District of Columbia
LIHEAP Energy Burden Analysis

Prepared for the
Department of Energy & Environment
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Washington, DC 20002

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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 benefit 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 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:

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.

About one-quarter (26%) 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 (49%) or electric (47%) 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 (12% in small, 2-4 unit buildings and 64% in large, 5+ unit buildings).

- Tenure – About 78% of the low-income households in the District are renters.

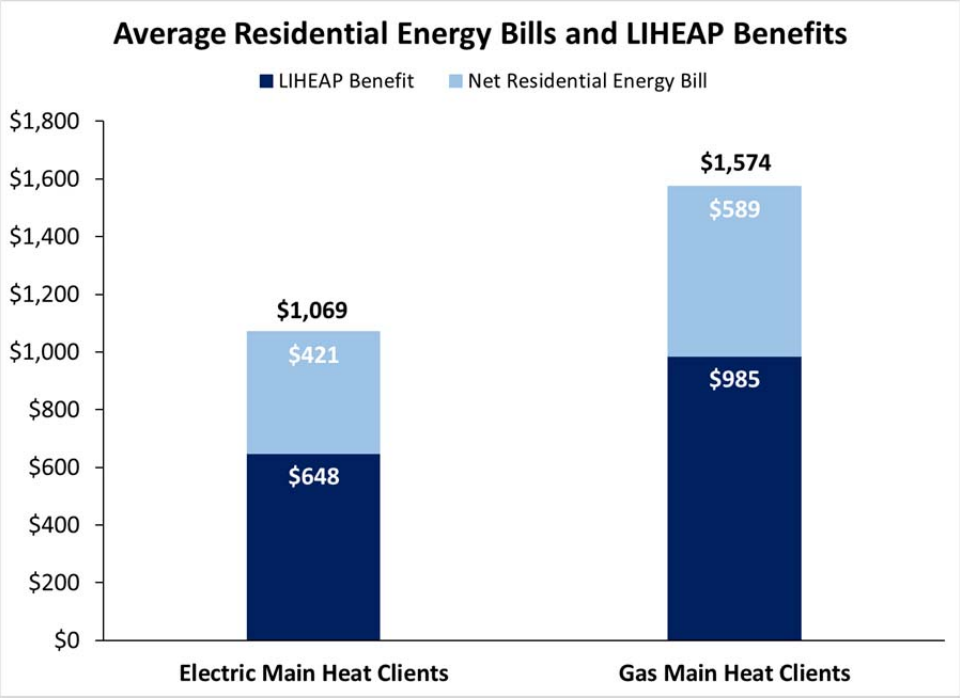
In FY 2019, the District's LIHEAP program was able to serve about 26% of the households that are income-eligible for LIHEAP. Since the District's LIHEAP program only serves households

who pay at least one energy bill, some households who are income-eligible for the program are not eligible to receive benefits. In FY 2019, the District's program was able to serve about 38% 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. DOEE implemented a revised benefit matrix for the FY 2019 program based on findings from the 2018 Study. The revised benefit matrix provides higher benefits to those who have lower income, more family members, live in single-family homes, and use gas as their main heating fuel. The revised benefit matrix was designed based on detailed analyses of the energy bill and energy burden differentials across these factors. Based on the current analysis, the revised benefit matrix appears to work as intended, resulting in group average net energy burden outcomes that are similar across the different dimensions of the benefit matrix.

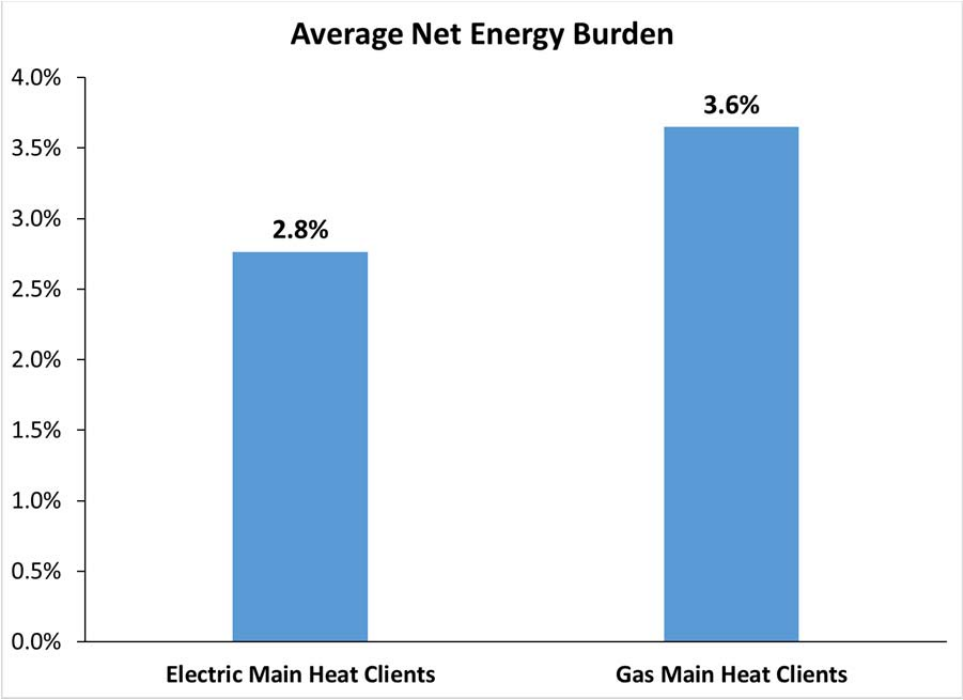
Figure 1 shows the average home energy bill (gross and net) and total LIHEAP benefits (regular and crisis assistance) by main heating fuel. Clients using electric as their main heating fuel have an average annual gross home energy bill of $1,069 and receive an average annual total LIHEAP benefit of $648, resulting in an average annual net home energy bill of $421. Clients using natural gas as their main heating fuel have an average annual gross home energy bill of $1,574 and receive an average annual total LIHEAP benefit of $985, resulting in an average annual net home energy bill of $589.

Figure 1. Average Residential 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. Figure 2 shows that the average net energy burden for clients using electric as their main heating fuel is about 2.8 percent of income compared to about 3.6 percent of income for gas main heat clients. The gap in group average net energy burden outcomes for these groups is much narrower since the implementation of the revised benefit matrix (in FY 2017, the group average net energy burden was 1.3 percent for electric main heat clients compared to about 4.8 percent gas main heat clients). The average net energy burden for both groups of clients is considered affordable.

Figure 2. Average Net Energy Burden by Main Heating Fuel



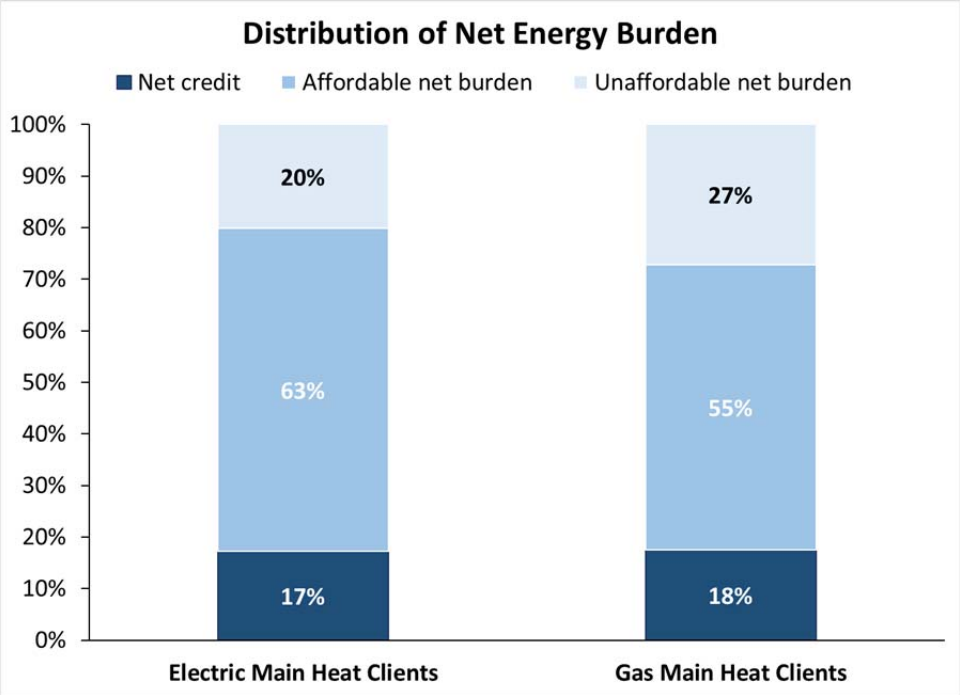
The current benefit matrix targets higher benefits to gas main heat clients than electric main heat clients, which is consistent with gas main heat clients having higher total energy bills and burden. However, a benefit matrix is an imperfect predictor of individual bills and burden for clients and, despite group average net energy burden being affordable for LIHEAP clients in the District, outcomes for individual clients continue to vary considerably. Figure 3 shows the following about the net energy burden of individual clients:

- 17% of electric main heat clients and 18% of gas main heat clients have a net credit after receiving LIHEAP.

- Over half of electric main heat clients and gas main heat clients have affordable net energy burden (0%-6% of income) after receiving LIHEAP.

- 27% of gas main heat clients and 20% of electric main heat clients have unaffordable net energy burden (>6% of income).

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



Based on these findings, the study makes recommendations to DOEE regarding the targeting of benefits to improve individual client outcomes. Detailed recommendations are examined in a separate memo discussing alternative 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 provides updated analyses that characterize the population of low-income households in the District of Columbia and estimate the penetration rate of the District of Columbia's existing energy assistance programs. It furnishes DOEE with the information that it needs to assess the impact of its revised benefit determination procedures and decide whether to modify those procedures further to meet the statutory guidance of the federal LIHEAP program. It also helps DOEE to assess whether the revised benefit determination procedures fulfill the District's mandates to make the distribution of benefits more equitable, maintain a year-round program, and coordinate LIHEAP with the Solar for All program. A separate memo provides analysis of alternative benefit determination procedures for DOEE to consider as it seeks to better address individual outcomes for clients.

The report consists of three complementary sections:

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 revised LIHEAP Benefit Matrix in targeting benefits to clients.

The study the study makes recommendations to DOEE regarding the targeting of benefits to improve individual client outcomes

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, define population subgroups in terms of differential benefit levels, and understand why certain households might not participate in the program at the same rate that they are found in the population.

We used four sources of information to characterize the program:

- FY 2020 LIHEAP State Plan – The plan describes how the program was to be implemented in the current program year (FY 2020); it was filed by the District of Columbia filed with the Office of Community Services.

- FY 2019 LIHEAP State Plan – The plan describes how the program was to be implemented in FY 2019. The purpose of using this plan is to identify any program changes that were to be implemented in FY 2020.

- Grantee Surveys and Household Reports (FY 2015 through FY 2019) – These reports furnished information on how much federal funding was available for LIHEAP, how much federal funding was used for each program element, how many households were served by the program using federal funding, and what types of households were served by the program.

- Other Documents – These documents furnished additional details on how the program is implemented. They included the DOEE FY 2019 Program Benefit Matrix and the web-based 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 2015 through FY 2019. 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. We also used the raw program data file for FY 2019 to develop program participation rates based on all funding sources.

- American Community Survey (ACS) – We used the five-year PUMS file for the District of Columbia for 2014-2018. This was supplemented with income-eligible population estimates for FY 2017 and FY 2018 based on the 2012-2016 ACS PUMS file and 2013-2017 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 2019 from DOEE.
- Washington Gas Data – We obtained annual usage and billing data from Washington Gas for calendar year 2017 for LIHEAP clients in FY 2019.
- Pepco Data – We obtained monthly usage and billing data from Pepco for calendar year 2017 for LIHEAP clients in FY 2019.

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's 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's 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, define population subgroups in terms of differential benefit levels, and 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 2020 LIHEAP State Plan – The plan describes how the program was to be implemented in the current program year (FY 2020); it 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 to be implemented in FY 2019. The purpose of using this plan is to identify any program changes that were to be implemented in FY 2020.
- Grantee Surveys and Household Reports (FY 2015 through FY 2019) – These reports furnished information on how much federal funding was available for LIHEAP, how much federal funding was used for each program element, how many households were served by the program using federal funding, and what types of households were served by the program.

- Other Documents – These documents furnished additional details on how the program is implemented. They included the DOEE FY 2019 Program Benefit Matrix and the web-based program application documents.

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 2015 through FY 2019. During this time period, DOEE's federal grant was fairly consistent, ranging from $11.2 million to $12.3 million. In addition, the percent of federal funding allocated to benefits remained relatively constant, ranging from 83 percent to 88 percent.

Table 2.1 - Federal Program Funding for the District of Columbia

Fiscal Year	Total Funding	Funding for Assistance Benefits	Percent Allocated to Benefits
2015	$11,429,251	$9,554,568	84%
2016	$11,270,439	$9,405,017	83%
2017	$11,209,544	$9,376,937	84%
2018	$12,149,911	$10,225,165	84%
2019*	$12,275,490	$10,811,772	88%

*Preliminary data

The District of Columbia LIHEAP program allocates funds to several different types of assistance benefits, including heating benefits, cooling benefits, year-round crisis assistance, 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. In addition, in more recent years, the District of Columba LIHEAP program has provided an emergency repair and replacement program for heating and

[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 from the 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, grantees are allowed to allocate funds to administration and Assurance 16 activities. Grantees also are allowed to carryover some funds to the next fiscal year.

cooling equipment. Table 2.7 shows the percent of federal funds that was allocated to each type of benefit for each year.

Table 2.2 shows the allocation of federal funding for heating assistance benefits. With the exception of FY 2018, the program has served about 7,500-8,300 households per year with heating assistance from its federal grant; the average heating benefit has been about $650-$850.

Table 2.2 - Heating Assistance Using Federal Funds

Fiscal Year	Heating Assistance Benefits	Number of Households Served	Average Benefit
2015	$6,184,927	7,479	$827
2016	$6,019,894	8,335	$722
2017	$5,358,867	8,181	$655
2018	$5,221,298	5,899	$855
2019*	$6,356,995	8,237	$772

*Preliminary data

Table 2.3 shows the amount of federal LIHEAP funding used for cooling assistance. This component of the District of Columbia's LIHEAP program has grown over time. [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 the program in FY 2015 to about two thousand in FY 2019. The average cooling benefit over this time period has fluctuated from about $423 in FY 2017 to $1,292 in FY 2016. In FY 2019, the average cooling benefit was $818.

Table 2.3 - Cooling Assistance Using Federal Funds

Fiscal Year	Funding for Assistance Benefits	Number of Households Served	Average Benefit
2015	$396,326	557	$712
2016	$1,539,683	1,192	$1,292
2017	$980,811	2,319	$423
2018	$1,484,172	2,031	$731
2019*	$1,594,824	1,950	$818

*Preliminary data

Table 2.4 shows the amount of federal LIHEAP funding used for crisis assistance to help pay clients' energy bills. The number of clients receiving this type of crisis assistance has decreased from nearly five thousand in FY 2015 to under two thousand in FY 2018 and FY

2019. However, the average benefit for this type of crisis assistance has increased during the time period.

Table 2.4 - Crisis Assistance Using Federal Funds

Fiscal Year	Funding for Assistance Benefits	Number of Households Served	Average Benefit
2015	$1,838,856	4,921	$374
2016	$764,013	2,646	$289
2017	$1,431,849	5,349	$268
2018	$966,599	1,926	$502
2019*	$886,980	1,871	$474

*Preliminary data; excludes funding and households receiving assistance for repair and replacement of home energy equipment

Table 2.5 shows the amount of federal LIHEAP funding that was used for weatherization. Up to 15 percent of federal LIHEAP funds can be transferred for use in weatherizing homes. Funds were transferred in FY 2015 through FY 2019. The number of households served and funding have varied over time. [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
2015	$1,134,459	273	$4,156
2016	$1,081,427	0	N/A
2017	$1,242,733	338	$3,677
2018	$1,638,382	648	$2,528
2019*	$1,423,591	132	$10,785

*Preliminary data; funding may be obligated to weatherization assistance in one year while households may be served the subsequent year.

Table 2.6 shows that the allocation of federal funds to different program elements has varied considerably over time. For example, the program's cooling component has increased from about four percent of assistance funding in FY 2015 to 15 percent of assistance funding in FY 2018 and FY 2019.

Table 2.6 - Allocation of Federal Funds for Assistance by Benefit Type

Fiscal Year	% Heating	% Cooling	% Bill Payment Crisis	% Weatherization	% Other Crisis	Total
2015	65%	4%	19%	12%	0%	100%
2016	64%	16%	8%	12%	0%	100%

Fiscal Year	% Heating	% Cooling	% Bill Payment Crisis	% Weatherization	% Other Crisis	Total
2017	57%	10%	15%	13%	4%	100%
2018	51%	15%	9%	16%	9%	100%
2019*	59%	15%	8%	13%	5%	100%

*Preliminary data

Table 2.7 shows the unduplicated count of households served with the program's federal block grant and the average value of total benefits (excluding weatherization and repair/replacement of heating or cooling equipment) delivered to each household.

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

Fiscal Year	Unduplicated Count of Households Served	Average Benefit per Household
2015	12,957	$650
2016	12,173	$684
2017	10,514	$739
2018	8,348	$919
2019*	10,435	$847

*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. In FY 2019, funding from the federal block grant used for bill payment assistance benefits represented about 46 percent of the total funding for bill payment assistance, with non-federal sources making up the difference. In years prior, the federal block grant represented about half of the funding needed for bill payment assistance.

