of the option chosen.*

Reference: LIURP Codebook, Appendix D, Coding Addendum for Jobs Beginning January 1, 1994, #1.

Health and Safety Expenses can be code-related, non-weatherization improvements that allow for the installation of LIURP weatherization measures. These differ from incidental repairs (needed for installation and/or proper function of energy efficiency measures) and do not produce energy savings. Health and safety can include items such as carbon monoxide detectors or smoke alarms.

Pilot Program Expenses apply to designated pilot program plans filed with the PUC in the company's Universal Service plan, or in a subsequent filing. Report the total, non- categorized expenses for each pilot. Attach a detailed description of each pilot program.

### Table 1b

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Other Coordinated Jobs are LIURP-only expenses incurred for jobs that are coordinated with other programs such as Act 129, WAP, LIHEAP Crisis and other available programs.

## LIURP COST INFORMATION

TABLE 1a

NON-COORDINATED LIURP JOBS                      TOTAL ANNUAL COST

EXCLUDE COORDINATED JOBS REPORTED AT TABLE 1b BELOW.

Field Support	\$1,567,156
Administrative	\$520,026 <sup>1</sup>
Post-Installation Inspections	\$47,687
No Measures Installed	
Health and Safety	\$141,215

TABLE 1b

COORDINATED JOBS                      TOTAL ANNUAL COST

Inter-Utility (LIURP-to-LIURP)	
Other Coordinated Jobs*	\$6,221

\*with Act 129, WAP, LIHEAP Crisis, etc.

PILOT PROGRAMS                      TOTAL ANNUAL COST

Pilot Program #1	
Pilot Program #2	
Pilot Program #3	
Pilot Program #4	

<sup>1</sup> Administrative costs include the PGW administrative costs allocated to the LIURP that were allocated through the demand side management portfolio cost allocation model and reported on with the demand side management portfolio. These costs were not previously included in PGW's LIURP reporting on the calendar year 2016.

## PUC LIURP ANNUAL REPORT

### Table 2

The following questions pertain to LIURP program evaluation and comply with § 58.15(2). Using these questions as a guide, please present an analysis and discussion of your utility's Low Income Usage Reduction Program(s).

1. Beginning with the start of the pre-weatherization and through the close of the post-weatherization period, describe how usage changed among households that received program services. What are the energy savings for each job type?

We analyzed the gas usage data for the 3,814 customers<sup>2</sup> completed during 2016. We were able to produce reliable weather-normalized savings results for 3,298 of these customers. The average pre-treatment weather-normalized usage was 1,574 ccf/yr and the post treatment usage averaged 1,473 ccf/yr, yielding an average usage reduction of 101 ccf/yr. equal to 6.4% of pre-treatment usage (gross savings). Results from the impact evaluation indicate that a comparison group composed of 2017 participants experienced an increase in gas use (70 ccf, 4.3%), implying that net savings are greater than the gross savings indicate.

Overall, the average savings increased from the 81 ccf/yr found in 2015. Compared to 2015, a higher proportion of jobs completed in 2016 received comprehensive treatments (47% in 2016 compared to 39% in 2015). The average savings differed by job type. For the 1,555 comprehensively closed jobs that received substantial measures, the average pre-treatment weather-normalized usage was 1,603 ccf/yr and the post treatment usage averaged 1,425 ccf/yr, yielding an average usage reduction of 177 ccf/yr. equal to 11.1% of pre-treatment usage (gross savings). For the 1,743 limited jobs that received minor measures, the average pre-treatment weather-normalized usage was 1,548 ccf/yr and the post treatment usage averaged 1,516 ccf/yr, yielding an average usage reduction of 33 ccf/yr. equal to 2.1% of pre-treatment usage (gross savings).

2. How does this compare to the changes in total energy use including any supplemental sources of heat? How have health and safety measures contributed to the effectiveness of weatherization measures?

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<sup>2</sup> The 3,814 customers reported herein amends the 3,815 figure reported in March 2017, which included one additional customer in error.

Supplemental heat is relatively rare among PGW customers and was not accounted for in the analysis. PGW recognizes that health and safety measures contribute to the effectiveness of weatherization measures, though has not fully quantified their effect. PGW will begin tracking the incremental impact of health and safety measures through implementation of its health and safety pilot program, approved as part of the 2017 – 2020 Universal Services Plan.

3. Electric utilities: Upon assessment, what is the impact of LIURP on patterns of usage? Where applicable, examine and describe shifts in usage during periods when service is more expensive compared with times when service is less expensive. Identify any financial impacts.

Not Applicable.

4. How has customer payment behavior changed? Have post-installation arrearage trends changed compared to pre-installation trends? To what extent have customers paid more consistently following weatherization?

In 2016, PGW's LIURP served customers enrolled in CRP. These customers pay a monthly amount based on a percent of their income, so we expect a limited relationship between LIURP treatments and bill payment behavior while customers are enrolled in CRP. Education provided about CRP may affect payment behavior, but observed changes for customers enrolled in CRP may also be due to changes in customer incomes or fuel assistance program details. However, since customers enter and exit the CRP over time, some 2016 LIURP participants exited the CRP in the year following LIURP service, while others remained in CRP. With these caveats in mind, the table below provides data on average bills, payments and arrearages for the 2,892 CRP Home Comfort customers with complete data, both those who left and who remained on the CRP.

	Year		Change
	Pre-Treatment	Post-Treatment	
Bill Amounts (asked-to-pay)	\$1,171	\$1,173	+\$2
Customer Payments	\$959	\$927	-\$31
Fuel Assistance	\$170	\$190	+\$20
Total Payments	\$1,129	\$1,117	-\$11
Arrearage start of year	\$928	\$776	
Arrearage: end of year	\$829	\$681	
Arrearage: change over year	-\$98	-\$95	+\$3

The table shows that natural gas bills in the year after LIURP treatment were about the same as in the year before LIURP. Customer payments decreased slightly by \$31 and fuel assistance increased by \$20 yielding a net \$11 decrease in payments.

5. Other than spending and production goals, what were the general and specific goals for LIURP during the reported year? Explain how these goals were or were not met?

In 2016, CRP Home Comfort sought to provide cost-effective energy savings to low-income customers who participate in PGW's Customer Responsibility Program (CRP). We believe this goal was met as the program continued to produce significant energy savings.

6. Describe steps taken to modify and improve program effectiveness. How has the company's experience with LIURP contribute to modifying management of the program? How was technical information and data collection used to modify and improve LIURP?

PGW has utilized information from LIURP evaluations and the outcomes of its quality assurance inspections to modify CRP Home Comfort over time to improve effectiveness. PGW periodically hires an independent evaluator to conduct a thorough impact evaluation to assess program success, compare performance among Conservation Service Providers (CSPs), and provide recommendations for program changes. In addition to the independent evaluator's review, PGW conducts its own bi-annual evaluations of each CSP to assess performance on criteria including estimated gas savings and project work quality and allocates program funds based on the results of the review. PGW also employs a rigorous quality assurance inspection process to inspect individual projects, both targeted and at random, to evaluate the work quality of its CSPs.

7. Describe how the company coordinates and manages LIURP with other weatherization programs such as Act 129, DCED's Weatherization Assistance Program (WAP) and LIHEAP Crisis.

Include coordination with available regional or temporary programs. Indicate the ability or inability to overcome any barriers to coordination.

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identified coordinating agencies. In cases identified for potential coordination, the CSP shares its audit report with the coordinating agency describing the health and safety measures that are preventing comprehensive weatherization. The coordinating agency reviews the improvements needed and, if it is able to, will address the issues. After the coordinating agencies' work on the house is completed, PGW's CSP will return to complete the comprehensive LIURP weatherization.

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COMMONWEALTH OF PENNSYLVANIA  
PENNSYLVANIA PUBLIC UTILITY COMMISSION  
P.O. BOX 3265, HARRISBURG, PA 17105-3265

IN REPLY PLEASE  
REFER TO OUR FILE

February 1, 2017

Dear LIURP Manager:

I am requesting the following information regarding your company's Low Income Usage Reduction Program (LIURP). Please use the attached table for your response.

1. 2016 LIURP spending;
2. 2017 LIURP projected budget;
- 2.A 2017 Over/Under Carryover\*;
3. 2016 completed LIURP heating jobs;
4. 2017 projected LIURP heating jobs;
5. 2016 average cost for heating job; Method 1 and Method 2

For your convenience, I have numbered the cells in the table to match the requested items listed above.

Please submit your response to Sarah Dewey, [sdewey@pa.gov](mailto:sdewey@pa.gov) by February 28, 2017. If you need more time, then let me know when I can expect to have the data. Thank you for your cooperation and please feel free to call me at (717) 705-4029 or send me an e-mail if you have any questions.

