BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

REBUTTAL TESTIMONY OF

H. GIL PEACH

ON BEHALF OF
PHILADELPHIA GAS WORKS

Docket No. R- 2017-2586783

Philadelphia Gas Works

General Rate Increase Request

Topics Addressed:

Expanding CRP Eligibility
Energy Affordability Guidelines
LIHEAP Crisis Grants
Terminations and Reconnections
Increases to Fixed Residential Customer Charge
Usage of Low-Income Customers
Low-Income/Replacement Program
CRP Offset

June 9, 2017

EXHIBIT
R-2017-2586783
PGW Statement
No. 11-R
6-28-17 CP PH

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I. INTRODUCTION AND BACKGROUND

Q. PLEASE STATE YOUR NAME AND TITLE.

A. My name is Hugh Gilbert Peach. I am President of H. Gil Peach & Associates LLC and I am also President and Chief Science Officer of Adapt.Global Inc. My office is at 16232 NW Oakhills Drive, Beaverton, OR 97006.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND WORK HISTORY.

A. I received the PhD in Sociology from New York University with specialties in study of economic sociology, social control and social statistics. I received the M.A. in Economics from the New School for Social Research. I received the M.A. and B.S. in Sociology from Michigan State University. I also completed the equivalent of a minor in physics from Michigan Technological University and one year of Metropolitan Urban Service Training from Union Theological Seminary.

Q. PLEASE DESCRIBE YOUR EARLY WORK HISTORY.

A. From 1969-1980: New York Public Library – Page; New York Stock Exchange – Sr. Clerk; New York City Housing & Development Administration – series of civil service positions working on housing statistics, urban renewal and development of training programs; New York City Health Department/Addiction Services Agency – Program Research Analyst and Sr. Quantitative Analyst, evaluating programs; The Fund for the City of New York – Research Statistician/Computer Analyst, working for the foundation to improve the efficiency and effectiveness in several areas of city services through management studies.

Q. PLEASE DESCRIBE YOUR LATER WORK HISTORY IN THE AREA OF UTILITIES AND UTILITY REGULATION

From 1980 – 1988/89: Pacific Power – At Pacific, I worked in load research and regulatory affairs and received training in all Rate Department functions, including a continuing education in rate fundamentals at Indiana University and expert witness training. In 1982, I moved to Customer Service where I became Coordinator, then Manager of Evaluation for energy conservation. The major project was the Hood River Conservation Project, the largest US public/private home energy retrofit project of that decade, designed to reach maximum participation levels at the then current state of technology. In addition, I supervised the engineering team that developed the demand-side of the company's integrated resource plan.

From 1988/1989 to 2017: In 1988/1989 I started consulting for the Conservation Law Foundation as they introduced first generation Demand-Side Management in Maine, Vermont, Massachusetts and Connecticut. I left Pacific Power in 1989 to continue to consult directly for utilities.

In Pennsylvania, I was evaluator for some of the early low-income pilot programs that eventually evolved to become today's Customer Assistance Programs and Low-Income Usage Reduction Programs and I have followed and participated in program/policy evaluation for these programs since 1990. I have completed one or more program/policy evaluations for West Penn Power, Duquesne Light, PECO Energy, all of the First Energy Utilities in Pennsylvania, PPL, Pennsylvania American Water Company, Equitable Gas, Columbia Gas, Peoples Natural Gas and the Philadelphia Gas Works. My practice includes primarily work in the US and Canada and encompasses all parts of low-income program and demand-side management program design, potential/planning

studies, management and staffing studies, decoupling and policy studies and verification studies. In addition to studies for utilities, I have conducted low-income evaluations for the US Department of Health & Human Services and have served on the US Department of Energy peer review committees for the design of major national low-income weatherization evaluations; also on the peer review committee for vetting of evaluation results from these studies prior to release of the evaluations.

On the regulatory side, I have served as an evaluation and/or savings verification and related policy expert directly for the California, New York, New Hampshire, Massachusetts and Nova Scotia public utility commissions. Since 2011, I have also been involved in climate adaptation analysis.

Q. HAVE YOU SUBMITTED TESTIMONY AT ANY REGULATORY BODIES BEFORE?

A. Yes. A list of the testimony I have provided is attached as PGW Exh. HGP-1.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?

A. My testimony is submitted on behalf of Philadelphia Gas Works ("PGW" or "Company").

Q. DID YOU SUBMIT DIRECT TESTIMONY IN THIS MATTER?

A. No.

Q. PLEASE SUMMARIZE THE PURPOSE OF YOUR TESTIMONY.

A. The purpose of my testimony is to address the analysis and proposals of Mr. Harry S. Geller on behalf of the Tenant Union Representative Network and Action Alliance of Senior Citizens of Greater Philadelphia (TURN et al. St. No. 1)[1] and the analysis and

[1] References are to the revised testimony served on June 7, 2017.

proposals of Roger D. Colton on behalf of the Pennsylvania Office of Consumer Advocate (OCA St. No. 4)[2].

Q. ARE OTHER WITNESSES ADDRESSING ISSUES RAISED BY THESE WITNESSES?

A. Yes. Denise Adamucci and Bernard Cummings are submitting rebuttal testimony regarding characteristics of low-income customers, universal service issues, and termination/reconnection policies. Greg Stunder is presenting testimony regarding Mr. Colton's recommended "CRP Offsets," Mr. Dybalski is presenting testimony addressing weather normalization, and Mr. Hanser is presenting testimony related to PGW's proposed customer charge increase.

II. RESPONSE TO TURN WITNESS HARRY GELLER

Q. ARE YOU FAMILIAR WITH PGW'S CUSTOMER RESPONSIBILITY PROGRAM ("CRP")?

A. Yes. I am familiar with CRP:

(1) At a high level and in its historical and institutional context in Philadelphia, and

(2) I have in-depth knowledge of the program developed from discussion, interviews, access to documents, study of PGW and CRP, and in-depth computer analysis of CRP data.

In 2001-2002 I was engaged by PGW to conduct a policy evaluation study of CRP to assist in the transition of PGW from city regulation to regulation by the Pennsylvania Public Utility Commission (PUC) to help insure conformance with PUC decisions, secretarial letters and the guidelines established for Customer Assistance Programs in the Pennsylvania Code.

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[2] References are to the revised testimony served on June 2, 2017.

In this study, I had complete access to the full database information for the program plus auxiliary information. I also was provided an opportunity to discuss, interview and study in order to understand the special nature of the Company, as the largest municipal natural gas company in the United States.

For this policy evaluation study my team included an engineer, a retired executive from a natural gas industry association to help provide industry perspective, an accountant with a specialty in utility accounting to get into the details of the accounting side of CRP, and analysts. I produced three reports: The first was on the strengths of PGW, the second was an analysis of the CRP with recommendations for conformance and improvement for the transition to PUC regulation, and the third was a speculative report on the future of CRP. This early work provided a sound base and extensive seasoning in understanding CRP and the critical balance between the needs of low-income customers and the needs of customers who pay the low-income subsidies (including low income customers who are not participating in CRP). It included the opportunity to model the CRP to look at alternative options that were relevant for the 2001-2002 timeframe.

On December 7, 2015, I was awarded a contract to again review PGW's CRP pursuant to a Request for Proposals and issued my final report in May of 2016. As part of that process, I developed information for consideration of several possible CRP policy options.

Q. DID THESE RECOMMENDATIONS INCLUDE PROPOSALS THAT WERE RAISED BY MR. GELLER?

A. Yes. As part of my analysis, I considered a proposal that would permit all income-eligible customers to participate in PGW's Customer Assistance Program ("CAP")

without the current processing step that individually tailors the most affordable monthly payment option for each customer (that is, CRP or Budget Billing or Budget Plus). I also reviewed the current percentage of income tiers used by PGW to determine the amount the CRP participant will be asked to pay toward their overall bill. Mr. Geller makes recommendations regarding both of these proposals on behalf of TURN.

Q. WHAT DOES MR. GELLER CONCLUDE BASED ON HIS REVIEW OF PGW'S UNIVERSAL SERVICE PROGRAMS AND OPTIONS FOR LOW-INCOME CUSTOMERS?

A. According to Mr. Geller, PGW's policies "severely limit the options that low-income customers have to connect to, maintain and restore service" resulting in PGW "providing an inadequate level of service." (TURN St. No. 1 at 6).

Q. DO YOU AGREE WITH THIS ASSESSMENT?

A. No. PGW offers a robust CRP program that is consistent with existing PUC guidance and which effectively balances a number of competing issues including PGW's status as a municipal owned utility and the cost impact to non-participants of its universal service programs.

(A) Expanding CRP Eligibility to All Income-Eligible Customers

Q. PLEASE SUMMARIZE MR. GELLER'S RECOMMENDATIONS TO EXPAND PGW'S CRP PROGRAM.

A. As Mr. Geller correctly acknowledges, PGW currently engages in an individual customer-specific analysis to determine the most affordable payment option for the customer. (TURN St. No. 1 at 8). If a customer's Budget Bill (if the customer is current and so does not require a payment agreement) or "Budget Plus" bill (for customers on budget billing who also must pay on a payment agreement) is calculated at an amount less than what she/he would be asked-to-pay through CRP participation, then the

customer is currently defined as ineligible to participate in CRP and he/she is required to pay the calculated budget amount.

While the customer is provided a lower monthly bill on Budget Plus, because the customer is not in CRP, the customer does not receive the other benefits of CRP such as access to the arrearage forgiveness component or potential access to the Low-Income Usage Reduction Program ("LIURP") component. Mr. Geller is critical of this approach taking the view that customers who are income eligible for CRP should receive all of the benefits of CRP regardless of whether or not the CRP asked-to-pay amount is higher. (TURN St. No. 1 at 8).

Q. HAVE YOU ANALYZED THE COSTS OF IMPLEMENTING THIS PROPOSAL?

A. Yes, I estimate that: (1) the cost of modifying active CRP customers' monthly amount to the average bill amount could be approximately $648,000;[3] and (2) the cost of adding low-income customers who are not on CRP at the average bill amount (with arrearage forgiveness) could be approximately $5,027,742.[4]

Q. DO YOU HAVE AN OPINION REGARDING THIS PROPOSAL?

A. Yes, my understanding of this is primarily a system perspective.

(1) From a system perspective, the general model for the provision of energy services is a cost of service model. That is, the costs for what is essentially a social energy system operated and managed by PGW should be allocated to the points at which the costs are incurred. At the customer level, the key to this model is that each customer pays

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[3] PGW Exh. HGP-2, 2015 Customer Responsibility Program Policy Evaluation, H. Gil Peach & Associates, LLC, dated May 2015 including Amendment at 28.

[4] PGW Exh. HGP-2, Amendment at 2.

for energy used plus their share in the cost of maintaining the energy system in good repair and at high resilience. In this ideal model, this system works best when each customer pays the "please pay" amount calculated for their monthly energy bills based on cost of service.

(2) However, some customers simply do not have the money to pay their cost of service energy bills. For these customers, for PGW, we have CRP which provides substantial subsidies. These subsidies are paid for by other customers in addition to the costs of their own individual energy services.

(3) Now, there are also other low income customers who, due to their income level, technically qualify for CRP but are not assigned to CRP by the Company because either they elect not to participate or it is possible for them to pay a lower monthly bill (including arrearage payments, if any) than they would be billed within CRP (including $5 arrearage payments, if there are any arrears). The question is whether or not these customers should be permitted to pay this lower monthly average bill amount (than comparable CRP customers) and also be provided the CRP arrearage forgiveness subsidy and possible access to the CRP Low Income Usage Reduction Program (LIURP) subsidy.

(4) My answer as to providing the CRP arrearage forgiveness plan is "no." The reason is that because the monthly bill for these customers (including arrearage payment, if any) is already lower than for a comparable CRP customer (including arrearage payment, if any) they are more likely to be able to pay their monthly bills (including full pay down of their arrearage amount) without additional subsidy from other customers. This brings them into fidelity to the system model in which customers are

responsible for paying for their energy use and for their share of the fixed costs of the energy system. The difference between these customers and CRP customers is that these customers are not subsidized by other customers and are paying a lower monthly bill. That is an optimal system result.

If they were in CRP they would be paying a higher monthly bill so they benefit in the monthly bill. They do not get the benefit of arrearage forgiveness, but, instead, will need to pay their full arrearage amount down to zero over time. This makes for a stronger system because it offers the lowest monthly bill available (including the arrearage payment, if there is one). Also, it does not require additional subsidy to be taken from other customers. So, for example, if there are two similarly situated customers who qualify for CRP based on the income criteria and the customer placed in CRP pays at 9% of income, while the other uses energy differently and qualifies for a Budget Plus bill equivalent to 7% of income it is not reasonable to subsidize the arrearage of the customer paying the Budget Plus bill. Instead, they simply fit the model of the customer who pays in full the amount of their monthly energy bill based on cost of service. Again, this is the optimal result.

(5) As to the LIURP benefit, it is a bit of a mirage to add another large pool of customers to the pool of CRP customers to compete for low-income weatherization. LIURP programs are easily oversubscribed already and are typically managed already so that the number of customers served is determined by the budget. Customers who have a lower monthly bill than the CRP bill with Budget or Budget Plus, likely would not make it in to LIURP service anyway due to the preference within LIURP for high use customers.

(B) ***Revising The Calculation of the CRP Asked-to-Pay Amount***

Q. WHAT DOES MR. GELLER RECOMMEND REGARDING THE CALCULATION OF THE CRP ASKED-TO-PAY AMOUNT?

A. According to Mr. Geller, PGW's current percentage of income targets are "beyond many low-income customers' ability to consistently afford" service and, therefore, he recommends that these targets be changed from 8, 9, and 10% to 5, 7 and 9%. (TURN St. No. 1 at 11-15). This amounts to changing CRP energy burden amounts.

Q. DO YOU HAVE AN OPINION REGARDING THIS PROPOSAL?

A. Yes and, to be clear, my opinion is only from a policy perspective and I would note that Mr. Geller has not undertaken any analysis of the effects of his proposal to adjust PGW's current CRP percentage of income targets.[5] Nor has he presented an economic study of bill affordability for low income customers in the City of Philadelphia. In my opinion, this type of analysis is necessary in order to establish an appropriate affordable energy burden. The Commission has recently undertaken such an evaluation through a statewide energy affordability study, and I believe this is an essential first step in revising energy burdens.[6] It is quite possible that on the basis of such a study the Pennsylvania Code guidelines for energy burdens may be revised as suggested by Mr. Geller. The Commission also opened a broader review of universal service and energy conservation programs, which I also support.[7]

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5 PGW Exh. HGP-3 (TURN Discovery Response to PGW-III-2).

6 *Energy Affordability for Low Income Customers*, Docket No. M-2017-2587711, Opinion and Order entered May 5, 2017.

7 *Review of Universal Service and Energy Conservation Programs*, Docket No. M-2017-2596907, Opinion and Order entered May 10, 2017.

While not clear how these two broader proceedings along with PGW's USECP proceeding fit together, my sense is that from customer service, customer relations, and customer communications perspective it would be better to minimize the need for successive program changes over a short period of time. The broader investigation of energy affordability with its statewide scope will likely be resourced to produce more current knowledge of affordability that may lead to the recommendation of new energy burden guidelines and other changes to the relevant portions of the Pennsylvania Code. Requiring PGW to change its current guidelines, which are in accordance with the commission guidance presented in the Pennsylvania Code – based purely on Mr. Geller's observations, and without empirical demonstration – only to revise them at a later date based on the outcome of the Commission's broader investigation is not a reasonable use of resources and could result in unnecessary costs for PGW's ratepayers. In addition to these concerns, changes of this kind should not be reviewed independently of the full panoply of PGW's Universal Service programs because the program services are inter-related and all changes will have a cost that will be passed on to PGW's other ratepayers. To the extent other changes are required to PGW's Universal Service programs in the USECP, those changes could also create costs; all of these costs and issues should be reviewed together in a comprehensive manner as part of PGW's USECP.

(C) LIHEAP Crisis Grant Policies

Q. WHAT CONCERNS DOES MR. GELLER RAISE REGARDING PGW'S LIHEAP CRISIS GRANT ACCEPTANCE POLICIES?

A. Mr. Geller makes the claim that PGW is refusing to accept a LIHEAP Crisis grant that does not – either separately or in combination with other funding – fully satisfy the

amounts due to maintain or restore service. (TURN St. No. 1 at 31). Ms. Adamucci more fully describes the Company's current process.

Q. WHAT IS YOUR OPINION REGARDING MR. GELLER'S PROPOSAL?

A. From a policy perspective, LIHEAP crisis grants are either an individual benefit to a specific household or a collective benefit to a class of households similarly situated. If LIHEAP crisis grants were a collective or pooled resource, then it follows that customers participating in the pool might be treated as a class and collectively treated. However, crisis grants have always been considered individual grants to specific households. Since this is the case, it is reasonable to treat each household individually as PGW does. My understanding of the current process is:

(1) If, for a specific household, the crisis grant plus any other available funding (for example, from the Utility Emergency Services Fund) can fully satisfy the amounts due, then the crisis grant will be accepted and service will be continued or restored.

(2) In some years, if, for a specific household, the crisis grant plus any other available funding cannot fully satisfy the amount due, but the household is still a continuing customer, and the total amount owed is under a certain amount (which is set from year to year) the crisis grant is accepted and service maintained.

(3) If, for a specific household, the crisis grant plus any other available funding cannot satisfy the amount due and service has already been terminated then the crisis grant will not be accepted and service will not be restored. An example would be a terminated household owing $5,000 that receives a $500 LIHEAP crisis grant. Policies on restoration of households that are not currently customers of PGW are standardized and approved by the Commission. As noted, this treatment is reasonable and consistent with my view that the crisis grant provides an individual benefit to the

customer receiving it in the form of an additional means to pay his or her bill – but should not otherwise alter PGW's restoration and termination policies.

(D) ***Terminations and Reconnections***

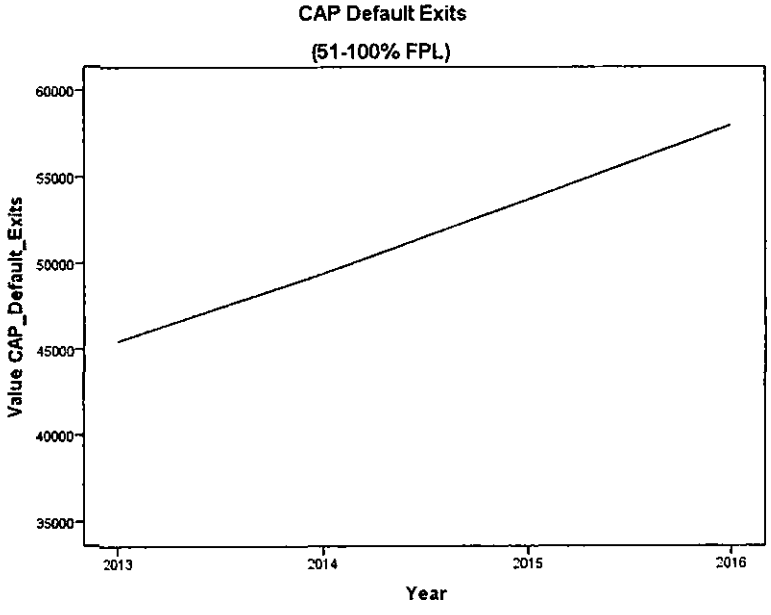
Q. COULD YOU PLEASE COMMENT ON MR. GELLER'S USE OF "CRP DEFAULT EXIT" NUMBERS ON PAGES 11-12 AND THE FOOTNOTE ON PAGE 13?

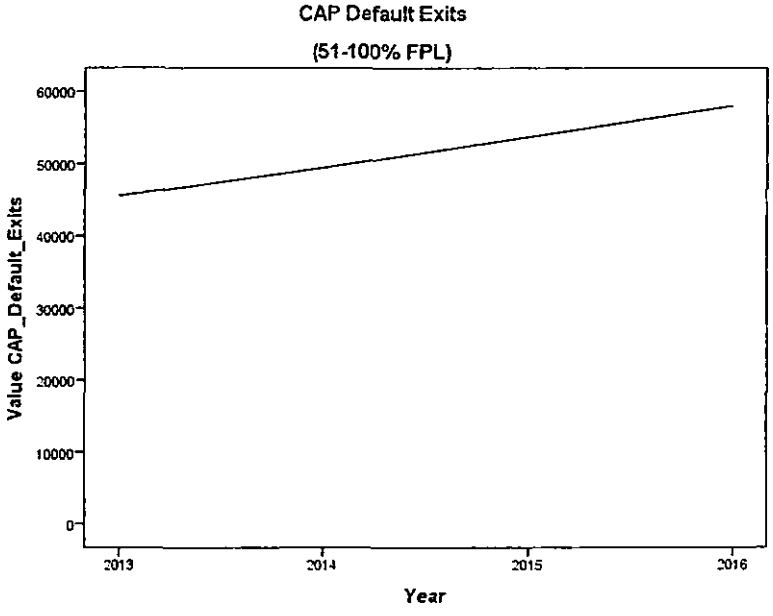
A. Yes. The use of "CRP Default Exits" is inappropriate. Mr. Geller presents this data in the form of graphs that are without a true zero point on the vertical or Y-axis. This is a technique that is part of rhetoric but frowned upon by statisticians because to the quick reader (most readers are not going to spend two hours pondering over a graph) it conveys an exaggerated effect.

(1) First, however, consider the values of CRP Default Exits (OCA-III-1, Attachment A, B) as shown in the table below in comparison with CRP customers on 12/31 for the years 2013-2015. The CRP Size is taken from the yearly BCS reports on Collections and Universal Service. Note that in the last two lines of the table, the number of CRP Default Exits is much larger than the size of CRP on 12/31 of each year. This means that CRP Default Exits is not a valid indicator of any problem with CRP operations or with terminations from CRP.

CRP Default Exits			
Tier	Year		
	2013	2014	2015
0-50%	23,902	26,240	28,029
51-100%	45,498	49,425	53,715
101-150%	24,773	26,491	28,418
Totals	94,173	102,156	110,162
CRP Size	68,458	61,319	58,282

(2) Second, the graphical presentation of this data is presented on graphs without a correct zero point on the vertical or Y-axis. The first graph below is as presented by Mr. Geller on page 12 of his testimony. The second graph presents the same information using a true zero. The top graph makes the effect seem much stronger than does the graph with the true zero point.