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	$7,676,960	$5,533,782	$1,468,096	$0	$14,678,839
2016	$7,501,229	$4,119,726	$1,234,036	$1,484,624	$14,339,615
2017	$6,642,215	$4,235,072	$1,442,688	$1,202,110	$13,522,084
2018	$6,543,622	$3,534,597	$3,885,851	$0	$13,959,056
2019	$7,703,011	$4,582,044	$4,476,050	$0	$16,758,507

2.4 Program Outreach Procedures

LIHEAP benefits are distributed to eligible clients when they apply for the program. 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 newspapers or making broadcast media announcements.
- Placing posters and flyers in social services offices.
- Furnishing information to households who apply for other types of means-tested assistance programs.
- Conducting targeted outreach in coordination with DOEE's Office of Community Engagement and Outreach.
- 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 at the DOEE website. DOEE has observed a steady increase in the number of applications received through the online application system. Applicants can also make an in-person appointment by calling 311.

Applicants are required to submit the following documents:

- Government issued ID for the applicant.
- 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 must pay their electric utility directly in order to receive a LIHEAP "heat in rent" benefit.

The application process is similar to apply for crisis benefits. In addition to the information listed above, the client must bring a disconnect notice or letter from the utility company that states the service has been disconnected.

Eligibility

Any household that meets the income-eligibility requirements, directly pays an energy bill, 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

Applicants who disagree with DOEE's decision on their LIHEAP application may appeal the decision by requesting a fair hearing at the District of Columbia's Office of Administrative Hearings. Applicants can ask for the hearing by calling 311, writing to OAH, or visiting the OAH offices.

2.7 Benefit Determination

Based on findings from the 2018 Energy Burden Report (the "2018 Study"), DOEE revised its benefit determination procedures for the FY 2019 program year by implementing a new benefit matrix designed to distribute benefits more equitably across main heating fuel type. As with the prior benefit determination procedures, the revised benefit matrix makes 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.

The revised benefit matrix was designed based on detailed analysis of differentials in energy bills and energy burden by client income level, household size, housing unit type, and main heating fuel. Consistent with the prior benefit determination procedures, clients whose heat is included in rent but who pay an electric bill are eligible for a $250 benefit, and clients who heat with fuel oil are eligible for a $1,500 benefit. All other clients who directly pay their electric or gas bills are eligible for a benefit that is based on their household and housing unit characteristics. Benefits for these clients range from $250 to $1,800. The following principles are built into the revised benefit matrix.

- Single-Family vs. Multifamily Homes – The benefits for clients living in single-family homes are higher than those for clients living in multifamily homes. Based on the 2018 Study, we found that clients residing in single-family homes had about 50 percent higher bills, on average, compared to clients residing in multifamily buildings. The revised benefit matrix was updated to account for this differential while targeting three percent mean group net energy burden.

- Income Level – Clients with lower income have higher benefits. Based on the 2018 Study, we found that bills were fairly consistent across different income levels, but gross energy burden varied considerably, ranging from 40 percent for gas main heat clients with the lowest incomes to less than six percent for gas main heat clients with the highest income. The revised benefit matrix was updated to account for these differentials while targeting three percent mean group net energy burden.

- Household Size – Clients with larger household sizes have higher benefits. Based on the 2018 Study, we found that electric main heat clients with four household members had electric bills that were 50 percent higher, on average, than electric main heat clients with one household member. The revised benefit matrix was updated to account for these differentials while targeting three percent mean group net energy burden.

- Main Heating Fuel – Based on the 2018 Study, we found that clients who heat with natural gas had about 50 percent higher total residential energy bills than clients heating with electric. The revised benefit matrix was updated to account for this differential while targeting three percent mean group net energy burden.

The revised benefit matrix is consistent with the LIHEAP requirements that those households with the lowest income and the highest home energy needs should receive the highest benefits. However, as identified in the 2018 Study, a benefit matrix focuses on group outcomes and is an inexact predictor of the needs of each individual client. Accordingly, a benefit matrix determination procedure, no matter how well designed, will result in some clients achieving the desired outcome while other clients will receive a benefit that is higher than their need while still others will receive a benefit that falls short of their need. Section 4 of this report explores outcomes for individual clients in more detail. A separate memo will discuss alternative benefit determination procedures that better address the needs of individual clients as opposed to focusing on the needs of groups of clients.

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:

- Utility Discount Program (UDP) – The UDP program consists of the Residential Aid Discount (RAD) program for discounted electric bills, the Residential Energy Services (RES) program for discounted gas bills, and the Customer Assistance Program (CAP) for discounted water and sewer bills. The RAD program offers year-round discounts on electric services and provides a discount of up to $475 per year on electric heating bills ($300 per year if the customer does not use electric as their heating fuel). The RES program offers heating season discounts on natural gas service of up to $276 per year. The CAP program offers discounts of up to $400 per year on water and sewer service. Like LIHEAP, each of the UDP programs is available to households with income at or below 60% of State Median Income (SMI) who pay their electric, gas, or water service directly to their utility. DOEE uses a combined application for LIHEAP and the UDP programs to streamline intake.

- Solar for All (SFA) – The SFA program was established in 2016 by the Renewable Portfolio Standard Expansion Amendment Act. The SFA program has an income-eligibility standard of 80% of Area Median Income (AMI). A long-term goal of the SFA program is to serve 100,000 low- and moderate-income households (LMI households)

by 2032. 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. One part of this study is to examine the SFA program in-depth and to assess how the program interacts with LIHEAP. The SFA program will be discussed at greater length in a separate memo.

- Fuel Fund Programs – Two charitable fuel funds also serve low-income households in the District of Columbia. The Washington Area Fuel Fund (WAFF) assists LMI households who have a disconnection notice and have exhausted all other sources of government assistance. The Greater Washington Urban League (GWUL) assists households with their electric bills.

- SPLASH – This program assists low-income households with water and sewer bills in emergency situations. It is funded through voluntary contributions. SPLASH is a DC Water program that is administered by the GWUL.

- DC Sustainable Energy Utility (DCSEU) – The DCSEU 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 is funded by the U.S. Department of Housing and Urban Development (HUD) and is administered by the District of Columbia Housing Authority (DC Housing). In addition to rent subsidies, HCVP program participants who pay their main heating fuel and/or electric bill are eligible for a utility allowance that helps to make their energy bills more affordable. While the LIHEAP and HCVP programs are not directly linked, low-income renter households may participate in both programs in the District.

The current study does not include new research on the energy burden faced by LIHEAP clients who also participate in the HCVP program and receive a utility allowance. In the 2018 Study, APPRISE conducted exploratory research on the energy burden of renter households, many of whom are likely to receive utility allowances, to inform the targeting of LIHEAP benefits to this

group. Additional research is needed to better understand the energy burden faced by this group of clients. Doing so would require establishing a data sharing agreement between DOEE and DC Housing.

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:

- LIHEAP Grantee Surveys and Household Reports (FY 2015 through FY 2019) – 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 2014-2018 to develop detailed statistics for a sample of households. For analysis of LIHEAP participation rates in FY 2017 and FY 2018, this is supplemented with eligible-population estimates using the ACS PUMS file for the District of Columbia for 2012-2016 and 2013-2017, respectively.

These data sources furnish the information 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. About 14 percent of households have income below the 100% of the HHS Poverty Guidelines

(HHSPG) and another six percent of households have income from the 101% HHSPG to 150% HHSPG. The income-eligibility standard for the District of Columbia LIHEAP program is 60 percent of median income. Table 3.2 shows that about 78 thousand households (28% of total households) in the District of Columbia are income-eligible for LIHEAP.[4] Of households that are income-eligible for LIHEAP, about 54 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	27,053	10%
76% to 100% of Poverty	10,751	4%
101% to 125% of Poverty	8,615	3%
126% to 150% of Poverty	7,348	3%
151% or More of Poverty	227,554	81%
TOTAL	281,321	100%

Source: 2014-2018 ACS

Table 3.2 - Income-Eligible Households

Household Group	Number of Households	Percent of Households
Income-Eligible for LIHEAP	78,309	28%
RAD Program-Eligible	53,876	19%
RES Program-Eligible	22,825	8%
Not Income-Eligible for LIHEAP	203,012	72%
TOTAL	281,321	100%

Source: 2014-2018 ACS

Table 3.3 shows that certain areas of the District of Columbia have a higher percentage of low-income households than other areas.[5] Over half of the households in the East Region (Ward 7 and Ward 8) are income-eligible for LIHEAP compared to only 12 percent of households in the West Region (Ward 3). Additional tables showing characteristics of the income-eligible population and program participation by Region are included in Appendix A.

[4] The LIHEAP program serves households, not 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.

[5] Regions were assigned using the Public Use Microdata Areas (PUMAs) defined in the 2014-2018 ACS and their approximate overlap with the Wards in the District of Columbia.

Table 3.3 - Income-Eligible Households by Region

Region	Income-Eligible Households	All Households	Percent Income-Eligible
West Region (Ward 3)	5,833	47,233	12%
North Region (Ward 4)	13,597	46,753	29%
Northeast Region (Wards 5/6)	12,104	47,276	26%
East Region (Wards 7/8)	30,527	59,722	51%
Central Region (Wards 1/2)	16,248	80,337	20%
TOTAL HOUSEHOLDS	78,309	281,321	28%

Source: 2014-2018 ACS

The LIHEAP program defines vulnerable households as those with elderly or disabled household members, or with children under the age of six. 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 3.4 shows the number of income-eligible households with vulnerable members.[6] Thirty-eight percent of income-eligible households have an elderly household member and 41 percent have a disabled member. Only about 12 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 (46 percent) or a disabled member (44 percent).

Table 3.4A - Vulnerability Status of Income-Eligible Households

Vulnerability Group	Number of Households	Percent of Households
Elderly Member	29,456	38%
Disabled Member	32,414	41%
Young Child	9,581	12%
No Vulnerable Members	26,686	34%

Source: 2014-2018 ACS

Table 3.4B - Vulnerability Status of Income-Eligible Households

Vulnerability Group	LIHEAP	RAD	RES
Elderly Member	38%	38%	46%
Disabled Member	41%	41%	44%
Young Child	12%	13%	12%
No Vulnerable Members	34%	34%	29%

Source: 2014-2018 ACS

[6] 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 3.3.

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

- Number of Household Members - Table 3.5 shows the distribution of households by the number of members in the household. About half of the income-eligible households in the District of Columbia are one-person households. About 16 percent have four or more household members.

- Race/Ethnicity - Table 3.6 shows the distribution of households by the race/ethnicity of the head of household. About 71 percent of income-eligible households have a non-Hispanic Black head of household. Thirteen percent are non-Hispanic White individuals and 10 percent are Hispanic.

- Language Spoken at Home - Table 3.7 shows the language spoken at home by income-eligible households. About 82 percent of households speak English as their primary language, while about 9 percent speak Spanish.

- Linguistic Isolation - Table 3.8 shows the share of income-eligible households that are linguistically isolated, wherein no member in the household aged 14 years or older speaks English only or "very well". About 7 percent of income-eligible households are linguistically isolated.

- Household Types - Table 3.9 shows the distribution of households by household type. About one quarter of income-eligible households are elderly individuals. Another 12 percent of households are elderly couples. About one quarter of households have children under the age of 18 and about 38 percent of households have neither an elderly member nor a children member under the age of 18.

- SNAP Recipient - Table 3.10 shows the percentage of income-eligible households that receive SNAP benefits. About 39 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 3.5A - Number of Household Members

Household Members	Number of Households	Percent of Households
One	41,361	53%
Two	16,693	21%
Three	7,836	10%
Four or More	12,419	16%
TOTAL HOUSEHOLDS	78,309	100%

Source: 2014-2018 ACS

Table 3.5B - Number of Household Members

Household Members	LIHEAP	RAD	RES
One	53%	48%	45%
Two	21%	23%	23%
Three	10%	11%	12%
Four or More	16%	18%	20%
TOTAL HOUSEHOLDS	100%	100%	100%

Source: 2014-2018 ACS

Table 3.6A - Race/Ethnicity

Race/Ethnicity	Number of Households	Percent of Households
White Non-Hispanic	10,445	13%
Black Non-Hispanic	55,697	71%
Hispanic	7,950	10%
Asian	2,044	3%
Other	2,173	3%
TOTAL HOUSEHOLDS	78,309	100%

Source: 2014-2018 ACS

Table 3.6B - Race/Ethnicity

Race/Ethnicity	LIHEAP	RAD	RES
White Non-Hispanic	13%	12%	11%
Black Non-Hispanic	71%	75%	77%
Hispanic	10%	9%	8%
Asian	3%	2%	1%
Other	3%	3%	3%
TOTAL HOUSEHOLDS	100%	100%	100%

Source: 2014-2018 ACS

Table 3.7A - Language Spoken at Home

Language	Number of Households	Percent of Households
English	63,904	82%
Spanish	7,321	9%
Indo-European	2,420	3%
Asian and Pacific Island	1,617	2%
Other	3,047	4%
TOTAL HOUSEHOLDS	78,309	100%

Source: 2014-2018 ACS

Table 3.7B - Language Spoken at Home

Language	LIHEAP	RAD	RES
English	82%	83%	85%
Spanish	9%	8%	8%
Indo-European	3%	3%	3%
Asian and Pacific Island	2%	2%	1%
Other	4%	4%	3%
TOTAL HOUSEHOLDS	100%	100%	100%

Source: 2014-2018 ACS

Table 3.8A - Linguistic Isolation

Language	Number of Households	Percent of Households
Not Linguistically Isolated	72,631	93%
Linguistically Isolated – Hispanic	3,731	5%
Linguistically Isolated – Non-Hispanic	1,947	2%
TOTAL HOUSEHOLDS	78,309	100%

Source: 2014-2018 ACS

Table 3.8B - Linguistic Isolation

Language	LIHEAP	RAD	RES
Not Linguistically Isolated	93%	94%	95%
Linguistically Isolated – Hispanic	5%	4%	3%
Linguistically Isolated – Non-Hispanic	2%	2%	2%
TOTAL HOUSEHOLDS	100%	100%	100%

Source: 2014-2018 ACS

Table 3.9A - Household Type

Household Type	Number of Households	Percent of Households
Elderly Individual (60+)	19,751	25%
Elderly Couple (60+)	9,705	12%
Older without Children (40-59)	16,415	21%
Older with Children (40-59)	7,930	10%
Younger without Children (<40)	13,233	17%
Younger with Children (<40)	11,275	14%
TOTAL HOUSEHOLDS	78,309	100%

Source: 2014-2018 ACS

Table 3.9B - Household Type

Household Type	LIHEAP	RAD	RES
Elderly Individual (60+)	25%	23%	25%
Elderly Couple (60+)	12%	15%	21%
Older without Children (40-59)	21%	20%	18%
Older with Children (40-59)	10%	11%	12%
Younger without Children (<40)	17%	15%	11%
Younger with Children (<40)	14%	16%	13%
TOTAL HOUSEHOLDS	100%	100%	100%

Source: 2014-2018 ACS

Table 3.10A - SNAP Recipient

SNAP Recipient	Number of Households	Percent of Households
Yes	30,594	39%
No	47,715	61%
TOTAL HOUSEHOLDS	78,309	100%

Source: 2014-2018 ACS

Table 3.10B - SNAP Recipient

SNAP Recipient	LIHEAP	RAD	RES
Yes	39%	38%	36%
No	61%	62%	64%
TOTAL HOUSEHOLDS	100%	100%	100%

Source: 2014-2018 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 2017 through FY 2019.

Table 3.11 shows the estimated participation rate in FY 2017. About 27 percent of income-eligible households received LIHEAP benefits. The estimated participation rate for young child households was above the average (35% compared to 27%). The estimated participation rate for elderly households was average (27%, the same as the overall participation rate), while the estimated participation rate for disabled households was well below the average (5% compared to 27%). [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 3.11 also shows that the highest participation rates are observed for the lowest income households; 46 percent of

households with income at or below 100% HHSPG received LIHEAP benefits, while less than one percent of those with income above 150% HHSPG received benefits.

Table 3.11 - Estimated LIHEAP Participation Rates - FY 2017

Group	Income Eligible Households	LIHEAP Recipient Households[7]	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; poverty level was unknown for 933 recipient households.

Table 3.12 shows the estimated participation rate in FY 2018. This includes both federal and local funding of the LIHEAP program. The participation rate was about the same in FY 2018 as it was in FY 2017 (26% in FY 2018 compared to 25% in FY 2017). The estimated participation rates for vulnerable households remained about the same in FY 2018 as in FY 2017. Table 3.10 also shows that the highest participation rates continued to be observed for the lowest income households in FY 2018. About 48 percent of households with income at or below the 100% HHSPG received LIHEAP benefits, while about two percent of households with income above 150% HHSPG received benefits.

[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.

Table 3.12 - Estimated LIHEAP Participation Rates - FY 2018

Group	Income Eligible Households	LIHEAP Recipient Households[8]	Estimated Participation Rate
All Households	82,290	21,002	26%
Vulnerable Households			
Elderly Households	29,421	7,407	25%
Disabled Household	33,011	1,648	5%
Young Child Households	11,026	3,796	34%
Poverty Group			
<=100% of Poverty	38,641	18,515	48%
101% - 125% of Poverty	9,392	1,247	13%
126% - 150% of Poverty	7,426	791	11%
151% or More	18,820	441	2%

Source: 2013-2017 ACS / FY 2018 Household Report (all sources); poverty level was unknown for eight recipient households.