Sincerely,

Sarah L. Dewey  
Policy Analyst III  
Bureau of Consumer Services

Attachment

Company Name: PGW

	2016	2017 <sup>1</sup>
<b>LIURP Spending<sup>2</sup></b>	<b>1. \$7,598,605</b>	
<b>LIURP Budget</b>		<b>2. \$5,179,225<sup>3</sup></b>
<b>Carry-over amount*</b>		<b>2A. \$0</b>
<b>Completed Jobs:</b>		
<b>Heating</b>	<b>3. 3,815</b>	<b>4. 2,587</b>
<b>Water Heating</b>	<b>5. 0</b>	<b>6. 0</b>
<b>Average Cost Per Job:</b>		
<b>Heating - Method 1</b>	<b>7A. \$1,562</b>	
<b>Heating - Method 2</b>	<b>7B. \$1,992</b>	

**\*If the Budget figure reported in Box #2 includes any over/under funding from the previous year, please indicate that amount in Box #2A.**

<sup>1</sup> Participation and budget reflects single family LIURP budget and does not include PGW's Low Income Multifamily Efficiency ("LIME") program launched pursuant to the Commission's Final Order on PGW's 2014-2016 Universal Services and Energy Conservation Plan. PGW's 2017 budget for LIME is \$160,065 and is expected to treat three buildings.

<sup>2</sup> Total reduced by \$39,785 from the figure initially reported on February 27, 2017.

<sup>3</sup> The CY 2017 forecasts above are based on PGW's prorated approved FY 2017 LIURP budget, and PGW's prorated September 2017 – December 2017 LIURP budget proposed in the ongoing Universal Services and Energy Conservation Plan proceeding. As such, these CY 2017 forecasts are subject to change, pending a Commission final order on the LIURP spend.

## PUC LIURP ANNUAL REPORT

### TABLE 1a and Table 1b

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The data reported in each table serves two purposes. First, each table captures program costs associated with field support, administration, post-installation inspections, no measures installed, health and safety, and coordination. Total program costs are obtained when these expenses are added to weatherization measures and education costs that are defined in the LIURP Codebook and reported in CSIS.

Secondly, the total costs associated for each pilot program, if any, are reported separately from the tables for LIURP and coordinated jobs. Pilot program costs include all the cost categories listed in the above table, as well as the measures and education expenses. (See explanation at LIURP Codebook, Weatherization Measure Variables.) It is necessary to report all pilot program costs separately in order to subtract this category from the overall LIURP base cost. The LIURP base cost is used to calculate the 15% administrative expense limit as agreed to by the Bureau of Consumer Services.

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*Be sure to inform the BCS in a cover letter of the option chosen.*

Reference: LIURP Codebook, Appendix D, Coding Addendum for Jobs Beginning January 1, 1994, #1.

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### Table 1b

Inter-Utility Coordination are LIURP expenses incurred by the reporting company for jobs coordinated with another company's LIURP program.

Other Coordinated Jobs are LIURP-only expenses incurred for jobs that are coordinated with other programs such as Act 129, WAP, LIHEAP Crisis and other available programs.

## LIURP COST INFORMATION

TABLE 1a

NON-COORDINATED LIURP JOBS                      TOTAL ANNUAL COST

EXCLUDE COORDINATED JOBS REPORTED AT TABLE 1b BELOW.

Field Support	\$ 1,274,375
Administrative	\$ 466,037 <sup>1</sup>
Post-Installation Inspections	\$ 73,093
No Measures Installed	
Health and Safety	\$ 70,185

TABLE 1b

COORDINATED JOBS                      TOTAL ANNUAL COST

Inter-Utility (LIURP-to-LIURP)	
Other Coordinated Jobs*	\$ 25,724

\*with Act 129, WAP, LIHEAP Crisis, etc.

PILOT PROGRAMS                      TOTAL ANNUAL COST

Low Income Multifamily Efficiency (LIME) Pilot	\$70,063 <sup>2</sup>
Pilot Program #2	
Pilot Program #3	
Pilot Program #4	

<sup>1</sup> Administrative costs include the PGW administrative costs allocated to the LIURP that were allocated through the demand side management portfolio cost allocation model and reported on with the demand side management portfolio.

<sup>2</sup> Landlords contributed an additional \$4,819 towards gas conservation measures installed under the pilot.

## PUC LIURP ANNUAL REPORT

### Table 2

The following questions pertain to LIURP program evaluation and comply with § 58.15(2). Using these questions as a guide, please present an analysis and discussion of your utility's Low Income Usage Reduction Program(s).

1. Beginning with the start of the pre-weatherization and through the close of the post-weatherization period, describe how usage changed among households that received program services. What are the energy savings for each job type?

#### Single-family LIURP

We analyzed the gas usage data for the 2,113 single family customers completed during 2017. We were able to produce reliable weather-normalized savings results for 1,895 of these customers. The average pre-treatment weather-normalized usage was 1,750 ccf/yr and the post-treatment usage averaged 1,537 ccf/yr, yielding an average usage reduction of 213 ccf/yr equal to 12.2% of pre-treatment usage (gross savings). Results from the impact evaluation indicate that a comparison group composed of 2018 participants experienced an increase in gas use (13 ccf, 0.8%). This results in a net savings of 226 ccf or 13%.

Overall, the average savings increased from the 171 ccf/yr and 10.9% of pre-treatment net savings found in 2016. Compared to 2016, a higher proportion of jobs completed in 2017 received comprehensive treatments (52% in 2017 compared to 47% in 2016). The average savings differed by job type. For the 984 comprehensively closed jobs that received substantial measures, the average pre-treatment weather-normalized usage was 1,802 ccf/yr and the post treatment usage averaged 1,503 ccf/yr, yielding an average usage reduction of 299 ccf/yr equal to 16.6% of pre-treatment usage (gross savings). For the 911 limited jobs that received minor measures, the average pre-treatment weather-normalized usage was 1,694 ccf/yr and the post treatment usage averaged 1,574 ccf/yr, yielding an average usage reduction of 120 ccf/yr. equal to 7.1% of pre-treatment usage (gross savings).

#### Low Income Multi-Family Efficiency (LIME) Pilot

In 2017, PGW implemented a LIURP Pilot that treated multifamily buildings. We analyzed the gas usage data for the five buildings that completed during 2017. The average pre-treatment weather-normalized usage was 15,852 ccf/yr and the post-

treatment usage averaged 14,907 ccf/yr, yielding an average usage reduction of 944 ccf/yr equal to 6.0% of pre-treatment usage (gross savings).

2. How does this compare to the changes in total energy use including any supplemental sources of heat? How have health and safety measures contributed to the effectiveness of weatherization measures?

Supplemental heat is relatively rare among PGW customers and was not accounted for in the analysis. PGW recognizes that health and safety measures contribute to the effectiveness of weatherization measures, though has not fully quantified their effect. PGW began tracking the incremental impact of health and safety measures in September 2018 through implementation of its health and safety pilot program, approved as part of the 2017 – 2020 Universal Services Plan.

3. Electric utilities: Upon assessment, what is the impact of LIURP on patterns of usage? Where applicable, examine and describe shifts in usage during periods when service is more expensive compared with times when service is less expensive. Identify any financial impacts.

Not Applicable.

4. How has customer payment behavior changed? Have post-installation arrearage trends changed compared to pre-installation trends? To what extent have customers paid more consistently following weatherization?

#### Single-family LIURP<sup>3</sup>

In 2017, PGW's LIURP served customers enrolled in CRP. These customers pay a monthly amount based on a percent of their income, so we expect a limited relationship between LIURP treatments and bill payment behavior while customers are enrolled in CRP. Education provided about CRP may affect payment behavior, but observed changes for customers enrolled in CRP may also be due to changes in customer incomes or fuel assistance program details. However, since customers enter and exit the CRP over time, some 2017 LIURP participants exited the CRP in the year following LIURP service, while others remained in CRP. With these caveats in mind, the table below provides data on average bills, payments, and arrearages for the 1,704 CRP Home Comfort customers with complete data, both those who left and who remained on the CRP.

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Year

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<sup>3</sup> The LIME pilot is excluded from this analysis because projects are reported at the whole-building level and included master metered buildings.



	Pre-Treatment	Post-Treatment	Change
Bill Amounts (asked-to-pay)	\$1,172	\$1,158	-\$14
Customer Payments	\$862	\$949	+\$87
Fuel Assistance	\$199	\$158	-\$41
Total Payments	\$1,061	\$1,107	+\$46
Arrearage start of year	\$918	\$802	
Arrearage: end of year	\$830	\$682	
Arrearage: change over year	-\$88	-\$120	-\$32

The table shows that natural gas bills in the year after LIURP treatment were on average \$14 lower than the year before LIURP. Customer payments increased by \$87 and fuel assistance decreased by \$41 yielding a net \$46 increase in payments.

5. Other than spending and production goals, what were the general and specific goals for LIURP during the reported year? Explain how these goals were or were not met?

#### Single-family LIURP

In 2017, CRP Home Comfort sought to provide cost-effective energy savings to low-income customers who participate in PGW's Customer Responsibility Program (CRP). We believe this goal was met as the program continued to produce significant energy savings.