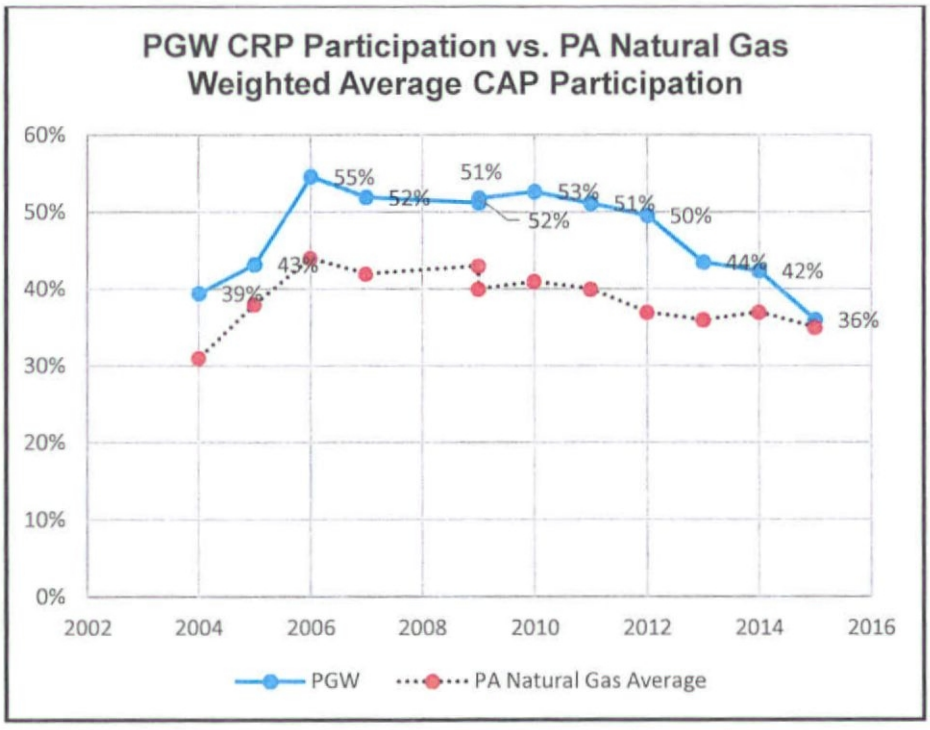
(3) Although the name "CRP Default Exit" sounds like a termination, for PGW it includes both termination of service and removal from CRP for failure to recertify when required.

(4) For these reasons, the use of CRP Default Exits on Pages 11- 13 should be disregarded. It is not an indicator of quality of service, nor is it an indicator whose numerical value explains termination rates.

Q. DO YOU HAVE A DIFFERENT, MORE RELEVANT, INDICATOR TO USE IN PLACE OF CAP DEFAULT EXITS?

A. Yes. It is the CRP Participation Rate, defined as the percentage of Confirmed Low-Income Customers in CRP. This rate is reported each year to BCS and is tabled in their annual report on collections and universal service. Here is how PGW CRP participation compares with the weighted average CAP participation of Pennsylvania natural gas utilities. Note that CRP performs above or at the level of weighted average CAP participation. The curve for CRP declines from above average to average which is normal and expected since gas costs have declined and for many customers eligible for

CRP, the Budget Bill or Budget Plus is a better alternative. As customers are tracked into these alternatives, the CRP participation curve naturally declines.



The data table on which the participation graph is based follows.

Participation Rate: PGW CRP vs. Weighted Average of PA Natural Gas CAP Programs

Year	PGW							PA Natural Gas Companies
	Residential Customers	Confirmed Low Income		Estimated Low Income		CRP Participation		Weighted Average CAP Participation
(Col. 1)	(Col. 2)	(Col 3)	(Col. 4)	(Col. 5)	(Col. 6)	(Col. 7)	(Col. 8)	(Col. 9)
		Number	Percent	Number	Percent	Number	Percent	Percent
2015	470,788	161,961	34.4%	178,899	38.0%	58,282	36%	35%
2014	469,283	144,696	30.8%	181,143	38.6%	61,319	42%	37%
2013	468,943	157,320	33.5%	186,780	39.8%	68,458	44%	36%
2012	479,889	151,789	31.6%	156,747	32.7%	75,224	50%	37%
2011	479,284	156,998	32.8%	163,836	34.2%	80,298	51%	40%
2010	479,564	156,711	32.7%	156,711	32.7%	82,544	53%	41%
2009	480,908	158,108	32.9%	202,655	42.1%	81,905	52%	40%
2009	481,218	153,239	31.8%	153,239	31.8%	78,490	51%	43%
2007	481,499	146,836	30.5%	152,540	31.7%	76,236	52%	42%
2006	478,594	139,303	29.1%	152,540	31.9%	76,045	55%	44%
2005	475,723	155,308	32.6%	156,723	32.9%	67,120	43%	38%
2004	466,662	153,707	32.9%	156,723	33.6%	60,621	39%	31%

Note: PGW was not required to submit data until 2004. Percent in Columns 4 & 5 is percentage of residential customers. Percent in Column 8 is percentage of Confirmed Low Income Customers.

Q. COULD YOU PLEASE COMMENT ON MR. GELLER'S NON-PAYMENT TERMINATIONS TABLE ON PAGE 13?

A. Yes. By requesting data of number of terminations due to non-payment of customers who were enrolled in CRP within the year (12 months) prior to termination, rather than for the yearly termination rate for CRP, Mr. Geller captures terminations in a way that is overly broad since this includes customers who may not have been on CRP at the time of termination. The usual way to present termination is by program year. In that way, the terminations for the year can be understood as a percentage in relation to the CRP size at the end of the year. The termination numbers used by Mr. Geller are correct for the specific way he has asked for data, but they are approximately double the actual terminations for each year. For example, the number of terminations for 2013 is 4,484 instead of 8,915; for 2015 the number of terminations is 3,999 instead of 9,028; and for (2015) the number of terminations is 2,991 instead of 7,279.[8]

Q. DOES MR. GELLER OFFER ANY OTHER SUPPORT FOR HIS CLAIM THAT PGW IS EXCESSIVELY TERMINATING AND FAILING TO REASONABLY RESTORE CUSTOMERS?

A. Mr. Geller claims that the discovery response provided by PGW in this proceeding and the data provided to the Commission for purposes of the Universal Service Reports show that PGW's residential customer base has declined between 2006 and 2015. (TURN St. No. 1 at 19-20). Since, according to Mr. Geller there has been a documented increase in the population of Philadelphia, he opines that this data shows that PGW is "not doing

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[8] Both sets of numbers are from PGW's response to Request TURN et al-II-1. The lower figure is the number of terminations from CRP during the program year as provided with the initial response. The higher figures are from the Supplemental Response to Request TURN et al-II-1.

everything in its power to maintain and increase its customer base by avoiding service terminations and facilitating reconnections." (TURN St. No. 1 at 20).

Q. DO YOU AGREE WITH THIS ANALYSIS?

A. No. As seen in the table above, PGW's annual CRP participation tracks the participation rate of the average CAP participation of the PA natural gas utilities. Given the fact that PGW provides each customer who qualifies the most affordable monthly payments which may not be participation in CRP and the lower cost of gas, there is no support for the view that PGW's specific policies are terminating more customers than would be expected. The reduction in CAP enrollment is an industry-wide trend and, therefore, attributing it to some failure by PGW's inappropriate.

(E) Increase to Fixed Residential Customer Charge

Q. MR. GELLER EXPLAINS WHY HE OPPOSES PGW'S PROPOSAL TO INCREASE ITS FIXED RESIDENTIAL CUSTOMER CHARGE BY 50% FROM $12 TO $18. PLEASE COMMENT.

A. PGW should increase its fixed charge to the extent the $18 reflects cost causation by fixed charges rather than variable charges.

(1) It is important to separate the argument that the rate change requested by PGW would have a greater percentage impact on low usage residential customers from the argument that the requested rate change is in some way inappropriate. The former is, of course, mathematically true. Because the percentage change in the fixed charge portion of residential rates is larger than the percentage increase in volumetric rates, customers with relatively lower usage will have a higher percentage increase in their bill than customers with relatively higher usage.[9] However, it is also true the rates

[9] The exception is customers on CRP billing who would not experience any change in their monthly gas bill.

should accurately reflect the cost of service so that rates send the correct signal to consumers.

(2) If a certain customer demographic is disproportionately impacted by the proposed rate change and the societal desire is to shield those customers from the impact, it is better from an economic systems perspective to provide a subsidy of some sort to those customers rather than distort the price signal for all customers. I show elsewhere that on average low income customers are most likely to use more gas than other residential customers (though, of course, there will be a distribution of cases, and so, exceptions). If other demographic groups such as the elderly and disabled experience greater percentage increases in the gas bill due to lower usage, a claim that may or may not be true since we do not have gas usage data for these customers, then the question should be what assistance if any should these customers be provided and who should provide it. Regardless of the answer to these questions, the rate structure that best reflects PGW's cost will provide the best price signal to all customers. For this reason, to the extent possible and reasonable, fixed charges that are currently recovered in variable rates should now be recovered in the fixed portion of energy bills.

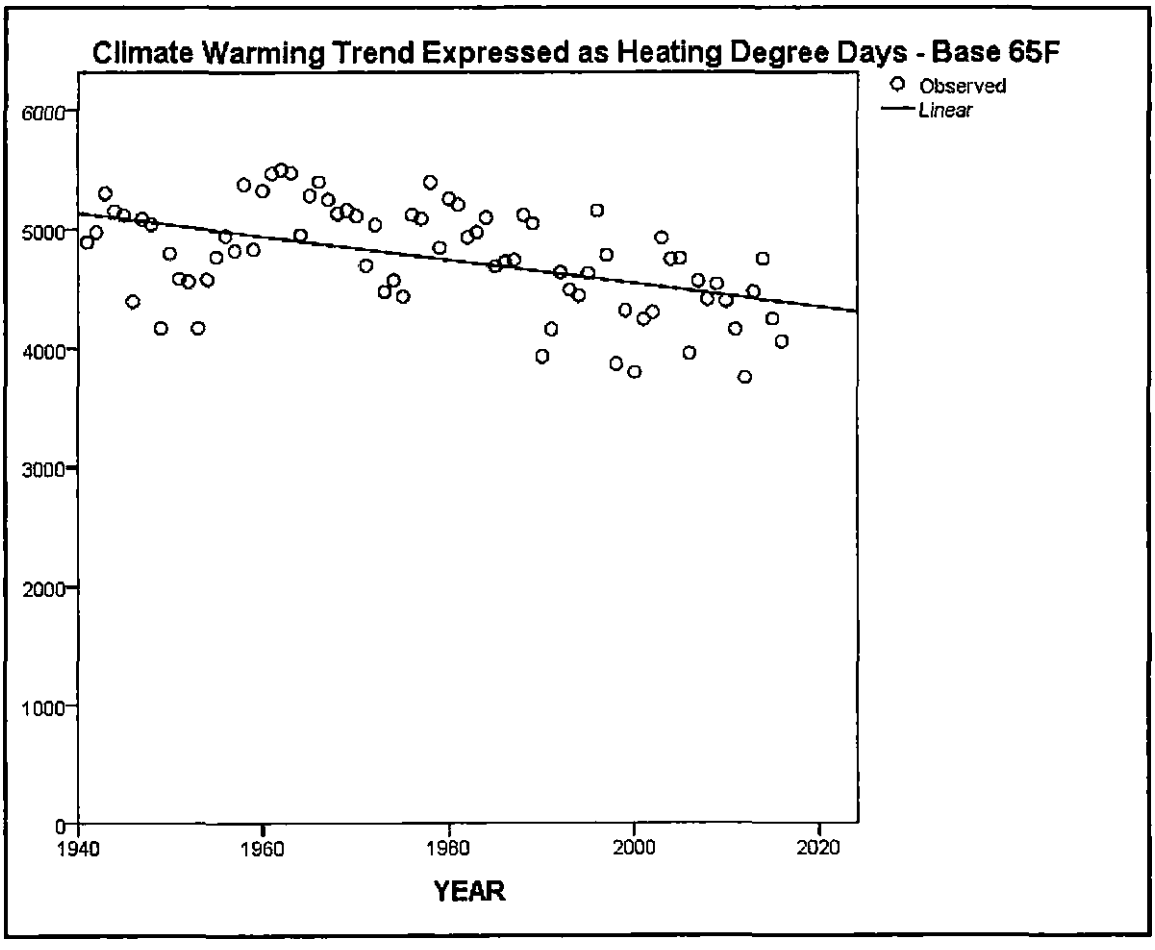
(3) It has been a strong and successful public policy objective to reduce unnecessary energy use for some time now in Pennsylvania, and both the Low-Income Usage Reduction Program (LIURP) and Pennsylvania's Demand-Side Management programs have demonstrated effectiveness in reducing energy use in many independent evaluations. At the same time, federal codes and standards programs have made remarkable gains in appliance energy efficiency and evolving building

standards are gradually reducing energy use in new, renovated and rehabbed houses and apartments. These changes mean there will be a trend towards decreased energy use per customer. For this reason, to the extent possible and reasonable, fixed charges that are currently recovered in variable rates should be moved to the fixed charge.

(4) Volumetric energy use is declining. To insure stability of the system and surety of revenue recovery it makes sense to recover fixed costs from the point at which they are incurred which is from the maintenance of the physical energy system. In other words, more of the fixed cost needs to be recovered from the fixed customer fee rather than from the volumetric portion of the bill which is declining and is expected to continue to decline. It must be paid for from somewhere for the system to exist and be maintained and resilient. The customer charge is the logical point for sharing out the cost of the common use system.

(5) Another reason why the fixed charge must be increased is climate warming. The climate warming trend line is shown in the graph below, expressed in terms of heating degree days (Base 65° F). As shown in the graph, although there is variation about the trend, heating degree days for Philadelphia are dropping meaningfully from the beginning of the yearly HDD data series in 1940 through 2016. Note, particularly, how the data points are tending to register below the declining trend line for at least the past 10 years. This suggests that the trend line will bend downwards at a steeper slope as time goes on. Data are from the Philadelphia airport weather

station.[10] The unstandardized "B" coefficient means airport data indicates an approximately 10 heating degree day drop per year due to climate warming. The F-test on the overall regression shows results are highly statistically significant.



Graph of Climate Warming Trend Line Expressed as HDD - Base 65 Degrees F.

[10] Weather History for KPHL (accessed 06/01/2017) https://www.wunderground.com/history/airport/KPHL/2016/1/1/CustomHistory.html?dayend=31&monthend=12&yearend=2016&req_city=&req_state=&req_statename=&reqdb.zip=&reqdb.magic=&reqdb.wmo=.

Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
YEAR	-9.885	1.995	-.499	-4.955	.000
(Constant)	24311.660	3947.204		6.159	.000

Regression Coefficients for Climate Warming HDD Analysis.

Airport weather data is useful because it is employed constantly for many purposes other than climate analysis and because the weather airport stations are professionally maintained; the source data for this analysis has high integrity. If we were to integrate the official weather data with the best climate models to project the downward sloping line through 2100, the downward slope would become considerably steeper. So, our analysis is conservative. Note that weather adjustment mechanisms will have to be revisited because normal weather is different (as indicated by the downward sloping curve of HDD).

(6) Another reason is that the $12 fixed cost was set in December 2001. Simply applying the BLS Consumer Price Index calculator (https://data.bls.gov/cgi-bin/cpicalc.pl), $12 in December 2001 is $16.61 in April 2017, which means it will be about $17 by the time the rate goes into effect.[11] This is very close to the $18 request and does not take into account the decline in volumetric energy use, changes

[11] There is good evidence that the BLS CPI loses costs over time, so that it is quite useful to compare years that are no more than three years apart, but over ten years it tends to understate the amount of inflation to a meaningful extent. There are other price indexes that show stronger inflation and the social work approach of household budget studies tends to capture more change than the CPI adjustment. We use the official CPI here because it is official, but it tends to meaningfully understate the loss of buying power in periods of ten or more years. In other words, our demonstration here is conservative.

in regulation to open markets and create risks or the downward trend in heating degree days. Simply put, an $18 fixed charge is fair and reasonable and from a technical perspective it sends the proper price signal.

III. RESPONSE TO THE TESTIMONY OF OCA WITNESS ROGER COLTON

(A) Usage of Low-Income Customers

Q. DOES MR. COLTON OFFER A VIEW ABOUT THE GAS USAGE OF LOW-INCOME CUSTOMERS?

A. Yes. According to Mr. Colton, Confirmed Low-Income customers have significantly lower usage than do residential customers generally. (OCA St. No. 4 at 7).

Q. WERE YOU ABLE TO VERIFY THE ACCURACY OF THIS CLAIM?

A. No. Mr. Colton's claim appears to be based on the dollars billed to Confirmed Low-Income customers. However, 36% of these customers were billed under CRP where usage is not a factor in determining the customer's requested payment. Our analysis provides evidence that the average usage of low income customers is actually higher than the average residential customer. From analysis completed as part of our 2016 report, full year CRP participants were found to use 112 mcf in 2015.[12] Since CRP customers make up 36% of low income customers (BCS 2015 USP Report at 42), non-CRP low income customers would have to use less than 56 mcf on average for low income customers to use less than the average residential customer usage of 76 mcf. This represents only 50% of average CRP usage (56/112) and 74% of the average residential customer usage (56/76). This is unreasonably low for low income customers who often

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[12] PGW Exh. HGP-2 at 5, reports 119 mcf based on PGW's 30 year normal weather calculation. To make this number comparable with 10 year normal weather, it was multiplied by the ratio of 76 (10 year weather normal) over 81 (30 year weather normal). 112=119*(76/81).

live in housing that is older and less efficient than the average residential housing stock. The analysis here is indirect but it does rule out the claim that Confirmed Low-Income customers have significantly lower usage than do residential customers generally.

(B) Low-Income / Replacement Program

Q. HAVE YOU REVIEWED MR. COLTON'S PROPOSED LOW-INCOME / REPLACEMENT PROGRAM?

A. Yes, I have reviewed this proposal from a policy perspective. PGW Witness Adamucci also provides information about this proposal from the Company's perspective.

Q. PLEASE DESCRIBE MR. COLTON'S PROPOSAL.

A. Mr. Colton recommends that for PGW customers (or non-customers if gas service has been terminated) with income at or below 200% of Federal Poverty Level unable to use their natural gas system as a heating source because it is broken and the consumer has not had the system repaired or replaced, PGW should be directed to implement a pilot program to repair or replace broken systems where the consumer has used, or is likely to use, electric space heaters as a replacement source. Mr. Colton proposes that PGW should be directed to fund the program at the rate of $500,000 per year to be recovered through the Universal Service Surcharge. (OCA St. No. 4 at 47-48).

Q. DO YOU HAVE AN OPINION REGARDING THIS PROPOSAL?

A. Yes.

(1) I am not in support of this proposal primarily because the issue needs to be addressed in a more comprehensive, societal manner.

(2) Other reasons for my opposition to this proposal include the unsupported claim of financial harm to consumers using non-gas portable heaters and to the natural gas and electric providers. Consumers using non-gas portable heaters may well suffer a loss

in comfort but whether or not they experience higher heating costs depends on many factors, including the age and efficiency of the failed gas equipment and the degree to which they rely on zonal heating with electric rather than whole house heating with gas. A consumer going from whole house heating with an old inefficient gas furnace operating in the 50% to 60% efficiency range to partial home heating with zonal electric may well experience lower heating costs. As a practical matter, though zonal electric is the correct technical term, what it comes down to is only heating certain rooms at certain times of the day and night.

(3) For the utility providers, moving an end-use from one system to the other is rarely a loss for both. More likely it is a loss to one and a gain for the other, the direction depending on the payment behavior of the consumer.

(4) I am also concerned that the need is far greater than what the proposed solution would address. Using a conservative estimate of a 25 years, the number of failures per year is estimated at over 6,900 with a total replacement cost of $27 million dollars each year.[13] A potential need this large should be approached with a comprehensive solution.

(5) When a gas heat customer is unable to replace a hazardous or inoperable furnace, has installed portable electric heaters and has then defaulted on the much lower cost (compared to replacing a furnace) of payment of the monthly bill to the electric company, this creates a firmly demonstrated record of inability not only to purchase a

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[13] Based on a low-income population estimate of 180,000 gas customers, a gas furnace/boiler saturation rate of 96% and gas equipment life of 25 years. The total replacement cost estimate uses the low end of a cost per replacement estimate of $4,000 to $6000. The 96% furnace/boiler saturation rate is derived from the 2015 American Housing Survey for the Philadelphia metropolitan area.

gas furnace, but also a firmly demonstrated record of inability to purchase energy in the absence of income transfer. The prospect of increased gas or electric sales in such a case falls out of market theory. It has become a residual concern, rather than a relevant factor in this situation.

(6) If the local electric company now faces unpaid bills, it means if the customer transfers heating to the gas company the gas company will be facing unpaid bills. So, this is only a statement of equivalence. It is not a relevant factor in this situation.

(7) The idea that the electric company is now facing higher than necessary electric universal service costs on electric ratepayers rests on the unsound assumption that the electric universal service costs are higher than necessary because the customer somehow "belongs" to the gas company for home heating. This unsound assumption is probably based on the customer having formerly purchased energy services for heating from the gas company and because old and broken gas heating equipment is present in the home. This assumption is a strange concept because the customer chooses to contract for service with one or more energy providers, in this case either gas heat or electric heat. Whoever holds the current contract and has not already terminated the customer (in this example, the electric company is experiencing unpaid heating bills and the gas company is no longer experiencing unpaid heating bills) would seem to hold liability to the extent that there is any liability. The gas company does not "own" the customer in any sense. In the case as described by Mr. Colton, the customer has failed to honor the contract with both providers, but is likely to be still connected to the electric company, unless terminated by both companies.

(8) What this comes down to is that the situation described by Mr. Colton is a social problem rather than a utility problem. But, if it is to be treated as a utility problem, it is a joint utility problem. It should not be addressed by the ratepayers of only one affected company.

Q. WHAT, IN YOUR VIEW, WOULD BE A BETTER A WAY TO ADDRESS THE CONCERNS IDENTIFIED BY MR. COLTON?

A. A better way would be the development of a statewide process for fuel blind funding for natural gas furnace replacement.

(1) I believe that a comprehensive statewide solution to this issue is needed given the fact that it impacts customers in overlapping utility service territories and in varying ways throughout the Commonwealth. As such, it is a much larger societal problem that would benefit from a broader societal solution. As an example, in Nevada both gas and electric customers pay a Universal Energy Charge on each monthly bill. The Public Utility Commission of Nevada insures and enforces this collection on an ongoing basis. Funds collected are sent to the Nevada Welfare Division which sends a certain percentage to the Nevada Housing Division. The Housing Division spends on weatherization work as needed, without regard to gas or electric funding and has a priority on replacing gas furnaces (and air conditioners in the desert areas of the state, where they are a health and safety issue). New Jersey also collects funds and distributes according to need.

(2) The City of Philadelphia already does offer a Basic Systems Repair Program ("BSRP") to provide major systems repairs for occupant homeowners. A fuel blind fund like this would be the preferable approach. While I recognize that there is

significant need facing this program, it is another example of how this issue should be addressed more broadly than the recommendation here.

(3) Mr. Colton does not describe what would be tested in a utility pilot or what the indicators of success and metrics of the utility pilot might be. These should be defined.

Q. IS THERE ANY OPEN COMMISSION PROCEEDING WHERE THIS PROPOSAL COULD BE PRESENTED?

A. Yes. The Commission recently initiated a comprehensive review of the entire Universal Service and Energy Conservation model.[14] The Commission noted that "only through collaboration can we address all relevant issues and balance the needs of all stakeholders."[15] Mr. Colton's recommendation could be addressed in that proceeding, where a statewide solution could be developed.

(C) CRP Offset

Q. WHAT DOES MR. COLTON RECOMMEND REGARDING THE AMOUNT OF COSTS THE COMPANY SHOULD BE PERMITTED TO RECOVER FOR ITS UNIVERSAL SERVICE PROGRAMS?

A. Mr. Colton recommends a series of offsets to the costs of the Company's universal service programs that it should be permitted to recover through the Universal Services Surcharge. (OCA St. No. 4 at 20-35). Though he offers four different offsets based on his theories about how participation in PGW's CRP impacts the ability of PGW to

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[14] *Review of Universal Service and Energy Conservation Programs*, Docket No. M-2017-2596907, Opinion and Order entered May 10, 2017.

[15] *Review of Universal Service and Energy Conservation Programs*, Docket No. M-2017-2596907, Opinion and Order entered May 10, 2017 at 3.

recover uncollectible expense and carrying costs, the proposed total of all four offsets is 73.4%. (OCA St. No. 4 at 34).

