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September 3, 2020

**VIA ELECTRONIC FILING**

Joel H. Peck, Clerk  
c/o Document Control Center  
State Corporation Commission  
1300 E. Main Street  
Richmond, VA 23219

**Re:** *Commonwealth of Virginia, ex rel. State Corporation Commission*  
*Ex Parte: Establishing the rates, terms and conditions of a universal fee to be*  
*paid by the retail customers of Virginia Electric and Power Company*  
**Case No. PUR-2020-00109**

Dear Mr. Peck:

Enclosed for filing in the above-captioned matter is the Direct Testimony of Roger D. Colton filed on behalf of the Sierra Club.

Should you have any questions about this filing, please do not hesitate to contact me.

Sincerely,

/s/ Matthew L. Gooch

Matthew L. Gooch

cc: Service List

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COMMONWEALTH OF VIRGINIA  
STATE CORPORATION COMMISSION

COMMONWEALTH OF VIRGINIA, <i>ex rel.</i>	)	
	)	
STATE CORPORATION COMMISSION	)	
	)	Case No. PUR-2020-00109
<i>Ex parte:</i> Establishing the rates, terms and conditions of	)	
a universal service fee to be paid by the retail customers of	)	
the Virginia Electric and Power Company	)	

Direct Testimony of Roger D. Colton

On Behalf Of

Sierra Club

September 3, 2020

## Executive Summary: Direct Testimony of Roger Colton (Sierra Club)

The Direct Testimony of Roger Colton, presented on behalf of the Sierra Club, addresses issues involved with the funding of the Virginia electric Percentage of Income Payment Plan (PIPP) program mandated by the Virginia Clean Economy Act. Mr. Colton's testimony in this proceeding addresses the PIPP funding proposal filed by Virginia Electric and Power Company in July 2020. Mr. Colton's testimony is presented in five major sections.

Part 1 of Mr. Colton's testimony documents his analysis of the bill credits which Virginia Electric and Power should provide for current service pursuant to the legislatively-mandated PIPP. Mr. Colton uses recent Census data (American Community Survey), applied to the various communities which Virginia Electric and Power lists in its electric tariff as comprising its service territory to estimate the number of income-eligible participants, incomes at various ranges of Federal Poverty Level (as well as the mix of incomes within each community), and the number of heating (and non-heating) customers. He uses Company-provided data to establish heating and non-heating electric bills. Combining this data, Mr. Colton calculates a "per-participant" shortfall (i.e., program cost) by income range and by community. Using this data, and an assumed PIPP participation rate, Mr. Colton calculates a total PIPP cost, both assuming 100% participation and assuming an "expected" participation.

In Part 2, Mr. Colton documents the legislative basis for an Arrearage Management Program (AMP) component to the Virginia electric PIPP. He notes that without an arrearage management program, the legislatively prescribed ceilings on low-income customer bill payments cannot be achieved. Using Company data, he estimates an annual first-year cost for the AMP component of PIPP.

In Part 3, Mr. Colton discusses the critical importance that energy efficiency plays both in advancing the objectives of the Virginia electric PIPP, and in controlling overall PIPP costs. He notes that without utility investments in energy efficiency, extensive "market barriers" will prevent PIPP participants from being able to make efficiency investments on their own. He explains how energy efficiency directed toward PIPP participants will allow a utility to generate double-savings, both "traditional" avoided costs (energy, capacity, environmental compliance) and reductions in PIPP credits. He proposes an annual budget for an energy efficiency component to PIPP. Mr. Colton's fourth section simply pulls each of his budget numbers into a single summary section.

Finally, Mr. Colton makes specific observations about the PIPP funding proposal filed by Virginia Electric and Power in July. He notes that he has more agreements than disagreements with the Company's proposal. For example, he agrees that the PIPP funding mechanism should be reconcilable on an annual basis.

Throughout his testimony, Mr. Colton addresses each of the issues presented by the Virginia Corporation Commission's June 12, 2020 Order Establishing Proceeding.

1   **Q.    PLEASE STATE YOUR NAME AND ADDRESS FOR THE RECORD.**

2    A.    My name is Roger D. Colton. My address is 34 Warwick Road, Belmont, MA 02478.

3

4   **Q.    ON WHOSE BEHALF ARE YOU TESTIFYING?**

5    A.    I am testifying on behalf of the Sierra Club, on whose behalf I have been retained as an  
6       expert.

7

8                                   **Introduction and Credentials**

9   **Q.    BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

10   A.    I am a principal in the firm Fisher, Sheehan & Colton, Public Finance and General  
11       Economic. In that capacity, I provide technical assistance to a variety of federal and state  
12       agencies, consumer organizations and public utilities on rate and customer service issues  
13       involving water/sewer, natural gas, and electric utilities.

14

15   **Q.    PLEASE DESCRIBE YOUR PROFESSIONAL BACKGROUND.**

16   A.    I work primarily on low-income utility issues. This involves regulatory work on rate and  
17       customer service issues, as well as research into low-income usage, payment patterns,  
18       and affordability programs. At present, I am working on various projects in the states of  
19       Maryland, Pennsylvania, Michigan, Illinois, Missouri, Iowa and Washington. My clients  
20       include state agencies (e.g., Pennsylvania Office of Consumer Advocate, Maryland  
21       Office of People's Counsel, Illinois Office of Attorney General), federal agencies (e.g.,  
22       the U.S. Department of Health and Human Services), community-based organizations  
23       (e.g., National Immigration Law Center, Natural Resources Defense Council, Advocacy

1 Centre Tenants Ontario), and private utilities (e.g., Unifil Corporation d/b/a Fitchburg  
2 Gas and Electric Company, Entergy Services, Xcel Energy d/b/a Public Service of  
3 Colorado). In addition to state-specific and utility-specific work, I engage in national  
4 work throughout the United States. For example, in 2007, I was part of a team that  
5 performed a multi-sponsor public/private national study of low-income energy assistance  
6 programs. In 2011, I worked with the U.S. Department of Health and Human Services  
7 (the federal LIHEAP office) to develop and advance the utilization of the Home Energy  
8 Insecurity Scale as an outcomes measurement tool for the federal Low-Income Home  
9 Energy Assistance Program ("LIHEAP"). This year, I completed a study of water  
10 affordability in twelve U.S. cities for the London-based newspaper, The Guardian.

11  
12 Overall, I have worked to help design and implement low-income bill affordability  
13 programs for electricity, natural gas, and water utilities throughout the United States and  
14 Canada. A brief description of my professional background is provided in Appendix A.

15  
16 **Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND.**

17 A. After receiving my undergraduate degree in 1975 (Iowa State University), I obtained  
18 further training in both law and economics. I received my law degree in 1981 (University  
19 of Florida). I received my Master's Degree (Regulatory Economics) from the  
20 MacGregor School in 1993.

21  
22 **Q. HAVE YOU EVER PUBLISHED ON PUBLIC UTILITY REGULATORY**  
23 **ISSUES?**

1 A. Yes. I have published three books and more than 80 articles in scholarly and trade  
2 journals, primarily on low-income utility and housing issues. I have published an equal  
3 number of technical reports for various clients on energy, water, telecommunications and  
4 other associated low-income utility issues. My most recent publication was a chapter in  
5 the book "Energy Justice: US and International Perspectives," with my chapter titled  
6 "The equities of energy efficiency: distributing energy usage reduction dollars" (Edward  
7 Elgar Publishing, London, UK, 2018). A list of my publications is included in Appendix  
8 A.

9  
10 **Q. HAVE YOU EVER TESTIFIED BEFORE THIS OR OTHER UTILITY**  
11 **COMMISSIONS?**

12 A. Yes. I have not testified before the Virginia Commission for more than twenty years. In  
13 1998, I testified on behalf of VMH Energy Services in the Virginia Electric restructuring  
14 proceeding (Docket No. PUE960296). Outside of Virginia, over the past 35 years, I have  
15 testified in roughly 300 regulatory proceedings in more than 35 states and various  
16 Canadian provinces on a wide range of utility issues affecting low-income customers and  
17 residential customer service. A list of the proceedings in which I have testified is listed  
18 in Appendix A.

19  
20 On the Eastern Seaboard, for example, I worked with the Office of Peoples Counsel to  
21 help design the Maryland Electric Universal Service Program (EUSP); with the  
22 Pennsylvania Office of Consumer Advocate to help design the Pennsylvania Customer  
23 Assistance Program(s); with the Division of Ratepayer Advocate to help design the New

1 Jersey Universal Service Fund; with the New York Department of Public Service to help  
2 design that state's low-income bill affordability programs; and with the New Hampshire  
3 Public Utilities Commission to help design that state's Electric Assistance Program.

4 Outside state regulatory proceedings, I worked with the Philadelphia City Council to help  
5 design that City's Income-based Water Rate Affordability Program (IWRAP, now called  
6 the Tiered Assistance Program) for the Philadelphia Water Department; and worked with  
7 a community-based organization (Food and Water Watch) to design the recently-adopted  
8 percentage of income plan for water and wastewater service in the City of Baltimore.

9  
10 **Q. PLEASE SUMMARIZE THE PURPOSE OF YOUR DIRECT TESTIMONY.**

11 A. The purpose of my Direct Testimony is to develop an estimated cost for the Virginia  
12 Percentage of Income Payment Plan (PIPP) mandated by the Virginia state legislature in  
13 the Virginia Clean Economy Act (S.B. 851; H.B. 1526), which went into effect on July 1,  
14 2020. More specifically, I estimate the costs of PIPP components relating to:

- 15 ➤ Bills for current service based on the affordable percentages of income included in
- 16 the state legislation;
- 17 ➤ Energy efficiency investments to supplement the bill credits for current service; and
- 18 ➤ Arrearage management credits to supplement the bill credits for current service.

19 In addition to providing cost estimates for the three program components I identify  
20 above, I discuss what a reasonable administrative cost would be for the implementation  
21 of a PIPP.

1    **Q.    ARE THERE ANY COSTS THAT YOU DO NOT ADDRESS IN YOUR DIRECT**  
2    **TESTIMONY?**

3    A.    Yes. I do not address the costs, if any, for each utility to modify its respective  
4    information system. I have no reason or basis, at this point, to question the information  
5    technology costs that have been presented by the utilities to date. Moreover, I have no  
6    basis to question the billing determinants advanced by each utility to translate total  
7    program costs into a cost per kWh for purposes of a universal service surcharge.

8  
9    **Q.    IS THERE A FUNDAMENTAL AGREEMENT THAT YOU HAVE WITH**  
10   **RESPECT TO THE STRUCTURE OF A UNIVERSAL SERVICE FEE?**

11   A.    Yes. I agree that a universal service fee should be allowed to be reconcilable on an  
12   annual basis. The costs of a PIPP can vary from year-to-year based on a number of  
13   factors that are outside of the utility's ability to control. Those factors include, for  
14   example, the total bills that would have been rendered at standard residential rates (and  
15   thus the level of the PIPP credits) based on weather. In addition, not merely the total  
16   participation level in the PIPP may vary from year-to-year, but the mix of incomes within  
17   that total participation level may vary. For example, even if two years have identical  
18   participation levels of 10,000 customers (using this number simply for illustration), the  
19   program costs would vary if, in one year, 30% of the participants had income at or below  
20   50% of Poverty while, in the other year, 45% of the participants had income at or below  
21   50% of Poverty.

1    **Q.     IS THERE A SECOND REASON WHY YOU RECOMMEND A**  
2       **RECONCILABLE SURCHARGE?**

3    A.    Yes. Virginia’s electric utilities should be encouraged to enroll as many eligible low-  
4       income customers as they can reasonable enroll. If the program cost recovery is not  
5       reconcilable, there is a disincentive for the utilities to seek to undertake those steps to  
6       increase enrollment. A non-reconcilable surcharge, in other words, unreasonably places a  
7       *de facto*, if not a *de jure*, ceiling on the number of PIPP participants.

8  
9       **PART 1. BILL CREDITS PROVIDED THROUGH A VIRGINIA PIPP.**

10       **A. Estimating the Costs of Bill Credits for Current Service.**

11   **Q.     WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?**

12   A.    In this first section of my Testimony, I present my estimate of the costs of providing bill  
13       credits to income-eligible customers, which bill credits are structured to reduce bills for  
14       current service to an affordable percentage of income. In these Virginia proceedings,  
15       stakeholders need not dispute what an “affordable” percentage of income might or might  
16       not be. The Virginia legislature has mandated that bill burdens be capped at 6% of  
17       income for non-heating customers, and at 10% of income for heating customers. I have  
18       used those two maximum bill burdens in my cost-estimation. My cost estimation  
19       involves the following primary steps, which I will explain step-by-step below.

1           **1. ESTIMATING THE NUMBER OF INCOME-ELIGIBLE CUSTOMERS.**

2   **Q.   PLEASE EXPLAIN AN INITIAL CONSIDERATION IN YOUR ESTIMATE OF**  
3   **THE NUMBER OF PROGRAM PARTICIPANTS IN YOUR COST**  
4   **ESTIMATION.**

5   A.   Virginia Electric and Power Company would not, in the absence of a low-income bill  
6       assistance program, have reason to know the income levels of its customer base.  
7       Accordingly, the design of a PIPP, particularly the design of a PIPP when the program is  
8       first starting, a utility needs to estimate the number of income-eligible customers in its  
9       service territory. There are, however, two elements in this estimate. The utility needs to  
10      know the total number of income-eligible customers. However, the utility also needs to  
11      know the total number of low-income customers at differing income ranges. A program  
12      with 100 participants, when those participants are divided 25% with income below 50%  
13      of Poverty; 35% with income between 50% and 100% of Poverty; and 40% with income  
14      between 100% and 150% of Poverty, will have a different cost than a program with 100  
15      participants, when those participants are divided 40% with income below 50% of  
16      Poverty; 35% with income between 50% and 100% of Poverty; and 25% with income  
17      between 100% and 150% of Poverty. In this illustration, even though the total  
18      participation rate is identical (100 customers), the second illustration would have a higher  
19      cost. For heating customers in Virginia, for example, 10% of income at 50% of Poverty is  
20      a lower affordable bill (thus implying higher bill credits) than 10% of income at 150% of  
21      Poverty. A good cost estimate, therefore, must look not only at the total number of  
22      income-eligible customers, but at the mix of incomes within that total number.

1 Q. HOW DID YOU ESTIMATE THE TOTAL NUMBER OF ELIGIBLE  
2 PARTICIPANTS, AS WELL AS THE MIX OF INCOMES WITHIN THAT  
3 TOTAL NUMBER, OF INCOME-ELIGIBLE CUSTOMERS?

4 A. My cost estimate began with the communities which are served within the Company's  
5 service territory, as listed in the Company's tariff. For each place<sup>1</sup> listed in the  
6 Company's tariff, I downloaded both the total population and the population  
7 disaggregated by ratio of annual income to Federal Poverty Level (American Community  
8 Survey, Table C17002, 5YR).<sup>2</sup> I determine the percentage of each community's  
9 population falling in each income range.

10  
11 After allocating the Company's total number of residential customers (as reported in its  
12 most recent EIA Form 861) amongst all communities, I distribute the Company's  
13 customers in each community over each income range. The income ranges I use are not  
14 ranges that I develop. Rather, I use the income ranges reported by the Census.<sup>3</sup> Through  
15 this process, I derive not only an estimate of the total number of low-income customers  
16 living in the Company's service territory, but an estimate of the distribution of low-  
17 income customers over income ranges. I apply the percentages I derive to the number of  
18 Company customers to ensure that I limit my analysis to electric customers, not to all  
19 households.

---

<sup>1</sup> In this sentence, I do not use the term "place" in the technical sense as defined by the Census Bureau.

<sup>2</sup> Since the Company's tariff lists both incorporated and unincorporated communities, I could not match 100% of its listed communities. The matching was virtually, but not completely, 100% since the Census Bureau would not separately report data for some very small, unincorporated communities.

<sup>3</sup> Below 50% of Poverty; 50 – <100% of Poverty; 100 - <125% of Poverty; and 125 - <150% of Poverty.

In addition to the difference in costs of providing affordability assistance based on income, the further importance of obtaining this distribution will be explained further below.

**Q. WHAT DID YOU FIND?**

A. The results of my analysis are presented in the Table immediately below.

Table 1. Income-Eligible Customers by Poverty Range	
Ratio: Income to Federal Poverty Level	Number of Customers
Less than 50%	118,300
50% - <100%	122,838
100% - <125%	75,082 <sup>4</sup>
125% - <150%	72,210
Total	388,430

**2. Estimating Incomes.**

**Q. PLEASE EXPLAIN AN INITIAL CONSIDERATION IN ESTIMATING INCOMES.**

A. In estimating incomes for the purpose of developing the cost of a PIPP for this utility, I need to develop an income for each community for which I have potential participation levels as estimated above. Since Poverty Level varies based on household size, I use the average household size for each individual community which the Company lists as being in its service territory. The Census Bureau reports average household size for each community (American Community Survey, Table B25010, 5YR). A unique income is

<sup>4</sup> While this number becomes much smaller than the two previous ranges, note that the range is narrower.

1 then assigned to each community based on household size. A community with an  
2 average household size of 1.5 persons, for example, would be assigned a lower income  
3 than a community with an average household size of 2.4 persons. In this fashion, I  
4 determine what 100% of Poverty would be given the average household size in the  
5 community.

6  
7 The income for each Poverty range is then set at the mid-point of each Poverty range,  
8 with the exception of the lowest Poverty range. Experience counsels that setting the  
9 income for households with income below 50% of Poverty at 25% under-states the  
10 income for that income range. Accordingly, income for that range is set at 40% of  
11 Poverty. Otherwise, the incomes are set at: (1) 75% of Poverty for the range 50 - <100%;  
12 (2) 112% of Poverty for the range at 100 - <125%; and (3) 137% of Poverty for the range  
13 at 125 - <150%. Incomes at each Poverty Range are calculated for each community  
14 served by the Company.

15  
16 **Q. WHY WOULD YOU NOT SIMPLY USE AN AVERAGE INCOME IN**  
17 **ESTIMATING THE COST OF A PERCENTAGE OF INCOME-BASED PIPP?**

18 A. Using an average income for cost-estimation purposes would likely result in understating  
19 the costs of a PIPP. The use of an average income would, in effect take some of the  
20 income from higher income customers and allocate that income to lower income  
21 customers. Instead of having some low-income customers who may need considerable  
22 assistance, while other higher income low-income customers may need little (or no)  
23 assistance, the calculation results in everyone needing a more moderate amount. It will

1 become evident below that, in Virginia, households with incomes at the higher income  
2 (low-income) ranges often have affordable electric burdens without PIPP credits. Instead  
3 of counting them as imposing a \$0 cost, using an average would assign some of their  
4 income to the lowest income customers such that everyone (on average) receives  
5 something, a result that does not occur in reality.