#### Low Income Multi-Family Efficiency (LIME) Pilot

PGW began its LIME pilot in 2017. During this initial year, PGW's goals were to design its program processes, select a vendor to provide conservation services, and begin establishing a pipeline of project leads. In addition to its work to establish the pilot, PGW completed the first five projects in coordination with PECO's Act 129 program and the Philadelphia Energy Authority.

6. Describe steps taken to modify and improve program effectiveness. How has the company's experience with LIURP contribute to modifying management of the program? How was technical information and data collection used to modify and improve LIURP?

PGW has utilized information from LIURP evaluations and the outcomes of its quality assurance inspections to modify CRP Home Comfort over time to improve effectiveness. PGW periodically hires an independent evaluator to conduct a thorough impact evaluation to assess program success, compare performance among Conservation Service Providers (CSPs), and provide recommendations for program

changes. In addition to the independent evaluator's review, PGW conducts its own bi-annual evaluations of each CSP to assess performance on criteria including estimated gas savings and project work quality and allocates program funds based on the results of the review. PGW also employs a rigorous quality assurance inspection process to inspect individual projects, both targeted and at random, to evaluate the work quality of its CSPs.

7. Describe how the company coordinates and manages LIURP with other weatherization programs such as Act 129, DCED's Weatherization Assistance Program (WAP) and LIHEAP Crisis. Include coordination with available regional or temporary programs. Indicate the ability or inability to overcome any barriers to coordination.

PGW coordinates with Habitat for Humanity and the Philadelphia Department of Public Health's Healthy Homes Program to address specific health and safety needs required to be completed before PGW can proceed with weatherization. In order to make referrals to the programs, all CRP Home Comfort customers are asked to sign an authorization form stating that PGW is allowed to share customer information with specifically identified coordinating agencies. In cases identified for potential coordination, the CSP shares its audit report with the coordinating agency describing the health and safety measures that are preventing comprehensive weatherization. The coordinating agency reviews the improvements needed and, if it is able to, will address the issues. After the coordinating agencies' work on the house is completed, PGW's CSP will return to complete the comprehensive LIURP weatherization.

This process has produced benefits for a small number of houses each year. PGW has made progress with partnerships by streamlining the customer authorization process for referrals. However, the additional oversight and administrative time required prevent it from being easily scaled up to serve a large number of homes in the program. The different eligibility requirements of the programs also inhibit broader coordination.

PGW separately coordinated in 2017 with PECO's Act 129 program on two initiatives. First, PGW and PECO coordinated through a mutual CSP to perform combined energy audits that identify qualifying energy conservation and related measures for both utilities' weatherization programs during a single visit. This CSP completed a two-week pilot in 2017 to evaluate the feasibility, effectiveness, and impact of performing a single energy audit to address both gas and electric measures. The effort was successful, and in 2018 the CSP began offering coordinated services regularly.

Second, PGW and PECO coordinated around the efficient delivery of weatherization services in multifamily buildings in PGW's LIME pilot. A single CSP administers the low income multifamily program for both PGW and PECO. The CSP was able to evaluate both

gas and electric savings opportunities at a single site visit, and coordinated the installation of these measures.



COMMONWEALTH OF PENNSYLVANIA  
PENNSYLVANIA PUBLIC UTILITY COMMISSION  
P.O. BOX 3265, HARRISBURG, PA 17105-3265

IN REPLY PLEASE  
REFER TO OUR FILE

February 5, 2018

Dear LIURP Manager:

I am requesting the following information regarding your company's Low Income Usage Reduction Program (LIURP). Please use the attached table for your response.

1. 2017 LIURP spending;
2. 2018 LIURP projected budget;
- 2.A 2018 Over/Under Carryover\*;
3. 2017 completed LIURP heating jobs;
4. 2018 projected LIURP heating jobs;
5. 2017 average cost for heating job; Method 1 and Method 2

For your convenience, I have numbered the cells in the table to match the requested items listed above.

Please submit your response to Sarah Dewey, [sdewey@pa.gov](mailto:sdewey@pa.gov) by February 28, 2018. If you need more time, then let me know when I can expect to have the data. Thank you for your cooperation and please feel free to call me at (717) 705-4029 or send me an e-mail if you have any questions.

Sincerely,

Sarah L. Dewey  
Policy Analyst III  
Bureau of Consumer Services

Attachment

Company Name: PGW

	2017	2018
<b>LIURP Spending<sup>1</sup></b>	<b>1. \$5,239,743</b>	
<b>LIURP Budget</b>		<b>2. \$7,988,818</b>
<b>Carry-over amount:</b>		<b>2A. \$0</b>
<b>Completed Jobs:<sup>2</sup></b>		
<b>Heating</b>	<b>3. 2,118</b>	<b>4. 3,293</b>
<b>Water Heating</b>	<b>5. 0</b>	<b>6. 0</b>
<b>Average Cost Per Job:</b>		
<b>Heating - Method 1</b>	<b>7A. \$1,651</b>	
<b>Heating - Method 2</b>	<b>7B. \$2,474</b>	

**\*If the Budget figure reported in Box #2 includes any over/under funding from the previous year, please indicate the amount of carryover in Box #2A.**

<sup>1</sup> Spending total includes programmatic and administrative costs (including labor) for the single family Home Comfort program and the Low Income Multifamily Efficiency (LIME) program.

<sup>2</sup> Completed jobs include single family homes treated in the Home Comfort program, and multifamily buildings treated in the LIME program.

## PUC LIURP ANNUAL REPORT

### TABLE 1a and Table 1b

The data reported in Table 1 now is separated into two tables: Table 1a applies to LIURP jobs only. Table 1b applies to coordinated jobs only. These are jobs coordinated with Act 129, WAP, LIHEAP Crisis and other resources, and/or jobs coordinated with another LIURP program. Separate tables are provided for reporting all costs associated with pilot programs.

The data reported in each table serves two purposes. First, each table captures program costs associated with field support, administration, post-installation inspections, no measures installed, health and safety, and coordination. Total program costs are obtained when these expenses are added to weatherization measures and education costs that are defined in the LIURP Codebook and reported in CSIS.

Secondly, the total costs associated for each pilot program, if any, are reported separately from the tables for LIURP and coordinated jobs. Pilot program costs include all the cost categories listed in the above table, as well as the measures and education expenses. (See explanation at LIURP Codebook, Weatherization Measure Variables.) It is necessary to report all pilot program costs separately in order to subtract this category from the overall LIURP base cost. The LIURP base cost is used to calculate the 15% administrative expense limit as agreed to by the Bureau of Consumer Services.

### Table 1a

Field Support Expenses are associated with non-central office functions related to the provision of direct program services. Field support functions include solicitation, intake, eligibility verification, field supervision and field data collection. Field support expenses may include insurance, field training, educational material production, and equipment costs. Equipment costs can include the purchase of an audit package that includes hardware, software and technical support. Field support expense excludes post-installation inspections that are reported separately.

Administrative Expenses are associated with utility *central office functions* such as program design, planning, budgeting, direction, control and evaluation. Administrative expenses should include utility central office personnel and equipment costs associated with program and fiscal management, data entry, recordkeeping and tracking, as well as filing and reporting to the PUC.

Post-Installation Inspection Expenses are associated with in-home inspections completed after LIURP measures are installed. These include inspections completed by utility staff, sub-contractors or third-party inspectors.

No Measures Installed Expenses are costs related to cases with no measures installed and no services provided beyond the first visit (pre-audit, audit, etc.). These cases are excluded from the data set in CSIS though are reported in Table 1a and Table 1b. *NOTE: If it is not possible to report these costs separately in Table 1a and Table 1b, include these cases in the data set.* Note that it is possible to report this cost in Table 1a and Table 1b, *and* include the cases in the LIURP data set.

*Be sure to inform the BCS in a cover letter of the option chosen.*

Reference: LIURP Codebook, Appendix D, Coding Addendum for Jobs Beginning January 1, 1994, #1.

Health and Safety Expenses can be code-related, non-weatherization improvements that allow for the installation of LIURP weatherization measures. These differ from incidental repairs (needed for installation and/or proper function of energy efficiency measures) and do not produce energy savings. Health and safety can include items such as carbon monoxide detectors or smoke alarms.

Pilot Program Expenses apply to designated pilot program plans filed with the PUC in the company's Universal Service plan, or in a subsequent filing. Report the total, non- categorized expenses for each pilot. Attach a detailed description of each pilot program.

### Table 1b

Inter-Utility Coordination are LIURP expenses incurred by the reporting company for jobs coordinated with another company's LIURP program.

Other Coordinated Jobs are LIURP-only expenses incurred for jobs that are coordinated with other programs such as Act 129, WAP, LIHEAP Crisis and other available programs.

## LIURP COST INFORMATION

TABLE 1a

NON-COORDINATED LIURP JOBS                      TOTAL ANNUAL COST

EXCLUDE COORDINATED JOBS REPORTED AT TABLE 1b BELOW.