Q. IS REQUIRING A COMPANY TO REDUCE THE AMOUNT OF COSTS IT CAN RECOVER FOR ITS UNIVERSAL SERVICE PROGRAMS GOOD POLICY?

A. No. Public policy should incent utilities to undertake robust universal service programs to advantage low-income customers. However, it would be inappropriate to double collect on an expense. But, in my view, that is not the case with respect to PGW.

Q. HAVE YOU EVALUATED DATA PROVIDED BY THE COMPANY REGARDING CRP PARTICIPATION AND ITS RATE OF BAD DEBT EXPENSE?

A. Yes. I have reviewed the information provided in the rebuttal testimony of Mr. Stunder to determine whether or not there has been a historical relationship between the number of CRP participants and PGW's bad debt expense.

Q. PLEASE DESCRIBE YOUR EVALUATION METHOD.

A. First, I defined the analysis as from 2012 through 2016 since that is the relevant period for analysis and coincides with the data in Mr. Stunder's rebuttal testimony. Then, I used a standard statistical analysis package, SPSS Version 24, for analyzing the data. Specifically I used the following data which conforms to the values used in Mr. Stunder's graphical and written analysis:

Values of Variables in Analysis

Year	CAP_Size	Percentage_Bad_Debt
2012	75224	5.8
2013	68458	5.8
2014	61319	5.3
2015	58282	5
2016	49321	4.9

A standard correlation analysis was performed, to determine the correlation of CAP_Size with Percentage_Bad_Debt. Then, I carried out a standard regression analysis using

CAP_Size as the independent variable and Percentage_Bad_Debt as the dependent variable

Q. WHAT CONCLUSIONS WERE YOU ABLE TO DRAW FROM THIS EVALUATION?

A. The first conclusion is that there is a strong positive correlation between CAP_Size and Percentage_Bad_Debt but the correlation is exactly the opposite of what Mr. Colton asserts. In other words, the larger the CAP Participation on 12/31 at the end of each year, the more Bad Debt exists. As shown below, the correlation is about r = 0.94 which is a very strong positive correlation.

Correlations

		CRP_Size	Bad_Debt_Expense
CRP_Size	Pearson Correlation	1	.939*
	Sig. (2-tailed)		.018
	N	5	5
Bad_Debt_Expense	Pearson Correlation	.939*	1
	Sig. (2-tailed)	.018	
	N	5	5

*. Correlation is significant at the 0.05 level (2-tailed).

Although we are not trying to predict from a sample to a population here, I would like to note that the statistical significance level is better than the 0.05 criterion level; it is about at the 0.02 level. Since statistical significance is, in part, driven by the sample size and the size of the group analyzed here is small, this is another indication of the strength of the relationship.

The second conclusion is that the size of the CRP at the end of each year explains most of the variation in Percentage Bad Debt, when the data is run in a standard

regression analysis. The size of the CRP explains about 88% of the variation in Percentage Bad Debt, leaving about 12% open to be explained by other variables.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.939[a]	.882	.842	.1698

a. Predictors: (Constant), CRP_Size

From this analysis, I conclude that for the relevant time period, the larger the CRP then the larger the percentage of Bad Debt. This likely has to do with PGW opening an alternative to CRP which costs the customer less per month and to the success in lowering the cost of gas service so Bad Debt is declining since more households are able to find regular cost of service billing more affordable.

Q. WHAT CONCLUSION DO YOU DRAW BASED ON THIS ANALYSIS?

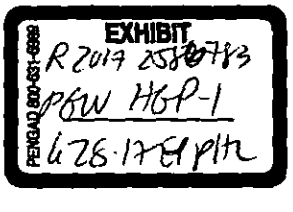
A. There is no evidence that if PGW CAP enrollment increases it will experience reduced bad debt expense – in fact the evidence is to the contrary – that as CAP enrollment increases its bad debt expense will increase. Accordingly, I recommend that Mr. Colton's recommended Bad Debt Offset by rejected.

IV. CONCLUSION

Q. DOES THIS COMPLETE YOUR REBUTTAL TESTIMONY?

A. Yes.

Exhibit HGP-1



H. Gil Peach, PhD
President, H. Gil Peach & Associates/Scan America®

16232 NW Oak Hills Drive, Beaverton, OR 97006 USA
Telephone: (503) 645-0716 Fax: (503) 946-3064
E-mail: hgilpeach@scanamerica.net
URL: www.peachandassociates.com

H. Gil Peach works in the areas of rates and regulatory affairs, general program evaluation, energy and water programs, low-income programs, improving efficiency and effectiveness of services (including organizational analysis and management and staffing studies), and social studies of science and technology. His current interests are in these areas and in the new area of climate adaptation.

EDUCATION

Doctor of Philosophy (PhD) Degree in Sociology (1985), New York University, New York, New York. Specializations in Social Statistics, Large-Scale Organizations/Society & Economy and Deviance and Social Control. Dissertation: *The Social Production of Applied Social Statistics*, a study of how organizational environments influence the construction of quantitative results when quantitative modeling and statistical results are developed in different organizations, including a large investor-owned electric utility, a government health agency, a small foundation and a public advocacy organization.

Master of Arts Degree in Economics (1972), New School for Social Research, New York, New York with a focus on political economy and econometrics and statistics.

Master of Arts Degree in Sociology (1969) and Bachelor of Arts Degree in Sociology (1965), Michigan State University, East Lansing, Michigan

One Year of Metropolitan Urban Service Training, Union Theological Seminary, New York, New York (1969).

Undergraduate study in physics and mathematics, (1961-1964) Michigan Technological University, Houghton, Michigan.

EXPERIENCE OVERVIEW

Dr. Peach has worked in the area of rates and regulatory affairs, provided regulatory support and/or expert testimony in several jurisdictions both for commission hearings (Massachusetts, Vermont, Connecticut, Pennsylvania, Ohio, Kentucky, Utah, Oregon, Washington, Nova Scotia) and for federal district court (Oregon and Washington) primarily in the areas of programs, results assessment (EM&V), measurement issues, low-income programs and low-income rate design. He has also led decoupling examinations (Cascade Gas and Puget Sound Energy), and tracked

specific case activity in California. Gil has carried out management/organizational and/or policy studies for Los Angeles Department of Water & Power (the largest municipal electric utility in the US), Long Island Lighting, Boston Edison, the Philadelphia Gas Works (the largest municipal natural gas utility in the US) and PECO Energy and other utilities. He has served as a key planner for two of the largest community-based DSM programs in North America, the Hood River Conservation Project in Oregon and the Espanola Power Savers Project in Ontario. In the early days of Demand Side Management, as a manager at a major multi-jurisdictional utility, Dr. Peach guided the development of the demand side of one of the first Integrated Resource Plans. Since 2005 he has led program portfolio development for fifteen utility potential studies including Vectren Indiana Electric, Vectren Indiana Gas, Indianapolis Power & Light, Citizens Energy, American Electric Power/Indiana, Duke Energy North Carolina, Duke Energy South Carolina, Duke Energy Indiana, Duke Energy Ohio-Kentucky, and Progress Energy. He has designed many individual energy efficiency programs and has also led over 200 energy program evaluations and other evaluations in the areas of health and human services. He has served on USDOE federal peer review panels, conducted evaluation for USDHHS, and has provided technical services for the Michigan, Massachusetts, Wisconsin, California, and New York Commissions and for the Nova Scotia Utilities and Review Board. Since the 1980's he has been a member of the Society for Social Studies of Science (4S) and is currently a member of the American Energy Services Professionals (AESP), the European Committee for an Energy Efficient Economy (ECEEE), the American Statistical Association (Past President of the Oregon Chapter), the Union of Concerned Scientists and the American Society of Adaptation Professionals (ASAP) where he is currently co-chair of the professional ethics working group. In addition to studies in the area of energy and evaluation, Dr. Peach has presented several papers on the social study of science and technology and written in the area of environment and natural resources, including climate change.

- **Manager/Principal Investigator:** Regulatory Support, Evaluation Research, Organizational & Management Studies to improve government and utility services, Process Evaluation, Behavioral program analysis, Survey Research, Socioeconomic Studies, Applied Statistics, Planning & Policy Studies, Strategic Policy Support.

- **Expert Services:** Program design, Evaluation design and Methods; Expert Witness Services on Measurement and Evaluation issues; Strategic Intelligence/Policy Development and Program Research; Due Diligence & Savings Verification Projects. Oversight of Auditors and Inspectors.

- **Academic Specialization:** Organizational Studies, Social Study of Science and Technology, Political Economics, Applied Social Statistics, Sociology of Economic Life, Sociology of Social Control, Econometrics.

- **Experience:** Over forty years of experience in organizational and program research, field studies, program development and evaluation work, and studies of science and technology, Marketing and Policy Studies.

EXPERIENCE

Principal, *H. Gil Peach & Associates (HGPA). January 1988 to present. HGPA provides regulatory support, program design, evaluation design, process and impact evaluation services, planning and program development services, management and organizational studies, studies in environment, resources, and climate change. HGPA provides, policy studies, expert witness services, and support for consensus building/collaborative initiatives. HGPA is the US member, along with a Canadian and a Swedish firm in the Scan America® Group, providing planning, measurement and evaluation services worldwide.*

Manager, Evaluation & Coordinator, Demand Side Management Planning, *Pacific Power & Light. 1988 to April 1989. Managed DSM evaluation, development of conservation supply curves, demand side of least-cost planning, development of portfolio of conservation programs.*

Manager, Research & Evaluation, *Pacific Power. 1984 to 1988. Managed evaluation research studies while maintaining consensus among industry, government, and public interest groups in a multi-year program of energy policy related social research.*

Research & Evaluation Coordinator, *Pacific Power. 1983 to 1984. Managed project evaluation for the Hood River Conservation Project, at the time the most ambitious community weatherization effort in the United States.*

Senior Analyst, Analyst, *Pacific Power. 1980 to 1982. Reviewed, designed, and coordinated survey research projects, load studies, statistical, and energy conservation studies; coordinated improvements in computer supported statistical analysis; developed staff capability in research methods. Responsible for direct day-to-day supervision of load research staff.*

Research Statistician/Computer Analyst, *Fund for the City of New York. 1978 to 1980. Conducted social research and statistical analysis for public sector management studies to improve efficiency and quality of service in hospital outpatient services, subways, and taxi regulation, social services, training and employment programs. Pioneered the role of research planning and technical analytic support for joint projects of non-profit agencies which developed, for a time, as a major focus of the foundation.*

Marketing Consultant. *1975 to 1980. Applied analytic problems, primarily in survey research. Principal clients: Pan Am, Citibank, Avon Products, American Market Research Bureau.*

Senior Quantitative Analyst, Program Research Analyst, *City of New York. 1972 to 1978. Evaluation research for Health Department; represented Director to funded university and hospital research teams. Various positions 1969 to 1972: Applied housing program research, urban renewal, training, budgeting, applied statistics.*

Senior Clerk - *New York Stock Exchange - 1969. Assisted on trading floor, developed statistical reports.*

SELECTED PAPERS & PUBLICATIONS

Peach, H. Gil, "Advances in Cost Effectiveness," Bright Business Conference. Halifax, Nova Scotia, October 2013.

Spector, Allison & H. Gil Peach, "All Natural: Straightforward ways to acknowledge the Continued Value of Natural Gas Conservation Programs," ACEEE Efficiency as a Resource Conference. Nashville, Tennessee, September 2013.

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Peach, H. Gil, "Global Perspectives on Technology in History" and "Public Understanding of Technology," essays in Sal Restivo, ed., *Science, Technology, and Society, an Encyclopedia.* Oxford, UK and New York, NY: Oxford University Press, 2005.

Peach, H. Gil, et al., "Evaluator as Fool; Tricking the Evaluator into Confirming Phantom Savings as Real," *Proceedings of the 2005 International Energy Program Evaluation Conference.* Brooklyn, New York: International Energy Program Evaluation Conference (IEPEC), Aug. 2005.

Peach, H. Gil, Ryan N. Miller, Anne West, and Howard Reichmuth, "Cost Evaluation Issues in Energy and Water Assistance Programs," Session on Cost Evaluation at the American Evaluation Association Meetings, Atlanta, GA, Nov. 2004.

Peach, Hugh, Ryan Miller, and Howard Reichmuth., "Representations of Inequality in the Context of Free Trade and Globalization," Joint Meetings of the Canadian Statistical Association and American Statistical Association, Toronto, Ontario, Canada, Aug. 8-12, 2004.

Peach, H. Gil, "Globalization: What do we owe the Future?" National Low-Income Energy Conference/NLIEC 2000, Workshop on Globalization, Los Angeles, CA, June 2000

Peach, H. Gil, "Improving Customer Service--The Customer Perspective." Paper presented to Workshop on Maintaining Quality Customer Service during the Transition to Competition, NLIEC 1999 Conference, Pittsburgh, PA, June 1999. Based on evaluation results, this paper contrasts the perspectives and pressures on utilities with the perspectives and needs of customers during organizational and economic transition.

Peach, H. Gil, "Implications of Income Shifts & Globalization for Program Evaluation in the United States." Beaverton, OR: H. Gil Peach and Associates, Monograph 99-1-1, 1999. Preliminary theoretical developments of this monograph were presented in Session 227, "Global Thinking in Evaluation," at the 1998 Annual Meeting of the American Evaluation

Association, "Transforming Society through Evaluation," Chicago, IL, Nov. 4-7, 1998; and at the Affordable Comfort Conference, Madison, WI, in the spring of 1998. This research monograph is an "alert to evaluators" detailing the need to take secular economic trends into account in evaluations, in that changes in social organization and economic context have become stronger factors than direct program influences in contributing to the outcomes of many programs.

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Peach, H. Gil, "Industrial Energy Efficiency in the Michigan Collaborative." in *Energy Program Evaluation: Uses, Methods, Results*, CONF-950817, Pp. 43-47. Chicago, IL: National Program Evaluation Conference, 1997. Based on evaluation results, this paper presents a public-responsibility perspective on industrial energy programs.

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Peach, H. Gil, "Low Income Program Evaluation for a Competitive Era," in *The Future of Energy Markets: Evaluation in a Changing Environment*, Pp. 293-300. Chicago, IL: National Program Evaluation Conference, 1997. This paper introduces improvements in evaluation perspectives and methods in the evaluation of low-income programs.

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Peach, H. Gil, Pamela Brandis, C. Eric Bonnyman, and Agneta Persson, "Market Transformation in Manufactured Housing: A Pacific Northwest Experience," Pp. 3.115-3.122 in the *Proceedings of the 1996 ACEEE Summer Study on Energy Efficiency in Buildings*, Panel 3, Residential Programs: Program Evaluation.

Peach, H. Gil, Ralph Prahl, Jeff Schlegel, and Rick Fleming, "Moving Towards Market Transformation", *Proceedings of the 1993 ECEEE Summer Study: The Energy Efficiency Challenge for Europe*. R. Ling & H. Wilhite (eds.). The European Council for an Energy

Efficient Economy, Oslo, Norway, Pp. 141-151, 1993. This paper deals with using market forces to promote program goals, and with how evaluation changes in a market context.

Peach, H. Gil, "Performance Contracting: Advice to Utilities." *Home Energy*, Vol. 9, Pp. 19-21, 1992. This article alerts readers to several differences in how some performance contractors approach evaluation and measurement issues, in contrast to program sponsors.

Peach, H. Gil, "Energy Conservation Technical Collaboratives," Paper presented to the 4S/EASST Joint Conference, Gothenburg, Sweden, August 1992. This paper contrasts the collaborative styles of California and New England in multi-party program and evaluation design.

Peach, H. Gil, "Verification and Sample Design." *Evaluation Exchange*, Vol. 1, No. 7, Pp. 12-13, 1991. This is a short technical contribution to quantitative method in evaluation.

Keating, Kenneth and H. Gil Peach, "Demonstration Projects: What's in Them for Utilities?" *Energy and Buildings*, Vol. 13, Pp. 85-91, 1989. This article calls for sponsorship of demonstration projects to promote social and organizational learning.

Peach, H. Gil and Eric Hirst, "Factors in the Practice, Organization, and Theory of Evaluation," *Evaluation and Program Planning*, Vol. 12, Pp. 163-170, 1989. This is an article on evaluation method, calling for positive inclusion of organizational context as a factor in evaluations.

Morse, William L. and H. Gil Peach, "Control Concepts in Conservation Supply," *Energy*, Vol. 14, No. 11, PP 727-735, 1989. This is a technical/statistical publication on energy conservation, incorporating evaluation as a tool for incremental social and organizational learning.

Peach, H. Gil, "Evaluation Strategies and Customer Response to Energy Efficiency Programmes: Pro-Active Evaluation--Lessons for the Future." *Workshop on Conservation Programmes for Electric Utilities*, Pp. 341-351. Paris, France: International Energy Agency and Organization for Economic Cooperation and Development, 1988. This paper is a call for evaluators to work with program planners and implementation staff. Thesis: While retaining a responsibility to "call things as they are" in the final evaluation, evaluators should share a common interest in and contribute to program success and social learning along with other parties.

Peach, H. Gil, "Utilization Focused Field Experiments", Paper presented to Conference on Advances in Knowledge Utilization: Impacts of Sciences and Professions in the Information Society, A Joint Conference Sponsored by the Howard R. Davis Society for Knowledge Utilization and Planned Change and the University of Pittsburgh, Oct. 8-10, 1987. A short paper contrasting different approaches to evaluation and knowledge development in different kinds of projects.

Peach, H. Gil, "Argumentation in Applied Research", Paper presented at the 10th Annual Meeting of the Society for Social Studies of Science, Rensselaer Polytechnic Institute, Troy, NY, Oct. 24-27, 1985. A paper illustrating the Dunn/Toulmin policy analysis approach to multi-party evaluation, employing "argument maps."

Keating, Kenneth M., Ruth L. Love, Terry V. Oliver, H. Gil Peach, & Cynthia B. Flynn, "The Hood River Project -- Take a Walk on the Applied Side", *The Rural Sociologist*, Vol. 5, No. 2, Pp. 112-118, 1985. This paper deals with the learning experience for program planners and evaluators in the contrast between evaluation planning and the encounter with realities in the field.

Peach, H. Gil, Terry V. Oliver, Mark Cherniack, David Goldstein, and Marion Philips, "Dialectic of Cooperation: How the Hood River Project Worked." In *ACEEE Summer Study on Energy Efficiency in Buildings*. University of California at Santa Cruz: American Council for an Energy Efficient Economy, 1984. The paper details the 'back and forth' relations of continued collaboration in a multi-year multi-party evaluation.

Peach, H. Gil, "The Hood River Conservation Project: A Model for Consensus-Building in Applied & Energy Research." Paper presented to the eighth annual meeting of the Society for Social Studies of Science, Session I, Taking Scientific Practice Seriously. Blacksburg, VA, 1983. The paper emphasizes the relationship of research quality, a focus on measurement and evaluation, and collaboration.

For additional papers, projects and clients, please see **www.peachandassociates.com**

H. GIL PEACH, PH.D.

EVALUATION & POLICY: LOW-INCOME PROGRAMS

Gil Peach (Hugh Gilbert Peach, PhD) is an independent professional analyst and consultant. He has experience as a Load Research Analyst in an electric utility Rate Department and has served as Evaluation Manager and coordinator of the demand-side of the integrated Least Cost Plan for a multi-jurisdictional electric utility. He has served as a statistical research analyst for a non-profit foundation working to improve the efficiency and effectiveness of government services. He has also been a Program Research Analyst and Senior Quantitative Analyst for the City of New York where he worked in health program evaluation and housing program development. He has been a clerk at the New York Stock Exchange.

Dr. Peach conducts studies for utilities, state utility regulatory commissions, and government agencies. For the past several years he has served as President of H. Gil Peach & Associates LLC.

Gil is a sociologist and economist and applied statistician. He works in policy studies, evaluation verification review, program evaluation and program development. In the evaluation area, he works from the perspective of the Campbell school which emphasizes truth in measurement.

Following is a list of low-income program and evaluation experience:

Evaluation and Program Design Experience (Low-Income or Projects with a Low-Income Component)

2015-2016 Policy Evaluation of Low-Income Programs for Philadelphia Gas Works in Pennsylvania
2014-2016 Decoupling Evaluation for Puget Sound Energy, including emphasis on effects on Low-Income programs and customers
2014-2015 PacifiCorp Low-Income Weatherization evaluations for Washington, Utah, Wyoming and Idaho
2014 Peer Reviewer of Draft Impact and Process Evaluations for US Department of Energy National Weatherization Program Evaluation
2014 New Hampshire Commission Evaluation Review Project, including Low-Income
2013 Low-Income Program Design for Duke Energy Indiana
2012 Low-Income Program Design for Progress Energy North Carolina
2012 Low-Income Program Design for Duke Ohio and Duke Kentucky
2012 Low-Income Program Design for AEP Indiana-Michigan Power
2012 Cascade Natural Gas Special Study of Performance of Low-Income Weatherization Work in Oregon Service Territory
2011 Evaluation of Low-Income Weatherization Economic Stimulus Program for Nevada
2010–2011 Decoupling Evaluation for Cascade Natural Gas, including effects on Low-Income programs and customers
2010 Consultant for development of Michigan Public Sector Consultants Cherryland Weatherization Pilot
2010 Evaluation of First Energy Companies in Pennsylvania Low-Income Programs
2009-2017 Savings Verification Consultant for Nova Scotia Utilities and Review Board (lead team for site visits and review all DSM evaluations, develop an annual report and serve as expert witness on energy savings for the Board)
2009-2016 Evaluation Advisor for New York State Department of Public Service staff (review evaluation plans, evaluation draft and evaluation final reports for Con Edison, New York State Electric & Gas, Rochester Gas & Electric, and Orange & Rockland Utilities; participation in Advisory Group work in development of NY evaluation methods standards)
2008-2009 Stakeholder Advisory Group Advisor for development of Program Evaluation (including Low-Income) for the State of Illinois
2007 Expert Witness for Nevada Power/Sierra Pacific Power at Commission Low-Income Hearing
2007 Process Evaluation of Northwest Natural Gas Low-Income Program in Oregon

2007 Evaluation of First Energy Companies in Pennsylvania Low-Income Programs
2007-2008 Evaluation of State of Oregon Weatherization Assistance Program
2000-2007 District of Columbia Energy Office, evaluation of Low-Income REACH grant program
2005 Evaluation Designs for DC Payment Assistance & Weatherization Programs
2003-2019 State of Nevada Performance Evaluations of Low-Income Payment Assistance and Weatherization Programs
2008 Low-Income Program Design for Indianapolis Power & Light
2007 Low-Income Program Design for Duke Energy North Carolina & South Carolina
2006-2017 Electric Low-Income Program Design for Vectren Energy Indiana
2006 Peer Reviewer for US Department of Energy Evaluation Plans for National Low-Income Evaluation
2005 & 2006 & 2007 Presenter for National Community Action Federation Low-Income conferences in Florida
2005 Gas Low-Income Program Design for Vectren Energy Indiana
2004-2005 Residential Evaluation, Jersey Central Power & Light
2004 Philadelphia Gas Works, Financial Analysis in support of Low-Income Rates
2004 Evaluation of First Energy Companies in Pennsylvania Low-Income Programs
2002-2003 Philadelphia Gas Works, Seniors & Low Income Rate Design
2002 US Department of Health & Human Services, Meta-Evaluation for Low-Income REACH Grants to improve effectiveness of Low-Income programs
2002 Evaluation of Residential & Low-Income Programs for General Public Utilities
2002 Philadelphia Gas Works, Low-Income Financial, Rate Design & Policy Study
2001-2005 Evaluation of Joint Utilities (First Energy, PPL, Allegheny Power), Low-Income Solar Hot Water & Photovoltaic Program
2000 Enbridge Consumers Gas, Audit of Evaluations, including Low-Income Programs
2000 PECo Energy Low-Income Solar Hot Water; Evaluation
2000-2003 Dominion Gas Low-Income Policy Study
2000-2003 PECo Energy Payment Universal Energy Charge Evaluations & Rate Design
2000 & 2002 Pennsylvania-American Water Company Low-Income Program Evaluation
1999 Columbia Gas Low-Income (Universal Service) Mini-Evaluation
1998-2001 NYSERDA Low-Income Program Evaluation (for Applied Energy Group)
1997 Allegheny Power Low-Income Program Evaluation
1995 Wisconsin Electric Evaluation Audit for Wisconsin Commission, including Low-Income Programs
1995-1996 Equitable Gas Low-Income (Universal Service) Evaluation
1994-1996 Michigan Detroit Edison Collaborative Evaluation Technical Consultant
1993-1995 Evaluations for Bonneville Power
1993-1994 Washington Water Power Low-Income Weatherization Assistance Evaluation
1992-1994 Commonwealth Edison & Cambridge Electric Program Design and Evaluation
1991-1994 Boston Edison Residential Performance Contracting Program Evaluation
1992-1993 Massachusetts Collaborative Management Study of Boston Edison DSM
1990 LA Department of Water & Power, Electric Division, Management Study of DSM Evaluation
1990-1993 Ontario Hydro, Espanola Community-Based Program Design Consultant.
1990-1992 Evaluation of Duquesne Light Universal Service Program
1989-1990 Northeast Utilities, Evaluation of Residential Performance Contracting Program
1989-1991 Series of Evaluations for Central Maine Power
1988-1994 Series of Evaluations for West Penn Power
Prior to 1988: DSM Evaluation Manager, Pacific Power & Light

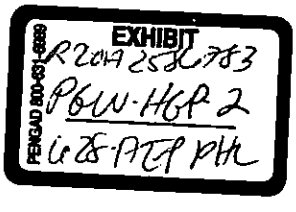
Educational Background

Dr. Peach completed the Ph.D. in Sociology (1985) from New York University. His dissertation topic: "The Social Production of Applied Social Statistics," is a study in how social factors influence the construction of quantitative results in different kinds of organizations. He holds the MA in Economics (1972) from The New School for Social Research in New York City and the MA (1969) and BS (1965) in Sociology from Michigan State University. In addition, he completed one year of Metropolitan Urban Service Training from Union Theological Seminary in New York, and substantial undergraduate study in physics and mathematics at Michigan Technological University.

