

# **Low Income Home Energy Data**

## **For Fiscal Year 2018**



**U.S. DEPARTMENT OF  
HEALTH AND HUMAN SERVICES  
Administration for Children and Families  
Office of Community Services  
Division of Energy Assistance  
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## **For Fiscal Year 2018**

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**List of Acronyms and Abbreviations**

ACF	HHS's Administration for Children and Families
ACS	American Community Survey
ASEC	CPS Annual Social and Economic Supplement
Btu	British thermal unit
CDD	Cooling Degree Day
CPI	Consumer Price Index
CPS	Current Population Survey
DEA	OCS's Division of Energy Assistance
DOE	U.S. Department of Energy
EIA	DOE's Energy Information Administration
FY	Fiscal Year
HDD	Heating Degree Day
HHS	U.S. Department of Health and Human Services
LIHEAP	Low Income Home Energy Assistance Program
LPG	Liquefied Petroleum Gas
MMBtus	Million British thermal units
NC	No cases in sample
NOAA	National Oceanographic and Atmospheric Administration
OBRA	Omnibus Budget Reconciliation Act of 1981
OCS	ACF's Office of Community Services
P.L.	Public Law
PUMS	Public Use Microdata Sample
RECS	Residential Energy Consumption Survey

## **Executive Summary**

This report presents home energy consumption and expenditure data. The primary information source for the data on residential energy is the 2009 Residential Energy Consumption Survey (RECS), which is administered by the Department of Energy's (DOE's) Energy Information Administration (EIA). The RECS covers all residential housing units that are primary residences in the United States and contains data for consumption and expenditures for calendar year 2009. All Fiscal Year (FY) 2018 residential energy consumption and expenditures figures for this report have been derived from the 2009 RECS data that were adjusted to reflect FY 2018 weather and fuel prices, as described in Appendix A.

### **Residential energy data**

In FY 2018, average residential energy expenditures for all households were \$2,174, and the mean individual energy burden was 8.1 percent of income.<sup>1</sup> Low income households had average energy expenditures of \$1,860, about 14 percent lower than the average for all households.<sup>2</sup> The mean individual energy burden for low income households was 17.5 percent, over twice the mean individual energy burden of all households. Low Income Home Energy Assistance Program (LIHEAP) recipient households had average residential energy expenditures of \$2,052, about 10 percent higher than the average for all low income households. The mean individual energy burden for LIHEAP recipients was 17.7 percent, over twice (9.6 percentage points higher than) the mean individual energy burden for all households and slightly higher (0.2 percentage points) than the mean individual energy burden for low income households.

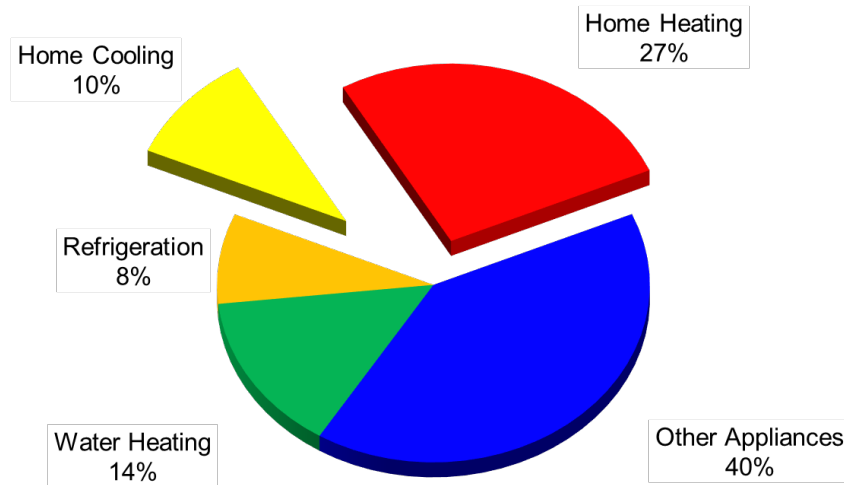
LIHEAP assists households with only that portion of residential energy costs that goes for home energy, i.e., home heating and home cooling. As shown in Figure 1, home heating and home cooling represented about 37 percent of residential energy expenditures for low income households in FY 2018. Refrigerators and freezers represented about 8 percent of residential energy expenditures, water heating represented about 14 percent of residential energy expenditures, and other appliances represented about 40 percent of residential energy expenditures.

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<sup>1</sup> The mean is the sum of all values divided by the number of values. The mean is also referred to as the average.

<sup>2</sup> Unless otherwise indicated, "low income" refers to households with income at or below the federal maximum LIHEAP eligibility standard (i.e., the greater of 150 percent of HHS Poverty Guidelines and 60 percent of state median income). The terms "low income" and "LIHEAP income eligible" are, unless otherwise indicated, equivalent in the Executive Summary. "Non-low income" refers to those households with incomes above the federal maximum LIHEAP eligibility standard.

**Figure 1. Percent of U.S. residential energy expenditures by low income households, by end use, FY 2018**



### **Home heating data**

The three most common heating fuels in 2009 were natural gas (49 percent), electricity (34 percent), and fuel oil (6 percent). Over the last decade, the share of households using electricity as a main heating fuel has increased significantly, while the share using fuel oil has declined. There were only small deviations from this pattern in main heating fuel choice by income group.

In FY 2018, as shown in Figures 2 and 3, average home heating expenditures for all households were \$539, and the mean individual home heating burden was 2.6 percent. Low income households had average home heating expenditures of \$498; this average was about 8 percent lower than that for all households. The mean individual home heating burden for low income households was 6.0 percent, over twice as much as the mean individual home heating burden for all households. The average home heating expenditures for LIHEAP recipient households was \$646, about 30 percent higher than the average for low income households and about 20 percent higher than the average for all households. Mean individual home heating burden for LIHEAP recipient households was 7.0 percent, more than two and a half times the average for all households, and one percentage point higher than that for all low income households. Average home heating expenditures (and consumption) for LIHEAP recipient households were greater than that for all low income households because LIHEAP heating assistance recipient households tend to live in colder climate regions.

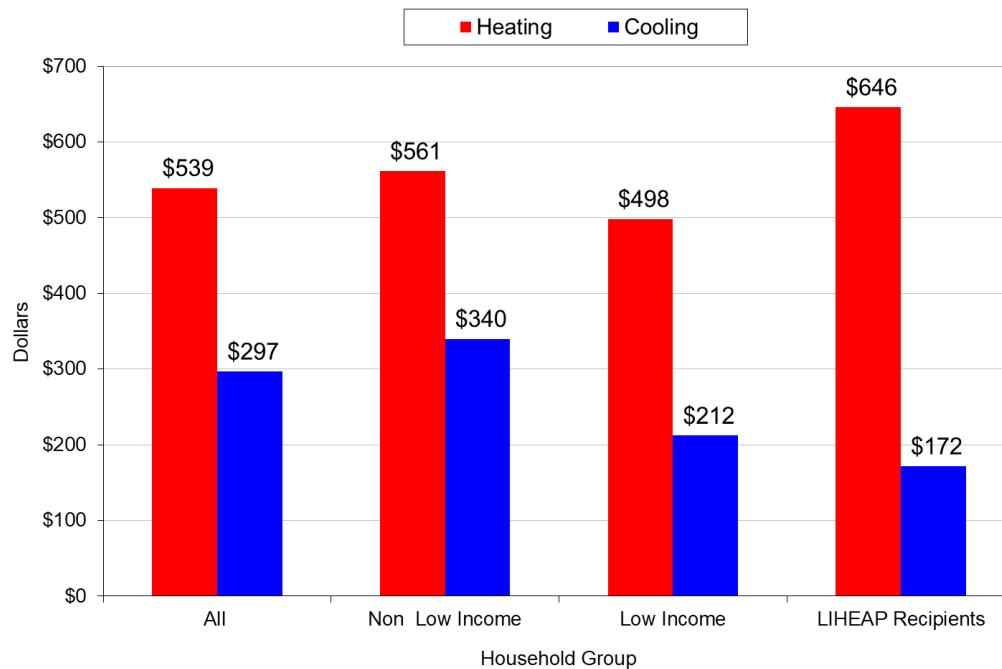


## Home cooling data

In 2009, nearly 93 percent of all households cooled their homes using one of the methods recorded by the RECS.<sup>3</sup> Low income and LIHEAP recipient households were less likely to cool their homes than were non-low income households; 89.1 percent of low income households and 88.6 percent of LIHEAP recipient households cooled their homes using one of these methods.

As Figures 2 and 3 show, in FY 2018, for households that cooled, average home cooling expenditures for all households were \$297, and the mean individual home cooling burden was 1.2 percent. Low income households had average home cooling expenditures of \$212; this average was about 29 percent lower than that for all households. The mean individual home cooling burden for low income households was 2.6 percent, more than twice as much as the mean individual home cooling burden for all households. Average home cooling expenditures for LIHEAP recipient households were \$172, about 19 percent lower than the average for low income households and about 42 percent lower than the average for all households. The mean individual home cooling burden for LIHEAP recipient households was 1.7 percent, about 42 percent higher than the mean individual home cooling burden for all households.

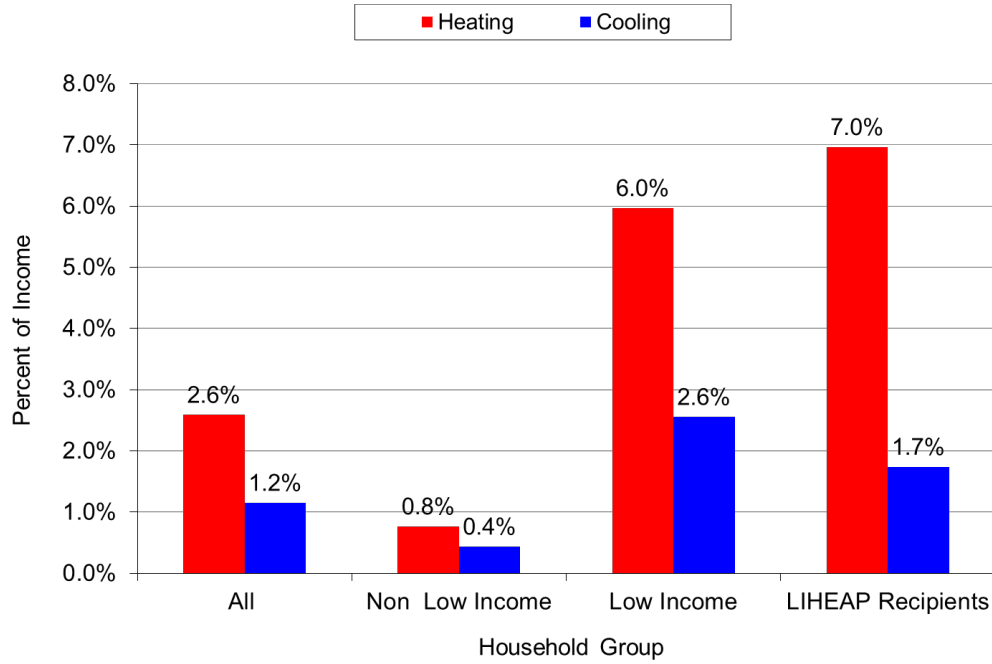
**Figure 2. Mean home heating and home cooling expenditures by all households, non-low income households, low income households, and LIHEAP recipient households, FY 2018**



<sup>3</sup> The 2009 RECS records cooling methods such as central or room air-conditioning as well as non-air-conditioning cooling devices (e.g., ceiling fans and evaporative coolers). The 2009 RECS excludes several types of cooling, such as table and window fans.

**Low Income Home Energy Data for FY 2018: Executive Summary**

**Figure 3. Mean individual burden of heating and cooling expenditures for all households, non-low income households, low income households, and LIHEAP recipient households, FY 2018**



## **I. Introduction**

The Low Income Home Energy Assistance Program (LIHEAP) is authorized by Title XXVI of the Omnibus Budget Reconciliation Act of 1981 (OBRA), Public Law 97-35, as amended. The Administration for Children and Families (ACF) within the U.S. Department of Health and Human Services (HHS) administers LIHEAP at the federal level. ACF awards annual LIHEAP block grants to assist eligible low income households in meeting their home energy costs. ACF issues such grants to the 50 states and the District of Columbia, certain Indian tribes and tribal organizations, and certain U.S. insular areas.

In 1994, Congress amended the purpose of LIHEAP to clarify that LIHEAP is “to assist low income households, particularly those with the lowest incomes, that pay a high proportion of household income for home energy, primarily in meeting their immediate home energy needs” (The Human Services Amendments of 1994, P.L. 103-252, Sec. 302). Congress further indicated that LIHEAP grantees need to reassess their LIHEAP benefit structures to ensure that they are actually targeting those low income households that have the highest energy costs or needs. The Energy Policy Act of 2005 (P.L. 109-58) reauthorized LIHEAP through Fiscal Year (FY) 2007 without substantive changes. LIHEAP’s reauthorization is currently pending.

For LIHEAP grantees to reassess their LIHEAP benefit structures, they need performance statistics on LIHEAP applicants and eligible households. In addition, they need technical assistance in how to make use of the performance statistics in planning and implementing changes to their programs.

The *Low Income Home Energy Data Report* focuses on the home energy mission of LIHEAP by providing LIHEAP grantees with the latest national and regional data on home energy consumption, expenditures, and burden; and by providing data on the characteristics of the low income population in each state. Previously, the *Low Income Home Energy Data Report* was published as part of the *LIHEAP Home Energy Notebook*, which included additional sections on low income home energy trends, federal LIHEAP targeting performance, and special studies of important issues related to LIHEAP and low income home energy needs. Beginning with data for FY 2015, the individual sections from the *LIHEAP Home Energy Notebook* have been published separately in an effort to make the data available to LIHEAP grantees in a more timely fashion.

The following sections present home energy consumption and expenditure data. The primary data source for these sections is the 2009 Residential Energy Consumption Survey (RECS), which has energy consumption and expenditures data for calendar year 2009. For this report, the 2009 residential energy, home heating, and home cooling consumption and expenditures have been adjusted to reflect FY 2018 weather and fuel prices, and described in Appendix A. National data on total residential energy, home heating, and home cooling are presented in the following section, with regional variations in the national data included in Appendix A. Information on the characteristics of the low income population, by state, is presented in Appendix B.

## II. Residential Energy Data

Tables 1a to 1d present data on average annual residential energy consumption, expenditures, and burden by fuel type for all, non-low income, low income, and LIHEAP recipient households.<sup>4</sup> In FY 2018, average residential energy consumption for all households was 89.7 million British thermal units (MMBtus) and average expenditures were \$2,174. The mean individual residential energy burden for all households was 8.1 percent of income.

Low income households had average residential energy consumption of 77.9 MMBtus (about 13 percent less than all households) and average energy expenditures of \$1,860 (about 14 percent less than all households). Their mean individual residential energy burden was 17.5 percent, over twice that for all households and over five times that for non-low income households.

Average residential energy expenditures for LIHEAP recipient households were \$2,052, about 10 percent higher than that for all low income households. The mean individual residential energy burden was 17.7 percent, slightly higher (0.2 percentage points) than that for all low income households.

Households consume residential energy for a variety of uses that include space heating, water heating, space cooling (air-conditioning or circulation), refrigeration, and other appliances. Table 2 furnishes data on the percentage of the residential energy bill that is attributable to each of these five end uses. By statute, LIHEAP targets assistance to home energy expenditures, i.e., to home heating and home cooling expenditures. In FY 2018, home heating was 27 percent of the residential energy bill for low income households, and home cooling made up 10 percent.