Table 3.13 shows the estimated participation rate in FY 2019. This includes both federal and local funding of the LIHEAP program. The overall participation rate was 26 percent. The estimated participation rate for young child households continued to be above the average (39% compared to the overall rate of 26%). Elderly households participated at a slightly lower rate than the overall population (25% compared to 26%). Disabled households continued to participate at a much lower rate than the overall population (4% compared to 12%). Table 3.13 also shows that households with incomes at or below 100% HHSPG continued to participate at a higher rate than the overall population (37% compared to 26%), but the difference is not as stark as in FY 2017. In addition, households with income greater than 150% HHSPG increased their participation compared to FY 2017 (12% in FY 2019 compared to less than 1% in FY 2017). This may be due to how income information is collected on the application. [Applicants can choose to report income that is weekly, bi-weekly, monthly, or based on some other time period; this can fluctuate throughout the year.]

[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.

Table 3.13 - Estimated LIHEAP Participation Rates - FY 2019

Group	Income Eligible Households	LIHEAP Recipient Households[9]	Estimated Participation Rate
All Households	78,309	20,231	26%
Vulnerable Households			
Elderly Households	29,456	7,231	25%
Disabled Household	32,414	1,414	4%
Young Child Households	9,581	3,728	39%
Poverty Group			
<=100% of Poverty	37,804	13,984	37%
101% - 125% of Poverty	8,615	2,039	24%
126% - 150% of Poverty	7,348	1,383	19%
151% or More	24,542	2,824	12%

Source: 2014-2018 ACS / FY 2019 Household Report (all sources); vulnerability status was unknown for 37 recipient households; poverty level was unknown for one recipient household.

An important finding in Table 3.11, Table 3.12, and Table 3.13 is that low-income households with income at or below 100% of the Poverty Guidelines are more likely to be served by the program than are low-income households with income above 150% HHSPG (but the estimated participation rates increased for households above 100% HHSPG in the most recent program year). In FY 2017, 91% of clients served by the program (18,069 out of 19,762 clients for whom poverty group was reported) had income at or below 100% HHSPG, 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 100% HHSPG, compared to 48% of income-eligible households. In FY 2019, 69% of clients served by the program (13,984 out of 20,230 clients for whom poverty group was reported) had income at or below 100% HHSPG, compared to 48% of income-eligible households (37,804 out of 78,309 income-eligible households). By contrast, 31% of clients served by the program had income above 100% HHSPG, compared to 52% 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 – Tables 3.14A and 3.14B show 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.

[9] 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.

- Tenure – Tables 3.15A and 3.15B show that 78 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 – 24 percent of RAD program-eligible households and 39 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 – Tables 3.16A and 3.16B show the main heating fuel for income-eligible households. Forty-nine percent of households use natural gas main heat and 47 percent have electric main heat. Only one percent of income-eligible households 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 – Tables 3.17A and 3,17B show the energy billing arrangements for income-eligible households. About 69 percent of household pay directly for their electricity and about 62 percent pay directly for their main heating fuel. Low-income households must pay their electric bill directly to qualify for RAD and they 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 3.14A - Housing Unit Type

Housing Unit Type	Number of Households	Percent of Households
Single-Family Detached	5,385	7%
Single-Family Attached (Row House)	14,013	18%
Small Multifamily (2-4 Units)	9,092	12%
Large Multifamily (5+ Units)	49,819	64%
TOTAL HOUSEHOLDS	78,309	100%

Source: 2014-2018 ACS

Table 3.14B - Housing Unit Type

Housing Unit Type	LIHEAP	RAD	RES
Single-Family Detached	7%	9%	18%
Single-Family Attached (Row House)	18%	21%	37%
Small Multifamily (2-4 Units)	12%	14%	18%
Large Multifamily (5+ Units)	64%	55%	27%
TOTAL HOUSEHOLDS	100%	100%	100%

Source: 2014-2018 ACS

Table 3.15A - Tenure

Tenure	Number of Households	Percent of Households
Owner	13,984	18%
Renter	61,421	78%
Other	2,904	4%
TOTAL HOUSEHOLDS	78,309	100%

Source: 2014-2018 ACS

Table 3.15B - Tenure

Tenure	LIHEAP	RAD	RES
Owner	18%	24%	39%
Renter	78%	73%	57%
Other	4%	3%	4%
TOTAL HOUSEHOLDS	100%	100%	100%

Source: 2014-2018 ACS

Table 3.16A - Main Heating Fuel

Main Heating Fuel	Number of Households	Percent of Households
Utility Gas	38,173	49%
Electric	36,827	47%
Fuel Oil	719	1%
Other*	2,590	3%
TOTAL HOUSEHOLDS	78,309	100%

Source: 2014-2018 ACS; *Other includes households who report not using a heating fuel

Table 3.16B - Main Heating Fuel

Main Heating Fuel	LIHEAP	RAD	RES
Utility Gas	49%	50%	100%
Electric	47%	47%	0%
Fuel Oil	1%	1%	0%
Other	3%	2%	0%
TOTAL HOUSEHOLDS	100%	100%	100%

Source: 2014-2018 ACS; *Other includes households who report not using a heating fuel

Table 3.17A - Energy Bill Payment Type

Energy Bills	Number of Households	Percent of Households
Electric Bill - Direct Payment	53,876	69%
Heating Bill		
Gas Main Heat Bill Direct Payment	22,825	29%
Electric Main Heat Bill Direct Payment	25,231	32%
Other Main Heat Bill Direct Payment	287	<1%
TOTAL	48,343	62%

Source: 2014-2018 ACS

Table 3.17B - Energy Bill Payment Type

Energy Bills	LIHEAP	RAD	RES
Electric Bill - Direct Payment	69%	100%	98%
Heating Bill			
Gas Main Heat Bill Direct Payment	29%	41%	100%
Electric Main Heat Bill Direct Payment	32%	47%	0%
Other Main Heat Bill Direct Payment	<1%	1%	0%
TOTAL	62%	89%	100%

Source: 2014-2018 ACS

Tables 3.18A and 3.18B show the bill payment type by housing unit type. The tables show that about 62 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 3.18A - Heating Bill Payment Type by Housing Unit Type

Payment Status	Number of Households	Percent of Housing Unit Type
Single-Family Homes		
Direct Payment for Heat	16,090	83%
Heat in Rent	2,249	12%
Other	1,059	5%
All Single-Family Homes	19,398	100%
Small Multifamily Homes		
Direct Payment for Heat	6,935	76%
Heat in Rent	1,440	16%
Other	717	8%
All Small Multifamily Homes	9,092	100%
Large Multifamily Homes		
Direct Payment for Heat	25,318	51%
Heat in Rent	19,288	39%
Other	5,213	10%
All Large Multifamily Homes	49,819	100%
TOTAL HOUSEHOLDS		
Direct Payment for Heat	48,343	62%
Heat in Rent	22,977	29%
Other	6,989	9%
All Households	78,309	100%

Source: 2014-2018 ACS

Table 3.18B - Energy Bill Payment Type by Housing Unit Type

Payment Status	LIHEAP	RAD	RES
Single-Family Homes			
Direct Payment for Heat	83%	96%	100%
Heat in Rent	12%	1%	0%
Other	5%	3%	0%
Small Multifamily Homes			
Direct Payment for Heat	76%	91%	100%
Heat in Rent	16%	4%	0%
Other	8%	6%	0%
Large Multifamily Homes			
Direct Payment for Heat	51%	84%	100%
Heat in Rent	39%	9%	0%
Other	10%	6%	0%
TOTAL HOUSEHOLDS			
Direct Payment for Heat	62%	89%	100%
Heat in Rent	29%	6%	0%
Other	9%	5%	0%

Source: 2014-2018 ACS.

Tables 3.19 and 3.20 show a more detailed analysis of housing unit type and the penetration of the LIHEAP program among households residing in single-family homes or multifamily buildings (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. 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 – 39 percent compared to 33 percent.

Table 3.19 - Share of Single-Family Households Served

Single-Family Homes	Eligible	Served	Percent Served
Total	19,398	5,468	28%
Pay Heating or Electric Direct	16,724	5,468	33%
Pay Heating Bill Direct	16,090	5,298*	33%
Gas Main Heat Bill Direct	12,560	3,851*	31%
Electric Main Heat Bill Direct	3,243	1,350*	42%

Source: 2014-2018 ACS, FY 2019 LIHEAP Data; *Excludes households whose heat is included in rent.

Table 3.20 - Share of Multifamily Building Households Served

Multifamily Homes	Eligible	Served	Percent Served
Total	58,911	14,763	25%
Pay Heating or Electric Direct	37,622	14,763	39%
Pay Heating Bill Direct	32,253	12,971*	40%
Gas Main Heat Bill Direct	10,265	5,065*	49%
Electric Main Heat Bill Direct	21,988	7,898*	36%

Source: 2014-2018 ACS, FY 2019 LIHEAP Data; *Excludes 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 that fuel. 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 3.21 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, followed by households with electric main heat. 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 3.22 shows that the combined bills for utility gas main heat households are reported to be $2,844, the combined bills for the fuel oil main heat households are $2,988, and the bills for the electric main heat households are $1,536.

Table 3.21 - Mean Heating Bills by Main Heating Fuel

Main Heating Fuel	Mean Heating Bill
Utility Gas	$1,314
Electric	$1,536
Fuel Oil*	$1,669

Source: 2014-2018 ACS; average bills are based on a sample of households who pay both their heating fuel and electric bill directly. *Small sample size.

Table 3.22 - Mean Energy Bills by Main Heating Fuel

Main Heating Fuel	Baseload Electric Bill	Heating Bill	Total Energy Bill
Utility Gas	$1,530	$1,314	$2,844
Electric	N/A	$1,536	$1,536
Fuel Oil*	$1,319	$1,669	$2,988

Source: 2014-2018 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 3.23 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 19 percent. Energy burden for natural gas main heat households was slightly lower, about 14 percent, and for electric main heat households, energy burden was about nine percent.

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

Main Heating Fuel	Mean Energy Bills	Mean Income	Mean Energy Burden
Utility Gas	$2,844	$20,231	14%
Electric	$1,536	$17,697	9%
Fuel Oil*	$2,988	$15,520	19%

Source: 2014-2018 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's LIHEAP program also varies the benefit by housing unit type. Table 3.24 shows the mean energy bills and burden by main heating fuel for single-family homes. Average energy bills for households in single-family homes are higher than the average shown in Table 3.23, but because their average income is also higher, their energy burden is about the same as for the average household.

Table 3.24 - 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	$3,271	$22,014	15%
Electric	$2,213	$22,751	10%
Fuel Oil*	$2,988	$15,520	19%

Source: 2014-2018 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 3.25 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 3.23, but their average energy burdens are about the same as those shown in Table 3.23.

Table 3.25 - 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	$2,655	$18,475	14%
Electric	$1,934	$19,183	10%
Fuel Oil	N/A	N/A	N/A

Source: 2014-2018 ACS; average energy bills are based on a sample of households who pay both their heating fuel and electric bill directly. N/A = no sample cases in 2014-2018 ACS.

Table 3.26 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 3.23.

Table 3.26 - 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	$2,041	$17,547	12%
Electric	$1,359	$16,609	8%
Fuel Oil	N/A	N/A	N/A

Source: 2014-2018 ACS; average energy bills are based on a sample of households who pay both their heating fuel and electric bill directly. N/A = no sample cases in 2014-2018 ACS.

Two other factors are included in the LIHEAP benefit matrix – household size and income. Table 3.27 shows the distribution of energy bills and burden for utility gas main heat households by household size; Table 3.28 shows the distribution of energy bills and burden by poverty group. Table 3.27 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 3.28 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 3.27 - Mean Energy Bills and Burden by Household Size - Utility Gas Main Heat

Household Size	Mean Energy Bills	Mean Income	Mean Energy Burden
One Person	$2,501	$14,340	17%
Two People	$2,679	$20,178	13%
Three or More People	$3,431	$28,333	12%

Source: 2014-2018 ACS; average energy bills are based on a sample of households who pay both their heating fuel and electric bill directly.

Table 3.28 - 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%	$2,905	$5,781	50%
76% to 100%	$3,047	$14,823	21%
101% or More	$2,770	$28,884	10%

Source: 2014-2018 ACS; average energy bills are based on a sample of households who pay both their heating fuel and electric bill directly.

These statistics furnish valuable information with respect to energy bills, income, and energy burden. However, these statistics are based on self-reported data and 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's 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 2019. As with the 2018 Study, the data file included all LIHEAP program participants regardless of funding source (local or federal grant).
- Washington Gas Usage and Billing Data – We received a data file from Washington Gas that furnished information on the 2019 annual gas usage and bills for LIHEAP clients in FY 2019 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 Billing Data – We received a data file from Pepco that furnished information on the 2019 monthly electric usage and bills for LIHEAP clients in FY 2019 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 needed to do in-depth targeting analysis of clients. Usage and billing 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's 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 those used for the previous energy burden reports conducted in 2014 and 2018. This included removing households with very low or very high annual income (less than $2,000 or greater than 400% of poverty).[10] In addition,

[10] Of the 20,231 LIHEAP clients in FY 2019, 2,147 had income of zero dollars, 575 had income between $1 and less than $2,000, two had income that was greater than 400% of poverty, based on their household size, and one had no income information recorded. These households were excluded from the analysis.

households with very high or very low gas or electric usage were removed.[11] Table 4.1 shows the number of gas main heat households included in the analysis; 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	8,916	100%
Excluding income outliers	7,701	86%
With gas bill data	7,370	83%
With annual gas bill data[12]	5,972	67%
With any electric bill data	5,480	61%
With annual electric bill data[13]	5,358	60%
With gas usage outliers removed (therms = 0 and top/bottom 1%)	5,250	59%
With electric usage outliers removed (kWh = 0 and top/bottom 1%)	5,144	58%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Table 4.2 - Attrition Analysis for Electric Main Heat Clients

	Number	Percent
Households using electric main heat	9,248	100%
Excluding income outliers	7,965	86%
With any electric bill data	7,369	80%
With annual electric bill data[13]	6,397	69%
With electric usage outliers removed (kWh = 0 and top/bottom 1%)	6,269	68%

Sources: FY 2019 LIHEAP Data, 2019 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 group average gross and group average 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 mean group gas energy burden (gross).[14] 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 mean group *net* energy burden. The *net* energy burden is the burden that the client faces after receiving LIHEAP.

[11] For households with complete utility bill data, the top and bottom 1% based on energy usage were excluded from the analysis.
[12] For purposes of this analysis, households with 12 monthly natural gas bills in 2019 were considered to have annual gas bill data, as reported by Washington Gas.
[13] For purposes of this analysis, households with electric bills beginning in January 2019 and ending in December 2019 were considered to have annual electric bill data.
[14] 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 4.3 - 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	$3,763	$696	19%	$1,401	-19%
$5,000-<$10,000	$8,291	$678	8%	$1,141	-6%
$10,000-<$15,000	$12,537	$752	6%	$975	-2%
$15,000-<$20,000	$17,341	$787	5%	$825	0%
$20,000 or More	$30,398	$825	3%	$797	0%
TOTAL	$16,226	$750	5%	$982	-1%

Sources: FY 2019 LIHEAP Data, 2019 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 19% of their income for energy if they did not receive LIHEAP (i.e., gross energy burden). However, those households received an average benefit of $1,401 in FY 2019. Because this amount is greater than their average gas bill, the resulting net energy burden is negative (-19%). In FY 2019, the LIHEAP program reduced energy burden for the lowest income group by 200% (computed as (19%-(-19%))/19%).

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 zero 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 or her total energy bill to maintain service. Because the revised benefit matrix that was implemented for the FY 2019 program year focused on total energy burden, the average benefits paid to clients heating with natural gas are higher than their gas bills alone.

In Table 4.4A 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 energy bill and burden for gas main heat clients. Tables 4.4A through 4.4E are broken down by Income Group (Table 4.4A), Poverty Group (Table 4.4B), Housing Type (Table 4.4C), Household Size (Table 4.4D), and Vulnerable Group (Table 4.4E).

Table 4.4A shows that the gross total energy burden by income group for gas main heat LIHEAP clients. Overall, the group average gross total energy burden for gas main heat clients is 10 percent, and the LIHEAP program is able to reduce that to a group average net total energy burden of four percent. For the lowest income households, the total energy net total energy burden also is four percent despite total gross energy burden being 41 percent.

Table 4.4A - 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	$3,763	$1,560	41%	$1,401	4%
$5,000-<$10,000	$8,291	$1,456	18%	$1,141	4%
$10,000-<$15,000	$12,537	$1,523	12%	$975	4%
$15,000-<$20,000	$17,341	$1,609	9%	$825	5%
$20,000 or More	$30,398	$1,735	6%	$797	3%
TOTAL	$16,226	$1,574	10%	$982	4%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Based on findings from the 2018 Study, the revised benefit matrix implemented by DOEE targeted three percent net total energy burden as the program goal for different groups of households.[15] For the lowest income group, clients with incomes at or below $5,000, the group average net total energy burden is four percent for clients using gas main heat, slightly higher than the target based on the revised benefit matrix. The group average net total energy burden is fairly consistent across income categories, ranging from three percent to five percent.

Table 4.4B shows the group average gross and net total energy burden by poverty level. It shows that gas main heat clients in the lowest poverty group receive the highest benefits. It also shows that the program achieves a similar mean net total energy burden across poverty levels, ranging from three percent to five percent after receipt of LIHEAP.

Table 4.4B - 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 Net Energy Burden
At or Below 75%	$8,963	$1,638	18%	$1,233	5%
76% to 100%	$12,839	$1,405	11%	$922	4%
101% to 125%	$18,098	$1,538	9%	$829	4%
126% to 150%	$22,415	$1,551	7%	$768	3%
151% or More	$30,700	$1,653	5%	$728	3%
TOTAL	$16,226	$1,574	10%	$982	4%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Table 4.4C shows the gross and net total energy burden by housing type. It shows that the gas main heat clients living in single-family homes have higher bills and receive higher benefits than gas main heat clients residing in multifamily buildings. However, the gas main heat clients residing in multifamily buildings have slightly lower group average net energy burden than the clients in single-family homes (two percent compared to five percent).