List of Testimony: H. Gil Peach

Commission or Court	Topic	Party
Massachusetts Commission	DSM Hearing	Conservation Law Foundation
Connecticut Commission	DSM Hearing	Conservation Law Foundation
Rhode Island Commission	DSM Hearing	Conservation Law Foundation
Massachusetts Commission	Savings Verification	Western Mass Electric Co. & Northeast Utilities
Utah Commission	Low-Income Assistance	Utah Housing Administration. & Salt Lake CAP Agency
Kentucky Commission	Low-Income Assistance	Kentucky CAP Agency
Ohio Commission	DSM & Low Income Hearing	Ohio Legal Services
Nova Scotia Commission	Savings Verification	Nova Scotia Commission
Washington Commission	TRC Hearing	Independent
Oregon Commission	DSM Hearing	Independent
Pennsylvania Commission	Decoupling En Banc Hearing	Pennsylvania Commission
Washington State Commission	Savings Verification	Snohomish PUD No. 1
Nevada	Low-Income	Nevada Welfare Division & Nevada Housing Division
Pennsylvania	Senior Citizens Rate	Philadelphia Gas Works
Pennsylvania	Low Income	TURN & Action Alliance of Senior Citizens
Washington Federal District Court	Savings Verification	Snohomish PUD No. 1

Exhibit HGP-2



PHILADELPHIA GAS WORKS – May 2016

2015 CUSTOMER RESPONSIBILITY PROGRAM POLICY EVALUATION

Peach, H. Gil, Mark Thompson & Erika Lehmann

H. Gil Peach & Associates, LLC

Vision Statement

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H. Gil Peach & Associates LLC
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Beaverton, Oregon 97006-5242, USA

Telephone: (503) 645-0716 EIN: 93-1323715
Fax: (503) 946-3064

H. Gil Peach, Ph.D.
hgilpeach@scanamerica.net

Suggested citation: Peach, H. Gil, Mark Thompson & Erika Lehmann, *PGW Customer Responsibility Program 2015 Policy Evaluation, an Independent Third-Party Evaluation of Philadephia Gas Work's Customer Responsibility Program.* Beaverton, Oregon: H. Gil Peach & Associates LLC, Monograph 2016-05-01, May 2016.

2015 Customer Responsibility Program Policy Evaluation

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Executive Summary

This report develops information for consideration of several possible Customer Responsibility Program (CRP) policy options, including Affordability considerations, Maximum CAP Credits or a Usage cap, Recertification Improvements, CAP Plus, Payment Troubled Customers, Self-Certification, Enrollment of Customers in CRP at an Average Bill Amount, and Arrearage Treatment. The first objective of the study is to develop useful information. In a few cases, we recommend against some policy options as incompatible with the Customer Responsibility Program which is a percentage of income payment plan (PIPP) design.

In particular, a CAP Plus approach is incompatible with a PIPP design when a utility is successful in helping a large percentage of customers generate federal LIHEAP dollars. If the percentage and total LIHEAP dollars are small, then collecting an amount equal to federal assistance in the previous year from all customer in a low-income program results in small monthly payments. If the percentage and total of LIHEAP dollars are large, collecting an amount equal to federal assistance in the previous year from all customers in a low-income program interferes meaningfully with program affordability.

Also, Self-Certification does not appear reasonable for a deep percentage of income payment program like CRP.

The other policy options appear to offer possibilities for exploration.

Affordability

Assessment of affordability involves assessing the percentage of income used for the three program tiers (currently 8%, 9% and 10%) and for the subgroup with a minimum bill of $25 per month.[1]

Analysis of Existing Percentage of Income Payment Levels

The specific focus of this analysis is the affordability of different percentage of income payment plan (PIPP) tiers. In Figure 1 the scale on the left side of the figure shows the percentage of customers active by month over calendar year 2015. The cases included are all households with Active status in CRP in December of 2014. The scale on the bottom of the figure shows months during 2015.

[1] Guidance from the Pa. Code § 69.265 (2)(i)(B) CAP design elements for these levels is 5-8%, 7-10% and 9-10%. The minimum bill is also guidance from the Pa. Code (§ 69.265 (3)(i)(A Control Features): .A CAP participant payment for a gas heating account should be at least $18-$25 a month.)

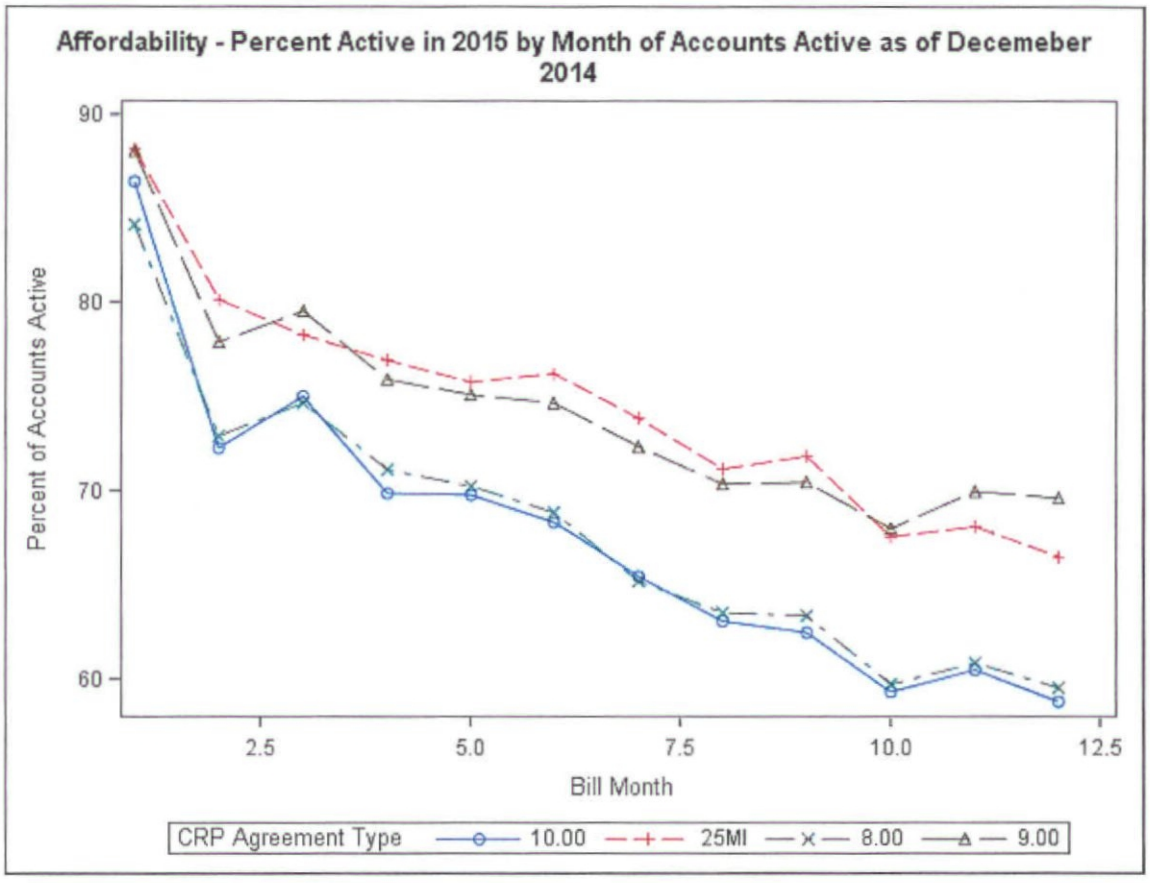

Figure 1: Changes in Percent Active (Calendar 2015).

As shown, accounts in the nine percent (9%) payment tier and accounts at the $25/month minimum payment tier follow almost exactly the same pattern. A similar pattern, but moved down in terms of percentage of accounts active, is followed by the two bottom curves in the diagram. These are the eight percent (8%) and ten percent (10%) percentage of income payment tiers. Program attrition from Active status is less for the $25 minimum payment tier and the 9% tier than for the 8% tier and the 10% tier.

Figure 1 shows the 9% tier performing better in terms of retention of Active status than the other two primary percentage of income tiers.[2] We interpret this to mean that affordability may be better in this tier in relation to income than it is for the 8% tier or for the 10% tier. In other words, if we were looking to adjust tiers for affordability to CRP customers we would look at lowering the 8% tier to 7% and the 10% tier to 9% and then

[2] We use "Active" status for the analysis because leaving Active status is the highest level indicator for customer problems. Alternatively, "Suspended" status or categories for different levels of processing in the payment system could be used. We feel that "Active" is the best level to use for this analysis since it is the highest level. We know these customers were at a level of full program participation in December 2014 with no indication of a payment problem.

see if the distance between the curves decreases. A key to interpreting the pattern in Figure 1 may be the Pa. Code guidance information referenced in footnote 1: the 9% percentage of income payment plan is the middle value in its range, while the 8% and 10% percentage of income payment levels are at the top of their respective ranges.

The curiously high performance of the $25 minimum bill customers may be attributed to receiving a LIHEAP grant. Due to these homes being in the lowest Federal Poverty Level, they tend to be awarded the largest grant amounts. Since this amount is applied to their CRP "asked to pay" amount first, and then to future bills, the grant amount tends to satisfy CRP monthly bills for multiple months before being exhausted or returned to DHS.

Cost of Moving the Top Tier from 10% to 9%

Because the current 10% percentage of income payment plan top tier is small (approximately 6,400 customers) and the average payment difference is also small ($13 less per month), based on 2015 data the cost per month is about $83,100 and the yearly cost is approximately $997,000.[3]

Cost of Moving the Bottom Tier from 8% to 7%

Because the current 8% percentage of income payment plan bottom tier is small (approximately 9,500 customers) and the average payment difference is also small ($6 less per month), the cost per month is about $56,000 and the yearly cost is approximately $682,056.[4]

Moving Certain Budget Customers into CRP

We understand that BCS may prefer that the company cover the cost of modifying CRP to include customers at an average monthly bill amount if that amount is lower than the CRP amount into CRP (with any arrearage forgiven through CRP), or some other modification. This would have an effect on the estimates for conversion of the current 10% and 8% tiers discussed above. Therefore, the determination of whether to modify percentages of income should not be made at this time, until the impacts of other changes to CRP that increase the subsidy paid by other customers are studied.

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[3] Data extracted by PGW from CRP Customer Information System in mid-January 2016, filename: CRP_master_accts.txt.

[4] Data extracted by PGW from CRP Customer Information System in mid-January 2016, filename: CRP_master_accts.txt.

Maximum CAP Credits/Consumption Limits/Usage Caps

For this analysis, we focus on both energy (measured in hundreds of cubic feet of natural gas or CCF) and on CAP credits.[5] Analysis is based on customer data.

- The CCF analysis is relevant since it is based on household gas use.
- The CAP credit analysis is relevant since dollars relate directly to affordability.

Affordability is used in two different senses: first, affordability to the customer on CRP and, second, affordability of the program to the non-CRP customers who pay for it year after year through the CRP subsidy.

- We run each analysis (CCF and CAP credit) three ways. First on 2015 customer records (one-year analysis), then on 2014 and 2015 customer records (two-year analysis) and finally on 2013-2015 customer records (three year analysis).
- We look at customers who have twelve bill records and twelve periods on CRP.[6]

Each of the resulting statistical distributions of CRP customers shows a strong skew towards the right (the red curve in each graph from Figure 2 – Figure 7). This is the standard pattern for both natural gas and electric consumption and cost distributions.[7]

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[5] In this section we limit the analysis to CRP customers. We don't include non-CRP customers in the analysis because our focus is the high end (right hand tail) of the frequency distribution of CRP home energy use (rather than on a comparison of CRP and non-CRP customers). It is more relevant to study each CRP customer's usage in comparison with other CRP customers – as opposed to in comparison with non-CRP customers' usage – because CRP customers likely share more household similarities, such as the quality of the housing stock.

[6] We have examined other ways to structure the data including twelve or more billing periods on CRP in a year and all data in the dataset find the results to be reasonably stable across all approaches. We use customers who received 12 bills and were active in CRP for 12 months in any calendar year included in the analysis (2013 through 2015). This is a subset of CRP customers. In order to analyze what happens to customers we need them to be stable for a year. If they are "on and off" CRP it is not possible to talk about annual CAP credits and it is not relevant to discuss consumption for customers who may be missing some months of the year. The decision to limit analysis to customers with 12 bills for the year could have been, alternatively, 12 or more bills for the year. But keeping the analysis at 12 bills keeps the analysis simple and clean.

[7] See, for example, Figure 1, Iso-Probability Curves, P. 550 in Monette, Jean, "A Descriptive Model of Electricity Consumption," *OMEGA, The International Journal of Management Science*, Vol. 2, No. 4, 1974, Pp. 549-552. Also for pricing at the HUB level, see Figure 5, P. 9 in Graves, Frank C & Steven H. Levine, Managing Natural Gas Price Volatility: Principles and Practices across the Industry. The Brattle Group, *Prepared for the American Clean Skies Foundation*, November 2010 (http://www.cleanskies.org/wp-content/uploads/2011/08/ManagingNGPriceVolatility.pdf). The right skew distribution is characteristic at different levels of analysis throughout the energy industry. Typically, for example homes need some basic quantity of energy use, but there are always a small number of homes with higher use, often (in a low-income analysis) due to poor housing stock and the relative lack of decent, safe, sanitary and well- constructed dwellings for low-income households in relation to the numbers of households in need of energy-efficient housing (see footnote 10).

We have overlaid a normal curve (the blue curve) in each graph to provide a visual reference for what a non-skewed distribution of the data would look like.

Usage is weather normalized so that results better represent a typical weather year. For the three CCF usage charts weather normalized total usage (NTU) (Figure 2, Figure 3 and Figure 4):

- In each CCF analysis, the highest annual energy consumption is 9,879 CCF.
- Mean annual energy use is similar (1,191 CCF, 1,186 CCF and 1,172 CCF).
- The medians are similar (1,122 CCF, 1,119 CCF and 1,106 CCF).
- The standard deviations are similar (518 CCF, 514 CCF and 519 CCF).

The three distributions are essentially the same. The skew is visible in the right tail where the red curve crosses over the blue (normal) curve l. The cutoff is set at the 95th percentile for each distribution (five percent of the CCF is located in the right tail). The area to the left of the cutoff line contains the other ninety-five percent. The skew is a problem in that it represents apparently excess energy use. It is not a major problem, but it is a problem to be managed on an ongoing basis.[8]

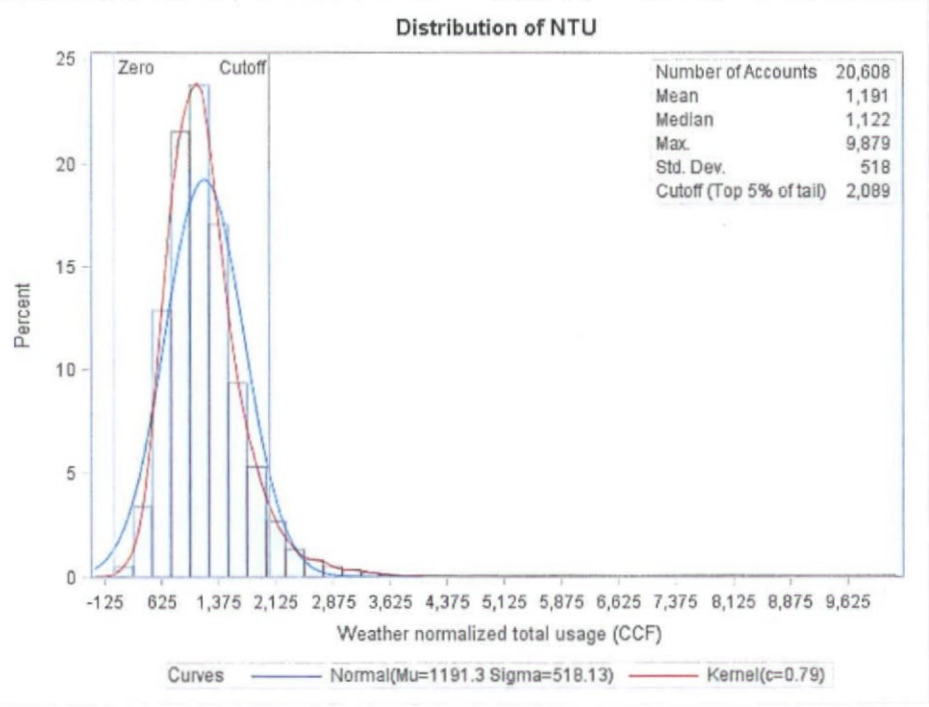

Figure 2: One-Year Analysis – 2015 Customers in CRP (weather normal total usage (NTU) in CCF).

[8] We overlay a normal curve for comparison rather than a comparison to non-CRP homes. We maintain the focus on understanding the CRP distributions (see footnote 5).

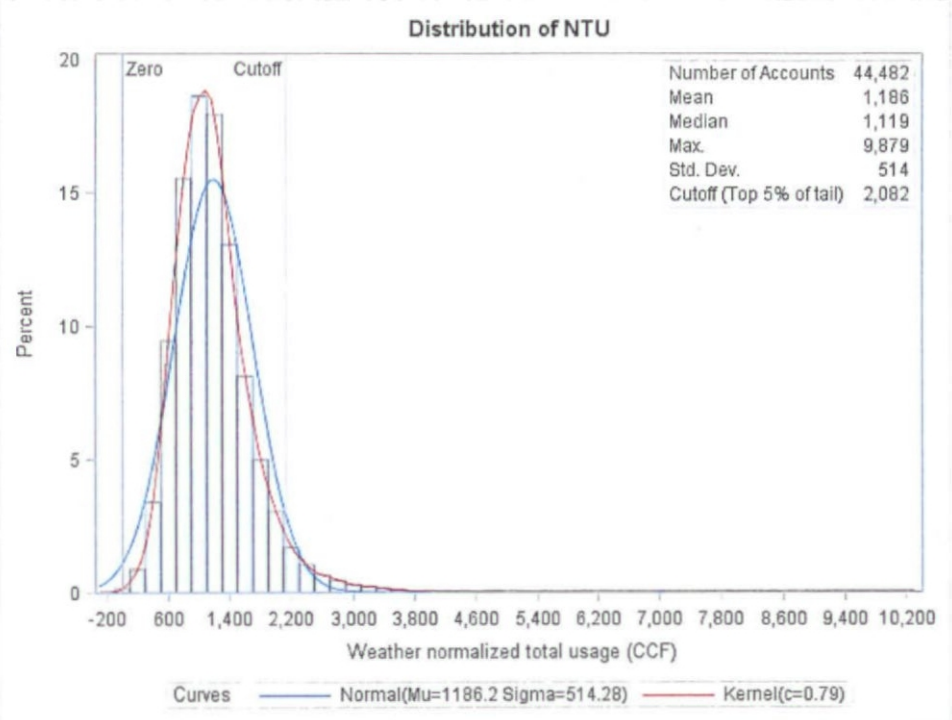

Figure 3: Two-Year Analysis – 2014 and 2015 Customers in CRP (weather normal total usage (NTU) in CCF).

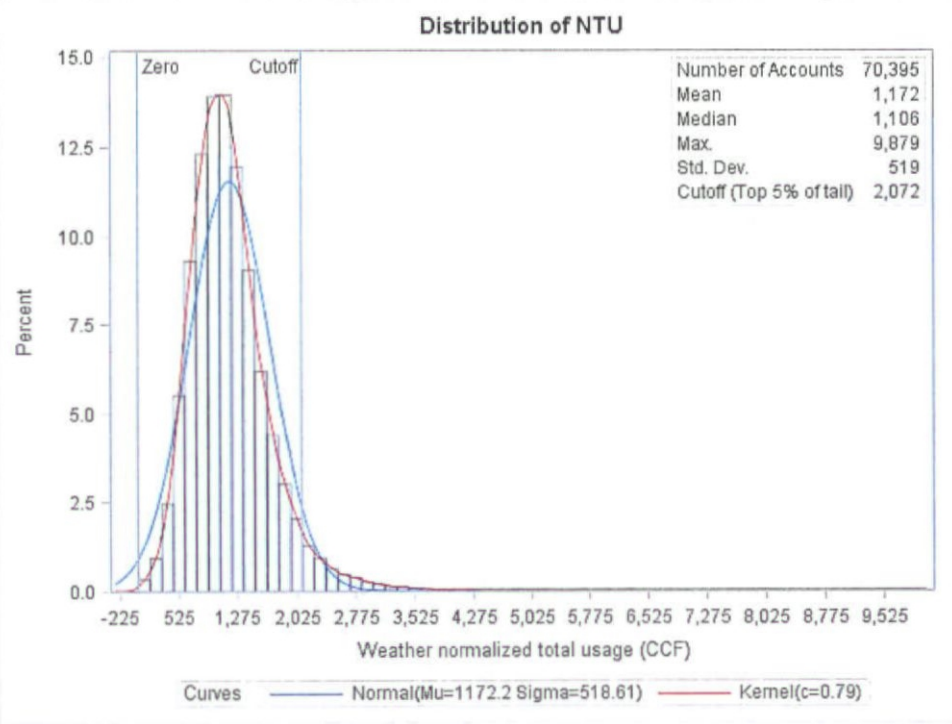

Figure 4: Three-Year Analysis – 2013 - 2015 Customers in CRP (weather normal total usage (NTU) in CCF).

