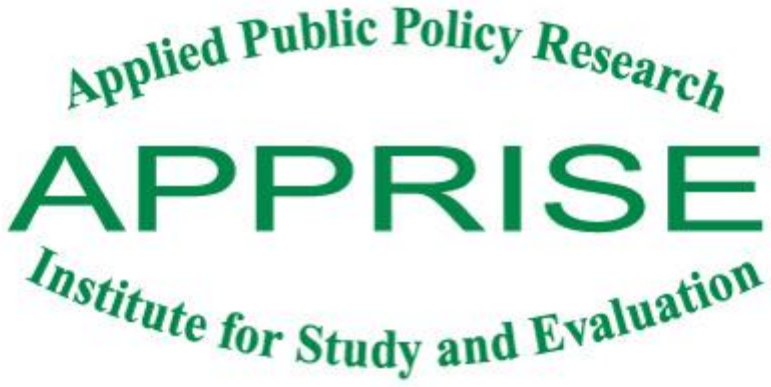

District of Columbia LIHEAP Energy Burden Analysis

Prepared for the
Department of Energy & Environment
1200 First Street, NE, 5th Floor
Washington, DC 20002

September 2018

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Table of Contents

Executive Summary

The purpose of this analysis is to assist the Department of Energy & Environment (DOEE) in its efforts to mitigate the energy costs of those with the highest home energy needs, greatest energy burdens, and least amount of available resources. The study characterized the population of low-income households in the District of Columbia and estimated the penetration rate of the District of Columbia's existing energy assistance programs. It furnishes DOEE with the information that it needs to modify its benefits matrix in a way that meets the statutory guidance of the federal LIHEAP program. It also helps DOEE to identify procedures to fulfill the District's mandates to make the distribution of benefits more equitable, maintain a year-round program, and coordinate LIHEAP with new the Solar for All program. The second phase of the study will use the results of this analysis to examine alternative benefit structure procedures.

The study consisted of three complementary tasks, including:

1. LIHEAP Program Documentation - Developed detailed information on the program design and implementation.

2. Characterization of Income-Eligible Households - Furnished information on the characteristics of low-income households and estimates of program participation rates.

3. Benefit Targeting Analysis - Examined the effectiveness of the LIHEAP Benefit Matrix in targeting benefits to clients.

The District of Columbia conducts outreach to low-income households and gives those households a number of different ways to enroll in the LIHEAP program. DOEE also has established linkages between LIHEAP and the District's other low-income energy assistance (e.g. RAD and RES) and energy efficiency programs (e.g. WAP) by developing a streamlined application process and eligibility verification. Our research found that there could be better communications between DOEE and the DC Housing Authority with respect to coordination of LIHEAP benefits with the utility allowances available through the Housing Choice Voucher Program.

About one quarter (27%) of the population in the District of Columbia is income-eligible for LIHEAP. Important household characteristics include:

- Main Heating Fuel - Most of these low-income households use natural gas (51%) or electric (44%) as their main heating fuel.

- Housing Unit Type - One-quarter of low-income households live in single family homes (either attached or detached) compared to three-quarters living in multifamily homes (13% in small, 2-4 unit buildings and 62% in large, 5+ unit buildings).

- Tenure - About 80% of the low-income households in the District are renters.

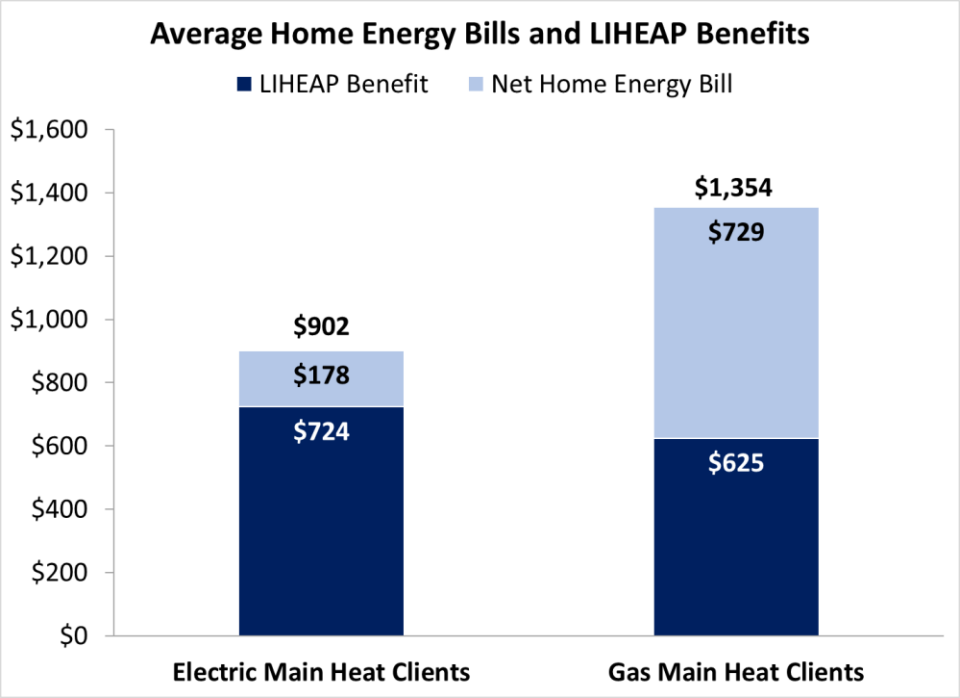
In FY 2017, the District's LIHEAP program was able to serve about 27% of the households that are income-eligible for LIHEAP. Since the District's LIHEAP program only serves households

who pay at least one energy bill, some households who are income-eligible for the program are not eligible to receive benefits. In FY 2017, the District's program was able to serve about 40% of the households who were eligible to receive benefits.

The District's benefit matrix is used to assign benefits to households who apply for LIHEAP. The intention of the matrix is to assign the highest benefits to those households with the highest energy burdens. Our review of the current matrix shows that it gives higher benefits to households who have lower income, more family members, live in single family homes, and use electricity as their main heating fuel. Our analysis of energy burden for the District's LIHEAP clients found that each of those factors is associated with higher energy burden, except for electric main heating fuel.

Figure 1 shows the average home energy bill (gross and net) and total LIHEAP benefits (regular and crisis assistance) by main heating fuel. Clients using electric as their main heating fuel have an average annual gross home energy bill of $902 and receive an average annual total LIHEAP benefit of $724, resulting in an average annual net home energy bill of $178. Clients using natural gas as their main heating fuel have an average annual gross home energy bill of $1,354 and receive an average annual total LIHEAP benefit of $625, resulting in an average annual net home energy bill of $729.

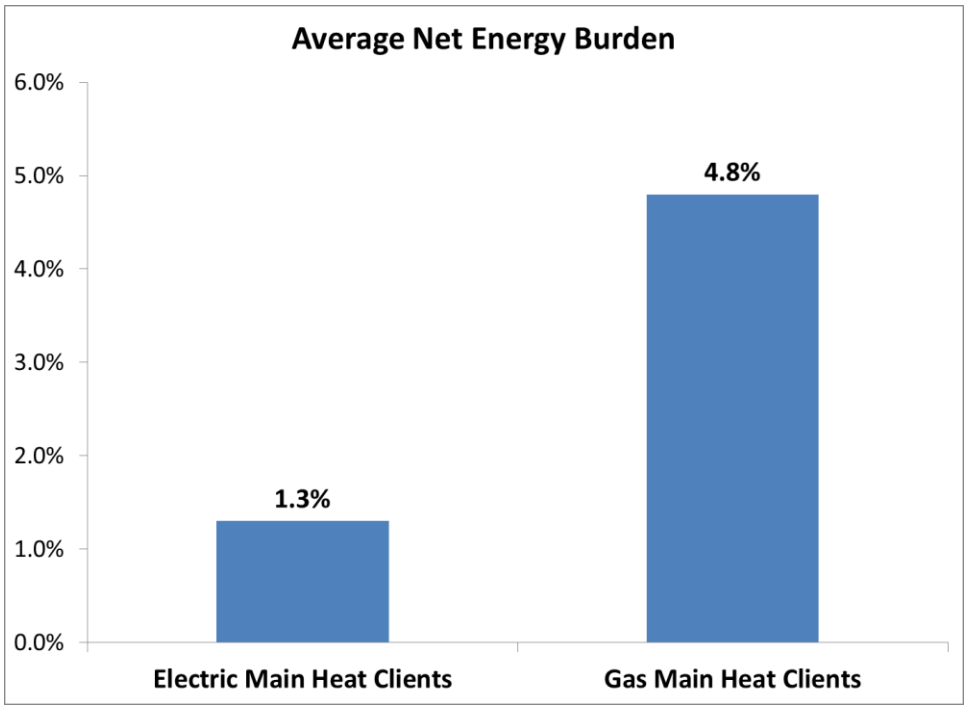
Figure 1. Average Home Energy Bill and LIHEAP Benefits by Main Heating Fuel



For both types of households, the LIHEAP program pays a significant share of a household's residential energy bill. However, since electric main heat clients have lower energy bills and receive a higher benefit than natural gas main heat clients, the program has a much greater

impact for those households. Figure 2 shows that the average net energy burden for clients using electric as their main heating fuel is about 1.3 percent of income compared to about 4.8 percent of income for clients with natural gas main heat. While the average net energy burden for both groups of clients is considered affordable, clients using natural gas as their main heating fuel have average net energy burden nearly four times higher than clients using electric has their main heating fuel.

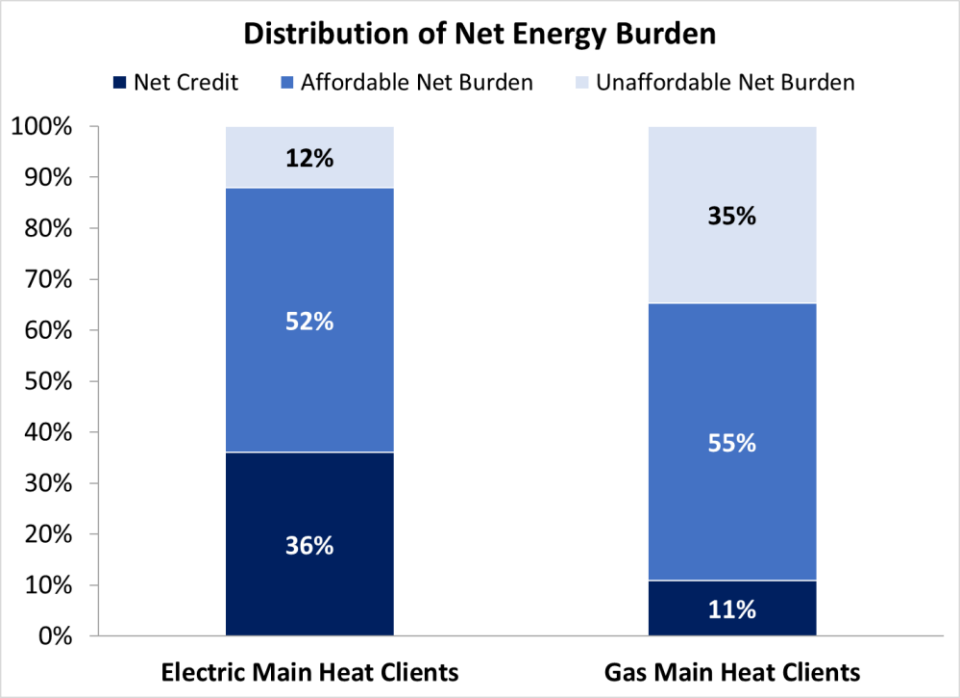
Figure 2. Average Net Energy Burden by Main Heating Fuel



The current benefits matrix targets higher benefits to electric main heat clients than natural gas main heat clients, despite natural gas main heat clients having higher total energy bills and burden. On a client-level basis, this leads to different distributions of net energy burden according to main heating fuel type. Figure 3 shows the following about the net energy burden of individual clients:

- 11% of natural gas main heat clients have a net credit after receiving LIHEAP compared to 36% of electric main heat clients.
- About one-half of both natural gas main heat clients and electric main heat clients have affordable net energy burden (0%-6% of income) after receiving LIHEAP.
- 35% of natural gas main heat clients have unaffordable (>6%) net energy burden (>6% of income) compared to 12% of electric main heat clients.

Figure 3. Distribution of Net Energy Burden by Main Heating Fuel



Based on these findings, the study makes short-term and longer-term recommendations to DOEE regarding the targeting of benefits to meet OCS performance targets and District goals. Detailed recommendations are examined in a separate memo discussing alternative options for benefit determination procedures.

Section 1 – Introduction

The purpose of this analysis is to assist the Department of Energy & Environment (DOEE) in its efforts to mitigate the energy costs of those with the highest home energy needs, greatest energy burdens, and least amount of available resources. The study characterized the population of low-income households in the District of Columbia and estimated the penetration rate of the District of Columbia's existing energy assistance programs. It furnishes DOEE with the information that it needs to modify its benefits matrix in a way that meets the statutory guidance of the federal LIHEAP program. It also helps DOEE to identify procedures to fulfill the District's mandates to make the distribution of benefits more equitable, maintain a year-round program, and coordinate LIHEAP with new the Solar for All program. The second phase of the study will use the results of this analysis to examine alternative benefit structure procedures.

The study consisted of three complementary tasks, including:

1. LIHEAP Program Documentation - Developed detailed information on the program design and implementation.

2. Characterization of Income-Eligible Households - Furnished information on the characteristics of low-income households and estimates of program participation rates.

3. Benefit Targeting Analysis - Examined the effectiveness of the LIHEAP Benefit Matrix in targeting benefits to clients.

The study makes short-term and longer-term recommendations to DOEE regarding the targeting of benefits to meet OCS performance targets and District goals.

1.1 District of Columbia LIHEAP Program Description

In this task, we prepared a detailed description of DOEE's LIHEAP procedures. The purpose of the task was to ensure that the project staff had a complete understanding of which households are eligible for the program, what documentation households must furnish to qualify for benefits, and how a household's benefit is determined. This information was needed to estimate the population of income-eligible and program-eligible households, to define population subgroups in terms of differential benefit levels, and to understand why certain households might not participate in the program at the same rate that they are found in the population.

We used five sources of information to characterize the program:

- FY 2018 LIHEAP State Plan - This is the plan that the District of Columbia filed with the Office of Community Services. It describes how the program was planned to be implemented in FY 2018.

- FY 2017 LIHEAP State Plan - This is the plan that was filed for FY 2017. The purpose of the plan review was to identify any program changes that were planned to be updated for FY 2018.

- FY 2017 LIHEAP Preliminary Household Report - This report furnished information on the number of households served by the program in FY 2017, as well as demographic data on those households. This preliminary report was filed with OCS as required by LIHEAP regulations.