Field Support	\$1,597,068
Administrative	\$370,278 <sup>1</sup>
Post-Installation Inspections	\$61,128
No Measures Installed	
Health and Safety	\$115,179

TABLE 1b

COORDINATED JOBS                      TOTAL ANNUAL COST

Inter-Utility (LIURP-to-LIURP)	
Other Coordinated Jobs*	\$468,794

\*with Act 129, WAP, LIHEAP Crisis, etc.

PILOT PROGRAMS                      TOTAL ANNUAL COST

Low Income Multifamily Efficiency (LIME) Pilot	\$19,317 <sup>2</sup>
Health & Safety Pilot	\$3,936 <sup>3</sup>

<sup>1</sup> Administrative costs include the PGW administrative costs allocated to the LIURP that were allocated through the demand side management portfolio cost allocation model and reported on with the demand side management portfolio.

<sup>2</sup> Landlords contributed an additional \$288 towards gas conservation measures installed under the pilot.

<sup>3</sup> This figure is the cost of health and safety measures that were excluded from jobs' cost-effectiveness reviews for cases closed within 2018.



Pilot Program #3	
Pilot Program #4	

## PUC LIURP ANNUAL REPORT

### Table 2

The following questions pertain to LIURP program evaluation and comply with § 58.15(2). Using these questions as a guide, please present an analysis and discussion of your utility's Low Income Usage Reduction Program(s).

1. Beginning with the start of the pre-weatherization and through the close of the post-weatherization period, describe how usage changed among households that received program services. What are the energy savings for each job type?

#### Single-family LIURP

We analyzed the gas usage data for the 2,465 single family customers completed during 2018.<sup>4</sup> We were able to produce reliable weather-normalized savings results for 2,119 of these customers. The average pre-treatment weather-normalized usage was 1,671 ccf/yr and the post-treatment usage averaged 1,524 ccf/yr, yielding an average usage reduction of 147 ccf/yr, equal to 8.8% of pre-treatment usage (gross savings). Results from the impact evaluation indicate that a comparison group composed of 2019 participants experienced a decrease in gas use (18 ccf, 1.2%). This results in a net savings of 129 ccf or 7.7%.

Overall, the average savings decreased from the 213 ccf/yr and 12.2% of pre-treatment net savings found in 2017. Compared to 2017, a lower proportion of jobs completed in 2018 received comprehensive treatments (41% in 2018 compared to 52% in 2017). The average savings differed by job type. For the 876 comprehensively closed jobs that received substantial measures, the average pre-treatment weather-normalized usage was 1,707 ccf/yr and the post treatment usage averaged 1,446 ccf/yr, yielding an average usage reduction of 261 ccf/yr, equal to 15.3% of pre-treatment usage (gross savings). For the 1,243 limited jobs that received minor measures, the average pre-treatment weather-normalized usage was 1,645 ccf/yr and the post treatment usage averaged 1,579 ccf/yr, yielding an average usage reduction of 67 ccf/yr, equal to 4.0% of pre-treatment usage (gross savings).

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<sup>4</sup> This figure excludes eight homes that were included in the job count on the 2019 short form report, but which were later discovered to have no measures installed and no billed costs.

## Low Income Multi-Family Efficiency (LIME) Pilot

In 2018, PGW continued to implement a LIURP Pilot that treated multifamily buildings. We analyzed the gas usage data for the 13 buildings completed during 2018. The average pre-treatment weather-normalized usage was 2,398 ccf/yr and the post-treatment usage averaged 2,265 ccf/yr, yielding an average usage reduction of 132 ccf/yr, equal to 5.5% of pre-treatment usage (gross savings).<sup>5</sup>

2. How does this compare to the changes in total energy use including any supplemental sources of heat? How have health and safety measures contributed to the effectiveness of weatherization measures?

Supplemental heat is relatively rare among PGW customers and was not accounted for in the analysis. PGW recognizes that health and safety measures contribute to the effectiveness of weatherization measures, though has not fully quantified their effect. PGW began tracking the incremental impact of health and safety measures in September 2018 through implementation of its health and safety pilot program, approved as part of the 2017 – 2020 Universal Services Plan.

3. Electric utilities: Upon assessment, what is the impact of LIURP on patterns of usage? Where applicable, examine and describe shifts in usage during periods when service is more expensive compared with times when service is less expensive. Identify any financial impacts.

Not Applicable.

4. How has customer payment behavior changed? Have post-installation arrearage trends changed compared to pre-installation trends? To what extent have customers paid more consistently following weatherization?

## Single-family LIURP<sup>6</sup>

In 2018, PGW expanded the Home Comfort program to allow income-eligible non-CRP customers to participate. Approximately six percent of the cases closed in 2018 were non-CRP customers and 95 percent were CRP customers at the time of enrollment. The CRP customers pay a monthly amount based on a percent of their income, so we expect a limited relationship between LIURP treatments and bill payment behavior while customers are enrolled in CRP. Education provided about CRP may affect payment

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<sup>5</sup> The LIME usage analysis included usage data for 75 of the 77 total units included in the 13 treated buildings.

<sup>6</sup> The LIME pilot is excluded from this analysis because projects are reported at the whole-building level and included master metered buildings.

behavior, but observed changes for customers enrolled in CRP may also be due to changes in customer incomes or fuel assistance program details. However, since customers enter and exit the CRP over time, some 2018 LIURP participants exited the CRP in the year following LIURP service, while others remained in CRP. With these caveats in mind, the table below provides data on average bills, payments, and arrearages for the 1,824 Home Comfort customers with complete data, both those who left and who remained on the CRP.

	Year		Change
	Pre-Treatment	Post-Treatment	
Bill Amounts (asked-to-pay)	\$1,254	\$1,331	+\$76
Customer Payments	\$985	\$1,037	+\$52
Fuel Assistance	\$162	\$180	+\$18
Total Payments	\$1,147	\$1,217	+\$70
Arrearage start of year	\$987	\$887	
Arrearage: end of year	\$908	\$788	
Arrearage: change over year	-\$79	-\$99	-\$20

The table shows that natural gas bills in the year after LIURP treatment were on average \$76 higher than the year before LIURP. Customer payments increased by \$52 and fuel assistance increased by \$18 yielding a net \$70 increase in payments.

5. Other than spending and production goals, what were the general and specific goals for LIURP during the reported year? Explain how these goals were or were not met?

#### Single-family LIURP

In 2018, Home Comfort sought to provide cost-effective energy savings to eligible low-income customers. The program originally served only CRP customers but was expanded in the fourth quarter of 2018 to begin serving all eligible low income customers. We believe this goal was met as the program continued to produce energy savings. PGW also had the goal to launch its Health and Safety pilot, which was successfully initiated in the fourth quarter of 2018.

#### Low Income Multi-Family Efficiency (LIME) Pilot

In 2018, PGW selected and on-boarded its conservation services provider (“CSP”) for the LIME pilot and established protocols and project evaluation procedures for the program. PGW began efforts to build out a pipeline of project leads by trialing and evaluating different pre-screening protocols and marketing and outreach activities. PGW

successfully exceeded its participation goal for 2018, but did not meet its budget goal due to challenges identifying income-qualified multifamily buildings with significant energy-savings potential and owners or operators interested and willing to participate in the pilot. PGW sought to provide cost-effective energy savings for owners or operators and residents of those multifamily buildings that did participate in the pilot, and we believe this goal was met.

6. Describe steps taken to modify and improve program effectiveness. How has the company's experience with LIURP contribute to modifying management of the program? How was technical information and data collection used to modify and improve LIURP?

PGW has utilized information from LIURP evaluations and the outcomes of its quality assurance inspections to modify Home Comfort over time to improve effectiveness. PGW periodically hires an independent evaluator to conduct a thorough impact evaluation to assess program success, compare performance among CSPs, and provide recommendations for program changes. In addition to the independent evaluator's review, PGW conducts its own annual analysis of participants' billing data, and performs bi-annual evaluations of each CSP to assess performance on criteria including estimated gas savings and project work quality. PGW also employs a rigorous quality assurance inspection process to inspect individual projects, both targeted and at random, to evaluate the work quality of its CSPs and provide feedback and guidance on areas for improvement.

7. Describe how the company coordinates and manages LIURP with other weatherization programs such as Act 129, DCED's Weatherization Assistance Program (WAP) and LIHEAP Crisis. Include coordination with available regional or temporary programs. Indicate the ability or inability to overcome any barriers to coordination.

PGW began coordinating in 2018 with PECO's Act 129 program on two initiatives through a mutual CSP. First, PGW and PECO coordinated through the mutual CSP to perform combined energy audits that identify qualifying energy conservation and related measures for both utilities' weatherization programs during a single visit. This approach offered cost savings for both programs, and increased convenience to the customer.

Second, PGW and PECO coordinated around the efficient delivery of weatherization services in multifamily buildings in PGW's LIME pilot. A single CSP administers the low income multifamily program for both PGW and PECO. Wherever possible, the CSP was able to evaluate both gas and electric savings opportunities at a single site visit, and coordinated the installation of these measures.

