Low Income Home Energy Data
For Fiscal Year 2015

U.S. DEPARTMENT OF
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Office of Community Services
Division of Energy Assistance
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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
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) 2015 residential energy consumption and expenditures figures for this report have been derived from the 2009 RECS data that were adjusted to reflect FY 2015 weather and fuel prices, as described in Appendix A.

Residential energy data

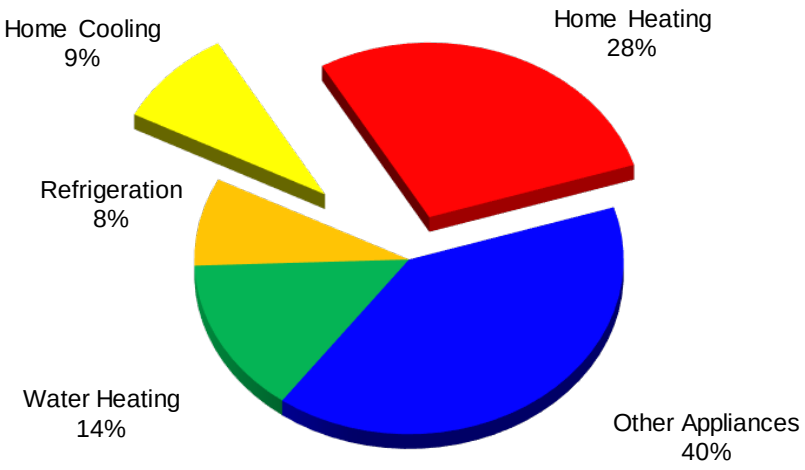
In FY 2015, average residential energy expenditures for all households were $2,146, and the mean individual energy burden was 8.4 percent of income.[1] Low income households had average energy expenditures of $1,842, about 14 percent lower than the average for all households.[2] The mean individual energy burden for low income households was 18.1 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 $2,053, about 11 percent higher than the average for all low income households. The mean individual energy burden for LIHEAP recipients was 18.4 percent, 10 percentage points higher than the mean individual energy burden for all households and 0.3 percentage points higher 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 2015. 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.

[1] The mean is the sum of all values divided by the number of values. The mean is also referred to as the average.

[2] 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 2015



Home heating data

The three most common heating fuels in 2009, the most recent year for which household heating fuel usage data are available, 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.

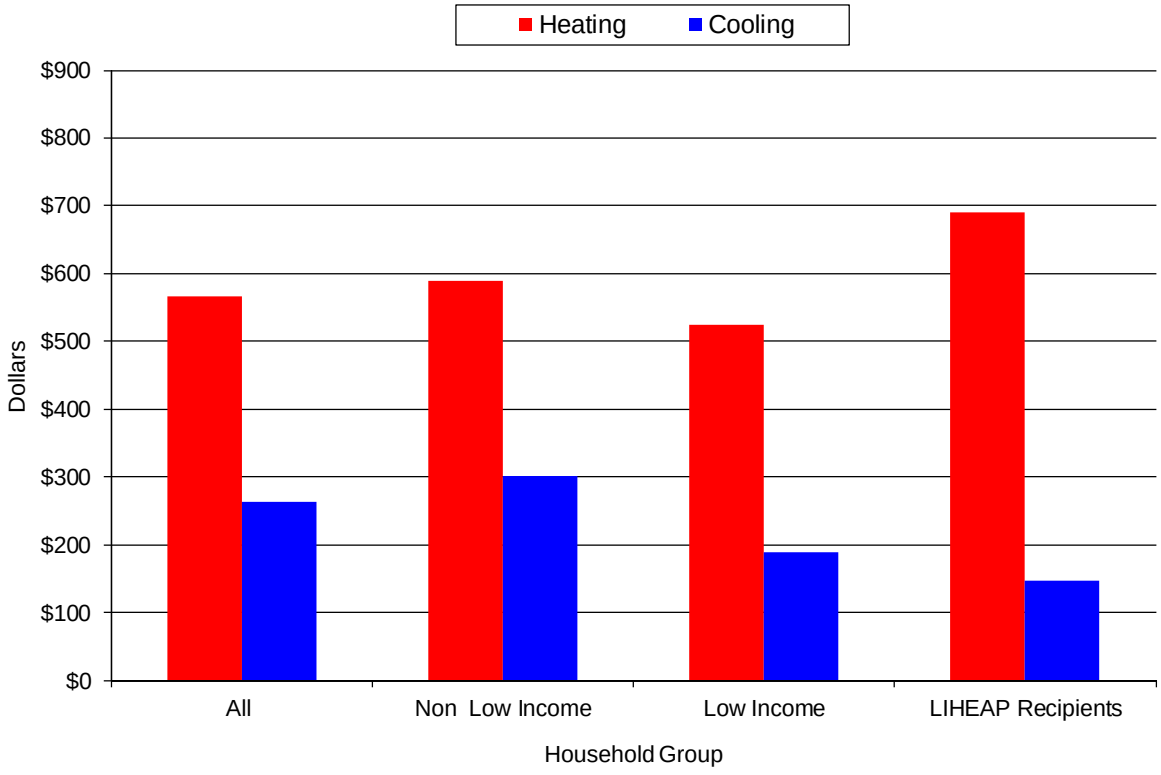
In FY 2015, as shown in Figures 2 and 3, average home heating expenditures for all households were $566, and the mean individual home heating burden was 2.9 percent. Low income households had average home heating expenditures of $525; this average was about 7 percent lower than that for all households. The mean individual home heating burden for low income households was 6.6 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 $690, about 31 percent higher than the average for low income households and about 22 percent higher than the average for all households. Mean individual home heating burden for LIHEAP recipient households was 7.7 percent, more than two and a half times the average for all households, and more than 1.1 percentage points 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.[3] 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.