- Grantee Surveys and Household Reports (FY 2010 through FY 2016) - These reports furnished information on how much funding was available for LIHEAP, how much funding was used for each program element, how many households were served by the program, and what types of households were served by the program.

- FY 2018 LIHEAP Program Operations Manual and Other Documents - These documents furnished additional details on how the program is implemented. They included the DOEE FY 2017 and FY 2018 Program Benefits Matrixes and the web-based and paper program application documents.

These information sources allowed us to furnish detailed information on:

- Program Funding
- Program Outreach Procedures
- Application and Eligibility Requirements
- Denial Appeal Procedures
- Summary Information on Households Served
- Linkages to Other Programs

This analysis furnishes useful documentation for the program, since it pulls together all information in one document.

1.2 Characteristics of LIHEAP Income-Eligible and Participating Households

In this task, we developed information on income-eligible and participating households in the District of Columbia. These data furnish DOEE with a better understanding of the population that is being served by the program and facilitate comparisons of the households served by the program with those that are income-eligible for the program.

We used two sources of data for this analysis:

- District of Columbia Grantee Surveys and Household Reports for FY 2010 through FY 2017. These reports show the federal funding available for the program, the number of households served with federal funds, and the demographic characteristics for the households served.

- American Community Survey (ACS) - We used the five-year PUMS file for the District of Columbia for 2012-2016. This was supplemented with income-eligible population

estimates for FY 2015 and FY 2016, published by the U.S. Department of Health and Human Services Office of Community Services (the federal LIHEAP office), based on the three-year average 2012-2014 ACS PUMS file and three-year average 2013-2015 ACS PUMS file, respectively.

These data allowed us to furnish information on:

- Participating Households by Demographic Group
- Eligible Households by Demographic Group
- Estimated Program Participation Rates
- Estimated Energy Bills and Energy Burden for Eligible Households

This new information gives DOEE a more complete understanding of the population of households eligible for the LIHEAP program.

1.3 Benefit Targeting Analysis

In this task, we conducted detailed analysis of the outcomes of DOEE's benefit determination procedures. We compared gross burden for LIHEAP recipients prior to receipt of LIHEAP benefits to net burden after receipt of LIHEAP benefits, and used that information to compute the District's Benefit Targeting Index and Burden Reduction Target Index, the LIHEAP Performance Measures specified by the Office of Community Services (OCS).

We used three sources of data for this task:

- LIHEAP Program Database - We obtained a LIHEAP client data for FY 2017 from DOEE.
- Washington Gas Data - We obtained annual usage and bill data from Washington Gas for calendar year 2017 for LIHEAP clients in FY 2017.
- Pepco Data - We obtained monthly usage and bill data from Pepco for calendar year 2017 for LIHEAP clients in FY 2017.

These data allowed us to develop information on:

- Gross Energy Burden for LIHEAP Participants
- Net Energy Burden for LIHEAP Participants
- Estimates of LIHEAP Performance Measures for DOEE's Program.

This analysis demonstrates the extent to which the District of Columbia LIHEAP benefit determination procedures are effective in meeting the goals set for the program by DOEE and those set by the LIHEAP program statute.

Section 2 – District of Columbia LIHEAP Program Description

In this section of the report, we furnish detailed information on the design and implementation of the District of Columbia LIHEAP program, including:

- Program Funding and Clients
- Program Outreach Procedures
- Application and Eligibility Requirements
- Denial Appeal Procedures
- Benefit Determination
- Linkages to Other Programs

The purpose of this analysis was to ensure that the project staff had a complete understanding of which households are eligible for the program, what documentation households must furnish to qualify for benefits, and how a household's benefit is determined. This information was used to estimate the population of income-eligible and program-eligible households, to define population subgroups in terms of differential benefit levels, and to understand why certain households might not have participated in the program at the same rate that they are found in the population.

2.1 Data Sources

To complete this task, we used the following data sources:

- FY 2018 LIHEAP State Plan - The plan describes how the program was planned to be implemented in FY 2018 and was filed by the District of Columbia filed with the Office of Community Services.
- FY 2017 LIHEAP State Plan - The plan describes how the program was planned to be implemented in FY 2017. The purpose of using this plan is to identify any program changes that were planned to be implemented in FY 2018.
- FY 2017 LIHEAP Household Report - This report furnishes information on the number of households served by the program in FY 2017, as well as demographic data on those households. This report was filed with OCS.
- Grantee Surveys and Household Reports (FY 2010 through FY 2016) - These reports furnish information on how much funding was available for LIHEAP, how much funding was used for each program element, how many households were served by the program, and what types of households were served by the program.

- Other Documents - Other documents used include the DOEE FY 2017 and FY 2018 Program Benefits Matrix and the LIHEAP eligibility criteria that were referenced in the scope of work.

These data sources furnished the information that we needed to document the District of Columbia LIHEAP program procedures.

2.2 Federal Program Funding and Clients Served

DOEE receives federal and local funds to administer the LIHEAP program. APPRISE used available data to document use of funds and average benefits for the share of the LIHEAP program funded with federal dollars.[1] Additional information on combined funding sources is available in Sections 2.3 and 3.3 Table 2.1 shows the total amount of federal funding[2] that the District of Columbia had available to deliver LIHEAP benefits and the total amount allocated to LIHEAP benefits[3] for each year from FY 2010 through FY 2016. The change in total funding is mainly a result of the change in federal program funding; in FY 2010, total funding for LIHEAP was about $5.3 billion, while it was only $3.5 billion in FY 2014. The percent of funds allocated directly to benefits by the District of Columbia changed each year as different amounts were allocated to program administration and carryover to the next fiscal year.

Table 2.1 - Federal Program Funding for the District of Columbia

Fiscal Year	Total Funding	Funding for Assistance Benefits	Percent Allocated to Benefits
2010	$16,838,341	$14,021,354	83%
2011	$16,115,313	$14,886,231	92%
2012	$10,847,490	$8,729,851	80%
2013	$11,045,975	$9,497,500	86%
2014	$11,153,264	$10,272,208	92%
2015	$11,429,251	$9,554,568	84%
2016	$11,270,439	$9,405,017	83%

The District of Columbia LIHEAP program allocates funds to several different types of assistance benefits, including: heating benefits, cooling benefits, winter crisis benefits, summer crisis benefits, and weatherization. Tables 2.2 through 2.6 show the trends for each type of benefit in terms of the amount of federal funds allocated, the number of households served with federal funding, and the average benefit granted. Table 2.7 shows the percent of federal funds that was allocated to each type of benefit for each year.

[1] Data on use of funds and average benefits for the full program inclusive of federal and local funding was unavailable for analysis and may differ than data using federal funds only.
[2] Total sources of funding are reported on the LIHEAP Grantee Survey for each referenced fiscal year.
[3] In addition to funding for LIHEAP assistance, the grantee is allowed to allocate funds to administration and Assurance 16 activities. The grantee also is allowed to carryover some funds to the next fiscal year.

Table 2.2 shows the allocation of federal funding for heating assistance benefits. There was a significant decrease in the amount of funding between 2011 and 2012, but the average benefit increased substantially and fewer households were served. In FY 2013, the number of households served increased and the average benefit decreased. Since then, the program has served between about 7,500 and 8,500 households per year with heating assistance and provided an average heating benefit between about $700 and $800.

Table 2.2 - Heating Assistance Using Federal Funds

Fiscal Year	Funding for Assistance Benefits	Number of Households Served	Average Benefit
2010	$9,807,950	16,716	$587
2011	$10,997,094	16,233	$677
2012	$6,842,594	5,922	$1,155
2013	$5,903,864	8,338	$708
2014	$6,871,649	8,624	$797
2015	$6,184,927	7,479	$827
2016	$6,019,894	8,335	$722
2017*	N/A	8,181	N/A

*Preliminary data

Table 2.3 shows that cooling assistance is a growing component of the program. [Note: Cooling assistance is only available to households that did not receive heating assistance.] The number of households served has increased from a few hundred in program years prior to FY 2016, to nearly 1,200 in FY 2016 and over 2,300 in FY 2017. The average cooling benefit over this period has been somewhat higher than the average heating benefit. [Note that the heating assistance program and the cooling assistance program use the same benefit matrix. Since the benefit matrix gives higher benefits to electric main heat households and all cooling assistance applicants are treated as electric heat households, the average benefit is higher for cooling program participants.]

Table 2.3 - Cooling Assistance Using Federal Funds

Fiscal Year	Funding for Assistance Benefits	Number of Households Served	Average Benefit
2010	$0	0	$0
2011	$401,360	334	$1,202
2012	$615,616	769	$801
2013	$346,658	329	$1,054
2014	$287,839	231	$1,246
2015	$396,326	557	$712

2016	$1,539,683	1,192	$1,292
2017*	N/A	2,319	N/A

*Preliminary data

Table 2.4 shows that the number of clients receiving crisis benefits has varied between about 2,300 to 5,300 over the program years examined by this study. [Note: winter crisis assistance and summer crisis assistance are combined because households can only receive one type of crisis assistance.] The average benefit in recent program years (2015 and 2016) is much lower than it was in 2010 and 2011.

Table 2.4 - Crisis Assistance Using Federal Funds

Fiscal Year	Funding for Assistance Benefits	Number of Households Served	Average Benefit
2010	$2,810,004	2,903	$968
2011	$1,794,637	2,315	$775
2012	$852,906	4,157	$205
2013	$1,871,100	2,701	$693
2014	$1,633,086	3,619	$451
2015	$1,838,856	4,921	$374
2016	$764,013	2,646	$289
2017*	N/A	5,349	N/A

*Preliminary data

Table 2.5 shows the amount of federal LIHEAP funding that was used for Weatherization. Up to 15 percent of LIHEAP funds can be transferred for use in weatherizing homes. Funds were transferred in FY 2010 through FY 2016. The number of households served varied significantly as the amount of funding varied. [Note: Funding can be obligated in one year and expended in another. That could be one source of variation in average spending per home for weatherization.]

Table 2.5 - Weatherization Crisis Assistance Using Federal Funds

Fiscal Year	Funding for Assistance Benefits	Number of Households Served	Average Benefit
2010	$1,403,400	344	$4,080
2011	$1,589,065	687	$2,313
2012	$418,735	84	$4,985
2013	$1,373,878	376	$3,654
2014	$1,479,634	221	$6,695
2015	$1,134,459	273	$4,156

Fiscal Year	Funding for Assistance Benefits	Number of Households Served	Average Benefit
2016	$1,081,427	0	N/A
2017*	N/A	96	N/A

*Preliminary data; federal funding obligated to weatherization assistance in FY 2016 was used to provide services to households in FY 2017.

Table 2.6 shows that allocation of funds to the different program elements has varied considerably over time.

Table 2.6 - Allocation of Federal Funds by Benefit Type

Fiscal Year	% Heating	% Cooling	% Winter Crisis	% Summer Crisis	% Weatherization	Total
2010	70%	0%	20%	0%	10%	100%
2011	74%	3%	12%	0%	11%	100%
2012	78%	7%	9%	1%	5%	100%
2013	62%	4%	19%	<1%	14%	100%
2014	67%	3%	15%	1%	14%	100%
2015	65%	4%	19%	0%	12%	100%
2016	64%	16%	8%	0%	12%	100%

Table 2.7 shows the unduplicated count of households served and the average value of benefits delivered to each household. [Note: In FY 2011, there was a new requirement from OCS that states furnish an unduplicated count of LIHEAP recipients. Those data are not available for FY 2010.] The table shows that the average benefit per household is more consistent from year to year than were the average benefit for individual assistance types.

Table 2.7 - Benefits Granted and Households Served (Excluding Weatherization) Using Federal Funds

Fiscal Year	Unduplicated Count of Households Served	Average Benefit per Household
2011	16,886	$787
2012	9,857	$843
2013	11,156	$728
2014	12,493	$704
2015	12,957	$650
2016	12,173	$684
2017*	10,514	N/A

*Preliminary data

2.3 Non-Federal Funding Sources

DOEE has a stated goal of operating a year-round LIHEAP program – providing assistance to clients during the heating, cooling, and shoulder seasons, meeting client needs when they arise. In recent years, staff at DOEE have estimated that a year-round program costs approximately $16 million in bill payment assistance benefits annually. To operate a year-round program, DOEE has blended its federal block grant with non-federal funding sources including local funds from the city government and funding from the Energy Assistance Trust Fund (EATF) and Sustainable Energy Trust Fund (SETF). Benefits are determined using the same procedures regardless of funding source for the individual client's grant. Table 2.8 provides the funding amounts from each of these sources for the most recent years available. Funding from the federal block grant used for bill payment assistance benefits represents about half of the funding needed each year, with non-federal sources making up the difference.

Table 2.8 - Total Program Funding Used for Bill Payment Assistance Benefits, by Funding Source

Fiscal Year	Federal Block Grant	Local City Funds	EATF	SETF	Total
2015	$7,728,614	$6,113,782	$1,469,750	$0	$15,312,146
2016	$7,514,400	$5,419,726	$1,234,036	$1,484,704	$15,652,866
2017	$7,397,248	$4,168,345	$1,446,169	$1,211,000	$14,222,762
2018	$8,235,134	$3,416,888	$4,150,656	$0	$15,802,678

2.4 Program Outreach Procedures

LIHEAP benefits are distributed to eligible clients when they apply for the program. Since the District of Columbia LIHEAP program sometimes runs out of funds before the end of the fiscal year, program outreach procedures can have an impact on who receives benefits. The outreach procedures listed in the LIHEAP State Plan include:

- Mailings to prior-year LIHEAP recipients and Utility Discount Program (UDP) participants (i.e., participants in the Residential Aid Discount Program (RAD), Residential Essential Services Program (RES), and/or Customer Assistance Program (CAP)).
- Requesting that utilities furnish bill inserts for customers.
- Publishing articles in local newspaper or broadcast media announcements.
- Placing posters and flyers in social service offices.
- Furnishing information to households who apply for other types of means-tested assistance programs.

- Providing intake services to clients through home visits or by phone for those clients who are physically infirm.

- Having DOEE staff attend Advisory Neighborhood Commission meetings and visit senior citizen housing complexes and other local organizations.

- Executing interagency agreements with other low-income program offices to perform outreach to target groups.

- Furnishing bilingual staff and translators at DOEE's offices to assist clients with completing applications.

The listed outreach procedures appear to focus outreach efforts on households that have previously participated in LIHEAP and households that receive public assistance. In addition, the in-home and phone intake procedures should increase the number of elderly or disabled households participating in the program. With these as the primary outreach activities, it is expected that the District of Columbia would have higher participation rates for lower-income and vulnerable households.

2.5 Program Application and Eligibility Requirements

Application Procedures

A household can apply for the LIHEAP program online or schedule an appointment at the DOEE Energy Office to submit an application. DOEE has observed a steady increase in the number of applications received through the online application system.