**Table 1a. Residential energy: Average annual household consumption, expenditures, and burden by all households, by main heating fuel type, United States, FY 2018<sup>1/</sup>**

Main heating fuel	Fuel consumption (MMBtus) <sup>2/</sup>	Fuel expenditures	Mean individual burden <sup>3/</sup>	Median individual burden <sup>4/</sup>	Mean group burden <sup>5/</sup>
<b>All fuels</b>	89.7	\$2,174	8.1%	3.7%	2.5%
<b>Natural gas</b>	108.7	\$2,120	7.2%	3.3%	2.5%
<b>Electricity</b>	61.1	\$1,982	8.9%	3.9%	2.3%
<b>Fuel oil</b>	116.9	\$3,318	10.3%	5.0%	3.8%
<b>Kerosene</b>	65.2	\$2,046	13.6%	8.9%	2.4%
<b>LPG<sup>6/</sup></b>	110.2	\$3,251	10.4%	5.9%	3.8%

<sup>4</sup> Comparisons are made among the four income groups of all, non-low income, low income, and LIHEAP recipient households. All households represent the total number of households in the U.S. Non-low income households represent those households with annual incomes above the LIHEAP income maximum of the greater of 150 percent of HHS Poverty Guidelines and 60 percent of the state median income. Low income households represent those households with annual incomes at or under the LIHEAP income maximum of the greater of 150 percent of HHS Poverty Guidelines and 60 percent of the state median income. LIHEAP recipient households represent those low income households that received federal fuel assistance.

**Low Income Home Energy Data for FY 2018: II. Residential Energy Data**

**Table 1b. Residential energy: Average annual household consumption, expenditures, and burden by non-low income households, by main heating fuel type, United States, FY 2018<sup>1/</sup>**

Main heating fuel	Fuel consumption (MMBtus) <sup>2/</sup>	Fuel expenditures	Mean individual burden <sup>3/</sup>	Median individual burden <sup>4/</sup>	Mean group burden <sup>5/</sup>
All fuels	96.0	\$2,344	3.1%	2.7%	2.1%
Natural gas	113.2	\$2,248	2.8%	2.5%	2.0%
Electricity	66.5	\$2,172	3.1%	2.7%	1.9%
Fuel oil	124.7	\$3,591	4.0%	3.7%	3.2%
Kerosene	71.2	\$2,356	4.3%	3.6%	2.1%
LPG <sup>6/</sup>	117.3	\$3,451	4.9%	4.5%	3.1%

**Table 1c. Residential energy: Average annual household consumption, expenditures, and burden by low income households, by main heating fuel type, United States, FY 2018<sup>1/</sup>**

Main heating fuel	Fuel consumption (MMBtus) <sup>2/</sup>	Fuel expenditures	Mean individual burden <sup>3/</sup>	Median individual burden <sup>4/</sup>	Mean group burden <sup>5/</sup>
All fuels	77.9	\$1,860	17.5%	8.4%	9.4%
Natural gas	99.2	\$1,845	16.7%	8.0%	9.3%
Electricity	52.3	\$1,676	18.1%	8.1%	8.4%
Fuel oil	102.7	\$2,814	21.8%	11.8%	14.2%
Kerosene	62.8	\$1,921	17.3%	9.9%	9.7%
LPG <sup>6/</sup>	95.5	\$2,838	21.6%	13.1%	14.3%

**Table 1d. Residential energy: Average annual household consumption, expenditures, and burden by LIHEAP recipient households, by main heating fuel type, United States, FY 2018<sup>1/</sup>**

Main heating fuel	Fuel consumption (MMBtus) <sup>2/</sup>	Fuel expenditures	Mean individual burden <sup>3/</sup>	Median individual burden <sup>4/</sup>	Mean group burden <sup>5/</sup>
All fuels	90.8	\$2,052	17.7%	8.7%	12.3%
Natural gas	109.4	\$1,960	17.0%	8.0%	11.7%
Electricity	56.0	\$1,701	17.2%	8.4%	10.2%
Fuel oil	110.7	\$3,023	19.4%	11.6%	18.1%
Kerosene	81.9*	\$2,647*	15.6%*	12.2%*	15.8%*
LPG <sup>6/</sup>	98.0	\$2,975	25.5%	16.4%	17.8%

<sup>1/</sup> Data are derived from the 2009 RECS, adjusted to reflect FY 2018 heating degree days, cooling degree days, and fuel prices. Data represent residential energy used from October 2017 through September 2018. See also Tables A-2, A-3a – A-3c, Appendix A.

<sup>2/</sup> A British thermal unit (Btu) is the amount of energy necessary to raise the temperature of one pound of water one degree Fahrenheit. MMBtus refer to values in millions of Btus.

<sup>3/</sup> Mean individual burden is calculated by taking the mean, or average, of individual energy burdens, as calculated from FY 2018 adjusted RECS data. See Appendix A for information on calculation of energy burden.

<sup>4/</sup> Median individual burden is calculated by taking the median of individual energy burdens, as calculated from FY 2018 adjusted RECS data.

<sup>5/</sup> Mean group energy burden has been calculated by (1) calculating average residential energy expenditures from the 2009 RECS for each group of households; (2) adjusting those figures for FY 2018; and (3) dividing the adjusted figures by the average income for each group of households from the 2018 CPS ASEC.

<sup>6/</sup> Liquefied petroleum gas (LPG) refers to any fuel gas supplied to a residence in liquid compressed form, such as propane or butane.

\* = This figure should be viewed with caution because of the small number of sample cases.

**Low Income Home Energy Data for FY 2018: II. Residential Energy Data**

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Residential energy expenditures of low income households are distributed in roughly the same way as those of all households. However, LIHEAP recipients spent a higher proportion of their annual residential expenditures for space heating and a lower proportion for space cooling than did other groups. LIHEAP recipient households spent 31 percent of their annual residential expenditures for space heating, 4 percentage points more than did the average low income household. LIHEAP recipient households spent 7 percent for space cooling, 3 percentage points less than did the average low income household.

**Table 2. Residential energy: Percent of residential energy expenditures for each of the major end uses by all, non-low income, low income, and LIHEAP recipient households, United States, FY 2018<sup>1/</sup>**

End Use	All households	Non-low income households	Low income households	LIHEAP recipient households
Space heating	25%	24%	27%	31%
Space cooling	13%	14%	10%	7%
Water heating	13%	12%	14%	14%
Refrigeration	8%	8%	8%	8%
Appliances	42%	42%	40%	39%
All uses	100%	100%	100%	100%

<sup>1/</sup> Data are derived from the 2009 RECS, adjusted to reflect FY 2018 heating degree days, cooling degree days, and fuel prices. Data represent residential energy used from October 2017 through September 2018. Percentages may not add to 100 percent due to rounding.

### III. Home Heating Data

This section presents data on main heating fuel type, home heating consumption, home heating expenditures, and home heating burden.

#### Main heating fuel type

Table 3 shows that, in 2009, about half of the households in each income group used natural gas as their main heating fuel. Non-low income households used natural gas at the highest rate among household groups, 51.4 percent. More than 30 percent of households in each group, except LIHEAP recipient households, used electricity as their main heating fuel. Low income households used electricity at the highest rate among household groups, 36.7 percent, and LIHEAP recipient households used electricity at the lowest rate among household groups, 29.3 percent. LIHEAP recipient households tended to use fuel oil and kerosene more frequently than did households in other groups.

**Table 3. Home heating: Percent of households using major types of heating fuels by all, non-low income, low income, and LIHEAP recipient households, United States, 2009<sup>1/</sup>**

Main heating fuel	All households	Non-low income households	Low income households	LIHEAP recipient households
Natural gas	49.0%	51.4%	44.4%	49.2%
Electricity	33.6%	31.9%	36.7%	29.3%
Fuel oil	6.1%	6.1%	6.1%	11.3%
Kerosene	0.4%	0.2%	0.9%	1.1%
LPG	4.9%	5.1%	4.6%	5.0%
Other <sup>2/</sup>	2.9%	2.9%	3.0%	2.7%

<sup>1/</sup> Data are derived from the 2009 RECS. Percentages may not add to 100 percent due to rounding and excluding households reporting no main fuel. See also Table A-4, Appendix A.

<sup>2/</sup> Households using wood, coal, and other minor fuels are categorized together under "Other."

Non-low income households increased their use of electricity for home heating from 29.2 percent in April 2005 to 31.9 percent in 2009.<sup>5</sup> Low income households increased their use of electricity as the main heat source from 31.8 percent in April 2005 to 36.7 percent in 2009. LIHEAP recipient households' use of electricity as their main heat source rose from 19.0 percent in April 2005 to 29.3 percent in 2009.

#### Home heating consumption, expenditures, and burden

Average annual home heating consumption, expenditures, and burden by fuel type for all, non-low income, low income, and LIHEAP recipient households are presented in Tables 4a to 4d. In FY 2018, average home heating consumption for all households was 35.9 MMBtus, average expenditures were \$539, and mean individual home heating burden was 2.6 percent.

Low income households had average home heating consumption of 32.1 MMBtus (about 11 percent less than the average for all households) and average home heating expenditures of \$498 (about 8 percent less than the average for all households). The mean individual home heating burden for low income households was 6.0 percent, over twice as much as the average home heating burden for all households and more than seven times the average home heating burden for non-low income households.

<sup>5</sup> Findings from the 2009 RECS, Energy Information Administration, U.S. Department of Energy.

**Low Income Home Energy Data for FY 2018: III. Home Heating Data**

Average home heating consumption for LIHEAP recipient households was 42.3 MMBtus (about 18 percent higher than the average for all households), and average home heating expenditures were \$646 (about 20 percent higher than the average for all households). Mean individual home heating burden for LIHEAP households was 7.0 percent, about 17 percent higher (or one percentage point higher) than the average for low income households and over twice the average for all households. Average home heating consumption for LIHEAP recipient households was about 32 percent greater than that for all low income households, because LIHEAP heating assistance recipient households tend to live in colder climate regions.

**Table 4a. Home heating: Average annual household consumption, expenditures, and burden by all households, by fuel type, United States, FY 2018<sup>1/</sup>**

Main heating fuel	Fuel consumption (MMBtus) <sup>2/</sup>	Fuel expenditures	Mean individual burden <sup>3/</sup>	Median individual burden <sup>4/</sup>	Mean group burden <sup>5/</sup>
All fuels	35.9	\$539	2.6%	0.8%	0.6%
Natural gas	51.1	\$538	2.5%	0.8%	0.6%
Electricity	10.6	\$346	2.2%	0.7%	0.4%
Fuel oil	70.6	\$1,425	5.6%	2.1%	1.7%
Kerosene	33.7	\$760	5.8%	2.7%	0.9%
LPG <sup>6/</sup>	51.8	\$1,280	5.0%	2.3%	1.5%

**Table 4b. Home heating: Average annual household consumption, expenditures, and burden by non-low income households, by fuel type, United States, FY 2018<sup>1/</sup>**

Main heating fuel	Fuel consumption (MMBtus) <sup>2/</sup>	Fuel expenditures	Mean individual burden <sup>3/</sup>	Median individual burden <sup>4/</sup>	Mean group burden <sup>5/</sup>
All fuels	37.9	\$561	0.8%	0.5%	0.5%
Natural gas	51.7	\$541	0.7%	0.6%	0.5%
Electricity	11.2	\$358	0.5%	0.4%	0.3%
Fuel oil	74.8	\$1,510	1.8%	1.4%	1.3%
Kerosene	34.1	\$768	1.3%	1.0%	0.7%
LPG <sup>6/</sup>	54.3	\$1,343	2.0%	1.6%	1.2%

**Table 4c. Home heating: Average annual household consumption, expenditures, and burden by low income households, by fuel type, United States, FY 2018<sup>1/</sup>**

Main heating fuel	Fuel consumption (MMBtus) <sup>2/</sup>	Fuel expenditures	Mean individual burden <sup>3/</sup>	Median individual burden <sup>4/</sup>	Mean group burden <sup>5/</sup>
All fuels	32.1	\$498	6.0%	2.0%	2.5%
Natural gas	49.7	\$533	6.2%	2.2%	2.7%
Electricity	9.8	\$326	4.9%	1.6%	1.6%
Fuel oil	62.9	\$1,268	12.6%	5.8%	6.4%
Kerosene	33.5	\$756	7.6%	4.6%	3.8%
LPG <sup>6/</sup>	46.5	\$1,149	11.3%	4.9%	5.8%



**Low Income Home Energy Data for FY 2018: III. Home Heating Data**

**Table 4d. Home heating: Average annual household consumption, expenditures, and burden by LIHEAP recipient households, by fuel type, United States, FY 2018<sup>1/</sup>**

Main heating fuel	Fuel consumption (MMBtus) <sup>2/</sup>	Fuel expenditures	Mean individual burden <sup>3/</sup>	Median individual burden <sup>4/</sup>	Mean group burden <sup>5/</sup>
<b>All fuels</b>	42.3	\$646	7.0%	2.6%	3.9%
<b>Natural gas</b>	57.5	\$622	7.4%	2.5%	3.7%
<b>Electricity</b>	11.2	\$368	5.1%	2.1%	2.2%
<b>Fuel oil</b>	67.0	\$1,366	10.6%	5.6%	8.2%
<b>Kerosene</b>	42.0*	\$947*	5.9%*	4.1%*	5.7%*
<b>LPG<sup>6/</sup></b>	49.0	\$1,234	11.2%	7.4%	7.4%

<sup>1/</sup> Data are derived from the 2009 RECS, adjusted to reflect FY 2018 heating degree days and fuel prices. Data represent home heating energy used from October 2017 through September 2018. See also Tables A-5, A-6a – A-6c, Appendix A.

<sup>2/</sup> A British thermal unit (Btu) is the amount of energy necessary to raise the temperature of one pound of water one degree Fahrenheit. MMBtus refer to values in millions of Btus.

<sup>3/</sup> Mean individual burden is calculated by taking the mean, or average, of individual heating energy burdens, as calculated from FY 2018 adjusted RECS data. See Appendix A for information on energy burden calculation.

<sup>4/</sup> Median individual burden is calculated by taking the median of individual heating energy burdens, as calculated from FY 2018 adjusted RECS data

<sup>5/</sup> Mean group heating energy burden is calculated by (1) computing average home heating energy expenditures from the 2009 RECS for each group of households; (2) adjusting those figures for FY 2018; and (3) dividing the adjusted figures by the average income for each group of households from the 2018 CPS ASEC.

<sup>6/</sup> Liquefied petroleum gas (LPG) refers to any fuel gas supplied to a residence in liquid compressed form, such as propane or butane

\* = This figure should be viewed with caution because of the small number of sample cases.

## IV. Home Cooling Data

This section presents data on home cooling type, home cooling consumption, home cooling expenditures, and home cooling burden.

### Cooling type

As shown in Table 5, about 93 percent of households in 2009 cooled their homes in ways recorded by the 2009 RECS (i.e. with air-conditioners or with non-air-conditioning cooling devices such as ceiling fans and evaporative coolers). Low income households were less likely to cool their homes than were non-low income households.

**Table 5. Home cooling: Percent of households with home cooling by all, non-low income, low income, and LIHEAP recipient households, United States, 2009<sup>1/</sup>**

Presence of Cooling	All Households	Non-low income households	Low income households	LIHEAP recipient households
Cooling <sup>2/</sup>	92.5%	94.3%	89.1%	88.6%
None <sup>3/</sup>	7.5%	5.7%	10.9%	11.4%

<sup>1/</sup> Data are derived from the 2009 RECS. See also Table A-7, Appendix A.

<sup>2/</sup> Represents households that cool with central or room air-conditioning as well as non-air-conditioning cooling devices (e.g., ceiling fans and evaporative coolers).

<sup>3/</sup> Represents households that do not cool or cool in ways other than those recorded by the 2009 RECS (e.g., the use of table and window fans).

### Home cooling consumption, expenditures, and burden

Average annual home cooling consumption, expenditures, and burden for all, non-low income, low income, and LIHEAP recipient households that cooled are presented in Table 6. In FY 2018, average home cooling consumption for all households that cooled was 7.6 MMBtus, average expenditures were \$297, and mean individual home cooling burden was 1.2 percent.