PGW also coordinates with Habitat for Humanity to address specific health and safety needs required to be completed before PGW can proceed with weatherization. In order to make referrals to the program, all Home Comfort customers are asked to sign an authorization form stating that PGW is allowed to share customer information with coordinating agencies identified by PGW. In cases identified for potential coordination, the CSP shares its audit report with the coordinating agency, describing the health and safety measures that are preventing comprehensive weatherization. The coordinating agency reviews the improvements needed and, if it is able to, will address the issues. After the coordinating agencies' work on the house is completed, PGW's CSP will return to complete the comprehensive LIURP weatherization.

This process has produced benefits for a small number of houses each year. PGW has made progress with partnerships by streamlining the customer authorization process for referrals. However, the additional oversight and administrative time required prevent it from being easily scaled up to serve a large number of homes in the program. The different eligibility requirements of the programs also inhibit broader coordination.



COMMONWEALTH OF PENNSYLVANIA  
PENNSYLVANIA PUBLIC UTILITY COMMISSION  
P.O. BOX 3265, HARRISBURG, PA 17105-3265

IN REPLY PLEASE  
REFER TO OUR FILE

February 5, 2019

Dear LIURP Manager:

I am requesting the following information regarding your company's Low-Income Usage Reduction Program (LIURP). Please use the attached table for your response.

1. 2018 LIURP spending;
2. 2019 LIURP projected budget;
- 2.A 2019 Over/Under Carryover\*;
3. 2018 completed LIURP heating jobs;
4. 2019 projected LIURP heating jobs;
5. 2018 average cost for heating job; Method 1 and Method 2

For your convenience, I have numbered the cells in the table to match the requested items listed above.

Please submit your response to Sarah Dewey, [sdewey@pa.gov](mailto:sdewey@pa.gov) and copy Regina O'Hara at [rohara@pa.gov](mailto:rohara@pa.gov) by February 28, 2019. If you need more time, please let me know. Thank you for your cooperation and please feel free to call me at (717) 705-4029 or send me an e-mail if you have any questions.

Sincerely,

Sarah L. Dewey  
Policy Analyst TRAQU  
Bureau of Consumer Services

Attachment

Company Name: Philadelphia Gas Works

	2018	2019
LIURP Spending <sup>1</sup>	1. \$7,848,602	
LIURP Budget <sup>2</sup>		2. \$7,988,818
Carry-over amount:		2A. \$0
Completed Jobs: <sup>3</sup>		
Heating	3. 2,500	4. 2,511
Water Heating	5. 0	6. 0
Average Cost Per Job:		
Heating - Method 1	7A. \$2,327	
Heating - Method 2	7B. \$3,139	

**\*If the Budget figure reported in Box #2 includes any over/under funding from the previous year, please indicate the amount of carryover in Box #2A.**

<sup>1</sup> Spending total includes programmatic and administrative costs (including labor) for the single family Home Comfort program and Low Income Multifamily program (LIME) projects.

<sup>2</sup> Budget total includes programmatic and administrative costs (including labor) for the single family Home Comfort program and LIME projects.

<sup>3</sup> Completed jobs include single family homes treated in the Home Comfort program, and multifamily buildings treated in the LIME program.





COMMONWEALTH OF PENNSYLVANIA  
 PENNSYLVANIA PUBLIC UTILITY COMMISSION  
 P.O. BOX 3265, HARRISBURG, PA 17105-3265

IN REPLY PLEASE  
 REFER TO OUR FILE

February 7, 2020

Dear LIURP Manager:

I am requesting the following information regarding your utility's Low-Income Usage Reduction Program (LIURP). Please use the attached table for your response.

1. 2019 LIURP spending;
2. 2020 LIURP projected budget;
- 2.A 2020 Over/Under Carryover\*;
3. 2019 completed LIURP heating jobs;
4. 2020 projected LIURP heating jobs;
5. 2019 average cost for heating job; Method 1 and Method 2

For your convenience, I have numbered the cells in the table to match the requested items listed above.

If your utility is also currently operating one or more LIURP pilot programs, please provide the following information for each pilot:

- 2019 Pilot spending;
- 2020 Pilot budget (projected);
- 2019 completed Pilot jobs;
- 2020 projected Pilot jobs;
- 2019 average cost for Pilot job

I ask that you return the completed table to Regina Carter, [regincarte@pa.gov](mailto:regincarte@pa.gov) and please copy Sarah Dewey at [sdewey@pa.gov](mailto:sdewey@pa.gov) by February 28, 2020. If you need more time, please let me know. Thank you for your cooperation and please feel free to call me at (717) 425-5441 if you have any questions.

Sincerely,

Regina M. Carter  
 Energy Policy Analyst  
 Bureau of Consumer Services

Attachment

**Natural Gas Distribution Utility Name: Philadelphia Gas Works**

LIURP		
	2019	2020
<b>LIURP Spending<sup>1</sup></b>	1. \$7,968,468	
<b>LIURP Budget<sup>2</sup></b>		2. \$7,988,818
<b>Carry-over amount</b>		2.A \$0
<b>Completed Jobs:<sup>3</sup></b>		
<b>Heating</b>	3. 3,010	4. 2,974
<b>Water Heating</b>	5. N/A	6. N/A
<b>Average Cost Per Job:</b>		
<b>Heating - Method 1</b>	7.A \$1,952	
<b>Heating - Method 2</b>	7.B \$2,647	

1 Spending total includes programmatic and administrative costs (including labor) for the single family Home Comfort program and Low Income Multifamily program (LIME) projects.

2 Budget total includes programmatic and administrative costs (including labor) for the single family Home Comfort program and LIME projects.

3 Completed jobs include single family homes treated in the Home Comfort program, and multifamily buildings treated in the LIME program.

**\*If the Budget figure reported in Box #2 includes any over/under funding from the previous year, please indicate the amount of carryover in Box #2A.**

<b>LIURP Pilot Program</b>		
	<b>2019</b>	<b>2020</b>
<b>Low-Income Multifamily Efficiency</b>		
<b>Pilot Spending</b>	\$120,048	
<b>Pilot Budget</b>		\$120,048
<b>Completed Jobs:</b>	7	2
<b>Average Cost Per Job:<sup>4</sup></b>	\$17,150	

*4 Average cost per job is based on total LIME spending (i.e. Method 2).*

<b>LIURP Pilot Program</b>		
	<b>2019</b>	<b>2020</b>
<b>Health &amp; Safety</b>		
<b>Pilot Spending</b>	\$92,099	
<b>Pilot Budget</b>		\$100,000
<b>Completed Jobs:</b>	99	Unknown
<b>Average Cost Per Job:<sup>5</sup></b>	\$930	

*5 Spending figures only include costs for health and safety measures that were excluded from each job's cost-effectiveness review. They do not include costs for energy efficiency measures installed.*

Philadelphia Gas Works  
Case Name: R-2020 BRC Rate Case TBA  
Docket No(s): BRC 2020 Rate Case

Response to Discovery Request: CAC-01-CAC-01-3  
Date of Response: 6/10/2020  
Response Provided By: Denise Adamucci

Question:

Please provide all analyses, reports, cost-benefit studies and analyses, savings projections, and Evaluation, Measurement and Verification (“EM&V”) studies produced by or for PGW concerning its EnergySense Program and any other energy efficiency programs of PGW. Please provide all analyses in their native electronic format with formulas intact.

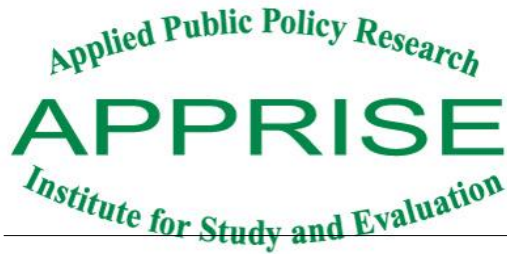
Attachments: 3

CAC-01-3 Attachment A - LIURP 2015 Additional Statistics.pdf  
CAC-01-3 Attachment B - LIURP 2016 Additional Statistics.pdf  
CAC-01-3 Attachment C - LIURP 2017 Additional Statistics.pdf

Response:

Please see the LIURP Billing Analysis Reports provided in response to CAC-I-2. Additionally, please find attached the LIURP Additional Statistics reports for 2015, 2016, and 2017. These memos provide supplementary statistics about the jobs analyzed for the Billing Analysis Reports filed with the PUC.

Please refer to the EnergySense Annual Reports at the dockets provided in response to CAC-I-2 for cost-benefits and savings analyses about PGW’s EnergySense programs.



# MEMO

**DATE:** June 29, 2017  
**TO:** Steven Jerue and Jonathan David  
**FROM:** Dan Bausch  
**SUBJECT:** Philadelphia Gas Work's Enhanced Low Income Retrofit Program – Statistics from CY 2015 Evaluation

APPRISE conducted an analysis of the energy savings for PGW's 2015 Enhanced Low-Income Retrofit Program (ELIRP) participants and developed the data submission required by the Pennsylvania Utility Commission. In addition to the data items required for this submission, PGW asked APPRISE to prepare supplemental statistics on program outcomes by ELIRP Conservation Service Provider (CSP). This memo provides the requested statistics and an analysis of these results.