[15] In deciding the target group mean net total energy burden of 3%, DOEE considered multiple thresholds and approaches, including a 6% net energy burden target. The 3% group mean net total energy burden target was selected knowing that benefit determination procedures based on a "benefit matrix" style approach, as implemented, would result in a share of clients having individual net energy burden less than or greater than the target.

Table 4.4C - 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	$17,610	$1,884	11%	$1,009	5%
Multifamily	$15,102	$1,321	9%	$959	2%
TOTAL	$16,226	$1,574	10%	$982	4%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Table 4.4D shows the gross and net total energy burden by the number of household members. It shows that gas main heat clients with the larger household sizes receive higher benefits. 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 4.4D - 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 Net Energy Burden
One	$13,634	$1,375	10%	$831	4%
Two	$16,088	$1,525	9%	$991	3%
Three	$18,593	$1,691	9%	$1,050	3%
Four	$19,553	$1,812	9%	$1,223	3%
Five or More	$20,724	$2,103	10%	$1,267	4%
TOTAL	$16,226	$1,574	10%	$982	4%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

It also is important to consider the benefit determination procedure results for other groups of households. Table 4.4E shows the gross and net total energy burden by vulnerable group, i.e. households with an elderly member (60+ years old), disabled member, and/or young child (5 years old or younger). It shows that all three types of vulnerable households have similar income and mean total energy bills. Group average gross total energy burden ranges from 9 percent to 10 percent for these vulnerable groups and, after LIHEAP, group average net total energy burden is about three percent to four percent. This is the same as for the group of clients with no vulnerable household members.

Table 4.4E - 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	$16,002	$1,509	9%	$844	4%
Disabled	$14,886	$1,515	10%	$965	4%
Young Child	$18,305	$1,722	9%	$1,181	3%
No Vulnerable Members	$16,043	$1,602	10%	$1,058	3%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

These analyses of the District of Columbia's 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 revised 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 and achieving the program goal of 3% group mean net total energy burden.

4.3 Group Energy Burden by Usage Group for LIHEAP Clients with Gas Main Heat

In the previous section, we looked at group energy burdens overall for gas main heat clients. In this section, we break group energy burdens down by usage group to show how energy burdens vary substantially based on whether clients are high energy users or low energy users. The data show that, while the average gas main heat client has a total energy bill of $1,574, one-fourth of gas main heat clients have a total energy bill less than $1,107 ("low usage" group) and one-fourth of gas main heat clients have a total energy bill greater than $1,954 ("high usage" group).

Tables 4.5A through 4.5E show the mean total energy bill and gross energy burden for gas main heat clients, overall and broken down by low and high usage group. The mean total energy bill and gross energy burden are broken down by Income Group (Table 4.5A), Poverty Group (Table 4.5B), Housing Type (Table 4.5C), Household Size (Table 4.5D), and Vulnerable Group (Table 4.5E).

Table 4.5A (Income Group) shows that 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, the one-fourth of households with low usage have group average gross energy burden (i.e., energy burden before LIHEAP) of six percent while the one-fourth of households with high usage have group average burden before LIHEAP of 13 percent. Among low usage households, group average gross energy burden varies from about three percent for households in the highest income group ($20,000 or more) to about 23 percent for households in the lowest income group (less than $5,000). Among high usage households, group average gross energy burden varies from about eight percent for households in the highest income group to about 63 percent for households in the lowest income group.

Table 4.5A - Gross Total Energy Burden by Income Level and Usage Group - Gas Main Heat Clients

Income Group	All Clients in Group		Lowest 25% in Group		Highest 25% in Group	
	Mean Total Energy Bill	Mean Gross Energy Burden	Mean Total Energy Bill	Mean Gross Energy Burden	Mean Total Energy Bill	Mean Gross Energy Burden
Less than $5,000	$1,560	41%	$861	23%	$2,405	63%
$5,000-<$10,000	$1,456	18%	$832	10%	$2,433	30%
$10,000-<$15,000	$1,523	12%	$845	7%	$2,450	20%
$15,000-<$20,000	$1,609	9%	$846	5%	$2,456	14%
$20,000 or More	$1,735	6%	$883	3%	$2,504	8%
TOTAL	$1,574	10%	$847	6%	$2,464	13%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Table 4.5B (Poverty Group) shows how group average gross energy burden varies by poverty group based on whether a household has low usage or high usage. Among low usage households, group average gross energy burden varies from about three percent for the highest poverty group (151% of poverty or greater) to about 11 percent for the lowest poverty group (at or below 75% of poverty). Among high usage households, group average gross energy burden varies from about seven percent for households in the highest poverty group to about 24 percent for households in the lowest poverty group.

Table 4.5B - Gross Total Energy Burden by Poverty Group and Usage Group - Gas Main Heat Clients

Poverty Group	All Clients in Group		Lowest 25% in Group		Highest 25% in Group	
	Mean Total Energy Bill	Mean Gross Energy Burden	Mean Total Energy Bill	Mean Gross Energy Burden	Mean Total Energy Bill	Mean Gross Energy Burden
At or Below 75%	$1,638	18%	$867	11%	$2,464	24%
76% to 100%	$1,405	11%	$815	7%	$2,438	15%
101% to 125%	$1,538	9%	$833	5%	$2,482	11%
126% to 150%	$1,551	7%	$848	4%	$2,459	10%
151% or More	$1,653	5%	$881	3%	$2,470	7%
TOTAL	$1,574	10%	$847	6%	$2,464	13%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Table 4.5C shows how group average gross energy burden varies by housing unit type based on whether a household has low usage or high usage. Group average gross energy burden is similar within the usage group regardless of housing type.

Table 4.5C - Gross Total Energy Burden by Housing Type and Usage Group - Gas Main Heat Clients

Housing Type	All Clients in Group		Lowest 25% in Group		Highest 25% in Group	
	Mean Total Energy Bill	Mean Gross Energy Burden	Mean Total Energy Bill	Mean Gross Energy Burden	Mean Total Energy Bill	Mean Gross Energy Burden
Single-Family	$1,884	11%	$902	6%	$2,490	13%
Multifamily	$1,321	9%	$836	6%	$2,385	12%
TOTAL	$1,574	10%	$847	6%	$2,464	13%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Table 4.5D shows how group average gross energy burden varies by household size based on whether a household has low usage or high usage. Group average gross energy burden is similar within the usage group regardless of household size.

Table 4.5D - Gross Total Energy Burden by Household Size and Usage Group - Gas Main Heat Clients

Household Members	All Clients in Group		Lowest 25% in Group		Highest 25% in Group	
	Mean Total Energy Bill	Mean Gross Energy Burden	Mean Total Energy Bill	Mean Gross Energy Burden	Mean Total Energy Bill	Mean Gross Energy Burden
One	$1,375	10%	$822	7%	$2,402	16%
Two	$1,525	9%	$878	6%	$2,441	13%
Three	$1,691	9%	$916	5%	$2,417	13%
Four	$1,812	9%	$888	5%	$2,473	12%
Five or More	$2,103	10%	$947	5%	$2,583	12%
TOTAL	$1,574	10%	$847	6%	$2,464	13%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Table 4.5E shows how group average gross energy burden varies by vulnerable group based on whether a household has low usage or high usage. Group average gross energy burden is similar within the usage group regardless of vulnerable group.

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

Vulnerable Group	All Clients in Group		Lowest 25% in Group		Highest 25% in Group	
	Mean Total Energy Bill	Mean Gross Energy Burden	Mean Total Energy Bill	Mean Gross Energy Burden	Mean Total Energy Bill	Mean Gross Energy Burden
Elderly	$1,509	9%	$806	6%	$2,464	13%
Disabled	$1,515	10%	$820	6%	$2,481	15%
Young Child	$1,722	9%	$916	6%	$2,501	12%
No Vulnerable Members	$1,602	10%	$884	6%	$2,452	13%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

In Tables 4.6A through 4.6E, we examine the mean LIHEAP benefit and group average net energy burden (i.e., energy burden after LIHEAP) for gas main heat clients, broken down by low usage group and high usage group. The mean LIHEAP benefit and group average net energy burden are broken down by Income Group (Table 4.6A), Poverty Group (Table 4.6B), Housing Type (Table 4.6C), Household Size (Table 4.6D), and Vulnerable Group (Table 4.6E). Table 4.6A 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 $840, compared to $1,117 for the high usage households. However, the group average net energy burden is about zero percent for the one-fourth of households with the lowest total energy bills and is seven percent for the one-fourth of households with the highest total energy bills.

Table 4.6A shows how group average net energy burden varies by income group based on whether a household has low usage or high usage. Among low usage households, group average net energy burden varies from about one percent for households in the highest income group ($20,000 or more) to about *negative* eight percent for households in the lowest income group (less than $5,000). Among high usage households, group average net energy burden varies from about five percent for households in the highest income group to about 20 percent for households in the lowest income group.

Table 4.6A - 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	$861	$1,162	-8%	$2,405	$1,646	20%
$5,000-<$10,000	$832	$943	-1%	$2,433	$1,404	13%
$10,000-<$15,000	$845	$826	0%	$2,450	$1,181	10%
$15,000-<$20,000	$846	$670	1%	$2,456	$941	9%
$20,000 or More	$883	$685	1%	$2,504	$891	5%
TOTAL	$847	$840	0%	$2,464	$1,117	7%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Table 4.6B shows how group average net energy burden varies by poverty group based on whether a household has low usage or high usage. Among low usage households, group average net energy burden varies from about one percent for the highest poverty group (151% of poverty or greater) to about *negative* two percent for the lowest poverty group (at or below 75% of poverty). Among high usage households, group average net energy burden varies from about five percent for households in the highest poverty group to about 10 percent for households in the lowest poverty group.

Table 4.6B - Net Total Energy Burden by Poverty Group and Usage Group - Gas Main Heat Clients

	Low Usage (Lowest 25% in Group)			High Usage (Highest 25% in Group)		
Poverty Group	Mean Total Energy Bill	Mean LIHEAP Benefit	Mean Net Energy Burden	Mean Total Energy Bill	Mean LIHEAP Benefit	Mean Net Energy Burden
At or Below 75%	$867	$1,025	-2%	$2,464	$1,390	10%
76% to 100%	$815	$840	0%	$2,438	$1,046	9%
101% to 125%	$833	$740	1%	$2,482	$916	7%
126% to 150%	$848	$667	1%	$2,459	$858	6%
151% or More	$881	$633	1%	$2,470	$816	5%
TOTAL	$847	$840	0%	$2,464	$1,117	7%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Table 4.6C shows how group average net energy burden varies by housing type based on whether a household has low usage or high usage. Group average net energy burden is similar within the usage group regardless of housing type.

Table 4.6C - Net Total Energy Burden by Housing Type and Usage Group - Gas Main Heat Clients

Housing Type	Low Usage (Lowest 25% in Group)			High Usage (Highest 25% in Group)		
	Mean Total Energy Bill	Mean LIHEAP Benefit	Mean Net Energy Burden	Mean Total Energy Bill	Mean LIHEAP Benefit	Mean Net Energy Burden
Single-Family	$902	$864	0%	$2,490	$1,109	7%
Multifamily	$836	$835	0%	$2,385	$1,143	6%
TOTAL	$847	$840	0%	$2,464	$1,117	7%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Table 4.6D shows how group average net energy burden varies by household size based on whether a household has low usage or high usage. Group average gross energy burden is similar within the low usage group regardless of household size. Among high usage households, group average net energy burden is higher for smaller households (10 percent group average net energy burden for households with one member) compared to larger households (6 percent group average net energy burden for households with 5+ members).

Table 4.6D - Net Total Energy Burden by Household Size and Usage Group - Gas Main Heat Clients

Household Members	Low Usage (Lowest 25% in Group)			High Usage (Highest 25% in Group)		
	Mean Total Energy Bill	Mean LIHEAP Benefit	Mean Net Energy Burden	Mean Total Energy Bill	Mean LIHEAP Benefit	Mean Net Energy Burden
One	$822	$775	0%	$2,402	$910	10%
Two	$878	$910	0%	$2,441	$1,035	8%
Three	$916	$943	0%	$2,417	$1,114	7%
Four	$888	$1,100	-1%	$2,473	$1,275	6%
Five or More	$947	$1,178	-1%	$2,583	$1,322	6%
TOTAL	$847	$840	0%	$2,464	$1,117	7%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Table 4.6E shows how group average net energy burden varies by vulnerable group based on whether a household has low usage or high usage. Group average gross energy burden is similar within the usage group regardless of vulnerable group.

Table 4.6E - Net Total Energy Burden by Vulnerable Group and Usage Group - Gas Main Heat Clients

Vulnerable Group	Low Usage (Lowest 25% in Group)			High Usage (Highest 25% in Group)		
	Mean Total Energy Bill	Mean LIHEAP Benefit	Mean Net Energy Burden	Mean Total Energy Bill	Mean LIHEAP Benefit	Mean Net Energy Burden
Elderly	$806	$761	0%	$2,464	$942	8%
Disabled	$820	$843	0%	$2,481	$1,129	8%
Young Child	$916	$1,048	-1%	$2,501	$1,280	6%
No Vulnerable Members	$884	$899	0%	$2,452	$1,204	7%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

4.4 Individual Energy Burden for LIHEAP Clients with Gas Main Heat

In the previous sections, we looked at group energy burdens for gas main heat clients. However, those averages mask some important differences for individual clients. This analysis shows that it is important to consider the individual differences in energy bills and energy burden, as well as the group differences.

In Table 4.3, we saw that the average annual gas bill for gas main heat clients was $750, and in Table 4.4A we saw that the average annual total energy bill was $1,574. Table 4.7 shows the distribution of gas bills and total energy bills for gas main heat clients. The median annual gas bill is about $698 and median annual total energy bill is about $1,474. About one-fourth of gas main heat clients have an annual gas bill of $459 or less and one-fourth have an annual gas bill of $991 or more. About one-fourth of gas main heat clients have an annual total energy bill of $1,107 or less and about one-fourth have an annual total energy bill of $1,954 or more.

Table 4.7 - Distribution of Gas Bills and Total Energy Bills - Gas Main Heat Clients

Distribution	Annual Gas Bill	Annual Total Energy Bill
Mean (average)	$750	$1,574
Bottom 10%	$292	$825
Bottom 25%	$459	$1,107
Median	$698	$1,474
Top 25%	$991	$1,954
Top 10%	$1,258	$2,461

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Tables 4.8A through 4.8E furnish data on the distribution of gross energy burden (i.e., energy burden before LIHEAP) for gas main heat clients. The distribution of gross energy burden is broken down by Income Group (Table 4.8A), Poverty Group (Table 4.8B), Housing Type (Table 4.8C), Household Size (Table 4.8D), and Vulnerable Group (Table 4.8E).

Table 4.8A shows overall, the median gross energy burden is 11 percent, meaning that half of gas main heat clients have gross energy burden less than 11 percent and half have gross energy burden greater than 11 percent. One-fourth of gas main heat clients have gross energy burden of seven percent or less and one-fourth have gross energy burden of 17 percent or more. Among households in the lowest income group (less than $5,000), gross energy burden varies from about 22 percent of income (bottom 10th percentile) to about 73 percent of income (top 10th percentile).

Table 4.8A - Distribution of Gross Total Energy Burden by Income Level - Gas Main Heat Clients

Income Group	Mean Gross Energy Burden	Bottom 10%	Bottom 25%	Median	Top 25%	Top 10%
Less than $5,000	45%	22%	28%	41%	56%	73%
$5,000-<$10,000	18%	8%	12%	17%	23%	29%
$10,000-<$15,000	12%	6%	8%	11%	15%	20%
$15,000-<$20,000	9%	5%	7%	9%	12%	15%
$20,000 or More	6%	3%	4%	5%	8%	10%
TOTAL	14%	4%	7%	11%	17%	26%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Table 4.8B shows how the distribution of gross energy burden for gas main heat clients varies by poverty group. Among clients in the lowest poverty group (at or below 75% of poverty), the median gross energy burden is 18 percent. Among clients in the highest poverty group (151% of poverty or greater), the median gross energy burden is five percent.

Table 4.8B - Distribution of Gross Total Energy Burden by Poverty Group - Gas Main Heat Clients

Poverty Group	Mean Gross Energy Burden	Bottom 10%	Bottom 25%	Median	Top 25%	Top 10%
At or Below 75%	22%	9%	13%	18%	26%	40%
76% to 100%	12%	6%	8%	11%	14%	19%
101% to 125%	9%	5%	6%	8%	11%	15%
126% to 150%	7%	4%	5%	7%	9%	12%
151% or More	6%	3%	4%	5%	7%	10%
TOTAL	14%	4%	7%	11%	17%	26%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Table 4.8C shows how the distribution of gross energy burden for gas main heat clients varies by housing type. The median gross energy burden is about 11 percent for clients residing in single-family homes compared to about 10 percent for clients residing in multifamily homes.

Table 4.8C - Distribution of Gross Total Energy Burden by Housing Type - Gas Main Heat Clients

Housing Type	Mean Gross Energy Burden	Bottom 10%	Bottom 25%	Median	Top 25%	Top 10%
Single-Family	15%	5%	7%	11%	19%	29%
Multifamily	13%	4%	6%	10%	16%	24%
TOTAL	14%	4%	7%	11%	17%	26%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Table 4.8D shows how the distribution of gross energy burden for gas main heat clients varies by household size. The median gross energy burden varies from about 10 percent to 13 percent. The 75th percentile for gross total energy burden of gas main heat clients with five or more households members is 23 percent, meaning that at least a quarter of gas main heat clients with large households sizes (five or more members) have a gross total energy burden exceeding 20 percent. By contrast, only about 10 percent of gas main heat clients with one household member have a gross total energy burden of this amount or greater.