For low income households that cooled, average home cooling energy consumption was 5.5 MMBtus (about 28 percent less than the average for all households) and average home cooling expenditures were \$212 (about 29 percent less than the average for all households). The mean individual home cooling burden for low income households was 2.6 percent, more than twice the average home cooling burden of all households and six times that of non-low income households.

For households that cooled, average home cooling consumption for LIHEAP recipient households was 4.4 MMBtus (about 42 percent less than all households and 20 percent less than the average low income household), and average home cooling expenditures were \$172 (about 42 percent less than all households and 19 percent less than the average low income household). Mean individual home cooling burden for LIHEAP recipient households was 1.7 percent, about 42 percent higher than the average for all households.

**Low Income Home Energy Data for FY 2018: IV. Home Cooling Data**

**Table 6. Home cooling: Average annual household consumption, expenditures, and percent of income by all, non-low income, low income and LIHEAP recipient households that cooled, United States, FY 2018<sup>1/</sup>**

Household group	Fuel consumption (MMBtus) <sup>2/</sup>	Fuel expenditures	Mean individual burden <sup>3/</sup>	Median individual burden <sup>4/</sup>	Mean group burden <sup>5/</sup>
<b>All households</b>	7.6	\$297	1.2%	0.3%	0.3%
<b>Non-low income households</b>	8.6	\$340	0.4%	0.3%	0.3%
<b>Low income households</b>	5.5	\$212	2.6%	0.7%	1.1%
<b>LIHEAP recipient households</b>	4.4	\$172	1.7%	0.5%	1.0%

<sup>1/</sup> Data are derived from the 2009 RECS, adjusted to reflect FY 2018 cooling degree days and fuel prices. Data represent residential energy used from October 2017 through September 2018. See also Table A-7, Appendix A.

<sup>2/</sup> A British thermal unit (Btu) is the amount of energy necessary to raise the temperature of one pound of water one degree Fahrenheit. MMBtus refer to values in millions of Btus.

<sup>3/</sup> Mean individual burden is calculated by taking the mean, or average, of individual cooling energy burdens, as calculated from FY 2018 adjusted RECS data. See Appendix A for information on energy burden calculation.

<sup>4/</sup> Median individual burden is calculated by taking the median of individual cooling energy burdens, as calculated from FY 2018 adjusted RECS data.

<sup>5/</sup> Mean group cooling energy burden is calculated by (1) computing average home cooling energy expenditures from the 2009 RECS for each group of households; (2) adjusting those figures for FY 2018; and (3) dividing the adjusted figures by the average income for each group of households from the 2018 Current Population Survey Annual Social and Economic Supplement (CPS ASEC).

## **Appendix A: Home Energy Estimates**

Appendix A provides information on how estimates of home energy data were derived from the 2009 Residential Energy Consumption Survey (RECS) and updated for FY 2018. The following topics are covered in this Appendix.

- Description of RECS.
- Strengths and limitations of RECS data.
- National and regional average home energy consumption and expenditures.
- Energy burden.

### **Description of RECS**

The RECS is a national household sample survey that provides information on residential energy use. It has been conducted by the Energy Information Administration (EIA) of the U.S. Department of Energy (DOE) since 1978. It is designed to provide reliable data at the national and Census regional levels. The RECS includes information on energy consumption and expenditures, household demographics, housing characteristics, weatherization/conservation practices, home appliances, and type of heating and cooling equipment. Typically, this survey is conducted every four to six years. The most recent RECS was conducted in 2015; however, significant methodological changes were introduced in the 2015 RECS, including changes to end-use modeling procedures, particularly for electricity usage, and changes that impact the ability to characterize low-income households. Therefore, this report utilizes the 2009 RECS to estimate energy expenditures and burden for FY 2018. Energy expenditures and burden based on the 2015 RECS will be explored for use in the FY 2019 report.

The survey consists of three parts:

- EIA interviews households for information about which fuels are used, how fuels are used, energy-using appliances, structural features, energy-efficiency measures taken, demographic characteristics of the household, heating interruptions, and receipt of energy assistance.
- EIA interviews rental agents for households whose rent includes some portion of their energy bill. This information augments information from those households that may not be knowledgeable about the fuels used for space heating or water heating.
- After obtaining permission from respondents, EIA mails questionnaires to their energy suppliers to collect the actual billing data on energy consumption and expenditures. This fuel supplier survey eliminates the inaccuracy of self-reported data. When a household does not consent or when fuel consumption records are unusable or nonexistent, regression analysis is used to impute missing data.<sup>6</sup>

The 2009 RECS is the thirteenth survey in the series of surveys.<sup>7</sup> For the 2009 RECS, 12,083 households were interviewed, including 724 verified LIHEAP recipient households. For the tabulations in this report,

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<sup>6</sup> Regression analysis is a statistical tool for evaluating the relationship of one or more independent variables to a single continuous dependent variable. Formulas developed from regression analysis are used to predict the value of the dependent variable under varying conditions of the independent variable(s).

<sup>7</sup> More information about the RECS sample design, see Energy Information Administration, *Sample Design for the Residential Energy Consumption Survey*, DOE/EIA-0555 (94)/1, Washington, DC, August 1994. The data collected from the 2009 RECS are available from the EIA website: *RECS Survey Data*, Energy Information Administration, <http://www.eia.gov/consumption/residential/data/2009/>

2009 RECS consumption and expenditure data were updated using price and weather data to represent consumption and expenditures for FY 2018.

## **Strengths and limitations of RECS data**

The RECS provides the most recent, comprehensive data on home energy consumption and expenditures. The strengths of using RECS to derive home energy estimates are as follows.

- RECS uses a representative national household sample, providing statistically reliable estimates for all, non-low income, and low income households.
- The 2009 RECS included an oversample of LIHEAP recipient households that is representative of the population of LIHEAP heating and cooling assistance recipients.
- The RECS includes usage data for all residential fuels.
- Energy suppliers provide information on actual residential energy consumption and expenditures of RECS sample households in order to eliminate the inaccuracy of self-reported data.
- Regression analyses of RECS data provide estimates of the amounts of fuels going to various end uses, including home heating and cooling.

While the updated 2009 RECS data provide the most comprehensive data on residential energy use by low income households, several significant limitations must be addressed:<sup>8</sup>

- The 2009 RECS data for calendar year 2009 were updated to FY 2018 (October 1, 2017 to September 30, 2018), using procedures that adjust the 2009 data to reflect the weather and fuel prices for FY 2018. These procedures are comparable to those used for the FY 1986 - FY 2017 annual *LIHEAP Reports to Congress*. However, the reader should exercise caution in comparing the data in this report with data in annual *LIHEAP Reports to Congress* prior to FY 1986, in which consumption and expenditure data were estimated from the RECS year (April 1 to March 31).
- For some variables, disaggregation of data into subgroups at the regional level results in estimates made from a small number of sample cases. This is particularly true of the LIHEAP recipient households and the fuel oil, liquefied petroleum gas and kerosene heating subgroups. This affects the reliability of the estimates.
- The household is a basic reporting unit for RECS and LIHEAP. RECS defines a household as all individuals living in a housing unit, whether related or not, who (1) share a common direct access entry to the unit from outside the building or from a hallway, and (2) do not normally eat their meals with members of other units in the building. A household does not include temporary visitors or household members away at college or in the military. LIHEAP defines a household as one or more individuals living together as an economic unit who purchase energy in common or make undesignated payments for energy in their rent. Some variation in the count of households, particularly those containing renters or boarders, may result from the difference in definitions.
- The Current Population Survey Annual Social and Economic Supplement (CPS ASEC), conducted by the Bureau of the Census, provides, at national and regional levels, data on total household income as a specific dollar amount. CPS's larger sample size and method of collecting income data result in more accurate income data than RECS income data. Therefore, the 2018 CPS ASEC

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<sup>8</sup> Information about the quality of RECS data is available from the EIA website: *RECS Methodology*, Energy Information Administration, <http://www.eia.gov/consumption/residential/data/2009/index.cfm?view=methodology>.

is used to develop estimates of the number of low income households. In addition, mean income statistics from the CPS ASEC are used in the calculation of group energy burden for this report.<sup>9</sup>

- Households were classified in the 2009 RECS as eligible or ineligible for LIHEAP based on whether their income was above or below the maximum statutory income eligibility criteria (the greater of 150 percent of U.S. Department of Health and Human Services (HHS) Poverty Guidelines or 60 percent of the state median income). These estimates do not include households whose incomes may have exceeded the statutory income standards but who received LIHEAP benefits because they (1) were categorically eligible for LIHEAP under section 8624 (b)(2)(A) of the LIHEAP statute; (2) became income-ineligible for LIHEAP at the time of the survey; or (3) were deemed eligible for LIHEAP based on incorrectly-reported income. However, the tabulations of LIHEAP households also include survey respondents who were identified as LIHEAP recipients from state LIHEAP administrative data but who reported incomes higher than the maximum statutory income in the RECS survey.

### **Average home energy consumption and expenditures**

Average heating and cooling consumption and expenditure estimates for FY 2018 were calculated at national and regional levels for all, non-low income, low income, and LIHEAP recipient households, for various fuels. The heating and cooling estimates were updated for each 2009 RECS sample case using FY 2018 heating degree days, cooling degree days, and price inflators applied to the original expenditure data, as well as the multiple regression formula developed from the 2009 RECS. Home energy consumption and expenditure data were developed by aggregating and averaging home heating and cooling estimates for the sample cases that represented all, non-low income, low income, and LIHEAP recipient households.

Tables A-2 through A-3c display national and regional consumption and expenditure data for residential energy (including energy used for space heating, water heating, space cooling, and appliances). Tables A-4 through A-6c display national and regional usage, consumption, and expenditure data for home heating. Table A-7 displays national and regional usage, consumption, and expenditure data for home cooling. Analysis and discussion of home energy consumption and expenditures appear in Section II, Section III, and Section IV of this report.

### **Energy burden**

Energy burden is an important statistic for policymakers who are considering the need for energy assistance. Energy burden can be defined broadly as the burden placed on household incomes by the cost of residential energy. However, there are different ways to compute energy burden and different interpretations of the energy burden statistics. The purpose of this section is to examine alternative energy burden statistics and discuss the interpretation of each.<sup>10</sup>

Different “measures of central tendency” can be used to describe energy burden. The most commonly used measures are the mean and the median. As previously noted, the mean or average is computed as the sum of all values divided by the number of values. The median is computed as the value that is at the center of the distribution of values (i.e., 50 percent of the values are greater than the median and 50 percent are less).

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<sup>9</sup> Note that household-level energy and income data from RECS are used to calculate mean and median individual energy burden.

<sup>10</sup> More detailed information is available in the Division of Energy Assistance's (DEA's) technical report, *Characterizing the Impact of Energy Expenditures on Low Income Households: An Analysis of Alternative Energy Burden Statistics*, (November, 1994).

## **Computational procedures**

There are two ways to compute mean energy burden for households.<sup>11</sup> The first is the “mean individual” approach, and the second is the “mean group” approach. While these approaches appear to be similar, they give quite different values.

Using the “mean individual burden” approach, energy burden is computed as follows.

1. First, the ratio of energy expenditures to annual income for each household in a specified population is computed
2. Then, the mean of these energy burden ratios is computed for the population.<sup>12</sup> For example, consider the situation where there are four households with energy burdens of 4, 5, 7, and 8 percent
3. The mean of these energy burdens is calculated by adding the percentages (24 percentage points) and dividing by the number of households (four households), resulting in a mean individual burden of 6 percent.

Using the “mean group burden” approach, energy burden is computed as follows.

1. First, total annual energy expenditures for households and total annual income for households in a specified population are computed
2. Then, the ratio of total energy expenditures to total income is computed for the specified population. For example, consider the situation where a group consists of four households that have a total income of \$100,000 and a total energy bill of \$4,000
3. Dividing the \$4,000 in total energy bills by \$100,000 in total income results in a mean group burden of 4 percent.

According to the 2009 RECS, the mean residential energy burden for all LIHEAP federally eligible households, in 2009, using the first approach was 18.7 percent and using the second approach was 9.6 percent. The disparity between the two statistics is because the lowest income households spend a greater share of their income on residential energy than do higher income households.<sup>13</sup> If the relationship between income and residential energy expenditures is linear (i.e., a 10 percent increase in income is associated with a 10 percent increase in residential energy expenditures), the two statistics would be equal. However, since a number of low income households spend a large share of their income on energy, the relationship between income and residential energy expenditures is not linear (i.e., a 10 percent increase in income is associated with a considerably smaller increase in energy expenditures). Therefore, there is a substantial difference between the two statistics.

In the discussion of computational procedures, the “mean individual burden” was examined. It is also possible to look at the “median individual burden.” As noted above for LIHEAP income eligible households, the mean residential energy burden computed as the “mean individual burden” was 18.7 percent. The median of the distribution of residential energy burdens from the 2009 RECS survey was 9.2 percent. The disparity between these two statistics is the result of the skewed distribution of energy burden

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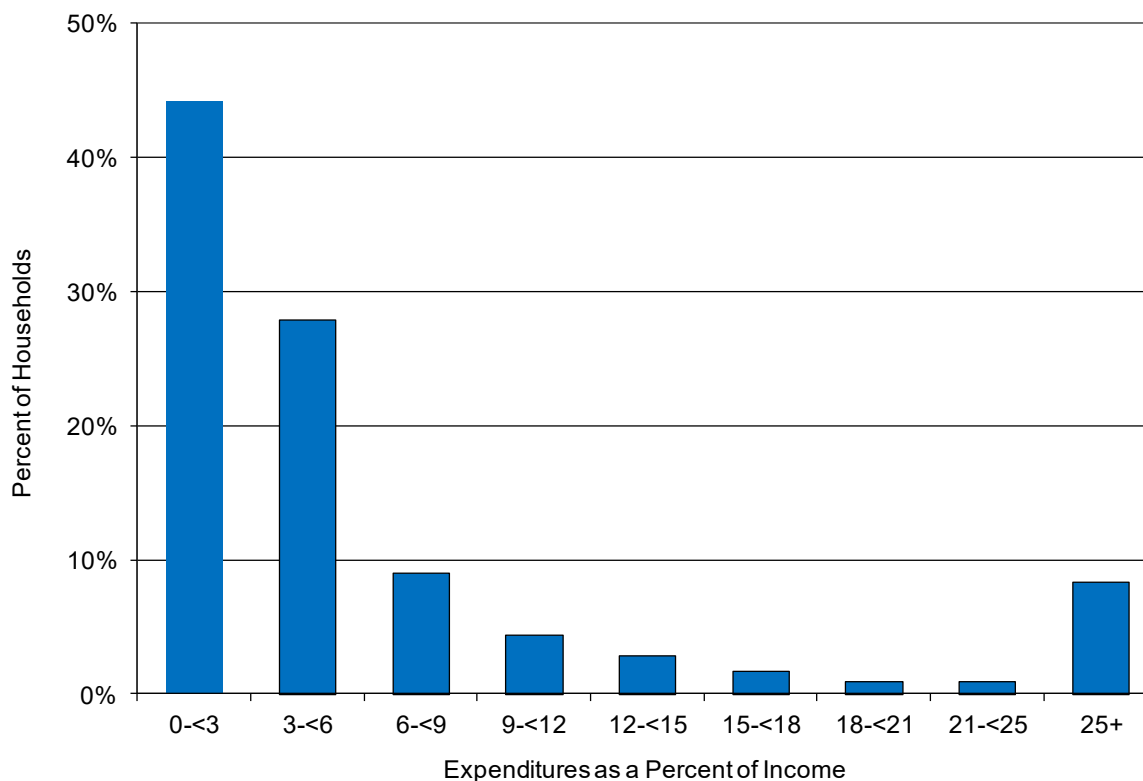
<sup>11</sup> The mean is the sum of all values divided by the number of values. The mean is also referred to as the average.