6  
7 **3. Estimating Heating and Non-Heating Bills and Customers.**

8 **Q. PLEASE EXPLAIN HOW YOU DISTINGUISH BETWEEN HEATING AND**  
9 **NON-HEATING BILLS.**

10 A. There are actually two steps in this part of the analysis. The first step calculates the  
11 percentage of customers who are electric heating customers (or, conversely, heating with  
12 a fuel other than electricity). The second step is to calculate the actual heating bill. Each  
13 step is reasonably straightforward.

14  
15 I calculate the number of customers heating with electricity by applying the Census data  
16 that is reported for each community. (American Community Survey, Table B25040,  
17 5YR). Using that Census data, I calculate the percentage of customers in each  
18 community who heat with electricity, and multiply that percentage times the number of  
19 electric customers in the community. The number of customers who heat with a fuel  
20 other than electricity is simply the total number of customers times one minus the  
21 percentage who heat with electricity.

1 I do not separately calculate heating and non-heating electric bills. The Company  
2 provided its estimated heating and non-heating bills in its July filing. I use those  
3 Company-provided bills (Gas-1 for non-heating; Electric-2 for heating).

4  
5 **4. Estimating Per-Participant PIPP Costs.**

6 **Q. HOW DO YOU TRANSLATE THE ABOVE DATA INTO AN ESTIMATE OF**  
7 **PIPP COSTS?**

8 A. Given the calculations I present above, all of the necessary data is available to estimate  
9 the costs of an electric PIPP for the Company. We know: (1) the income by Poverty  
10 range for each community; and (2) the percentage of income burden that the Virginia  
11 legislature has deemed to be affordable. By multiplying each income times the  
12 affordable percentage of income burden, I derive an affordable bill. For example, the  
13 income at 50% of Poverty in Ashland (VA) is \$7,398. An affordable non-heating bill  
14 (6%) in Ashland is thus \$444 ( $\$7,398 \times 0.06$ ). An affordable non-heating bill is \$740  
15 ( $\$7,398 \times 0.10$ ).

16  
17 The per-participant PIPP cost is thus the difference between the affordable bill and the  
18 actual bill. If the actual bill is higher than the affordable bill, I subtract the affordable bill  
19 from the actual bill to derive the difference (i.e., the program cost). If the actual bill is  
20 lower than the affordable bill, the program cost is set at \$0.

21  
22 It is this last observation which makes knowing an income disaggregated by community  
23 and by Poverty range so important. Consider illustrative data for heating customers in

the communities listed below. With an income that begins to exceed \$20,000 at the higher Poverty Level ranges, a 10% affordable burden implies that a customer will likely be able to afford his or her electric heating bill without additional ratepayer-provided assistance. The “per-participant” cost for such customers is thus \$0. While the Table below illustrates this point with electric heating bills, the same observation is true for electric non-heating bills as well.

Geographic Area Name	Income by Poverty				Per Participant PIPP Cost	
	100-125 FPL	125-150 FPL			100-125 FPL	125-150 FPL
Alberta town	\$21,008	\$25,676			\$0	\$0
Alexandria city	\$20,453	\$24,999			\$0	\$0
Appomattox town	\$20,806	\$25,430			\$0	\$0
Ashland town	\$20,806	\$25,430			\$0	\$0
Bowling Green town	\$21,058	\$25,738			\$0	\$0
Boydton town	\$23,175	\$28,325			\$0	\$0
Boykins town	\$23,578	\$28,818			\$0	\$0
Branchville town	\$23,074	\$28,202			\$0	\$0

**Q. DID YOU MAKE ANY ADDITIONAL ADJUSTMENT IN CALCULATING PER-PARTICIPANT COSTS?**

A. Yes. I built into my calculations a non-heating “minimum charge” of \$15 per month (\$180 per year) (\$25/month for heating). This minimum charge is designed to prevent situations from arising where sufficiently low incomes would result in a percentage of income payment of \$0 (or nearly \$0). In the communities and income ranges I used, however, the minimum charge did not come into play (i.e., the affordable payment exceeded the minimum charge in each instance). Nonetheless, the minimum charge is built into the model.

5. Estimating Aggregated Costs.

Q. PLEASE EXPLAIN HOW YOU ESTIMATE AGGREGATED COSTS BASED ON YOUR PER-PARTICIPANT COST.

A. There are two aspects to estimating the aggregated costs of the PIPP credits for bills for current service. First, given the estimated number of eligible participants I explain in the first sub-section above, it is necessary then to estimate how many of those income-eligible customers will actually participate in the PIPP bill assistance program. Accordingly, I multiply the estimated number of eligible customers by an expected participation rate to derive how many customers will, in fact, receive bill credits.

Q. WHY IS IT NOT REASONABLE TO EXPECT A PARTICIPATION RATE OF 100% OR NEAR 100%?

A. No public assistance program of which I am aware has a participation rate of at, or even near, 100%. There are too many reasons that households (or customers in the case of the PIPP) will not participate even though they are income-eligible. Research I have undertaken for Energy Outreach Colorado (the nation's largest fuel fund), as well as for the Iowa Department of Human Rights (the Iowa state LIHEAP office), supports a finding of multiple institutional *barriers* which *prevent* enrollment in programs such as the Virginia PIPP.

- **Lack of effective knowledge:** The lack of "effective knowledge" is one such barrier. "Effective knowledge" is a concept first articulated by the Pennsylvania PUC's Bureau of Consumer Services (BCS). It recognizes that while consumers may indicate an awareness of energy assistance, their knowledge may not be sufficient to allow them to act. Many consumers, for example, who say they "know about" energy assistance cannot name a single program.

- **Lack of program awareness:** Similarly, many low-income households do not know of, and thus do not use, existing energy intervention programs designed for their benefit. Since no intervention program can be effective unless it is known and used, the degree to which eligible persons are aware of and utilize such programs is important.
- **Access to program offices:** In some areas, transportation to offices that accept applications may be a problem. For those who are homebound or socially isolated, getting to an office may be nearly impossible.
- **Confusing application forms:** The application forms for some programs represent a major barrier to participation. In particular, many participants find application forms complex and overwhelming *the first time* they seek to enroll in a program.
- **Misperceptions as to eligibility:** Many eligible nonparticipants have misperceptions regarding their eligibility for a program. These households might, for example, mistakenly believe that their income or assets are too high to entitle them to receive fuel assistance, or that some other program requirement precludes their participation. Persons who have been found ineligible for one program (however unrelated to fuel assistance, for example) are less likely to apply for fuel assistance. Similarly, persons who have been found ineligible in the past for fuel assistance are not likely to apply again, even if their circumstances have changed.

These barriers prevent participation by even those who might have an interest in, and be eligible for, participation. Barriers such as those I identify above represent one reason why even LIHEAP has a participation rate that is a fraction of the total number of income-eligible households.

**Q. WHAT PARTICIPATION RATE DO YOU INCLUDE IN YOUR COST ESTIMATE?**

**A.** I estimate a participation rate of 40% of eligible customers. The Table immediately below sets forth the participation rates in the Pennsylvania Customer Assistance

1 Programs (CAPs) for the three years for which data is most recently available. The  
 2 statewide average participation rate is roughly 40% in all three years. This statewide  
 3 average, however, is pulled upwards by the atypically high participation rates of  
 4 Duquesne Light and PECO Energy. Nonetheless, I use 40% as a comfortably  
 5 conservative estimated participation rate.

Table 3. Pennsylvania Electric CAP Participation Rates (2016 – 2018) (Pennsylvania PUC Bureau of Consumer Services Annual Report on Universal Service Programs and Collections Performance) <sup>5</sup>			
	2016	2017	2017
Duquesne	89.9%	71.01%	73.1%
Met-Ed	22.1%	21.2%	20.7%
PECO-Electric	78.5%	76.7%	80.2%
Penelec	25.5%	23.8%	23.1%
Penn Power	24.0%	23.6%	23.0%
PPL	31.8%	28.4%	29.8%
West Penn	38.3%	37.4%	26.5%
State average (electric)	44.3%	40.3%	39.5%

6  
 7 **Q. IS THERE REASON TO BELIEVE THAT THE VIRGINIA PIPP MAY HAVE A**  
 8 **PARTICIPATION RATE LOWER THAN PENNSYLVANIA?**

9 A. Yes. Given the number of customers who would receive a benefit of \$0 in the higher  
 10 income ranges of the Virginia PIPP, there may be more customers choosing not to  
 11 participate than exist in Pennsylvania. However, depending on whether the Virginia  
 12 PIPP adopts an Arrearage Management Program component for its PIPP, as I recommend

<sup>5</sup> The annual BCS Report on Universal Service Programs and Collections Performance can be accessed at:  
[http://www.puc.state.pa.us/filing\\_resources/universal\\_service\\_reports.aspx](http://www.puc.state.pa.us/filing_resources/universal_service_reports.aspx) (last accessed on March 30, 2020).

below, even customers who receive a \$0 credit may participate if, in choosing to participate, they might earn Arrearage Management Program credits by successfully making payments on levelized budget billing plans.

**Q. PLEASE RECONCILE YOUR METHOD FOR ESTIMATING PARTICIPATION RATES WITH THE STATUTORY LANGUAGE THAT PARTICIPATION ELIGIBILITY IS EXTENDED BASED ON PARTICIPATION IN DESIGNATED PROGRAMS RATHER THAN STRICTLY ON INCOME?**

A. I understand that the Virginia legislation defines a “PIPP eligible customer” as “any person or household participating in any of the following public assistance programs: the Supplemental Nutrition Assistance Program, Temporary Assistance for Needy Families, Special Supplemental Nutrition Program for Women, Infants and Children, Virginia Low Income Home Energy Assistance Program, federal Low Income Home Energy Assistance Program, state plan for medical assistance, Medicaid, Housing Choice Voucher Program, or Family Access to Medical Insurance Security Plan.” While the legislature made PIPP participation broadly available within the low-income population, it did not extend participation (or define participant eligibility) strictly in terms of income (or ratio of income to Federal Poverty Level).

Limiting the definition of “eligible” PIPP participant to those who are participating in prescribed programs will, in fact, limit the percentage of income-eligible households who might participate in PIPP. I have taken that into account in setting my participation level at 40% of those who are income-eligible. Participation in the selected programs will not

In sum, the limitation of the definition of “eligibility” for a PIPP in Virginia to prescribed public assistance programs is taken into account in my estimated participation rate of 40% of income-eligible customers.

**Q. GIVEN YOUR ESTIMATED PARTICIPATION RATE, HOW DID YOU CALCULATE AN AGGREGATED COST FOR THE PIPP?**

A. Calculating the aggregated cost is a straightforward process. As I have explained (step-by-step) above, we now know: (1) the number of estimated income-eligible customers by income-range by community; (2) the per-participant benefit by income-range by community; and (3) the estimated participation rate. By multiplying those three numbers (estimated eligible participants x participation rate x per-participant benefit), one derives an aggregated total cost.

**Q. HAVE YOU APPLIED ANY LIHEAP BENEFITS AS AN OFFSET TO THE BILL CREDITS PROVIDED THROUGH A VIRGINIA PIPP?**

1 A. No. Under federal law, it would be impermissible to do so. The Federal LIHEAP statute  
2 explicitly provides that “Notwithstanding any other provision of law unless enacted in  
3 express limitation of this paragraph, the amount of any home energy assistance payments  
4 or allowances provided directly to, or indirectly for the benefit of, an eligible house-hold  
5 under this title shall not be considered income or resources of such household (or any  
6 member thereof) for any purpose under any Federal or State law, including any law  
7 relating to taxation, food stamps, public assistance, or welfare programs.”  
8

9 **B. Administrative Costs.**

10 **Q. DO YOU INCLUDE AN ADMINISTRATIVE COST ALLOWANCE IN YOUR**  
11 **ESTIMATE OF PIPP COSTS?**

12 A. Yes. Operating a bill affordability program for a public utility, of course, cannot occur  
13 without incurring some level of administrative costs. Such costs, however, need to be  
14 divided into two categories: (1) the Gross Administrative Costs; and (2) the Net  
15 Administrative Costs. The Gross Administrative Costs represent the total costs of  
16 administering the affordable rate. These Gross Administrative Costs include expenses on  
17 activities such as outreach, intake, income verification, and annual recertification of  
18 eligibility. In this section of my testimony, I discuss Gross Administrative Costs. In the  
19 next section, I will examine the offsets which result in Net Administrative Costs.  
20

21 **Q. WHAT EXPERIENCE HAVE OTHER STATES HAD WITH THE**  
22 **ADMINISTRATIVE COSTS TO OPERATE A PIPP?**

	2015	2016	2017
Electric	4%	5%	5.9%
Natural gas	5%	7%	6.3%

In contrast to Pennsylvania, the State of Ohio is another state where gas and electric utilities have offered income-based affordable rates for an extended period of time. Ohio adopted its “percentage of income payment program” (“PIPP”) in the mid-1980s. According to the Public Utilities Commission of Ohio (“PUCO”), the costs of administering the Ohio PIPP are somewhat lower than the costs of administering the Pennsylvania CAPs. The statewide administrative costs as reported by PUCO are set forth immediately below:

<sup>6</sup> Pennsylvania PUC, Bureau of Consumer Services. Report on Universal Service Programs and Collections Performance (2017: page 59; 2016, page 58) (prior to 2017, Gross Administrative Costs were only reported in whole percentages.)

Table 5. Percentage of Income Payment Plan Gross Administrative Costs  
(Public Utilities Commission of Ohio) (PUCO)

	FY 10-11	FY 11-12	FY12-13	FY13-14	FY14-15	FY16 (budgeted)
Percent	2.86%	3.70%	2.79%	2.50%	1.77%	2.99%

Unlike the Pennsylvania utilities, Ohio's utilities operate their income-based affordable rates with an administrative cost of between two percent (2%) and four percent (4%).

These reported Ohio costs, too, represent gross program costs.

Finally, New Jersey's Universal Service Fund ("USF") has both similarities and dissimilarities to its Ohio counterpart. Like Ohio, the New Jersey USF is administered through the state's LIHEAP office, the state Department of Community Affairs ("DCA"). Like Ohio, the state's LIHEAP office submits an annual budget to state utility regulators for approval. That annual budget is then translated into a cost per unit of energy that is collected through a rider. Like Ohio, the New Jersey state LIHEAP office must submit and justify its annual budget devoted to administration.

Unlike Ohio, New Jersey establishes a uniform amount to be charged to electric customers, with a separate amount charged to natural gas customers, irrespective of the utility. As discussed above, Ohio establishes individual Rider amounts for each electric utility. Unlike Ohio, New Jersey sets its "affordable" percentage of income payment equal to six percent (even though, like Ohio, LIHEAP benefits are used in providing the subsidy to achieve that percentage of income goal).

Schedule RDC-1 sets forth, for the past three years (2016/2017, 2017/2018, 2018/2019) the calculation of the USF Rider approved by the New Jersey BPU. The dollar costs included in Schedule RDC-1 are the estimated utility costs for the program year.<sup>7</sup> For purposes here, however, I set forth this data simply to provide insights into the administrative costs that are borne by the utilities in New Jersey. I summarize the New Jersey administrative cost data in the Table immediately below.

Table 6. Combined State/Utility Administrative Costs As Percent of Percentage of Income Bill Credits for Current Usage (New Jersey USF)			
	Total	Natural Gas	Electric
2016/2017	4.4%	5.0%	4.5%
2017/2018	5.2%	5.2%	5.2%
2018/2019	5.6%	5.6%	5.6%

As can be seen from the Table above, the combined administrative costs of the government and utility entities administering the New Jersey PIP (i.e., USF) consistently ranged at almost exactly 5% of the bill credits for current usage.

The approved rates as set forth in Schedule RDC-1 should be recognized as having some uncertainty to them. As the New Jersey BPU states each year in approving the rates, “the Utilities note that these calculations are subject to uncertainties due to a number of factors, such as program changes, participation rates and jurisdiction volumes.”<sup>8</sup> Any under- or over-recovery of costs, however, is identified and reconciled in the immediately subsequent year’s proceeding to establish the USF charge.

<sup>7</sup> The six percent burden refers to both gas and electric bills combined.

<sup>8</sup> See, e.g., Order, Docket No. ER18060661, at 3.

1    **Q.     WHAT DO YOU INCLUDE AS AN ADMINISTRATIVE COST FOR THE**  
2        **OPERATION OF THE COMPANY’S PIPP?**

3    A.    I include a four percent (4%) gross administrative cost component for the operation of the  
4        Company’s PIPP. While this gross administrative cost would exceed the \$3.0 million  
5        ceiling established by statute, when considered in light of offsetting embedded lost  
6        revenues, the net cost would be less than the statutory ceiling.

7  
8                    **C. Offsets for Embedded Lost Revenue.**

9    **Q.     PLEASE EXPLAIN THE PURPOSE OF THIS SECTION OF YOUR**  
10       **TESTIMONY.**

11   A.    In this section of my testimony, I explain the offset to Gross Administrative Costs which  
12        should be implemented to reflect unpaid low-income electric bills that are already  
13        included in rates. The Company proposes to recover its PIPP costs through a  
14        reconcilable revenue rider in this proceeding. One of the costs to be recovered through  
15        that Rider is the cost of providing PIPP credits applied toward current usage. The level  
16        of PIPP credits which the calculations above document, however, represents 100% of the  
17        difference between the revenues which the Company would have billed at standard  
18        residential rates and the revenues that the Company bills at PIPP rates. To recognize  
19        100% of that discount as a new cost is inappropriate.

20  
21   **Q.     PLEASE EXPLAIN THE CONCEPTUAL BASIS FOR THE OFFSET FOR**  
22        **EMBEDDED LOST REVENUE.**

23   A.    A bill for current service rendered to a PIPP participant is comprised of two parts:

- that portion of the bill that is at or below an affordable percentage of income, which is charged to the PIPP participant; and
- that portion of the bill that is above an affordable percentage of income (“PIPP Credit”), which is collected from PIPP non-participants.

The issue that I discuss below involves how the second part of the bill (“PIPP Credit”) is treated.

**Q. IF THE AMOUNT OF PIPP CREDITS INCREASES OR DECREASES AS PIPP PARTICIPATION INCREASES OR DECREASES, WHAT HAPPENS TO BASE RATES?**

A. Base rates remain the same. It is important to remember that the Company has already set its proposed base rates as though the unpaid bills from non-PIPP customers will be a part of uncollectibles. Through its proposed base rates, the Company continues to collect that uncollectible expense as though PIPP participation rates are exactly as they were at the time base rates were established.