## I. Usage Impact Analysis Results by Conservation Service Provider (CSP)

APPRISE analyzed natural gas savings for the 2015 ELIRP participants using a pre/post treatment/comparison group analysis design. Table I-1 presents the savings estimates, by CSP, for the 2015 ELIRP participants and the comparison group of customers who received ELIRP services in the following year (2016).

**Table I-1**  
**Average Usage and Savings by CSP**

	ELIRP 2015 Participants					Comparison Group*					Net Savings	
	Obs	Usage (ccf)		Savings		Obs	Usage (ccf)		Savings			
		Pre	Post	ccf	%		Pre	Post	ccf	%	ccf	%
<b>All Participants</b>	3,192	1,537	1,457	81	5.2%	2,583	1,533	1,573	-40	-2.6%	120	7.8%
CMC	1,787	1,517	1,463	54	3.5%						93	6.2%
ECA	489	1,579	1,389	190	12.0%						229	14.5%
Mark	303	1,626	1,531	95	5.8%						134	8.3%
FMG	613	1,521	1,456	64	4.2%						104	6.8%

The table shows that the gross savings estimated using the degree day weather-normalized approach were approximately 81 ccf or 5.2 percent of pre-treatment usage. After adjusting the savings with the comparison group, the net savings were approximately 120 ccf or 7.8 percent of pre-treatment usage. These results show that CMC had the lowest savings of 93 ccf (or 6.2

CAC-01-3 Attachment A

percent of pre-treatment usage), ECA had the highest savings of 229 ccf (or 14.5 percent of pre-treatment usage), and the Mark Group and FMG had comparable savings of 134 ccf and 104 ccf, respectfully.<sup>1</sup>

**II. Projected Savings and Realization Rates by Conservation Service Provider (CSP)**

Table II-1 displays a comparison of the projected savings based on the Technical Reference Manual and the net savings computed in the usage impact analysis. The Mean Customer Realization Rate is the average of the realization rates for each job in the group. The Mean Program Realization Rate is the average savings across all participants in the group, divided by the average projected savings across all participants in the group. For all CSPs, the mean projected savings exceeded the mean estimated net savings. But, the Customer Realization Rates varied by contractor. The Mark Group had a lower mean Customer Realization Rate of 54%, while ECA had a mean Customer Realization Rate above 100% due to several jobs with much higher than projected savings.

**Table II-1  
 Projected Savings and Realization Rates by CSP**

	ELIRP 2015 Participants				
	Obs	Projected Savings (ccf) <sup>1</sup>	Net Savings (ccf)	Customer Realization Rate	Program Realization Rate
<b>All Participants</b>	3,192	164	120	85%	73%
CMC	1,787	104	93	67%	89%
ECA	489	303	229	174%	76%
Mark	303	190	134	54%	71%
FMG	613	212	104	79%	49%

<sup>1</sup> 95 limited completion jobs and 1 full completion job with energy savings results did not have projected savings.

**III. Benefit-to-Cost Ratios by Conservation Service Provider (CSP)**

Table III-1 displays the cost-benefit analysis for all 2015 participants by CSP. Program benefits are based on the avoided costs of the saved natural gas. Program costs are the labor, materials, and administrative and support spending for the jobs completed in calendar year 2015.<sup>2</sup> The table shows the value of the cost and savings across all projects, as well as the average cost and savings per job.

<sup>1</sup> In the Spring of 2015, all customers assigned to The Mark Group were reassigned to FMG, and the Mark Group did not complete any of the comparison group jobs.

<sup>2</sup> Per-job material and labor costs were based on the invoiced job costs. For 12 jobs, the material and labor costs reported in the program data were used because those jobs did not have invoiced cost data. APPRISE estimated per-job administrative costs by multiplying the direct material and labor costs for each job by an administrative cost factor. This factor was estimated for each CSP as follows: (CY 2015 administrative spending + CY 2015 operations spending) / (CY 2015 labor spending + CY 2015 materials

CAC-01-3 Attachment A

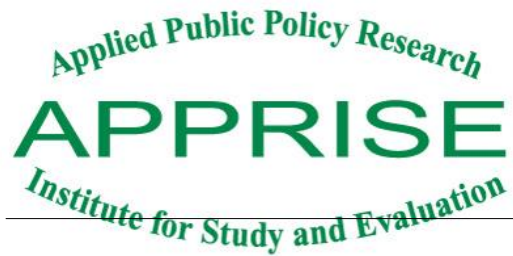
Overall, the program had a benefit-to-cost ratio of 0.83, indicating that program costs exceeded the estimated value of energy savings. CMC obtained the highest benefit-to-cost ratio of 1.42 and Mark Group obtained the lowest ratio of 0.49.

**Table III-1  
 Cost Effectiveness and Benefit-to-Cost Ratios by CSP**

	Aggregate Results			Per-Job Results			Benefit/ Cost Ratio
	Value of Savings	Program Costs	Net Benefit	Value of Savings	Program Costs	Net Benefit	
<b>All Participants</b>	\$5.84 mill	\$7.06 mill	-\$1.22 mill	\$1,575	\$1,904	-\$329	0.83
CMC	\$2.53 mill	\$1.78 mill	\$0.74 mill	\$1,221	\$861	\$360	1.42
ECA	\$1.77 mill	\$2.54 mill	-\$0.78 mill	\$3,006	\$4,327	-\$1,321	0.69
Mark	\$0.63 mill	\$0.79 mill	-\$0.16 mill	\$1,759	\$2,207	-\$449	0.80
FMG	\$0.94 mill	\$1.94 mill	-\$1.0 mill	\$1,365	\$2,811	-\$1,446	0.49

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spending). This is the same approach used to assign per-job administrative costs in the CY 2014 analysis and the CY 2013 and CY 2011 evaluation reports.



# MEMO

**DATE:** June 11, 2018  
**TO:** Steven Jerue and Jonathan David  
**FROM:** Dan Bausch  
**SUBJECT:** Philadelphia Gas Work's Enhanced Low Income Retrofit Program – Statistics from CY 2016 Evaluation

APPRISE conducted an analysis of the energy savings for PGW's 2016 Enhanced Low-Income Retrofit Program (ELIRP) participants and developed the data submission required by the Pennsylvania Public Utility Commission. In addition to the data items required for this submission, PGW asked APPRISE to prepare supplemental statistics on program outcomes by ELIRP Conservation Service Provider (CSP). This memo provides the requested statistics and an analysis of these results.

## I. Usage Impact Analysis Results by Conservation Service Provider (CSP)

APPRISE analyzed natural gas savings for the 2016 ELIRP participants using a pre/post treatment/comparison group analysis design. Table I-1 presents the savings estimates, by CSP, for the 2016 ELIRP participants and the comparison group of customers who received ELIRP services in the following year (2017).

The table shows that the gross savings estimated using the degree day weather-normalized approach were approximately 101 ccf or 6.4 percent of pre-treatment usage. After adjusting the savings with the comparison group, the net savings were approximately 171 ccf or 10.9 percent of pre-treatment usage. ECA's savings were significantly greater than any of the other contractors. While ECA's net savings averaged 342 ccf or 21.2 percent of pre-treatment usage, savings for the other contractors ranged from 139 to 160 ccf or 9.1 to 10.1 percent of pre-treatment usage.

**Table I-1**  
**Average Usage and Savings by CSP**

	ELIRP 2016 Participants					Comparison Group					Net Savings	
	Obs	Usage (ccf)		Savings		Obs	Usage (ccf)		Savings		ccf	%
		Pre	Post	ccf	%		Pre	Post	ccf	%		
<b>All Participants</b>	3,298	1,574	1,473	101	6.4%						171	10.9%
CMC	1,928	1,593	1,503	90	5.7%	1,563	1,630	1,701	-70	-4.3%	160	10.1%
ECA	320	1,614	1,342	272	16.8%						342	21.2%



CAC-01-3 Attachment B

FMG	1,050	1,527	1,458	68	4.5%					139	9.1%
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Table I-2 presents statistics by CSP for all comprehensive closed jobs and all limited partial jobs with estimated savings results. The table shows that both ECA and FMG comprehensively weatherized a large portion of their jobs (74% for ECA and 67% for FMG) compared to less than a third of CMC's jobs receiving comprehensive treatment (31%). While FMG and ECA provided similar percentages with comprehensive treatment, the average job costs and the average number of measures provides more insight into ECA's higher savings. The average spending by ECA for comprehensive jobs was nearly 2.5 times the average spending by FMG. In addition, on average, ECA's comprehensive jobs received 12 measures compared to only 7 measures for FMG jobs. Finally, when examining major measures (roof insulation, heating system replacement, infiltration work, and programmable thermostats), ECA's comprehensive jobs received an average of three major measures compared to an average of two for FMG and CMC. As a result, FMG saved an average of only 82 ccf for comprehensive jobs, compared to 321 for ECA. While CMC's savings for comprehensive jobs was closer to ECA's savings for these jobs, CMC only provided comprehensive treatments to 31 percent of their jobs, compared to 74 percent for ECA.