<sup>12</sup> For some households, residential energy expenditures appear to exceed income. Elderly households living on their savings are an example of such households. In calculating mean individual burden, the energy burden figures for such households have been limited to 100 percent.

<sup>13</sup> For example, 2009 RECS households with incomes of \$10,000 or less had average residential energy expenditures of \$1,556, while those with incomes between \$20,000 and \$35,000 had average residential energy expenditures of \$1,714. Thus, households which had more than twice as much income spent only 10 percent more on energy.

ratios. Figure A-1 demonstrates a skewed distribution of LIHEAP income eligible households by home energy burden.

**Figure A-1. Distribution of LIHEAP income eligible households by home energy burden, 2009**



**Data files**

The data files used to make estimates of energy burden also have some impact on the statistic. The RECS data file is the only reliable source of national information on energy expenditures. However, the income reported on the RECS is known to be deficient in several ways. First, it is generally true that income is underreported on household surveys. Second, the RECS collects income data less precisely through the use of income intervals. Finally, the CPS ASEC collects income more precisely by asking a series of detailed questions on income than the RECS does and also has a larger sample size than the RECS.

The RECS, which categorizes more households as income eligible for LIHEAP than the CPS ASEC, thus categorizes too many households as income eligible for LIHEAP. Based on the 2009 RECS, in calendar year 2009, 39.7 million households were estimated to be LIHEAP income eligible households. Based on the 2010 CPS ASEC, the estimate of LIHEAP income eligible households for calendar year 2009 was 37.1 million households. Since some households that were not LIHEAP income eligible were categorized by RECS as LIHEAP income eligible, the RECS overestimated the average energy expenditures for LIHEAP income eligible households.<sup>14</sup>

<sup>14</sup> The estimates of average energy burden may be overstated since RECS, like other surveys, understates income. Comparisons between the estimates of the number of LIHEAP income eligible households from the 1990 RECS and the March 1991 CPS suggest that the probable range of the overestimate in mean group energy burden is from 5-10 percent.



## **Data interpretations**

The statistic used to describe energy burden depends on the question being asked. Each statistic offers some data on energy burden while not telling the whole story by itself.

The key difference between “mean individual burden” and “mean group burden” is that the first statistic focuses on the experience of individual households and the second on the experience of a group of households. The “mean individual burden” furnishes more information on how individual households are affected by energy burden (i.e., it computes a mean by using each household’s burden). The “mean group burden” furnishes more information on group burden (i.e., it computes the share of all income earned by LIHEAP income eligible households that goes to pay for energy). Both statistics are useful, though the individual burden statistic puts more emphasis on the experience of individual households, and the group burden puts more emphasis on the share of group income that is used for energy.

The key difference between the “mean individual burden” and the “median individual burden” is that the first statistic furnishes information on all LIHEAP income eligible households at the expense of overstating what is happening to the “average” LIHEAP income eligible household. The second statistic furnishes information on the “average” LIHEAP income eligible household at the expense of disregarding what is happening to households at either end of the distribution.

The best way to furnish information on energy burden is to use all available statistics. For example, it would be informative to show the “mean individual burden,” the “median individual burden,” and the “distribution of individual energy burdens,” for all LIHEAP income eligible households, to indicate how individual households are affected by energy costs. In addition, it would be useful to show the “mean group burden” to indicate what share of income is going to pay energy bills for the group as a whole.

However, when doing an analysis of energy burden among several groups of households, it is very difficult to present the entire spectrum of available statistics. Thus, we usually limit the analysis to a comparison of one statistic between groups. In general, if only one statistic is used, either the “mean individual burden” or the “mean group burden” is preferred, since a mean is a more complete statistic than is a median. The choice between the two means is dictated by which of the following types of analysis is being conducted.

- If funding levels are being examined, the group burden is probably more useful. This statistic furnishes information on the size of the energy bill of LIHEAP income eligible households and the portion of income for this group that is spent on energy. Using this statistic allows direct examination of the relationship between the total energy bill and total LIHEAP funding.
- If targeting decisions are being examined, the mean or median individual burden is probably more useful. These statistics furnish information on the distribution of burdens among households in a group. Using these statistics helps to target those groups where a significant number of households have high energy burdens.

All three energy burden statistics are presented in this report’s tables to fully inform the reader. Beginning with the *LIHEAP Report to Congress for FY 1992*, the mean individual energy burden and mean group burden statistics have been furnished in the reports. Previous *Reports to Congress* presented only the mean group burden. The text of this report references mean group burden to maintain consistency with the previous *Reports to Congress*.

## **Projecting energy consumption and expenditures**

Projections were developed using microsimulation techniques that adjusted consumption and energy expenditures for changes in weather and prices. Consumption amounts for each household were adjusted for changes in heating and cooling degree days. Projected expenditures for each household were estimated

## ***Low Income Home Energy Data for FY 2018: Appendix A: Home Energy Estimates***

as a function of projected consumption changes and actual changes in fuel prices. In order to make these projections, it was assumed that households did not change their energy use behavior (that is, their tendency to seek a specific indoor temperature) as a result of weather, price, or other changes.

Consumption projections utilized end use consumption estimates that were developed with the 2009 RECS data. These estimates were based on models for each fuel, using households that had actual (not imputed) consumption records for the fuel. The models used nonlinear estimation techniques to estimate parameters that described the relationship of consumption to end uses, housing characteristics, weather, and demographics.

To develop consumption projections, heating and cooling end use estimates for Calendar Year 2009 were adjusted for weather differences between 2009 and FY 2018. The following equation was applied to each household in the microsimulation data file.

$$\text{FY 2018 Projected Btus} = \begin{aligned} & (2009 \text{ estimated heat use} * \text{HDD change}) + \\ & (2009 \text{ estimated cooling use} * \text{CDD change}) + \\ & (2009 \text{ estimated water heat use} + 2009 \text{ estimated appliance use}) \end{aligned}$$

Expenditure projections were a function of projected changes in consumption and actual changes in prices. The following equations were used.

$$\text{Preliminary Expenditures} = 2009 \text{ Expenditures} * (\text{FY 2018 Projected Usage} / 2009 \text{ Actual Usage})$$

$$\text{Final Expenditures} = \text{Preliminary Expenditures} * \text{Price Change}^{15}$$

Table A-1 shows the national price factors that were used. The price factors show the actual change in the average price of a fuel from calendar year 2009 to FY 2018. For example, electricity prices increased by about 12.0 percent from 2009 to FY 2018.

**Table A-1. National price factors for FY 2018**

Fuel	Price Factors for FY 2018 Projections
<b>Electricity</b>	1.1197
<b>Natural gas</b>	0.8682
<b>Fuel oil / kerosene</b>	1.1291
<b>Liquefied petroleum gas (LPG)</b>	1.1205

Expenditure data were adjusted using national price factors for FY 2018. Earlier *LIHEAP Home Energy Notebooks* used state-level price factor data. For FY 1993/1994, state-level data did not vary much from the national average for electricity and natural gas. For electricity, price changes varied between 0.3 percent and 1.2 percent; the national average was 0.8 percent. For natural gas, price changes varied between 1.7 percent and 2.8 percent; the national average was 2 percent. Expenditure projections using national price data do not appear to be significantly different from those obtained using state-level price data.

<sup>15</sup> Price factors were developed using price data obtained from the Energy Information Administration for electricity, natural gas, and LPG, and the BLS Consumer Price Index for fuel oil. Consumption data were obtained from the Energy Information Administration for all fuels. Electricity price data used for calculating price factors are from the *Monthly Energy Review*, January 2019, and electricity consumption data is from the *Electric Power Monthly*, January 2019. Natural gas price and consumption data used for calculating price factors are from the *Monthly Energy Review*, January 2019. Fuel oil/kerosene price data for calculating price factors are from the U.S. City Average, Fuel Oil #2, Consumer Price Index of the Bureau of Labor Statistics, Series ID APU000072511. LPG price data were obtained from the Energy Information Administration website (<http://www.eia.doe.gov>). Fuel oil/kerosene and LPG consumption data are from the *Monthly Energy Review*, January 2019.

**Low Income Home Energy Data for FY 2018: Appendix A: Home Energy Estimates**

**Table A-2. Residential energy: Average consumption per household, by all fuels and specified fuels, by all, non-low income, low income and LIHEAP recipient households, by Census region, FY 2018<sup>1/</sup>**

Census Region	All Fuels <sup>2/</sup> (MMBtus) <sup>3/</sup>	Natural Gas (MMBtus)	Electricity (MMBtus)	Fuel Oil (MMBtus)	Kerosene (MMBtus)	LPG (MMBtus)
US - All households	89.7	108.7	61.1	116.9	65.2	110.2
US - Non-low income households	96.0	113.2	66.5	124.7	71.2	117.3
US - Low income households <sup>4/</sup>	77.9	99.2	52.3	102.7	62.8	95.5
US - LIHEAP recipient households <sup>5/</sup>	90.8	109.4	56.0	110.7	81.9*	98.0
Northeast - All households	107.0	116.4	51.5	118.5	69.5	114.2
Northeast - Non-low income households	114.2	122.9	56.8	127.1	75.7	123.2
Northeast - Low income households	94.2	105.4	42.7	101.7	66.8	90.2
Northeast - LIHEAP recipient households	98.4	104.1	45.7	111.8	85.1*	93.6*
Midwest - All households	113.2	125.6	67.7	109.1	NC	127.1
Midwest - Non-low income households	119.6	130.4	77.5	111.1	NC	130.8
Midwest - Low income households	101.6	116.5	53.5	107.4	NC	118.7
Midwest - LIHEAP recipient households	106.4	119.9	59.5	95.5*	NC	103.8
South - All households	77.1	104.4	62.3	110.1	59.3	95.1
South - Non-low income households	83.7	111.7	66.7	112.8	67.9*	105.1
South - Low income households	65.0	88.1	54.7	104.4	57.2*	78.0
South - LIHEAP recipient households	75.9	111.1	59.9	115.1*	62.7*	103.0*
West - All households	71.9	84.7	55.9	111.1	49.8*	98.0
West - Non-low income households	77.8	88.1	62.0	110.5	50.2*	102.3
West - Low income households	60.0	74.7	47.7	112.8*	49.3*	89.4
West - LIHEAP recipient households	65.0	87.3	45.1	113.9*	NC	56.8*

<sup>1</sup> Developed from the 2009 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy, and adjusted for FY 2018 for heating and cooling degree days.

<sup>2</sup> Weighted average of natural gas, electricity, fuel oil, kerosene, and liquefied petroleum gas consumption. RECS consumption data are not collected for other fuels.

<sup>3</sup> A British thermal unit (Btu) is the amount of energy necessary to raise the temperature of one pound of water one degree Fahrenheit. MMBtus refer to values in millions of Btus.

<sup>4</sup> Households with income at or below the maximum in section 2605(b)(2)(B) of Public Law 97-35.

<sup>5</sup> Includes verified LIHEAP recipient households from the 2009 RECS.

NC = No cases in the 2009 RECS household sample.

\* = This figure should be viewed with caution because of the small number of sample cases.

**Low Income Home Energy Data for FY 2018: Appendix A: Home Energy Estimates**

**Table A-3a. Residential energy: Average annual expenditures, by amount (dollars) and mean group burden (percent of income), for all, non-low income, low income, and LIHEAP recipient households, by Census region and main heating fuel, FY 2018**

Census Region	All Fuels <sup>1/</sup>	All Fuels <sup>2/</sup>	Natural Gas Heat	Natural Gas Heat	Electric Heat	Electric Heat	Fuel Oil Heat	Fuel Oil Heat	Kerosene Heat	Kerosene Heat	LPG Heat	LPG Heat
US - All households	\$2,174	2.5%	\$2,120	2.5%	\$1,982	2.3%	\$3,318	3.8%	\$2,046	2.4%	\$3,251	3.8%
US - Non-low income households	\$2,344	2.1%	\$2,248	2.0%	\$2,172	1.9%	\$3,591	3.2%	\$2,356	2.1%	\$3,451	3.1%
US - Low income households <sup>3/</sup>	\$1,860	9.4%	\$1,845	9.3%	\$1,676	8.4%	\$2,814	14.2%	\$1,921	9.7%	\$2,838	14.3%
US - LIHEAP recipient households <sup>4/</sup>	\$2,052	12.3%	\$1,960	11.7%	\$1,701	10.2%	\$3,023	18.1%	\$2,647*	15.8%*	\$2,975	17.8%
Northeast - All households	\$2,751	2.9%	\$2,531	2.7%	\$1,981	2.1%	\$3,393	3.6%	\$2,198	2.3%	\$3,998	4.2%
Northeast - Non-low income households	\$2,989	2.3%	\$2,724	2.1%	\$2,172	1.7%	\$3,684	2.8%	\$2,537	1.9%	\$4,287	3.3%
Northeast - Low income households	\$2,327	10.3%	\$2,201	9.8%	\$1,670	7.4%	\$2,828	12.5%	\$2,050	9.1%	\$3,225	14.3%
Northeast - LIHEAP recipient households	\$2,399	13.5%	\$2,148	12.1%	\$1,645	9.3%	\$3,028	17.1%	\$2,738*	15.5%*	\$3,171*	17.9%*
Midwest - All households	\$2,092	2.5%	\$2,022	2.4%	\$1,730	2.1%	\$2,730	3.3%	NC	NC	\$3,406	4.1%
Midwest - Non-low income households	\$2,213	2.1%	\$2,122	2.0%	\$1,904	1.8%	\$2,830	2.6%	NC	NC	\$3,514	3.3%
Midwest - Low income households	\$1,873	9.4%	\$1,829	9.2%	\$1,481	7.4%	\$2,649	13.3%	NC	NC	\$3,161	15.8%
Midwest - LIHEAP recipient households	\$1,953	11.8%	\$1,828	11.1%	\$1,592	9.6%	\$2,570*	15.6%*	NC	NC	\$2,906	17.6%
South - All households	\$2,250	2.8%	\$2,366	3.0%	\$2,152	2.7%	\$3,149	3.9%	\$1,820	2.3%	\$2,964	3.7%
South - Non-low income households	\$2,443	2.4%	\$2,566	2.5%	\$2,327	2.2%	\$3,285	3.2%	\$2,001*	1.9%*	\$3,193	3.1%
South - Low income households	\$1,895	10.5%	\$1,919	10.6%	\$1,847	10.2%	\$2,862	15.8%	\$1,774*	9.8%*	\$2,569	14.2%
South - LIHEAP recipient households	\$2,047	13.8%	\$2,245	15.1%	\$1,878	12.6%	\$3,563*	24.0%*	\$2,102*	14.1%*	\$3,594*	24.2%*
West - All households	\$1,650	1.8%	\$1,681	1.8%	\$1,561	1.7%	\$2,953	3.2%	\$1,615*	1.7%*	\$2,840	3.1%
West - Non-low income households	\$1,796	1.5%	\$1,787	1.5%	\$1,758	1.5%	\$2,921	2.5%	\$1,962*	1.7%*	\$3,021	2.5%
West - Low income households	\$1,359	6.7%	\$1,367	6.7%	\$1,296	6.4%	\$3,043*	15.0%*	\$1,245*	6.1%*	\$2,486	12.2%
West - LIHEAP recipient households	\$1,278	7.4%	\$1,373	7.9%	\$1,179	6.8%	\$2,379*	13.7%*	NC	NC	\$1,573*	9.0%*

<sup>1/</sup> Estimates are derived from the 2009 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy. The 2009 RECS data have been adjusted for heating degree days, cooling degree days, and fuel price estimates for FY 2018. Expenditures represent the costs for fuel oil, kerosene, and LPG delivered and billed costs for natural gas and electricity. RECS expenditure data are not collected for other fuels.