Applicants are required to bring the following items to their appointment:

- Government issued ID for the applicant.

- Proof of US citizenship or permanent resident of US.

- Proof of present address (e.g., rent receipt, lease or deed, property tax bill).

- Social Security cards for all household members.

- Proof of income information for everyone in the home who receives income.

- Copies of recent heating fuel, electric, and water bills.

- A completed application form.

If the household has their heat included in rent, they need to bring a rent receipt or a copy of their lease instead of their heating bill.

The application process is similar to apply for crisis benefits. In addition to the information listed above, the client must bring a disconnect notice.

Eligibility

Any household that meets the income-eligibility requirements and is a legal resident of the District of Columbia is eligible to receive benefits. That includes households whose main heating fuel bill is included in their rent but who pay a bill directly to the electric utility.

Households can also apply for the Utility Discount Program (UDP) at the same time as applying for LIHEAP, and the LIHEAP online application is used for Solar for All eligibility determination. The UDP provides assistance with electric, gas heat, and water bills.

2.6 Denial Appeals Procedure

Households that are denied or whose applications are not acted on in a timely manner are provided with the following resources by DOEE:

- A letter describing the decision
- A printout of the database information on which the decision was made
- The Benefits Matrix used to determine the applicant's benefits level
- Detailed instructions on how to appeal the decision if the applicant is dissatisfied with the outcome

2.7 Benefit Determination

The benefit determination procedures make use of information on the client's gross income, household size, housing unit type, main heating fuel, and payment status to set the client's LIHEAP benefit.

Since the benefit matrix is multi-dimensional, it is somewhat difficult to get a good understanding of how benefits are distributed. However, the following general guidelines apply. [Note: No changes have been made to the benefit matrix since at least 2014, when the previous study was conducted.]

- Heat in Rent - All households with heat in rent receive a benefit of $250.
- Fuel Oil Main Heat - All households with fuel oil main heat are eligible to receive a benefit of $1,500.
- Single Family vs. Multifamily - The benefits for clients living in single family homes are higher than those for clients living in multifamily homes.
- Income - Clients with lower income have higher benefits.
- Household Size - Clients with larger household sizes have higher benefits.

- Main Heating Fuel - Clients with electric main heat have higher benefits than those with gas main heat.

Table 2.9 shows one example of how the benefits vary by income, housing unit type, and main heating fuel. Several benefit determination factors for one-person households can be derived by looking at the table.

- Multifamily vs. Single Family - It appears that the multifamily benefit is about 75% of the single family benefit.
- Gas Heat vs. Electric Heat - It appears that the gas heat benefit is about 60% of the electric heat benefit.
- Income - We do not see any clear pattern with respect to the reduction in benefit as income increases.
- Minimum Benefit - Independent of other factors, it appears that the minimum benefit for households with electric main heat is $420 and the minimum benefit for households with gas main heat is $250.

Table 2.9 - Benefits for One-Person Household by Income, Housing Unit Type, and Main Heating Fuel

Income	Single Family Electric Heat	Multifamily Electric Heat	Single Family Gas Heat	Multifamily Gas Heat
$0	$1,040	$784	$620	$467
$2,000	$967	$727	$576	$433
$4,000	$813	$613	$485	$365
$6,000	$800	$601	$476	$358
$8,000	$749	$563	$446	$335
$10,000	$667	$502	$398	$299
$12,000	$551	$420	$329	$250
$14,000	$420	$420	$250	$250
$16,000	$420	$420	$250	$250
$18,000+	$420	$420	$250	$250

Table 2.10 shows the same set of data for a four-person household. Many of the same factors appear to apply. The multifamily benefit is 75% of the single family benefit. The gas heat benefit is 60% of the electric heat benefit. And, there is a minimum benefit of $420 for electric heat and $250 for gas heat. In addition, we can see that the benefit for a four-person household is about 40% higher than the benefit for a one-person household.

Table 2.10 - Benefits for Four-Person Household by Income, Housing Unit Type, and Main Heating Fuel

Income	Single Family Electric Heat	Multifamily Electric Heat	Single Family Gas Heat	Multifamily Gas Heat
$0	$1,457	$1,094	$868	$652
$2,000	$1,351	$1,011	$805	$602
$4,000	$1,139	$856	$678	$510
$6,000	$1,117	$841	$665	$501
$8,000	$1,040	$784	$620	$467
$10,000	$938	$700	$559	$417
$12,000	$771	$580	$459	$346
$14,000	$565	$424	$337	$253
$16,000	$420	$420	$250	$250
$18,000+	$420	$420	$250	$250

In general, the benefit matrix appears to be consistent with the LIHEAP requirements that those households with the lowest income and the highest home energy needs should receive the highest benefits.

- Income - Lower income households receive higher benefits.
- Household Size - Other things being equal, a larger household size is likely to be associated with a higher energy bill and higher need.
- Single Family - Other things being equal, single family homes are likely to have higher energy bills and a higher need.

Where the benefit matrix may need to be reexamined is the provision of higher benefits to electric main heat households than natural gas main heat households. Section 4 of this report will demonstrate that the energy burden of natural gas main heat households is higher than that of electric main heat households when the total energy bill (main heat plus electric) is considered.

2.8 Linkages to Other Programs

The LIHEAP program is coordinated with several other payment assistance programs that are funded by non-federal sources. The other programs include:

- Residential Aid Discount Program (RAD) - This program furnishes low-income customers with a discounted electric bill. LIHEAP recipients who pay an electric bill directly to the utility can receive this benefit. RAD program recipients can receive a discount of up to $475 per year on their electric bills ($300 per year if the recipient does

not use electric main heat). The discount lasts 18 months and participants can reapply annually. Discounts are applied to distribution charges. Participants also do not pay additional surcharges, such as those that fund RAD and other low-income programs. Customers who receive their electric supply from a competitive supplier are eligible to receive RAD because the discount applies only to the distribution portion of the bill.

- Residential Essential Service (RES) - This program furnishes low-income customers with a discounted gas bill. LIHEAP recipients who use natural gas as their primary heating fuel and who pay a gas bill directly to the utility can receive this benefit. RES program recipients can receive a discount of up to $276 per heating season on their gas heat bills. Participants can reapply annually. Discounts are applied on a per therm basis between November 1 and April 30.

- Customer Assistance Program (CAP) - This program furnishes low-income customers with a discounted water bill. LIHEAP recipients can receive this benefit.

- Solar for All (SFA) - This program was established in 2016 and intends to expand the amount of solar power generated within the District of Columbia and provide the benefits to low-income households, small business, nonprofits, and seniors. SFA is funded by the Renewable Energy Development Fund in the District of Columbia. LIHEAP recipients can participate in this program, which has an income-eligibility standard of 80% of Area Median Income (AMI). Households are considered categorically eligible for SFA if they received LIHEAP within the past six months or participated in other low-income programs including TANF, SNAP, or the Housing Choice Voucher Program, or received SSI income. Households that are not deemed categorically eligible must complete the LIHEAP online application. One part of this study is to examine the SFA program in-depth and to assess its impact on the LIHEAP program. The SFA program will be discussed at greater length in a separate memo.

- Washington Area Fuel Fund - This program assists low-income households with utility bills in emergency situations after they have exhausted other available energy assistance programs including LIHEAP. It is funded through voluntary contributions.

- S.P.L.A.S.H. - This program assists low-income households with water and sewer bills in emergency situations. It is funded through voluntary contributions.

- DC Sustainable Energy Utility - This organization delivers energy efficiency services to low-income households. The Income-Qualified Efficiency Fund provides assistance to owners and operators of multifamily properties, shelters, or clinics that serve low- to moderate-income residents in the District of Columbia.

Two federal programs that are closely related to LIHEAP, but not necessarily linked, are the Weatherization Assistance Program (WAP) and Housing Choice Voucher Program (HCVP).

- The WAP program in the District of Columbia is overseen by DOEE and administered by local Community Based Organizations (CBOs). Funded by the U.S. Department of Energy, the WAP program helps low-income residents reduce their energy bills by making their homes more energy efficient. LIHEAP and WAP utilize the same income-eligibility thresholds in the District, and DOEE makes information available for both LIHEAP and WAP under the same section of its website.

- The HCVP program provides rental assistance to low-income households and is administered by the District of Columbia Housing Authority. Rental assistance through the HCVP program includes utility allowances for low-income renters who pay their electric and/or main heating fuel vendor directly for energy services. While the LIHEAP and HCVP programs are not directly linked, low-income renter households may participate in both programs in the District.

APPRISE conducted exploratory research on the energy burden of households with utility allowances to inform the targeting of LIHEAP benefits to this group. The utility allowance research is discussed at greater length in a separate memo.

Section 3 – Characteristics of LIHEAP Income Eligible and Participating Households

This section of the report furnishes information on the households that are income-eligible for the LIHEAP program, and to the extent that the data are available, the characteristics of program participants, including:

- Households by Demographic Group
- Program Participation Rates by Demographic Group
- Households by Housing Unit Characteristics
- Energy Bills and Burdens

These data furnish DOEE with a better understanding of the population that is being served by the program and facilitate comparisons of the households served by the program with those that are eligible for the program.

In addition, many LIHEAP income-eligible households are program eligible for the RAD and/or RES utility discounts programs – both RAD and RES use the same income standard for eligibility as the LIHEAP program, with program eligibility determined based on direct payment of utility bills and, in the case of the RES program, using natural gas as the main heating fuel in the home. Each table in the section showing population characteristics for LIHEAP income-eligible households is accompanied by a companion table showing how the RAD and RES program-eligible subpopulations are similar or different compared to the LIHEAP income-eligible population.

3.1 Data Sources

To complete this task, we used the following data sources:

- Grantee Surveys and Household Reports (FY 2010 through FY 2017) - These reports furnish information on how much funding was available for LIHEAP, how much funding was used for each program element, how many households were served by the program, and what types of households were served by the program.
- American Community Survey (ACS) - We used the five-year PUMS file for the District of Columbia for 2012-2016 to develop detailed statistics for a sample of households. For analysis of LIHEAP participation rates in FY 2015 and FY 2016, this is supplemented with eligible population estimates published by the Office of Community Services using the three-year average PUMS file for the District of Columbia for 2012-2014 and 2013-2015, respectively.

These data sources furnish the information that we needed to furnish summary statistics on income-eligible and LIHEAP-participant households.

3.2 Income-Eligible Households by Demographic Group

Table 3.1 shows the distribution of households in the District of Columbia by poverty group. The 2012-2016 ACS data estimate that about 15 percent of households have income below the Poverty Line, and that another 6 percent of households have income from the Poverty Line to 150% of the Poverty Line. The income-eligibility standard for the District of Columbia LIHEAP program is 60 percent of median income. Table 3.2 shows that almost 76 thousand households (27%) are income-eligible for LIHEAP.[4] Of households that are income-eligible for LIHEAP, about 52 thousand (19% of total households) are eligible for the RAD discount from PEPCO because they report paying their electric bill directly. About 23 thousand (8% of total households) are eligible for the RES discount from Washington Gas because they report heating their homes with natural gas and pay their natural gas bill directly.

Table 3.1 - Households by Poverty Level

Poverty Group	Number of Households	Percent of Households
Income at or below 75% of Poverty	29,820	11%
76% to 100%	9,713	4%
101% to 125%	9,367	3%
126% to 150%	8,088	3%
151% or More	219,559	79%
TOTAL	276,547	100%

Source: 2012-2016 ACS

Table 3.2 - Income-Eligible Households

Poverty Group	Number of Households	Percent of Households
Income-Eligible for LIHEAP	75,808	27%
RAD Program-Eligible	51,894	19%
RES Program-Eligible	23,168	8%
Not Income-Eligible for LIHEAP	200,739	73%
TOTAL	276,547	100%

Source: 2012-2016 ACS

The LIHEAP program defines vulnerable households as those with elderly or disabled household members, or with children under the age of 6. The program defines elderly households as those with an individual who is 60 years or older. The program allows grantees to define which individuals are included in their definition of disabled. Table 3.3 shows the

[4] The LIHEAP program serves households, rather than individuals. Program eligibility is based on the incomes of all individuals in the household. For that reason, the share of households that are income-eligible for the program cannot be derived from Census statistics on the percent of families and individuals by poverty level.

number of income-eligible households with vulnerable members.[5] Thirty-four percent of income-eligible households have an elderly household member and 40 percent have a disabled member. Only about 14 percent have a young child. About one-third of income-eligible households have no vulnerable members. The percent of the population with vulnerable members is similar among the RAD-eligible population, whereas the RES-eligible population has a slightly greater percentage of households with an elderly member (44 percent) or a disabled member (44 percent).

Table 3.3A - Vulnerability Status of Income-Eligible Households

Vulnerability Group	Number of Households	Percent of Households
Elderly Member	25,988	34%
Disabled Member	30,504	40%
Young Child	10,986	14%
No Vulnerable Members	25,940	34%
TOTAL HOUSEHOLDS	75,808	100%

Source: 2012-2016 ACS

Table 3.3B - Vulnerability Status of Income-Eligible Households

Vulnerability Group	LIHEAP	RAD	RES
Elderly Member	34%	35%	44%
Disabled Member	40%	40%	44%
Young Child	14%	16%	13%
No Vulnerable Members	34%	33%	27%
TOTAL HOUSEHOLDS	100%	100%	100%

Source: 2012-2016 ACS

The ACS also furnishes other information that helps to characterize the income-eligible households, including:

- Number of Household Members - Table 3.4 shows the distribution of households by the number of members in the household. Fifty percent of income-eligible households in the District of Columbia are one-person households. About 18 percent have four or more household members.

- Race/Ethnicity - Table 3.5 shows the distribution of households by the race/ethnicity of the head of household. About 72 percent of income-eligible households have a non-Hispanic Black head of household. Thirteen percent are non-Hispanic White individuals and 11 percent are Hispanic.

[5] In their annual reports, the Office of Community Services (OCS) uses a number of ACS questions to determine whether an individual is disabled. Those same definitions are used for Table 3.

- Language Spoken at Home - Table 3.6 shows the language spoken at home by income-eligible households. About 81 percent of households speak English as their primary language, while about 10 percent speak Spanish.

- Household Types - Table 3.7 shows the distribution of households by household type. About one-fourth of households have only elderly individuals, and most of those are a single elderly person (23 percent). About 30 percent of households have children, and most of those are single-parent families. About 38 percent of households do not have either elderly members or children.

- SNAP Recipient - Table 3.8 shows the percentage of income-eligible households that receive SNAP benefits. About 41 percent of income-eligible households reported receiving SNAP.

These population statistics show that a large share of the income-eligible households are one-person households. Almost 20 percent of the income-eligible households speak a language other than English at home and about 40 percent of the households are SNAP recipients.