**Q. DOES THIS ADJUSTMENT DEPEND ON, OR ASSUME IN ANY WAY, THAT THE OFFER OF AN AFFORDABLE BILL WILL IMPROVE THE PAYMENT PATTERNS OF PROGRAM PARTICIPANTS?**

A. No. Whether or not PIPP participants improve their payment patterns is completely irrelevant to this adjustment. This adjustment is based on the simple observation that the revenues reflected in the PIPP credits represent dollars that had historically been billed to

1 low-income customers but, under the PIPP program, will instead be billed to residential  
2 customers in general in the future.

3  
4 Whenever a public utility adopts a low-income bill affordability program such as PIPP,  
5 there will, by definition, be some amount of discount offered to program participants tied  
6 to bills that would have been rendered at standard residential rates. The difference  
7 between the bill at standard residential rates and the discounted bill, however, does not  
8 constitute lost revenue to the utility. The loss to the utility is not the difference between  
9 billings and the discounted rate, but rather is the difference between revenue collected  
10 and the discounted rate. If, in other words, the utility is not fully collecting the bills that  
11 it is rendering in the first place, the fact that some portion of that bill is set aside as a  
12 discount does not represent lost revenue that should be separately recovered as a “cost” of  
13 the program.

14  
15 **Q. WHAT IS THE IMPACT OF FAILING TO RECOGNIZE THE DOLALRS THAT**  
16 **ARE BILLED TO LOW-INCOME CUSTOMERS BUT THAT ARE NOT**  
17 **ACTUALLY COLLECTED AS REVENUE?**

18 A. The impact of failing to recognize these dollars that are billed to low-income customers,  
19 but that are not collected from those customers even in the absence of their participation  
20 in PIPP, is that the Company claims an already existing cost as a “new” PIPP program  
21 cost. The Company is claiming that the PIPP causes the Company to lose revenue that  
22 would not have been lost in the absence of the program. That lost revenue, however, is  
23 already included in rates.

**Q. TO WHAT EXTENT DOES THE COMPANY NOT COLLECT ALL OF THE REVENUE THAT IT BILLS?**

A. The Company fails to collect the revenue that it bills to the extent that there are dollars that the Company ultimately writes off as uncollectible. According to the Company's most recent data reported in its FERC Form 1, it has uncollectibles as a percentage of its revenues from ultimate customers (excluding sales to public authorities and public street/highway lighting) of roughly 0.35 percent. Adjusting that to account for the fact that PIPP credits will be for low-income customers, I find the embedded lost revenue will be 1.38%.

**Q. UPON WHAT DO YOU BASE THE ADJUSTMENT OF UNCOLLECTIBLES FOR LOW-INCOME CUSTOMERS?**

A. Virginia utilities do not have data on the differences in uncollectibles between their low-income customers and their non-low-income customers. However, other states near-by to Virginia do have such data. The Table immediately below, for example, shows the electric uncollectibles in Pennsylvania for "confirmed low-income" customers<sup>9</sup> and residential customers as a whole.

Table 7. Gross Write-offs: Residential vs. Confirmed Low-income (Pennsylvania, 2018) (Penn PUC, Bureau of Consumer Services) Annual Report on Universal Service Programs and Collections Performance			
Electric utility	Residential Write-Off	Low-Income Write-Off	Ratio (LI to Residential)
Duquesne	3.5%	10.6%	3.0
Met-Ed	2.4%	11.0%	4.6

<sup>9</sup> In Pennsylvania, "confirmed low-income" is a term-of-art defined by the Pennsylvania PUC.

PECO-Electric	1.4%	4.6%	3.3
Penelec	2.6%	9.6%	3.7
Penn Power	1.7%	9.0%	5.3
PPL	2.6%	10.3%	4.0
West Penn	2.2%	11.6%	5.3
Total Electric	2.2%	9.5%	4.3

As can be seen, the low-income write-offs average roughly 4.0 times higher than the residential write-offs as a whole.

**Q. DO OTHER STATES CONFIRM THIS PENNSYLVANIA DATA?**

A. Yes. Data from Maryland demonstrates that low-income customers are not only more likely to be in arrears, but, also, that those who are in arrears are more likely to be deeper in arrears. In its 2007 evaluation<sup>10</sup> of the Electric Universal Service Program ("EUSP"),<sup>11</sup> the PA Consulting Group compared a variety of attributes of payment difficulties, including but not limited to the number of elapsed days after receiving a bill before making a payment, the completeness of payment,<sup>12</sup> the regularity of payments,<sup>13</sup> and the continuity

<sup>10</sup> PA Consulting (May 2007). *Electric Universal Service Program Evaluation: Final Evaluation Report*, prepared for Maryland Public Service Commission. (hereafter, "PA Consulting"). Available at <http://webapp.psc.state.md.us/intranet/reports/EUSP051107.pdf> (last accessed May 9, 2020).

<sup>11</sup> Maryland Public Service Commission (2014). *Electric Universal Service Report: 2014 Annual Report*, at 1, prepared for the General Assembly of Maryland. ("The Electric Universal Service Program ("EUSP"), enacted as part of the Electric Customer Choice Act of 1999, was designed by the Maryland General Assembly to assist low-income electric customers with retiring utility bill arrearages, making current bill payments, and accessing home weatherization following the restructuring of Maryland's electric utilities and electricity supply market. The Act, codified as Section 7-512.1 of the Public Utilities Article, Annotated Code of Maryland ("PUA §7-512.1" or "EUSP Legislation") required the Public Service Commission of Maryland ("Commission") to establish the program, make it available to low-income electric customers Statewide, and provide oversight to the Office of Home Energy Programs ("OHEP"), the arm of the Department of Human Resources ("DHR") responsible for administering the EUSP.")

<sup>12</sup> "The completeness index is an indicator of the percent of the total bill for which the household was responsible that was paid during the before and after periods." PA Consulting, *supra*, at 4-3.

<sup>13</sup> The regularity index "is the percentage of payments the customer made compared to the number of billings." PA Consulting, *supra*, at 4-4.

of payments.<sup>14</sup> PA Consulting found that “all households” outperformed low-income customers on each of these payment metrics. “All households” paid a higher percentage of their bills, made more payments in response to bills, and exhibited more regularity in payments than did low-income customers prior to their participation in EUSP. Table 8 below presents data comparing low-income performance to residential performance as a whole. Even when Maryland’s low-income energy customers did make payments, PA Consulting found, they were less regular and less continuous. Moreover, low-income households making payments took more days before making their payments.

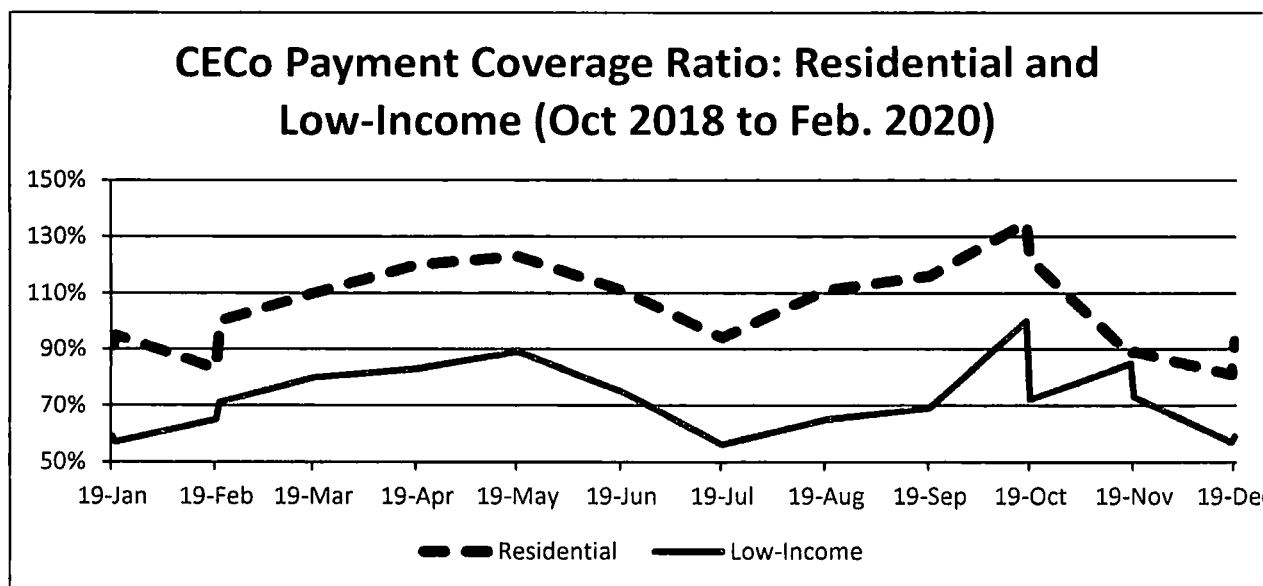
Table 8. Low-Income <sup>15</sup> vs. All Residential Customers Selected Payment Performance Indicators				
	Completeness of Payment	Regularity of Payment	Continuity of Payment <sup>16</sup>	Elapsed Days before Payment
Low-income customers	83.6%	70.0%	0.3	32.6
All customers	97.6%	86.8%	0.52	21.8

<sup>14</sup> The continuity index “is an indicator of how consistently payments were made. For example, making nine payments in a row would yield a higher consistency score than making three payments in a row.” PA Consulting, *supra*, at 4-4.

<sup>15</sup> “Low-income” is defined as a participant in the Maryland EUSP program prior to their entry into EUSP. All EUSP participants, however, receive federal fuel assistance through the Maryland Energy Assistance Program (“MEAP”). The reported performances would, as a result, be better than low-income customers not receiving MEAP. MEAP serves a fraction of all Maryland low-income customers.

<sup>16</sup> The “continuity of payment” is measured as follows according to PA Consulting: “The continuity index is the sum of the square of payments made in sequence divided by the square of the number of billings in the study period. Thus, if a participant makes 12 payments in a row and there are 12 billing periods then the continuity index is  $12^2 / 12^2$  or one. This means that the participant consistently paid the electric bill. The continuity index is structured so that the more payments that are made in sequence, the higher the continuity index. A household that made 9 of 12 payments in contiguous months would have a continuity index of  $9^2 / 12^2$  or 0.56. A household that made 9 of 12 payments where four and five of the payments were in sequence, would have a continuity index of  $(5^2 + 4^2) / 12^2 * 100$  or 0.28. The three missed payments could have been dispersed at the beginning, middle, or end of the study period; have all been at the beginning, middle, or end; or in some other combination. A final illustration is that nine payments made in clusters of 3 would result in a continuity index of  $(3^2 + 3^2 + 3^2) / 12^2$  or 0.19. The continuity index captures how payments are made in sequence.” PA Consulting, *supra*, at 4-4.

In addition, I recently had occasion to study the difference in bill payment patterns for a Michigan electric utility, Consumers Energy (electric). One aspect of these bill payment patterns involved the degree to which low-income customers, and residential customers as a whole, made “complete” payments, measured by the “payment coverage ratio.” The payment coverage ratio places the dollars actually received in the numerator and the dollars billed in the denominator. If a customer’s payments equal the customer’s bills, the payment coverage ratio is 100%. If the customer’s payments equal half of the customer’s bills, the payment coverage ratio is 50%. My findings are summarized in the Chart immediately below. The residential payment-coverage ratio by month is the dashed line while the low-income payment coverage ratio by month is the solid line.



A number of observations stand out from looking at the Chart above. First, the Payment Coverage Ratio for residential customers as a whole is substantially higher than for low-income customers. Over the 17-month study period,<sup>17</sup> the cumulative residential

<sup>17</sup> Data was collected beginning in October 2018. That month was selected to allow for at least one full heating season to be included in the data (October 2018 – February 2020).

1 Payment Coverage Ratio (cumulative payments divided by cumulative bills) was 101%.<sup>18</sup>  
 2 In contrast, the low-income Payment Coverage Ratio for that 17-month period was only  
 3 71%. That means that, as a whole, low-income customers were paying only \$70 for  
 4 every \$100 they received as their bill.

5  
 6 Second, for the residential population as a whole, in 9 of the 17 study months, CEC  
 7 collected more than it billed (*i.e.*, had a Payment Coverage Ratio of 100% or more). In  
 8 13 of the 17 months, CEC collected 90% or more of what it billed. In two of the  
 9 remaining four months the Payment Coverage Ratios were 88% (November 2018) and  
 10 89% (November 2019) respectively. In contrast, with the low-income customer base, in  
 11 five months, the Payment Coverage Ratios were lower than 60% (*i.e.*, CEC collected  
 12 fewer than \$6 for every \$10 billed). In three more months, the Payment Coverage Ratio  
 13 was less than 70% (but higher than 60%), while in four additional months, the Payment  
 14 Coverage Ratio was between 70% and 75%. The point here is not to critique or assess  
 15 CEC's collection practices. Rather, the point is to compare low-income payment  
 16 patterns to the payment patterns of residential customers as a whole.

17  
 18 **Q. WHAT DO YOU CONCLUDE?**

19 A. For purposes of this proceeding, two conclusions flow from the above data and  
 20 discussion. First, there will be a portion of Virginia PIPP credits that are already  
 21 currently included in base rates. Accordingly, to allow the Company to collect 100% of  
 22 PIPP credits as though the PIPP created "new" costs would be to allow for a double-

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<sup>18</sup> The "bills" reported by CEC included arrears. See MEC-CE-564.

1 recovery of those embedded lost revenues. Second, the extent of embedded lost revenues  
2 for low-income customers will be substantially higher than they would be for residential  
3 customers as a whole. Accordingly, the adjustment I make to reflect this observation is  
4 appropriate.

5  
6 **Q. DOES THE COMPANY'S PROPOSED COST RECOVERY CONSIDER THE**  
7 **COLLECTION RATE FOR LOW-INCOME BILLS IN THE ABSENCE OF A**  
8 **BILL AFFORDABILITY PROGRAM?**

9 A. No. What the Company does in its PIPP cost analysis is to assume that 100% of the bills  
10 to PIPP participants will be collected in the absence of the PIPP discount. (Virginia  
11 Electric Proposal, at 15). We know this to be wrong. The Company then assigns the  
12 difference between the discounted PIPP bill and 100% of the billed revenue at standard  
13 residential rates as a cost of the program. We know, too, this to be incorrect. To allow  
14 the Company to collect 100% of the difference through the universal service Rider would  
15 thus allow it to recover the portion of the bills that would go unpaid even without PIPP  
16 twice: first by inclusion of this unpaid revenue in the Company's write-offs and again by  
17 its inclusion of this unpaid revenue as part of the PIPP Credits recovered through the  
18 universal service Rider.

19  
20 **Q. IS THERE A SIMILAR ADJUSTMENT THAT SHOULD BE MADE TO THE**  
21 **COSTS OF ARREARAGE FORGIVENESS?**

22 A. Yes. The lost revenue already included in rates is higher for arrearage forgiveness than  
23 it is for bills for current service. It is generally recognized in the utility industry that bills

1 are less and less subject to collection the older they become. Accordingly, to provide  
2 credits against those pre-existing arrears is not to create new costs, but rather to recognize  
3 lost revenue that is already included in base rates.

4  
5 **Q. DID THE VIRGINIA COMMISSION RECOGNIZE THE EXISTENCE OF SUCH**  
6 **EMBEDDED LOST REVENUES TO USE AS AN OFFSET TO PIPP CREDITS?**

7 A. Yes. The Commission's order establishing this proceeding explicitly stated that the  
8 proceeding should address "the amount of uncollectible expense in base rates associated  
9 with eligible customers. Include a credit in the calculation of the proposed fee to avoid  
10 double-recovery of this expense." (Order Establishing Proceeding, at 3).

11  
12 **D. Total PIPP Credits toward Current Usage.**

13 **Q. PLEASE EXPLAIN THE PURPOSE OF THIS SECTION OF YOUR**  
14 **TESTIMONY.**

15 A. In this section of my testimony, I compile and summarize the various calculations I have  
16 described in my testimony above to present the total estimated cost of providing PIPP  
17 credits for electric heating and non-heating bills exceeding the affordable percentage of  
18 income as defined by the Virginia legislature. I include the PIPP credits plus the  
19 administrative allowance minus an offset for embedded lost revenues. The total PIPP  
20 credits I propose to be allowed in the PIPP surcharge, adding administration while  
21 offsetting embedded lost revenues, is set forth in Schedule RDC-3.



1 retiring pre-existing arrears would result in an “electric bill payment” that exceeds the  
2 statutorily established percentage of income limits.

3  
4 The Commission appears to recognize this statutory directive when it said in its Order  
5 Establishing Proceeding that the proceeding shall “address the following issues. . .costs  
6 proposed to be recovered related to arrearages. . .” (Order, at 3).

7  
8 While the Virginia utilities, such as the Company, have no experience in assessing  
9 either: (1) the percentage (and thus the number) of PIPP participants who will have pre-  
10 existing arrearages; or (2) the magnitude of the pre-existing arrearages that will be  
11 brought into the PIPP (in dollar terms), there is a basis upon which to make some  
12 reasonable estimates, with actual costs being reconciled in future years of the PIPP  
13 Surcharge.

14  
15 **Q. FOR DEFINITIONAL PURPOSES, PLEASE DESCRIBE WHAT ARREARAGES**  
16 **WOULD BE SUBJECT TO AN ARREARAGE MANAGEMENT PROGRAM**  
17 **COMPONENT TO PIPP.**

18 A. I reference “pre-existing arrearages” as those arrears that would be subject to the  
19 Arrearage Management Program component of PIPP. A “pre-existing arrearage” is that  
20 dollar level of arrearage that exists on a customer’s bill at the time they first apply to  
21 become a PIPP participant. Any arrearage that is incurred subsequent to enrollment in  
22 PIPP, in other word, is not subject to being retired through arrearage credits provided  
23 through the PIPP AMP program component.

1  
2 **Q. IN ADDITION TO FINDING A BASIS IN THE PIPP LEGISLATION AND**  
3 **COMMISSION ORDER, IS THERE A SUBSTANTIVE RATIONALE FOR**  
4 **INCLUDING AN ARREARAGE MANAGEMENT PROGRAM COMPONENT IN**  
5 **PIPP?**

6 A. Yes. Providing an opportunity for customers to make complete payments for current  
7 service in the future, and providing an arrearage management program, are inextricably  
8 related. People do not make separate payments for their bill for current service and for  
9 their arrearages. Rather people make a payment toward their total bill. From a payment  
10 perspective, therefore, it makes no difference whether that total payment is unaffordable  
11 due to the bill for current service or unaffordable due to a pre-existing arrearage. In the  
12 absence of an AMP, pre-existing arrearages will represent a substantial contributor to the  
13 inability of low-income customers to pay their current bills for current electric service  
14 and to retain service. This result impedes, if not completely frustrates, the purpose of the  
15 legislatively-mandated PIPP in the first instance.