<sup>2/</sup> Represents the percent of household's income used for residential energy expenditures. National and regional mean incomes are calculated from the 2018 CPS ASEC, which reports income for calendar year 2017. Mean group residential burden is computed as mean group energy expenditures (from RECS) divided by mean group income (from CPS ASEC). See text in Appendix A for a discussion of energy burden.

<sup>3/</sup> Households with annual incomes at or below the maximum in section 2605(b)(2)(B) of Public Law 97-35.

<sup>4/</sup> Includes verified LIHEAP recipient households from the 2009 RECS.

NC = No cases in the 2009 RECS household sample.

\* = This figure should be viewed with caution because of the small number of sample cases.

**Low Income Home Energy Data for FY 2018: Appendix A: Home Energy Estimates**

**Table A-3b. Residential energy: Average annual expenditures, by amount (dollars) and mean individual burden (percent of income), for all, non-low income, low income, and LIHEAP recipient households, by Census region and main heating fuel, FY 2018**

Census Region	All Fuels <sup>1/</sup>	All Fuels <sup>2/</sup>	Natural Gas Heat	Natural Gas Heat	Electric Heat	Electric Heat	Fuel Oil Heat	Fuel Oil Heat	Kerosene Heat	Kerosene Heat	LPG Heat	LPG Heat
US - All households	\$2,174	8.1%	\$2,120	7.2%	\$1,982	8.9%	\$3,318	10.3%	\$2,046	13.6%	\$3,251	10.4%
US - Non-low income households	\$2,344	3.1%	\$2,248	2.8%	\$2,172	3.1%	\$3,591	4.0%	\$2,356	4.3%	\$3,451	4.9%
US - Low income households <sup>3/</sup>	\$1,860	17.5%	\$1,845	16.7%	\$1,676	18.1%	\$2,814	21.8%	\$1,921	17.3%	\$2,838	21.6%
US - LIHEAP recipient households <sup>4/</sup>	\$2,052	17.7%	\$1,960	17.0%	\$1,701	17.2%	\$3,023	19.4%	\$2,647*	15.6%*	\$2,975	25.5%
Northeast - All households	\$2,751	9.0%	\$2,531	7.9%	\$1,981	9.7%	\$3,393	10.4%	\$2,198	16.3%	\$3,998	9.2%
Northeast - Non-low income households	\$2,989	3.4%	\$2,724	3.0%	\$2,172	2.7%	\$3,684	4.1%	\$2,537	4.4%	\$4,287	4.8%
Northeast - Low income households	\$2,327	19.0%	\$2,201	16.2%	\$1,670	21.1%	\$2,828	22.7%	\$2,050	21.5%	\$3,225	21.2%
Northeast - LIHEAP recipient households	\$2,399	16.9%	\$2,148	14.8%	\$1,645	17.3%	\$3,028	20.3%	\$2,738*	16.9%*	\$3,171*	19.7%*
Midwest - All households	\$2,092	8.3%	\$2,022	7.9%	\$1,730	9.0%	\$2,730	13.1%	NC	NC	\$3,406	9.7%
Midwest - Non-low income households	\$2,213	3.0%	\$2,122	2.9%	\$1,904	2.7%	\$2,830	4.4%	NC	NC	\$3,514	4.6%
Midwest - Low income households	\$1,873	17.8%	\$1,829	17.4%	\$1,481	18.0%	\$2,649	20.1%	NC	NC	\$3,161	21.2%
Midwest - LIHEAP recipient households	\$1,953	20.4%	\$1,828	19.9%	\$1,592	19.5%	\$2,570*	16.0%*	NC	NC	\$2,906	22.8%
South - All households	\$2,250	9.3%	\$2,366	8.6%	\$2,152	9.6%	\$3,149	6.4%	\$1,820	9.9%	\$2,964	11.6%
South - Non-low income households	\$2,443	3.5%	\$2,566	3.3%	\$2,327	3.5%	\$3,285	3.6%	\$2,001*	5.1%*	\$3,193	5.7%
South - Low income households	\$1,895	20.0%	\$1,919	20.6%	\$1,847	20.3%	\$2,862	12.5%	\$1,774*	11.1%*	\$2,569	21.6%
South - LIHEAP recipient households	\$2,047	19.6%	\$2,245	19.7%	\$1,878	18.8%	\$3,563*	13.2%*	\$2,102*	7.9%*	\$3,594*	55.8%*
West - All households	\$1,650	5.3%	\$1,681	4.4%	\$1,561	5.9%	\$2,953	14.0%	\$1,615*	4.4%*	\$2,840	10.6%
West - Non-low income households	\$1,796	2.2%	\$1,787	2.1%	\$1,758	2.3%	\$2,921	4.1%	\$1,962*	1.8%*	\$3,021	4.3%
West - Low income households	\$1,359	11.4%	\$1,367	11.1%	\$1,296	10.8%	\$3,043*	41.9%*	\$1,245*	7.1%*	\$2,486	22.9%
West - LIHEAP recipient households	\$1,278	9.4%	\$1,373	10.3%	\$1,179	8.6%	\$2,379*	9.0%*	NC	NC	\$1,573*	17.6%*

<sup>1/</sup> Estimates are derived from the 2009 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy. The 2009 RECS data have been adjusted for heating degree days, cooling degree days, and fuel price estimates for FY 2018. Expenditures represent the costs for fuel oil, kerosene, and LPG delivered and billed costs for natural gas and electricity. RECS expenditure data are not collected for other fuels.

<sup>2/</sup> Represents the percent of household income used for residential energy expenditures. For individual households, FY 2018 income is estimated by inflating income reported in the 2009 RECS by the consumer price index (CPI) and FY 2018 energy expenditures are estimated by adjusting energy expenditures reported in the 2009 RECS for changes in weather and energy prices. FY 2018 residential energy burden for each household is computed as estimated FY 2018 residential energy expenditures divided by estimated FY 2018 annual income. Mean individual residential burden is computed by computing the mean of the individual values. See text in Appendix A for a discussion of energy burden.

<sup>3/</sup> Households with annual incomes at or below the maximum in section 2605(b)(2)(B) of Public Law 97-35.

<sup>4/</sup> Includes verified LIHEAP recipient households from the 2009 RECS.

NC = No cases in the 2009 RECS household sample.

\* = This figure should be viewed with caution because of the small number of sample cases.

**Low Income Home Energy Data for FY 2018: Appendix A: Home Energy Estimates**

**Table A-3c. Residential energy: Average annual expenditures, by amount (dollars) and median individual burden (percent of income), for all, non-low income, low income, and LIHEAP recipient households, by Census region and main heating fuel, FY 2018**

Census Region	All Fuels <sup>1/</sup>	All Fuels <sup>2/</sup>	Natural Gas Heat	Natural Gas Heat	Electric Heat	Electric Heat	Fuel Oil Heat	Fuel Oil Heat	Kerosene Heat	Kerosene Heat	LPG Heat	LPG Heat
US - All households	\$2,174	3.7%	\$2,120	3.3%	\$1,982	3.9%	\$3,318	5.0%	\$2,046	8.9%	\$3,251	5.9%
US - Non-low income households	\$2,344	2.7%	\$2,248	2.5%	\$2,172	2.7%	\$3,591	3.7%	\$2,356	3.6%	\$3,451	4.5%
US - Low income households <sup>3/</sup>	\$1,860	8.4%	\$1,845	8.0%	\$1,676	8.1%	\$2,814	11.8%	\$1,921	9.9%	\$2,838	13.1%
US - LIHEAP recipient households <sup>4/</sup>	\$2,052	8.7%	\$1,960	8.0%	\$1,701	8.4%	\$3,023	11.6%	\$2,647*	12.2%*	\$2,975	16.4%
Northeast - All households	\$2,751	4.1%	\$2,531	3.8%	\$1,981	3.5%	\$3,393	4.9%	\$2,198	9.1%	\$3,998	5.0%
Northeast - Non-low income households	\$2,989	2.9%	\$2,724	2.6%	\$2,172	2.2%	\$3,684	3.6%	\$2,537	3.6%	\$4,287	4.3%
Northeast - Low income households	\$2,327	9.9%	\$2,201	9.2%	\$1,670	7.7%	\$2,828	11.9%	\$2,050	10.9%	\$3,225	10.3%
Northeast - LIHEAP recipient households	\$2,399	9.4%	\$2,148	7.8%	\$1,645	5.9%	\$3,028	12.5%	\$2,738*	12.9%*	\$3,171*	11.2%*
Midwest - All households	\$2,092	3.7%	\$2,022	3.5%	\$1,730	3.5%	\$2,730	7.1%	NC	NC	\$3,406	5.1%
Midwest - Non-low income households	\$2,213	2.7%	\$2,122	2.6%	\$1,904	2.4%	\$2,830	4.5%	NC	NC	\$3,514	4.2%
Midwest - Low income households	\$1,873	8.5%	\$1,829	8.2%	\$1,481	6.8%	\$2,649	10.9%	NC	NC	\$3,161	15.3%
Midwest - LIHEAP recipient households	\$1,953	8.8%	\$1,828	8.2%	\$1,592	8.6%	\$2,570*	6.9%*	NC	NC	\$2,906	16.4%
South - All households	\$2,250	4.3%	\$2,366	3.8%	\$2,152	4.3%	\$3,149	4.2%	\$1,820	9.0%	\$2,964	6.8%
South - Non-low income households	\$2,443	3.0%	\$2,566	2.9%	\$2,327	3.0%	\$3,285	3.3%	\$2,001*	4.4%*	\$3,193	5.3%
South - Low income households	\$1,895	9.5%	\$1,919	10.1%	\$1,847	9.1%	\$2,862	7.7%	\$1,774*	9.3%*	\$2,569	13.5%
South - LIHEAP recipient households	\$2,047	9.7%	\$2,245	11.6%	\$1,878	8.8%	\$3,563*	6.2%*	\$2,102*	7.9%*	\$3,594*	15.9%*
West - All households	\$1,650	2.4%	\$1,681	2.2%	\$1,561	2.8%	\$2,953	4.9%	\$1,615*	2.0%*	\$2,840	6.3%
West - Non-low income households	\$1,796	1.9%	\$1,787	1.8%	\$1,758	1.9%	\$2,921	3.4%	\$1,962*	2.0%*	\$3,021	4.0%
West - Low income households	\$1,359	5.3%	\$1,367	5.2%	\$1,296	5.4%	\$3,043*	49.1%*	\$1,245*	7.0%*	\$2,486	9.3%
West - LIHEAP recipient households	\$1,278	6.1%	\$1,373	5.6%	\$1,179	5.4%	\$2,379*	9.0%*	NC	NC	\$1,573*	9.4%*

<sup>1/</sup> Estimates are derived from the 2009 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy. The 2009 RECS data have been adjusted for heating degree days, cooling degree days, and fuel price estimates for FY 2018. Expenditures represent the costs for fuel oil, kerosene, and LPG delivered and billed costs for natural gas and electricity. RECS expenditure data are not collected for other fuels.

<sup>2/</sup> Represents the percent of household income used for residential energy expenditures. For individual households, FY 2018 income is estimated by inflating income reported in the 2009 RECS by the consumer price index (CPI) and FY 2018 energy expenditures are estimated by adjusting energy expenditures reported in the 2009 RECS for changes in weather and energy prices. FY 2018 residential energy burden for each household is computed as estimated FY 2018 residential energy expenditures divided by estimated FY 2018 annual income. Median individual residential burden is computed by computing the median of the individual values. See text in Appendix A for a discussion of energy burden.

<sup>3/</sup> Households with annual incomes at or below the maximum in section 2605(b)(2)(B) of Public Law 97-35.

<sup>4/</sup> Includes verified LIHEAP recipient households from the 2009 RECS.

NC = No cases in the 2009 RECS household sample.

\* = This figure should be viewed with caution because of the small number of sample cases.

**Low Income Home Energy Data for FY 2018: Appendix A: Home Energy Estimates**

**Table A-4. Home heating: Percent of households using major types of heating fuels, by all, non-low income, low income, and LIHEAP recipient households, by Census region and main heating fuel type, 2009<sup>1/</sup>**

Census Region	Natural Gas <sup>2/</sup>	Electricity	Fuel Oil	Kerosene	LPG	Other <sup>3/</sup>
US - All households	49.0%	33.6%	6.1%	0.4%	4.9%	2.9%
US - Non-low income households	51.4%	31.9%	6.1%	0.2%	5.1%	2.9%
US - Low income households <sup>4/</sup>	44.4%	36.7%	6.1%	0.9%	4.6%	3.0%
US - LIHEAP recipient households <sup>5/</sup>	49.2%	29.3%	11.3%	1.1%	5.0%	2.7%
Northeast - All households	51.9%	11.5%	27.5%	1.5%	3.6%	3.9%
Northeast - Non-low income households	51.1%	11.2%	28.4%	0.7%	4.1%	4.5%
Northeast - Low income households	53.4%	12.2%	26.0%	2.9%	2.7%	2.7%
Northeast - LIHEAP recipient households	53.0%	10.3%	28.4%	2.9%	4.1%	1.3%
Midwest - All households	69.0%	17.6%	1.8%	NC	8.2%	3.2%
Midwest - Non-low income households	70.4%	16.1%	1.3%	NC	8.8%	3.2%
Midwest - Low income households	66.4%	20.3%	2.9%	NC	7.0%	3.0%
Midwest - LIHEAP recipient households	66.4%	17.0%	3.2%	NC	9.8%	3.6%
South - All households	31.7%	57.4%	1.4%	0.4%	4.5%	2.1%
South - Non-low income households	33.9%	56.3%	1.5%	0.1%	4.4%	1.8%
South - Low income households	27.8%	59.4%	1.3%	0.8%	4.7%	2.7%
South - LIHEAP recipient households	28.0%	62.0%	2.9%	0.6%	2.2%	3.1%
West - All households	54.8%	28.3%	0.5%	0.1%	3.3%	3.2%
West - Non-low income households	61.4%	24.3%	0.6%	0.1%	3.3%	3.0%
West - Low income households	41.4%	36.3%	0.4%	0.2%	3.4%	3.8%
West - LIHEAP recipient households	45.9%	37.7%	0.8%	NC	2.8%	3.8%

<sup>1/</sup> Data derived from the 2009 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy. Represents main heating fuel used in 2009.

<sup>2/</sup> The sum of percentages across fuel types may not equal 100%, due to rounding and excluding households reporting no main fuel.

<sup>3/</sup> This category includes households using wood, coal, and other minor fuels as a main heating source and households reporting no main fuel. It excludes households reporting no main fuel.

<sup>4/</sup> Households with income at or below the maximum in section 2605(b)(2)(B) of Public Law 97-35.

<sup>5/</sup> Includes verified LIHEAP recipient households from the 2009 RECS.