For the CAP credit analysis:

- The maximum annual CAP credit for the one-year 2015 analysis is $9,455 (Figure 5). The maximum annual CAP credit for both the two-year and the three-year analysis is $12,300 (Figure 6 and Figure 7).

- The mean annual CAP credit for 2015 is $697. For 2014 and 2015 together, it is $768. For 2013-2015 it is $781

- The median CAP credit for 2015 is $611, for 2014 and 2015 it is $680 and for 2013-2015 the median annual CAP credit is $691.

- The standard deviation for 2015 is $605 (Figure 5), for the two-year analysis it is $644 (Figure 6) and for the three-year analysis it is $659 (Figure 7)

The pattern for each of the three CAP credit distributions is the same, though the values for CAP credit show a slight increasing tendency. The right skew can be seen where the red curve crosses the blue (normal) curve in the right tail. The area under the red curve beyond the cutoff represents apparently excess energy use. This is about one twentieth of the CRP energy use, so the problem is not large.

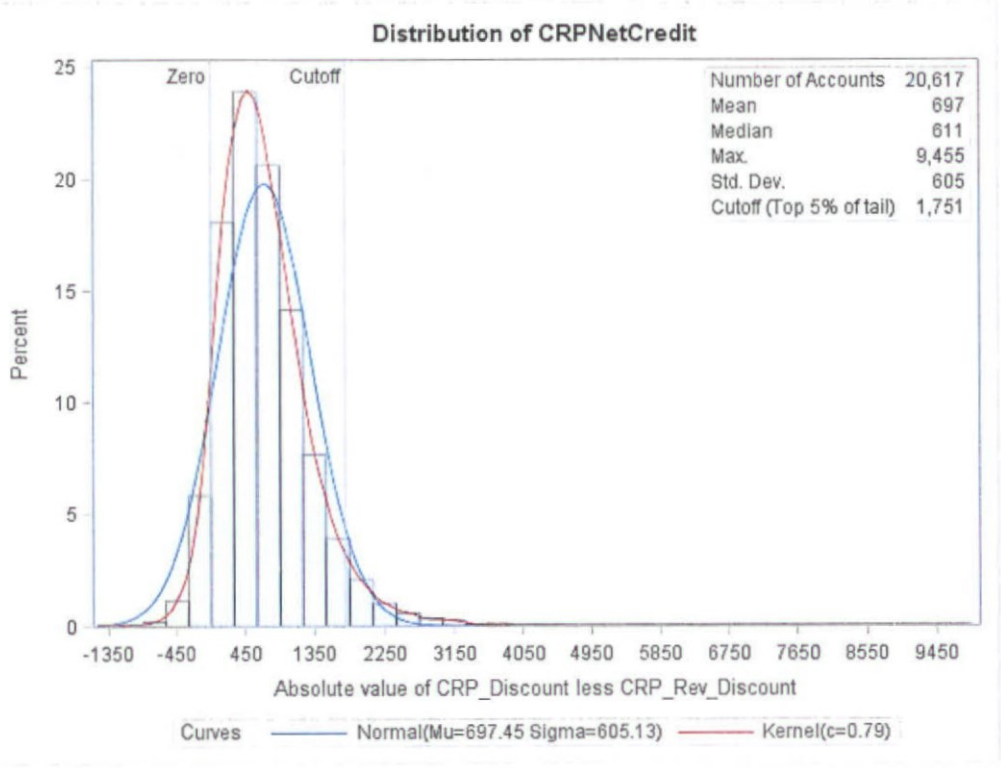

Figure 5: One-Year Analysis – 2015 Cap Credit ($).

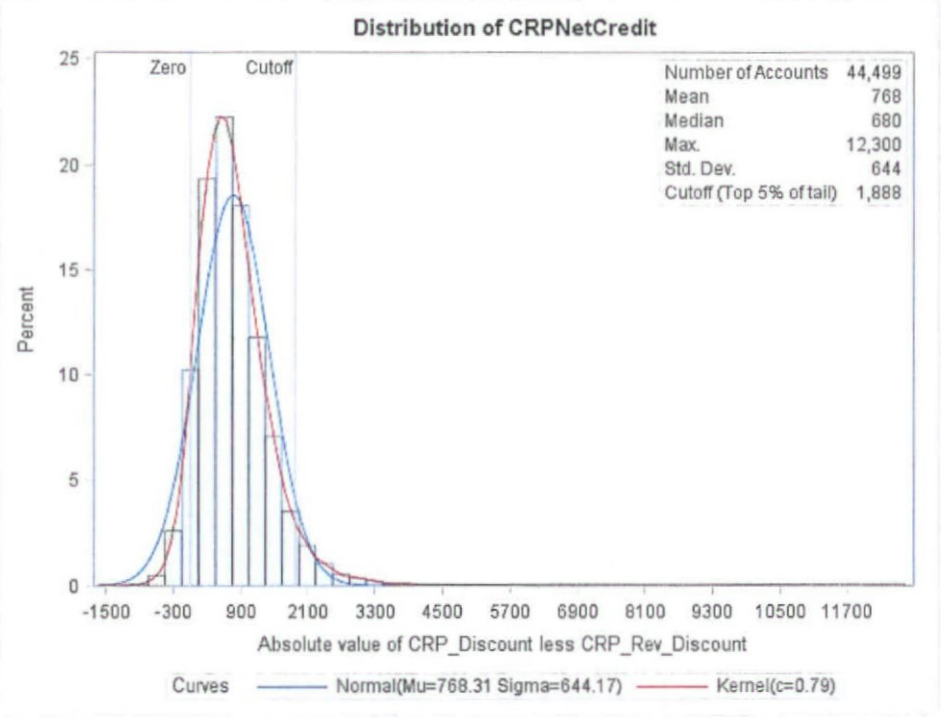

Figure 6: Two-Year Analysis – 2014 and 2015 Cap Credit ($).

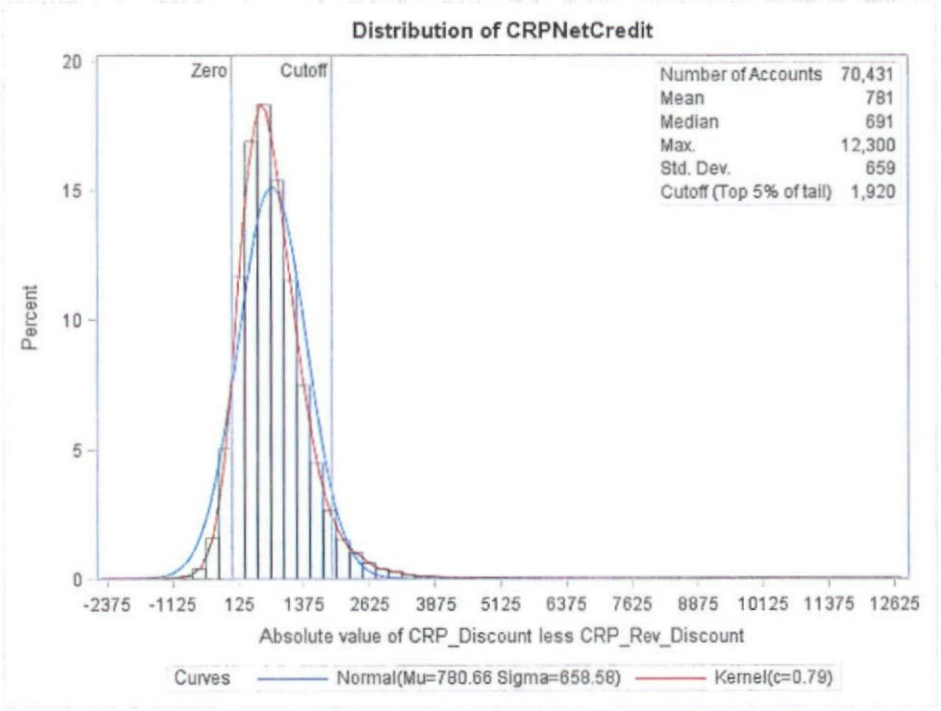

Figure 7: Three-Year Analysis – 2013-2015 Cap Credit ($).

The similarity of the three CCF distributions and the three CAP credit distributions underlies their stability and that the problem of setting a limit to energy use or a maximum CAP credit could be approached through either key quantity.

In principle, a percentage of income payment plan (PIPP) should cover energy consumption, and we know that in some homes consumption cannot be properly controlled due to housing characteristics. However, looking at the long tail running to the right in Figure 2 through Figure 7, we can see energy usage and CAP credit *amounts that may be excessive and so warrant investigation. Energy consumption* distributions are typically skewed to the right for many reasons, including housing characteristics and household behavior. At the same time, in each of the graphs, we can see that cases in the right tail beyond the cutoff are not enough to drive the CRP subsidy beyond reasonable levels.[9]

The purpose of this analysis is to move towards developing an information base for future policy maximum limits decisions to insure that charges transferred to the non-CRP customers who pay for the CRP program can be reasonably contained, so as not to become either inequitable or unaffordable to participants and to non-participants. The long right tail is a flag for the need for investigation related to homes outside a reasonable consumption limit for the CRP population. A right tail is the place to look for curtailing energy use that appears to be wasteful or unreasonable for a program that is supported by other customers or may contain unexpected or unusual end uses in addition to regular residential use. Once a maximum limit is set the proportion of total usage beyond the maximum limit and the number of customers out beyond the maximum limit can be determined. Here, based on visual inspection of the curves, we set the cutoff at 95% of the CCF or CAP Credit in each graph. The cutoff looks reasonable given the shape of each curve.

The Reason for Introducing a Maximum CAP Credit

It is reasonable to support necessary energy use through the CAP credit subsidy to qualifying low-income households. However, it is not reasonable to pay for energy that is wasted. Yet, at the same time what would be classified as high energy use is sometimes necessary due to conditions outside customer control.[10]

---

[9] There is no major (Pareto) 80/20 effect. However, since non-CRP customers are helping to pay for energy use by means of CAP Credits, it is a part of management concern to develop a better understanding of what is happening in the right-hand tail of the distribution with the goal of finding ways to identify the causes of high energy use and reduce high energy use to lower levels.

[10] Philadelphia housing stock presents a particular problem. Much of the poverty in Philadelphia is long term poverty and much of the housing available for people in poverty is not in good shape. Some of it is very old brick construction that would be impossible to adequately weatherize. The pressure on housing is suggested by the growing waiting list for public housing. According to the PEW Charitable Trust Philadelphia 2015 State of the City Report, March 2015, P. 49 the Philadelphia Housing Authority has

Setting a Maximum CAP credit recognizes two principles, which we take to be self-evident:

- While there is enough energy to use, there is not enough to waste.
- We need to keep energy use to a level that is necessary and adequate for normal household living (social inclusion), but not more.

We recognize that since CRP is a program supported by PGW non-CRP customers it is essential to keep energy use to the level that is necessary for each participant household.

Recommendation for Maximum CAP Credit Approach and Goal

We recommend that a maximum CAP credit limit (however, developed from and based on CCF usage) be set for gas heated homes and that homes above that limit be addressed to determine why energy use appears to be excessive and if it can be reduced.

For example, is substantial weatherization work required? Does the condition of the structure permit substantial weatherization work, or, for various reasons such as deterioration, health hazards or code violations is the home a "walk away"? Is the gas line supporting more than a residential household? To keep the process simple, fair and reasonable for customers, we recommend that all CRP participants with a 12-month record that exceeds the new consumption limit (expressed as a maximum CAP credit) be notified by letter that a consumption limit has been established. The letter should also communicate a list of possible exemptions (including the list from the Pa Code[11]) so as to be fully open and transparent, and provide conservation tips.

In addition, the property should be referred for possible LIURP treatment and related education if the property is eligible. If LIURP is offered to the customer, it must be accepted fully, or the customer should be removed from CRP. For homes that are inspected through the LIURP program, the homes should be binned into three groups:

- Home has conditions that explain the extreme energy usage and these can be remedied by provision of weatherization services, which must be accepted in full.

39,959 family units. There were, in addition to the filled units, 77,694 additional applications in the queue for public housing in 2014.

[11] Title 52 PA Code §69.265(3)(vi)(A-E). Consumption limits are recommended at 110% of historical average usage. 69.265(3)(iii)

- Home has conditions that explain the extreme energy usages, but, for example, due to old brick construction or some other reason conditions exist that are beyond control of the customer and of PGW services. Participants in the second group will continue to receive credits without application of the Maximum CAP credit.

- *Some other reason (including no identifiable reason) for extreme energy use.* These properties can be used to develop policy.

Reason Analysis

The use of the maximum CAP credit and the goal of the investigation will be to develop a comprehensive list of reasons for apparent excessive energy use and an approximation of the numbers of homes in the right hand tail of the distribution (beyond the maximum CAP credit amount) that fall into each reason category. Currently, the Low-Income Usage Reduction Program (LIURP) has as a goal of addressing high-use CRP customers. This goal should be continued. Since this can only be one goal of the program among others, we plan a three to five year emphasis on developing a "reason analysis" for apparent excess energy use. Any policy development after completion of the reason analysis will be dependent on the information developed in the analysis.

Setting the Size of the Maximum CAP credit

PA Code at Title 52 §69.265(3)(v)(A) recommends the Maximum CAP credit per home should not exceed $840 annually.[12] However, this dollar amount was placed in the Control Features, Maximum CAP Credits section of the PA Code in 1992.[13] This means that however well the Maximum CAP credit was developed from past data available in 1992, this 'not to exceed" amount is dated and cannot be relevant to households in 2016.

There are three ways to update the amount. First, an appropriate Consumer Price Index could be used. We do not choose this approach due to problems with the Bureau of Labor Statistics Consumer Price Index and lack of consensus for using other index approaches. Second a household budget study of the type done by social workers could be used. This would be precise but would be administratively complicated to work with. Alternatively, we could develop a reasonable amount for the gas heat usage maximum from current PGW data for conversion to a $ Maximum CAP credit amount. We choose to use this method because it is based on what customers are currently

[12] Checked on the Internet on 2/25/2016 (http://www.pacode.com/secure/data/052/chapter69/s69.265.html).

[13] The 1992 Pa. Code is not on the Internet. We thank Adeline Gaydosh, Managing Legal Editor, Pa. Code/ Pa. Bulletin for providing a scanned in copy of Title 52 §69.625 from 1992.

using and based on easily available and continually updated data from PGW's Customer Information System.

Calculation

The calculation of a limit could be based on a normal distribution. However we do not recommend this approach. A rule that is often used is to set the limit for the right hand tail at the mean plus two standard deviations.[14] For a normal distribution, this rule would provide inclusion for about 95% of CCF or CAP Credit (the middle 95%) and about 2.5% of customers would be beyond the limit in the right hand tail of the distribution.[15] A standard normal curve is shown in Figure 8. However, we will not use this rule since as we have seen in Figure 2 through Figure 7, all of the CCF distributions and all of the CAP Credit distributions are skewed to the right with fat right tails.

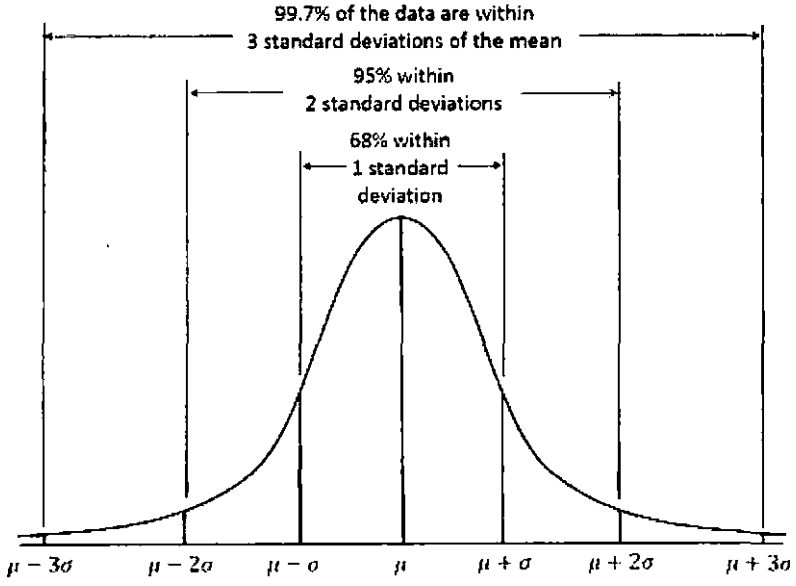

Figure 8: Standard Normal Distribution: Setting the Limit.

So, a standard normal curve and the commonly used rule will not be useful. Also, it will not be useful because we are only interested in the right hand tail while the rule for normal distributions is focused on both tails.

[14] For standard normal distribution, this is called the "68% - 95% - 99.7%" rule, and the 95% level is often used in statistical procedures. See, for example: http://www.oswego.edu/~srp/stats/6895997.htm.

[15] See: https://en.wikipedia.org/wiki/68%E2%80%9395%E2%80%9399.7. Drawing from Wikipedia.

Instead, by inspection, we set the cut off at the 95th percentile of each distribution (with 95% of CCF or CAP Credit to the left, below the limit). Looking at each of the figures from Figure 2 through Figure 7, in turn, the 95th percentile is a reasonable cut off point for each graph. An additional advantage in this method is that selecting the 95th percentile determines the potential savings over the limit (it will be 5% of CCF or CAP Credit under the curve) and defines the number of customers out in the tail. These right tail cases are technically not generally outliers;[16] however, they are extreme cases.

Table 1 shows six options for setting a limit. The first three are based on working with CAP credits and the other three are based on working from weather normalized CCF and then translating results into dollars (CAP credit). The goal is to ensure that funds are applied prudently and not unnecessarily used to support apparently excessive energy use.

	Annual CRP Credits			Annual Weather Normalized CCF		
	1 Year	2 Year	3 Year	1 Year	2 Year	3 Year
	2015	2014-2015	2013-2015	2015	2014-2015	2013-2015
Calculation of Annual Limit:						
Number of Accounts	20,617	44,499	70,431	20,614	44,488	70,406
	------- Dollars-------			------ CCF -------		
Mean	$697	$768	$781	1,191	1,186	1,172
Standard Deviation	$605	$644	$659	518	514	519
Cutoff (95th percentile, 5% in top tail)	$1,751	$1,888	$1,920	2,089	2,082	2,072
Dollar Impact of Limit:						
Avg. Annual # of Accounts Over Limit	3,022	2,277	2,135	2,764	2,834	3,050
Annual Amount Over Limit	$1,752,237	$1,392,457	$1,322,300	1,461,040	1,442,470	1,576,800
Billing rate per CCF (eff. 3/1/2016)	NA	NA	NA	$1.1382	$1.1382	$1.1382
Annual Savings From Limit	$1,752,237	$1,392,457	$1,322,300	$1,662,956	$1,641,819	$1,794,714
Annual Impact to Customers Over Limit	$580	$612	$619	$602	$579	$588
Impact to Customers Over Limit by CRP Tier						
Impact per account by CRP Tier (Type)						
$25 Monthly	$549	$611	$615	$715	$620	$580
8% of Income	$520	$557	$567	$550	$542	$565
9% of Income	$602	$629	$640	$596	$582	$591
10% of Income	$675	$671	$663	$636	$599	$606
No.of Accounts by CRP Tier						
$25 Monthly	299	213	201	101	99	120
8% of Income	912	659	612	503	532	598
9% of Income	1,502	1,151	1,077	1,486	1,508	1,603
10% of Income	309	254	245	674	696	729
Total accounts	3,022	2,277	2,135	2,764	2,834	3,050

Table 1: Setting a Limit.

[16] By convention, outliers are defined as beyond three standard deviations.

We focus on the two-year analyses since they provide a middle analysis of the three. Of the two two-year analyses, the CCF computation is more closely linked to the physical nature of actual energy use and is desirable for that reason, but as a practical consideration, this should be converted to dollars each year so the customer will understand it more easily. Once the CCF cutoff is set, the processing steps follow. The computation would be completed yearly and results communicated to customers in the tail the following month.

Recommendation

We recommend using the CCF two-year analysis with a cutoff at 2,082 CCF. At this level, there are 2,834 accounts over the limit with what appears to be excess energy use. These homes are associated with $1,641,819 (in 2015 dollars) of unusually high energy use. Translation of this amount in average customer amounts and average customer amounts by tier is shown in Table 1.

We envision the maximum CAP credit used for the Reason Analysis to be an annual amount, with a new calculation each year. Each yearly recalculation would be based on similar usage distribution analysis, using the most recent years.

We recommend the analysis be run once a year at the end of winter, defined as a day in May or July.[17] This would allow the summer and fall to work on reducing the apparently excess energy use. Ideally the analysis and results would be weather normalized but generally not adjusted for gas costs or for inflation since the analysis is driven by weather normalized CCF.

The end product is to be a Reason Analysis report based on homes actually treated through LIURP, developing the reasons for this excess use and tallying homes for each reason established.[18] The end goal is to develop a reason analysis that can be used in policy development. At the same time, a secondary goal is to identify those homes that can be treated with a meaningful amount of weatherization and to treat them with weatherization as appropriate.

The process would be to set a maximum CAP credit based on the recommendation from this study. Those that exceed this boundary amount would receive a letter which includes recommendations for reducing usage and a list of the exemptions from the Pa. Code and conservation tips. For research purposes we recommend a special pilot project. The homes in the study group (in this example, 2,834 homes) would be ranked on energy use and then split into two groups (based on energy use). The first group

[17] Alternatively, since LIHEAP is run as a winter program in Pennsylvania and the PGW fiscal year begins each September 1st, the analysis year could be defined as running from September through the end of August to coincide with the PGW fiscal year. Then, the results would be applied to the CRP customers in the next federal fiscal year (beginning September 1st).

[18] Homes that cannot be treated by LIURP would also be binned by reason to the extent that reasons are developed in the information development process.

would be the top fifty homes based on energy use and would be referred to LIURP (in accordance with the process described in the "Recommendation for Maximum CAP Credit Approach and Goal" section) in order beginning with the home having the highest energy use. The remaining homes would be randomized and referred to LIURP in list order. This would provide 100% coverage for the top fifty homes (probability of selection equal to one) and an equi-probability selection of other homes in the tail to provide a breath of information. The sample size would be fifty (n=50) plus the size of the sample for the second group. The minimum size for the second sample would be seventy (n=70) and if resources are available could alternatively be 120, 240 or 300.

As noted earlier, apparently excessive energy use in CRP is not an extreme problem in size and it is not large enough in aggregate to cause balance problems for the CRP. The amount of annual CCF usage beyond the cutoff of 2,082 per account is 1,442,470 CCF and this is five percent (5.5%) of the total CCF per year in Table 1 (26.4 million weather normalized CCF) for the two-year CCF analysis. While not extreme, it is a practical management problem that should be researched and addressed in policy development.