16  
17 **Q. HAVE YOU ASSESSED THE INCOME REQUIRED TO PAY BILLS FOR**  
18 **CURRENT SERVICE PLUS RETIRING PRE-EXISTING ARREARS?**

19 A. Yes. In making this assessment, I assume that pre-existing arrears would be retired over  
20 a one-year (i.e., 12-month) time period without a PIPP. Adding an arrears equal to four  
21 Bills Behind –the basis for which I will explain below—to the existing bill for current  
22 service would require an annual income of \$30,717 for non-heating bills (6% burden) and  
23 an annual income of \$22,050 for heating bills (10% burden).

1  
2 For non-heating bills (plus arrears), this income (\$30,717) would exceed the income for  
3 the Poverty Level range below 50% of Poverty in 100% of the communities studied for  
4 the Company; for the Poverty Level range between 50% and 100% of Poverty in 100% of  
5 the communities studied for the Company; for the Poverty Level range between 100%  
6 and 124% of Poverty in 100% of the communities studied for the Company; and for the  
7 Poverty Level between 125% and 150% of Poverty in 90% of the communities studied  
8 for the Company.

9  
10 For heating bills (plus arrears), the necessary income (\$22,050) would exceed the income  
11 for the income range below 50% of Poverty in 100% of the communities studied for the  
12 Company; for the income range between 50% and 100% of Poverty in 100% of the  
13 communities studied for the Company; and would exceed the income for the Poverty  
14 Level range between 100% and 124% of Poverty in 54% of the communities studied for  
15 the Company.

16  
17 The broad contribution that pre-existing arrearages would make to unaffordable bills,  
18 despite the legislative directive that the PIPP shall limit bill payments to no more than the  
19 legislatively prescribed percentages of income, is evident.

20  
21 **Q. WHAT PERCENTAGE OF PIPP PARTICIPANTS DO YOU ESTIMATE WILL**  
22 **BRING PRE-EXISTING ARREARAGES INTO THE PIPP?**

1 A. As with my discussion of low-income uncollectibles above, Virginia's utilities, including  
2 the Company, do not have the experience in tracking the incidence and level of low-  
3 income arrearages to allow an estimate of potential pre-existing arrears subject to  
4 forgiveness. For the states I examined above, however, the data shows that 26% of low-  
5 income electric customers are in arrears at any given time in Pennsylvania; 32% of  
6 Michigan (CECo-electric) low-income customers are in arrears at any given time; and  
7 roughly 30% of Maryland electric customers are in arrears at any given time. These three  
8 states appear to present a common story. Based upon this data from these states, I  
9 estimate that 30% of the Company's PIPP customers will bring pre-existing arrearages  
10 into the PIPP program.

11  
12 **Q. HOW DO YOU ESTIMATE THE POTENTIAL LEVEL OF PRE-EXISTING**  
13 **ARREARAGES BEING BROUGHT INTO A PIPP ARREARAGE**  
14 **MANAGEMENT PROGRAM COMPONENT PER PARTICIPANT?**

15 A. I begin with the same disclaimer as I have provided above. The Company does not have  
16 sufficient experience in working specifically with low-income customers to offer a  
17 Company-specific basis upon which to make an estimate, I rely on data from other states.  
18 In Pennsylvania, the average arrearage for a confirmed low-income customer was \$623 in  
19 2018, on an average bill of \$1,513 (41%). In Michigan, the average low-income  
20 customer arrearage paid 70% of his/her bill on an annual basis (indicating an arrearage of  
21 30%). Maryland does not provide data on low-income customers not participating in its  
22 bill assistance program.

1 Based on this data, I find that it is not unreasonable to estimate that a Virginia PIPP  
2 customer with arrears will bring an arrearage of 35% of his or her annual bill into the  
3 PIPP as a pre-existing arrearage. Accordingly, I estimate a pre-existing arrearage of \$484  
4 for a non-heating customer and of \$579 for an electric heating customer.

5  
6 **Q. IS THERE A FINAL ADJUSTMENT TO MAKE WITH RESPECT TO**  
7 **ESTIMATING THE COSTS OF AN ARREARAGE MANAGEMENT**  
8 **PROGRAM?**

9 A. Yes. Not all PIPP participants will make complete payments on all of their monthly bills  
10 in order to earn a credit toward their pre-existing arrearages. Based on low-income  
11 program performance in Pennsylvania (80 – 90% complete payments) and Maryland  
12 (84% complete payments), I find that a conservative estimate of the number of eligible  
13 arrearage credits that are actually earned will equal roughly 80%.

14  
15 **Q. WHAT IS YOUR ESTIMATED COST FOR AN ARREARAGE MANAGEMENT**  
16 **PROGRAM?**

17 A. In estimating the cost for credits provided to retire pre-existing arrearages through an  
18 Arrearage Management Program for PIPP, I spread the costs of arrearage management  
19 credits over a two-year period. The annual cost for AMP credits, disaggregated by  
20 heating and non-heating customers is set forth in Schedule RDC-3.

21  
22 **PART 3. THE ROLE AND FUNDING OF PIPP ENERGY EFFICIENCY AND**  
23 **WEATHERIZATION INVESTMENTS.**

**Q. PLEASE EXPLAIN THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY.**

A. In this section of my testimony, I provide a cost estimate for implementing the legislative directive that the Virginia PIPP provide a program component to “reduce the amount of electricity used by the eligible participant’s household through participation in weatherization or energy efficiency programs and energy conservation education programs.” In addition to this legislative language, the Commission’s Order Establishing Proceeding stated that the proceeding shall “address the following issues. . .How the objective of reducing usage through participation in weatherization, energy efficiency, and conservation will be accomplished.” (Order Establishing Proceeding, at 3).

**A. A Proposed PIPP Energy Efficiency Budget.**

**Q. WHAT FUNDING DO YOU RECOMMEND FOR THE COMPANY’S PIPP ENERGY EFFICIENCY BUDGET?**

A. I recommend an energy efficiency and weatherization budget for the Company of \$19,400,000 raised through the PIPP Rider to supplement the provision of bill credits through PIPP. This stands in contrast to the Company’s proposal to raise no new energy efficiency and weatherization dollars through its PIPP, but instead to rely exclusively on “its existing and soon-to-be-proposed DSM programs.” (Virginia Electric Proposal, at 16). This efficiency budget is a reasonable percentage of total utility revenues. The Company’s FERC Form 1 reports total sales to ultimate customers in 2018 of \$7,634,198,469. A PIPP efficiency budget of \$19.4 million, therefore, would represent only 0.3% of income. This is similar, for example, to the State of Pennsylvania, which

mandates that utilities spend a minimum of 0.2% of revenues on their Low-Income Usage Reduction Program (LIURP). The total budget which I recommend for the PIPP energy efficiency budget is set forth in Schedule RDC-3.

**Q. UPON WHAT DO YOU BASE YOUR RECOMMENDED ENERGY EFFICIENCY BUDGET?**

A. A energy efficiency budget should be outcomes based. The question, in other words, is not “what should the utility do” so much as the question should be “what should the utility accomplish.” In answering that question, the Company should ground its energy efficiency budget in a needs analysis.

As I establish above, the Company has 388,430 estimated low-income customers. If it seeks to serve that entire population of customers over a 20-year period, which I recommend for this utility, it would need to serve 19,400 low-income customers per year. The Company does not provide a needs analysis, and its proposal to use its “existing and soon-to-be-proposed” DSM budget would not serve the unique needs of the PIPP program or generate the unique benefits of a PIPP energy efficiency and weatherization program. The Company’s weatherization budget should be scaled up to a level that will ensure appropriate outcomes.

**Q: DO YOU HAVE ANY OTHER COMMENTS ABOUT THE NATURE OF A PIPP WEATHERIZATION PROGRAM?**

A: Yes. Recognizing that the precise contours of the PIPP program may be decided outside of this proceeding, the Company should budget realistically for such a program. Specifically, the Company should budget for comprehensive home retrofit, to include electrification so that the PIPP program does not cause negative health outcomes. Weatherizing without electrification can exacerbate indoor air quality and health problems by reducing air circulation in and out of a residence. The PIPP program budget should account for the need to ensure positive health outcomes associated with the weatherization program. Additionally, electrification can ensure protection from rising gas infrastructure costs going forward, making the costs of the PIPP program less variable in the long term. The Company should also recognize that many low-income customers' homes may present health and safety repairs that may need to be completed as part of a retrofit.

**Q. DO YOU RECOMMEND A SPECIFIC CARVE-OUT FOR PIPP PARTICIPANTS?**

A. Yes. Of the 19,400 customers served by my recommended energy efficiency budget, I recommend that the Commission direct that the Company devote one portion of that funding to customers participating in PIPP and the other portion to customers not participating in PIPP. I recommend that 67% of the energy efficiency budget be directed to PIPP participants. With such a carve-out, the Company would serve roughly 13,000 (12,998) PIPP participants per year. Through this carve-out, the total expected PIPP participant population (155,372) would be expected to be served within roughly a seven-

1 year period (155,372 PIPP participants / 12,998/per year served = 12.0 years to serve  
2 entire PIPP population).

3  
4 It is important to remember that in creating a carve-out for PIPP participants, by design,  
5 the customers being served will likely be customers with higher usage than other low-  
6 income customers. PIPP participants include only those customers with bills which  
7 exceed a prescribed percentage of income burden. If a customer has a sufficient low  
8 usage to not need PIPP credits, in other words, that customer will not be a PIPP  
9 participant. To be clear, I recommend that the Company adopt a PIPP energy efficiency  
10 and weatherization budget that will also serve low-income customers not enrolled in PIPP  
11 because doing so will benefit the PIPP program and customers, as explained in more  
12 detail below.

13  
14 **Q. DO YOU RECOMMEND A SECOND ENERGY EFFICIENCY CARVE OUT?**

15 **A.** Yes. While I recommend that the primary targeting for energy efficiency investments be  
16 high usage, I recommend that 20% of the energy efficiency investments for PIPP  
17 participants be targeted not based on high usage, but rather on high levels of PIPP credits.  
18 While those populations will likely have some overlap, that overlap will not be 100%.  
19 High PIPP credits can arise not simply because of high consumption (and thus high bills),  
20 but also because of very low-income. To illustrate, let me assume an average annual  
21 heating bill of the Company of \$1,600 and two different customers. If Customer A has  
22 an annual income of \$10,000 (paying 10% of his/her income), that customer will receive  
23 a PIPP credit of \$600 a year ( $\$1,600 - [\$10,000 \times 10\%] = \$600$ ). If Customer B,

1           however, has an annual income of \$4,000 a year (paying 10% of his/her income), that  
2           customer will receive a PIPP credit of \$1,200 a year ( $\$1,600 - [\$4,000 \times 10\%] = \$400$ ).  
3           As can be seen, while both customers have “average” consumption, Customer B will  
4           impose a much higher PIPP credit cost on the Company.

5  
6           Accordingly, while I recommend that the primary targeting mechanism for the energy  
7           efficiency investment be high usage, I recommend a 20% carve-out from the efficiency  
8           investments in PIPP participants based on high PIPP credits rather than on high usage.

9  
10   **Q.    WOULD ENERGY EFFICIENCY INVESTMENTS BE AN INCREMENTAL**  
11   **INCREASE IN PIPP COSTS FROM YEAR-TO-YEAR?**

12   A.    No. My response in this regard does not vary based on whether the efficiency investment  
13           is based on high usage or on high levels of PIPP credits. Usage reduction investments  
14           directed toward PIPP participants result in a corresponding reduction in the PIPP credits  
15           that will be provided to PIPP participants. If usage reduction investments are targeted to  
16           high usage customers, the degree of corresponding PIPP credit reductions is  
17           disproportionately higher. The reduction in PIPP credits occurs because PIPP participant  
18           bills remain constant (capped at a maximum percentage of income) while usage (and thus  
19           bills at standard rates) would be reduced. The resulting PIPP credit (bills at standard  
20           residential rates minus bills at PIPP rates) would become lower as consumption is  
21           reduced as a result of the usage reduction investments.

1   **Q.    GIVEN THESE ADDED ADVANTAGES TO INVESTING ENERGY**  
2       **EFFICIENCY DOLLARS IN PIPP CUSTOMERS, WHY NOT DIRECT 100% OF**  
3       **PIPP ENERGY EFFICIENCY EXCLUSIVELY TO PIPP PARTICIPANTS?**

4    A.    It is important to remember that however beneficial PIPP is to low-income customers, the  
5       expected participation rate in PIPP is, nonetheless, still expected to be less than 50% of  
6       the eligible population. To the extent that there are high usage low-income customers  
7       who are not participating in PIPP, energy efficiency investments directed toward such  
8       customers may allow such customers avoid the need to enroll in PIPP at all (i.e., may  
9       reduce electric burdens to less than the prescribed PIPP burdens of 6% or 10%). Not  
10      only would such investments benefit the customer, such investments would also benefit  
11      the Company (and non-participant customer base) by reducing future PIPP expenditures.  
12      (In the same fashion, to the extent that energy efficiency investments directed toward  
13      PIPP participants may reduce participant burdens to below the statutorily-prescribed  
14      percentage of income burdens, those expenditures would help control both the  
15      participation in, and thus the cost of, the PIPP program as a whole.)

16  
17   **Q.    IS THERE ADDITIONAL BENEFIT FROM USAGE REDUCTION**  
18       **INVESTMENTS DIRECTED TOWARD PIPP PARTICIPANTS?**

19   A.    The accumulation of reduced PIPP credits will increase for each year in which usage  
20       reduction investments are made. PIPP credit reductions in Year 2, for example, will  
21       include not only the reductions from Year 2, but all of the PIPP credit reductions from  
22       Year 1 as well. Year 3 PIPP credit reductions will include all reductions from Year 1,  
23       Year 2, and Year 3 combined. Each year of usage reduction investment, in other words,

1 will generate corresponding annual PIPP credit reductions for the useful lives of the  
2 usage reduction measures.

3  
4 In addition to these accumulating reductions in PIPP credits, the utilities will achieve all  
5 of the otherwise applicable “avoided” costs associated with electricity usage reduction.  
6 Usage reduction directed toward PIPP participants, in other words, allows the utility to  
7 “double-dip.” The utility will generate its typical avoided costs. *In addition*, the utility  
8 will generate a reduction in PIPP credits on a dollar-for-dollar basis of bill reductions.  
9

10 **B. The Need for Utility Investments in PIPP Energy Efficiency.**

11 **Q. WHY IS THERE A NEED FOR THE UTILITY TO INVEST ITS DOLLARS IN**  
12 **PIPP ENERGY EFFICIENCY IN THE FIRST PLACE?**

13 A. Substantial market barriers impede, if not completely prevent, low-income households  
14 from investing in energy efficiency measures that would help those customers reduce  
15 their energy consumption. I know from a review of empirical data relating to low-  
16 income households in Virginia that certain market barriers prevent low-income  
17 households from investing in energy efficiency measures.  
18

19 **Q. WHAT MARKET BARRIERS HAVE YOU EXAMINED IN PARTICULAR FOR**  
20 **VIRGINIA?**

21 A. Market barriers impede the realization of cost-effective opportunities for energy  
22 efficiency investments for all customer classes. However, there can be no question but  
23 that the cost-effective opportunities that are lost due to market barriers overwhelmingly

disproportionately adversely affect low-income households. The market barriers that I have examined in particular include:

- **High initial capital costs**: This market barrier is overwhelmingly applicable to low-income customers rather than generic to all programs.
- **Lack of access to capital**: This market barrier is overwhelmingly applicable to low-income customers rather than generic to all programs. Obviously there would be, however, customers who are near-poor (e.g., customers at 200-250% of Federal Poverty Level; customers at 200-300% of Federal Poverty Level), who would also be subject to a constraint on their access to capital. It is always difficult to draw a line such as this at where this constraint no longer exists, since where ever the line is drawn, there would be someone “just over” the line.
- **High implicit discount rates/payback periods**: This market barrier is overwhelmingly applicable to low-income customers rather than generic to all programs.
- **High proportion of low-income renters**: This market barrier is overwhelmingly applicable to low-income customers rather than generic to all programs.
- **Split incentives between landlord and tenants**: This market barrier is overwhelmingly applicable to low-income customers rather than generic to all programs.
- **High mobility rate of low-income renters**: This market barrier is overwhelmingly applicable to low-income customers rather than generic to all programs.

As can be seen, references to “market barriers” that impede investment in low-income conservation are not references to some hypothetical or generic type of “market barrier.” Since these market barriers are not unique to individual utilities, my discussion below will examine them on a state-wide basis.

## 1. High Capital Costs

**Q. PLEASE EXPLAIN HOW HIGH CAPITAL COSTS PRESENT A LOW-INCOME MARKET BARRIER.**

A. The “high initial capital costs” considers the extent to which low-income customers have funds to invest in energy efficiency, even if that investment is “cost-effective.” If a household lacks the funds to invest in efficiency improvements in the first instance, the cost-effectiveness of those investments become irrelevant.

The barrier posed by high initial capital costs was considered by examining the discretionary income of Virginia households at different levels of the Federal Poverty Level. Discretionary income for 2018 was calculated for each county and city in Virginia. The maximum income at three different levels of the Federal Poverty Level was considered (50% of FPL; 100% of FPL; 150% of FPL). When I refer to the “maximum” income, I refer to the fact that the Census data reports the number of people with annual income at or below 50% of FPL; at or below 100% of FPL; and at or below 150% of FPL. This discussion, however, focuses on households who are at the ceiling of each range.

I then compare the incomes at each Poverty range to the self-sufficiency income for each county and city as reported for 2018.<sup>19</sup> To the extent that the Poverty incomes are less than the self-sufficiency income, I determine the extent of the deficit. Since the self-

---

<sup>19</sup> The self-sufficiency study was prepared by faculty at the University of Washington. (The Excel spreadsheet with the calculations for each of the different family compositions can be accessed at <http://www.selfsufficiencystandard.org/node/85> (last accessed September 1, 2020).

sufficiency income varies by household size and composition, I focus on three specific three-person household types: (1) one adult with one preschooler and one school-age child; (2) two adults with one preschool age child; and (3) two adults with one school-age child.<sup>20</sup>

The results for Virginia's counties and cities are summarized in Schedule RDC-2 (page 1 through page 3). Since the point is not to associate cost-of-living with particular counties, the counties are simply numbered (in the "x" axis) and ranked from lowest deficit to highest deficit.

The data shows the extent of the market barrier presented by the inability to address the front-end capital costs of implementing usage reduction measures, irrespective of whether those usage reduction measures are "cost-effective" over time.