**Low Income Home Energy Data for FY 2018: Appendix A: Home Energy Estimates**

**Table A-5. Home heating: Average consumption per household, by all fuels and specified fuels, by all, non-low income, low income and LIHEAP recipient households, by Census region, FY 2018<sup>1/</sup>**

Census Region	All Fuels <sup>2/</sup> (MMBtus) <sup>3/</sup>	Natural Gas (MMBtus)	Electricity (MMBtus)	Fuel Oil (MMBtus)	Kerosene (MMBtus)	LPG (MMBtus)
US - All households	35.9	51.1	10.6	70.6	33.7	51.8
US - Non-low income households	37.9	51.7	11.2	74.8	34.1	54.3
US - Low income households <sup>4/</sup>	32.1	49.7	9.8	62.9	33.5	46.5
US - LIHEAP recipient households <sup>5/</sup>	42.3	57.5	11.2	67.0	42.0*	49.0
Northeast - All households	57.0	62.0	13.9	72.5	39.9	55.8
Northeast - Non-low income households	59.4	63.3	15.1	77.0	41.5	57.8
Northeast - Low income households	52.8	59.7	12.0	63.9	39.2	50.7
Northeast - LIHEAP recipient households	55.3	58.3	10.8	69.3	47.3*	51.5*
Midwest - All households	56.3	67.1	16.3	64.2	NC	67.0
Midwest - Non-low income households	58.6	68.7	18.2	64.3	NC	67.9
Midwest - Low income households	52.1	64.2	13.7	64.1	NC	65.1
Midwest - LIHEAP recipient households	55.0	68.2	14.7	51.7*	NC	52.1
South - All households	20.2	37.9	9.6	61.1	23.4	35.8
South - Non-low income households	21.9	39.7	10.0	64.6	21.7*	40.0
South - Low income households	17.2	33.9	9.0	53.6	23.8*	28.5
South - LIHEAP recipient households	21.4	42.5	10.9	57.4*	10.1*	41.1*
West - All households	23.5	34.2	9.4	54.7	21.8*	45.9
West - Non-low income households	26.2	35.3	9.6	56.2	13.9*	46.1
West - Low income households	18.2	31.0	9.1	50.4*	30.1*	45.5
West - LIHEAP recipient households	22.3	38.6	8.4	64.5*	NC	25.9*

<sup>1/</sup> Developed from the 2009 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy, and adjusted for FY 2018 for heating degree days.

<sup>2/</sup> Weighted average of natural gas, electricity, fuel oil, kerosene, and liquefied petroleum gas space heating consumption. Consumption data are not collected for other fuels.

<sup>3/</sup> A British thermal unit (Btu) is the amount of energy necessary to raise the temperature of one pound of water one degree Fahrenheit. MMBtus refer to values in millions of Btus.

<sup>4/</sup> Households with income at or below the maximum in section 2605(b)(2)(B) of Public Law 97-35.

<sup>5/</sup> Includes verified LIHEAP recipient households from the 2009 RECS.

NC = No cases in the 2009 RECS household sample.

\* = This figure should be viewed with caution because of the small number of sample cases.



**Low Income Home Energy Data for FY 2018: Appendix A: Home Energy Estimates**

**Table A-6a. Home heating: Average annual expenditures by amount and mean group burden, by all, non-low income, low income, and LIHEAP recipient households, by Census region and main heating fuel type, FY 2018**

Census Region	All Fuels <sup>1/</sup>	All Fuels <sup>2/</sup>	Natural Gas Heat	Natural Gas Heat	Electric Heat	Electric Heat	Fuel Oil Heat	Fuel Oil Heat	Kerosene Heat	Kerosene Heat	LPG Heat	LPG Heat
US - All households	\$539	0.6%	\$538	0.6%	\$346	0.4%	\$1,425	1.7%	\$760	0.9%	\$1,280	1.5%
US - Non-low income households	\$561	0.5%	\$541	0.5%	\$358	0.3%	\$1,510	1.3%	\$768	0.7%	\$1,343	1.2%
US - Low income households <sup>3/</sup>	\$498	2.5%	\$533	2.7%	\$326	1.6%	\$1,268	6.4%	\$756	3.8%	\$1,149	5.8%
US - LIHEAP recipient households <sup>4/</sup>	\$646	3.9%	\$622	3.7%	\$368	2.2%	\$1,366	8.2%	\$947*	5.7%*	\$1,234	7.4%
Northeast - All households	\$970	1.0%	\$796	0.8%	\$584	0.6%	\$1,465	1.5%	\$885	0.9%	\$1,663	1.7%
Northeast - Non-low income households	\$1,018	0.8%	\$816	0.6%	\$610	0.5%	\$1,552	1.2%	\$955	0.7%	\$1,692	1.3%
Northeast - Low income households	\$885	3.9%	\$762	3.4%	\$541	2.4%	\$1,297	5.8%	\$854	3.8%	\$1,587	7.0%
Northeast - LIHEAP recipient households	\$933	5.3%	\$731	4.1%	\$457	2.6%	\$1,408	7.9%	\$1,064*	6.0%*	\$1,552*	8.8%*
Midwest - All households	\$664	0.8%	\$623	0.8%	\$460	0.6%	\$1,213	1.5%	NC	NC	\$1,496	1.8%
Midwest - Non-low income households	\$682	0.6%	\$630	0.6%	\$487	0.5%	\$1,250	1.2%	NC	NC	\$1,523	1.4%
Midwest - Low income households	\$631	3.2%	\$609	3.1%	\$421	2.1%	\$1,183	5.9%	NC	NC	\$1,435	7.2%
Midwest - LIHEAP recipient households	\$664	4.0%	\$653	4.0%	\$451	2.7%	\$955*	5.8%*	NC	NC	\$1,175	7.1%
South - All households	\$390	0.5%	\$441	0.6%	\$319	0.4%	\$1,281	1.6%	\$558	0.7%	\$975	1.2%
South - Non-low income households	\$410	0.4%	\$458	0.4%	\$329	0.3%	\$1,354	1.3%	\$433*	0.4%*	\$1,073	1.0%
South - Low income households	\$353	1.9%	\$402	2.2%	\$303	1.7%	\$1,128	6.2%	\$590*	3.3%*	\$807	4.5%
South - LIHEAP recipient households	\$421	2.8%	\$485	3.3%	\$353	2.4%	\$1,351*	9.1%*	\$245*	1.6%*	\$1,108*	7.5%*
West - All households	\$302	0.3%	\$319	0.3%	\$281	0.3%	\$1,100	1.2%	\$480*	0.5%*	\$1,083	1.2%
West - Non-low income households	\$322	0.3%	\$329	0.3%	\$289	0.2%	\$1,118	0.9%	\$296*	0.2%*	\$1,111	0.9%
West - Low income households	\$263	1.3%	\$288	1.4%	\$270	1.3%	\$1,049*	5.2%*	\$677*	3.3%*	\$1,027	5.1%
West - LIHEAP recipient households	\$284	1.6%	\$335	1.9%	\$260	1.5%	\$1,207*	6.9%*	NC	NC	\$605*	3.5%*

<sup>1/</sup> Expenditures shown in this table are derived from the 2009 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy. The 2009 RECS data have been adjusted for heating degree days and fuel price estimates for FY 2018. Expenditures represent the costs for fuel oil, kerosene, and LPG delivered, and billed costs for natural gas and electricity used. RECS expenditure data are not collected for other fuels.

<sup>2/</sup> Represents the percent of household income used for home heating energy expenditures. National and regional mean incomes are calculated from the 2018 CPS ASEC, which reports income for calendar year 2017. Mean group home heating burden is computed as mean group energy expenditures (from RECS) divided by mean group income (from CPS ASEC). See text in Appendix A for a discussion of energy burden.

<sup>3/</sup> Households with annual incomes at or below the maximum in section 2605(b)(2)(B) of Public Law 97-35.

<sup>4/</sup> Includes verified LIHEAP recipient households from the 2009 RECS.

NC = No cases in the 2009 RECS household sample.

\* = This figure should be viewed with caution because of the small number of sample cases.

**Low Income Home Energy Data for FY 2018: Appendix A: Home Energy Estimates**

**Table A-6b. Home heating: Average annual expenditures by amount and mean individual burden, by all, non-low income, low income, and LIHEAP recipient households, by Census region and main heating fuel type, FY 2018**

Census Region	All Fuels <sup>1/</sup>	All Fuels <sup>2/</sup>	Natural Gas Heat	Natural Gas Heat	Electric Heat	Electric Heat	Fuel Oil Heat	Fuel Oil Heat	Kerosene Heat	Kerosene Heat	LPG Heat	LPG Heat
US - All households	\$539	2.6%	\$538	2.5%	\$346	2.2%	\$1,425	5.6%	\$760	5.8%	\$1,280	5.0%
US - Non-low income households	\$561	0.8%	\$541	0.7%	\$358	0.5%	\$1,510	1.8%	\$768	1.3%	\$1,343	2.0%
US - Low income households <sup>3/</sup>	\$498	6.0%	\$533	6.2%	\$326	4.9%	\$1,268	12.6%	\$756	7.6%	\$1,149	11.3%
US - LIHEAP recipient households <sup>4/</sup>	\$646	7.0%	\$622	7.4%	\$368	5.1%	\$1,366	10.6%	\$947*	5.9%*	\$1,234	11.2%
Northeast - All households	\$970	4.1%	\$796	3.3%	\$584	3.9%	\$1,465	5.7%	\$885	7.4%	\$1,663	5.0%
Northeast - Non-low income households	\$1,018	1.2%	\$816	1.0%	\$610	0.8%	\$1,552	1.8%	\$955	1.5%	\$1,692	2.0%
Northeast - Low income households	\$885	9.2%	\$762	7.4%	\$541	9.0%	\$1,297	13.3%	\$854	10.0%	\$1,587	13.0%
Northeast - LIHEAP recipient households	\$933	8.3%	\$731	7.3%	\$457	5.0%	\$1,408	11.4%	\$1,064*	6.8%*	\$1,552*	9.2%*
Midwest - All households	\$664	3.4%	\$623	3.2%	\$460	3.8%	\$1,213	6.4%	NC	NC	\$1,496	5.1%
Midwest - Non-low income households	\$682	1.0%	\$630	0.9%	\$487	0.7%	\$1,250	2.1%	NC	NC	\$1,523	2.2%
Midwest - Low income households	\$631	7.9%	\$609	7.6%	\$421	8.2%	\$1,183	9.9%	NC	NC	\$1,435	11.7%
Midwest - LIHEAP recipient households	\$664	8.8%	\$653	9.1%	\$451	8.5%	\$955*	6.6%*	NC	NC	\$1,175	11.7%
South - All households	\$390	2.1%	\$441	2.2%	\$319	2.0%	\$1,281	2.8%	\$558	3.3%	\$975	4.4%
South - Non-low income households	\$410	0.6%	\$458	0.6%	\$329	0.5%	\$1,354	1.5%	\$433*	1.1%*	\$1,073	2.0%
South - Low income households	\$353	4.8%	\$402	5.8%	\$303	4.5%	\$1,128	5.5%	\$590*	3.8%*	\$807	8.5%
South - LIHEAP recipient households	\$421	5.4%	\$485	6.8%	\$353	4.9%	\$1,351*	5.6%*	\$245*	0.9%*	\$1,108*	16.2%*
West - All households	\$302	1.3%	\$319	1.0%	\$281	1.4%	\$1,100	9.9%	\$480*	1.9%*	\$1,083	6.6%
West - Non-low income households	\$322	0.4%	\$329	0.4%	\$289	0.4%	\$1,118	1.6%	\$296*	0.3%*	\$1,111	1.7%
West - Low income households	\$263	3.0%	\$288	2.9%	\$270	2.7%	\$1,049*	33.3%*	\$677*	3.6%*	\$1,027	16.2%
West - LIHEAP recipient households	\$284	2.1%	\$335	2.3%	\$260	2.1%	\$1,207*	4.6%*	NC	NC	\$605*	6.8%*

<sup>1/</sup> Expenditures shown in this table are derived from the 2009 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy. The 2009 RECS data have been adjusted for heating degree days and fuel price estimates for FY 2018. Expenditures represent the costs for fuel oil, kerosene, and LPG delivered, and billed costs for natural gas and electricity used. RECS expenditure data are not collected for other fuels.

<sup>2/</sup> Represents the percent of household income used for home heating energy expenditures. For individual households, FY 2018 income is estimated by inflating income reported in the 2009 RECS by the consumer price index (CPI) and FY 2018 energy expenditures are estimated by adjusting energy expenditures reported in the 2009 RECS for changes in weather and energy prices. FY 2018 home heating energy burden for each household is computed by computing the mean of the individual values. See text in Appendix A for a discussion of energy burden.

<sup>3/</sup> Households with annual incomes at or below the maximum in section 2605(b)(2)(B) of Public Law 97-35.

<sup>4/</sup> Includes verified LIHEAP recipient households from the 2009 RECS.

NC = No cases in the 2009 RECS household sample.

\* = This figure should be viewed with caution because of the small number of sample cases.

**Low Income Home Energy Data for FY 2018: Appendix A: Home Energy Estimates**

**Table A-6c. Home heating: Average annual expenditures by amount and median individual burden, by all, non-low income, low income, and LIHEAP recipient households, by Census region and main heating fuel type, FY 2018**

Census Region	All Fuels <sup>1/</sup>	All Fuels <sup>2/</sup>	Natural Gas Heat	Natural Gas Heat	Electric Heat	Electric Heat	Fuel Oil Heat	Fuel Oil Heat	Kerosene Heat	Kerosene Heat	LPG Heat	LPG Heat
US - All households	\$539	0.8%	\$538	0.8%	\$346	0.7%	\$1,425	2.1%	\$760	2.7%	\$1,280	2.3%
US - Non-low income households	\$561	0.5%	\$541	0.6%	\$358	0.4%	\$1,510	1.4%	\$768	1.0%	\$1,343	1.6%
US - Low income households <sup>3/</sup>	\$498	2.0%	\$533	2.2%	\$326	1.6%	\$1,268	5.8%	\$756	4.6%	\$1,149	4.9%
US - LIHEAP recipient households <sup>4/</sup>	\$646	2.6%	\$622	2.5%	\$368	2.1%	\$1,366	5.6%	\$947*	4.1%*	\$1,234	7.4%
Northeast - All households	\$970	1.4%	\$796	1.2%	\$584	1.2%	\$1,465	2.1%	\$885	3.4%	\$1,663	2.0%
Northeast - Non-low income households	\$1,018	0.9%	\$816	0.8%	\$610	0.6%	\$1,552	1.4%	\$955	1.4%	\$1,692	1.5%
Northeast - Low income households	\$885	3.7%	\$762	3.0%	\$541	2.7%	\$1,297	6.2%	\$854	4.8%	\$1,587	5.0%
Northeast - LIHEAP recipient households	\$933	3.7%	\$731	2.3%	\$457	2.0%	\$1,408	6.7%	\$1,064*	4.1%*	\$1,552*	6.9%*
Midwest - All households	\$664	1.1%	\$623	1.1%	\$460	1.0%	\$1,213	3.6%	NC	NC	\$1,496	2.7%
Midwest - Non-low income households	\$682	0.8%	\$630	0.8%	\$487	0.6%	\$1,250	2.1%	NC	NC	\$1,523	1.8%
Midwest - Low income households	\$631	2.7%	\$609	2.7%	\$421	2.2%	\$1,183	5.4%	NC	NC	\$1,435	7.4%
Midwest - LIHEAP recipient households	\$664	3.1%	\$653	3.1%	\$451	2.5%	\$955*	3.2%*	NC	NC	\$1,175	7.4%
South - All households	\$390	0.7%	\$441	0.7%	\$319	0.6%	\$1,281	1.7%	\$558	1.5%	\$975	2.2%
South - Non-low income households	\$410	0.4%	\$458	0.5%	\$329	0.4%	\$1,354	1.3%	\$433*	1.0%*	\$1,073	1.6%
South - Low income households	\$353	1.7%	\$402	2.0%	\$303	1.5%	\$1,128	3.5%	\$590*	2.7%*	\$807	4.2%
South - LIHEAP recipient households	\$421	2.2%	\$485	2.5%	\$353	2.1%	\$1,351*	2.5%*	\$245*	0.9%*	\$1,108*	9.8%*
West - All households	\$302	0.4%	\$319	0.4%	\$281	0.5%	\$1,100	1.7%	\$480*	0.5%*	\$1,083	1.9%
West - Non-low income households	\$322	0.3%	\$329	0.3%	\$289	0.3%	\$1,118	1.5%	\$296*	0.5%*	\$1,111	1.2%
West - Low income households	\$263	0.8%	\$288	1.0%	\$270	1.1%	\$1,049*	21.8%*	\$677*	5.1%*	\$1,027	4.4%
West - LIHEAP recipient households	\$284	1.4%	\$335	1.6%	\$260	1.4%	\$1,207*	4.6%*	NC	NC	\$605*	3.6%*

<sup>1/</sup> Expenditures shown in this table are derived from the 2009 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy. The 2009 RECS data have been adjusted for heating degree days and fuel price estimates for FY 2018. Expenditures represent the costs for fuel oil, kerosene, and LPG delivered, and billed costs for natural gas and electricity used. RECS expenditure data are not collected for other fuels.