Cost

This is basically a Reason Analysis, but it will make use of existing LIURP functionality to move some homes back within normal energy usage patterns and may lead to a solution of using removal from CRP for certain customers. Since the LIURP functionality already exists, other than administrative costs there will not be much additional cost and there will be some cost recovery from moving some homes into a normal range of energy use.

Because LIURP is currently bundled with DSM, it is potentially subject to a Total Resource Cost test (TRC test) in which the goal is typically to achieve a TRC of one or better. Generically, low-income programs are often exempted from a standard TRC test through one or more of several modifications to the test which, facing forward, might be considered on an ongoing basis.[19]

- Generally low-income programs require health and safety expenses and repair expenses that are not required for general DSM programs. They also try to meet low-income needs such as furnace replacement that cannot be addressed by any other source. It would be reasonable to consider excluding health and safety expenditures, repairs and furnace or AC replacement from the TRC calculation.

- In the study of high use CRP customers, the administrative cost of the study should be classified as a special category and excluded from the TRC (this would

[19] Peach, H. Gil, "The TRC and Low-Income," Research paper developed for the Low-Income Subcommittee, NV Energy Collaborative, May 2012.

be a change; it is not done in the program currently). Otherwise these costs could unbalance the general DSM effort into which LIURP is currently melded.

Recertification Improvements

Recertification improvements are developed from the surveys.

1. Create an easier or clearer application process for Spanish speakers (i.e. present documents in Spanish, train bilingual staff, etc.).
2. To mitigate CRP drop-out due to the inability to garner all the required documents, allow a longer grace period for recertification (i.e. five weeks' notice instead of four weeks' notice). CRP currently notifies customers of a 30-day grace period but actually uses a 45 day grace period.
3. Provide refresher training for all CRP staff through the application process to ensure information about yearly recertification is distributed with every client. All CRP staff currently receive yearly training.
4. Train staff to ensure that all recertification notice letters (either initial or secondary) are sent in a timely manner. These notices are sent out by the system, not manually. However, the system should be periodically checked to make sure it contines to work as planned and does not drop any communications.
5. Send Spanish recertification notice letters to Spanish speakers. All letters are currently sent in both English and Spanish. The notice that reminds customers to turn over the letter to find the Spanish version could be enlarged.
6. Make it clear to clients that they can also send their information for recertification by mail, not just in-person.
7. Ensure bilingual staff is provided refresher training in CRP application and recertification.
8. Continue with written letter communications but also implement other communication instruments such as automated phone calls, emails, and texts to clients.
9. Create practice interactions or secret simulations with the call center to ensure all elements are being consistently provided to customers; add a rating system survey for customers to rate the staff they talk with on a scale of 1-5 and record any problems with attitude, knowledge level, and taking 'ownership' of the customer's problems. PGW currently has a third-party vendor running these checks. PGW should review this system for possible improvement.
10. Use multiple forms of communication when it is time to recertify (i.e. phone calls/messages, letters, emails, etc.).
11. Improve recertification processes by mail, through email, or securely online. Also, retain unchangeable information (i.e. social security numbers). PGW is in the process of automating the recertification process.

In general, the surveys show that most customers would recommend CRP to family and friends and the initial application process was easy for most people. PGW was clear about what information was required and for most it was easy to provide the information. There was much less understanding of the recertification process. And, Spanish speakers had more difficulty in understanding than English speakers.

The recommendations here have to do with insuring fidelity of messaging, and introducing quality control checks, as well as improving communications (especially for Spanish speakers).

CAP Plus

CAP Plus is a policy that adds an amount to customer's bills that is calculated as an average of the aggregate total Low Income Home Energy Assistance Program (LIHEAP) payment from the previous year. The primary concerns with CAP Plus are the added cost to CRP customers and how this will impact their energy burden.

Some History on the Application of LIHEAP Cash Grants

LIHEAP is a federal block grant program that replaced a prior program with more stringent rules for payment assistance to utility customers on the theory that the individual states might better determine the use of federal funds than the federal government. In approximately 2009 and thereafter, certain Pennsylvania utilities modified their application of LIHEAP cash grant funds secured by CAP customers to apply it directly to the CAP customers' asked to pay bills. Previously the grants were applied by many utilities to the subsidized costs of the CAPs.

Subsequent to this change, a number of utilities have instituted a CAP Plus program. In a case involving Columbia Gas brought by ACTION United against the Pennsylvania Public Utility Commission, it was decided that the CAP Plus method is legal. Using PPL as an example, the way that CAP Plus works for PPL is that it is an adder to participant bills on top of all other calculations of an affordable bill plus payment of an arrearage amount. PPL began adding the amount to participant bills beginning in late 2011. For 2011-2012 the CAP Plus adder was $8 and for 2012-2013 the CAP Plus adder was $5.[20] This provides an idea of the relative size of the adder for a different utility (PPL). Using data from 2014 and 2015, a similar adder for PGW would be much higher.

Conceptually, the way it could work is that PGW would determine the total amount of LIHEAP Cash grant funding received by CRP participants in a given operating year. Then, on an annual basis, the total would be divided among the number of all CRP

[20] PPL Docket No. R-2010-2161694 and PPL Proposed 2014-2016 Universal Service and Energy Conservation Plan, September 30, 2014.

participants (whether or not they had received a LIHEAP grant), then divided by 12 to create a monthly bill adder. The CAP Plus bill adder would be applied for inclusion within the "please pay" amount on top of the affordable bill.[21] PPL excludes LIHEAP recipients who have a current credit balance due to a LIHEAP grant from the adder, until the credit balance is exhausted. The adder would vary from year to year depending on the total of LIHEAP grant payments to CRP participants in the prior year and the number of current CRP participants.

Some Observations

CAP Plus appears to be a workaround to approximate the way LIHEAP Cash grants were applied by utilities, following commission guidance, in a previous time window.

We estimate the 2015 impact in offsetting the CRP subsidy would have been approximately $ 9,292,449 in 2014 to apply in 2015.[22] This amount would vary each year depending on the LIHEAP grants awarded to CRP participants in the previous year. Also, we assume that 100% of the bill adder would be collected in order to create the boundary condition.

The analysis includes customers with any number of billing periods and any participation (even one billing period) in CRP in 2015, the CAP Plus bill adder is distributed over all CRP customers and bills. An analysis designed to estimate how CAP Plus would work using these assumptions is shown in Table 2. In this table, all 2015 CRP billing periods are used. LIHEAP grants received in 2014 by CRP participants are spread over CRP participants in 2015 (whether or not they received a 2014 or a 2015 LIHEAP grant) in a way that includes all billing periods. This method captures every CRP bill in 2015 regardless of retention in the CRP program and includes 78,198 CRP customers.[23]

The results of this analysis produce an increase above the current percentage of income payment from 97% to 147% of income for minimum payment customers, 8% to 10.4% of income for the current eight percent tier, from 9% to 10.5% of income for the current nine percent tier.

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[21] We suggest doing this calculation on a yearly basis so that the adder for each customer for each year remains a stable adder in the customer bill.

[22] Data for this analysis is from a text file extract from the PGW Customer Information System, CRP_all_grants.txt. The grant file was used to set the data range to 2014 and the grant type to LIHEAP. The 2015 data used was from a combination of extracts from the PGW Customer Information System, a *summary of the information contained in the sixty text files named CRP_yyyymm_billing.txt. Where* "yyyy" is the year between 2011 and 2015 and "mm" is month between 01 and 12.

[23] This analysis is based on CRP bill months in a year rather than the number of CRP customers at a point in time. This method provides a more exact estimate of the monthly CAP Plus bill adder. Alternatively, the analysis could be run on CRP customers in the program at a particular point in time and any over-collection handled through a balancing account.

If customers currently receiving LIHEAP in 2015 are excluded from the CAP Plus adder until their LIHEAP amount runs out, the burden on non-CRP customers will increase. In practice, a standard "CAP Plus bill adder" would be computed on all CRP participants on a certain day. It would be important to keep the CAP Plus bill adder a fixed amount until the next year. But the amount would not be applied in any month of the new year to CRP customers who currently have a LIHEAP grant (until the current grant is expended). After that point, for every month in which the customer does not have a LIHEAP grant, the CAP Plus bill adder would be applied.

CRP_AGR_TYPE	N Obs	Variable	N	Mean	Minimum	Maximum	Std Dev
10.00	12791	TotalLIHEAP2014	12791	9292449.000	9292449.000	9292449.000	0.000
		MonthlyLIHEAP	12791	12.687	12.687	12.687	0.000
		CRP_MONTH_AMOUNT	12791	138.891	25.000	457.880	40.935
		NewCRPAmount	12791	151.579	37.687	470.567	40.935
		CurrentIncomePct	12791	0.100	0.033	0.505	0.005
		CAPPlusIncomePct	12791	0.110	0.035	0.540	0.006
25MI	4321	TotalLIHEAP2014	4321	9292449.000	9292449.000	9292449.000	0.000
		MonthlyLIHEAP	4321	12.687	12.687	12.687	0.000
		CRP_MONTH_AMOUNT	4321	25.000	25.000	25.000	0.000
		NewCRPAmount	4321	37.687	37.687	37.687	0.000
		CurrentIncomePct	4317	0.974	0.007	25.000	4.434
		CAPPlusIncomePct	4317	1.469	0.010	37.687	6.685
8.00	18389	TotalLIHEAP2014	18389	9292449.000	9292449.000	9292449.000	0.000
		MonthlyLIHEAP	18389	12.687	12.687	12.687	0.000
		CRP_MONTH_AMOUNT	18389	48.618	20.000	169.740	18.438
		NewCRPAmount	18389	61.305	32.687	182.427	18.438
		CurrentIncomePct	18389	0.080	0.007	0.523	0.005
		CAPPlusIncomePct	18389	0.104	0.009	0.734	0.011
9.00	42697	TotalLIHEAP2014	42697	9292449.000	9292449.000	9292449.000	0.000
		MonthlyLIHEAP	42697	12.687	12.687	12.687	0.000
		CRP_MONTH_AMOUNT	42697	83.610	41.130	290.300	28.515
		NewCRPAmount	42697	96.297	53.817	302.987	28.515
		CurrentIncomePct	42697	0.090	0.018	4.900	0.024
		CAPPlusIncomePct	42697	0.105	0.021	6.310	0.031

Table 2: Analysis of CAP Plus Projection.

Recommendation

CAP Plus would be a CRP customer payment above an affordable bill (as defined by the PUC), and would provide an additional burden on CRP customers with an additional benefit to non-CRP customers (some of whom are low-income and many of whom are near-low-income).

All CRP customers would receive the bill adder (not only those who received a LIHEAP grant in the previous year). But for PGW, with its strong record of motivating customers

to apply for and receive LIHEAP grants the bill adder would be significantly higher than for other Pennsylvania utilities and the benefits and costs to different customer groups will need to be carefully examined.

At this time, we do not recommend CAP Plus for programs based on a program logic of percentage of income payment plans because it appears to interfere with the affordability of the program to the participants.

Payment Troubled

PGW has based its CRP program on percentage of poverty without a requirement to demonstrate payment trouble. Outside of PGW, the concept of "payment troubled" has developed in Pennsylvania as an additional criterion of eligibility. Outside of PGW "payment troubled' can have various specific definitions, but it involves requiring a pattern of partial or skipped payments to qualify for program eligibility. The Bureau of Consumer Services defines "Payment Troubled" as follows:[24]

> "A payment troubled customer is a customer who has failed to maintain one or more payment agreements in a 1-year period."

The problem with this approach is that a low-income customer would be encouraged by economic rationality to skip payments (or break a payment agreement) in order to fully meet the program eligibility rules.

PGW, however, is looking at defining "payment troubled" differently, in ways that would not cause any economic rationality problems on the part of community workers. For example under the CAP policy statement, payment troubled would be prioritized based on:

(a) A household where housing plus utility costs exceed 45% of the household's total income. Housing and utility costs would be defined to include rent or mortgage/taxes and gas, electric, water, oil, telephone and sewage.
(b) A household who has $100 or less disposable income after subtracting all household expenses from all household income.[25]

Option "A" is probably not calculable. There is old federal guidance sometimes used in low-income analysis that suggests housing budget of 30%. While it is not unusual in large cities to spend 50% or 60% of income on housing, there is not sufficient guidance showing what percentage would be appropriate in Philadelphia. It is not that the old federal budget advice was wrong, only that it fit a different time window than the one we

[24] Definition of "payment troubled" from 52 Pa. Code § 62.2, Definitions. As used in *2014 Report on Universal Service Programs & Collections Performance.* Pennsylvania Public Utilities Commission, Bureau of Consumer Service, October 2015, Page 8.

[25] 52 Pa.Code § 265(4)(iii)(A-B).

are in today. One frequently finds this type of guideline in mortgage lending calculations but they are not well related to actual housing costs.

Option "B" is also problematic. Generally, everyone has much less disposable income today than a similar household thirty or forty years ago but $100 may not be the appropriate level to use since "disposable income" is more of a necessity today.[26] In 1965, the 1950s pattern of a household supported by one wage or salary worker plus one live-in partner performing unwaged housework and reproducing society by raising children was still a common pattern. Today, costs are keyed to two adults working for wage or salary, which leaves single parent families and families with a recent job loss with difficult financial problems. The real problem is that income has been reallocated from the poor, the middle classes and the lower upper classes to the upper 2% or so of households by income. The top 3% by income own approximately one-half of all wealth.[27] An exploration of disposable income could be developed, but it would need to use the Shadow Government Statistics Consumer Price Index and the household budget study approach and abandon any reliance on the official Bureau of Labor Statistics Consumer Price Index in determining actual disposable income.

Recommendation

A special approach to "payment troubled" could be developed but the data for this is not currently collected and retained. Also it would require facing up to the decline in the *quality and durability of goods and services and to problems of significant loss of* purchasing power that are not recognized within the official matrix of government and news media information and interpretation. It might require a lot of work and not produce an incrementally useful result. For these reasons we do not recommend development in this direction.

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[26] This corresponds to the commonsense observation that for the lower and middle ranges of the income distribution, it typically takes two incomes today to cover the income of an equivalent single wage-earner household in the late 1950's: According to Warren and Tyagi, "Today's two-income family earns 75% more than its single income counterpart a generation ago, but actually has less to spend." (That is, less discretionary income.) See: Warren, Elizabeth & Amelia Warren Tyagi, *The Two-Income Trap, Why Middle-Class Mothers & Fathers are Going Broke.* New York: Basic Books, 2003.

[27] Arloc Sherman & Brandon Debot, "A Guide to Statistics on Historical Trends in Income Inequality". Washington, DC: Center for Budget and Policy Priorities, Updated October 26, 2015 (http://www.cbpp.org/research/poverty-and-inequality/a-guide-to-statistics-on-historical-trends-in-income-inequality); also see: DeSliver, Drew, "U.S. income inequality, on rise for decades, is now highest since 1928". Philadelphia, PA: PEW Research Center, December 5, 2015 (http://www.pewresearch.org/fact-tank/2013/12/05/u-s-income-inequality-on-rise-for-decades-is-now-highest-since-1928/).

Commercial Use

Commercial uses of natural gas are generally the same as residential uses (heating, water heating, and cooking and gas appliances). There are other kinds of commercial use such as cooling and on-site electricity generation but these are not likely to occur among low-income customers. The most likely commercial use would appear to be use for a commercial purpose within a house or apartment. Apparently inappropriate meter size and apparently excessive energy use would be cues to investigate to determine if commercial use is present on the connection.

Recommendation

- If a household on CRP is found to be using natural gas to create a legal commercial product or service within their home and their income from sales of the product or service still places them within CRP eligibility, the case becomes one of innovation and entrepreneurship rather than a problem (though the rules for Maximum CAP credit would apply).

Self-Certification Options

In review of the California program, which is the primary example of a self-certification program, we find that both energy use and program structure in California make it a different kind of program than PGW's Customer Responsibility Program. Although the California Energy Commission has established sixteen weather zones for the state,[28] and the zones vary from arctic to desert, energy use in California tends to be predominate quite light in comparison to the states of the Northeast and Middle Atlantic. California has mostly a mild Mediterranean climate. Also, the California Alternate Rates for Energy (CARE) program was originally a moderate 20% rate discount program for customer up to and including 175% of poverty it did not have anything like the depth and seriousness of a program designed for the realities of winter, like PGW's CRP program.[29]

A predecessor program began in 1989; the present program in 1994. The emphasis on inclusion was strengthened during the circa 2001 California Energy Crisis, during which the Enron corporation was secretly manipulating electric system choke points to run up profits in the newly deregulated electricity market. Due to the emergency, enrollment to provide rate relief for low-income customers was a priority. California tends to initiate visionary programs. Its economy is "outsized" compared with the other US states (if it

[28] See: http://www.energy.ca.gov/maps/renewable/building_climate_zones.html.

[29] More recently, the CARE programs of the four California investor-owned utilities have increased the discount to 30-35%.

were an independent country, it would be the eighth largest economy in the world, larger than Russia).[30] So, nearly every reform effort that California tries may seem similarly outsized. The goal of complete enrollment continues to the present. However, talk about the program has shifted more towards promoting climate adaptation without environmental discrimination due to income or ethnic group. Specifically, enrollment of *all qualifying (income less than or equal to 175% of the federal poverty level)* low-income homes in the CARE program and treatment of all similarly qualifying homes with California's comparatively light weatherization program remain strong state goals.[31]

Although there are outreach efforts using contractors and door-to-door canvasing and other methods such as use of utility call centers and posters, having set the goal for total enrollment of eligible homes, some years ago it became evident that the goal could not be approximated through a process of careful eligibility checks. Too many homes would simply not go through the hassle of an eligibility screening process and there is a problem of perceived vulnerability in parts of the low-income population and a desire not to give out information.[32]

So, the option for self-certification was discussed and adopted (see text box).[33]

> It only takes a few minutes to fill out the online application. No proof of income is necessary and your answers will remain confidential.

Adoption of self-certification in combination with multiple additional approaches led to a very large increase in participation in the rate discount program. However, because self-certification was introduced as part of a multi-layered strategy using many recruitment approaches simultaneously, it is not possible to reasonably assign a percentage increase to self-certification alone.

There is monitoring of a sample of participants to determine the error rate by utility. The utility samples range from 1% to 18%. But because inclusion is a state goal, the program philosophy is to tolerate a reasonable amount of error in order to increase enrollment of many households that belong in the program and would not otherwise have become participants. The utilities have provisions for strict treatment of customers

[30] See: http://lao.ca.gov/LAOEconTax/Article/Detail/1.

[31] Building codes are being constantly updated so that soon only zero net energy or energy plus home (homes that self-power plus power at least one other home) can be built in California, and the plan is for zero net energy commercial new construction not long after the residential goal is reached.

[32] This is the situation with every low-income payment assistance program set up on an opt-in basis. Participation rates are often in the range of 20% to 25%. APPRISE found that PGW's participation rate is 57%. Apprise Public Policy Research Institute for Study and Evaluation, *PGW Universal Service Program, Final Report*, November 2012.

[33] Text box from Pacific Gas & Electric website.

who incorrectly fill out self-certification information and obtain program benefits,[34] *including collection of the difference in required payment. However, these policies are* not fully implemented in practice. In the 2003 program evaluation, two of the utilities did not back bill, one back billed up to twelve months, and the other up to three months.[35] Certification is valid for two years. Pacific Gas & Electric has established additional requirements for high use customers.[36]

Discussion

Self-certification with random inspection can be developed and implemented. It would be fairly easy to do so. However, the cost of being wrong is much higher for PGW than it is for California because the California program is "light" compared to the serious levels of support provided by CRP. Due to this difference there is more risk involved for PGW than for the California utilities. Also, the California CARE program was mandated by the California Public Utility Commission, and it is the state that is leading the emphasis on inclusion. It is reasonable to develop a relatively strong emphasis on inclusion; however, it is a different situation to do so without a strong state mandate.

Recommendation

If PGW develops a form of self-certification, it would be important to have an ongoing verification sample size worked out in advance and to set up a tipping point for tolerable misclassification error.

However, we recommend that PGW not develop self-certification unless it becomes required by the state. The CRP is not a "light" program and Philadelphia has a northern climate with real winters, so the inherent risks of self-certification would have higher costs. It is a type of program modification that might make sense for the duration of an emergency of some kind, but only if mandated by the state.

Cost

It is likely that, initially, self-certification would lead to a substantial increase in participation within a short time window. The error rate determined by the inspection of

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[34] Some of the utilities provide additional benefits

[35] See: Dimetrosky, Scott; M. Sami Khawaja, Sharon Baggett, *Evaluation of California Alternate Rates for Energy (CARE) Program's Outreach and Administrative Practices.* Portland, Oregon: Quantec with Global Energy Partners
September 15, 2003. This evaluation is available on California's CALMAC Internet evaluation report site.

[36] Pacific Gas & Electric Company, ELECTRIC RULE NO. 19.1, CALIFORNIA ALTERNATE RATES FOR ENERGY FOR INDIVIDUAL CUSTOMERS AND SUBMETERED TENANTS OF MASTER-METERED CUSTOMERS.

the continuing verification sampling would establish additional costs, conditioned by whether or not a full back billing would be applied for misclassified cases.

Enrollment of Customers in CRP vs. Average Bill Amount

This policy option begins with two questions:

1. Assuming it made sense from a policy perspective, how many low income customers would be better off in the CRP program at an average bill (instead of PIPP amount) compared to a Payment Agreement + Budget Billing?

2. What would be the additional cost to non-CRP customers from bringing these customers into the CRP program?

For this part of the study, to develop a ratio, we used a dataset that PGW compiled of over 40,000 low-income accounts that were qualified for participation in CRP, but outside CRP. This dataset, which was prepared in late 2015, includes current household income, the estimated budget pay amount and current arrearage balance. In order to compare the average bill with CRP payments we obtained CRP Tier ($25 monthly, 8%, 9% or 10%) by matching the special dataset to records of all CRP participants between 2011 and 2015. These records could be matched since these matching customers had previously been in CRP at one time or another in the past.

Of the 40,000 accounts, just over 13,000 accounts matched (i.e. the customers that matched had prior CRP data). While the information is not perfect in that parts of the information are taken from different years, the combined data does provide a basis for a practical estimate. CRP program payments were estimated from monthly income and CRP Tier. From this analysis it was found that 42% of the approximately 13,000 low income accounts outside CRP would be better off moving into the CRP program (Table 4) at an average amount (with arrearage forgiven through CRP) rather than on a Payment Agreement+ or on CRP as currently structured.

Program	Number	Percent
CRP	5,649	42%
Average Bill	7,650	58%
Total	13,299	100%

Table 3: Optimum Allocation to Payment Plan (Lowest Customer Payment including Arrearages).

Customer arrearage payments under the two payment plans (Average Bill vs. CRP) were also calculated. This information was then used to calculate the amount of CRP

arrearage subsidy that would be paid by the non-CRP customers to cover the new CRP customers. As shown in Table 5, the average cost per customer moved into CRP would be $588 in CAP credit and $155 in arrearage subsidy for a per customer total of $743.

Low-Income Customers Outside CRP			
Category	Sample Used for Analysis	Identified Low Income	Estimated Low Income
	---- Average Per Customer ----		
CRP Payments	$1,001	$1,001	$1,001
Average Bill Payments	$1,588	$1,588	$1,588
CRP Value to Customer (excluding arrears)	$588	$588	$588
CRP Arrearage Subsidy	$155	$155	$155
Avg Subsidy Paid by Non-CRP Customers	$743	$743	$743
	---- Annual Totals ----		
Number of Customers	5,649	35,399	50,897
Percent of Total population	42%	42%	42%
Total Cost to Non-CRP Customers	$4,197,433	$26,302,840	$37,818,874

Table 4: Per Customer and Total Subsidy Results.