- For families (1Adult, 1 Preschool Child, 1 School-age Child) living with income at 50% of Federal Poverty Level in Virginia, the lowest income deficit is roughly \$25,000, while the highest income deficit ranges up to more than \$80,000 on an annual basis. For the same family composition at 100% of Poverty, the income deficit ranges from roughly \$15,000 to more than \$75,000. For the same family composition at 150% of Poverty, the income deficit ranges from \$5,000 to roughly \$55,000.
- For families (2 Adults, 1 Preschool Child) living with income at 50% of Poverty, the income deficit ranges from \$30,000 to more than \$70,000. The same family composition at 100% of Poverty has an income deficit of \$20,000 to \$60,000. The same family composition at 150% of Poverty has an income deficit of \$10,000 to \$50,000.
- For families (2 Adults, 1 School-age Child) living with income at 50% of Poverty Level in Virginia, the lowest income deficit is nearly \$40,000, with the deficit ranging up to more than \$70,000. At 100% of Poverty, a family with this composition has an

<sup>20</sup> The self-sufficiency study calculates self-sufficiency incomes for 638 different family compositions.

1 income deficit of nearly \$30,000 to more than \$60,000. At 150% of Poverty, this  
2 family composition has an income deficit of nearly \$10,000 to more than \$40,000.  
3

4 Given these deficits between the annual incomes which Virginia's low-income  
5 households actually experience and the annual incomes which these same households  
6 would need simply to meet minimum levels of "self-sufficiency," it thus comes as no  
7 surprise that these households lack the financial resources necessary to meet the capital  
8 costs of investing in usage reduction measures. The fact that these measures might have a  
9 positive payback over time, or that these measures might help the household to more  
10 sustainably afford to pay their electric bills on a monthly basis, is irrelevant when the  
11 household simply does not have the discretionary income to devote to such an investment  
12 in the first instance.  
13

## 14 2. Lack of Access to Investment Capital.

15 **Q. PLEASE EXPLAIN HOW THE LACK OF ACCESS TO INVESTMENT**  
16 **CAPITAL POSES A MARKET BARRIER TO LOW-INCOME INVESTMENT IN**  
17 **USAGE REDUCTION MEASURES.**

18 A. Not only are low-income households unable to invest in usage reduction measures from  
19 their own financial resources, these households lack the ability to access investment  
20 capital (i.e., borrowing) to invest in the usage reduction measures which would improve  
21 the affordability of their electric bills. It is not possible for me to directly measure the  
22 extent to which low-income Virginia residents have access to borrowing. However, some  
23 reasonable conclusions can be drawn from their financial characteristics. Financial  
24 institutions will not generally lend to persons who are already over-extended financially.

One demarcation of being financially over-extended is when a household has housing costs that exceed 30% of its income. It is possible to examine the extent to which low-income households in Virginia fall within this group of over-extended consumers.

Looking at statewide data in Virginia, I examined the Census data on housing costs as a percentage of income disaggregated by annual household income (American Community Survey, Table B25106, 5YR). Then, separately for homeowners and renters, I examined the percentage of households having housing costs that exceed 30% of income, which is that level of housing burden at which access to investment capital becomes constrained, for four different income ranges: (1) less than \$20,000; (2) \$20,000 - \$34,999; (3) \$50,000 - \$74,999; and (4) \$75,000 or more.

I found that there is a distinct difference between households with low incomes and households with higher incomes. The constraints on access to capital are readily evident disaggregated by income. While 73% of homeowners with annual income less than \$20,000, and 89% of tenants with income that low, have housing costs exceeding 30% of income, only 8% of homeowners, and 8% of renters, with income exceeding \$75,000 have housing burdens that fall into that “over-extended” category (exceeding 30% housing burden).

Table 9. Percent of Households with Housing Burdens Exceeding 30% of Income By Tenure and Annual Income (Virginia 2018)							
Homeowner				Tenant			
<\$20,000	\$20,000 - \$34,999	\$50,000 - \$74,999	\$75,000 or more	<\$20,000	\$20,000 - \$34,999	\$50,000 - \$74,999	\$75,000 or more
73%	48%	27%	8%	89%	82%	34%	8%

1 Even at moderate income levels in Virginia, only 27% of homeowners, and 34% of  
2 renters with income between \$50,000 and \$74,999 have housing burdens exceeding 30%  
3 of income.

4  
5 **Q. DO THESE HIGH TOTAL SHELTER BURDENS RELATE TO HOME ENERGY**  
6 **EFFICIENCY IN OTHER WAYS?**

7 A. Yes. High shelter burdens relate to energy efficiency in two ways. First, the high shelter  
8 costs, themselves, present an impediment to low-income households being able to invest  
9 in energy efficiency measures. If the household struggles to meet its day-to-day bills, it  
10 does not have the discretionary income to invest in energy savings measures, even if  
11 those measures are “cost-effective” over some reasonable period of time. In addition,  
12 however, as home energy takes up an increasing proportion of total shelter costs, there is  
13 less money “left” to pay for the housing component of total shelter costs. As a result,  
14 low-income households are either forced into increasingly lower-priced (and  
15 presumptively lower quality) housing, or those households face ongoing bill payment  
16 problems attributable to the mismatch between household resources and household  
17 expenses. In either case, the very housing cost characteristics that cause the need for  
18 improving energy efficiency in order to reduce bills is also the characteristic that makes it  
19 less likely that such investments in energy efficiency can occur.

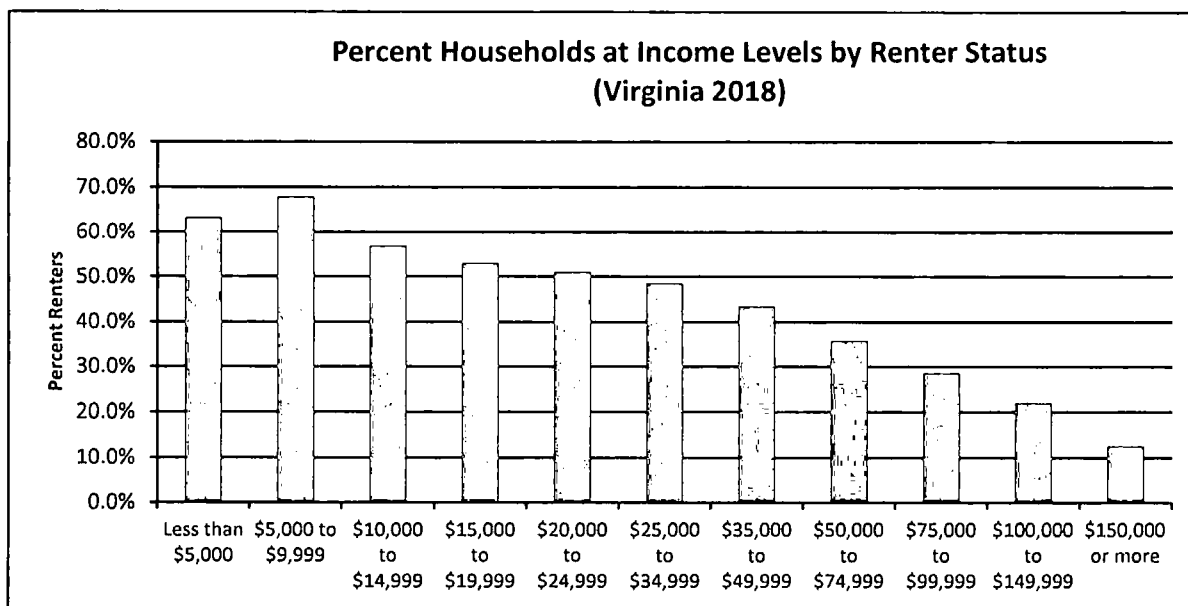
### 3. Low-income Renters

**Q. PLEASE EXPLAIN WHY TENURE IS A MARKET BARRIER TO HAVING LOW-INCOME HOUSEHOLDS INVEST IN USAGE REDUCTION MEASURES.**

A. The “tenure” of households considers whether such households own or rent their homes. Renters, particularly low-income renters, run into the problem of “split incentives.” Split incentives refers to the situation where the cost of installing measures is generally borne by the owner of a housing unit while the benefit of reduced consumption (and thus reduced bills) is directed toward the resident (i.e., the tenant). As a result, since the costs and benefits are borne by different stakeholders, no investment occurs.

From a usage reduction perspective, however, the problems caused by renter status goes well beyond this economic problem. There is a legal problem as well. When a person is a tenant, the person does not have what is called the “dominion interest” over the major systems in a home that would generate substantial usage reduction (and thus bill reduction). The “dominion interest” refers to the authority to make decisions. Even if the tenant had the desire to make usage reduction investments, and the financial wherewithal to fund such investments, as a non-owner of the home, the tenant would not have the authorization to make such changes to the major systems and appliances, (whether it be heating, hot water, refrigeration or something else) resulting in the usage reduction improvements.

The Chart immediately below shows Census data from the 2018 American Community Survey (Table B25118 5YR) demonstrating that renter status is overwhelmingly disproportionately the province of the poor in Virginia.



The data for Virginia is set forth in the Table below. The Table shows that:

- In Virginia in 2018, while 63% of households with income less than \$5,000 were renters, and 68% of households with income between \$5,000 and \$10,000 were, only 13% of households with income greater than \$150,000 were renters, and only 22% of households with income between \$100,000 and \$150,000 were.
- In Virginia, while 22% of renters had income less than \$15,000, only 8% of homeowners did.
- In Virginia, while 28% of renters had income less than \$25,000, only 10% of homeowners did. In contrast, while 44% of homeowners in Virginia had income of \$100,000 or more, only 18% of renters did.

Table 10. Tenure by Income (Virginia 2018)

Household annual income	Percent Renter by Income	Percent Homeowner by income
Less than \$5,000	5%	2%
\$5,000 to \$9,999	5%	1%
\$10,000 to \$14,999	6%	2%
\$15,000 to \$19,999	6%	3%
\$20,000 to \$24,999	6%	3%
\$25,000 to \$34,999	11%	6%
\$35,000 to \$49,999	15%	10%
\$50,000 to \$74,999	18%	16%
\$75,000 to \$99,999	11%	14%
\$100,000 to \$149,999	11%	20%
\$150,000 or more	7%	24%
Total	100%	100%

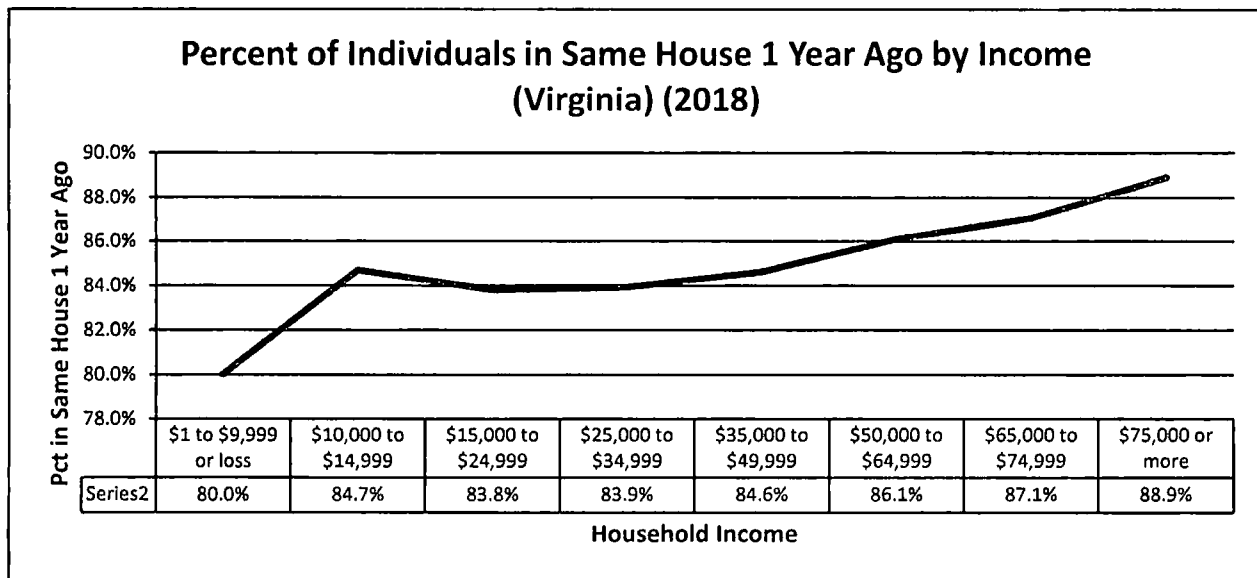
There is no question but that to the extent that renter status presents a market barrier to the installation of energy usage reduction measures, in Virginia, those market barriers disproportionately impede the installation of energy usage reduction measures for low-income households.

#### 4. Low-Income Mobility

**Q. PLEASE EXPLAIN WHY MOBILITY IS A MARKET BARRIER TO THE INSTALLATION OF LOW-INCOME USAGE REDUCTION MEASURES.**

A. In addition to their tenure, and their income status, another attribute of low-income customers that impedes their ability to use energy efficiency as a mechanism to reduce home energy consumption, is their tendency to be more mobile. Census data demonstrates quite clearly that, compared to the proportion of the total population that changes residences each year, substantially more low-income households move. As a result, even in those instances where a tenant may have the authority to invest in an energy efficiency measure, and assuming a financial ability to do so, the payback period required to justify such an investment often exceeds the household's expected time in any particular home. For an energy efficiency investment to make economic sense to an individual household, the payback period would need to match the household's tenure. A low-income household, in other words, will not invest in a measure with a two-year payback if that household intends to move to a different dwelling in the next 12 months. A low-income household will not invest in a measure with a three-year payback if that household does not anticipate remaining in the home for more than two years.

I first examine the extent to which households remained in the same home for the past year, disaggregated by income (Table B07010 5YR). The data is presented immediately below. As can be seen, in Virginia, as income increases, the degree of mobility declines.



As the Chart (and its accompanying data) show, the percentage of households with the lowest income not remaining in the same house in the past twelve months is nearly two times greater than the percentage of households with the highest income (20% vs. 11%). The percentage with the lowest income have the lowest rate of having stayed in the same house. The percentage of individuals with income of \$35,000 and higher have a noticeable increase in stability, as income increases.

This mobility is partially reflective of the relationship between income and tenure status discussed above. The mobility data supports the conclusion that tenants are more mobile than homeowners. The Census reports data on the “move-in date” for households in each geographic area (Table B25038 5YR). The data is disaggregated by homeowners and renters. In Virginia, while 8.9% of homeowners had moved into their current home in 2015 or later, 35.1% of renters had moved into their current home in 2015 or later. Clearly, Virginia renters, not only because of split-incentives and their lack of dominion interest, are ill-equipped to be able, on their own without external direct install utility

1 programs, to invest in energy efficiency measures that might improve their electric bill  
 2 affordability and/or reduce the costs of providing PIPP credits.

Table 11. Date Moved in By Tenure (Virginia) (2018)

	Population
Estimate!!Total	3,128,415
Owner occupied	2,070,879
Owner occupied!!Moved in 2017 or later	49,174
Owner occupied!!Moved in 2015 to 2016	134,481
Owner occupied!!Moved in 2010 to 2014	402,493
Owner occupied!!Moved in 2000 to 2009	687,507
Owner occupied!!Moved in 1990 to 1999	382,715
Owner occupied!!Moved in 1989 or earlier	414,509
Renter occupied	1,057,536
Renter occupied!!Moved in 2017 or later	111,478
Renter occupied!!Moved in 2015 to 2016	259,479
Renter occupied!!Moved in 2010 to 2014	473,151
Renter occupied!!Moved in 2000 to 2009	153,311
Renter occupied!!Moved in 1990 to 1999	35,594
Renter occupied!!Moved in 1989 or earlier	24,523

3  
 4 This data can be used as a surrogate for households that do not have a sufficient length of  
 5 tenure to be able to justify nearly any energy efficiency investment. Few energy  
 6 efficiency investments provide a one-year payback. In addition to excluding many low-  
 7 income households completely from the efficiency market, restricting investments  
 8 exclusively to measures that would generate a one-year payback would result in  
 9 substantial cream-skimming of usage reduction, with the bulk of cost-effective usage  
 10 reduction missed.

11  
 12 **Q. WHAT DO YOU CONCLUDE BASED ON THE ABOVE DATA AND**  
 13 **DISCUSSION?**

1 A. I conclude that low-income households face substantial market barriers to making  
2 investments in usage reduction measures out of their own resources. If usage reduction  
3 measures are to be pursued in low-income homes, they must be pursued through direct-  
4 install investments by third parties. Given the harms to the Company from not having  
5 such investments made, and the benefits to the Company from pursuing such low-income  
6 investment, I conclude that the Company's PIPP should include the budget for energy  
7 efficiency programs as I recommend above.

8  
9 **Q. DO YOU HAVE A FURTHER RECOMMENDATION?**

10 A. Yes. I recommend further that the Company be directed to report and make publicly  
11 available, on an annual basis: (1) the expenditures on low-income energy efficiency; (2)  
12 the estimated savings (in kWh) from such expenditures; (3) the estimated bill reductions  
13 (in dollars) from such expenditures; (4) the allocation of the low-income energy  
14 efficiency expenditures between PIPP and non-PIPP participants; and (5) the estimated  
15 PIPP credit reductions accruing as a result of the energy efficiency investments.

16  
17 **PART 4. TOTAL PIPP PROGRAM FUNDING TO BE COLLECTED THROUGH A**  
18 **UNIVERSAL SERVICE RIDER.**

19 **Q. PLEASE EXPLAIN THE PURPOSE OF THIS SECTION OF YOUR**  
20 **TESTIMONY.**

21 A. In this section of my testimony, I summarize the annual costs to be included in the PIPP  
22 Universal Service Fee for the Company. Those total costs are set forth in Schedule RDC-  
23 3. The costs include costs for: (1) the PIPP credits toward bills for current service; (2) the

PIPP credits toward pre-existing arrearages; and (3) the PIPP credits to support energy usage reduction directed toward PIPP participants. The Table immediately below summarizes those total PIPP costs by program component.