<sup>2/</sup> Represents the percent of household income used for home heating energy expenditures. For individual households, FY 2018 income is estimated by inflating income reported in the 2009 RECS by the consumer price index (CPI) and FY 2018 energy expenditures are estimated by adjusting energy expenditures reported in the 2009 RECS for changes in weather and energy prices. FY 2018 home heating energy burden for each household is computed by computing the median of the individual values. See text in Appendix A for a discussion of energy burden.

<sup>3/</sup> Households with annual incomes at or below the maximum in section 2605(b)(2)(B) of Public Law 97-35.

<sup>4/</sup> Includes verified LIHEAP recipient households from the 2009 RECS.

NC = No cases in the 2009 RECS household sample.

\* = This figure should be viewed with caution because of the small number of sample cases.

**Low Income Home Energy Data for FY 2018: Appendix A: Home Energy Estimates**

**Table A-7. Home cooling: Percent of households that cool, average annual consumption per household, average annual expenditures per household, mean group burden, mean individual burden, and median individual burden for households that cooled, by all, non-low income, low income, and LIHEAP recipient households, by Census region, FY 2018**

Census Region	Percent that cool <sup>1/</sup>	Consumption <sup>2/</sup> (in MMBtus)	Expenditures <sup>2/</sup>	Mean group burden <sup>3/</sup>	Mean individual burden <sup>3/</sup>	Median individual burden <sup>3/</sup>
US - All households	92.5%	7.6	\$297	0.3%	1.2%	0.3%
US - Non-low income households	94.3%	8.6	\$340	0.3%	0.4%	0.3%
US - Low income households <sup>4/</sup>	89.1%	5.5	\$212	1.1%	2.6%	0.7%
US - LIHEAP recipient households <sup>5/</sup>	88.6%	4.4	\$172	1.0%	1.7%	0.5%
Northeast - All households	89.0%	3.4	\$182	0.2%	0.6%	0.2%
Northeast - Non-low income households	93.4%	3.8	\$204	0.2%	0.2%	0.1%
Northeast - Low income households	81.1%	2.6	\$136	0.6%	1.4%	0.4%
Northeast - LIHEAP recipient	79.9%	2.9	\$152	0.9%	1.2%	0.4%
Midwest - All households	95.0%	4.7	\$160	0.2%	0.6%	0.2%
Midwest - Non-low income households	97.1%	5.4	\$182	0.2%	0.2%	0.2%
Midwest - Low income households	91.3%	3.4	\$118	0.6%	1.3%	0.4%
Midwest - LIHEAP recipient households	91.2%	3.0	\$104	0.6%	1.2%	0.3%
South - All households	98.7%	12.4	\$472	0.6%	2.0%	0.7%
South - Non-low income households	99.4%	14.4	\$549	0.5%	0.7%	0.6%
South - Low income households	97.3%	8.8	\$328	1.8%	4.3%	1.4%
South - LIHEAP recipient households	99.5%	7.7	\$273	1.8%	3.0%	1.0%
West - All households	82.2%	5.0	\$209	0.2%	0.6%	0.1%
West - Non-low income households	83.7%	5.7	\$238	0.2%	0.3%	0.1%
West - Low income households	79.3%	3.6	\$146	0.7%	1.3%	0.3%
West - LIHEAP recipient households	81.8%	3.3	\$122	0.7%	0.9%	0.4%

<sup>1/</sup> Cooling includes central and room air-conditioning, as well as non-air-conditioning cooling devices (e.g., ceiling fans, evaporative coolers). Excludes households that do not cool or cool in ways other than those recorded by the 2009 RECS (e.g., table and window fans.)

<sup>2/</sup> Consumption and expenditures are derived from the 2009 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy. The 2009 RECS data have been adjusted for cooling degree days and electricity price estimates for FY 2018. Expenditures represent billed costs for electricity used for home cooling.

<sup>3/</sup> Represents the percent of household income used for home cooling energy expenditures.

<sup>4/</sup> Households with annual incomes at or below the maximum in section 2605(b)(2)(B) of Public Law 97-35.

<sup>5/</sup> Includes verified LIHEAP recipient households from the 2009 RECS.

## **Appendix B: Income Eligible Household Estimates**

ACF encourages LIHEAP grantees to use performance measurement systems to manage LIHEAP programs. ACF has developed targeting performance indicators to support measurement of LIHEAP targeting at the grantee level. For a number of years, ACF has furnished state grantees with state-level estimates of the number of LIHEAP income eligible households, including the number of vulnerable households and the number of households by poverty level. State grantees can use these estimates with their own data on LIHEAP recipient characteristics to compute reciprocity targeting performance statistics.

State-level estimates of the number of income eligible households for FY 2018 were developed using the American Community Survey (ACS). The Census Bureau recommends the use of the ACS for the state-level income and poverty analysis.<sup>16</sup> ACF also uses the estimates from the ACS and household recipient data from the states' *LIHEAP Household Report* to develop state-level targeting indexes.

The 2013-2017 five-year ACS Public Use Microdata Sample (PUMS) data file is used to develop more precise estimates of the number of income eligible households than those that would have been obtained using the 2017 single-year ACS PUMS data.<sup>17</sup>

The federal maximum LIHEAP income standard is the greater of 60 percent of the state median income or 150 percent of HHS Poverty Guidelines.

Tables B-1 and B-2 show estimates of the number of LIHEAP income eligible households by vulnerability group,<sup>18</sup> derived from the 2013-2017 five-year ACS, using the federal maximum income standard and the FY 2018 state income standards, respectively. The state income standards are the income levels that the states set to define LIHEAP income eligibility. These state income standards may vary by LIHEAP component; however, they must fall between 110 percent of HHS Poverty Guidelines and the federal maximum income standard.

Similarly, Tables B-3 through B-4 show estimates of the number of LIHEAP income eligible households by poverty group, derived from the 2013-2017 five-year ACS, using the using the federal maximum income standard and the FY 2018 state income standards, respectively.

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<sup>16</sup> For an explanation, and to better understand the differences between the ACS and CPS ASEC, please visit the Census Bureau's Guidance for Data Users regarding "Which Data Source to Use" for poverty and income research at the following website: <https://www.census.gov/topics/income-poverty/poverty/guidance/data-sources.html>.

<sup>17</sup> The Census Bureau recommends multi-year data estimates from the ACS instead of estimates from the one-year ACS when the precision of the estimates is of primary importance. (See the Census Bureau's Guidance for Data Users regarding estimates from the ACS at the following website: <https://www.census.gov/programs-surveys/acs/guidance/estimates.html>) In prior *Notebooks*, state-level estimates of the income eligible population were derived from the Census Bureau's 3-year ACS PUMS product. However, in 2015, the Census Bureau discontinued publication of its 3-year ACS PUMS. For the *FY 2015 Notebook* and the *FY 2016 Notebook*, the methodology chosen to develop state-level estimates of the income eligible population was the three-year average of 1-year ACS PUMS files, which produced comparable estimates to the discontinued 3-year ACS PUMS. To maintain consistency with the Census Bureau's published ACS PUMS data, beginning with the *FY 2017 Notebook*, the methodology chosen to develop state-level estimates of the income eligible population was the 5-year ACS PUMS data published by the Census Bureau. The *FY 2018 Notebook* uses the most recent 5-year (2013-2017) ACS PUMS file to develop state-level estimates of the income eligible population.

<sup>18</sup> The Census Bureau changed the questions on disability in ACS in 2008. Since the new questions were not comparable to those in previous years, the reader should exercise caution in comparing the estimates of households with disabled individuals with those in previous *Notebooks*.

***LIHEAP Home Energy Notebook for FY 2018: Appendix B: Income Eligible Household Estimates***

**Table B-1. State-level estimates of the number of LIHEAP income eligible households using the federal maximum LIHEAP income standard by vulnerability category<sup>1/ 2/ 3/</sup>**  
(2013-2017 ACS)

State	Total number of LIHEAP eligible households <sup>4/</sup>	LIHEAP eligible households with at least one person 60+ years	LIHEAP eligible households with at least one child less than 6 yrs. old	LIHEAP eligible households with at least one person with a disability <sup>5/</sup>	LIHEAP eligible households with no vulnerable members
Alabama	589,952	225,695	98,045	265,002	163,912
Alaska	65,823	19,970	16,436	24,074	20,573
Arizona	654,898	248,036	130,192	224,769	205,682
Arkansas	333,739	126,896	64,182	157,294	81,524
California	3,708,530	1,419,382	756,027	1,263,257	1,186,607
Colorado	573,289	208,168	102,323	188,305	197,265
Connecticut	430,825	186,425	61,083	153,525	130,871
Delaware	101,882	42,901	16,543	34,711	30,734
District of Columbia	82,290	29,421	11,026	33,011	28,742
Florida	2,044,074	922,114	319,721	729,613	588,915
Georgia	1,058,459	375,403	213,568	395,027	327,522
Hawaii	113,359	52,715	21,362	39,959	30,802
Idaho	154,042	53,711	30,122	59,232	45,778
Illinois	1,467,814	591,326	246,362	513,904	467,851
Indiana	717,722	263,671	132,832	289,158	210,041
Iowa	351,929	143,072	56,979	127,262	106,032
Kansas	313,273	115,283	61,879	117,688	93,152
Kentucky	560,836	215,815	93,631	282,398	132,265
Louisiana	611,206	234,915	104,215	257,480	176,672
Maine	167,128	77,983	19,956	77,993	37,700
Maryland	646,002	269,676	113,449	224,408	196,375
Massachusetts	849,796	390,417	113,555	350,062	228,200
Michigan	1,178,417	454,257	198,415	497,052	327,195
Minnesota	621,641	257,703	105,380	220,952	182,099
Mississippi	354,687	135,237	63,686	163,597	94,500
Missouri	694,784	271,014	117,139	297,206	189,252
Montana	118,571	48,116	18,339	46,210	35,209
Nebraska	205,173	76,481	40,246	71,700	64,175
Nevada	264,251	94,464	50,606	93,386	85,804
New Hampshire	147,082	66,527	18,983	60,059	39,716
New Jersey	1,038,856	461,331	167,456	351,300	311,741
New Mexico	229,216	88,148	42,088	92,696	66,343
New York	2,355,971	1,015,070	377,991	881,800	680,497
North Carolina	1,134,767	436,334	199,724	449,647	336,693
North Dakota	90,255	34,579	15,034	29,364	31,522
Ohio	1,417,116	554,733	239,214	598,035	384,399
Oklahoma	411,958	150,799	79,651	178,721	112,987
Oregon	419,196	164,753	70,779	173,658	118,858
Pennsylvania	1,559,045	710,583	223,614	666,822	393,327
Rhode Island	135,836	56,983	19,198	57,739	37,239
South Carolina	536,519	211,207	93,406	219,967	154,666
South Dakota	91,689	38,244	16,830	34,022	25,389
Tennessee	737,674	280,181	133,762	329,733	195,299
Texas	2,636,330	888,538	600,464	916,627	853,360
Utah	212,123	64,515	57,437	68,709	65,890
Vermont	76,729	36,455	8,986	33,187	19,476
Virginia	909,320	365,463	156,759	333,195	275,616
Washington	753,012	287,279	140,990	292,750	217,599
West Virginia	243,375	102,329	34,823	128,819	52,947
Wisconsin	681,311	278,888	106,512	250,861	203,139
Wyoming	61,529	24,134	10,207	21,534	20,094
All States	34,913,301	13,867,340	6,191,207	13,367,480	10,262,246

<sup>1/</sup> State estimates are subject to sampling error, and may not sum to U.S. total due to rounding.

<sup>2/</sup> The federal maximum LIHEAP income standard is the greater of 60 percent of the state median income estimates or 150 percent of the HHS Poverty Guidelines.

<sup>3/</sup> A household can be counted under more than one vulnerability category.

<sup>4/</sup> The 2013-2017 ACS estimate of the total number of all U.S. households is 118,825,933.

<sup>5/</sup> The Census Bureau changed the questions on disability in ACS in 2008. The definition above includes individuals aged 15 years and older with any of the six difficulty types (hearing, vision, cognitive, ambulatory, self-care, and independent living) reported in ACS and individuals ages 15 through 64 who received Supplemental Security Income in the past year, and non-widowed individuals ages 19 through 61 who received Social Security income in the past year. The reader should exercise caution in comparing these estimates with those in previous *Notebooks*.

## ***LIHEAP Home Energy Notebook for FY 2018: Appendix B: Income Eligible Household Estimates***

**Table B-2. State-level estimates of the number of LIHEAP income eligible households using state maximum LIHEAP income standards by vulnerability category<sup>1/ 2/ 3/</sup>**  
(2013-2017 ACS)

State	State Income Guidelines for 4-Person Households as % of HHS Poverty Guidelines	Total number of LIHEAP eligible households <sup>4/</sup>	LIHEAP eligible households with at least one person 60+ years	LIHEAP eligible households with at least one child less than 6 yrs. old	LIHEAP eligible households with at least one person with a disability <sup>3/</sup>	LIHEAP eligible households with no vulnerable members
Alabama	150%	511,855	190,424	90,033	232,873	139,147
Alaska	150%	47,976	14,925	12,114	19,560	13,354
Arizona	164% <sup>6/7/</sup>	654,898	248,036	130,192	224,769	205,682
Arkansas	148% <sup>6/8/</sup>	330,573	126,313	62,361	156,090	80,787
California	196% <sup>6/8/</sup>	3,706,003	1,418,617	753,940	1,262,236	1,186,532
Colorado	165%	394,798	138,433	75,068	136,004	130,716
Connecticut	265% <sup>6/8/</sup>	430,825	186,425	61,083	153,525	130,871
Delaware	200%	89,377	36,635	15,185	30,901	26,771
District of Columbia	241% <sup>6/8/</sup>	82,290	29,421	11,026	33,011	28,742
Florida	150%	1,739,470	765,928	289,299	629,088	493,246
Georgia	171% <sup>6/8/</sup>	1,057,514	374,879	212,820	394,681	327,444
Hawaii	150%	83,689	39,331	16,142	31,583	21,261
Idaho	150%	140,504	46,886	28,421	54,064	41,949
Illinois	150%	964,057	355,568	180,312	355,565	301,083
Indiana	150%	549,725	185,023	110,807	225,001	160,193
Iowa	175%	294,027	114,589	49,477	109,392	88,517
Kansas	130%	182,112	60,142	38,321	71,273	54,133
Kentucky	130%	401,669	141,508	72,077	211,402	90,624
Louisiana	179% <sup>6/8/</sup>	610,874	234,888	103,964	257,410	176,614
Maine	150% <sup>9/</sup>	129,434	62,846	16,234	63,688	25,146
Maryland	175%	375,690	152,223	70,112	144,337	104,478
Massachusetts	266% <sup>6/8/</sup>	849,796	390,417	113,555	350,062	228,200
Michigan	110%	575,917	179,038	111,099	257,241	162,180
Minnesota	192% <sup>6/10/</sup>	492,793	202,685	84,995	183,393	138,247
Mississippi	146% <sup>6/8/</sup>	349,611	134,246	61,154	161,950	93,233
Missouri	135%	463,482	165,702	84,632	205,595	123,500
Montana	174% <sup>6/11/</sup>	118,571	48,116	18,339	46,210	35,209
Nebraska	130%	116,788	39,784	25,245	43,538	34,762
Nevada	150%	218,272	74,328	44,533	78,258	69,997
New Hampshire	245% <sup>6/8/</sup>	147,082	66,527	18,983	60,059	39,716
New Jersey	200%	738,606	322,009	128,160	264,990	209,120
New Mexico	150%	220,435	82,949	41,847	89,226	63,618
New York	216% <sup>6/12/</sup>	2,355,971	1,015,070	377,991	881,800	680,497
North Carolina	130%	787,406	281,606	152,548	321,343	226,990
North Dakota	216% <sup>6/8/</sup>	90,246	34,579	15,025	29,364	31,522
Ohio	191% <sup>6/8/</sup>	1,416,711	554,675	238,849	597,852	384,370
Oklahoma	130%	301,588	99,925	61,525	132,405	83,693
Oregon	177% <sup>6/8/</sup>	418,591	164,615	70,368	173,463	118,761
Pennsylvania	150%	1,003,683	413,947	159,206	453,145	249,799
Rhode Island	223% <sup>6/8/</sup>	135,836	56,983	19,198	57,739	37,239
South Carolina	150%	466,967	177,588	85,893	193,150	133,154
South Dakota	175% <sup>13/</sup>	81,470	32,856	16,067	30,562	22,178
Tennessee	150%	641,908	235,484	122,977	292,071	165,889
Texas	150%	2,153,919	702,243	522,904	759,531	678,353
Utah	150%	161,789	47,295	45,333	54,057	49,031
Vermont	185%	63,976	29,972	7,921	28,797	15,640
Virginia	130%	437,151	161,547	79,653	178,489	124,930
Washington	125%	370,371	125,421	71,923	155,639	105,180
West Virginia	150%	204,702	80,471	31,243	111,208	43,606
Wisconsin	205% <sup>6/8/</sup>	681,222	278,888	106,431	250,839	203,139
Wyoming	199% <sup>6/8/</sup>	61,523	24,134	10,201	21,532	20,094
All States	Not applicable	28,903,743	11,146,140	5,326,786	11,259,961	8,399,137

<sup>1/</sup> State estimates are subject to sampling error, and may not sum to U.S. total due to rounding.