Confirmed Low-Income Customers

PGW reported 144,696 confirmed low-income customers for the *Bureau of Consumer Services Report on 2014 Universal Service Programs & Collections Performance* (Page 7) while 61,319 participated in CRP as of 12/31/2014. This leaves 83,377 outside CRP. Assuming 42% of these outside CRP customers would find an Average Bill under CRP optimal as compared with a Payment Agreement (35,415), the cost of moving them into CRP is estimated in the middle column of Table 5.

Estimated Low-Income Customers

PGW reported 181,143 estimated low-income customers for the Bureau of Consumer Services *Report on 2014 Universal Service Programs & Collections Performance* (Page 8) while 61,319 participated in CRP as of 12/31/2014.[37] This leaves 119,824 outside CRP. Assuming 42% of these would find an Average Bill under CRP optimal as

[37] Participation is currently lower. If CRP participation decreases, the cost of moving non-CRP customers into CRP would, accordingly, increase.

compared with a Payment Agreement+ (50,920), the cost of moving them into CRP is estimated in the last column of Table 5.

Table 5 takes into account the new, lower, cost of natural gas. Figure 9 shows PGW residential customers as reported in the Bureau of Consumer Services *Report on 2014 Universal Service Programs & Collections Performance*. For this chart, the estimated and confirmed low-income customers remaining outside CRP are shown as a single category.

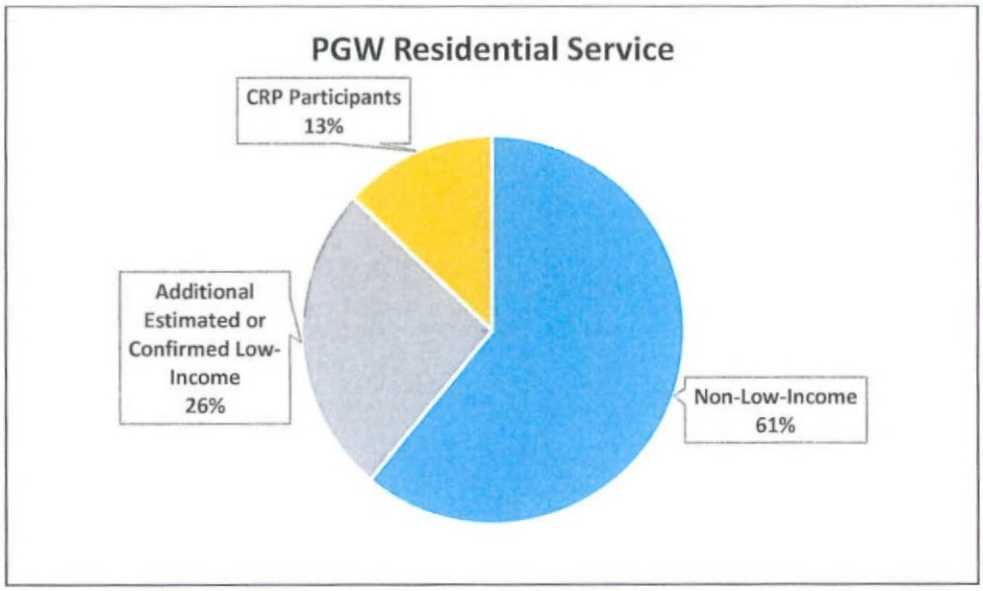


Figure 9: PGW Residential Customers.

Recommendation

Given the significant costs, rather than develop a second mechanism based on average bills as an overlay across the percentage of income payment plan, we recommend addressing affordability through the existing system of percentage of income tiers. This approach is transparent and easy to understand. Also, if a Payment Agreement is cheaper for a low income customer than going onto CRP, then CRP does not need to be expanded to provide additional benefits to these customers as they already have a bill that is affordable.

We recommend maintaining the pure percentage of income payment program approach, with consideration of possible adjustments to the percentages (see Affordability section).

CRP Customers Lower Average Bill Payment

As it turns out, with the recent large reductions in the commodity cost of natural gas and for homes with relatively low use, there are CRP customers who would receive a lower bill at the Average Bill. Table 5 shows the results when the PIPP of active CRP participants is compared to the estimates Average Bill payment. As shown near the bottom of the table, nearly 3,000 CRP participants, 14% of customers on CRP for 12 of 12 billing periods in 2015, would have been better off on Average Bill payments. Putting these customers on the Average Bill while maintaining their CRP treatment of arrearages would result in a lower annual bill of $219, on average. This equates to a subsidy paid by non-CRP customers of nearly $650,000 annually.

Active 2015 CRP Participants with Lower Estimated Average Bill Payments

Category	Annual Payments - Active CRP With Lower Avg. Bill
	-- Avg Per Customer --
CRP Payments	$1,255
Average Bill Payments *	$1,036
CRP Value to Customer (excluding arrears)	-$219
CRP Arrearage Subsidy	NA
Avg Subsidy Paid by Non-CRP Customers	$219
	-- Annual Totals --
Customers with Lower Average Bill Payments	2,959
Pct. of Total (On CRP for 12 of 12 billing periods)	14%
Total Cost to Non-CRP Customers	$648,021

* Average bill payments estimated using total rate per CCF of $1.1382 (Eff. 3/1/2016)

Table 5: CRP Customers with Potentially Lower Average Bill Payments.

Auto-Enrollment

Auto-enrollment would involve relying on another party to verify CRP program eligibility. The only agency that would be available to do that because it is required to independently verity income, household size and percentage of poverty is the Department of Human Services (DHS). DHS is required to verify this information as a federal requirement attached to block grant funding that is used for utility payment assistance under the Low Income Home Assistance Program (LIHEAP). The primary use of auto-enrollment appears to be as a method of insuring that households that

qualify for the CRP program can be identified and enrolled in CRP. It is primarily an outreach tool. It can also be used for verification. We have observed it in use in providing about a one to two-minute check on qualifications during recertification reviews. Since the procedure is automated, the staff person doing recertification can call a special telephone number, enter a social security number and receive a quick "yes" or "no" result immediately.

History of Use of DHS for Auto-Enrollment

An arrangement for auto enrollment through the Department of Human Services (DHS) was negotiated by PECO Energy and was in place, and used off and on, since at least the early 2000's. With the precedent of an existing arrangement, it is likely that a similar arrangement would be fairly easy for PGW to negotiate, which is a favorable factor for the use of this tool. However, DHS does not provide the actual percentage of poverty for each household. It will provide information that the customer is verified as qualified for LIHEAP by DHS.

In most years, this means that DHS has verified that the household's percentage of poverty is 150% or less. However, in 2010 the LIHEAP eligibility went to 210% of poverty and in 2011 it was at 160% of poverty.

Using DHS according to the way it has been set up to provide information in the past would have two drawbacks. In certain years the eligibility requirement for LIHEAP would diverge from the eligibility requirement for CRP. Also, DHS has not been providing exact household size and household income information so cannot be used to assign customers to the right percentage of income payment plan.

Other Considerations

To date, DHS has provided "Yes" and "No" answers to the question of DHS verification of eligibility for LIHEAP. But, in order to do this, DHS must gather information on household size and household income. So, it could simply use either these two values and calculate a percentage of poverty and it might agree to provide that information on an immediate turn-around basis. With that information, PGW could directly assign a household to the correct percentage of income payment plan. If this could be negotiated, it would provide a definite advantage to PGW and to customers, and could make auto-enrollment more viable.

PGW has been working on the possibility that information from DHS on size of grant could be used to back-engineer the percentage of poverty level for the household. Based on examination, there are patterns in the grant amounts that indicate that it is likely this approach will work for certain households, but that for others there is too much overlap in size of grant among the three tiers and the minimum payment group to make a definite assignment. Also, at one point PECO was ordered to conduct direct

verification of DHS data on a home by home basis,[38] so it is unlikely that an automated or bulk assignment of homes is possible and an alternative process could be quite costly.

Recommendation

We recommend that PGW undertake to negotiate an arrangement with DHS that can be used for auto-enrollment involving DHS providing verification of the household income and size.

It is understood that DHS may be reluctant to provide the full set of information elements but the possibility should be explored since it would enhance the general goals of DHS for public welfare and it would be of definite advantage in securing quick and accurate assignment of households to CRP.

We recommend that PGW attempt to negotiate bulk data transfer on an ongoing basis. The bulk transfer would facilitate identification of customers who should be in CRP but are not.

As a first step, we initially estimate the maximum increase in customers who could be enrolled would be approximately 11,849. This would correspond to an annual additional CAP credit cost of $6,658,738.[39] However, using a ratio developed in an earlier section of this report (Enrollment of Customers in CRP at Average Bill Amount – see Page 25), approximately 42% of these customers would benefit from a CRP that uses an average bill over a Payment Agreement/Budget Billing so the revised number of customers to

[38] According to PECO's 2013-2015 Universal Service Plan (page 5 of 44): "The Company continues to explore and develop opportunities to improve efficiencies in program operations. Such efficiencies help increase customer participation and satisfaction. One such efficiency has resulted from coordinating with the Department of Public Welfare ("DPW") and using DPW data to identify and verify CAP Rate program eligibility and participation. By using DPW data, PECO can enroll and re-certify more customers into CAP Rate. PECO will continue to use DPW data via LIHEAP grants to enroll and recertify customers into CAP, however, as directed by the Commission's April 4, 2013 Order (p. 52, concluding paragraph 4), PECO will modify that process to ensure customers who are enrolled into CAP for the first time are informed of the benefits and responsibilities of the CAP program via a 60-day income verification CAP enrollment process." However, according to the Tentative Order by the Commission approving PECO's new Universal Service and Energy Conservation Plan for 2016-2018 in Docket M-2015-2507139, February 25, 2016, P. 9: "PECO will no longer automatically enroll Low Income Home Energy Assistance Program (LIHEAP) recipients in CAP."

[39] There were 11,849 LIHEAP customers outside CRP in 2014-2015. For the cost calculation, we distribute them according to the percentages in four tiers (25 MI, 8%, 9% and 10%) in the current program for customers with 12 payment periods and 12 periods in CRP. These numbers are then multiplied by the average CAP credit amount in 2015 for each tier ($1,030, $857, $549 and $227) and totaled, equaling $6,658,738. This number is approximate. The data is from the PGW Customer Information System, filename: Recvd FY15 LHP, never on CRP 11849 MET xls.

transfer into CRP and the revised CAP Credit amount would be as shown in Table 6. The additional cost of contribution to arrearage subsidy is also included in the table.

Analysis of Annual Impact From Moving Low Income Customers into CRP			
Category	All on CRP	Program With Lowest Payment	
		CRP	Average Bill w/CRP Arrearage Treatment
	---- Average Per Customer ----		
CRP Payments	$1,479	$1,001	$1,833
Average Bill Payments	$1,336	$1,588	$1,150
CRP Value to Customer (excluding arrears)	-$143	$588	-$683
CRP Arrearage Subsidy	126	155	105
Avg Subsidy Paid by Non-CRP Customers	-17	743	105
	---- Annual Totals ----		
Number of Customers	11,849	5,033	6,816
Percent of Total	100%	42%	58%
Total Cost to Non-CRP Customers	-$197,641	$3,739,784	$714,853

Table 6: Cost of Inclusion of LIHEAP Customers Outside of CRP.

Arrearage Treatment for Restored Months

Currently, PGW has a 36-month arrearage pay off for CRP customers who pay in full. When a customer has been suspended from CRP and returns by paying the equivalent of the CRP bill plus the $5.00 per month payment towards arrearage for the missing months, the customer is treated as if they have been continuous in CRP with one exception. Currently, the customer does not receive the subsidy credit towards arrearage for months missed.

The approximate cost of implementing this adjustment to arrearage treatment for 2011 through 2015, by year is shown in Table 7. The calculation is based on data from PGW's Customer Information System and is limited to customers who move off CRP and then back to CRP. We limited the time off CRP to six bill periods for purposes of the calculation.[40]

[40] This table does not figure in a discount for six bills.

Cost of Crediting CRP Arrearage Subsidy on Return to Active Status		
Year	**Number**	**Annual Credit ($Millions)**
2011	94,466	$4.80
2012	101,809	$5.50
2013	101,010	$4.60
2014	99,332	$5.10
2015	92,868	$4.90
Note: Limited to 6 billing periods off CRP		

Table 7: Crediting Arrearage on Return to Active Status.

Recommendation

When customers return to CRP by making payments equivalent to their CRP amount plus the $5.00 a month payment towards arrearages, PGW should credit the arrearage subsidy amount for each month "made up". This seems fair to the CRP customer.

As a control tool, we recommend that this provision be limited to a maximum forgiveness of six months regardless of the CRP cure amount.

Peach, H. Gil, Mark Thompson & Erika Lehmann, *PGW Customer Responsibility Program 2015 Policy Evaluation, an Independent Third-Party Evaluation of Philadephia Gas Work's Customer Responsibility Program.* Beaverton, Oregon: H. Gil Peach & Associates LLC, Monograph 2016-05-01, May 2016.

Amendment to Program Policy Evaluation

Amended - Enrollment of Customers in CRP vs Average Bill Amount

This policy option begins with two questions:

1. Assuming it made sense from a policy perspective, how many low income customers would be better off with CRP pricing compared to Average Bill pricing?

2. What would be the additional cost to non-CRP customers from bringing these customers into the CRP program at the lower of CRP or Average Bill pricing and extending CRP arrearage treatment to these customers?

For this part of the study, to develop a ratio, we used a dataset that PGW compiled of over 40,000 low-income accounts that were qualified for participation in CRP, but outside CRP. This dataset, which was prepared in late 2015, includes current household income, the estimated budget pay amount and current arrearage balance. In order to compare the average bill with CRP payments we obtained CRP Tier ($25 monthly, 8%, 9% or 10%) by matching the special dataset to records of all CRP participants between 2011 and 2015. These records could be matched since these matching customers had previously been in CRP at one time or another in the past.

Of the 40,000 accounts, just over 13,000 accounts matched (i.e. the customers that matched had prior CRP data). While the information is not perfect in that parts of the information are taken from different years, the combined data does provide a basis for a practical estimate. CRP program payments were estimated from monthly income and CRP Tier. From this analysis it was found that 42% of the approximately 13,000 low income accounts would be better off moving into the CRP program (Table 4) with the lower monthly PIPP. The remaining 58% would have a lower monthly payment under Average Billing but would still benefit on average from the treatment of arrearages under the CRP.

Program	Number	Percent
CRP	5,649	42%
Average Bill	7,650	58%
Total	13,299	100%

Table 1: Optimum Allocation to Payment Plan (Lowest Customer Payment including Arrearages).

Customer arrearage payments under the two payment plans (Average Bill vs. CRP) were also calculated. This information was then used to calculate the amount of CRP arrearage subsidy that would be paid by the non-CRP customers. As shown in Table 4,

the average cost per customer moved into CRP would be $588 in CAP credit and $155 in arrearage subsidy for a per customer total of $743. For customers with lower Average Bill payments, extending CRP arrearage treatment would result in an average subsidy of $105 per customer.

		Program With Lowest Payment	
		CRP	Average Bill
		---- Average Per Customer ----	
CRP Payments - Projected		$1,001	$1,833
Average Bill Payments - Projected		$1,588	$1,150
CRP Value to Customer (excluding arrears)		$588	-$683
CRP Arrearage Subsidy		$155	$105
Avg Subsidy Paid by Non-CRP Customers		$743	$105
		---- Annual Totals ----	
Low Income Not on CRP - Distribution	100%	42.47688%	58%
Low Income Population Not on CRP:			
Low (Confirmed)	83,337	35,399	47,938
High (Estimated)	*119,824*	*50,897*	*68,927*
Subsidy Paid by Non-CRP Customers (Low Population Estimate):			
CRP Value to Customers (excluding arreage)	$20,801,842	$20,801,842	NA
CRP Arrearage Treatment	$10,528,740	$5,500,998	$5,027,742
Total	$31,330,582	$26,302,840	$5,027,742
Subsidy Paid by Non-CRP Customers (High Population Estimate):			
CRP Value to Customers (excluding arreage)	$29,909,404	$29,909,404	NA
CRP Arrearage Treatment	$15,138,483	$7,909,471	$7,229,012
Total	$45,047,886	$37,818,874	$7,229,012

Table 2: Per Customer and Total Subsidy Results.

Confirmed Low-Income Customers

PGW reported 144,696 confirmed low-income customers for the *Bureau of Consumer Services Report on 2014 Universal Service Programs & Collections Performance* (Page 7) while 61,319 participated in CRP as of 12/31/2014. This leaves 83,377 outside CRP. Assuming 42% would benefit from being moved into CRP, over 35,000 customers would be impacted by such a move. The cost of moving them into CRP and moving 58% onto an Average Bill is estimated in Table 4.

Estimated Low-Income Customers

PGW reported 181,143 estimated low-income customers for the Bureau of Consumer Services *Report on 2014 Universal Service Programs & Collections Performance* (Page 8) while 61,319 participated in CRP as of 12/31/2014.[1] This leaves 119,824 outside CRP. Assuming 42% would benefit from being moved into CRP, nearly 51,000 customers would be impacted by such a move. The costs of moving customers onto CRP or Average Bill are estimated in Table 4.

Table 4 takes into account the new, lower, cost of natural gas. Figure 9 shows PGW residential customers as reported in the Bureau of Consumer Services *Report on 2014 Universal Service Programs & Collections Performance*. For this chart, the estimated and confirmed low-income customers remaining outside CRP are shown as a single category.

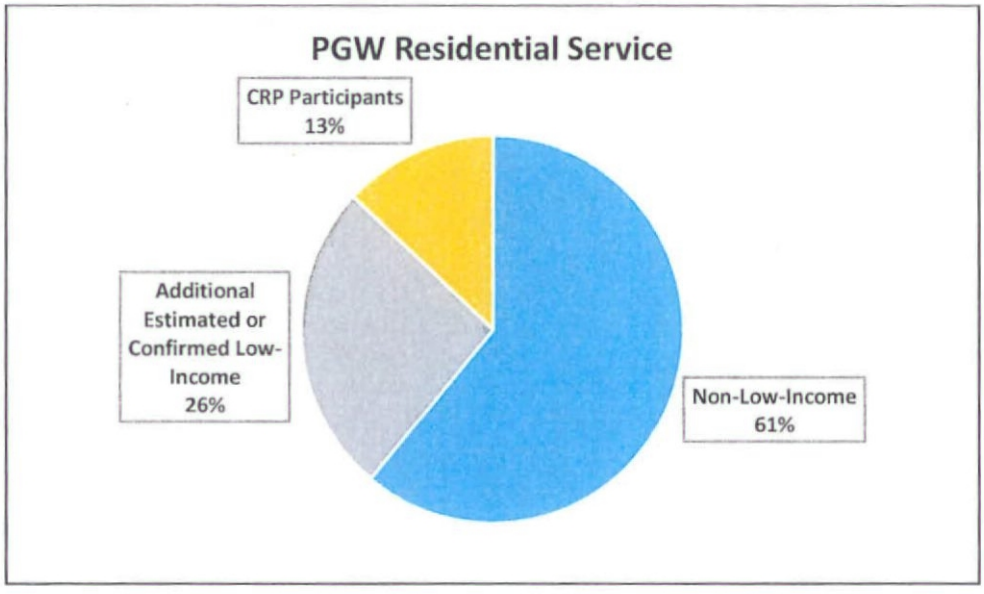


Figure 1: PGW Residential Customers.

Recommendation

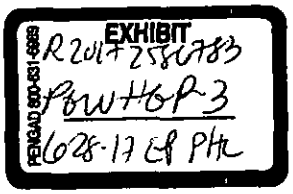
Given the significant costs, rather than develop a second mechanism based on average bills as an overlay across the percentage of income payment plan, we recommend addressing affordability through the existing system of percentage of income tiers. This approach is transparent and easy to understand. Also, if a Payment Agreement is cheaper for a low income customer than going onto CRP, then CRP does not need to

[1] Participation is currently lower. If CRP participation decreases, the cost of moving non-CRP customers into CRP would, accordingly, increase.

be expanded to provide additional benefits to these customers as they already have a bill that is affordable.

We recommend maintaining the pure percentage of income payment program approach, with consideration of possible adjustments to the percentages (see Affordability section).

EXHIBIT HGP-3



Response of TURN et al. to PGW Interrogatories to TURN et al., Set III

Docket No. R-2017-2586783

Request: 2. Reference TURN, St. 1 (Geller) at 11-15. Has Mr. Geller undertaken any analysis of the effects of his proposal to adjust PGW's current CRP percentage of income targets on: (a) low-income customers who are not enrolled in CRP; and/or, (b) non-CRP customers? If so, provide the analysis as well as all documents, workpapers and supporting information utilized to perform the analysis.

Response: 2. Mr. Geller has not performed such an analysis. As his testimony indicates, it is Mr. Geller's belief that low-income individuals who have access to a more affordable CRP energy burden will benefit by continued service and reduced levels of service termination.

Response provided by: Harry Geller, Esq.
Dated: June 5, 2017

VERIFICATION

I, Harry S. Geller, witness of Tenant Union Representative Network and Action Alliance of Senior Citizens of Greater Philadelphia ("TURN *et al.*") hereby state that the facts contained in the foregoing pleading are true and correct to the best of my knowledge, information and belief, that I am duly authorized to make this Verification, and that I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 10 Pa.C.S. § 4904 (relating to unsworn falsification to authorities).

Harry S. Geller

Date: 6/5/17

Harry S. Geller witness of TURN et al.

PGW St. No. 11-RJ

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

REJOINDER TESTIMONY OF

H. GIL PEACH

ON BEHALF OF
PHILADELPHIA GAS WORKS

Docket No. R- 2017-2586783

Philadelphia Gas Works

General Rate Increase Request

Topics Addressed:

Low-Income / Replacement Program
CRP Offset
Usage of Low-Income Customers
Terminations and Reconnections
Energy Affordability Guidelines

June 26, 2017

{L0691437.1} 300025-55

EXHIBIT

TABLE OF CONTENTS

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND TITLE.

A. My name is Hugh Gilbert Peach. I am President of H. Gil Peach & Associates LLC and I am also President and Chief Science Officer of Adapt.Global Inc.

Q. DID YOU PREVIOUSLY SUBMIT TESTIMONY IN THIS PROCEEDING ON BEHALF OF PGW?

A. Yes. I submitted my rebuttal testimony, PGW St. No. 11-R on June 9, 2017.

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. The purpose of my rebuttal testimony is to respond to the surrebuttal testimony of Office of the Consumer Advocate ("OCA") Witness Roger Colton (OCA St. No. 4-S) and the surrebuttal testimony of Harry S. Geller submitted on behalf of Tenant Union Representative Network and Action Alliance of Senior Citizens of Greater Philadelphia (collectively, "TURN").

II. RESPONSE TO THE SURREBUTTAL TESTIMONY OF OCA WITNESS ROGER COLTON

(A) Low-Income / Replacement Program

Q. IS MR. COLTON CORRECT THAT YOUR ANALYSIS REGARDING HIS PROPOSED REPAIR AND REPLACEMENT PROGRAM ASSUMES THAT PGW IS THE ONLY UTILITY TO WHICH THE NEED FOR SUCH PROGRAM HAS BEEN PRESENTED? (OCA ST. NO. 4-S AT 8).

A. No, setting aside what other NGDCs may or may not be doing in Pennsylvania and whether they voluntarily offered to undertake such a program or agreed to such programs as part of settlements of various rate cases and universal service dockets, Mr. Colton's response ignores the point of my rebuttal.