Table 12. Total Costs of Virginia PIP (Dominion)	
Combined cost of all three components of Virginia PIP	
PIPP credits (plus admin less bad debt offset)	\$60,885,285
Low-income PIP energy efficiency and weatherization investments	\$19,400,000
AMP credits	\$9,983,617
Total combined annual cost of all three components of Virginia PIP	\$90,268,902

#### **PART 5. A Review of the Company's PIPP Funding Proposal.**

**Q. PLEASE EXPLAIN THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY.**

A. In this section of my testimony, I respond to various elements of the filing which Virginia Electric and Power made with the Commission in this docket in July 2020. I have a limited number of comments on the Company's filed proposal:

- The Company states that its "analysis identified approximately 204,000 likely eligible customers." (Virginia Electric Proposal, at 8). I believe that number to be too small. Without having a specific critique of the Company's use of its internal "DataMart," developed and updated through updates from Experian (a fee-based service), the Company states that "Experian predicts the income estimate using multiple statistical methodologies and where insufficient data is available. . .will use the median income assigned to other living units in the same ZIP+4 area." (Virginia Electric Proposal, at 8). As detailed in my testimony, I use the most recent data provided by the Census Bureau's American Community Survey (2018, 5-year data). I believe the Company's estimate of likely eligible customers to be too low. If the Company's estimate of

1 204,000 is correct, that would mean that only 9.1% of the Company's residential  
2 customer base (2,220,798) would have income at or below 150% of Poverty.  
3 According to the American Community Survey (Table C17002, 5-YR, 2018), as a  
4 whole, Virginia had 10.7% of its population below 100% of Poverty (not the 150%  
5 which I used to define income-eligibility). In contrast, the Census Bureau reports that,  
6 statewide, Virginia has 17.3% of its population with income below 150% of Poverty.  
7 My calculation, described above, found that 17.5% of the Company's customer base  
8 would have income at or below 150% of Poverty.

9 ➤ The Company projects that "approximately 50%" of its fuel assistance customers  
10 "were served by electric heat. . ." (Virginia Electric Proposal, at 11). I have no reason  
11 to disagree with that estimate. My estimate, based on data reported by the Census  
12 Bureau (as described in my testimony above), was that 51.5% of low-income  
13 customers would be served by electric heat.

14 ➤ The Company assumes that "the Department of Housing and Community  
15 Development and the Department of Social Services, which are the agencies  
16 responsible for administering the PIPP. . .will be responsible for monitoring PIPP  
17 eligibility and will determine the process and frequency of such monitoring."  
18 (Virginia Electric Proposal, at 11). I agree with this approach. The electric utilities  
19 should not be involved with enrollment or income verification. As the Company  
20 suggests, "the process and frequency" of income verification should be an  
21 administrative task left to the DSS and DHCD.

22 ➤ The Company proposes that "any revenue requirement approved in this proceeding  
23 and associated universal service fee. . .should be subject to future revision and an

1 annual true-up process.” (Virginia Electric Proposal, at 12). For the reasons I outline  
2 in my testimony above, I agree with this recommendation.

3 ➤ The Company’s proposal assumes that the two Virginia utilities will spend the  
4 maximum administrative costs, capped at an aggregate of \$3.0 million per year, and  
5 allocate those administrative costs between the utilities based on “a Virginia customer  
6 count.” (Virginia Electric Proposal, at 13). I calculate the administrative costs using a  
7 somewhat different methodology, with a result that, at a participation rate of 40%, the  
8 net administrative costs (combined between the two utilities) will equal somewhat  
9 less than \$3.0 million.

10 ➤ The Company’s proposal posits that there is no practical impact of including (or  
11 excluding) PIPP participants from being charged the PIPP surcharge. (Virginia  
12 Electric Proposal, at 15). With annual bill payments capped at a maximum percentage  
13 of income, I agree with the Company’s reasoning that including the PIPP surcharge as  
14 an element of PIPP customer rates will have no practical effect. Whether the  
15 surcharge is included or excluded, the PIPP bills will be capped at the maximum  
16 percentage of income ceilings prescribed by the legislature.

17 ➤ The Company’s proposal does not propose (“at this time”) a credit to reflect any  
18 improvement in bill payment patterns for PIPP participants. (Virginia Electric  
19 Proposal, at 15). While I agree that a credit attributable to improved bill payment  
20 patterns needs to be postponed until additional experience is obtained, what Virginia  
21 Electric failed to take into account is the need for an immediate bill credit to prevent  
22 the double-recovery of bad debt as I document above. The double-recovery credit

1 should be adopted from the beginning, even if the credit for improved bill payment  
2 patterns is delayed for additional information.

3  
4 **Q. DO YOU HAVE ANY MAJOR DISAGREEMENT WITH THE COMPANY'S**  
5 **PIPP COST PROPOSAL?**

6 A. Yes. Virginia Electric recommends that no new weatherization funding be provided  
7 through PIPP. (Virginia Electric Proposal, at 16). The Company asserts that its "existing  
8 and future low-income programs" will "fulfill the PIPP's objectives." (Virginia Electric  
9 Proposal, at 16).

10  
11 For all the reasons I outline in my testimony above, that recommendation should be  
12 rejected. While low-income weatherization programs should certainly be a specific  
13 element of program planning for "existing and to-be-proposed DSM programs. . .," those  
14 programs should be separate from PIPP. As I describe above, the offer of PIPP energy  
15 efficiency programs can be cost-justified on a different basis from the offer of low-  
16 income efficiency programs operated through a DSM portfolio. As I explain, PIPP  
17 energy efficiency programs not only generate the "traditional" avoided costs to the utility  
18 (e.g., energy, capacity, environmental compliance), but will generate avoided PIPP  
19 credits as well. As I explain further, PIPP energy efficiency programs should be directed  
20 toward PIPP participants (in order to gain this "double-dip"), and should include a  
21 targeting based not only on high consumption, but should include a specific carve-out for  
22 PIPP participants who generate high PIPP credits.

Without repeating my testimony, the energy efficiency budget should be tied to the outcomes sought to be achieved. The question should not solely be “how much should we spend,” but rather, the question should also be “what do we want to accomplish?” The outcomes sought should be to treat low-income PIPP participants over a reasonable planning horizon. I recommend the energy efficiency budget which I propose, and justify, above.

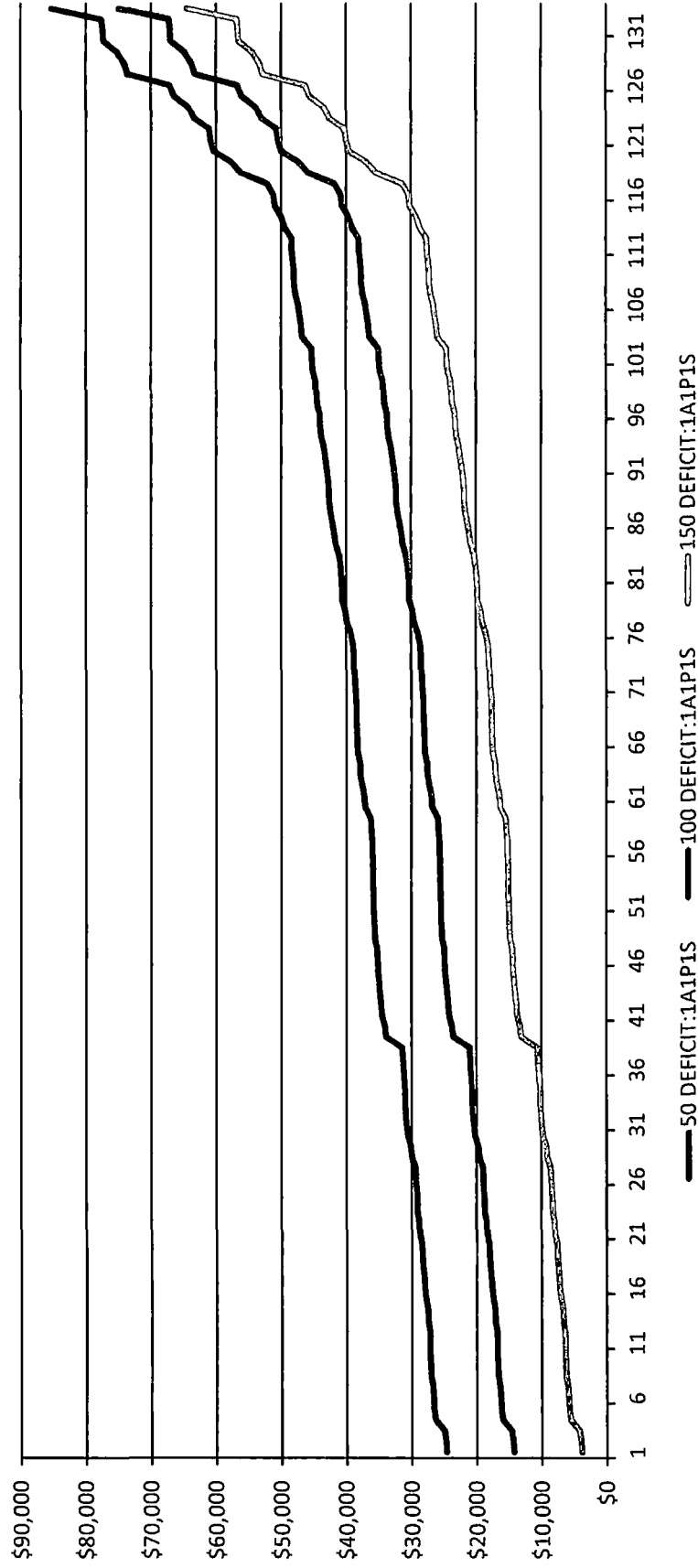
**Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

**A.** Yes, it does.

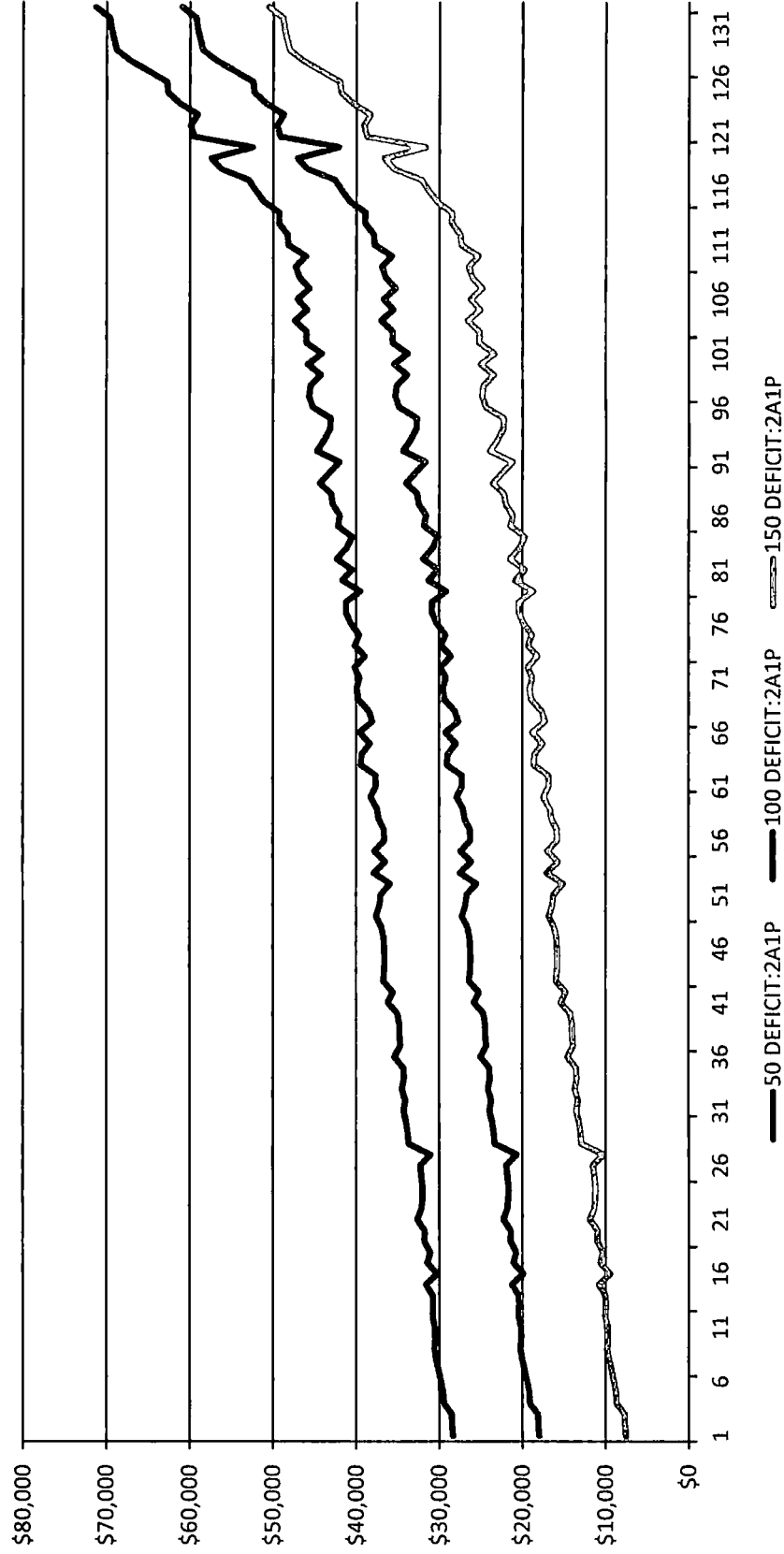
## Colton Schedules



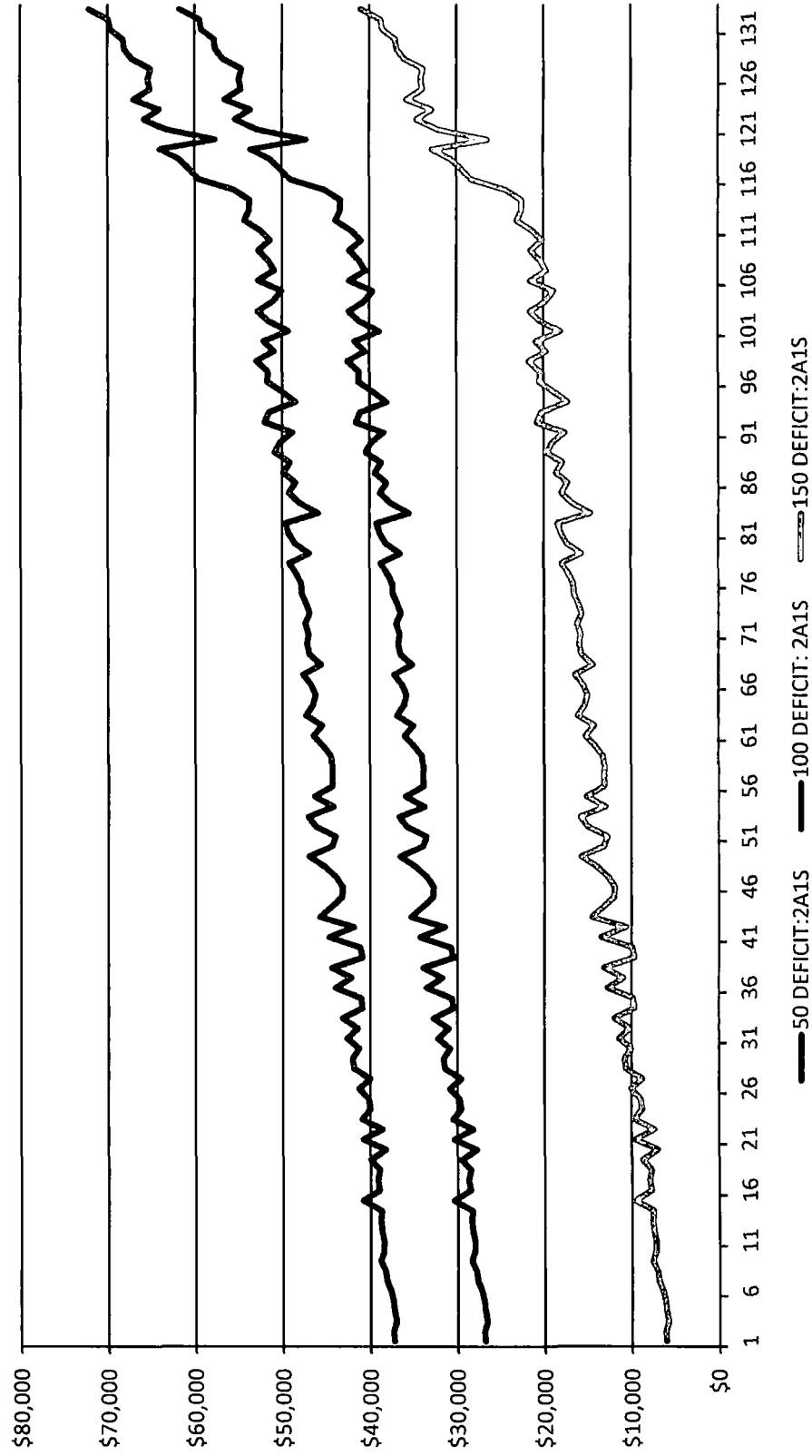
### Income Deficit: 1 Adult, 1 Preschool, 1 School-age (Virginia counties and cities) (2018)



### Income Deficit: 2 Adults, 1 Preschool (Virginia counties and cities) (2018)



### Income Deficit: 2 Adults, 1 Scholage (Virginia Counties and Cities) (2018)



Schedule RDC-3 Total Costs of Virginia PIPP (Dominion)	
	Dominion
Shortfall at 100% participation	
Below 50% FPL--Non-heating	\$51,029,324
50-100% FPL--Non-heating	\$28,562,094
100-125% FPL--Non-heating	\$2,287,009
125-150% FPL--Non-heating	\$814
Total Non-heating	\$81,879,241
Below 50% FPL--Heating	\$54,466,737
50-100% FPL--Heating	\$11,985,849
100-125% FPL--Heating	\$0
125-150% FPL--Heating	\$0
Total Heating	\$66,452,586
Total shortfall at 100% participation	\$148,331,826
Shortfall at Expected participation	
Below 50% FPL--Non-heating	\$20,411,729
50-100% FPL--Non-heating	\$11,424,838
100-125% FPL--Non-heating	\$914,803
125-150% FPL--Non-heating	\$326
Total Non-heating	\$32,751,696
Below 50% FPL--Heating	\$21,786,695
50-100% FPL--Heating	\$4,794,339
100-125% FPL--Heating	\$0
125-150% FPL--Heating	\$0
Total Heating	\$26,581,034
Total shortfall at expected participation (heating plus non-heating)	\$59,332,730
Admin allowance	4%
Total gross costs with admin at 100% participation	\$154,265,099
Total gross costs with admin at expected participation	\$61,706,040
Bad debt offset	
Company uncollectible dollars	\$22,727,826
Company revenues from sales	\$6,572,021,567
Write-offs as pct of sales	0.346%
Low-income multiplier	4.0
Low-income write-off as pct of sales	1.38%
Bad-debt offset at 100% participation	\$2,051,886
Bad debt offset at expected participation	\$820,754

Schedule RDC-3 Total Costs of Virginia PIPP (Dominion)	
Total net costs with admin less bad debt offset--100% participation	\$152,213,213
Total net costs with admin less bad debt offset--expected participation	\$60,885,285
Low-income PIPP energy efficiency and weatherization investments	
Proposed energy efficiency budget to supplement PIPP bill credits	\$19,400,000
Total electric sales to ultimate customers	\$7,634,198,469
% sales revenues devoted to low-income PIPP energy efficiency and weatherization	0.3%
Arrearage Management Program--Non-heating	
Percent PIP non-heating participants expected to have pre-existing arrearages	30.0%
Number of PIP non-heating participants (at expected participation rate) with pre-existing arrearages	22,037
Expected average level of pre-existing arrearages (in dollars) per non-heating participant	\$484
Aggregate expected level of pre-existing non-heating arrearages (in dollars)	\$10,659,055
Expected success in earning AMP arrearage credits	80%
Total cost of non-heating AMP arrearage credits	\$8,527,244
Years over which total AMP credits spread	2
Annual cost of non-heating AMP arrearage credit	\$4,263,622
Arrearage Management Program--Heating	
Expected PIP heating participants expected to have pre-existing arrearages	30.0%
Number of PIP heating participants (at expected participation rate) with pre-existing arrearages	22,037
Expected average level of pre-existing heating arrearages (in dollars) per heating participant	\$484
Aggregate expected level of pre-existing heating arrearages (in dollars)	\$10,659,055
Expected success in earning AMP arrearage credits	80%
Total cost of heating AMP arrearage credits	\$8,527,244
Years over which total AMP credits spread	2
Annual cost of heating AMP arrearage credit	\$4,263,622
Combined cost of all three components of Virginia PIP	
PIPP credits (plus admin less bad debt offset)	\$60,885,285
Low-income PIPP energy efficiency and weatherization investments	\$19,400,000
AMP credits	\$9,983,617
Total combined annual cost of all three components of Virginia PIP	\$90,268,902

## APPENDIX: Colton Vitae

## ROGER D. COLTON

### **BUSINESS ADDRESS:**

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Public Finance and General Economics  
34 Warwick Road, Belmont, MA 02478  
617-484-0597 (voice) \*\*\* 617-484-0594 (fax)  
roger@fsconline.com (e-mail)  
http://www.fsconline.com (www address)

### **EDUCATION:**

J.D. (Order of the Coif), University of Florida (1981)

M.A. (Regulatory Economics), McGregor School, Antioch University (1993)

B.A. Iowa State University (1975) (journalism, political science, speech)

### **PROFESSIONAL EXPERIENCE:**

#### **Fisher, Sheehan and Colton, Public Finance and General Economics:** 1985 - present.

As a co-founder of this economics consulting partnership, Colton provides services in a variety of areas, including: regulatory economics, poverty law and economics, public benefits, fair housing, community development, energy efficiency, utility law and economics (energy, telecommunications, water/sewer), government budgeting, and planning and zoning.