<sup>2/</sup> State income guidelines can vary from 110 percent of the HHS Poverty Guidelines up to the federal maximum LIHEAP income standard and can be different for different components of LIHEAP assistance. The table shows the estimates of LIHEAP income eligible households for heating assistance. The state maximum LIHEAP income standards for a family of four were obtained from ACF's *LIHEAP Performance Data Form – Module I (Grantee Survey)* and confirmed with other program resources.

<sup>3/</sup> A household can be counted under more than one vulnerability category.

<sup>4/</sup> The 2013-2017 ACS estimate of the total number of all U.S. households is 118,825,933.

<sup>5/</sup> The Census Bureau changed the questions on disability in ACS in 2008. The definition above includes individuals aged 15 years and older with any of the six difficulty types (hearing, vision, cognitive, ambulatory, self-care, and independent living) reported in ACS and individuals ages 15 through 64 who received Supplemental Security Income in the past year, and non-widowed individuals ages 19 through 61 who received Social Security income in the past year. The reader should exercise caution in comparing these estimates with those in previous *Notebooks*.

## **LIHEAP Home Energy Notebook for FY 2018: Appendix B: Income Eligible Household Estimates**

<sup>6/</sup> These states use a percent of state median income as the state income guideline. The figures reported are the conversion to a percent of the HHS Poverty Guidelines for four person households.

<sup>7/</sup> The state income guideline is 60 percent of the state median income for households with 1-6 members and 150 percent of HHS Poverty Guidelines for households with 7 or more members.

<sup>8/</sup> These states use 60 percent of the state median income as the state income guideline for all household sizes.

<sup>9/</sup> The state income guideline is the lesser of 150 percent of HHS Poverty Guidelines and 60 percent of the state median income, depending on household size. For households with vulnerable members (defined as elderly 60 years or older, very young children less than 2 years old, or susceptible to hypothermia), the state income guideline is the lesser of 170 percent of HHS Poverty Guidelines and 60 percent of the state median income.

<sup>10/</sup> The state income guideline is the greater of 50 percent of the state median income and 110 percent of HHS Poverty Guidelines, depending upon household size.

<sup>11/</sup> The state income guideline is 60 percent of the state median income for households with 1-7 members and 150 percent of HHS Poverty Guidelines for households with 8 or more members.

<sup>12/</sup> The state income guideline is 60 percent of the state median income for households with 1-10 members and 150 percent of HHS Poverty Guidelines for households with 11 or more members.

<sup>13/</sup> The state income guideline is 175 percent of the HHS Poverty Guidelines for households with 1-6 members, 60 percent of the state median income for households with 7 or 8 members and 150 percent of HHS Poverty Guidelines for households with 9 or more members.



***LIHEAP Home Energy Notebook for FY 2018: Appendix B: Income Eligible Household Estimates***

**Table B-3. State-level estimates of the number of LIHEAP income eligible households using the federal maximum LIHEAP income standard categorized by income as a percentage of HHS Poverty Guidelines<sup>1/ 2/</sup>**  
(2013-2017 ACS)

State	Total number of LIHEAP eligible households <sup>3/</sup>	Number of LIHEAP eligible households at or below poverty guidelines	Number of LIHEAP eligible households >100%-125% poverty guidelines	Number of LIHEAP eligible households >125%-150% poverty guidelines	Number of LIHEAP eligible households over 150% poverty guidelines
Alabama	589,952	304,726	106,108	101,021	78,097
Alaska	65,823	28,111	10,176	9,689	17,847
Arizona	654,898	331,013	117,013	119,335	87,537
Arkansas	333,739	183,503	73,664	69,762	6,810
California	3,708,530	1,563,008	561,202	546,678	1,037,642
Colorado	573,289	195,776	75,113	77,245	225,155
Connecticut	430,825	121,685	41,531	44,427	223,182
Delaware	101,882	37,035	12,815	12,543	39,489
District of Columbia	82,290	38,641	9,392	7,426	26,831
Florida	2,044,074	974,710	380,192	384,568	304,604
Georgia	1,058,459	526,069	182,391	174,999	175,000
Hawaii	113,359	50,782	16,316	16,591	29,670
Idaho	154,042	76,951	31,528	32,025	13,538
Illinois	1,467,814	570,557	193,308	200,192	503,757
Indiana	717,722	309,468	119,453	120,804	167,997
Iowa	351,929	126,399	52,068	58,635	114,827
Kansas	313,273	122,572	47,664	49,762	93,275
Kentucky	560,836	283,023	96,405	91,558	89,850
Louisiana	611,206	303,880	100,015	90,764	116,547
Maine	167,128	63,222	27,023	27,360	49,523
Maryland	646,002	182,626	62,385	63,611	337,380
Massachusetts	849,796	263,117	90,946	86,193	409,540
Michigan	1,178,417	503,916	173,386	177,505	323,610
Minnesota	621,641	185,967	77,176	76,951	281,547
Mississippi	354,687	216,050	69,533	65,621	3,483
Missouri	694,784	300,998	113,096	113,766	166,924
Montana	118,571	51,881	21,675	20,361	24,654
Nebraska	205,173	74,868	33,934	30,451	65,920
Nevada	264,251	120,791	49,121	48,360	45,979
New Hampshire	147,082	35,847	16,168	17,101	77,966
New Jersey	1,038,856	302,039	106,079	110,935	519,803
New Mexico	229,216	136,103	44,823	39,509	8,781
New York	2,355,971	969,184	302,414	301,161	783,212
North Carolina	1,134,767	533,418	206,222	197,275	197,852
North Dakota	90,255	30,782	12,270	12,116	35,087
Ohio	1,417,116	599,710	207,707	207,792	401,907
Oklahoma	411,958	202,023	81,203	78,519	50,213
Oregon	419,196	186,562	70,992	71,133	90,509
Pennsylvania	1,559,045	573,104	212,912	217,667	555,362
Rhode Island	135,836	51,146	17,508	17,112	50,070
South Carolina	536,519	271,499	99,918	95,550	69,552
South Dakota	91,689	35,731	16,027	15,439	24,492
Tennessee	737,674	370,021	138,408	133,479	95,766
Texas	2,636,330	1,256,794	455,601	441,524	482,411
Utah	212,123	87,912	34,366	39,511	50,334
Vermont	76,729	23,138	12,163	11,345	30,083
Virginia	909,320	299,256	112,419	109,006	388,639
Washington	753,012	271,649	98,722	102,651	279,990
West Virginia	243,375	119,664	43,280	41,758	38,673
Wisconsin	681,311	233,567	96,975	98,564	252,205
Wyoming	61,529	21,866	8,530	9,652	21,481
All States	34,913,301	14,722,360	5,339,336	5,287,002	9,564,603

<sup>1/</sup> State estimates are subject to sampling error and may not sum to U.S. total due to rounding.

<sup>2/</sup> The federal maximum LIHEAP income standard is the greater of 60 percent of state median income estimates or 150 percent of the HHS Poverty Guidelines.

<sup>3/</sup> The 2013-2017 ACS estimate of the total number of all U.S. households is 118,825,933.

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**Table B-4. State-level estimates of the number of LIHEAP income eligible households using the state maximum LIHEAP income standards categorized by income as a percentage of HHS Poverty Guidelines<sup>1/ 2/</sup> (2013-2017 ACS)**

State	State Income Guidelines for 4-Person Households as % of HHS Poverty Guidelines	Total number of LIHEAP eligible households <sup>3/</sup>	Number of LIHEAP eligible households at or below poverty guidelines	Number of LIHEAP eligible households >100%-125% poverty guidelines	Number of LIHEAP eligible households >125%-150% poverty guidelines	Number of LIHEAP eligible households over 150% poverty guidelines
Alabama	150%	511,855	304,726	106,108	101,021	0
Alaska	150%	47,976	28,111	10,176	9,689	0
Arizona	164% <sup>4/5/</sup>	654,898	331,013	117,013	119,335	87,537
Arkansas	148% <sup>4/6/</sup>	330,573	183,503	73,363	66,897	6,810
California	196% <sup>4/6/</sup>	3,706,003	1,563,008	561,048	544,305	1,037,642
Colorado	165%	394,798	195,776	75,113	77,245	46,664
Connecticut	265% <sup>4/6/</sup>	430,825	121,685	41,531	44,427	223,182
Delaware	200%	89,377	37,035	12,815	12,543	26,984
District of Columbia	241% <sup>4/6/</sup>	82,290	38,641	9,392	7,426	26,831
Florida	150%	1,739,470	974,710	380,192	384,568	0
Georgia	171% <sup>4/6/</sup>	1,057,514	526,069	182,337	174,108	175,000
Hawaii	150%	83,689	50,782	16,316	16,591	0
Idaho	150%	140,504	76,951	31,528	32,025	0
Illinois	150%	964,057	570,557	193,308	200,192	0
Indiana	150%	549,725	309,468	119,453	120,804	0
Iowa	175%	294,027	126,399	52,068	58,635	56,925
Kansas	130%	182,112	122,572	47,664	11,876	0
Kentucky	130%	401,669	283,023	96,405	22,241	0
Louisiana	179% <sup>4/6/</sup>	610,874	303,880	100,012	90,435	116,547
Maine	150% <sup>6/</sup>	129,434	63,222	27,023	27,270	11,919
Maryland	175%	375,690	182,626	62,385	63,611	67,068
Massachusetts	266% <sup>4/6/</sup>	849,796	263,117	90,946	86,193	409,540
Michigan	110%	575,917	503,916	72,001	0	0
Minnesota	192% <sup>4/7/</sup>	492,793	185,967	77,138	76,695	152,993
Mississippi	146% <sup>4/6/</sup>	349,611	216,050	69,333	60,745	3,483
Missouri	135%	463,482	300,998	113,096	49,388	0
Montana	174% <sup>4/8/</sup>	118,571	51,881	21,675	20,361	24,654
Nebraska	130%	116,788	74,868	33,934	7,986	0
Nevada	150%	218,272	120,791	49,121	48,360	0
New Hampshire	245% <sup>4/6/</sup>	147,082	35,847	16,168	17,101	77,966
New Jersey	200%	738,606	302,039	106,079	110,935	219,553
New Mexico	150%	220,435	136,103	44,823	39,509	0
New York	216% <sup>4/9/</sup>	2,355,971	969,184	302,414	301,161	783,212
North Carolina	130%	787,406	533,418	206,222	47,766	0
North Dakota	216% <sup>4/6/</sup>	90,246	30,782	12,270	12,107	35,087
Ohio	191% <sup>4/6/</sup>	1,416,711	599,710	207,624	207,470	401,907
Oklahoma	130%	301,588	202,023	81,203	18,362	0
Oregon	177% <sup>4/6/</sup>	418,591	186,562	70,959	70,561	90,509
Pennsylvania	150%	1,003,683	573,104	212,912	217,667	0
Rhode Island	223% <sup>4/6/</sup>	135,836	51,146	17,508	17,112	50,070
South Carolina	150%	466,967	271,499	99,918	95,550	0
South Dakota	175% <sup>10/</sup>	81,470	35,731	16,027	15,439	14,273
Tennessee	150%	641,908	370,021	138,408	133,479	0
Texas	150%	2,153,919	1,256,794	455,601	441,524	0
Utah	150%	161,789	87,912	34,366	39,511	0
Vermont	185%	63,976	23,138	12,163	11,345	17,330
Virginia	130%	437,151	299,256	112,419	25,476	0
Washington	125%	370,371	271,649	98,722	0	0
West Virginia	150%	204,702	119,664	43,280	41,758	0
Wisconsin	205% <sup>4/6/</sup>	681,222	233,567	96,975	98,475	252,205
Wyoming	199% <sup>4/6/</sup>	61,523	21,866	8,530	9,646	21,481
All States	Not applicable	28,903,743	14,722,360	5,237,085	4,506,926	4,437,372

<sup>1/</sup> State estimates are subject to sampling error, and may not sum to U.S. total due to rounding.

<sup>2/</sup> State income guidelines can vary from 110 percent of the HHS Poverty Guidelines up to the federal maximum LIHEAP income standard and can be different for different components of LIHEAP assistance. The table shows the estimates of LIHEAP income eligible households for heating assistance. The state maximum LIHEAP income standards for a family of four were obtained from ACF's *LIHEAP Performance Data Form – Module I (Grantee Survey)*.

<sup>3/</sup> The 2013-2017 ACS estimate of the total number of all U.S. households is 118,825,933.

<sup>4/</sup> These states use a percent of state median income as the state income guideline. The figures reported are the conversion to a percent of the HHS Poverty Guidelines for four person households.

<sup>5/</sup> The state income guideline is 60 percent of the state median income for households with 1-6 members and 150 percent of HHS Poverty Guidelines for households with 7 or more members.

<sup>6/</sup> The state income guideline is the lesser of 150 percent of HHS Poverty Guidelines and 60 percent of the state median income, depending on household size. For households with vulnerable members (defined as elderly 60 years or older, very young children less than 2 years old, or

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susceptible to hypothermia), the state income guideline is the lesser of 170 percent of HHS Poverty Guidelines and 60 percent of the state median income.

<sup>7/</sup> The state income guideline is the greater of 50 percent of the state median income and 110 percent of HHS Poverty Guidelines, depending upon household size.

<sup>8/</sup> The state income guideline is 60 percent of the state median income for households with 1-7 members and 150 percent of HHS Poverty Guidelines for households with 8 or more members.

<sup>9/</sup> The state income guideline is 60 percent of the state median income for households with 1-10 members and 150 percent of HHS Poverty Guidelines for households with 11 or more members.

<sup>10/</sup> The state income guideline is 175 percent of the HHS Poverty Guidelines for households with 1-6 members, 60 percent of the state median income for households with 7 or 8 members and 150 percent of HHS Poverty Guidelines for households with 9 or more members.