Table 3.4A - Number of Household Members

Household Members	Number of Households	Percent of Households
One	38,162	50%
Two	15,468	20%
Three	8,816	12%
Four or More	13,362	18%
TOTAL HOUSEHOLDS	75,808	100%

Source: 2012-2016 ACS

Table 3.4B - Number of Household Members

Household Members	LIHEAP	RAD	RES
One	50%	46%	45%
Two	20%	21%	20%
Three	12%	13%	13%
Four or More	18%	19%	22%
TOTAL HOUSEHOLDS	100%	100%	100%

Source: 2012-2016 ACS

Table 3.5A - Race/Ethnicity

Race/Ethnicity	Number of Households	Percent of Households
White Non-Hispanic	9,984	13%

Race/Ethnicity	Number of Households	Percent of Households
Black Non-Hispanic	54,313	72%
Hispanic	8,059	11%
Asian	2,036	3%
Other	1,416	2%
TOTAL HOUSEHOLDS	75,808	100%

Source: 2012-2016 ACS

Table 3.5B - Race/Ethnicity

Race/Ethnicity	LIHEAP	RAD	RES
White Non-Hispanic	13%	10%	10%
Black Non-Hispanic	72%	76%	77%
Hispanic	11%	10%	9%
Asian	3%	2%	2%
Other	2%	2%	2%
TOTAL HOUSEHOLDS	100%	100%	100%

Source: 2012-2016 ACS

Table 3.6A - Language Spoken at Home

Language	Number of Households	Percent of Households
English	61,532	81%
Spanish	7,738	10%
Indo-European	2,541	3%
Asian and Pacific Island	1,462	2%
Other	2,535	3%
TOTAL HOUSEHOLDS	75,808	100%

Source: 2012-2016 ACS

Table 3.6B - Language Spoken at Home

Language	LIHEAP	RAD	RES
English	81%	82%	82%
Spanish	10%	10%	9%
Indo-European	3%	3%	3%
Asian and Pacific Island	2%	2%	1%
Other	3%	4%	3%
TOTAL HOUSEHOLDS	100%	100%	100%

Source: 2012-2016 ACS

Table 3.7A - Household Type

Household Type	Number of Households	Percent of Households
Elderly Couple*	1,677	2%
Elderly Individual	17,427	23%
Two Parents with Children**	3,476	5%
One Parent with Children**	19,387	26%
Other Households with Children**	193	<1%
Other Households with Elderly	4,573	6%
Other Households	29,075	38%
TOTAL HOUSEHOLDS	75,808	100%

Source: 2012-2016 ACS, *Can include a non-elderly spouse, **Can include an elderly individual

Table 3.7B - Household Type

Household Type	LIHEAP	RAD	RES
Elderly Couple*	2%	3%	4%
Elderly Individual	23%	21%	24%
Two Parents with Children**	5%	4%	5%
One Parent with Children**	26%	28%	27%
Other Households with Children**	<1%	<1%	<1%
Other Households with Elderly	6%	7%	10%
Other Households	38%	36%	31%
TOTAL HOUSEHOLDS	100%	100%	100%

Source: 2012-2016 ACS, *Can include a non-elderly spouse, **Can include an elderly individual

Table 3.8A - SNAP Recipient

SNAP Recipient	Number of Households	Percent of Households
Yes	30,845	41%
No	44,963	59%
TOTAL HOUSEHOLDS	75,808	100%

Source: 2012-2016 ACS

Table 3.8B - SNAP Recipient

SNAP Recipient	LIHEAP	RAD	RES
Yes	41%	41%	39%
No	59%	59%	61%
TOTAL HOUSEHOLDS	100%	100%	100%

Source: 2012-2016 ACS

3.3 Program Participation Rates by Demographic Group

OCS requests that each grantee submit annual reports on the number and characteristics of LIHEAP recipient households. In this section of the memo, we compare the income-eligible population to the recipient population (based on all sources of LIHEAP funding in the District of Columbia) to estimate the program participation rates for FY 2015 through FY 2017.

Table 3.9 shows the estimated participation rate in FY 2015. About 26 percent of income-eligible households received LIHEAP benefits. The estimated participation rate for young child households was above the average (31% compared to 26%). The estimated participation rate for elderly households was slightly lower than average (25% compared to 26%), while the estimated participation rate for disabled households was well below the average (4% compared to 26%). [Note: It is important to understand that the definition used to estimate the population from the ACS is not likely to match the designation used by the DC LIHEAP office; most grantees have more restrictive definitions for identifying disabled households. However, the very low participation rate by disabled households is unlikely to be the result solely of a difference in definitions and may be the result of a data tracking error.] Table 3.9 also shows that the highest participation rates are observed for the lowest income households; 49 percent of households with income at or below the Poverty Line received LIHEAP benefits, while less than one percent of those with income above 150% of Poverty Line received benefits.

Table 3.9 - Estimated LIHEAP Participation Rates - FY 2015

Group	Income Eligible Households	LIHEAP Recipient Households[6]	Estimated Participation Rate
All Households	80,213	21,096	26%
Vulnerable Households			
Elderly Households	27,564	6,824	25%
Disabled Household	31,782	1,171	4%
Young Child Households	11,887	3,678	31%
Poverty Group			
<=100% of Poverty	39,538	19,493	49%
101% - 125% of Poverty	9,785	1,075	11%
126% - 150% of Poverty	8,085	469	6%
151% or More	22,805	40	<1%

Source: 2012-2014 ACS / FY 2015 Household Report

Table 3.10 shows the estimated participation rate in FY 2016. This includes both federal and local funding of the LIHEAP program. The participation rate was about the same in FY 2016 as it was in FY 2015 (25% in FY 2016 compared to 26% in FY 2015). The estimated participation

[6] Data for all LIHEAP recipient households and households by vulnerability type are based on the unduplicated number of households assisted for the fiscal year. Data for LIHEAP recipient households by poverty group are based on the reported number of households that received heating assistance or cooling assistance for the year. LIHEAP Grantees are not required to submit unduplicated data by poverty interval.

rate for young child households increased from 31% in FY 2015 to 39% in FY 2016 and continued to be above the average (39% compared to 25%). Elderly households and disabled households participated at a lower rate than in FY 2015, and the participation rates of these groups compared to the average followed a similar trend; elderly households participated at a slightly lower rate than the average (19% compared to 25%), while disabled households continued to participate at a much lower rate than the average (3% compared to 25%). Table 3.10 also shows that the highest participation rates continued to be observed for the lowest income households. About 37 percent of households with income at or below the Poverty Line received LIHEAP benefits, however, this was a decrease compared to FY 2015 (when 49% of households with income at or below the Poverty Line received LIHEAP benefits).

Table 3.10 - Estimated LIHEAP Participation Rates - FY 2016

Group	Income Eligible Households	LIHEAP Recipient Households[7]	Estimated Participation Rate
All Households	87,721	22,322	25%
Vulnerable Households			
Elderly Households	30,191	5,883	19%
Disabled Household	33,798	887	3%
Young Child Households	12,612	4,895	39%
Poverty Group			
<=100% of Poverty	39,185	14,363	37%
101% - 125% of Poverty	9,730	1,142	12%
126% - 150% of Poverty	8,111	704	9%
151% or More	30,696	141	<1%

Source: 2013-2015 ACS / FY 2016 Household Report (all sources)

Table 3.11 shows the estimated participation rate in FY 2017. This includes both federal and local funding of the LIHEAP program. The overall participation rate was slightly higher in FY 2017 than in FY 2016 (27% compared to 25%), despite fewer households served, because the income-eligible population decreased. The estimated participation rate for young child households continued to be above the average (35% compared to the overall rate of 25%). Elderly households participated at the same rate as the overall population (27%), an improvement from FY 2016 when the elderly population participated at a lower rate than the overall population. Disabled households continued to participate at a much lower rate than the overall population (5% compared to 27%). Table 3.11 also shows that households with incomes at or below the Poverty Line participated at a much higher percentage than the overall population (46% compared to 27%).

Table 3.11 - Estimated LIHEAP Participation Rates - FY 2017

[7] Data for all LIHEAP recipient households and households by vulnerability type are based on the unduplicated number of households assisted for the fiscal year. Data for LIHEAP recipient households by poverty group are based on the reported number of households that received heating assistance or cooling assistance for the year. LIHEAP Grantees are not required to submit unduplicated data by poverty interval.

Group	Income Eligible Households	LIHEAP Recipient Households[8]	Estimated Participation Rate
All Households	75,808	20,695	27%
Vulnerable Households			
Elderly Households	25,988	6,917	27%
Disabled Household	30,504	1,404	5%
Young Child Households	10,986	3,882	35%
Poverty Group			
<=100% of Poverty	39,533	18,069	46%
101% - 125% of Poverty	9,367	1,101	12%
126% - 150% of Poverty	8,088	583	7%
151% or More	18,820	9	<1%

Source: 2012-2016 ACS / FY 2017 Household Report (all sources)

An important finding across Table 3.9 through Table 3.11 is that the District's LIHEAP program mainly serves low-income households with income at or below the Poverty Line, while it generally is not serving low-income households with income above the Poverty Line up to the program's maximum income-eligibility standard. In FY 2017, 87% of clients served by the program (18,069 out of 19,762 clients for whom poverty group was reported) had income at or below the Poverty Line, compared to 52% of income-eligible households (39,533 out of 75,808 income-eligible households). By contrast, only 9% of clients served by the program had income above the Poverty Line, compared to 48% of income-eligible households.

3.4 Housing Characteristics for Income-Eligible Households

The ACS furnishes information that helps us to understand the types of housing units occupied by income-eligible households and the way that those households use energy.

- Housing Unit Type - Table 3.12 shows the distribution of households by the housing unit type. Only 25 percent of income-eligible households live in single family homes (detached and attached), while over 60 percent live in large multifamily buildings (5+ units). This differs from the RAD and RES program-eligible population – about one-third of RAD program-eligible households live in single family homes, while more than half of RES program-eligible households live in single family homes. Income-eligible households that are not program-eligible for RAD or RES are much more likely to live in large multifamily buildings where utilities are included in their rents.

- Tenure - Table 3.13 shows that 80 percent of income-eligible households are renters. Households that are program-eligible for RAD or RES are still mostly renters, but the share that own their homes is greater than the overall income-eligible population – 22

[8] Data for all LIHEAP recipient households and households by vulnerability type are based on the unduplicated number of households assisted for the fiscal year. Data for LIHEAP recipient households by poverty group are based on the reported number of households that received heating assistance or cooling assistance for the year. LIHEAP Grantees are not required to submit unduplicated data by poverty interval.

percent of RAD program-eligible households and 37 percent of RES program-eligible households own their homes. Income-eligible households that are not program-eligible for RAD or RES are much more likely to rent their homes.

- Main Heating Fuel - Table 3.14 shows the main heating fuel for income-eligible households. Fifty-one percent of households have natural gas main heat and 44 percent have electric main heat. Only two percent use fuel oil main heat. The main heating fuel type used by RAD program-eligible households is similar to the overall low-income population, while RES program-eligible households must use natural gas as their main heating fuel to qualify for the RES discount.

- Bill Payment - Table 3.15 shows the energy billing arrangements for income-eligible households. About 68 percent of household pay directly for their electric, and about 61 percent pay directly for their main heating fuel. Low-income households must pay their electric bill directly to qualify for RAD, and low-income households must pay their natural gas bill directly (and use natural gas main heat) to qualify for RES. About 88 percent of RAD program-eligible households pay their heating bill directly and 98 percent of RES program-eligible households pay their electric bill directly.

These population statistics show that most of the income-eligible households are renters who live in large multifamily buildings. While most households have a direct energy bill, about 40 percent have their main heating fuel included in their rent. In addition, there are some differences across each of these housing characteristics for income-eligible households and those who are eligible for the RAD or RES discounts.

Table 3.12A - Housing Unit Type

Housing Unit Type	Number of Households	Percent of Households
Single Family Detached	4,846	6%
Single Family Attached (Row House)	14,207	19%
Small Multifamily (2-4 Units)	9,527	13%
Large Multifamily (5+ Units)	47,228	62%
TOTAL HOUSEHOLDS	75,808	100%

Source: 2012-2016 ACS

Table 3.12B - Housing Unit Type

Housing Unit Type	LIHEAP	RAD	RES
Single Family Detached	6%	9%	16%
Single Family Attached (Row House)	19%	22%	38%
Small Multifamily (2-4 Units)	13%	15%	18%
Large Multifamily (5+ Units)	62%	54%	28%
TOTAL HOUSEHOLDS	100%	100%	100%

Source: 2012-2016 ACS

Table 3.13A - Tenure

Tenure	Number of Households	Percent of Households
Owner	12,775	17%
Renter	60,272	80%
Other	2,761	4%
TOTAL HOUSEHOLDS	75,808	100%

Source: 2012-2016 ACS

Table 3.13B - Tenure

Tenure	LIHEAP	RAD	RES
Owner	17%	22%	37%
Renter	80%	74%	59%
Other	4%	4%	4%
TOTAL HOUSEHOLDS	100%	100%	100%

Source: 2012-2016 ACS

Table 3.14A - Main Heating Fuel

Main Heating Fuel	Number of Households	Percent of Households
Utility Gas	38,819	51%
Electric	33,412	44%
Fuel Oil	1,230	2%
Other	2,347	3%
TOTAL HOUSEHOLDS	75,808	100%

Source: 2012-2016 ACS

Table 3.14B - Main Heating Fuel

Main Heating Fuel	LIHEAP	RAD	RES
Utility Gas	51%	52%	100%
Electric	44%	44%	0%
Fuel Oil	2%	1%	0%
Other	3%	2%	0%
TOTAL HOUSEHOLDS	100%	100%	100%

Source: 2012-2016 ACS

Table 3.15A - Energy Bill Payment Type

Energy Bills	Number of Households	Percent of Households

Electric Bill - Direct Payment	51,894	68%
Heating Bill		
Gas Heat Bill Direct Payment	23,168	31%
Electric Heat Bill Direct Payment	22,724	30%
Other Heat Bill Direct Payment	340	<1%
TOTAL	46,232	61%

Source: 2012-2016 ACS

Table 3.15B - Energy Bill Payment Type

Energy Bills	LIHEAP	RAD	RES
Electric Bill - Direct Payment	68%	100%	98%
Heating Bill			
Gas Heat Bill Direct Payment	31%	44%	100%
Electric Heat Bill Direct Payment	30%	44%	0%
Other Heat Bill Direct Payment	<1%	1%	0%
TOTAL	61%	88%	100%

Source: 2012-2016 ACS

Table 3.16 shows the bill payment type by housing unit type. The table shows that about 61 percent of households pay directly for their main heating bill. However, while over 80 percent of households in single family homes pay directly for their main heating bills, only about one-half of households in large multifamily buildings pay directly.