Colton has testified in state and federal courts in the United States and Canada, as well as before regulatory and legislative bodies in more than three dozen states. He is particularly noted for creative program design and implementation within tight budget constraints.

#### **Belmont Media Center – Belmont Journal:** 2017 - present

Host of *Belmont Journal*, the weekly hyper-local news show for Belmont (MA), produced by the Belmont Media Center. Assistant producer of *Belmont Journal*.

#### **Commentator: Belmont Citizen-Herald:** 2014 – present

Author of biweekly “Community Conversations” column for Belmont Citizen-Herald, weekly newspaper (June 2014 to present).

Host of biweekly “Community Conversations” podcast, Belmont Media Center, BMC Podcast Network (October 2016 to present)

**National Consumer Law Center (NCLC): 1986 - 1994**

As a staff attorney with NCLC, Colton worked on low-income energy and utility issues. He pioneered cost-justifications for low-income affordable energy rates, as well as developing models to quantify the non-energy benefits (e.g., reduced credit and collection costs, reduced working capital) of low-income energy efficiency. He designed and implemented low-income affordable rate and fuel assistance programs across the country. Colton was charged with developing new practical and theoretical underpinnings for solutions to low-income energy problems.

**Community Action Research Group (CARG): 1981 - 1985**

As staff attorney for this non-profit research and consulting organization, Colton worked primarily on energy and utility issues. He provided legal representation to low-income persons on public utility issues; provided legal and technical assistance to consumer and labor organizations; and provided legal and technical assistance to a variety of state and local governments nationwide on natural gas, electric, and telecommunications issues. He routinely appeared as an expert witness before regulatory agencies and legislative committees regarding energy and telecommunications issues.

**PROFESSIONAL AFFILIATIONS:**

Chair:	Belmont Zoning By-law Review Working Committee (climate change)
Member:	Board of Directors, Massachusetts Rivers Alliance
Columnist:	Belmont Citizen-Herald
Producer:	Belmont Media Center: BMC Podcast Network
Host:	Belmont Media Center: Belmont Journal
Member:	Belmont Town Meeting
Vice-chair:	Belmont Light General Manager Screening Committee
Chair:	Belmont Goes Solar
Coordinator:	BelmontBudget.org (Belmont's Community Budget Forum)
Coordinator:	Belmont Affordable Shelter Fund (BASf)
Chair:	Belmont Solar Initiative Oversight Committee
Member:	City of Detroit Blue Ribbon Panel on Water Affordability
Chair:	Belmont Energy Committee
Member:	Massachusetts Municipal Energy Group (Mass Municipal Association)
Past Chair:	Housing Work Group, Belmont (MA) Comprehensive Planning Process
Past Member:	Board of Directors, Belmont Housing Trust, Inc.
Past Chair:	Waverley Square Fire Station Re-use Study Committee (Belmont MA)
Past Member:	Belmont (MA) Energy and Facilities Work Group
Past Member:	Belmont (MA) Uplands Advisory Committee
Past Member:	Advisory Board: Fair Housing Center of Greater Boston.
Past Chair:	Fair Housing Committee, Town of Belmont (MA)
Past Member:	Aggregation Advisory Committee, New York State Energy Research and Development Authority.
Past Member:	Board of Directors, Vermont Energy Investment Corporation.

- Past Member: Board of Directors, National Fuel Funds Network
- Past Member: Board of Directors, Affordable Comfort, Inc. (ACI)
- Past Member: National Advisory Committee, U.S. Department of Health and Human Services, Administration for Children and Families, Performance Goals for Low-Income Home Energy Assistance.
- Past Member: Editorial Advisory Board, International Library, *Public Utility Law Anthology*.
- Past Member: ASHRAE Guidelines Committee, GPC-8, *Energy Cost Allocation of Comfort HVAC Systems for Multiple Occupancy Buildings*
- Past Member: National Advisory Committee, U.S. Department of Housing and Urban Development, Calculation of Utility Allowances for Public Housing.
- Past Member: National Advisory Board: Energy Financing Alternatives for Subsidized Housing, New York State Energy Research and Development Authority.

### **PROFESSIONAL ASSOCIATIONS:**

- National Association of Housing and Redevelopment Officials (NAHRO)
- National Society of Newspaper Columnists (NSNC)
- Association for Enterprise Opportunity (AEO)
- Iowa State Bar Association
- Energy Bar Association
- Association for Institutional Thought (AFIT)
- Association for Evolutionary Economics (AEE)
- Society for the Study of Social Problems (SSSO)
- International Society for Policy Studies
- Association for Social Economics

### **BOOKS**

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# COLTON EXPERIENCE AS EXPERT WITNESS

## 1999 – PRESENT

CASE NAME	CLIENT NAME	Docket No. (if available)	TOPIC	JURIS.	YEAR
I/M/O Eversource, Energy Missouri West	National Housing Trust	EU-2020-0350	COVID-19 response	MO	20
I/M/O Spire Missouri	National Housing Trust	EU-2020-0376	COVID-19 response	MO	20
I/M/O UGI GAs	Office of Consumer Advocate	R-2020-3015162	Low-income program design	PA	20
I/M/O Columbia Gas of Pennsylvania	Office of Consumer Advocate	R-2020-3018835	Low-income program design	PA	20
I/M/O Pennsylvania-American Water Co.	Office of Consumer Advocate	R-2020-3019369	Low-income program design	PA	20
I/M/O Philadelphia Gas Works	Office of Consumer Advocate	R-2020-3017206	Low-income program design	PA	20
I/M/O Philadelphia Water Department	City of Philadelphia/Public Advocate	None	Low-income program design	Philadelphia	20
I/M/O Pittsburgh Water and Sewer Authority	Office of Consumer Advocate	R-2020-3017951	Low-income program design	PA	20
I/M/O Consumers Energy (electric)	Michigan Office of Attorney General, et al.	U-20697	Low-income program design	Michigan	20
I/M/O Eversource	New Hampshire Legal Assistance	DE-19-057	Low-income program design / customer service	NH	19
I/M/O DTE (electric) rates	Michigan Office of Attorney General, et al.	U-20561	Low-income program design	Michigan	19
I/M/O DTE Energy Waste Reduction (EWR) Plan (gas)	Natural Resources Defense Council, et al.	U-20429	Low-income program design	Michigan	19
I/M/O DTE Energy Waste Reduction (EWR) Plan (electric)	Natural Resources Defense Council, et al.	U-20373	Low-income program design	Michigan	19
I/M/O Ameren Energy	Illinois Office of Attorney General	18-1486	Minimization of uncollectible accounts	Illinois	19
I/M/O Commonwealth Edison Company	Illinois Office of Attorney General	18-1456	Minimization of uncollectible accounts	Illinois	19
I/M/O NICOR Illinois	Illinois Office of Attorney General	18-1437	Minimization of uncollectible accounts	Illinois	19

CASE NAME	CLIENT NAME	Docket No. (if available)	TOPIC	JURIS.	YEAR
I/M/O Peoples Gas	Office of Consumer Advocate	R-2018-3006818	Customer service / Low-income cost recovery	Pennsylvania	19
I/M/O UGI Electric	Office of Consumer Advocate	R-2018-3006814	Customer service / Low-income cost recovery	Pennsylvania	19
I/M/O Pittsburgh Water Authority	Office of Consumer Advocate	M-2640802	Customer service / Low-income cost recovery	Pennsylvania	19
I/M/O Ameren Prepayment Meter	Illinois Office of Attorney General	Docket 18-1008 – 18-1009 (cons)	Prepayment meters	Illinois	18
I/M/O Pittsburgh Water and Sewer Authority	Office of Consumer Advocate	R-2018-3002645/3002647 (cons)	Customer service / Low-income cost recovery	Pennsylvania	18
I/M/O National Grid (electric)	Division of Public Utility Control	Docket No. 4770	Customer service / Low-income cost recovery	Rhode Island	18
I/M/O Columbia Gas Company	Office of Consumer Advocate	R-2018-2647577	Customer service / Low-income cost recovery	Pennsylvania	18
I/M/O PECO (electric)	Office of Consumer Advocate	R-2018-3000164	Customer service / Low-income cost recovery	Pennsylvania	18
i/N/O Duquesne Light Company	Office of Consumer Advocate	R-2018-3000124	Customer service / Low-income cost recovery	Pennsylvania	18
I/M/O UGI-Electric	Office of Consumer Advocate	R-2017-2640058	Customer service / Low-income cost recovery	Pennsylvania	18
I/M/O Philadelphia Water Department requested rates for 2019 - 2021	Philadelphia Public Advocate	None	Water rate:: low-income program cost recovery / public fire protection / storm water charge exemptions	Philadelphia	18
I/M/O Commonwealth Edison Prepayment Meters	Illinois Office of Attorney General	17-0837	Electric customer service	Illinois	18
I/M/O 2018/2020 Statewide Energy Efficiency Plan	The Way Home / New Hampshire Legal Assistance	DE 17-136	Non-energy impacts / Low-income energy efficiency	New Hampshire	17
I/M/O DTE (electric) / gas EWR (energy waste reduction) plan	Sierra Club / Natural Resources Defense Council	Case No. U-18262	Low-income energy efficiency	Michigan	17
I/M/O DTE (electric)	Sierra Club / Natural Resources Defense Council	Case No. U-18255	Low-income energy efficiency	Michigan	17
I/M/O Merger of AltaGas and WGL Holdings	Office of People's Counsel	Case No. 9449	Low-income / charitable contributions / community impacts	Maryland	17
I/M/O Philadelphia Gas Works	Office of Consumer Advocate	R-2017-2587783	Low-income / rate design	Pennsylvania	17

CASE NAME	CLIENT NAME	Docket No. (if available)	TOPIC	JURIS.	YEAR
I/M/O UGI-Peoples Natural Gas	Office of Consumer Advocate	R-2016-2580030	Low-income	Pennsylvania	17
I/M/O Peoples Natural Gas	Office of Attorney General	16-0376	Low-income	Illinois	17
I/M/O UGI-PNG	Office of Consumer Advocate	R-2016-2580030	Rate design/EE&CP/Low-Income	Pennsylvania	17
I/M/O Pacific Gas and Electric Company	TURN	15-09-001	Electric bill affordability	California	16
I/M/O FirstEnergy Companies (Met Ed, Penelec, PennPower, West Penn Power)	Office of Consumer Advocate	R-2016-2537349, R-2016-2537352, R-2016-2537355, R-2016-2537359 (consolidated)	Rate design / low-income program cost recovery	Pennsylvania	16
I/M/O PGW Demand Side Management	Office of Consumer Advocate	P-2014-2459362	Demand Side Management	Pennsylvania	16
I/M/O Columbia Gas of Pennsylvania	Office of Consumer Advocate	R-2016-2529660	Rate design / customer service / Low-income program cost recovery	Pennsylvania	16
I/M/O Philadelphia Water Department	Public Advocate, City of Philadelphia	N/A	Low-income program design	Philadelphia	16
I/M/O UGI Gas	Office of Consumer Advocate	M-2015-2518438	Rate design, energy efficiency, customer service	Pennsylvania	16
Keener v. Consumers Energy	Keener (plaintiff)	15-146908-NO	Collections	State District Ct-MI	16
I/M/O Energy Efficiency and Conservation Plan, Phase III, PECO Energy	Office of Consumer Advocate	M-2015-2515691	Multi-Family Energy Efficiency	Pennsylvania	16
I/M/O Energy Efficiency and Conservation Plan, Phase III, Duquesne Light Company	Office of Consumer Advocate	M-2015-2515375	Multi-Family Energy Efficiency	Pennsylvania	16
I/M/O Energy Efficiency and Conservation Plan, Phase III, FirstEnergy Companies (Metropolitan Edison, Penelec, Penn Power, West Penn Power)	Office of Consumer Advocate	M-2015-2514767; M-2015-2514768; M-2015-2514769; M-2015-2514772	Multi-Family Energy Efficiency	Pennsylvania	16
I/M/O Energy Efficiency and Conservation Plan, Phase III, PPL Electric Corporation	Office of Consumer Advocate	M-2015-251-2515642	Multi-Family Energy Efficiency	Pennsylvania	16
I/M/O BC Hydro	Public Interest Action Centre	N/A	Rate design / terms and conditions / energy efficiency	British Columbia	15 - 16

CASE NAME	CLIENT NAME	Docket No. (if available)	TOPIC	JURIS.	YEAR
Augustin v. Philadelphia Gas Works	Augustin (Plaintiffs)	2:14—cv-04238	Constitutional notice issues	U.S. District Court (E.D. PA)	15
I/M/O PPL Utilities	Office of Consumer Advocate	R-2015-2469275	Rate design / customer service	Pennsylvania	15
I/M/O Columbia Gas Company	Office of Consumer Advocate	R-2015-2468056	Rate design / customer service	Pennsylvania	15
I/M/O PECO Energy Company	Office of Consumer Advocate	R-2015-2468981	Rate design / customer service	Pennsylvania	15
I/M/O Philadelphia Gas Works	Office of Consumer Advocate	P-2014-2459362	Demand Side Management	Pennsylvania	15
I/M/O SBG Management v. Philadelphia Gas Works	SBG Management	C-2012-2308454	Customer service	Pennsylvania	15
I/M/O Manitoba Hydro	Resource Action Centre		Low-income affordability	Manitoba	15
I/M/O FirstEnergy Companies (Met Ed, WPP, Penelec, Penn Power)	Office of Consumer Advocate	R-2014-2428742 (8743, 8744, 8745)	Rate design / customer service / storm communications	Pennsylvania	14
I/M/O Xcel Energy Company	Energy CENTS Coalition	E002/GR-13-868	Rate design / energy conservation	Minnesota	14
I/M/O Peoples Gas Light and Coke Company / North Shore Gas	Office of Attorney General	14-0224 / 14--0225	Rate design / customer service	Illinois	14
I/M/O Columbia Gas of Pennsylvania	Office of Consumer Advocate	R-2014-2406274	Rate design / customer service	Pennsylvania	14
I/M/O Duquesne Light Company Rates	Office of Consumer Advocate	R-2013-2372129	Rate design / customer service / storm communications	Pennsylvania	13
I/M/O Duquesne Light Company Universal Service	Office of Consumer Advocate	M-2013-2350946	Low-income program design	Pennsylvania	13
I/M/O Peoples-TWP	Office of Consumer Advocate	P-2013-2355886	Low-income program design / rate design	Pennsylvania	13
I/M/O PECO CAP Shopping Plan	Office of Consumer Advocate	P-2013-2283641	Retail shopping	Pennsylvania	13
I/M/O PECO Universal Service Programs	Office of Consumer Advocate	M-201202290911	Low-income program design	Pennsylvania	13
I/M/O Privacy of Consumer Information	Legal Services Advocacy Project	CI-12-1344	Privacy of SSNs & consumer information	Minnesota	13
I/M/O Atlantic City Electric Company	Division of Rate Counsel	BPU-12121071	Customer service / Storm communications	New Jersey	13
I/M/O Jersey Central Power and Light Company	Division of Rate counsel	BPU-12111052	Customer service / Storm communications	New Jersey	13
I/M/O Columbia Gas Company	Office of Consumer Advocate	R-2012-2321748	Universal service	Pennsylvania	13