Q. PLEASE EXPLAIN THE BASIC QUESTIONS ABOUT MR. COLTON'S PROPOSAL THAT YOU IDENTIFIED.

A. Some basic questions about the proposed emergency repair and replacement program are if (or to what degree) PGW's ratepayers should bear financial responsibility for repairing broken heating equipment for free for (a) the Philadelphia landlord community, (b) former PGW customers, and (c) active customers who have elected to become de facto electric heat customers (whether for financial or other reasons).

Q. PLEASE EXPLAIN YOUR VIEW OF THE RELATIONSHIP REGARDING FORMER PGW CUSTOMERS AND ACTIVE CUSTOMERS WHO HAVE BECOME DE FACTO ELECTRIC HEAT CUSTOMERS.

A. For a customer or (if renting) their landlord who has a broken furnace or boiler on their premise, Mr. Colton seems to hold a "Hotel California" theory ("...you can check out, but you can never leave") to define the relationship with the customer. I would assert that this is not correct. The relationship between PGW and a gas customer essentially ends at either the termination of service or the physical shut off of the heater. If a customer then turns to electric heat, they become a heating customer of the electric company. This is confirmed by electric company classification of their customer as a "de facto electric heating customer" (using portable heaters as their heat source). While Mr. Colton says "...the case here is about PGW and the benefit of having safe, working natural gas heating systems for PGW customers," the issue here is whether PGW ratepayers should bear these costs.

Q. WHAT IS YOUR EXPERIENCE REGARDING TENANTS AND THEIR LANDLORDS?

A. In my experience, maintaining heat and heating equipment is a legal responsibility of the landlord, and it is difficult to work out how and under what specific conditions it is permissible or advisable for a a city-owned utility to intervene and replace heating

equipment for a landlord (with or without the landlord's permission). Mr. Colton does not address this concern. Instead, his proposal appears to be simply that the landlord receives the heating equipment for free at the expense of PGW ratepayers.

(B) CRP Offset

Q. PLEASE RESPOND TO MR. COLTON COMMENTS ON YOUR STATISTICAL ANALYSIS. OCA ST. 4-S AT 10-11.

A. I assert a statistical analysis showing there is no relationship between the size of the CRP population and PGW's bad debt expense. The analysis is conducted using the level of CRP participation and the *total* bad debt expense. Mr. Colton suggest this analysis is inappropriate because there is no reason that the level of CRP participation would affect either the bad debt expense of non-low-income accounts, or the bad debt expense of confirmed low-income customers who do not participate in CRP. But the main point is that, overall, bad debt is decreasing. This brings a question to the heart of the debt offset mechanism that Mr. Colton proposes. I do not find his assertion of a relationship between CRP participation and bad debt expense persuasive since overall bad debt is declining. Mr. Colton is correct that a tighter analysis could be performed by limiting the study to confirmed low-income customers not participating in CRP, who subsequently enroll in CRP. The reason I did not limit the analysis is that I do not have bad debt data for confirmed low-income customers not participating in CRP, who subsequently enroll in CRP.

But, that commentary does not cast doubt on my analysis. My analysis would still show if the assumptions underlying Mr. Colton's offsets were correct. It did not. The result is not confirmatory, but it is suggestive. It is often the case that when you cannot get the best data, you can run a short analysis to suggest the lay of the land.

I would not expect a more focused analysis to yield a different result because the assumptions underlying Mr. Colton's offsets no longer appear to be appropriate for PGW for the following reasons:

(1) Bad debt, in general, is declining for PGW in the current era. This is a signal that something is happening of a kind that in econometrics is called a "change in structure." I think this change in structure is the lowering gas cost for all customers, including confirmed low-income customers and the portion of confirmed low-income customer who are included in the CRP.

(2) Since PGW has (a) generally lowered bills to all customers and (b) has also lowered bills to the point at which some low-income customers can be put on a cost-of-service bill (including Budget and Budget Plus) the type of analysis that Mr. Colton puts forward (that decline in participation in CRP is associated with lowering bad debt) is not necessarily correct. To the extent that confirmed low-income customers can be given a lower monthly bill outside of CRP than inside CRP, Mr. Colton's analysis logically does not follow. For these customers, bad debt should decline even as they are restored to cost-of-service billing. I think Mr. Colton's analysis might have been more correct for an earlier era with higher gas prices and in which the CRP bill was necessarily the lowest monthly cost option. But now, some customers have a lower monthly bill (including the arrearage pay down arrangement) off CRP. So the assumptions for the cost-offset proposals do not hold. We also need to recall that the utility model is that customers pay the cost-of-service bill (plus any arrearage, on a Budget Plus plan). PGW should not be

penalized for generally lowering gas cost to all customers and for opening an opportunity for some low-income customers to return to paying cost-of-service.

(C) ***Usage of Low-Income Customers***

Q. DO YOU AGREE THAT RELIANCE ON REC DATA IS APPROPRIATE TO ANALYZE PGW'S PROGRAMS AND USAGE?

A. Mr. Colton uses U.S. Department of Energy reports in its Residential Energy Consumption Survey ("RECS") to show that low income customers use less gas than high income customers and is critical that I did not rely on it. OCA St. No. 4-S at 11. The data he uses is for total Northeast. It is not Philadelphia data. If we think for a moment of the diversity of a region that runs from the top of the state of Maine down to Pennsylvania, it is reasonable to question whether the RECS data for the Northeast US is applicable to the City of Philadelphia. In fact, the relationship varies by utility as demonstrated in a section of a peer reviewed paper by Serj Berelson, "Myths of Low-Income Energy Efficiency Programs: Implications for Outreach," *Proceedings of the American Council for an Energy Efficient Economy 2014 Summer Study on Energy Efficiency in Buildings*, Pp. 7-32 to 7.43.[1]

Q. DOES THIS STUDY CORRESPOND WITH YOUR OWN EXPERIENCES?

A. Yes. The Berelson study corresponds to my experience in that for some utilities, low-income households typically use more energy than non-low-income households and in others, the reverse. The Berelson study is sufficient to show this relationship varies by utility and to refute the logic that since Philadelphia is a piece of the Northeast region it is

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[1] Available at: http://aceee.org/files/proceedings/2014/data/index.htm

thereby identical to the summative patterns for the Region. The RECS data is not useful for Philadelphia.

III. RESPONSE TO TURN WITNESS GELLER

(A) Terminations and Reconnections

Q. HAS MR. GELLER PERSUADED YOU THAT PGW'S DECLINING PARTICIPATION RATES ARE "DEMONSTRATIVE OF UNREASONABLE SERVICE PROVIDED TO PGW CUSTOMERS?"

A. No. Mr. Geller attempts to blunt my criticisms of his view that the declining rate of CRP participation is some type of indicator of a problem with PGW's CRP or termination/reconnection policies. (TURN St. NO. 1SR at 6-9). Upon consideration of his surrebuttal testimony, I have updated my initial analysis which further supports my view that: (1) PGW's CRP participation rates have always exceeded or were equal to the participation rate for the weighted average of NGDCs, (2) the same participation pattern occurs across all Pennsylvania's NGDCs, and, (3) changes in price impact CRP participation.[2]

Q. PLEASE EXPLAIN YOUR UPDATES REGARDING THE PGW CRP PARTICIPATION VS. PA NATURAL GAS WEIGHTED AVERAGE CAP PARTICIPATION TABLE YOU PROVIDED ON PAGE 16, LINES 2-3 OF YOUR REBUTTAL TESTIMONY.

A. Here is the same graph but updated to include more data labels:

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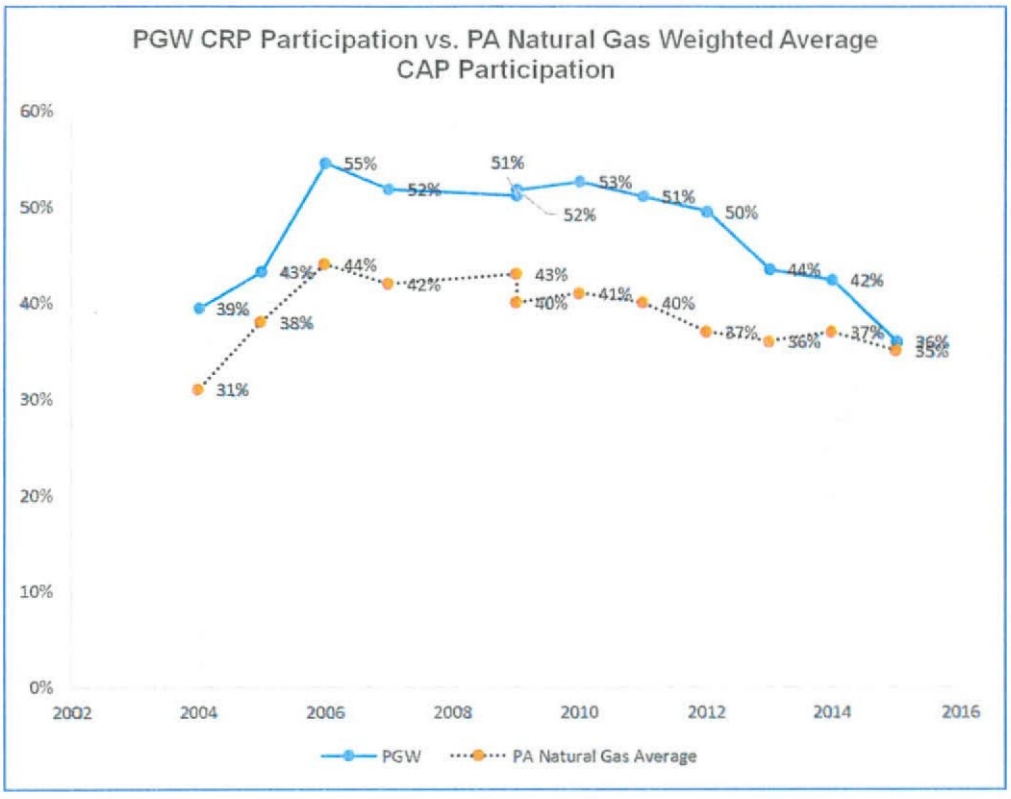
[2] I would also note that Mr. Geller attempts to downplay my criticism of his use of tables without a true zero point on the vertical or Y-axis as "nonmaterial" because there is no CRP default exist data which approaches the zero point. (TURN St. 1SR at 8). However, a graph that focuses on where the data occurs tends to convey the impression of sharp differences. The effect is like looking through a magnifying glass. A graph of the same data with a true zero point can make the same differences appear more like small ripples in a pond.



The indicator that I selected to show declining CRP participation is the "CRP Participation Rate," defined as the percentage of Confirmed Low Income Customers in CRP. This rate is reported each year to the Bureau of Consumer Services and the data source is the annual BCS reports and is tabled in their annual Report on Universal Service Programs & Collections Performance of the Pennsylvania Electric Distribution Companies & Natural Gas Distribution Companies.[3] As shown in the graph the PGW "CRP Participation Rate" has varied from 39% in 2004 up to 55% in 2006 and declined to 36% in 2016. This compares with the weighted average "CAP Participation Rate" for Pennsylvania natural gas distribution companies of 31% in 2004, rising to 44% in 2006 and declining to 35% in 2016. With this more complete data labeling, I note that from

[3] Reports located at: http://www.puc.state.pa.us/filing_resources/universal_service_reports.aspx

2004 through 2015 PGW participation has always exceeded or was equal to the participation rate for the weighted average of natural gas distribution companies.

Q. HOW DO THE PGW CRP PARTICIPATION CURVE AND THE PA NATURAL GAS WEIGHTED AVERAGE CAP PARTICIPATION CURVE COMPARE?

A. They are both quite similar. They both have a low point in 2004, a high point in 2006 and then approximately the same pattern of slope segments by year from 2006 to 2016. This means that the same participation pattern occurs across all Pennsylvania natural gas companies, although it is more pronounced for PGW, both where the curves increase and where they decline. The common pattern suggests that some variable that affects all gas companies plays a major role in giving shape to the curves. A variable that explains this common effect is the "Cost per MCF."

Q. WHAT DATA IS USED TO FOCUS IN ON THE BEHAVIOR OF THE DEPENDENT VARIABLE (CRP SIZE, I.E. NUMBER OF CUSTOMERS IN CRP

IN DECEMBER OF EACH YEAR) IN RELATION TO PRICE (ANNUALIZED COST PER MCF) AS THE INDEPENDENT VARIABLE?

A. The table below shows this data.

Values used in Analysis of CRP Size				
Year	Fixed Cost	Annualized Cost/MCF	Constant Dollars	CRP Size
(Col. 1)	(Col. 2)	(Col. 3)	(Col. 4)	(Col. 5)
2000	$8.00	$8.68	$12.04	46,960
2001	$11.06	$11.69	$15.31	46,106
2002	$12.00	$10.03	$13.39	55,261
2003	$12.00	$12.78		
2004	$12.00	$14.27	$18.10	60,621
2005	$12.00	$16.02	$19.65	67,120
2006	$12.00	$18.06	$21.61	76,045
2007	$12.00	$17.38	$19.98	76,236
2008	$12.00	$20.01	$22.98	78,490
2009	$12.00	$16.55	$18.50	81,905
2010	$12.00	$15.45	$17.02	82,544
2011	$12.00	$15.46	$16.54	80,298
2012	$12.00	$14.05	$14.77	75,224
2013	$12.00	$14.55	$15.07	68,458
2014	$12.00	$14.47	$14.88	61,319
2015	$12.00	$12.30	$12.56	58,282
2016	$12.00	$11.79	$11.79	49,321

Note that data from PGW on "Annualized Cost Per MCF" was annualized before starting the analysis, because it can change several times in a year. "Fixed Cost" is not analyzed because it does not show enough variation to be useful. The correlation of "CRP Size" with "Annualized Cost per MCF" and three lagged "Annualized Cost per MCF" variables is shown in the correlation table below.

Correlation of CRP Size with Cost Per MCF				
Calculation	PER_MCF	PER_MCF (Lag 1)	PER_MCF (Lag 2)	PER_MCF (Lag 3)
Pearson Correlation	.827**	.899**	.833**	.752**
Sig. (2-tailed)	0	0	0	0.001
N	16	16	16	16

As shown in the correlation table, the best correlation of "CRP Size" is with "Cost Per MCF (Lag 1)". This correlation, rounded to two digits, is r = 0.90 which is very high.

Q. PLEASE EXPLAIN THE NEXT STEP IN YOUR ANALYSIS.

A. Consistent with this result, if we next regress "CRP Size" as the dependent variable on "Cost Per MCF (Lag1)" as the independent variable, the result, rounded to two digits is a high value of R-squared: R2 = 0.81.

Model Summary and Parameter Estimates

Dependent Variable: CRP_Size

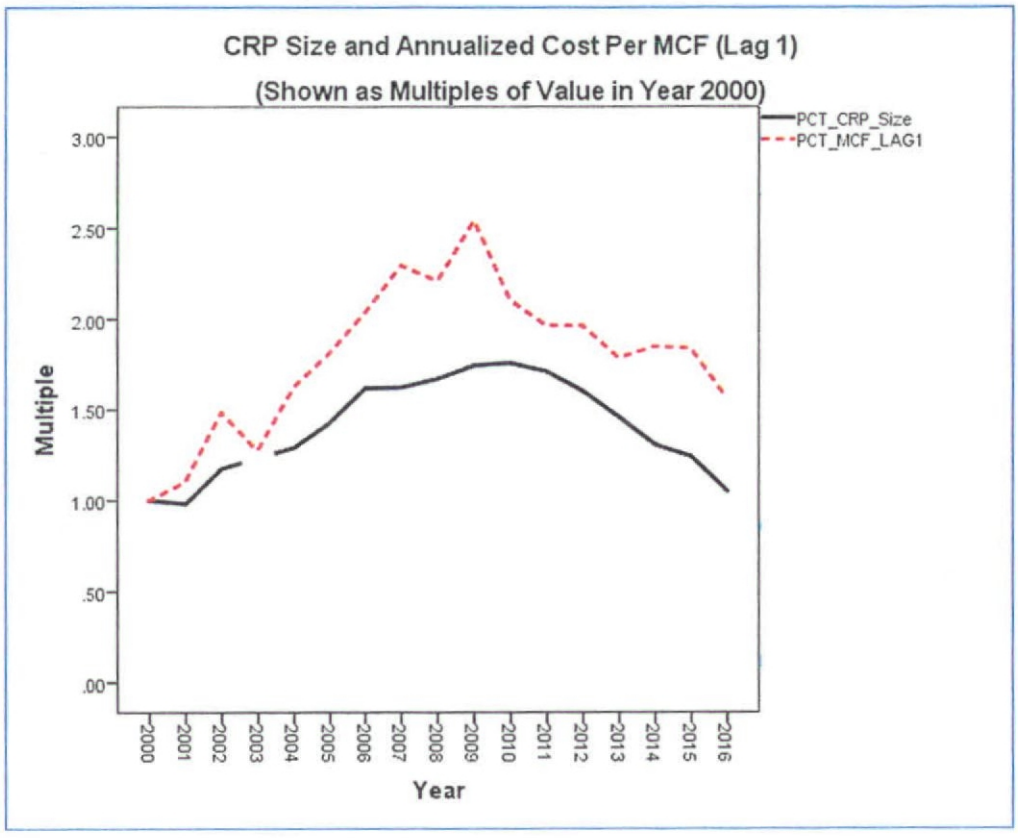
	Model Summary					Parameter Estimates	
Equation	R Square	F	df1	df2	Sig.	Constant	b1
Linear	.808	58.857	1	14	.000	14987.912	3590.676

The independent variable is MCF_LAG1.

This means that the price effect, operationalized as "Cost Per MCF" Lag 1, explains 81% of the variation in "CRP Size." It makes sense that the social response to changes in price of natural gas contains a lag of one year because most people have only a general sense of utility cost so likely lag in their responses to changes in utility costs.

Q. CAN YOU PLACE THIS ANALYSIS IN CONTEXT?

A. Yes. If both variables are expressed as multiples of their values in the year 2000, they can be graphed using the same scale. The result is shown below:



Q. WHAT DOES THIS ANALYSIS LEAD YOU TO CONCLUDE?

A. As shown in the graph above, "CRP Size" follows essentially the same curve as "Annualized Cost Per MCF Lag 1." This variable explains 81% of the variation in "CRP Size", leaving 19% of variation to be explained by other factors. It also explains the general tendencies in "CRP Size," rising with a lag when "Annualized Cost per MCF" increases and declining with a lag when "Annualized Cost per MCF" declines. While diligence of buyers in completing gas purchases is a factor in declining "Annualized Cost per MCF," "Annualized Cost per MCF" is a market variable. The general explanation for decline in CRP participation is social response to this market variable. For example, in 2001, the Annualized Cost per MCF was $11.69 and the number of participants in CRP was 46,106. In 2016, the "Annualized Cost per MCF" was $11.79 and the number of participants in CRP was 49,321. This analysis does not fully explain the declining

participation in CRP, nor does it fully explain periods of increasing participation in CRP earlier, but it does show that in addition to any program administration variables such as terminations, there is an autonomous market effect: changes in price.

Q. IS MR. GELLER'S COST ANALYSIS REGARDING EXTENDING ARREARAGE FORGIVENESS TO NON-CRP-LOW-INCOME CUSTOMERS PERSUASIVE?

A. No. Mr. Geller attempts to compare PGW's reconnection fee as set forth in its tariff ($123.23) with the cost I determined would be incurred to extent arrearage forgiveness is extended to non-CRP low-income customers ($105) to claim that extending arrearage forgiveness would cost PGW ratepayers less than reconnecting customers. (TURN St. No. 1SR at 4). This comparison is not valid. First, the customer seeking the reconnection is required to pay for the reconnection – that is not a cost passed on to all customers like the costs of the CRP program. Second, the $105 was an average/per customer benefit – the full costs to the non-CRP customers of making this change were estimated to be more than $5 million annually. Finally, Mr. Geller is looking at the charge for reconnection, not the costs incurred by PGW; the costs of termination and reconnection together would be much higher than the $123.23 rate figure used. For customers who have no shut off valve or whose meter is inside the premises, a substantial number of customers, the costs could be several thousand dollars. (See PGW St. 10-R at 23-24.

(B) Energy Affordability Guidelines

Q. MR. GELLER NOTES THAT YOU DO NOT "EXPRESS CLEAR DISAGREEMENT AS TO THE FUNDAMENTAL NEED TO REDUCE ENERGY

BURDENS FOR LOW-INCOME CUSTOMERS." (TURN ST. NO. 1-SR AT 5). HOW DO YOU RESPOND?

A. As stated in my rebuttal testimony, I believe that a comprehensive analysis is necessary to establish an appropriate affordable energy burden. (PGW St. 11-R at 10). In 2000-2001 when I proposed the current energy burden structure for CRP tiers (in the context of PGW's transition from city regulation to regulation by the Commission) we engaged in very detailed study over a nearly two-year period and I was able to learn the complexities and balancing required in CRP design. To design a low-income CRP structure that will work for all or almost all customers, including those who pay cost-of-service rates and those who cannot afford cost-of-service rates, requires careful modeling of trade-offs as to projected energy burdens to meet the needs of low-income customers in relation to the cumulative burden this places on cost-of-service customers. In this balancing, we need to model expected payments for different energy burden targets, and run the trade-offs. Also, we need to recognize that PGW is not a suburban utility with a large upper income population, a large moderate income population and a small pocket of households at or under 150% of poverty. PGW is an urban municipal (non-profit) utility in a city for which approximately 30% of customers qualify at or below 150% of poverty. Within poverty in Philadelphia, there is a sizable pocket of deep poverty. And, above 150% of poverty, approximately another 30% of PGW households would meet a reasonable definition of income insufficiency. Yet, they are asked to subsidize the energy use of households for which cost-of-service billing is not affordable (under current PUC guidance on affordability). This inherently creates strong constraints in program design. The combination presents deep challenges. Importantly, this is only a perspective from the needs side, which must be balanced off against cost and the allocation of cost to

customers, many of which are similar to or just a bit different form current CRP customers. This is a challenging problem of optimization under constraints and a new optimization should be based on an affordability study and/or at least careful modeling to assess trade-offs in order to secure an optimum result.

IV. CONCLUSION

Q. DOES THIS COMPLETE YOUR REJOINDER TESTIMONY?

A. Yes.

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Pennsylvania Public Utility Commission	:	R-2017-2586783
Office of Consumer Advocate	:	C-2017-2592092
Office of Small Business Advocate	:	C-2017-2593497
Philadelphia Industrial & Commercial	:	
Gas Users Group	:	C-2017-2595147
William Dingfelder	:	C-2017-2593903
	:	
v.	:	
	:	
Philadelphia Gas Works	:	

VERIFIED STATEMENT

I, H. Gil Peach, hereby state that the facts set forth below are true and correct to the best of my knowledge, information and belief and I understand that the statements herein are made subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).

1. I have submitted testimony in this proceeding on behalf of Philadelphia Gas Works and am authorized to make this statement on its behalf.

2. I prepared PGW St. No. 11-R, which includes Exhibit HGP-1 through HGP-3, and which was served on the parties in this proceeding on June 9, 2017.

3. I prepared PGW St. No. 11-RJ which was served on the parties in this proceeding on June 26, 2017.

4. I do not have any corrections to any of this testimony.

5. If I were asked the same questions set forth in each of these statements today, my answers would be the same.

Date: June 27, 2017

H. Gil Peach