Table 4.8D - Distribution of Gross Total Energy Burden by Household Size - Gas Main Heat Clients

Household Members	Mean Gross Energy Burden	Bottom 10%	Bottom 25%	Median	Top 25%	Top 10%
One	12%	5%	7%	10%	15%	21%
Two	14%	4%	6%	11%	17%	27%
Three	14%	4%	6%	11%	19%	28%
Four	16%	4%	6%	12%	21%	29%
Five or More	17%	4%	7%	13%	23%	33%
TOTAL	14%	4%	7%	11%	17%	26%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Table 4.8E shows how the distribution of gross energy burden for gas main heat clients varies by vulnerable group. The median gross energy burden is lowest for households with elderly members (9 percent) and highest for households with young children (13 percent).

Table 4.8E – Distribution of Gross Total Energy Burden by Vulnerable Group – Gas Main Heat Clients

Vulnerable Group	Mean Gross Energy Burden	Bottom 10%	Bottom 25%	Median	Top 25%	Top 10%
Elderly	12%	5%	6%	9%	14%	21%
Disabled	13%	5%	7%	11%	16%	24%
Young Child	15%	4%	6%	13%	21%	29%
No Vulnerable Members	16%	4%	7%	12%	20%	31%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Tables 4.9A through 4.9E furnish data on the distribution of net energy burden (i.e., energy burden before LIHEAP) for gas main heat clients. The distribution of net energy burden is broken down by Income Group (Table 4.9A), Poverty Group (Table 4.9B), Housing Type (Table 4.9C), Household Size (Table 4.9D), and Vulnerable Group (Table 4.9E).

Table 4.9A shows overall, the median net energy burden is three percent, meaning that half of gas main heat clients have net energy burden less than three percent and half have net energy burden greater than three percent. One-fourth of gas main heat clients have net energy burden of one percent or less and one-fourth have net energy burden of six percent or more. Among households in the lowest income group (less than $5,000), one-fourth of clients have net energy burden of *negative* 5 percent or less (meaning that their total LIHEAP benefits exceed their total energy bills), and one-fourth of clients have net energy burden 12 percent or more.

Table 4.9A – Distribution of Net Total Energy Burden by Income Level – Gas Main Heat Clients

Income Group	Mean Net Energy Burden	Bottom 10%	Bottom 25%	Median	Top 25%	Top 10%
Less than $5,000	4%	-14%	-5%	3%	12%	24%
$5,000-<$10,000	4%	-4%	-1%	3%	8%	12%
$10,000-<$15,000	4%	-1%	1%	4%	7%	11%
$15,000-<$20,000	4%	1%	2%	4%	7%	9%
$20,000 or More	3%	1%	2%	3%	5%	7%
TOTAL	4%	-2%	1%	3%	6%	10%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Table 4.9B shows how the distribution of net energy burden for gas main heat clients varies by poverty group. Among clients in the lowest poverty group (at or below 75% of poverty), the median net energy burden is four percent. Among clients in the highest poverty group (151% of poverty or greater), the median net energy burden is three percent.

Table 4.9B – Distribution of Net Total Energy Burden by Poverty Group – Gas Main Heat Clients

Poverty Group	Mean Net Energy Burden	Bottom 10%	Bottom 25%	Median	Top 25%	Top 10%
At or Below 75%	4%	-4%	0%	4%	8%	13%
76% to 100%	4%	-2%	1%	3%	6%	10%
101% to 125%	4%	0%	1%	4%	6%	9%
126% to 150%	4%	1%	2%	3%	5%	8%
151% or More	3%	1%	2%	3%	5%	7%
TOTAL	4%	-2%	1%	3%	6%	10%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Table 4.9C shows how the distribution of net energy burden for gas main heat clients varies by housing type. The median net energy burden is about five percent for clients residing in single-family homes compared to about two percent for clients residing in multifamily homes.

Table 4.9C - Distribution of Net Total Energy Burden by Housing Type - Gas Main Heat Clients

Housing Type	Mean Energy Burden	Bottom 10%	Bottom 25%	Median	Top 25%	Top 10%
Single-Family	6%	1%	3%	5%	8%	13%
Multifamily	2%	-3%	0%	2%	5%	8%
TOTAL	4%	-2%	1%	3%	6%	10%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Table 4.9D shows how the distribution of net energy burden for gas main heat clients varies by household size. The median net energy burden varies is about three to four percent for all household sizes.

Table 4.9D - Distribution of Net Total Energy Burden by Household Size - Gas Main Heat Clients

Household Members	Mean Energy Burden	Bottom 10%	Bottom 25%	Median	Top 25%	Top 10%
One	4%	-1%	1%	3%	7%	10%
Two	3%	-2%	1%	3%	6%	9%
Three	4%	-1%	1%	3%	6%	10%
Four	3%	-2%	1%	3%	6%	10%
Five or More	5%	-1%	2%	4%	7%	12%
TOTAL	4%	-2%	1%	3%	6%	10%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Table 4.9E shows how the distribution of net energy burden for gas main heat clients varies by vulnerable member. The median gross energy burden is about three to four percent for each group of households.

Table 4.9E - Distribution of Net Total Energy Burden by Vulnerable Group - Gas Main Heat Clients

Vulnerable Group	Mean Net Energy Burden	Bottom 10%	Bottom 25%	Median	Top 25%	Top 10%
Elderly	4%	-1%	1%	4%	7%	10%
Disabled	4%	-2%	1%	3%	6%	10%
Young Child	3%	-3%	1%	3%	6%	9%
No Vulnerable Members	4%	-2%	1%	3%	6%	11%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

4.5 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 clients.

Tables 4.10A through 4.10E show the mean income, mean electric bill, mean gross energy burden, mean total LIHEAP benefit, and mean net electric energy burden for electric main heat clients. The gross energy burden is the burden clients would have faced if they had not received LIHEAP. The net energy burden is the burden clients faced after factoring in their LIHEAP benefits. It is important to note that the electric billing data for clients receiving the RAD discount are the charges the clients received after the discount was applied; all of the electric main heat clients in the sample were approved for the RAD discount. Mean income, mean electric bill, mean gross energy burden, mean total LIHEAP benefit, and mean net electric energy burden are broken down by Income Group (Table 4.10A), Poverty Group (Table 4.10B), Housing Type (Table 4.10C), Household Size (Table 4.10D), and Vulnerable Group (Table 4.10E).

Table 4.10A shows that the group average gross energy burden by income group for electric main heat LIHEAP clients. Overall, the group average gross energy burden for electric main heat clients was seven percent and the LIHEAP program was able to reduce that to a group average net energy burden of three percent. For the lowest income households (i.e., those with income less than $5,000), the group average gross energy burden was 31 percent. However, those households received an average total LIHEAP benefit of $895 in FY 2019. As a result, the group average net energy burden was six percent. In FY 2019, the LIHEAP program reduced energy burden for the lowest income group by 80 percent (computed as (31%-6%)/31%).

Table 4.10A - 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	$3,712	$1,136	31%	$895	6%
$5,000-<$10,000	$8,181	$1,067	13%	$768	4%
$10,000-<$15,000	$12,310	$1,035	8%	$612	3%
$15,000-<$20,000	$17,426	$1,037	6%	$515	3%
$20,000 or More	$30,089	$1,096	4%	$491	2%
TOTAL	$15,229	$1,069	7%	$648	3%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

Table 4.10A 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 two and four percent of income) for the other income groups.

Table 4.10B 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. Group average net electric energy burden is about the same across poverty level groups, about two to four percent of income after receiving LIHEAP.

Table 4.10B - 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%	$8,288	$1,189	14%	$830	4%
76% to 100%	$12,250	$979	8%	$585	3%
101% to 125%	$17,945	$1,014	6%	$510	3%
126% to 150%	$22,703	$961	4%	$484	2%
151% or More	$30,285	$970	3%	$443	2%
TOTAL	$15,229	$1,069	7%	$648	3%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

Table 4.10C shows the gross and net electric energy burden by housing type. It shows that the clients residing in single-family homes have higher energy bills and receive higher benefits, but their net electric energy burden is slightly higher than clients living in multifamily buildings.

Table 4.10C - 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	$17,159	$1,426	8%	$732	4%
Multifamily	$14,915	$1,011	7%	$634	3%
TOTAL	$15,229	$1,069	7%	$648	3%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

Table 4.10D 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. Group average net electric energy burden is about the same across household sizes.

Table 4.10D - 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	$13,002	$851	7%	$534	2%
Two	$15,289	$1,091	7%	$674	3%
Three	$16,598	$1,235	7%	$765	3%
Four	$18,492	$1,401	8%	$804	3%
Five or More	$21,505	$1,551	7%	$818	3%
TOTAL	$15,229	$1,069	7%	$648	3%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

It also is important to consider the benefit determination procedure results for other groups of households. Table 4.10E shows the gross and net electric energy burden by vulnerable group. It shows that the households with young children have the highest bills and receive the highest benefit. Net electric energy burden is the same across each vulnerable group.

Table 4.10E - 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	$14,570	$884	6%	$508	3%
Disabled	$13,878	$1,109	8%	$645	3%
Young Child	$16,361	$1,277	8%	$815	3%
No Vulnerable Members	$15,498	$1,140	7%	$697	3%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

Unlike clients whose main heating fuel is natural gas, clients who use electricity as their main heating fuel often do not have any other energy sources. So, their *electric* energy burden is their *total* energy burden. Table 4.11 compares the LIHEAP benefits and the estimated *total* net energy burden for gas main heat households to those for electric main heat households. Under the prior benefit matrix, in FY 2017, clients heating with gas had much higher group average net energy burden across all income levels compared to clients heating with electric. Under the revised benefit matrix, in FY 2019, clients heating with gas or electric had similar group average net energy burden (about three to four percent of income). At each income level, gas main heat clients receive higher LIHEAP benefits than did electric main heat clients. That is because the revised benefit matrix assigns higher benefits to households that heat with gas and who, on average, have higher total residential energy bills.

Table 4.11 - 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	$1,401	4%	$895	6%
$5,000-<$10,000	$1,141	4%	$768	4%
$10,000-<$15,000	$975	4%	$612	3%
$15,000-<$20,000	$825	5%	$515	3%
$20,000 or More	$797	3%	$491	2%
TOTAL	$982	4%	$648	3%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

The District of Columbia's LIHEAP program gives higher benefits to households with lower income, those living in single-family homes, and those with more household members, all else being equal. It appears from this analysis that the revised 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 and achieving the program goal of 3% group average net total energy burden.

In addition, the program's revised benefit matrix provides higher benefits to households with gas 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 higher burden households when it gives higher benefits to gas main heat clients.

4.6 Group Energy Burden by Usage Group for LIHEAP Clients with Electric Main Heat

In the previous section, we looked at group energy burdens overall for electric main heat clients. In this section, we break group energy burdens down by usage group to show how energy burdens vary substantially based on whether clients are high energy users or low energy users. The data show that, while the average electric main heat client has an electric bill of $1,069, one-fourth of electric main heat clients have an electric bill less than $657 ("low usage" group) and one-fourth of electric main heat clients have an electric bill greater than $1,567 ("high usage" group).

Tables 4.12A through 4.12E show the mean electric bill and gross energy burden for electric main heat clients, overall and broken down by low and high usage group. The mean electric bill and gross energy burden are broken down by Income Group (Table 4.12A), Poverty Group (Table 4.12B), Housing Type (Table 4.12C), Household Size (Table 4.12D), and Vulnerable Group (Table 4.12E).

Table 4.12A (Income Group) shows that 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 relatively high energy bills. For example, the one-fourth of households with low usage have group average gross energy burden (i.e., energy burden before LIHEAP) of three percent while the one-fourth of households with high usage have group average burden before LIHEAP of 11 percent. Among low usage households, group average gross energy burden varies from about three percent for households in the highest income group ($20,000 or more) to about 13 percent for households in the lowest income group (less than $5,000). Among high usage households, group average gross energy burden varies from about six percent for households in the highest income group to about 49 percent for households in the lowest income group.

Table 4.12A - 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 Gross Electric Burden	Mean Electric Bill	Mean Gross Electric Burden	Mean Electric Bill	Mean Gross Electric Burden
Less than $5,000	$1,136	31%	$516	13%	$1,856	49%
$5,000-<$10,000	$1,067	13%	$502	6%	$1,765	22%
$10,000-<$15,000	$1,035	8%	$495	4%	$1,862	15%
$15,000-<$20,000	$1,037	6%	$477	3%	$1,866	11%
$20,000 or More	$1,096	4%	$482	2%	$1,870	6%
TOTAL	$1,069	7%	$492	3%	$1,827	11%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

Table 4.12B (Poverty Group) shows how group average gross energy burden varies by poverty group based on whether a household has low usage or high usage. Among low usage households, group average gross energy burden varies from about three percent for the highest poverty group (151% of poverty or greater) to about seven percent for the lowest poverty group (at or below 75% of poverty). Among high usage households, group average gross energy burden varies from about five percent for households in the highest poverty group to about 20 percent for households in the lowest poverty group.

Table 4.12B - Gross Total Energy Burden by Poverty Group and Usage Group - Electric Main Heat Clients

	All Clients in Group		Lowest 25% in Group		Highest 25% in Group	
Poverty Group	Mean Total Energy Bill	Mean Gross Energy Burden	Mean Total Energy Bill	Mean Gross Energy Burden	Mean Total Energy Bill	Mean Gross Energy Burden
At or Below 75%	$1,189	14%	$507	7%	$1,826	20%
76% to 100%	$979	8%	$500	5%	$1,824	12%
101% to 125%	$1,014	6%	$489	3%	$1,824	8%
126% to 150%	$961	4%	$487	2%	$1,839	6%
151% or More	$970	3%	$473	2%	$1,830	5%
TOTAL	$1,069	7%	$492	3%	$1,827	11%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

Table 4.12C shows how group average gross energy burden varies by housing unit type based on whether a household has low usage or high usage. Group average gross energy burden is similar within the usage group regardless of housing type.

Table 4.12C - Gross Total Energy Burden by Housing Type and Usage Group - Electric Main Heat Clients

	All Clients in Group		Lowest 25% in Group		Highest 25% in Group	
Housing Type	Mean Total Energy Bill	Mean Gross Energy Burden	Mean Total Energy Bill	Mean Gross Energy Burden	Mean Total Energy Bill	Mean Gross Energy Burden
Single-Family	$1,426	8%	$502	3%	$1,970	11%
Multifamily	$1,011	7%	$492	3%	$1,774	12%
TOTAL	$1,069	7%	$492	3%	$1,827	11%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

Table 4.12D shows how group average gross energy burden varies by household size based on whether a household has low usage or high usage. Among the low usage group, group average gross energy burden is similar regardless of household size. Among the high usage group, group average gross energy burden is higher among smaller households (14 percent group average gross energy burden for households with one member compared to 9 percent for households with 5+ members).

Table 4.12D - Gross Total Energy Burden by Household Size and Usage Group - Electric Main Heat Clients

Household Members	All Clients in Group		Lowest 25% in Group		Highest 25% in Group	
	Mean Total Energy Bill	Mean Gross Energy Burden	Mean Total Energy Bill	Mean Gross Energy Burden	Mean Total Energy Bill	Mean Gross Energy Burden
One	$851	7%	$484	3%	$1,754	14%
Two	$1,091	7%	$503	3%	$1,751	12%
Three	$1,235	7%	$507	3%	$1,819	11%
Four	$1,401	8%	$527	3%	$1,862	10%
Five or More	$1,551	7%	$573	3%	$1,978	9%
TOTAL	$1,069	7%	$492	3%	$1,827	11%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

Table 4.12E shows how group average gross energy burden varies by vulnerable group based on whether a household has low usage or high usage. Group average gross energy burden is similar within the usage group regardless of vulnerable group.

Table 4.12E - Gross Total Energy Burden by Vulnerable Group and Usage Group - Electric Main Heat Clients

Vulnerable Group	All Clients in Group		Lowest 25% in Group		Highest 25% in Group	
	Mean Total Energy Bill	Mean Gross Energy Burden	Mean Total Energy Bill	Mean Gross Energy Burden	Mean Total Energy Bill	Mean Gross Energy Burden
Elderly	$884	6%	$484	3%	$1,832	11%
Disabled	$1,109	8%	$510	4%	$1,845	12%
Young Child	$1,277	8%	$520	3%	$1,845	11%
No Vulnerable Members	$1,140	7%	$499	3%	$1,818	11%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

In Tables 4.13A through 4.13E, we examine the mean LIHEAP benefit and group net energy burden for electric main heat clients, broken down by low usage group and high usage group. The mean LIHEAP benefit and group net energy burden are broken down by Income Group (Table 4.13A), Poverty Group (Table 4.13B), Housing Type (Table 4.13C), Household Size (Table 4.13D), and Vulnerable Group (Table 4.13E). Table 4.13A shows that the LIHEAP benefit is about 76 percent 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 $471, compared to $831 for the high usage households. However, because the electric bills are so low ($492) for the one-fourth of households with the lowest electric bills, their group average net electric burden is about zero, while group average net electric burden is 6% for the one-fourth of households with the highest electric bills.