ECA saved an average of 132 ccf on limited jobs, compared to 41 for FMG and 24 for CMC. ECA and FMG spent approximately the same amount per limited job, but ECA's average number of total measures and of major measures exceeded FMG's and CMC's installations. These statistics indicate that ECA achieved higher savings than other CSPs due to installing more major and minor measures, spending more per job, and providing comprehensive treatment to a larger portion of their overall caseload.

**Table I-2  
 Statistics for Comprehensive and Limited Jobs by CSP**

Comprehensive Jobs					
	Percent of All Jobs	Avg. Job Cost <sup>1</sup>	Avg. Number of Measures	Avg. Major Measures	Avg. Gross Savings
CMC	31%	\$4,991	9	2	231
ECA	74%	\$6,906	12	3	321
FMG	67%	\$2,765	7	2	82
All Participants	47%	\$4,274	8	2	177
Limited Jobs					
	Percent of All Jobs	Avg. Job Cost	Avg. Number of Measures	Avg. Major Measures	Avg. Gross Savings
CMC	68%	\$259	5	0	24
ECA	26%	\$377	8	1	132

<sup>1</sup> Job costs include the labor, materials, and estimated per-job administrative and support costs. See footnote two for more information.

CAC-01-3 Attachment B

FMG	32%	\$377	5	0	41
All Participants	53%	\$288	5	0	33

**II. Projected Savings and Realization Rates by Conservation Service Provider (CSP)**

Table II-1 displays a comparison of the projected savings based on the Technical Reference Manual and the net savings computed in the usage impact analysis. The Mean Program Realization Rate is the average savings across all participants in the group, divided by the average projected savings across all participants in the group. For all CSPs except FMG, the mean projected savings exceeded the mean estimated net savings, resulting in Program Realization Rates of less than 100%. The Mean Customer Realization Rate is the average of the individual realization rates calculated for each job in the group. The Customer Realization Rates vary by contractor. ECA had the lowest mean Customer Realization Rate of 120%, while CMC and FMG had similar rates (206% for CMC and 198% for FMG).

**Table II-1  
 Projected Savings and Realization Rates by CSP**

	ELIRP 2016 Participants				
	Obs	Projected Savings (ccf) <sup>1</sup>	Net Savings (ccf)	Customer Realization Rate <sup>2</sup>	Program Realization Rate
<b>All Participants</b>	3,298	179	171	194%	96%
CMC	1,928	170	160	206%	94%
ECA	320	371	342	120%	92%
FMG	1,050	136	139	198%	102%

<sup>1</sup> 168 limited completion jobs with energy savings results did not have projected savings.

<sup>2</sup> 312 Jobs with outlier realization rates were excluded from the customer realization statistics.

**III. Benefit-to-Cost Ratios by Conservation Service Provider (CSP)**

Table III-1 displays the cost-benefit analysis for all 2016 participants by CSP. Program benefits are based on the avoided costs of the saved natural gas. Program costs are the labor, materials, and administrative and support spending for the jobs completed in calendar year 2016.<sup>2</sup> The table shows the value of the cost and savings across all projects, as well as the average cost and savings per job.

Overall, the program had a benefit-to-cost ratio of 0.96, indicating that program costs slightly exceeded the estimated value of energy savings. CMC obtained the highest benefit-to-cost ratio of 1.08 and ECA obtained the lowest ratio of 0.84.

<sup>2</sup> Per-job material and labor costs were based on the invoiced job costs. For 8 jobs, the material and labor costs reported in the program data were used because those jobs did not have invoiced cost data. APPRISE estimated per-job administrative costs by multiplying the direct material and labor costs for each job by an administrative cost factor. This factor was estimated for each CSP as follows: (CY 2016 administrative spending + CY 2016 operations spending) / (CY 2016 labor spending + CY 2016 materials spending). This is the same approach used to assign per-job administrative costs in the CY 2015 and CY 2014 analyses and in the CY 2013 and CY 2011 evaluation reports.

CAC-01-3 Attachment B

**Table III-1  
 Cost Effectiveness and Benefit-to-Cost Ratios by CSP**

	Aggregate Results			Per-Job Results			Benefit/ Cost Ratio
	Value of Savings	Program Costs	Net Benefit	Value of Savings	Program Costs	Net Benefit	
<b>All Participants</b>	\$8.13 mill	\$8.43 mill	-\$0.31 mill	\$2,131	\$2,211	-\$80	0.96
CMC	\$4.45 mill	\$4.13 mill	\$0.32 mill	\$1,994	\$1,849	\$145	1.08
ECA	\$1.66 mill	\$1.99 mill	-\$0.33 mill	\$4,262	\$5,104	-\$842	0.84
FMG	\$2.06 mill	\$2.32 mill	-\$0.25 mill	\$1,732	\$1,945	-\$213	0.89

**IV. Measure Savings Estimates for ELIRP During CY 2016**

PGW requested that APPRISE furnish statistics on estimated and projected savings for specific measures of interest. APPRISE used information from PGW's program data and from APPRISE's analysis of natural gas savings for the 2016 ELIRP participants to estimate measure-level savings using a regression model. The final regression model includes measures requested by PGW, including roof insulation, wall insulation, heating system replacement, air sealing for jobs that did have a blower door test conducted, air sealing for jobs that did not have a blower door test conducted, and installation of a programmable thermostat. In addition, water heater replacement was included in the model to understand the impact of this measure. Table IV-1 shows the final regression-estimated savings, the projected savings based on the Technical Reference Manual, and the measure realization rates.

The regression results show that all measures in the model had statistically significant positive energy savings except for wall insulation. The table shows estimated savings were lower than projected savings for all measures except water heater replacement.

- Estimated savings for water heater replacement were 71 ccf compared to projected savings of 38 ccf, resulting in a realization rate of 184%.
- The measures found to have the highest estimated savings and realization rates were heating system replacement (284 ccf with a 69% realization rate), roof insulation (87 ccf with a 65% realization rate), and water heater replacement (71 ccf with a 184% realization rate).
- The installation of wall insulation, which only occurred in 48 homes, was estimated to have a negative impact on overall gas savings.
- For air sealing, jobs that received blower door testing had higher estimated savings of 40 ccf compared with 24 ccf for jobs that did not have blower door testing.

CAC-01-3 Attachment B

**Table IV-1  
 Measure Savings Estimates<sup>1</sup>**

Measure	Obs.	Savings (ccf/yr)	Projected Savings (ccf/yr) <sup>2</sup>	Realization Rate <sup>3</sup>
Roof Insulation	364	87±33***	133	65%
Wall Insulation	48	-73±76*	2	-3,635%
Heating System Replacement	523	284±25***	409	69%
Air Sealing w/ Blower Door <sup>4</sup>	718	40±24***	112	36%
Air Sealing w/o Blower Door	482	24±26*	76	32%
Program. Thermostat	1,391	37±18***	64	57%
Water Heater Replacement	60	71±66*	38	184%
Regression Constant <sup>5</sup>	3,298	18±13***	31	59%

\*\*\*Statistically significant at the 99 percent level; \*\*95% level. \*90% level.

<sup>1</sup> Includes 3,298 jobs with usage impact results. The regression model R-squared value was 0.1799.

<sup>2</sup> Excludes jobs with no reported projected savings for a specific measure.

<sup>3</sup> The Realization Rate is the average savings estimated for the measure, divided by the average projected savings for the measure.

<sup>4</sup> Includes all jobs that received air sealing work and that which had a blower door test conducted during the audit or measure installation.

<sup>5</sup> Includes all measures not accounted for in the regression model.

**V. Measure Savings Estimates by Conservation Service Provider (CSP)**

Table V-1 displays the measure savings estimates by CSP. The savings were estimated using the same regression model discussed above. Overall, CMC had the most measures with reliable, statistically significant estimates due to their large number of completed 2016 jobs.

- Heating system replacements had a statistically significant impact on savings for all three CSPs. The CSPs achieved similar realization rates (62% for ECA, 66% for CMC, and 75% for FMG).
- The results for air sealing suggest that FMG’s air sealing work (both with and without the blower door) is not effective. CMC’s air sealing work appears to be the most effective, and PGW should encourage them to assess whether barriers to air sealing can be overcome in more jobs.
- For water heater replacement, ECA had statistically significant estimated savings of 185 ccf, substantially higher than the projected savings of 27 ccf.
- The programmable thermostat results suggest that ECA’s installations are not effective and they need to conduct more assessment of whether the customer can benefit from the thermostat installation.