Table 3.16 - Energy Bill Payment Type by Housing Unit Type

Payment Status	Number of Households	Percent of Housing Unit Type
Single Family Homes		
Direct Payment for Heat	15,436	81%
Heat in Rent	2,475	13%
Other	1,142	6%
All Single Family Homes	19,053	100%
Small Multifamily Homes		
Direct Payment for Heat	6,957	73%
Heat in Rent	1,768	19%
Other	802	8%
All Small Multifamily Homes	9,527	100%
Large Multifamily Homes		

Payment Status	Number of Households	Percent of Housing Unit Type
Direct Payment for Heat	23,839	50%
Heat in Rent	18,281	39%
Other	5,108	11%
All Large Multifamily Homes	47,228	100%
TOTAL HOUSEHOLDS		
Direct Payment for Heat	46,232	61%
Heat in Rent	22,524	30%
Other	7,052	9%
All Households	75,808	100%

Source: 2012-2016 ACS

Table 3.16B - Energy Bill Payment Type by Housing Unit Type

Payment Status	LIHEAP	RAD	RES
Single Family Homes			
Direct Payment for Heat	81%	96%	100%
Heat in Rent	13%	1%	0%
Other	6%	3%	0%
Small Multifamily Homes			
Direct Payment for Heat	73%	89%	100%
Heat in Rent	19%	5%	0%
Other	8%	6%	0%
Large Multifamily Homes			
Direct Payment for Heat	50%	83%	100%
Heat in Rent	39%	11%	0%
Other	11%	6%	0%
TOTAL HOUSEHOLDS			
Direct Payment for Heat	61%	88%	100%
Heat in Rent	30%	7%	0%
Other	9%	5%	0%

Source: 2012-2016 ACS

Table 3.17 and Table 3.18 show a more detailed analysis of housing unit type and the penetration of the LIHEAP program among single family households and multifamily building

households (small or large multifamily buildings with 2+ units since the LIHEAP program collects information at this level of detail). Data on the number of households served come from the LIHEAP program data received for this study, which include households served with federal or local funding sources. The tables show that the LIHEAP program is serving households in multifamily buildings and single family homes at about the same rate – about one quarter of the households in those two groups are served, overall. When bill payment type is accounted for, the program reaches a greater share of households residing in multifamily buildings than in single family homes – about 40 percent compared to 33 percent.

Table 3.17 - Share of Single-Family Households Served

Single Family Homes	Eligible	Served	Percent Served
Total	19,053	5,231	27%
Pay Heating or Electric Direct	16,042	5,217*	33%
Pay Heating Bill Direct	15,436	4,936**	32%
Gas Main Heat Bill Direct	12,365	3,963**	32%
Electric Main Heat Bill Direct	2,741	822**	30%

Source: 2012-2016 ACS, FY 2017 LIHEAP Data; *Excludes households whose heat is included in rent and who do not pay an electric bill directly; **Excludes all households whose heat is included in rent

Table 3.18 - Share of Multifamily Building Households Served

Multifamily Homes	Eligible	Served	Percent Served
Total	56,755	14,602	26%
Pay Heating or Electric Direct	36,333	14,456*	40%
Pay Heating Bill Direct	30,796	11,402**	37%
Gas Main Heat Bill Direct	10,803	5,439**	50%
Electric Main Heat Bill Direct	19,983	5,743**	29%

Source: 2012-2016 ACS, FY 2017 LIHEAP Data; *Excludes households whose heat is included in rent and who do not pay an electric bill directly; **Excludes all households whose heat is included in rent

3.5 Estimated Energy Bills and Burdens

The ACS asks survey respondents to furnish their most recent monthly bill for electricity, as well as their most recent monthly bill for natural gas if they use natural gas. If the household uses another type of fuel, the survey asks for the annual bill amount. Because electric and heating bills vary by the month of the year, and the ACS surveys households in all months of the year, the individual bills are not useful in terms of looking at the distribution of bills for households. However, they can be used to estimate the average annual bills for groups of households.

Table 3.19 shows the mean energy bill by main heating fuel for income-eligible households in the District of Columbia. According to the self-reported estimates on the ACS, the households with fuel oil main heat have the highest average bill for their main heating fuel, and households

with electric main heat have a comparable average bill for their main heating fuel. However, electric main heat households only have an electric bill, while those households that heat with utility gas or fuel oil have both a heating bill and an electric bill to pay. Table 3.20 shows that the combined bills for utility gas main heat customers are reported to be the highest - $2,694, the combined bills for the fuel oil main heat customers are next - $2,507, and that the bills for the electric main heat customers are the lowest - $1,423.

Table 3.19 - Mean Heating Bills by Main Heating Fuel

Main Heating Fuel	Mean Heating Bill
Utility Gas	$1,310
Electric	$1,423
Fuel Oil*	$1,455

Source: 2012-2016 ACS; average bills are based on a sample of households who pay both their heating fuel and electric bill directly; *small sample size

Table 3.20 - Mean Energy Bills by Main Heating Fuel

Main Heating Fuel	Baseload Electric Bill	Heating Bill	Total Energy Bill
Utility Gas	$1,384	$1,310	$2,694
Electric	N/A	$1,423	$1,423
Fuel Oil*	$1,394	$1,052	$2,507

Source: 2012-2016 ACS; average energy bills are based on a sample of households who pay both their heating fuel and electric bill directly; *small sample size

However, the LIHEAP program targets the households with the highest ***burden*** rather than the households with the highest bills. Table 3.21 shows the estimated average burden for households by main heating fuel. Fuel oil main heat households have comparable average energy bills to natural gas main heat households, but much lower income. As a result, the average energy burden is highest for fuel oil main heat households - about 18%. Energy burden for natural gas main heat households was slightly lower - about 15% - and for electric main heat households, energy burden was about 9%.

Table 3.21 - Mean Energy Bills and Burden by Main Heating Fuel

Main Heating Fuel	Mean Energy Bills	Mean Income	Mean Energy Burden
Utility Gas	$2,694	$18,298	15%
Electric	$1,423	$16,222	9%
Fuel Oil*	$2,507	$13,670	18%

Source: 2012-2016 ACS; average energy bills are based on a sample of households who pay both their heating fuel and electric bill directly; *small sample size

The benefit matrix used by the District of Columbia LIHEAP program also varies the benefit by housing unit type. Table 3.22 shows the mean energy bills and burden by main heating fuel for

single family homes. Average energy bills for single family homes are higher than the average shown in Table 3.21, but because their average income is also higher, their energy burden is about the same as for the average household.

Table 3.22 - Mean Energy Bills and Burden by Main Heating Fuel - Single Family Homes

Main Heating Fuel	Mean Energy Bills	Mean Income	Mean Energy Burden
Utility Gas	$3,215	$20,475	16%
Electric	$2,036	$20,756	10%
Fuel Oil*	$2,541	$14,142	18%

Source: 2012-2016 ACS; average energy bills are based on a sample of households who pay both their heating fuel and electric bill directly; *small sample size

Table 3.23 shows the mean energy bills and burden by main heating fuel for small multifamily homes. Energy bills for small multifamily homes are lower on average for utility gas main heat homes and higher on average for electric main heat homes than the average shown in Table 3.21, but their average energy burdens are about the same as those shown in Table 3.21.

Table 3.23 - Mean Energy Bills and Burden by Main Heating Fuel - Small Multifamily Homes

Main Heating Fuel	Mean Energy Bills	Mean Income	Mean Energy Burden
Utility Gas	$2,267	$14,590	16%
Electric	$1,583	$17,305	9%
Fuel Oil*	N/A	N/A	N/A

Source: 2012-2016 ACS; average energy bills are based on a sample of households who pay both their heating fuel and electric bill directly; *small sample size

Table 3.24 shows the mean energy bills and burden by main heating fuel for large multifamily homes. Average energy bills and burdens for large multifamily homes are lower on average than the average shown in Table 3.21.

Table 3.24 - Mean Energy Bills and Burden by Main Heating Fuel - Large Multifamily Homes

Main Heating Fuel	Mean Energy Bills	Mean Income	Mean Energy Burden
Utility Gas	$1,918	$16,406	12%
Electric	$1,301	$15,334	8%
Fuel Oil*	N/A	N/A	N/A

Source: 2012-2016 ACS; average energy bills are based on a sample of households who pay both their heating fuel and electric bill directly; *small sample size

Two other factors are included in the LIHEAP benefit matrix - household size and income. Table 3.25 shows the distribution of energy bills and burden for utility gas households by household size and Table 3.26 shows the distribution of energy bills and burden by poverty group. Table 3.25 shows that both energy bills and income are higher for households with more members. The net result is that mean energy burden is highest for one-person households. Table 3.26 shows households in the lowest poverty group have average energy bills about equal to those in the highest poverty group, but because of the income differential, the average energy burden is far higher for households with income below the Poverty Line than it is for households with income above the Poverty Line.

Table 3.25 - Mean Energy Bills and Burden by Household Size - Utility Gas Main Heat

Household Size	Mean Energy Bills	Mean Income	Mean Energy Burden
One Person	$2,249	$12,427	18%
Two People	$2,645	$17,509	15%
Three or More People	$3,278	$26,079	13%

Source: 2012-2016 ACS; average energy bills are based on a sample of households who pay both their heating fuel and electric bill directly; *small sample size

Table 3.26 - Mean Energy Bills and Burden by Poverty Group - Utility Gas Main Heat

Poverty Group	Mean Energy Bills	Mean Income	Mean Energy Burden
At or below 75%	$2,614	$6,273	42%
76% to 100%	$2,943	$14,516	20%
101% or More	$2,687	$27,001	10%

Source: 2012-2016 ACS; average energy bills are based on a sample of households who pay both their heating fuel and electric bill directly; *small sample size

These statistics furnish valuable information with respect to energy bills, income, and energy burden. However, these statistics are based on self-reported data and on group averages. In the next section, data from energy suppliers and the LIHEAP database will be used to develop more detailed information on the performance of the District of Columbia LIHEAP program on benefit targeting.

Section 4 – Benefit Targeting Analysis

This section of the report furnishes information on an analysis of LIHEAP benefit targeting using available data sources.

It includes information on:

- Gross Energy Burden for LIHEAP Participants
- Net Energy Burden for LIHEAP Participants
- Estimates of LIHEAP Performance Measures for DOEE's Program.

This research furnishes a detailed analysis of the outcomes of DOEE's benefit determination procedures and furnishes DOEE with options for changing the program outcomes should that be needed.

4.1 Data Sources

To complete this task, we used the following data sources:

- LIHEAP Program Data - We received data on LIHEAP program participants from the District of Columbia for FY 2017. [Note: The data file included all LIHEAP clients in the District of Columbia in FY 2017, including those whose benefits were funded solely through local funds. Because benefits are determined in the exact same manner regardless of funding source – federal or local – the analysis was conducted using all program participants to maximize the number of clients included in the analysis.]
- Washington Gas Usage and Bill Data - We received a data file from Washington Gas that furnished us with information on the 2017 annual gas usage and gas bills for LIHEAP clients in FY 2017 who use Washington Gas for their main heating fuel. For households that received the RES discount, the gas bill data reflect the net gas charges for these households.
- Pepco Electric Usage and Bill Data - We received a data file from Pepco that furnished us with information on the 2017 monthly electric usage and electric bills for LIHEAP clients in FY 2017 who use Pepco to provide their electric (regardless of their main heating fuel). For households that received the RAD discount, the electric bill data reflect the net electric charges for these households.

These data sources furnish the information that we needed to do in-depth targeting analysis of clients. Usage and bill data were not obtained for LIHEAP clients using delivered fuels. However, almost all LIHEAP clients in the District of Columbia use natural gas or electric as their main heating fuel. Therefore, the data used are sufficient to illustrate the benefit targeting achievements and issues with the District of Columbia LIHEAP Program.

In the following analyses of energy burden, data processing steps were taken to remove outliers from the data. These steps were consistent with the previous energy burden report conducted

in 2014. This included removing households with very low or very high annual income (less than $2,000 or greater than 400% of poverty).[9] In addition, households with very high or very low gas or electric usage were removed.[10] Table 4.1 shows the number of gas main heat households included in the analysis and Table 4.2 shows the number of electric main heat households included in the analysis.

Table 4.1 - Attrition Analysis for Natural Gas Main Heat Clients

	Number	Percent
Households using natural gas main heat	7,653	100%
With gas bill data	5,745	75%
With annual gas bill data[11]	5,497	72%
With any electric bill data	2,627	34%
With annual electric bill data[12]	2,295	30%
With gas usage outliers removed (therms = 0 and top/bottom 1%)	2,226	29%
With electric usage outliers removed (kWh = 0 and top/bottom 1%)	2,181	28%

Sources: FY 2017 LIHEAP Data, 2017 Washington Gas Data, 2017 Pepco Data

Table 4.2 - Attrition Analysis for Electric Main Heat Clients

	Number	Percent
Households using electric main heat	5,164	100%
With any electric bill data	4,956	96%
With annual electric bill data[12]	4,226	82%
With electric usage outliers removed (kWh = 0 and top/bottom 1%)	4,140	80%

Sources: FY 2017 LIHEAP Data, 2017 Pepco Data

4.2 Group Energy Burden for LIHEAP Clients with Gas Main Heat

We merged data from the LIHEAP database with the Washington Gas records and Pepco records for LIHEAP clients who use natural gas as their main heating fuel to develop information on the gross and net energy burden for these clients. These data show the extent to which the LIHEAP program helps make gas and electric bills more affordable for gas main heat clients.

Table 4.3 shows gross and net gas energy burden for natural gas main heat clients by income level. For each income group, the table shows the mean income, the mean gas bill, and the

[9] Of the 20,695 records received from the LIHEAP database, 2,590 had income of zero dollars, 1,278 had income between $1 and less than $2,000, four had income that was greater than 400% of poverty, based on their household size, and two had no income information recorded. These households were excluded from the analysis.

[10] For households with complete utility bill data, the top and bottom 1% based on energy usage were excluded from the analysis.

[11] For purposes of this analysis, households with 11 or 12 monthly natural gas bills in 2017 were considered to have annual gas bill data.

[12] For purposes of this analysis, households with electric bills beginning in January 2017 and ending in December 2017 were considered to have annual electric bill data.

mean group gas energy burden (gross).[13] The *gross* energy burden is the burden clients would have faced if they had not received LIHEAP. The table also shows the mean LIHEAP benefit received by those clients (both regular benefits and crisis benefits) and the resulting *net* energy burden. The *net* energy burden is the burden that the client faces after receiving LIHEAP.