Table 4.13A shows how group average net energy burden varies by income group based on whether a household has low usage or high usage. Among low usage households, group average net energy burden varies from about one percent for households with income between $15,000 and $20,000, to about *negative* five percent for households in the lowest income group (less than $5,000). Among high usage households, group average net energy burden varies from about four percent for households in the highest income group ($20,000 or more) to about 20 percent for households in the lowest income group.

Table 4.13A - Net Electric Energy Burden by Income Level and Usage Group - Electric Main Heat Clients

	Low Usage (Lowest 25% in Group)			High Usage (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	$516	$722	-5%	$1,856	$1,075	20%
$5,000-<$10,000	$502	$578	-1%	$1,765	$988	10%
$10,000-<$15,000	$495	$460	0%	$1,862	$821	9%
$15,000-<$20,000	$477	$358	1%	$1,866	$685	7%
$20,000 or More	$482	$357	0%	$1,870	$619	4%
TOTAL	$492	$471	0%	$1,827	$831	6%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

Table 4.13B shows how group average net energy burden varies by poverty group based on whether a household has low usage or high usage. Among low usage households, group average net energy burden varies from about one percent for the highest poverty group (151% of poverty or greater) to about *negative* two percent for the lowest poverty group (at or below 75% of poverty). Among high usage households, group average net energy burden varies from about three percent for households in the highest poverty group to about nine percent for households in the lowest poverty group.

Table 4.13B - Net Total Energy Burden by Poverty Group and Usage Group - Electric Main Heat Clients

	Low Usage (Lowest 25% in Group)			High Usage (Highest 25% in Group)		
Poverty Group	Mean Total Energy Bill	Mean LIHEAP Benefit	Mean Net Energy Burden	Mean Total Energy Bill	Mean LIHEAP Benefit	Mean Net Energy Burden
At or Below 75%	$507	$632	-2%	$1,826	$980	9%
76% to 100%	$500	$500	0%	$1,824	$726	7%
101% to 125%	$489	$413	0%	$1,824	$616	6%
126% to 150%	$487	$375	1%	$1,839	$660	4%
151% or More	$473	$327	1%	$1,830	$576	3%
TOTAL	$492	$471	0%	$1,827	$831	6%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

Table 4.13C shows how group average net energy burden varies by housing type based on whether a household has low usage or high usage. Group average net energy burden is similar within the usage group regardless of housing type.

Table 4.13C - Net Total Energy Burden by Housing Type and Usage Group - Electric Main Heat Clients

	Low Usage (Lowest 25% in Group)			High Usage (Highest 25% in Group)		
Housing Type	Mean Total Energy Bill	Mean LIHEAP Benefit	Mean Net Energy Burden	Mean Total Energy Bill	Mean LIHEAP Benefit	Mean Net Energy Burden
Single-Family	$502	$530	0%	$1,970	$820	6%
Multifamily	$492	$467	0%	$1,774	$836	6%
TOTAL	$492	$471	0%	$1,827	$831	6%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

Table 4.13D shows how group average net energy burden varies by household size based on whether a household has low usage or high usage. Group average gross energy burden is similar within the low usage group regardless of household size. Among high usage households, group average net energy burden is higher for smaller households (nine percent group average net energy burden for households with one member) compared to larger households (five percent group average net energy burden for households with 5+ members).

Table 4.13D - Net Total Energy Burden by Household Size and Usage Group - Electric Main Heat Clients

	Low Usage (Lowest 25% in Group)			High Usage (Highest 25% in Group)		
Household Members	Mean Total Energy Bill	Mean LIHEAP Benefit	Mean Net Energy Burden	Mean Total Energy Bill	Mean LIHEAP Benefit	Mean Net Energy Burden
One	$484	$440	0%	$1,754	$713	9%
Two	$503	$504	0%	$1,751	$811	6%
Three	$507	$547	0%	$1,819	$893	6%
Four	$527	$600	0%	$1,862	$876	5%
Five or More	$573	$683	-1%	$1,978	$866	5%
TOTAL	$492	$471	0%	$1,827	$831	6%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

Table 4.13E shows how group average net energy burden varies by vulnerable group based on whether a household has low usage or high usage. Group average gross energy burden is similar within the usage group regardless of vulnerable group.

Table 4.13E - Net Total Energy Burden by Vulnerable Group and Usage Group - Electric Main Heat Clients

Vulnerable Group	Low Usage (Lowest 25% in Group)			High Usage (Highest 25% in Group)		
	Mean Total Energy Bill	Mean LIHEAP Benefit	Mean Net Energy Burden	Mean Total Energy Bill	Mean LIHEAP Benefit	Mean Net Energy Burden
Elderly	$884	$422	0%	$1,832	$674	7%
Disabled	$1,109	$468	0%	$1,845	$848	6%
Young Child	$1,277	$617	-1%	$1,845	$927	6%
No Vulnerable Members	$1,140	$516	0%	$1,818	$836	6%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

4.7 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. This analysis shows that it is important to consider the individual differences in energy burden as well as the group differences.

In Table 4.10, we saw that the average annual electric bill for electric main heat clients was $1,069. Table 4.14 shows the distribution of electric bills for electric main heat clients. The median annual electric bill is about $966. About one-fourth of electric main heat clients have an annual electric bill of $657 or less and one-fourth have an annual gas bill of $1,352 or more.

Table 4.14 - Distribution of Electric Bills - Electric Main Heat Clients

Distribution	Annual Total Energy Bill
Mean (average)	$1,069
Bottom 10%	$475
Bottom 25%	$657
Median	$966
Top 25%	$1,352
Top 10%	$1,808

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

Tables 4.15A through 4.15E furnish data on the distribution of gross energy burden (i.e., energy burden before LIHEAP) for electric main heat clients. The distribution of gross energy burden is broken down by Income Group (Table 4.15A), Poverty Group (Table 4.15B), Housing Type (Table 4.15C), Household Size (Table 4.15D), and Vulnerable Group (Table 4.15E).

Table 4.15A shows overall, the median gross energy burden is eight percent, meaning that half of electric main heat clients have gross energy burden less than eight percent and half have gross energy burden greater than eight percent. One-fourth of electric main heat clients have gross energy burden of four percent or less and one-fourth have gross energy burden of 13 percent or more. Among households in the lowest income group (less than $5,000), gross

energy burden varies from about 13 percent of income (bottom 10th percentile) to about 54 percent of income (top 10th percentile).

Table 4.15A - 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	33%	13%	21%	30%	41%	54%
$5,000-<$10,000	14%	6%	8%	12%	18%	23%
$10,000-<$15,000	9%	4%	5%	7%	11%	15%
$15,000-<$20,000	6%	2%	4%	5%	8%	10%
$20,000 or More	4%	2%	2%	3%	5%	7%
TOTAL	11%	3%	4%	8%	13%	22%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

Table 4.15B shows how the distribution of gross energy burden for electric main heat clients varies by poverty group. Among clients in the lowest poverty group (at or below 75% of poverty), the median gross energy burden is 14 percent. Among clients in the highest poverty group (151% of poverty or greater), the median gross energy burden is three percent.

Table 4.15B - Distribution of Gross Total Energy Burden by Poverty Group - Electric Main Heat Clients

Poverty Group	Mean Gross Energy Burden	Bottom 10%	Bottom 25%	Median	Top 25%	Top 10%
At or Below 75%	17%	6%	9%	14%	21%	31%
76% to 100%	8%	4%	6%	7%	10%	14%
101% to 125%	6%	3%	4%	5%	7%	9%
126% to 150%	4%	2%	3%	4%	5%	7%
151% or More	3%	1%	2%	3%	4%	5%
TOTAL	11%	3%	4%	8%	13%	22%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

Table 4.15C shows how the distribution of gross energy burden for electric main heat clients varies by housing type. The median gross energy burden is about nine percent for clients residing in single-family homes compared to about seven percent for clients residing in multifamily homes.

Table 4.15C - Distribution of Gross Total Energy Burden by Housing Type - Electric Main Heat Clients

Housing Type	Mean Gross Energy Burden	Bottom 10%	Bottom 25%	Median	Top 25%	Top 10%
Single-Family	13%	3%	5%	9%	16%	26%
Multifamily	10%	2%	4%	7%	13%	21%
TOTAL	11%	3%	4%	8%	13%	22%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

Table 4.15D shows how the distribution of gross energy burden for electric main heat clients varies by household size. The median gross energy burden varies from about seven percent to 10 percent across different household sizes.

Table 4.15D - Distribution of Gross Total Energy Burden by Household Size - Electric Main Heat Clients

Household Members	Mean Gross Energy Burden	Bottom 10%	Bottom 25%	Median	Top 25%	Top 10%
One	9%	3%	4%	7%	10%	16%
Two	12%	2%	4%	8%	16%	26%
Three	13%	3%	4%	9%	17%	25%
Four	12%	3%	5%	10%	16%	24%
Five or More	13%	3%	4%	9%	17%	27%
TOTAL	11%	3%	4%	8%	13%	22%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

Table 4.15E shows how the distribution of gross energy burden for electric main heat clients varies by vulnerable group. The median gross energy burden is lowest for households with elderly members (six percent) and highest for households with young children (10 percent).

Table 4.15E - Distribution of Gross Total Energy Burden by Vulnerable Group - Electric Main Heat Clients

Vulnerable Group	Mean Gross Energy Burden	Bottom 10%	Bottom 25%	Median	Top 25%	Top 10%
Elderly	8%	2%	4%	6%	10%	14%
Disabled	10%	3%	5%	8%	12%	18%
Young Child	13%	3%	5%	10%	17%	25%
No Vulnerable Members	12%	3%	4%	9%	16%	26%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

Tables 4.16A through 4.16E furnish data on the distribution of net energy burden (i.e., energy burden before LIHEAP) for electric main heat clients. The distribution of net energy burden is broken down by Income Group (Table 4.16A), Poverty Group (Table 4.16B), Housing Type (Table 4.16C), Household Size (Table 4.16D), and Vulnerable Group (Table 4.16E).

Table 4.16A shows overall, the median net energy burden is two percent, meaning that half of electric main heat clients have net energy burden less than two percent and half have net energy burden greater than two percent. One-fourth of electric main heat clients have net energy burden of one percent or less and one-fourth have net energy burden of five percent or more. Among households in the lowest income group (less than $5,000), one-fourth of clients have net energy burden of *negative* 2 percent or less (meaning that their total LIHEAP benefits exceed their electric bills), and one-fourth of clients have net energy burden 12 percent or more.

Table 4.16A - 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	7%	-8%	-2%	5%	12%	24%
$5,000-<$10,000	4%	-2%	0%	3%	6%	11%
$10,000-<$15,000	3%	0%	1%	3%	5%	9%
$15,000-<$20,000	3%	0%	1%	2%	4%	7%
$20,000 or More	2%	0%	1%	2%	3%	4%
TOTAL	3%	-1%	1%	2%	5%	9%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

Table 4.16B shows how the distribution of net energy burden for electric main heat clients varies by poverty group. Among clients in the lowest poverty group (at or below 75% of poverty), the median net energy burden is four percent. Among clients in the highest poverty group (151% of poverty or greater), the median net energy burden is one percent.

Table 4.16B - Distribution of Net Total Energy Burden by Poverty Group - Electric Main Heat Clients

Poverty Group	Mean Net Energy Burden	Bottom 10%	Bottom 25%	Median	Top 25%	Top 10%
At or Below 75%	4%	-3%	0%	4%	7%	12%
76% to 100%	3%	-1%	1%	3%	5%	8%
101% to 125%	3%	0%	1%	2%	4%	6%
126% to 150%	2%	0%	1%	2%	3%	5%
151% or More	2%	0%	1%	1%	3%	4%
TOTAL	3%	-1%	1%	2%	5%	9%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

Table 4.16C shows how the distribution of net energy burden for electric main heat clients varies by housing type. The median net energy burden is about four percent for clients residing in single-family homes compared to about two percent for clients residing in multifamily homes.

Table 4.16C - Distribution of Net Total Energy Burden by Housing Type - Electric Main Heat Clients

Housing Type	Mean Energy Burden	Bottom 10%	Bottom 25%	Median	Top 25%	Top 10%
Single-Family	5%	0%	1%	4%	7%	12%
Multifamily	3%	-1%	1%	2%	5%	8%
TOTAL	3%	-1%	1%	2%	5%	9%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

Table 4.16D shows how the distribution of net energy burden for electric main heat clients varies by household size. The median net energy burden is about two to three percent for all household sizes.

Table 4.16D - Distribution of Net Total Energy Burden by Household Size - Electric Main Heat Clients

Household Members	Mean Energy Burden	Bottom 10%	Bottom 25%	Median	Top 25%	Top 10%
One	3%	-1%	0%	2%	4%	8%
Two	3%	-1%	1%	2%	5%	9%
Three	4%	-1%	1%	2%	6%	10%
Four	4%	-1%	1%	3%	6%	11%
Five or More	5%	0%	1%	3%	7%	13%
TOTAL	3%	-1%	1%	2%	5%	9%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

Table 4.16E shows how the distribution of net energy burden for electric main heat clients varies by vulnerable group. The median gross energy burden is about two to three percent for each group of households.

Table 4.16E - Distribution of Net Total Energy Burden by Vulnerable Group - Electric Main Heat Clients

Vulnerable Group	Mean Net Energy Burden	Bottom 10%	Bottom 25%	Median	Top 25%	Top 10%
Elderly	3%	-1%	1%	2%	4%	7%
Disabled	4%	-1%	1%	3%	5%	9%
Young Child	4%	-2%	1%	2%	6%	10%
No Vulnerable Members	4%	-1%	1%	3%	6%	10%

Sources: FY 2019 LIHEAP Data, 2019 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 greater 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.

In the 2018 Study, the data provided by Washington Gas included the value of the RES discount for clients who participated in that program, and the data provided by Pepco allowed for estimating the value of the RAD program based on monthly usage. The data provided by Washington Gas for the current study do not include the value of the RES discount for clients who participated in that program, but the data provided by Pepco still allow for estimating the value of the RAD discount based on monthly usage. As such, Table 4.17 examines the estimated combined impact of the LIHEAP program and the RAD program for electric main heat clients, but does not include an estimate of the combined impact of LIHEAP, RES, and RAD for gas main heat clients since the value of the RES program could not be estimated.

Table 4.17 shows that for electric main heat clients, the combined impact of the LIHEAP and RAD programs were able to reduce electric burden from about nine percent to about three percent net burden.

Table 4.17 – Gross Bills & Burden and Impact of RAD and LIHEAP by Main Heating Fuel

	Gross[16]		Actual			
Main Heating Fuel	Mean Energy Bill	Mean Energy Burden	Mean Energy Bill	Mean Energy Burden	Mean LIHEAP Benefit	Mean Net Energy Burden
Gas	N/A	N/A	$1,574	10%	$982	4%
Electric	$1,389	9%	$1,069	7%	$648	3%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

4.7 Energy Affordability and 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. Table 4.18 shows the share of clients who have negative net energy burden (i.e., these clients received a total LIHEAP benefit for bill payment assistance that exceeds their energy bills and are likely to accrue a bill credit on their account), "affordable" net energy burden (defined as net energy burden between 0%-6% of income), and "unaffordable" net energy burden (defined as net energy burden greater than 6% of income, with "severely unaffordable" defined as greater than 10% of income). Overall, about 17 percent of LIHEAP clients have negative net energy burden (net energy burden is less than 0%), and this finding is consistent for clients heating with gas or electric. Nearly 60 percent of clients

[16] The value of the RAD discount was calculated as 25% of the estimated gross electric bill, up to $475 maximum for clients using electric main heat and $300 maximum for clients using natural gas main heat. The value of the RES discount was not available and was unable to be estimated using the available data. Accordingly, the combined impact of LIHEAP, RES, and RAD is not examined for gas main heat clients.

have affordable net energy burden after receiving LIHEAP, with electric main heat clients slightly more likely to have an affordable net energy burden (63% compared to 55% of gas main heat clients). About one-quarter of clients have an unaffordable or severely unaffordable burden after LIHEAP, with gas main heat clients slightly more likely to have an unaffordable/severely unaffordable net energy burden (27% compared to 20% of electric main heat clients).

Table 4.18 – 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)	18%	17%	17%
Affordable (0%-6%)	55%	63%	59%
Unaffordable (>6%-10%)	17%	12%	14%
Severely Unaffordable (>10%)	10%	8%	9%
Total	100%	100%	100%

Sources: FY 2019 LIHEAP Data; 2019 Washington Gas Data; 2019 Pepco Data.

DOEE's policy allows gas main heat clients to choose which utility – Pepco or Washington Gas –to assign their benefits. Gas main heat clients are not permitted to split their regular LIHEAP benefit between both accounts, so the full regular benefit goes either to their gas account or electric account, despite the regular benefit being based on average total energy bills for similar gas main heat households. However, gas main heat clients can receive a regular benefit for one utility and a crisis benefit for the other utility. So, energy affordability and bill credits are more complicated for gas main heat clients than for electric main heat clients, who just have their LIHEAP benefits applied to their Pepco accounts.

Table 4.19 examines LIHEAP benefits and energy bills for gas main heat clients in a more nuanced way to better understand energy affordability and bill credits among this group of clients. Since gas main heat clients can have their regular benefit go to their gas account or their electric account, but not both, Table 4.19 examines what share of clients have a regular LIHEAP benefit that exceeds their gas bill or electric bill, based on which utility received the regular LIHEAP benefit. For clients who assigned their regular LIHEAP benefit to their gas account, about 46 percent have a regular LIHEAP benefit that exceeds their gas bill. For clients who assigned their regular LIHEAP benefit to their electric account, about half have a regular LIHEAP benefit that exceeds their electric bill. As such, bill credits accruing to a particular utility account are a larger issue among gas main heat clients due to procedures that require gas main heat clients to assign their regular benefit to one utility or another rather than assigning a portion to each utility.