CAC-01-3 Attachment B

**Table V-1  
 Measure Savings Estimates by CSP**

	CMC				ECA				FMG			
# of Jobs	1,928				320				1,050			
Measure	Obs	Savings (ccf/yr)	Proj. (ccf) <sup>1</sup>	RR <sup>2</sup>	Obs	Savings (ccf)	Proj. (ccf) <sup>1</sup>	RR <sup>2</sup>	Obs	Savings (ccf/yr)	Proj. (ccf) <sup>1</sup>	RR <sup>2</sup>
Roof Ins.	183	76±53***	125	61%	75	77±137	140	55%	106	56±48**	143	39%
Wall Ins.	48	-87±83**	2	-4,367%	0	-	-	-	0	-	-	-
HS	305	282±32***	424	66%	165	257±69***	414	62%	53	231±65***	306	75%
AS w/ B <sup>3</sup>	312	74±39***	100	74%	63	59±133	101	59%	343	14±36	121	12%
AS w/o B	94	59±60*	70	84%	38	12±147	100	12%	350	11±34	75	15%
Tstat	811	29±24**	66	44%	255	-5±84	58	-8%	325	31±30**	63	49%
HW	19	3±118	50	7%	22	185±136***	27	685%	19	25±106	37	66%
Constant <sup>4</sup>	1,928	13±16	36	37%	320	100±86**	42	237%	1,050	33±25***	20	164%

\*\*\*Statistically significant at the 99 percent level. \*\*95% level. \*90% level.

<sup>1</sup> Excludes jobs with no reported projected savings for a specific measure.

<sup>2</sup> The Realization Rate is the average savings estimated for the measure, divided by the average projected savings for the measure.

<sup>3</sup> Includes all jobs that received air sealing work and that which had a blower door test conducted during the audit or measure installation.

<sup>4</sup> Includes all measures not accounted for in the regression model.

## VI. Summary

The analysis of savings by CSP showed that ECA had a greater percentage of comprehensive jobs, installed more minor and major measures, and had much higher savings than the other CSPs. However, due to ECA's greater investment, they had lower realization rates and a lower benefit-cost ratio.

The overall analysis of measure-level savings and realization rates found statistically significant savings from heating system replacement, roof insulation, water heater replacement, air sealing, and programmable thermostats. Analysis of measure-level savings by CSP found that all CSPs had similar strong savings results from heating system replacement, but notable differences existed for other measures. The results for air sealing suggest that FMG's air sealing work is not effective, while CMC's air sealing work appears to be the most effective. For ECA, the replacement of water heaters produced high estimated savings, but the results for programmable thermostats indicate they did not produce meaningful savings.

Based on these results, PGW should undertake additional research to further explore the following:

- ECA's higher savings and how their approach to installing ELIRP measures contributes to their savings results.
- ECA's approach to identifying candidates for new programmable thermostats and how this could be improved to ensure that the installation of programmable thermostats produces stronger savings.

### CAC-01-3 Attachment B

- CMC's approach to air sealing and aspects of their procedures that appear to be most effective.
- How to improve FMG's savings from air sealing.

**Jerue, Steven J**

**Subject:** PGW 2017 LIURP Evaluation Report - Data for Persistence Analysis

**From:** Daniel Bausch [<mailto:Daniel-Bausch@appraiseinc.org>]  
**Sent:** Thursday, May 30, 2019 5:04 PM  
**To:** Jerue, Steven J; Jackie Berger  
**Cc:** Rhea Ninan; Johnson, Robert  
**Subject:** RE: PGW 2017 LIURP Evaluation Report - Data for Persistence Analysis

Hi Stu,

Below are tables showing the average usage and savings, realization rates, and cost-effectiveness results by contractor. We are moving forward on the report and making updates based on the comments you provided for the past report.

Also, I have attached a spreadsheet listing the CASE\_IDs, ACCOUNT\_IDs, and PREMISE\_IDs for the cases that we can include in the persistence analysis. This includes the 2012, 2015, and 2015 jobs that had final usage results for the original analyses. The file is protected with the same password used previously.

Please let me know if you have any questions.

#### Average Usage and Savings By Contractor and Job Completion Type

	LIURP 2017 Participants					Comparison Group					Net Savings	
	Obs	Usage (ccf)		Savings		Obs	Usage (ccf)		Savings		ccf	%
		Pre	Post	ccf	%		Pre	Post	ccf	%		
<b>All Participants</b>	1,895	1,750	1,537	213	12.2%	1,825	1,625	1,637	-13	-0.8%	226	12.9%
CMC	1,066	1,691	1,527	164	9.7%						177	10.5%
ECA	277	1,991	1,526	464	23.3%						477	24.0%
FMG	552	1,743	1,562	181	10.4%						194	11.1%

#### Projected Savings and Realization Rates

	LIURP 2017 Participants				
	Obs	Projected Savings (ccf) <sup>1</sup>	Net Savings (ccf)	Customer Realization Rate <sup>2</sup>	Program Realization Rate
<b>All Participants</b>	1,895	203	226	205%	111%
CMC	1,066	130	177	254%	136%
ECA	277	496	477	127%	96%
FMG	552	181	194	169%	107%

<sup>1</sup>120 limited completion jobs with energy savings results did not have projected savings.

<sup>2</sup>176 jobs with outlier realization rates were excluded from the customer realization statistics.

### Cost Effectiveness and Benefit-to-Cost Ratios by Contractor

	Aggregate Results			Per-Job Results			Benefit/ Cost Ratio
	Value of Savings	Program Costs	Net Benefit	Value of Savings	Program Costs	Net Benefit	
<b>All Participants</b>	\$6.27 mill	\$5.63 mill	\$0.65 mill	\$2,970	\$2,663	\$306	1.12
CMC	\$2.71 mill	\$1.62 mill	\$1.10 mill	\$2,326	\$1,386	\$940	1.68
ECA	\$2.04 mill	\$2.55 mill	-\$0.51 mill	\$6,268	\$7,851	-\$1,584	0.80
FMG	\$1.59 mill	\$1.46 mill	\$0.13 mill	\$2,549	\$2,348	\$202	1.09

Thanks,  
Dan



Philadelphia Gas Works  
Case Name: R-2020 BRC Rate Case TBA  
Docket No(s): BRC 2020 Rate Case

Response to Discovery Request: CAC-01-CAC-01-5  
Date of Response: 6/10/2020  
Response Provided By: Denise Adamucci and Gregory Stunder

Question:

Please provide all analyses, reports, or cost-benefit studies produced by or for PGW concerning the impact that changing the balance of fixed and variable charges on customer bills would have on PGW's EnergySense or any other PGW energy efficiency programs. Please provide all analyses in their native electronic format with formulas intact.

Attachments: 0

Response:

PGW has not conducted such a study. Such a study would likely not provide useful results or be cost-effective due to the large number of variables involved.

Philadelphia Gas Works  
Case Name: R-2020 BRC Rate Case TBA  
Docket No(s): BRC 2020 Rate Case

Response to Discovery Request: CAC-01-CAC-01-6  
Date of Response: 6/10/2020  
Response Provided By: Denise Adamucci

Question:

Please provide all analyses, reports, or cost-benefit studies produced by or for PGW concerning the impact that changing the balance of fixed and variable charges on customer bills would have on low-income PGW ratepayers. Please provide all analyses in their native electronic format with formulas intact.

Attachments: 0

Response:

PGW has not conducted such a study. Such a study would likely not provide useful results, as many low income customers participate in PGW's Customer Responsibility Program PIPP and are billed based on a percentage of their income.

**VERIFICATION**

I, Sarah C. Stoner, hereby state that I am an attorney for Philadelphia Gas Works (“PGW”), I am authorized to make this verification on its behalf, and that the facts set forth in the attached discovery responses which I am sponsoring are true and correct to the best of my knowledge, information and belief. I understand that the statements herein are made subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).

June 10, 2020

\_\_\_\_\_  
Dated

*Sarah C. Stoner*

\_\_\_\_\_  
Sarah C. Stoner, Esq.  
Eckert Seamans Cherin & Mellott, LLC  
Counsel for Philadelphia Gas Works

**VERIFICATION**

I, Denise Adamucci, hereby state that I am Vice President of Regulatory Compliance and Customer Programs for Philadelphia Gas Works (“PGW”), I am authorized to make this verification on its behalf, and that the facts set forth in the attached discovery responses which I am sponsoring are true and correct to the best of my knowledge, information and belief. I understand that the statements herein are made subject to the penalties of 18 Pa.C .S. § 4904 (relating to unsworn falsification to authorities).

June 10, 2020  
\_\_\_\_\_  
Dated

*Denise Adamucci*  
\_\_\_\_\_  
Denise Adamucci, Vice President  
Regulatory Compliance & Customer Programs  
Philadelphia Gas Works

**VERIFICATION**

I, Gregory Stunder, hereby state that I am the Vice President – Regulatory and Legislative Affairs for Philadelphia Gas Works (“PGW”), I am authorized to make this verification on its behalf, and that the facts set forth in the attached discovery responses which I am sponsoring are true and correct to the best of my knowledge, information and belief. I understand that the statements herein are made subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).

June 10, 2020

\_\_\_\_\_  
Dated



\_\_\_\_\_  
Gregory Stunder  
Vice President – Regulatory and Legislative Affairs  
Philadelphia Gas Works