CASE NAME	CLIENT NAME	Docket No. (if available)	TOPIC	JURIS.	YEAR
I/M/O Public Service Company of Colorado Low-Income Program Design	Xcel Energy d/b/a PSCo	12A-EG	Low-income program design / cost recovery	Colorado	12
I/M/O Philadelphia Water Department.	Philadelphia Public Advocate	No. Docket No.	Customer service	Philadelphia	12
I/M/O PPL Electric Power Corporation	Office of Consumer Advocate	R-2012-2290597	Rate design / low-income programs	Pennsylvania	12
I/M/O Peoples Natural Gas Company	Office of Consumer Advocate	R-2012-2285985	Rate design / low-income programs	Pennsylvania	12
I/M/O Merger of Constellation/Exelon	Office of Peoples Counsel	CASE 9271	Customer Service	Maryland	11
I/M/O Duke Energy Carolinas	North Carolina Justice Center	E-7, SUB-989	Customer service/low-income rates	North Carolina	11
Re. Duke Energy/Progress Energy merger	NC Equal Justice foundation	E-2, SUB 998	Low-income merger impacts	North Carolina	11
Re. Atlantic City Electric Company	Division of Rate Counsel	ER1186469	Customer Service	New Jersey	11
Re. Camelot Utilities	Office of Attorney General	11-0549	Rate shock	Illinois	11
Re. UGI—Central Penn Gas	Office of Consumer Advocate	R-2010-2214415	Low-income program design/cost recovery	Pennsylvania	11
Re. National Fuel Gas	Office of Consumer Advocate	M-2010-2192210	Low-income program cost recovery	Pennsylvania	11
Re. Philadelphia Gas Works	Office of Consumer Advocate	P-2010-2178610	Program design	Pennsylvania	11
Re. PPL	Office of Consumer Advocate	M-2010-2179796	Low-income program cost recovery	Pennsylvania	11
Re. Columbia Gas Company	Office of Consumer Advocate	R-2010-2215623	Rate design/Low-income program cost recovery	Pennsylvania	11
Crowder et al. v. Village of Kauffman	Crowder (plaintiffs)	3:09-CV-02181-M	Section 8 utility allowances	Texas Fed Court	11
I/M/O Peoples Natural Gas Company.	Office of Consumer Advocate	T-2010-220172	Low-income program design/cost recovery	Pennsylvania	11
I/M/O Commonwealth Edison	Office of Attorney General	10-0467	Rate design/revenue requirement	Illinois	10
I/M/O National Grid d/b/a Energy North	NH Legal Assistance	DG-10-017	Rate design/revenue requirement	New Hampshire	10
I/M/O Duquesne Light Company	Office of Consumer Advocate	R-2010-2179522	Low-income program cost recovery	Pennsylvania	10
I/M/O Avista Natural Gas Corporation	The Opportunity Council	UF-100467	Low-income assistance/rate design	Washington	10
I/M/O Manitoba Hydro	Resource Conservation Manitoba (RCM)	CASE NO. 17/10	Low-income program design	Manitoba	10
I/M/O TW Phillips	Office of Consumer Advocate	R-2010-2167797	Low-income program cost recovery	Pennsylvania	10
I/M/O PECO Energy—Gas Division	Office of Consumer Advocate	R-2010-2161592	Low-income program cost recovery	Pennsylvania	10
I/M/O PECO Energy—Electric Division	Office of Consumer Advocate	R-2010-2161575	Low-income program cost recovery	Pennsylvania	10
I/M/O PPL Energy	Office of Consumer Advocate	R-2010-2161694	Low-income program cost recovery	Pennsylvania	10

CASE NAME	CLIENT NAME	Docket No. (if available)	TOPIC	JURIS.	YEAR
I/M/O Columbia Gas Company	Office of Consumer Advocate	R-2009-2149262	Low-income program design/cost recovery	Pennsylvania	10
I/M/O Atlantic City Electric Company	Office of Rate Council	R09080664	Customer service	New Jersey	10
I/M/O Philadelphia Gas Works	Office of Consumer Advocate	R-2009-2139884	Low-income program cost recovery	Pennsylvania	10
I/M/O Philadelphia Gas Works	Office of Consumer Advocates	R-2009-2097639	Low-income program design	Pennsylvania	10
I/M/O Xcel Energy Company	Xcel Energy Company (PSCo)	085-146G	Low-income program design	Colorado	09
I/M/O Atmos Energy Company	Atmos Energy Company	09AL-507G	Low-income program funding	Colorado	09
I/M/O New Hampshire CORE Energy Efficiency Programs	New Hampshire Legal Assistance	D-09-170	Low-income efficiency funding	New Hampshire	09
I/M/O Public Service Company of New Mexico (electric)	Community Action of New Mexico	08-00273-UT	Rate Design	New Mexico	09
I/M/O UGI Pennsylvania Natural Gas Company (PNG)	Office of Consumer Advocate	R-2008-2079675	Low-income program	Pennsylvania	09
I/M/O UGI Central Penn Gas Company (CPG)	Office of Consumer Advocate	R-2008-2079660	Low-income program	Pennsylvania	09
I/M/O PECO Electric (provider of last resort)	Office of Consumer Advocate	R-2008-2028394	Low-income program	Pennsylvania	08
I/M/O Equitable Gas Company	Office of Consumer Advocate	R-2008-2029325	Low-income program	Pennsylvania	08
I/M/O Columbia Gas Company	Office of Ohio Consumers' Counsel	08-072-GA-AIR	Rate design	Ohio	08
I/M/O Dominion East Ohio Gas Company	Office of Ohio Consumers' Counsel	07-829-GA-AIR	Rate design	Ohio	08
I/M/O Vectren Energy Delivery Company	Office of Ohio Consumers' Counsel	07-1080-GA-AIR	Rate design	Ohio	08
I/M/O Public Service Company of North Carolina	NC Department of Justice	G-5, SUB 495	Rate design	North Carolina	08
I/M/O Piedmont Natural Gas Company	NC Department of Justice	G-9, SUB 550	Rate design	North Carolina	08
I/M/O National Grid	New Hampshire Legal Assistance	DG-08-009	Low-income rate assistance	New Hampshire	08
I/M/O EnPower Maryland	Office of Peoples Counsel	PC-12	Low-income energy efficiency	Maryland	08
I/M/O Duke Energy Carolinas Save-a-Watt Program	NC Equal Justice Foundation	E-7, SUB 831	Low-income energy efficiency	North Carolina	08
I/M/O Zia Natural Gas Company	Community Action New Mexico	08-00036-UT	Low-income/low-use rate design	New Mexico	08
I/M/O Universal Service Fund Support for the Affordability of Local Rural Telecomm Service	Office of Consumer Advocate	I-0004010	Telecomm service affordability	Pennsylvania	08
I/M/O Philadelphia Water Department	Public Advocate	No Docket No.	Credit and Collections	Philadelphia	08
I/M/O Portland General Electric Company	Community Action--Oregon	UE-197	General rate case	Oregon	08
I/M/O Philadelphia Electric Company (electric)	Office of Consumer Advocate	M-00061945	Low-income program	Pennsylvania	08

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I/M/O Philadelphia Electric Company (gas)	Office of Consumer Advocate	R-2008-2028394	Low-income program	Pennsylvania	08
I/M/O Columbia Gas Company	Office of Consumer Advocate	R-2008-2011621	Low-income program	Pennsylvania	08
I/M/O Public Service Company of New Mexico	Community Action New Mexico	08-00092-UT	Fuel adjustment clause	New Mexico	08
I/M/O Petition of Direct Energy for Low-Income Aggregation	Office of Peoples Counsel	CASE 9117	Low-income electricity aggregation	Maryland	07
I/M/O Office of Consumer Advocate et al. v. Verizon and Verizon North	Office of Consumer Advocate	C-20077197	Lifeline telecommunications rates	Pennsylvania	07
I/M/O Pennsylvania Power Company	Office of Consumer Advocate	P-00072437	Low-income program	Pennsylvania	07
I/M/O National Fuel Gas Distribution Corporation	Office of Consumer Advocate	M-00072019	Low-income program	Pennsylvania	07
I/M/O Public Service of New Mexico—Electric	Community Action New Mexico	07-00077-UT	Low-income programs	New Mexico	07
I/M/O Citizens Gas/NIPSCO/Vectren for Universal Service Program	Citizens Gas & Coke Utility/Northern Indiana Public Service/Vectren Energy	CASE 43077	Low-income program design	Indiana	07
I/M/O PPL Electric	Office of Consumer Advocate	R-00072155	Low-income program	Pennsylvania	07
I/M/O Section 15 Challenge to NSPI Rates	Energy Affordability Coalition	P-886	Discrimination in utility regulation	Nova Scotia	07
I/M/O Philadelphia Gas Works	Office of Consumer Advocate	R-00061931	Low-income programs / credit and collections	Pennsylvania	07
I/M/O Equitable Gas Company	Office of Consumer Advocate	M-00061959	Low-income program	Pennsylvania	07
I/M/O Public Service Company of New Mexico	Community Action of New Mexico	Case No. 06-000210-UT	Late charges / winter moratorium / decoupling	New Mexico	06
I/M/O Verizon Massachusetts	ABCD	Case NO. DTE 06-26	Late charges	Massachusetts	06
I/M/O Section 11 Proceeding, Energy Restructuring	Office of Peoples Counsel	PC9074	Low-income needs and responses	Maryland	06
I/M/O Citizens Gas/NIPSCO/Vectren for Univ. Svc. Program	Citizens Gas & Coke Utility/Northern Indiana Public Service/Vectren Energy	Case No. 43077	Low-income program design	Indiana	06
I/M/O Public Service Co. of North Carolina	North Carolina Attorney General/Dept. of Justice	G-5, Sub 481	Low-income energy usage	North Carolina	06
I/M/O Electric Assistance Program	New Hampshire Legal Assistance	DE 06-079	Electric low-income program design	New Hampshire	06
I/M/O Verizon Petition for Alternative Regulation	New Hampshire Legal Assistance	DM-06-072	Basic local telephone service	New Hampshire	06
I/M/O Pennsylvania Electric Co./Metropolitan Edison Co.	Office of Consumer Advocate	N/A	Universal service cost recovery	Pennsylvania	06
I/M/O Duquesne Light Company	Office of Consumer Advocates	R-00061346	Universal service cost recovery	Pennsylvania	06

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I/M/O Natural Gas DSM Planning	Low-Income Energy Network	EB-2006-0021	Low-income gas DSM program.	Ontario	06
I/M/O Union Gas Co.	Action Centre for Tenants Ontario (ACTO)	EB-2005-0520	Low-income program design	Ontario	06
I/M/O Public Service of New Mexico merchant plant	Community Action New Mexico	05-00275-UT	Low-income energy usage	New Mexico	06
I/M/O Customer Assistance Program design and cost recovery	Office of Consumer Advocate	M-00051923	Low-income program design	Pennsylvania	06
I/M/O NIPSCO Proposal to Extend Winter Warmth Program	Northern Indiana Public Service Company	Case 42927	Low-income energy program evaluation	Indiana	05
I/M/O Piedmont Natural Gas	North Carolina Attorney General/Dept. of Justice	G-9, Sub 499	Low-income energy usage	North Carolina	05
I/M/O PSEG merger with Exelon Corp.	Division of Ratepayer Advocate	EM05020106	Low-income Issues	New Jersey	05
Re. Philadelphia Water Department	Public Advocate	No docket number	Water collection factors	Philadelphia	05
I/M/O statewide natural gas universal service program	New Hampshire Legal Assistance	N/A	Universal service	New Hampshire	05
I/M/O Sub-metering requirements for residential rental properties	Tenants Advocacy Centre of Ontario	EB-2005-0252	Sub-metering consumer protections	Ontario	05
I/M/O National Fuel Gas Distribution Corp.	Office of Consumer Advocate	R-00049656	Universal service	Pennsylvania	05
I/M/O Philadelphia Gas Works (PGW)	Office of Consumer Advocate	R-00049157	Low-income and residential collections	Pennsylvania	04
I/M/O Nova Scotia Power, Inc.	Dalhousie Legal Aid Service	NSUARB-P-881	Universal service	Nova Scotia	04
I/M/O Lifeline Telephone Service	National Ass'n State Consumer Advocates (NASUCA)	WC 03-109	Lifeline rate eligibility	FCC	04
Mackay v. Verizon North	Office of Consumer Advocate	C20042544	Lifeline rates—vertical services	Pennsylvania	04
I/M/O PECO Energy	Office of Consumer Advocate	N/A	Low-income rates	Pennsylvania	04
I/M/O Philadelphia Gas Works	Office of Consumer Advocate	P00042090	Credit and collections	Pennsylvania	04
I/M/O Citizens Gas & Coke/Vectren	Citizens Action Coalition of Indiana	Case 42590	Universal service	Indiana	04
I/M/O PPL Electric Corporation	Office of Consumer Advocate	R00049255	Universal service	Pennsylvania	04
I/M/O Consumers New Jersey Water Company	Division of Ratepayer Advocate	N/A	Low-income water rate	New Jersey	04
I/M/O Washington Gas Light Company	Office of Peoples Counsel	Case 8982	Low-income gas rate	Maryland	04
I/M/O National Fuel Gas	Office of Consumer Advocate	R-00038168	Low-income program design	Pennsylvania	03
I/M/O Washington Gas Light Company	Office of Peoples Counsel	Case 8959	Low-income gas rate	Maryland	03

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Golden v. City of Columbus	Helen Golden	C2-01-710	ECOA disparate impacts	Ohio	02
Huegel v. City of Easton	Phyllis Huegel	00-CV-5077	Credit and collection	Pennsylvania	02
I/M/O Universal Service Fund	Public Utility Commission staff	N/A	Universal service funding	New Hampshire	02
I/M/O Philadelphia Gas Works	Office of Consumer Advocate	M-00021612	Universal service	Pennsylvania	02
I/M/O Washington Gas Light Company	Office of Peoples Counsel	Case 8920	Rate design	Maryland	02
I/M/O Consumers Illinois Water Company	Illinois Citizens Utility Board	02-155	Credit and collection	Illinois	02
I/M/O Public Service Electric & Gas Rates	Division of Ratepayer Advocate	GR01050328	Universal service	New Jersey	01
I/M/O Pennsylvania-American Water Company	Office of Consumer Advocate	R-00016339	Low-income rates and water conservation	Pennsylvania	01
I/M/O Louisville Gas & Electric Prepayment Meters	Kentucky Community Action Association	200-548	Low-income energy	Kentucky	01
I/M/O NICOR Budget Billing Plan Interest Charge	Cook County State's Attorney	01-0175	Rate Design	Illinois	01
I/M/O Rules Re. Payment Plans for High Natural Gas Prices	Cook County State's Attorney	01-0789	Budget Billing Plans	Illinois	01
I/M/O Philadelphia Water Department	Office of Public Advocate	No docket number	Credit and collections	Philadelphia	01
I/M/O Missouri Gas Energy	Office of Peoples Counsel	GR-2001-292	Low-income rate relief	Missouri	01
I/M/O Bell Atlantic-New Jersey Alternative Regulation	Division of Ratepayer Advocate	T001020095	Telecommunications universal service	New Jersey	01
I/M/O Entergy Merger	Low-income Intervenor	2000-UA925	Consumer protections	Mississippi	01
I/M/O T.W. Phillips Gas and Oil Co.	Office of Consumer Advocate	R00994790	Rate-making of universal service costs.	Pennsylvania	00
I/M/O Peoples Natural Gas Company	Office of Consumer Advocate	R-00994782	Rate-making of universal service costs.	Pennsylvania	00
I/M/O UGI Gas Company	Office of Consumer Advocate	R-00994786	Rate-making of universal service costs.	Pennsylvania	00
I/M/O PFG Gas Company	Office of Consumer Advocate	R00994788	Rate-making of universal service costs.	Pennsylvania	00
Armstrong v. Gallia Metropolitan Housing Authority	Equal Justice Foundation	2-98-CV-373	Public housing utility allowances	Ohio	00
I/M/O Bell Atlantic-New Jersey Alternative Regulation	Division of Ratepayer Advocate	T099120934	Telecommunications universal service	New Jersey	00
I/M/O Universal Service Fund for Gas and Electric Utilities	Division of Ratepayer Advocate	EX00200091	Design and funding of low-income programs	New Jersey	00
I/M/O Consolidated Edison Merger with Northeast Utilities	Save Our Homes Organization	DE 00-009	Merger impacts on low-income	New Hampshire	00
I/M/O UtiliCorp Merger with St. Joseph Light & Power	Missouri Dept. of Natural Resources	EM2000-292	Merger impacts on low-income	Missouri	00

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I/M/O UtiliCorp Merger with Empire District Electric	Missouri Dept. of Natural Resources	EM2000-369	Merger impacts on low-income	Missouri	00
I/M/O PacifiCorp	The Opportunity Council	UE-991832	Low-income energy affordability	Washington	00
I/M/O Public Service Co. of Colorado	Colorado Energy Assistance Foundation	99S-609G	Natural gas rate design	Colorado	00
I/M/O Avista Energy Corp.	Spokane Neighborhood Action Program	UE9911606	Low-income energy affordability	Washington	00
I/M/O TW Phillips Energy Co.	Office of Consumer Advocate	R-00994790	Universal service	Pennsylvania	00
I/M/O PECO Energy Company	Office of Consumer Advocate	R-00994787	Universal service	Pennsylvania	00
I/M/O National Fuel Gas Distribution Corp.	Office of Consumer Advocate	R-00994785	Universal service	Pennsylvania	00
I/M/O PFG Gas Company/Northern Penn Gas	Office of Consumer Advocate	R-00005277	Universal service	Pennsylvania	00
I/M/O UGI Energy Company	Office of Consumer Advocate	R-00994786	Universal service	Pennsylvania	00
Re. PSCO/NSP Merger	Colorado Energy Assistance Foundation	99A-377EG	Merger impacts on low-income	Colorado	99 - 00
I/M/O Peoples Gas Company	Office of Consumer Advocate	R-00994782	Universal service	Pennsylvania	99
I/M/O Columbia Gas Company	Office of Consumer Advocate	R-00994781	Universal service	Pennsylvania	99
I/M/O PG Energy Company	Office of Consumer Advocate	R-00994783	Universal service	Pennsylvania	99
I/M/O Equitable Gas Company	Office of Consumer Advocate	R-00994784	Universal service	Pennsylvania	99
Alleruzzo v. Klarchek	Barlow Alleruzzo	N/A	Mobile home fees and sales	Illinois	99
I/M/O Restructuring New Jersey's Natural Gas Industry	Division of Ratepayer Advocate	GO99030123	Universal service	New Jersey	99
I/M/O Bell Atlantic Local Competition	Public Utility Law Project	P-00991648	Lifeline telecommunications rates	Pennsylvania	99
I/M/O Merger Application for SBC and Ameritech Ohio	Edgemont Neighborhood Association	N/A	Merger impacts on low-income consumers	Ohio	98 - 99
I/M/O Baltimore Gas and Electric Restructuring Plan	Maryland Office of Peoples Counsel	Case No. 8794	Consumer protection/basic generation service	Maryland	98 - 99
I/M/O Delmarva Power and Light Restructuring Plan	Maryland Office of Peoples Counsel	Case No. 8795	Consumer protection/basic generation service	Maryland	98 - 99
I/M/O Potomac Electric Power Co. Restructuring Plan	Maryland Office of Peoples Counsel	Case No. 8796	Consumer protection/basic generation service	Maryland	98 - 99

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I/M/O Potomac Edison Restructuring Plan	Maryland Office of Peoples Counsel	Case No. 8797	Consumer protection/basic generation service	Maryland	98 - 99

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