Table 4.19 - Bill Credits for Gas Main Heat Clients

Gas main heat clients	Percent of clients
Regular LIHEAP benefit for gas account greater than gas bill	46%
Regular LIHEAP benefit for electric account greater than electric bill	50%

Sources: FY 2019 LIHEAP Data; 2019 Washington Gas Data; 2019 Pepco Data.

Additional tables showing the breakdown of energy affordability and bill credits by Income Group, Poverty Group, Housing Type, Household Size, and Vulnerable Group, by main heating fuel, are presented in Appendix B.

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 = $1,132
- Average Total LIHEAP Benefit for All Clients = $798
- Ratio = 1.42
- Index = 100 * Ratio = 142.

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 142, OCS would consider that the program is targeting benefits for all clients.

Table 4.20 also 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 4.20 - 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	$1,132	$956	$1,275
Average Total LIHEAP Benefit – All Clients	$798	$648	$982
Ratio	1.42	1.48	1.30
Benefit Targeting Index	142	148	130

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

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 = 64.0%
- Average Burden Reduction for All Clients = 61.6%
- Ratio = 1.04
- Index = 100 * Ratio = 104.

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 104, OCS would consider that the program is targeting burden reduction for all clients.

Table 4.21 provides Burden Reduction Targeting Index results broken down by main heating fuel. Natural gas main heat clients have Burden Reduction Targeting Index scores greater than 100, so OCS would consider that the program is targeting burden reduction to this group of clients. Electric main heat clients have a Burden Reduction Targeting Index score of 100, so OCS would consider that the program is treating the average electric main heat client and high burden electric main heat clients equally.

Table 4.21 - 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	64.0%	60.9%	66.0%
Average Burden Reduction – All Clients	61.6%	60.6%	62.4%
Ratio	1.04	1.00	1.06
Burden Reduction Targeting Index	104	100	106

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Overall and for both main heating fuel groups, the Burden Reduction Targeting Index results were similar using the average total LIHEAP benefit and the average regular assistance benefit.

4.9 Comparison to Prior Study

Based on findings from the 2018 Study, DOEE implemented a revised benefit matrix that targeted higher benefits to gas main heat clients and updated the differentials in benefits according to each dimension of the matrix (income level, household size, housing type). And, based on the average electric bills for electric main heat clients, the electric main heat benefits were decreased slightly in order to offset the increase in gas main heat benefits and to target an equitable net energy burden for both fuel types. The following sections compare outcomes observed in the FY 2017 program year from the prior study with outcomes observed in the FY 2019 program year.

Comparison of Group Outcomes

Compared to the results from the 2018 Study, the revised benefit matrix has helped to improve group outcomes for gas main heat households while creating a more equitable outcome between gas and electric main heat. For example:

- In FY 2017, the average total LIHEAP benefit for gas main heat clients was $625 and the group average net energy burden was five percent. For electric main heat clients, the average total LIHEAP benefit was $724 and group average net energy burden was about one percent.

- In FY 2019, the average total LIHEAP benefit for gas main heat clients was $982 and the group average net energy burden was four percent (Table 4.4A). For electric main heat clients, the average total LIHEAP benefit was $648 and group average net energy burden was about three percent (Table 4.10A).

Group outcomes also improved for the lowest income households, particularly those with the highest usage, due to improved differentials in benefits by income level. For example:

- For clients in the lowest income group (less than $5,000), in FY 2017, the average total LIHEAP benefit for gas main heat clients was $908 and the group average net energy burden was 14 percent, while for electric main heat clients, the average total LIHEAP benefit was $1,047 and group average net energy burden was negative two percent. In FY 2019, gas main heat clients in this income group received an average total LIHEAP benefit of $1,401 and the group average net energy burden was four percent (Table 4.4A), while for electric main heat clients in this income group, the average total LIHEAP benefit was $895 and the group average net energy burden was six percent (Table 4.10A).

- For clients in the lowest income group (less than $5,000) *and* with high usage, in FY 2017, the average total LIHEAP benefit for gas main heat clients was $1,052 and the group average net energy burden was 42 percent, while for electric main heat clients, the average total LIHEAP benefit was $1,168 and group average net energy burden was 18 percent. In FY 2019, gas main heat clients in this income group and usage group received an average total LIHEAP benefit of $1,646 and the group average net energy burden was 20 percent (Table 4.6A), while for electric main heat clients in this income group and usage group, the average total LIHEAP benefit was $1,075 and the group average net energy burden was 20 percent (Table 4.13A).

Comparison of Individual Outcomes

Compared to the findings from the 2018 Study, the revised benefit matrix has contributed to a reduction in individual energy burden for natural gas main heat clients while maintaining a similar distribution for electric main heat clients. Tables 4.22A and 4.22B show that the net energy burden for the quarter of gas main heat clients with the highest individual energy burden (top 25%) was nine percent in FY 2017 and six percent in FY 2019. It is the lowest income group, particularly gas main heat clients, where the revised benefit matrix has had the greatest impact on outcomes for individual clients.

Table 4.22A - Distribution of Individual Net Energy Burden by Income Group - Gas Main Heat, FY 2017 & FY 2019

Income Group	Year	Median	Bottom 25%	Top 25%
All households	FY 2017	4%	2%	9%
	FY 2019	3%	1%	6%
Less than $5,000	FY 2017	11%	3%	24%
	FY 2019	3%	-5%	12%
$20,000 or more	FY 2017	3%	2%	5%
	FY 2019	3%	2%	5%

Source: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data; FY 2017 LIHEAP Data, 2017 Washington Gas Data, 2017 Pepco data.

Table 4.22B - Distribution of Individual Net Energy Burden by Income Group - Electric Main Heat, FY 2017 & FY 2019

Income Group	Year	Median	Bottom 25%	Top 25%
All households	FY 2017	1%	-1%	4%
	FY 2019	2%	1%	5%
Less than $5,000	FY 2017	-1%	-15%	8%
	FY 2019	5%	-2%	12%
$20,000 or more	FY 2017	1%	0%	2%
	FY 2019	2%	1%	3%

Source: FY 2019 LIHEAP Data, 2019 Pepco Data; FY 2017 LIHEAP Data, 2017 Pepco data.

However, the revised benefit matrix has not resulted in substantial changes to energy affordability outcomes on an individual basis, with about 59 percent of clients overall having an "affordable" net energy burden in FY 2019 compared to about 53 percent in FY 2017. The reason behind this minimal shift in individual outcomes is that the benefit matrix is based on average energy bills for groups of clients while the actual energy bills for clients within any particular group vary widely. Table 4.23 compares energy affordability outcomes, by main heating fuel and overall, across the two years.

Table 4.23 - Energy Affordability and Bill Credits for FY 2017 and FY 2019

Net Total Energy Burden	Gas Main Heat		Electric Main Heat		All Households	
	FY 2017	FY 2019	FY 2017	FY 2019	FY 2017	FY 2019
Less than 0% (i.e. bill credit)	11%	18%	36%	17%	27%	17%
Affordable (0%-6%)	55%	55%	52%	63%	53%	59%
Unaffordable (>6%)	35%	27%	12%	20%	20%	23%
Total	100%	100%	100%	100%	100%	100%

Source: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data; FY 2017 LIHEAP Data, 2017 Washington Gas Data, 2017 Pepco data.

Comparison of Performance Measures Outcomes

The LIHEAP Performance Measures developed by the federal LIHEAP office are based on group outcomes. As such, the higher benefits targeted to gas main heat clients under the revised benefit matrix, and the improved differentials in benefits by income level, result in improved outcomes on the LIHEAP Performance Measures. For example, in FY 2017, the average total LIHEAP benefit to high burden households was $899 compared to $690 for all clients. This resulted in a benefit targeting index score of 130, meaning that the program targeted 30 percent higher benefits to high burden households. In FY 2019, the benefit targeting index score was 142 (Table 4.20), meaning that the program targeted 42 percent higher benefits to high burden households.

In addition, in FY 2017, the burden reduction targeting index score was 88, meaning that the program paid 12 percent less of the energy bill for high burden households than it did for all households. This was because the program was targeting higher benefits to electric main heat clients compared to gas main heat clients, despite gas main heat clients having higher energy burden, on average. In FY 2019, the burden reduction targeting index score was 104 (Table 4.21), meaning that the program paid 4 percent more of the energy bill for high burden households than it did for all households. As such, the program did a better job of targeting burden reduction in FY 2019 compared to FY 2017.

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 provides updated analyses that characterize the population of low-income households in the District of Columbia and estimate the penetration rate of the District of Columbia's existing energy assistance programs. It furnishes DOEE with the information that it needs to assess the impact of its revised benefit determination procedures and decide whether to modify those procedures further to meet the statutory guidance of the federal LIHEAP program. It also helps DOEE to assess whether the revised benefit determination procedures fulfill the District's mandates to make the distribution of benefits more equitable, maintain a year-round program, and coordinate LIHEAP with the Solar for All program. A separate memo provides analysis of alternative benefit determination procedures for DOEE to consider as it seeks to better address individual outcomes for clients.

The report consists of three complementary sections:

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 revised LIHEAP Benefit Matrix in targeting benefits to clients.

The study makes recommendations to DOEE regarding the targeting of benefits to improve individual client outcomes.

5.1 Overview of Benefit Determination Recommendations

This analysis finds that the revised benefit matrix implemented by DOEE 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 main heat – the matrix appears to correctly assess which groups of households have higher energy burdens *on average*. Table 4.4A shows that the highest burden groups get the highest benefits. Moreover, the Benefit Targeting Index and Burden Reduction Targeting Index show that the program is successfully targeting benefits and burden reduction for high burden households. In addition, Table 4.11 shows that the program is targeting higher benefits to gas main heat clients who have higher total energy bills, on average, than do electric main heat clients. These findings demonstrate an improvement compared to outcomes observed in the 2018 Study (using FY 2017 program data).

However, like the 2018 Study, the current analysis 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 4.9A showed that for gas

main heat households with income between $5,000 and $10,000, the median individual net energy burden (i.e., energy burden after LIHEAP) was three percent and ranged from -4% to 12% for the 10th and 90th percentiles. For electric main heat households in the same income group, Table 4.16A showed that mean individual net energy burden also was three percent, and the net energy burden ranged from -2% to 11% for the 10th and 90th percentiles. And, Table 4.18 showed that about 17 percent of clients had net energy burden of less than zero (i.e., they received total LIHEAP benefits that were greater than their energy bills), while about 23 percent of clients had net energy burden greater than 6 percent.

So, while the revised benefit matrix has resulted in more consistent group average net energy burden outcomes across the dimensions of the benefit matrix (income level, household size, housing unit type, heating fuel type) and more equitable treatment of clients heating with natural gas and electric, there is still the issue of inequity in the outcomes for individual clients. The only way to account for these differences is to utilize information on the actual energy bills for individual clients served by the program as part of the benefit determination process.

In several states, grantees have replaced a 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. Short of developing real-time information sharing with the District's utilities, one recommendation for the program is to utilize the energy bill data being collected as part of the LIHEAP Performance Measures in assigning benefit levels to clients.

A second recommendation for the program is to allow gas main heat clients to assign a portion of their regular LIHEAP benefits to each of their utility vendors. In FY 2019, while about 18 percent of gas main heat clients received a total LIHEAP benefit that exceeded their total energy bill, Table 4.19 shows that about half of the gas main heat clients likely are accruing a bill credit on one of their utility accounts—electric or gas—because current procedures require that they assign their regular benefit to one utility only. Allowing gas main heat clients to assign a portion of their regular LIHEAP benefit to their gas account and a portion to their electric account might help these clients maintain an affordable energy burden with each vendor and prevent clients from accruing back charges that result in crisis situations, while at the same time, minimize the accrual of bill credits on one utility account while the other utility account has an unaffordable energy burden. Since gas and electric bills for gas main heat households are approximately equal, on average, the most straightforward procedural change would be to allow gas main heat clients to assign half of their regular LIHEAP benefit to their gas account and half to their electric account.

A third recommendation for the program is to consider further updates to the existing benefit matrix to account for differences in energy burden outcomes between group of clients, particularly clients residing in single-family homes versus those residing in multifamily homes. Table 4.4C shows that for gas main heat clients, the group average net energy burden was about five percent for clients residing in single-family homes compared to about two percent for those in multifamily homes. Table 4.9C shows a similar finding when examining the distribution of individual net energy burden, and Table B.1C and Appendix B show that gas main heat clients residing in single-family homes are twice as likely to have unaffordable net energy burden (greater than 6% of income). The findings are similar for electric main heat clients by housing unit type.

5.2 Alternative Benefit Structure

The recommendations in this report are explored in more detail in a companion memo that examines potential outcomes of revised benefit determination procedures. The focus of that memo will be on exploring client outcomes achieved in FY 2019 versus what those outcomes would have been using the prior benefit matrix. Additionally, that memo will examine benefit determination procedures designed to achieve a standard net energy burden for individual clients. This will build off of the modeling done in the 2018 Study and include more detailed analyses of a standard net energy burden approach and its impact on client outcomes and program budgets.

Appendix A

Appendix A presents demographic estimates of the income-eligible population by Region in the District of Columbia. Estimates were developed using the 2014-2018 ACS.

Table A.1 - Income-Eligible Households by Region

Region	Income-Eligible Households	All Households	Percent Income-Eligible
West Region (Ward 3)	5,833	47,233	12%
North Region (Ward 4)	13,597	46,753	29%
Northeast Region (Wards 5/6)	12,104	47,276	26%
East Region (Wards 7/8)	30,527	59,722	51%
Central Region (Wards 1/2)	16,248	80,337	20%
TOTAL HOUSEHOLDS	78,309	281,321	28%

Source: 2014-2018 ACS.

Table A.2 - Vulnerability Status of Income-Eligible Households by Region

	Geographic Region				
Vulnerability Group	West (Ward 3)	North (Ward 4)	Northeast (Wards 5/6)	East (Wards 7/8)	Central (Wards 1/2)
Elderly Member	35%	43%	50%	32%	36%
Disabled Member	21%	40%	53%	46%	33%
Young Child	2%	14%	11%	19%	4%
No Vulnerable Members	58%	31%	22%	29%	46%
TOTAL HOUSEHOLDS	100%	100%	100%	100%	100%

Source: 2014-2018 ACS.

Table A.3 - Number of Household Members of Income-Eligible Households by Region

	Geographic Region				
Household Members	West (Ward 3)	North (Ward 4)	Northeast (Wards 5/6)	East (Wards 7/8)	Central (Wards 1/2)
One	69%	48%	58%	42%	68%
Two	17%	24%	19%	23%	19%
Three	6%	9%	10%	14%	5%
Four or More	8%	19%	14%	21%	8%
TOTAL HOUSEHOLDS	100%	100%	100%	100%	100%

Source: 2014-2018 ACS.

Table A.4 - Race/Ethnicity of Income-Eligible Households by Region

Race/Ethnicity	Geographic Region				
	West (Ward 3)	North (Ward 4)	Northeast (Wards 5/6)	East (Wards 7/8)	Central (Wards 1/2)
White Non-Hispanic	59%	6%	11%	1%	28%
Black Non-Hispanic	16%	63%	81%	95%	46%
Hispanic	11%	27%	5%	2%	14%
Asian	7%	1%	1%	0%	8%
Other	6%	3%	2%	2%	4%
TOTAL HOUSEHOLDS	100%	100%	100%	100%	100%

Source: 2014-2018 ACS.

Table A.5 - Language Spoken at Home by Income-Eligible Households by Region

Language	Geographic Region				
	West (Ward 3)	North (Ward 4)	Northeast (Wards 5/6)	East (Wards 7/8)	Central (Wards 1/2)
English	70%	59%	88%	96%	74%
Spanish	10%	27%	5%	2%	11%
Indo-European	8%	3%	3%	1%	5%
Asian and Pacific Island	7%	1%	1%	0%	5%
Other	6%	10%	3%	1%	5%
TOTAL HOUSEHOLDS	100%	100%	100%	100%	100%

Source: 2014-2018 ACS.

Table A.6 - Linguistic Isolation of Income-Eligible Households by Region

Language	Geographic Region				
	West (Ward 3)	North (Ward 4)	Northeast (Wards 5/6)	East (Wards 7/8)	Central (Wards 1/2)
Not Linguistically Isolated	93%	76%	96%	99%	93%
Linguistically Isolated – Hispanic	2%	18%	2%	1%	4%
Linguistically Isolated – Non-Hispanic	6%	5%	2%	1%	3%
TOTAL HOUSEHOLDS	100%	100%	100%	100%	100%

Source: 2014-2018 ACS.

Table A.7 - Household Type of Income-Eligible Households by Region

Household Type	Geographic Region				
	West (Ward 3)	North (Ward 4)	Northeast (Wards 5/6)	East (Wards 7/8)	Central (Wards 1/2)
Elderly Individual (60+)	31%	26%	33%	19%	28%
Elderly Couple (60+)	4%	17%	17%	13%	8%
Older without Children (40-59)	13%	21%	19%	22%	23%
Older with Children (40-59)	7%	12%	10%	13%	4%
Younger without Children (<40)	42%	12%	12%	9%	30%
Younger with Children (<40)	2%	13%	10%	23%	7%
TOTAL HOUSEHOLDS	100%	100%	100%	100%	100%

Source: 2014-2018 ACS.

Table A.8 - SNAP Recipient Income-Eligible Households by Region

SNAP Recipient	Geographic Region				
	West (Ward 3)	North (Ward 4)	Northeast (Wards 5/6)	East (Wards 7/8)	Central (Wards 1/2)
Yes	9%	35%	36%	54%	27%
No	91%	65%	64%	46%	73%
TOTAL HOUSEHOLDS	100%	100%	100%	100%	100%

Source: 2014-2018 ACS.