Table 4.3 - Gross and Net Gas Energy Burden by Income Level - Gas Main Heat Clients

Income Group	Mean Income	Mean Gas Bill	Mean Gross Gas Burden	Mean LIHEAP Benefit	Mean Net Gas Burden
Less than $5,000	$3,572	$649	18%	$908	-7%
$5,000-<$10,000	$8,262	$589	7%	$681	-1%
$10,000-<$15,000	$12,268	$616	5%	$586	0%
$15,000-<$20,000	$17,353	$627	4%	$517	1%
$20,000 or More	$30,499	$658	2%	$519	0%
TOTAL	$15,167	$623	4%	$625	0%

Sources: FY 2017 LIHEAP Data, 2017 Washington Gas Data

Table 4.3 shows that the lowest income households have the highest gross main heating fuel energy burden; households with less than $5,000 in income would pay about 18% of their income for energy if they did not receive LIHEAP (i.e., gross energy burden). However, those households received an average benefit of $908 in FY 2017. Because this amount is greater than their average gas bill, the resulting net energy burden is negative (-7%). In FY 2017, the LIHEAP program reduced energy burden for the lowest income group by 139% (computed as (18%-(-7%))/18%).

Table 4.3 also shows that the gross gas burden was highest for the lowest income group, and that after LIHEAP, the net gas burden for each income group was one percent or less. It is important to understand that this is not the total energy burden faced by these clients. Note that the LIHEAP program, by statute, is focused on *home energy*. Home energy is defined by the LIHEAP program as energy used for home heating and home cooling. However, state and local policymakers usually focus on total energy burden, since a client needs to pay his/her total energy bill to maintain service.

In Table 4.4 and subsequent tables for natural gas main heat clients, we add the gas bills obtained from Washington Gas to the electric bills obtained from Pepco to determine the total client energy bill and burden. Table 4.4 shows that the gross total energy burden for gas main heat LIHEAP clients is 9%, and that the program is able to reduce that to a net burden of 5%. For the lowest income households, the net total energy burden is 14%.

[13] Group energy burden is a useful statistic for examining how the program impact changes by target group. It uses group means instead of individual burdens. The distribution of individual energy burdens will be presented later.

Table 4.4 - Gross and Net Total Energy Burden by Income Level - Gas Main Heat Clients

Income Group	Mean Income	Mean Total Energy Bill	Mean Gross Energy Burden	Mean LIHEAP Benefit	Mean Net Energy Burden
Less than $5,000	$3,572	$1,419	40%	$908	14%
$5,000-<$10,000	$8,262	$1,255	15%	$681	7%
$10,000-<$15,000	$12,268	$1,308	11%	$586	6%
$15,000-<$20,000	$17,353	$1,335	8%	$517	5%
$20,000 or More	$30,499	$1,497	5%	$519	3%
TOTAL	$15,167	$1,354	9%	$625	5%

Sources: FY 2017 LIHEAP Data, 2017 Washington Gas Data, 2017 Pepco Data

In the public policy sector, two energy burden thresholds have been used to identify high energy burden. The *Energy Affordability Index* developed by Roger Colton of Fisher, Sheehan, and Colton recommends that policymakers target total energy burden of 6% as affordable.[14] That energy burden is estimated to be about two times the energy burden of non-low-income households. In a study conducted for the LIHEAP Office of Community Services (OCS), APPRISE developed an affordability target of 10.9%.[15] That energy burden is estimated to be the energy share of a 50% housing burden which is considered to be very high by many policy analysts.

For the lowest income group, clients with incomes at or below $5,000, the mean net total energy burden is above both targeted thresholds. For example, the mean gross total energy burden for households with incomes less than $5,000 is 40 percent and the mean net total energy burden for those households is 14%. So, even though the District of Columbia LIHEAP program does substantially reduce the *gas* energy burden for many low-income households, the total energy burden for many of those households still is significant.

It also is important to consider the benefit determination procedure results for other groups of households. Table 4.5 shows the gross and net total energy burden by vulnerable group. It shows that all three types of vulnerable households have similar income and mean total energy bills. Gross total energy burden ranges from 8% to 10% for these vulnerable groups, and after LIHEAP, net total energy burden is about 5%. This is the same as the group of clients with no vulnerable household members.

[14] Colton, Roger D. "The Impact of Missouri Gas Energy's Experimental Low-Income Rate (ELIR) On Utility Bill Payments by Low-Income Customers: Preliminary Assessment." Prepared for Missouri Gas Energy Company (2003): Web. http://www.fsconline.com/downloads/Papers/2003%2010%20ELIR_Impacts.pdf

[15] "LIHEAP Energy Burden Evaluation Study: Final Report" July 2005, APPRISE, Prepared for Division of Energy Assistance, Office of Community Services, U.S. Department of Health and Human Services

Table 4.5 - Gross and Net Total Energy Burden by Vulnerable Group - Gas Main Heat Clients

Vulnerable Group	Mean Income	Mean Total Energy Bill	Mean Gross Energy Burden	Mean LIHEAP Benefit	Mean Net Energy Burden
Elderly	$15,646	$1,318	8%	$530	5%
Disabled	$13,043	$1,251	10%	$638	5%
Young Child	$16,141	$1, 505	9%	$744	5%
No Vulnerable Members	$15,166	$1,354	9%	$625	5%

Sources: FY 2017 LIHEAP Data, 2017 Washington Gas Data, 2017 Pepco Data

Table 4.6 shows the gross and net total energy burden by poverty level. It shows that the lowest poverty group receives the highest benefit. It also shows that net total energy burden is highest for the lowest poverty group, but that the LIHEAP benefit brings the net gas burden much closer together for the different poverty groups; the range is from 4% to 17% prior to LIHEAP, and from 3% to 8% after receipt of LIHEAP.

Table 4.6 - Gross and Net Total Energy Burden by Poverty Level - Gas Main Heat Clients

Poverty Group	Mean Income	Mean Total Energy Bill	Mean Gross Energy Burden	Mean LIHEAP Benefit	Mean Energy Gas Burden
At or Below 75%	$8,373	$1,407	17%	$753	8%
76% to 100%	$13,755	$1,217	9%	$544	5%
101% to 125%	$18,181	$1,297	7%	$488	4%
126% to 150%	$22,970	$1,298	6%	$484	4%
151% or More	$31,343	$1,408	4%	$491	3%
TOTAL	$15,167	$1,354	9%	$625	5%

Sources: FY 2017 LIHEAP Data, 2017 Washington Gas Data, 2017 Pepco Data

Table 4.7 shows the gross and net total energy burden by housing type. It shows that the households living in single family homes have higher bills and receive higher benefits. However, the households in multifamily buildings have lower net energy burden than the households in single family homes.

Table 4.7 - Gross and Net Total Energy Burden by Housing Type - Gas Main Heat Clients

Housing Type	Mean Income	Mean Total Energy Bill	Mean Gross Energy Burden	Mean LIHEAP Benefit	Mean Net Energy Burden
Single Family	$16,829	$1,696	10%	$669	6%
Multifamily	$13,946	$1,101	8%	$592	4%
TOTAL	$15,170	$1,354	9%	$625	5%

Sources: FY 2017 LIHEAP Data, 2017 Washington Gas Data, 2017 Pepco Data

Table 4.8 shows the gross and net total energy burden by the number of household members. It shows that the households with the largest family size receive the highest benefit. Net total energy burden is similar for all household groups, showing that, by varying the benefits by the number of household members, the program is effective in addressing energy burden.

Table 4.8 - Gross and Net Total Energy Burden by Number of Household Members - Gas Main Heat Clients

Household Members	Mean Income	Mean Total Energy Bill	Mean Gross Energy Burden	Mean LIHEAP Benefit	Mean Energy Gas Burden
One	$12,543	$1,108	9%	$525	5%
Two	$15,279	$1,295	8%	$610	4%
Three	$16,505	$1,441	9%	$676	5%
Four	$17,930	$1,611	9%	$714	5%
Five or More	$18,290	$1,807	10%	$791	6%
TOTAL	$15,167	$1,354	9%	$625	5%

Sources: FY 2017 LIHEAP Data, 2017 Washington Gas Data, 2017 Pepco Data

These analyses of the District of Columbia LIHEAP program show that the program gives higher benefits to households with lower income, those living in single family homes, and those with more household members. It appears from this analysis that the Benefit Matrix used by the program has targeted many of the correct parameters in terms of working to make energy bills affordable for all households.

4.3 Individual Energy Burden for LIHEAP Clients with Gas Main Heat

In the previous section, we looked at group energy burdens. However, those averages mask some important differences for individual clients. The data show that, while the average client has total energy bills of $1,354 per year, one-fourth of the clients have bills less than $643 and one fourth of the clients have bills that are more than $2,265. Table 4.9 shows some of those differences by income group.

- In the first set of columns, it shows that mean total energy bills and burdens for all clients by income group.
- In the second set of columns, it shows the results for clients that have energy bills of less than $642 (about one-fourth of clients).
- In the third set of columns, it shows the results for the clients that have energy bills of more than $2,265 (about one-fourth of clients).

Even though the program targets benefits by income level, it doesn't account for the fact that some households at a particular income level have relatively low energy bills while others have relative high energy bills. For example, one-fourth of households with income between $5,000

and $10,000 have average burden of 8%, while one-fourth of the clients in that income group have average burden of 29%.

Table 4.9 - Gross Total Energy Burden by Income Level and Usage Group - Gas Main Heat Clients

	All Clients in Group		Lowest 25% in Group		Highest 25% in Group	
Income Group	Mean Total Energy Bill	Mean Energy Burden	Mean Total Energy Bill	Mean Energy Burden	Mean Total Energy Bill	Mean Energy Burden
Less than $5,000	$1,419	43%	$668	20%	$2,281	68%
$5,000-<$10,000	$1,255	16%	$632	8%	$2,283	29%
$10,000-<$15,000	$1,308	11%	$646	5%	$2,244	18%
$15,000-<$20,000	$1,335	8%	$635	4%	$2,197	13%
$20,000 or More	$1,497	5%	$654	2%	$2,287	8%
TOTAL	$1,354	14%	$643	7%	$2,265	23%

Sources: FY 2017 LIHEAP Data, 2017 Washington Gas Data, 2017 Pepco Data

In Table 4.10, we show how this affects the mean LIHEAP benefit and the net energy burden. The table shows that the LIHEAP benefit is somewhat higher for the higher expenditure group, but it does not account for all of the difference in energy burden. The average LIHEAP benefit for the low usage households is $532, compared to $723 for the high usage households. However, the net energy burden is about 1% for the one-fourth of households with the lowest total energy bills and is 15% for the one-fourth of households with the highest total energy bills.

Table 4.10 - Net Total Energy Burden by Income Level and Usage Group - Gas Main Heat Clients

	Low Usage (Lowest 25% in Group)			High Usage (Highest 25% in Group)		
Income Group	Mean Total Energy Bill	Mean LIHEAP Benefit	Mean Net Energy Burden	Mean Total Energy Bill	Mean LIHEAP Benefit	Mean Net Energy Burden
Less than $5,000	$668	$786	-4%	$2,281	$1,052	42%
$5,000-<$10,000	$632	$558	1%	$2,283	$817	19%
$10,000-<$15,000	$646	$485	1%	$2,244	$690	13%
$15,000-<$20,000	$635	$424	1%	$2,197	$619	9%
$20,000 or More	$654	$490	1%	$2,287	$580	6%
TOTAL	$643	$532	1%	$2,265	$723	15%

Sources: FY 2017 LIHEAP Data, 2017 Washington Gas Data, 2017 Pepco Data

This analysis shows that it is important to consider the individual differences in energy burden, as well as the group differences. Table 4.11 furnishes data on the distribution of *gross total energy burden* by income group. For the lowest income group, before receiving LIHEAP benefits, gross total energy burden varies from about 18% of income to about 77% of income. Overall, a quarter of gas main heat clients have gross total energy burden of 6% or less of income and a quarter have gross total energy burden of 16% or more of income.

Table 4.11 - Distribution of Gross Total Energy Burden by Income Level - Gas Main Heat Clients

Income Group	Mean Energy Burden	Bottom 10%	Bottom 25%	Median	Top 25%	Top 10%
Less than $5,000	43%	18%	24%	37%	56%	77%
$5,000-<$10,000	16%	6%	9%	14%	20%	28%
$10,000-<$15,000	11%	5%	7%	10%	14%	18%
$15,000-<$20,000	8%	4%	5%	7%	10%	13%
$20,000 or More	5%	2%	3%	5%	6%	8%
TOTAL	14%	4%	6%	9%	16%	29%

Sources: FY 2017 LIHEAP Data, 2017 Washington Gas Data, 2017 Pepco Data

Table 4.12 furnishes data on the distribution of *net total energy burden* by income group. For the lowest income group, after receiving LIHEAP benefits, net total energy burden varies from about -6% of income (i.e., these households have built up credits on their accounts) to about 39% of income. Overall, a quarter of gas main heat clients have net total energy burden of 2% or less of income and a quarter have net total energy burden of 9% or more of income.

Table 4.12 - Distribution of Net Total Energy Burden by Income Level - Gas Main Heat Clients

Income Group	Mean Energy Burden	Bottom 10%	Bottom 25%	Median	Top 25%	Top 10%
Less than $5,000	17%	-6%	3%	11%	24%	39%
$5,000-<$10,000	7%	-1%	2%	6%	11%	18%
$10,000-<$15,000	6%	0%	2%	5%	9%	13%
$15,000-<$20,000	5%	1%	2%	4%	7%	9%
$20,000 or More	3%	1%	2%	3%	5%	6%
TOTAL	7%	0%	2%	4%	9%	15%

Sources: FY 2017 LIHEAP Data, 2017 Washington Gas Data, 2017 Pepco Data

4.4 Group Energy Burden for LIHEAP Clients with Electric Main Heat

We merged data from the LIHEAP database with the Pepco records for a group of LIHEAP clients who use electric as their main heating fuel to develop information on the gross and net energy burden for clients. These data show the extent to which the LIHEAP program is able to make electric heating bills more affordable for Pepco clients.

Table 4.13 shows the gross and net electric energy burden for this group of clients by income level. For each income group, the table shows the mean income, the mean electric bill, and the mean group electric energy burden (gross).[16] The *gross* energy burden is the burden clients would have faced if they had not received LIHEAP. The table also shows the mean LIHEAP benefit received by those clients (both regular benefits and crisis benefits) and the resulting *net* energy burden. The *net* energy burden is the burden that the client faces after receiving LIHEAP. It is important to note that the electric bill data for clients receiving the RAD discount are the charges the clients received after the discount was applied, and almost all electric main heat clients in the sample were approved for the RAD discount (about 7% of electric main heat clients in the sample were not approved for RAD in FY 2017, however, some of these households may have received the RAD discount during the year because of the 18-month approval period).

Table 4.13 shows that the lowest income households have the highest energy burden; households with less than $5,000 in income would pay about 68% of their income for energy if they did not receive LIHEAP (i.e., gross energy burden). However, those households received an average benefit of $1,047 in FY 2017, an amount greater than their average electric bill. As a result, the group net energy burden for the lowest income group was negative (-2%). In FY 2017, the LIHEAP program reduced energy burden for the lowest income group by 107% (computed as (28%-(-2%))/28%). The gross energy burden for all electric main heat households was about 8%, and after receiving LIHEAP, their net energy burden was about 1%.

Table 4.13 - Gross and Net Electric Energy Burden by Income Level - Electric Main Heat Clients

Income Group	Mean Income	Mean Electric Bill	Mean Gross Electric Burden	Mean LIHEAP Benefit	Mean Net Electric Burden
Less than $5,000	$3,492	$961	28%	$1,047	-2%
$5,000-<$10,000	$8,347	$853	10%	$776	1%
$10,000-<$15,000	$12,336	$858	7%	$650	2%
$15,000-<$20,000	$17,343	$905	5%	$592	2%
$20,000 or More	$29,090	$998	3%	$619	1%
TOTAL	$13,874	$902	7%	$724	1%

Sources: FY 2017 LIHEAP Data, 2017 Pepco Data

[16] Group energy burden is a useful statistic for examining how the program impact changes by target group. It uses group means instead of individual burdens. The distribution of individual energy burdens will be presented later.

Table 4.13 shows that the gross energy burden was highest for the lowest income group and that the burden reduction percentage also was highest for that group, while the net energy burden after LIHEAP was about the same (between one and two percent of income) for the other income groups.

Unlike clients who heat with gas main heat, clients who use electric as their main heating fuel often do not have any other energy sources. So, their *electric* energy burden is their *total* energy burden. Table 4.14 compares the LIHEAP benefits and the estimated *total* net energy burden for gas main heat households to those for electric main heat households. At each income level, electric main heat clients receive higher LIHEAP benefits than gas main heat clients. That is because the program Benefit Matrix assigns higher benefits to households that heat with electricity. However, when one looks at total energy burden, we find that the gas main heat households have higher energy bills and higher net energy burden than households that heat with electricity.

Table 4.14 - LIHEAP Benefits and Net Total Energy Burden by Income Level, for Gas Mean Heat and Electric Main Heat Clients

	Gas Main Heating LIHEAP Clients		Electric Main Heating LIHEAP Clients	
Income Group	Mean LIHEAP Benefit	Mean Total Net Burden	Mean LIHEAP Benefit	Mean Total Net Burden
Less than $5,000	$908	14%	$1,047	-2%
$5,000-<$10,000	$681	7%	$776	1%
$10,000-<$15,000	$586	6%	$650	2%
$15,000-<$20,000	$517	5%	$592	2%
$20,000 or More	$519	3%	$619	1%
TOTAL	$625	5%	$724	1%

Sources: FY 2017 LIHEAP Data, 2017 Washington Gas Data, 2017 Pepco Data

It also is important to consider the benefit determination procedure results for other groups of households. Table 4.15 shows the gross and net electric energy burden by vulnerable group. It shows that the young child households have the highest bills and receive the highest benefit. Net electric energy burden is the same across each vulnerable group.

Table 4.15 - Gross and Net Electric Energy Burden by Vulnerable Group - Electric Main Heat Clients

Vulnerable Group	Mean Income	Mean Electric Bill	Mean Gross Electric Burden	Mean LIHEAP Benefit	Mean Net Electric Burden
Elderly	$13,350	$773	6%	$605	1%

Vulnerable Group	Mean Income	Mean Electric Bill	Mean Gross Electric Burden	Mean LIHEAP Benefit	Mean Net Electric Burden
Disabled	$12,331	$816	7%	$663	1%
Young Child	$14,271	$1,067	7%	$905	1%
No Vulnerable Members	$13,873	$901	6%	$724	1%

Sources: FY 2017 LIHEAP Data, 2017 Pepco Data

Table 4.16 shows the gross and net electric energy burden by poverty level. It shows that the households in the lowest poverty level receive the highest benefit. It shows that net electric energy burden is about the same across poverty level groups, but that the range of energy burden went from 3% to 12% prior to receipt of benefits, to about one percent after LIHEAP.

Table 4.16 - Gross and Net Electric Energy Burden by Poverty Level - Electric Main Heat Clients

Poverty Group	Mean Income	Mean Electric Bill	Mean Gross Electric Burden	Mean LIHEAP Benefit	Mean Net Electric Burden
At or Below 75%	$8,079	$964	12%	$870	1%
76% to 100%	$12,584	$840	7%	$633	2%
101% to 125%	$17,240	$784	5%	$567	1%
126% to 150%	$21,102	$850	4%	$563	1%
151% or More	$29,211	$903	3%	$576	1%
TOTAL	$13,874	$902	7%	$724	1%

Sources: FY 2017 LIHEAP Data, 2017 Pepco Data

Table 4.17 shows the gross and net electric energy burden by housing type. It shows that the single family homes have higher energy bills and receive higher benefits, but their net electric energy burden is slightly higher than households living in multifamily buildings.

Table 4.17 - Gross and Net Electric Energy Burden by Housing Type - Electric Main Heat Clients

Housing Type	Mean Income	Mean Electric Bill	Mean Gross Electric Burden	Mean LIHEAP Benefit	Mean Net Electric Burden
Single Family	$16,625	$1,342	8%	$903	3%
Multifamily	$13,499	$842	6%	$700	1%
TOTAL	$13,874	$902	7%	$724	1%

Sources: FY 2017 LIHEAP Data, 2017 Pepco Data

Table 4.18 shows the gross and net electric energy burden by the number of household members. It shows that households with 5 or more members have the highest bills and receive the receive the highest benefit. It shows that net electric energy burden is about the same across household sizes.

Table 4.18 - Gross and Net Electric Energy Burden by Number of Household Members - Electric Main Heat Clients

Household Members	Mean Income	Mean Electric Bill	Mean Gross Electric Burden	Mean LIHEAP Benefit	Mean Net Electric Burden
One	$12,091	$723	6%	$608	1%
Two	$13,920	$906	7%	$742	1%
Three	$16,210	$1,055	7%	$812	1%
Four	$16,708	$1,125	7%	$907	1%
Five or More	$16,177	$1,343	8%	$955	2%
TOTAL	$13,874	$902	7%	$724	1%

Sources: FY 2017 LIHEAP Data, 2017 Pepco Data

Earlier analysis of the District of Columbia LIHEAP program showed that the program gives higher benefits to households with lower income, those living in single family homes, and those with more household members. It appears from this analysis that the Benefit Matrix used by the program has targeted many of the correct parameters in terms of working to make energy bills affordable for all households.

However, the program Benefit Matrix also gives higher benefits to households with electric main heat. The analysis finds that households with gas main heat have higher *total* energy bills than those with electric main heat. Therefore, on average, the program is targeting lower burden households when it gives higher benefits to electric heat clients.

4.5 Individual Energy Burden for LIHEAP Clients with Electric Main Heat

In the previous section, we looked at group energy burdens. However, those averages mask some important differences for individual clients. The data show that, while the average client has electric bills of $902 per year, one-fourth of the clients have electric bills less than $298 and one fourth of the clients have bills that are more than $1,657. Table 4.19 shows some of those differences by income group.

- In the first set of columns, it shows that mean bills and burdens for all clients by income group.
- In the second set of columns, it shows the results for clients that have electric bills of less than $298 (about one-fourth of clients).
- In the third set of columns, it shows the results for the clients that have electric bills of more than $1,657 (about one-fourth of clients).

Even though the program targets benefits by income level, it doesn't account for the fact that some households at a particular energy level have relatively low energy bills while others have relative high energy bills. For example, one-fourth of households with income between $5,000 and $10,000 have average burden of 3%, while one-fourth of the clients in that income group have average burden of 21%.

Table 4.19 - Gross Electric Energy Burden by Income Level and Usage Group - Electric Main Heat Clients

	All Clients in Group		Lowest 25% in Group		Highest 25% in Group	
Income Group	Mean Electric Bill	Mean Electric Burden	Mean Electric Bill	Mean Electric Burden	Mean Electric Bill	Mean Electric Burden
Less than $5,000	$961	30%	$296	9%	$1,700	54%
$5,000-<$10,000	$854	11%	$287	3%	$1,623	21%
$10,000-<$15,000	$861	7%	$305	2%	$1,715	14%
$15,000-<$20,000	$905	5%	$302	2%	$1,642	9%
$20,000 or More	$998	4%	$312	1%	$1,641	6%
TOTAL	$902	10%	$298	3%	$1,657	18%

Sources: FY 2017 LIHEAP Data, 2017 Pepco Data

In Table 4.20, we show how this affects the mean LIHEAP benefit and the net energy burden. The table shows that the LIHEAP benefit is somewhat higher for the higher expenditure group, but it does not account for all of the difference in energy burden. The average LIHEAP benefit for the low usage households is $703, compared to $864 for the high usage households. However, because the electric bills are so low ($298) for the one-fourth of households with the lowest electric bills, their net electric burden is negative (i.e., their benefits are greater than their bills), while net electric burden is 8% for the one-fourth of households with the highest electric bills.

Table 4.20 - Net Electric Energy Burden by Income Level and Usage Group - Electric Main Heat Clients

	Lowest 25% in Group			Highest 25% in Group		
Income Group	Mean Electric Bill	Mean LIHEAP Benefit	Mean Net Electric Burden	Mean Electric Bill	Mean LIHEAP Benefit	Mean Net Electric Burden
Less than $5,000	$296	$1,057	-25%	$1,700	$1,168	18%
$5,000-<$10,000	$287	$750	-6%	$1,623	$941	9%
$10,000-<$15,000	$305	$617	-3%	$1,715	$860	7%
$15,000-<$20,000	$302	$559	-1%	$1,642	$726	5%
$20,000 or More	$312	$592	-1%	$1,641	$701	3%

Income Group	Lowest 25% in Group			Highest 25% in Group		
	Mean Electric Bill	Mean LIHEAP Benefit	Mean Net Electric Burden	Mean Electric Bill	Mean LIHEAP Benefit	Mean Net Electric Burden
TOTAL	$298	$703	-6%	$1,657	$864	8%

Sources: FY 2017 LIHEAP Data, 2017 Pepco Data

This analysis shows that it is important to consider the individual differences in energy burden, as well as the group differences. Table 4.21 furnishes data on the distribution of gross total energy burden by income group. For the lowest income group, before receiving LIHEAP, gross total energy burden varies from about 7% of income to about 61% of income. Overall, a quarter of electric main heat clients have gross total energy burden of 4% or less of income and a quarter have gross total energy burden of 12% or more of income.

Table 4.21 - Distribution of Gross Total Energy Burden by Income Level - Electric Main Heat Clients

Income Group	Mean Energy Burden	Bottom 10%	Bottom 25%	Median	Top 25%	Top 10%
Less than $5,000	30%	7%	14%	26%	41%	61%
$5,000-<$10,000	11%	3%	6%	9%	14%	20%
$10,000-<$15,000	7%	2%	4%	6%	9%	13%
$15,000-<$20,000	5%	2%	3%	5%	7%	9%
$20,000 or More	4%	1%	2%	3%	5%	7%
TOTAL	10%	2%	4%	7%	12%	21%

Sources: FY 2017 LIHEAP Data, 2017 Pepco Data

Table 4.22 furnishes data on the distribution of *net total energy burden* by income group. For the lowest income group, after receiving LIHEAP benefits, net total energy burden varies from about -30% of income (i.e., these households have built up credits on their accounts) to about 20% of income, with at least 50 percent of clients in this income group accruing a credit on their electric accounts. Overall, half of electric main heat clients have net total energy burden of 1% or less of income (with at least a quarter having built up a credit on their accounts) and 10 percent have net total energy burden of 7% or more of income.

Table 4.22 - Distribution of Net Total Energy Burden by Income Level - Electric Main Heat Clients

Income Group	Mean Energy Burden	Bottom 10%	Bottom 25%	Median	Top 25%	Top 10%
Less than $5,000	-3%	-30%	-15%	-1%	8%	20%

Income Group	Mean Energy Burden	Bottom 10%	Bottom 25%	Median	Top 25%	Top 10%
$5,000-<$10,000	1%	-7%	-3%	1%	5%	8%
$10,000-<$15,000	2%	-3%	-1%	1%	4%	7%
$15,000-<$20,000	2%	-2%	0%	2%	3%	6%
$20,000 or More	1%	-1%	0%	1%	2%	4%
TOTAL	1%	-6%	-1%	1%	4%	7%

Sources: FY 2017 LIHEAP Data, 2017 Pepco Data

4.6 Impact of Ratepayer Discount Programs

During the LIHEAP application process, most clients who directly pay their utilities are approved to receive the RAD and/or RES rate discount programs. In the previous sections, we looked at the energy bills and burden of clients *after* those rate discounts were applied. Without the rate discount programs, LIHEAP clients would face higher residential energy burden. Therefore, it is important to understand the combined impact of the LIHEAP program and rate discount programs, as well as differences in energy bills and burden of clients who receive the rate discount programs versus those who do not. The tables in the following section examine the combined impact of the LIHEAP program and rate discount programs.

Table 4.23 shows the gross residential energy bill and burden *before* the rate discounts were applied and the impact of the District's UDP and LIHEAP programs for gas main heat clients. For natural gas, the actual value of the RES discount was provided by Washington Gas; this value was added to the billed amount to determine the gross natural gas bill. For electricity, the value of the RAD discount was estimated and then added to the billed amount to determine the gross electric bill.[17] Combined, the District's UDP and LIHEAP programs were able to reduce residential energy burden for natural gas main heat clients by over 50 percent – from about 11 percent gross mean energy burden to about five percent mean net energy burden.

Table 4.23 - Gross Bills and Burden and Impact of Rate Discounts and LIHEAP for Natural Gas Main Heat Households

Energy Source	Gross		Actual		Mean LIHEAP Benefit	Mean Net Energy Burden
	Mean Energy Bill	Mean Energy Burden	Mean Energy Bill	Mean Energy Burden		
Natural Gas	$763	5%	$623	4%		
Electric	$924	6%	$730	5%		
Total Residential Energy	$1,687	11%	$1,354	9%	$625	5%

Sources: FY 2017 LIHEAP Data; 2017 Washington Gas Data; 2017 Pepco Data

Table 4.24 shows the gross residential energy bill and burden *before* the rate discounts were applied and the impact of the District's UDP and LIHEAP programs for electric main heat clients. The value of the RAD discount was estimated and then added to the billed amount to determine the gross electric bill.[18] Combined, the District's UDP and LIHEAP programs were able to reduce residential energy burden for electric main heat clients by about 90 percent – from about eight percent gross mean energy burden to about one percent mean net energy burden.