Table A.9A - Estimated LIHEAP Participation Rates in West Region (Ward 3) - FY 2019

Group	Income Eligible Households	LIHEAP Recipient Households	Estimated Participation Rate
All Households	5,833	91	2%
Vulnerable Households			
Elderly Households	2,020	49	2%
Disabled Household	1,226	7	1%
Young Child Households	108	8	7%
Poverty Group			
<=100% of Poverty	2,602	63	2%
101% - 125% of Poverty	668	6	1%
126% - 150% of Poverty	673	3	<1%
151% or More	1,890	19	1%

Source: 2014-2018 ACS / FY 2019 Household Report (all sources).
Note: Overall, region information was unknown for 572 households and vulnerable population data were unknown for 37 households.

Table A.9B - Estimated LIHEAP Participation Rates in North Region (Ward 4) - FY 2019

Group	Income Eligible Households	LIHEAP Recipient Households	Estimated Participation Rate
All Households	13,597	1,328	10%
Vulnerable Households			
Elderly Households	5,802	656	11%
Disabled Household	5,425	27	<1%
Young Child Households	1,841	159	9%
Poverty Group			
<=100% of Poverty	5,978	808	14%
101% - 125% of Poverty	1,656	161	10%
126% - 150% of Poverty	1,264	102	8%
151% or More	4,699	257	5%

Source: 2014-2018 ACS / FY 2019 Household Report (all sources).
Note: Overall, region information was unknown for 572 households and vulnerable population data were unknown for 37 households.

Table A.9C - Estimated LIHEAP Participation Rates in Northeast Regions (Wards 5/6) - FY 2019

Group	Income Eligible Households	LIHEAP Recipient Households	Estimated Participation Rate
All Households	12,104	4,875	40%
Vulnerable Households			
Elderly Households	6,013	2,240	37%
Disabled Household	6,378	244	4%
Young Child Households	1,288	642	50%
Poverty Group			
<=100% of Poverty	5,599	3,199	57%
101% - 125% of Poverty	1,240	548	44%
126% - 150% of Poverty	851	380	45%
151% or More	4,414	748	17%

Source: 2014-2018 ACS / FY 2019 Household Report (all sources).
Note: Overall, region information was unknown for 572 households and vulnerable population data were unknown for 37 households.

Table A.9D - Estimated LIHEAP Participation Rates in East Region (Wards 7/8) - FY 2019

Group	Income Eligible Households	LIHEAP Recipient Households	Estimated Participation Rate
All Households	30,527	11,669	38%
Vulnerable Households			
Elderly Households	9,703	3,330	34%
Disabled Household	13,982	1,038	7%
Young Child Households	5,759	2,606	45%
Poverty Group			
<=100% of Poverty	14,971	8,363	56%
101% - 125% of Poverty	3,623	1,083	30%
126% - 150% of Poverty	3,075	733	24%
151% or More	8,858	1,490	17%

Source: 2014-2018 ACS / FY 2019 Household Report (all sources).
Note: Overall, region information was unknown for 572 households and vulnerable population data were unknown for 37 households.

Table A.9E - Estimated LIHEAP Participation Rates in Central Region (Wards 1/2) - FY 2019

Group	Income Eligible Households	LIHEAP Recipient Households	Estimated Participation Rate
All Households	16,248	1,696	10%
Vulnerable Households			
Elderly Households	5,918	795	13%
Disabled Household	5,403	40	1%
Young Child Households	585	196	34%
Poverty Group			
<=100% of Poverty	8,654	1,146	13%
101% - 125% of Poverty	1,428	193	14%
126% - 150% of Poverty	1,485	133	9%
151% or More	4,681	224	5%

Source: 2014-2018 ACS / FY 2019 Household Report (all sources).
Note: Overall, region information was unknown for 572 households and vulnerable population data were unknown for 37 households.

Table A.10 - Housing Unit Type of Income-Eligible Households by Region

Housing Unit Type	Geographic Region				
	West (Ward 3)	North (Ward 4)	Northeast (Wards 5/6)	East (Wards 7/8)	Central (Wards 1/2)
Single-Family Detached	13%	5%	11%	7%	2%
Single-Family Attached	9%	19%	23%	21%	11%
Small Multifamily (2-4 units)	2%	9%	20%	15%	5%
Large Multifamily (5+ units)	77%	67%	46%	57%	82%
TOTAL HOUSEHOLDS	100%	100%	100%	100%	100%

Source: 2014-2018 ACS.

Table A.11 - Tenure of Income-Eligible Households by Region

Tenure	Geographic Region				
	West (Ward 3)	North (Ward 4)	Northeast (Wards 5/6)	East (Wards 7/8)	Central (Wards 1/2)
Owner	30%	21%	26%	14%	13%
Renter	68%	76%	70%	81%	85%
Other	3%	2%	4%	5%	3%
TOTAL HOUSEHOLDS	100%	100%	100%	100%	100%

Source: 2014-2018 ACS.

Table A.12 - Main Heating Fuel of Income-Eligible Households by Region

Main Heating Fuel	Geographic Region				
	West (Ward 3)	North (Ward 4)	Northeast (Wards 5/6)	East (Wards 7/8)	Central (Wards 1/2)
Utility Gas	53%	56%	53%	51%	34%
Electric	39%	38%	44%	46%	62%
Fuel Oil	2%	2%	1%	<1%	1%
Other*	6%	4%	3%	3%	3%
TOTAL HOUSEHOLDS	100%	100%	100%	100%	100%

Source: 2014-2018 ACS. *"Other" includes households who report not using a heating fuel.

Table A.13 - Energy Bill Payment Type of Income-Eligible Households by Region

Energy Bill Payment Status	Geographic Region				
	West (Ward 3)	North (Ward 4)	Northeast (Wards 5/6)	East (Wards 7/8)	Central (Wards 1/2)
Electric Bill Direct Payment	48%	69%	75%	78%	54%
Heating Bill					
Gas Main Heat Bill Direct Payment	22%	31%	38%	34%	15%
Electric main heat Bill Direct Payment	19%	26%	30%	37%	34%
Other Main Heat Bill Direct Payment	<1%	1%	1%	<1%	<1%
TOTAL	41%	58%	69%	71%	50%

Source: 2014-2018 ACS.

Table A.14 - Heating Bill Payment Type by Housing Unit Type of Income-Eligible Households by Region

Heating Bill Payment Status	Geographic Region				
	West (Ward 3)	North (Ward 4)	Northeast (Wards 5/6)	East (Wards 7/8)	Central (Wards 1/2)
Single-Family Homes					
Direct Payment for Heat	89%	90%	91%	81%	63%
Heat in Rent	6%	6%	7%	13%	28%
Other	5%	4%	3%	6%	9%
Small Multifamily Homes					
Direct Payment for Heat	83%	76%	76%	76%	78%
Heat in Rent	0%	12%	18%	17%	14%
Other	17%	13%	6%	7%	8%
Large Multifamily Homes					
Direct Payment for Heat	27%	44%	50%	65%	46%
Heat in Rent	61%	43%	40%	27%	43%
Other	12%	13%	10%	8%	12%
TOTAL HOUSEHOLDS					
Direct Payment for Heat	41%	58%	69%	71%	50%
Heat in Rent	49%	31%	24%	22%	39%
Other	11%	11%	7%	7%	11%

Source: 2014-2018 ACS.

Table A.15A - Share of Single-Family Households Served in West Region (Ward 3) - FY 2019

Single-Family Homes	Eligible	Served	Percent Served
Total	1,236	28	2%
Pay Heating or Electric Direct	1,168	28	2%
Pay Heating Bill Direct	1,099	28	3%
Gas Main Heat Bill Direct	867	23	3%
Electric Main Heat Bill Direct	220	3	1%

Source: 2014-2018 ACS, FY 2019 LIHEAP Data. Region information was unknown for 572 households served.

Table A.15B - Share of Single-Family Households Served in North Region (Ward 4) - FY 2019

Single-Family Homes	Eligible	Served	Percent Served
Total	3,269	725	22%
Pay Heating or Electric Direct	3,041	725	24%
Pay Heating Bill Direct	2,946	712	24%
Gas Main Heat Bill Direct	2,490	631	25%
Electric Main Heat Bill Direct	376	61	16%

Source: 2014-2018 ACS, FY 2019 LIHEAP Data. Region information was unknown for 572 households served.

Table A.15C - Share of Single-Family Households Served in Northeast Region (Wards 5/6) - FY 2019

Single-Family Homes	Eligible	Served	Percent Served
Total	4,107	1,409	34%
Pay Heating or Electric Direct	3,799	1,409	37%
Pay Heating Bill Direct	3,722	1,362	37%
Gas Main Heat Bill Direct	3,107	1,034	33%
Electric Main Heat Bill Direct	507	293	58%

Source: 2014-2018 ACS, FY 2019 LIHEAP Data. Region information was unknown for 572 households served.

Table A.15D - Share of Single-Family Households Served in East Region (Wards 7/8) - FY 2019

Single-Family Homes	Eligible	Served	Percent Served
Total	8,635	3,028	35%
Pay Heating or Electric Direct	7,340	3,028	41%
Pay Heating Bill Direct	6,972	2,929	42%
Gas Main Heat Bill Direct	5,252	1,990	38%
Electric Main Heat Bill Direct	1,680	907	54%

Source: 2014-2018 ACS, FY 2019 LIHEAP Data. Region information was unknown for 572 households served.

Table A.15E - Share of Single-Family Households Served in Central Region (Wards 1/2) - FY 2019

Single-Family Homes	Eligible	Served	Percent Served
Total	2,151	276	13%
Pay Heating or Electric Direct	1,376	276	20%
Pay Heating Bill Direct	1,351	265	20%
Gas Main Heat Bill Direct	844	171	20%
Electric Main Heat Bill Direct	460	86	19%

Source: 2014-2018 ACS, FY 2019 LIHEAP Data. Region information was unknown for 572 households served.

Table A.16A - Share of Multifamily Building Households Served in West Region (Ward 3) - FY 2019

Multifamily Homes	Eligible	Served	Percent Served
Total	4,597	63	1%
Pay Heating or Electric Direct	1,684	63	4%
Pay Heating Bill Direct	1,284	50	4%
Gas Main Heat Bill Direct	399	11	3%
Electric Main Heat Bill Direct	885	38	4%

Source: 2014-2018 ACS, FY 2019 LIHEAP Data. Region information was unknown for 572 households served.

Table A.16B - Share of Multifamily Building Households Served in North Region (Ward 4) - FY 2019

Multifamily Homes	Eligible	Served	Percent Served
Total	10,328	603	6%
Pay Heating or Electric Direct	6,457	603	9%
Pay Heating Bill Direct	4,894	476	10%
Gas Main Heat Bill Direct	1,695	214	13%
Electric Main Heat Bill Direct	3,199	262	8%

Source: 2014-2018 ACS, FY 2019 LIHEAP Data. Region information was unknown for 572 households served.

Table A.16C - Share of Multifamily Building Households Served in Northeast Region (Wards 5/6) - FY 2019

Multifamily Homes	Eligible	Served	Percent Served
Total	7,997	3,466	43%
Pay Heating or Electric Direct	5,260	3,466	66%
Pay Heating Bill Direct	4,624	2,926	63%
Gas Main Heat Bill Direct	1,535	1,205	79%
Electric Main Heat Bill Direct	3,089	1,718	56%

Source: 2014-2018 ACS, FY 2019 LIHEAP Data. Region information was unknown for 572 households served.

Table A.16D - Share of Multifamily Building Households Served in East Region (Wards 7/8) - FY 2019

Multifamily Homes	Eligible	Served	Percent Served
Total	21,892	8,641	39%
Pay Heating or Electric Direct	16,766	8,641	52%
Pay Heating Bill Direct	14,706	7,756	53%
Gas Main Heat Bill Direct	5,033	3,384	67%
Electric Main Heat Bill Direct	9,673	4,371	45%

Source: 2014-2018 ACS, FY 2019 LIHEAP Data. Region information was unknown for 572 households served.

Table A.16E - Share of Multifamily Building Households Served in Central Region (Wards 1/2) - FY 2019

Multifamily Homes	Eligible	Served	Percent Served
Total	14,097	1,420	10%
Pay Heating or Electric Direct	7,455	1,420	19%
Pay Heating Bill Direct	6,745	1,264	19%
Gas Main Heat Bill Direct	1,603	148	9%
Electric Main Heat Bill Direct	5,142	1,116	22%

Source: 2014-2018 ACS, FY 2019 LIHEAP Data. Region information was unknown for 572 households served.

Appendix B

Appendix B provides analysis of energy affordability and bill credits by Income Group, Poverty Group, Housing Type, Household Size, and Vulnerable Group, by main heating fuel type. The statistics were developed using the sample of households included in Section 4 of this report. Clients with total LIHEAP benefits that exceed their energy bills have a negative net energy burden (less than 0%) and are likely to accrue bill credits. Clients with net energy burden between zero and six percent are considered to have "affordable" net energy burden. Clients with energy burden greater than six percent are considered to have "unaffordable" net energy burden.

Table B.1A - Net Energy Burden by Income Group - Gas Main Heat Clients

Income Group	Less than 0% (i.e., bill credit)	Affordable (0-6%)	Unaffordable (>6%)	Total
Less than $5,000	38%	22%	40%	100%
$5,000-<$10,000	31%	37%	32%	100%
$10,000-<$15,000	15%	52%	32%	100%
$15,000-<$20,000	7%	64%	30%	100%
$20,000 or More	5%	82%	13%	100%
TOTAL	18%	55%	27%	100%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Table B.1B - Net Energy Burden by Poverty Group - Gas Main Heat Clients

Poverty Group	Less than 0% (i.e., bill credit)	Affordable (0-6%)	Unaffordable (>6%)	Total
At or Below 75%	27%	37%	37%	100%
76% to 100%	21%	52%	27%	100%
101% to 125%	10%	64%	25%	100%
126% to 150%	6%	76%	18%	100%
151% or More	5%	82%	14%	100%
TOTAL	18%	55%	27%	100%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Table B.1C - Net Energy Burden by Housing Type - Gas Main Heat Clients

Housing Type	Less than 0% (i.e., bill credit)	Affordable (0-6%)	Unaffordable (>6%)	Total
Single-Family	8%	53%	39%	100%
Multifamily	26%	57%	17%	100%
TOTAL	18%	55%	27%	100%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Table B.1D - Net Energy Burden by Household Size - Gas Main Heat Clients

Household Members	Less than 0% (i.e., bill credit)	Affordable (0-6%)	Unaffordable (>6%)	Total
One	18%	54%	28%	100%
Two	21%	56%	23%	100%
Three	16%	56%	27%	100%
Four	18%	57%	24%	100%
Five or More	12%	55%	33%	100%
TOTAL	18%	55%	27%	100%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Table B.1E - Net Energy Burden by Vulnerable Group - Gas Main Heat Clients

Vulnerable Group	Less than 0% (i.e., bill credit)	Affordable (0-6%)	Unaffordable (>6%)	Total
Elderly	15%	56%	30%	100%
Disabled	19%	52%	28%	100%
Young Child	21%	56%	23%	100%
No Vulnerable Members	19%	55%	26%	100%

Sources: FY 2019 LIHEAP Data, 2019 Washington Gas Data, 2019 Pepco Data.

Table B.2A - Net Energy Burden by Income Group - Electric Main Heat Clients

Income Group	Less than 0% (i.e., bill credit)	Affordable (0-6%)	Unaffordable (>6%)	Total
Less than $5,000	32%	23%	45%	100%
$5,000-<$10,000	24%	48%	28%	100%
$10,000-<$15,000	15%	65%	20%	100%
$15,000-<$20,000	10%	78%	13%	100%
$20,000 or More	9%	86%	5%	100%
TOTAL	17%	63%	20%	100%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

Table B.2B - Net Energy Burden by Poverty Group - Electric Main Heat Clients

Poverty Group	Less than 0% (i.e., bill credit)	Affordable (0-6%)	Unaffordable (>6%)	Total
At or Below 75%	24%	43%	33%	100%
76% to 100%	16%	65%	19%	100%
101% to 125%	11%	79%	10%	100%
126% to 150%	12%	83%	5%	100%
151% or More	9%	88%	3%	100%
TOTAL	17%	63%	20%	100%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

Table B.2C - Net Energy Burden by Housing Type - Electric Main Heat Clients

Housing Type	Less than 0% (i.e., bill credit)	Affordable (0-6%)	Unaffordable (>6%)	Total
Single-Family	11%	57%	32%	100%
Multifamily	18%	64%	18%	100%
TOTAL	17%	63%	20%	100%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

Table B.2D - Net Energy Burden by Household Size - Electric Main Heat Clients

Household Members	Less than 0% (i.e., bill credit)	Affordable (0-6%)	Unaffordable (>6%)	Total
One	18%	67%	16%	100%
Two	19%	61%	20%	100%
Three	18%	58%	24%	100%
Four	14%	56%	29%	100%
Five or More	11%	59%	29%	100%
TOTAL	17%	63%	20%	100%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.

Table B.2E - Net Energy Burden by Vulnerable Group - Electric Main Heat Clients

Vulnerable Group	Less than 0% (i.e., bill credit)	Affordable (0-6%)	Unaffordable (>6%)	Total
Elderly	16%	69%	15%	100%
Disabled	15%	65%	20%	100%
Young Child	20%	56%	24%	100%
No Vulnerable Members	17%	59%	24%	100%

Sources: FY 2019 LIHEAP Data, 2019 Pepco Data.