[17] The value of the RAD discount was calculated as 25% of the estimated gross electric bill, up to $300 maximum for non-electric heat.
[18] The value of the RAD discount was calculated as 25% of the estimated gross electric bill, up to $475 maximum for electric heat.

Table 4.24 - Gross Bills and Burden and Impact of Rate Discounts and LIHEAP for Electric Main Heat Households

Energy Source	Gross		Actual		Mean LIHEAP Benefit	Mean Net Energy Burden
	Mean Energy Bill	Mean Energy Burden	Mean Energy Bill	Mean Energy Burden		
Electric	$1,172	8%	$902	6%	$724	1%

Sources: FY 2017 LIHEAP Data; 2017 Pepco Data

The next set of tables examines the energy bills for clients who did or did not receive the RAD discount. While nearly all gas main heat clients received the RES discount on their gas bills, some did not receive the RAD discount on their electricity bills. Table 4.25 shows the average electric bills and usage for natural gas main heat clients who did or did not receive the RAD discount. The average electric bill was about 19 percent higher for gas main heat clients who did not receive the RAD discount ($866 compared to $728), despite electric usage that was about 14 percent lower than gas main heat clients did receive the RAD discount (7,604 kWh compared to 8,875 kWh).

Table 4.25 - Electric Bills and Usage for Natural Gas Main Heat Households by RAD Status

Ratepayer Program Group	Number of Households	Electric Bill		Electric Usage (kWh)	
		Mean	Median	Mean	Median
Received RAD	2,138	$728	$625	8,872	8,009
Did not receive RAD	43	$866	$799	7,604	7,019
TOTAL	2,181	$730	$628	8,850	7,990

Sources: FY 2017 LIHEAP Data; 2017 Washington Gas Data; 2017 Pepco Data

Table 4.26 shows the average electric bill, gross electric burden, LIHEAP benefit, and net electric burden for gas main heat households based on receiving the RAD discount or not. Clients who did not receive the RAD discount had higher average electric bills and burden before receiving LIHEAP. However, the net energy burden was similar for these two groups because gas main heat clients who did not receive the RAD discount had lower income, on average, and received higher LIHEAP benefits than gas main heat clients who did receive the RAD discount.

Table 4.26 - Gross and Net Electric Burden for Natural Gas Main Heat Households by RAD Status

Ratepayer Program Group	Mean Income	Mean Electric Bill	Mean Gross Energy Burden	Mean LIHEAP Benefit	Mean Net Energy Burden
Receives RAD	$15,208	$728	5%	$623	1%
Does not receive RAD	$13,126	$866	7%	$715	1%
TOTAL	$15,167	$730	5%	$625	1%

Sources: FY 2017 LIHEAP Data; 2017 Pepco Data

LIHEAP clients who use electric main heat are only eligible for the RAD program. [Clients must use natural gas main heat to receive the RES discount.] Table 4.27 shows the average electric bills and usage for electric main heat clients who received the RAD discount compared to those who did not. The average electric bill was about 28 percent higher for electric main heat clients who did not receive the RAD discount than those who did ($1,149 compared to $896), despite having less than two percent higher usage (11,049 kWh compared to 10,881 kWh).

Table 4.27 - Electric Bills and Usage for Electric Main Heat Households by RAD Status

Ratepayer Program Group	Number of Households	Electric Bill		Electric Usage (kWh)	
		Mean	Median	Mean	Median
Received RAD	4,049	$896	$806	10,881	9,987
Did not receive RAD	91	$1,149	$970	11,049	10,327
TOTAL	4,140	$902	$808	10,885	9,988

Sources: FY 2017 LIHEAP Data; 2017 Pepco Data

Table 4.28 shows the average electric bill, gross energy burden, LIHEAP benefit, and net energy burden for electric main heat households based on having received the RAD discount or not. As seen in the previous table, clients who did not receive the RAD discount had higher average electric bills, and because their income was about the same as those who did receive RAD, their gross energy burden was higher (8% compared to 6%). However, clients who did not receive the RAD discount received a higher average LIHEAP benefit than those who did receive the RAD discount.

Table 4.28 - Gross and Net Total Energy Burden for Electric Main Heat Households by RAD Status

Ratepayer Program Group	Mean Income	Mean Electric Bill	Mean Gross Energy Burden	Mean LIHEAP Benefit	Mean Net Energy Burden
Received RAD	$13,874	$896	6%	$722	1%
Did not receive RAD	$13,893	$1,149	8%	$845	2%
TOTAL	$13,874	$902	7%	$724	1%

Sources: FY 2017 LIHEAP Data; 2017 Pepco Data

4.7 Bill Credits

The previous analyses shed light on the issue of bill credits accrued by many LIHEAP clients. DOEE's policy is to not grant a new LIHEAP benefit to any client that has $1,000 or more in credits in their utility account. For LIHEAP clients included in the natural gas and electric main heat analyses above, Table 4.29 shows the share of clients who have negative net energy burden (i.e., these clients have accrued a bill credit on their account because of the LIHEAP benefits they have received), net energy burden between zero percent and six percent of income, and net energy burden greater than six percent of income. Overall, about one quarter of LIHEAP clients accrue a bill credit (net energy burden is less than zero percent), but it varies by main heating fuel – about 36 percent of clients using electric main heat have negative net energy burden compared to 11 percent of clients using natural gas main heat. The story is the opposite for clients whose net energy burden is greater than six percent of income – about 35 percent of clients using natural gas main heat have net energy burden greater than six percent compared to 12 percent of clients using electric main heat.

Table 4.29 – Net Energy Burden by Main Heating Fuel Type

Net Total Energy Burden	Gas Main Heat	Electric Main Heat	Total
Less than 0% (i.e., bill credit)	11%	36%	27%
0%-6% of income	55%	52%	53%
Greater than 6% of income	35%	12%	20%
Total	100%	100%	100%

Sources: FY 2017 LIHEAP Data; 2017 Washington Gas Data; 2017 Pepco Data

4.8 LIHEAP Benefit Targeting Findings

One way the Office of Community Services (OCS) is looking at whether grantees are targeting the clients with the highest energy burden is to look at the Benefit Targeting Index. This Index compares the LIHEAP benefits for the highest burden households to those for the average LIHEAP household. The calculation for all clients is:

- Average Total LIHEAP Benefit for High Burden Clients = $899
- Average Total LIHEAP Benefit for All Clients = $690
- Ratio = 1.30
- Index = 100 * Ratio = 130

OCS considers a grantee to be targeting benefits if the grantee has a Benefit Targeting Index of greater than 100. Since the Index for these clients is 130, OCS would consider that the program is targeting benefits for all clients.

Table 4.30 provides Benefit Targeting Index results broken down by main heating fuel. Both electric and natural gas main heat clients have Benefit Targeting Index scores greater than 100, so OCS would consider that the program is targeting benefits to both groups of clients.

Table 4.30 - Benefit Targeting Index Results by Main Heating Fuel

Benefit Targeting Index Results	All Households	Electric Main Heat	Natural Gas Main Heat
Average Total LIHEAP Benefit – High Burden Clients	$899	$724	$625
Average Total LIHEAP Benefit – All Clients	$690	$992	$791
Ratio	1.30	1.37	1.27
Benefit Targeting Index	130	137	127

Sources: FY 2017 LIHEAP Data, 2017 Washington Gas Data, 2017 Pepco Data

The Benefit Targeting Index asks grantees to compare households with all heating sources. Even though the District of Columbia LIHEAP program targets higher benefits to higher burden households within heating fuel group, it targets higher benefits to electric heat clients, even though gas heat clients have higher energy burdens. (See Table 4.14)

A second index used by OCS is the Burden Reduction Targeting Index. That Index compares the percent reduction in burden for the highest burden households to the percent reduction for the average LIHEAP household. The calculation for al clients included in the analysis is:

- Average Burden Reduction for High Burden Clients = 57.2%
- Average Burden Reduction for All Clients = 65.2%
- Ratio = 0.88
- Index = 100 * Ratio = 88

OCS considers a grantee to be targeting benefits if the grantee has a Burden Reduction Targeting Index of greater than 100. Since the Index for these clients is 88, OCS would not consider than the program is targeting burden reduction for all clients.

Table 4.31 provides Burden Reduction Targeting Index results broken down by main heating fuel. Both electric and natural gas main heat clients have Burden Reduction Targeting Index scores less than 100, so OCS would not consider that the program is targeting burden reduction to these groups of clients. However, the Index score for natural gas main heat clients is 99, so high burden natural gas main heat clients have their burden reduced nearly the same as all clients using natural gas main heat.

Table 4.31 - Burden Reduction Targeting Index Results by Main Heating Fuel

Burden Reduction Targeting Index Results	All Households	Electric Main Heat	Natural Gas Main Heat
Average Burden Reduction – High Burden Clients	57.2%	69.7%	45.5%
Average Burden Reduction – All Clients	65.2%	80.3%	46.1%
Ratio	0.88	0.87	0.99
Burden Reduction Targeting Index	88	87	99

Sources: FY 2017 LIHEAP Data, 2017 Washington Gas Data, 2017 Pepco Data

Overall and for electric main heat clients, the Burden Reduction Targeting Index results were similar using the average total LIHEAP benefit and the average regular assistance benefit. For natural gas main heat clients, when examining the average regular assistance benefit only (and excluding crisis and supplemental bill payment assistance benefits), the Burden Reduction Targeting Index score if 105, indicating that the program's regular assistance benefit is targeting burden reduction for this group.

Section 5 – Recommendations

The purpose of this analysis is to assist the Department of Energy & Environment (DOEE) in its efforts to mitigate the energy costs of those with the highest home energy needs, greatest energy burdens, and least amount of available resources. The study characterized the population of low-income households in the District of Columbia and estimated the penetration rate of the District of Columbia's existing energy assistance programs. It furnishes DOEE with the information that it needs to modify its benefits matrix in a way that meets the statutory guidance of the federal LIHEAP program. It also helps DOEE to identify procedures to fulfill the District's mandates to make the distribution of benefits more equitable, maintain a year-round program, and coordinate LIHEAP with new the Solar for All program. The second phase of the study will use the results of this analysis to examine alternative benefit structure procedures.

The study consisted of three complementary tasks, including:

1. LIHEAP Program Documentation - Developed detailed information on the program design and implementation.

2. Characterization of Income-Eligible Households - Furnished information on the characteristics of low-income households and estimates of program participation rates.

3. Benefit Targeting Analysis - Examined the effectiveness of the LIHEAP Benefit Matrix in targeting benefits to clients.

The study makes short-term and longer-term recommendations to DOEE regarding the targeting of benefits to meet OCS performance targets and District goals.

5.1 Overview of Benefit Determination Recommendations

This analysis finds that basic approach used by the District of Columbia benefit determination procedures is consistent with the LIHEAP program requirements. The program attempts to target higher benefits to clients with higher energy burdens. And, for an individual heating fuel - e.g., gas heat - the matrix appears to correctly assess which groups of households have higher energy burdens *on average*. Tables 4.1-4.6 shows that the highest burden groups get the highest benefits. Moreover, the Benefit Targeting Index shows that the program has targeting indexes with values greater than 100, indicating the program is estimated to target benefits within each fuel group.

However, the Burden Reduction Targeting index shows that the program has targeting index values less than 100, indicating that the program is targeting burden reduction less for households with the highest burden. In addition, Table 4.14 shows that the program is targeting higher benefits to electric heat clients, even though those clients, on average, have lower energy burdens than gas heat clients.

The analysis conducted for this study also demonstrates that while a group of clients may be expected to have a certain energy burden, individual clients within that group may have substantially higher or lower energy burdens. For example, Table 4.12 showed that for natural

gas main heat households with income between $5,000 and $10,000, mean individual net energy burden (i.e., energy burden after LIHEAP) was 7% of income and ranged from -1% to 18% of income for the 10th and 90th percentiles. For electric main heat households with the same income, Table 4.22 showed that mean individual net energy burden was only 1%, but net energy burden ranged from -7% to 8% of income for the 10th and 90th percentiles. And, Table 4.29 showed that about one-third of electric main heat clients had negative net energy burden (i.e., they received LIHEAP benefits that were greater than their energy bills), while about one-third of natural gas main heat clients had net energy burden greater than 6 percent. The only way to account for these differences is to get information on the actual energy bills for individual clients served by the program as part of the benefit determination process.

In several states, the grantees have replaced the Benefit Matrix that assigned benefits based on group characteristics with a benefit determination procedure that collects prior year energy expenditure data from energy vendors at the time of application and uses that information to assign benefits to clients. Some examples of states that use those procedures include Colorado, Minnesota, and Wisconsin.

5.2 Specific Benefit Matrix Issues

DOEE has expressed a concern about the targeting of LIHEAP benefits to clients in the District of Columbia, and to ensure equitable distribution of benefits while operating a year-round program. Based on the analyses conducted for this study, there are three components of the Benefit Matrix that DOEE could review to improve the targeting of LIHEAP benefits to clients in the short run.

1. Main Heating Fuel Differentials - Based on the data available from Pepco and Washington Gas, it appears that the benefit matrix differentials by heating fuel do not target the highest burden households. Based on the analysis in Table 4.2 and Table 4.10, natural gas main heat clients have higher total energy bills and burden than electric main heat clients. In order to meet the goal of targeting the highest burden households, DOEE would need to change the benefit matrix to be consistent with actual energy bills by providing the higher average benefits to natural gas main heat clients than electric heat clients.

2. Housing Unit Type Differential - It appears from the analysis in Table 4.5 and Table 4.14 that the housing unit type differential may not be large enough to account for differences in average usage by housing unit type.

3. Household Member Differential - It appears from the analysis in Table 4.6 that the differential used to vary benefits by the number of household member is appropriate. However, if the main heat differentials and the housing unit differentials are changed, it will be appropriate to consider whether that impacts the household member differential.

5.3 Alternative Benefit Structure

The second phase of the study will use the results of this analysis to examine alternative benefit determination procedures. Specific benefit matrix issues will be examined and optimized under a new benefit structure that equitably distributes benefits and addresses concerns of DOEE regarding operating LIHEAP as a year-round program.

In addition, DOEE has expressed interest in understanding the combined impact of LIHEAP and Solar for All, as well as LIHEAP and utility allowances renter households participating in the Housing Choice Voucher Program (HCVP) may be eligible to receive. The combined impacts of these programs will be examined in the analysis of an alternative benefit structure.

The Alternative Benefit Structure Analysis will focus on short-term changes that DOEE can make in the LIHEAP program. In the longer run, DOEE might want to consider whether they would change from a Benefit Matrix approach to a benefit determination procedure that makes use of client expenditure data from the energy vendors. Those procedures take time to implement and add to the program operations cost. However, they also have been shown to do a better job in terms of targeting client benefits. The Alternative Benefit Structure Analysis memo will discuss alternative long-term options for the District's LIHEAP program.