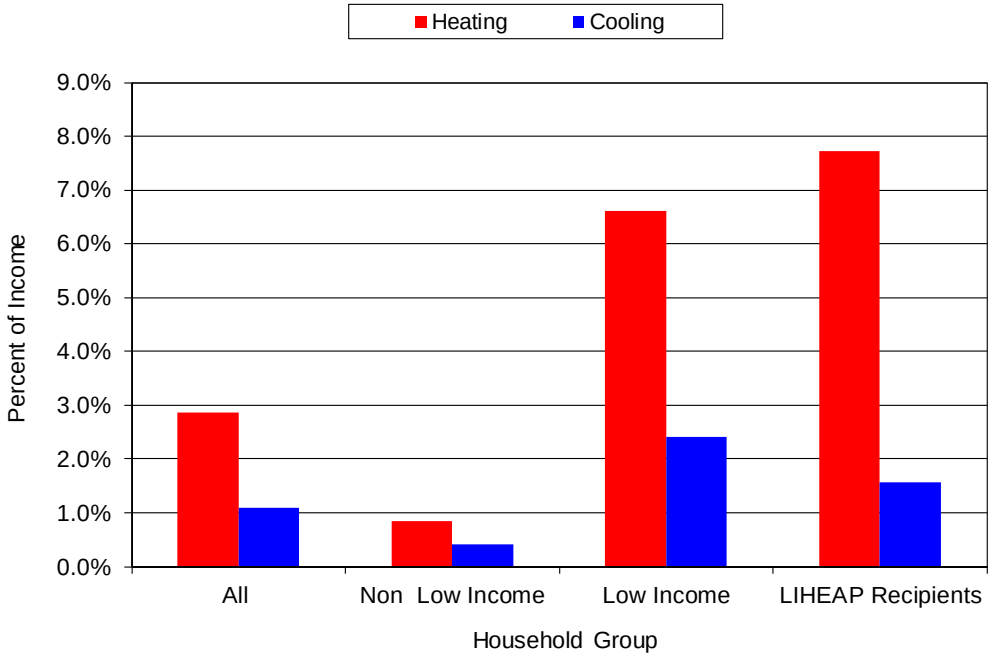
As Figures 2 and 3 show, in FY 2015, for households that cooled, average home cooling expenditures for all households were $264, and the mean individual home cooling burden was 1.1 percent. Low income households had average home cooling expenditures of $188; this average was about 29 percent lower than that for all households. The mean individual home cooling burden for low income households was 2.4 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 $148, about 21 percent lower than the average for low income households and about 44 percent lower than the average for all households. The mean individual home cooling burden for LIHEAP recipient households was 1.6 percent, about 45 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 2015



[3] 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.

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 2015



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 2015 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.[4] In FY 2015, average residential energy consumption for all households was 90.8 million British thermal units (MMBtus) and average expenditures were $2,146. The mean individual residential energy burden for all households was 8.4 percent of income.

Low income households had average residential energy consumption of 79.1 MMBtus (about 13 percent less than all households) and average energy expenditures of $1,842 (about 14 percent less than all households). Their mean individual residential energy burden was 18.1 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 $2,053, about 11 percent higher than that for all low income households. The mean individual residential energy burden was 18.4 percent, 0.3 percentage points higher than that for 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 2015, home heating was 28 percent of the residential energy bill for low income households, and home cooling made up 9 percent.

[4] 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.

Table 1a. Residential energy: Average annual household consumption, expenditures, and burden by all households, by main heating fuel type, United States, FY 2015[1/]

Main heating fuel	Fuel consumption (MMBtus)[2/]	Fuel expenditures	Mean individual burden[3/]	Median individual burden[4/]	Mean group burden[5/]
All fuels	90.8	$2,146	8.4%	3.8%	2.8%
Natural gas	110.4	$2,087	7.4%	3.4%	2.8%
Electricity	60.9	$1,939	9.1%	4.0%	2.6%
Fuel oil	122.3	$3,439	11.0%	5.6%	4.5%
Kerosene	67.4	$2,090	14.5%	9.7%	2.8%
LPG[6/]	111.4	$3,180	10.7%	6.2%	4.2%

Table 1b. Residential energy: Average annual household consumption, expenditures, and burden by non-low income households, by main heating fuel type, United States, FY 2015[1/]

Main heating fuel	Fuel consumption (MMBtus)[2/]	Fuel expenditures	Mean individual burden[3/]	Median individual burden[4/]	Mean group burden[5/]
All fuels	97.1	$2,309	3.2%	2.8%	2.3%
Natural gas	114.5	$2,207	2.9%	2.6%	2.2%
Electricity	66.4	$2,124	3.3%	2.8%	2.1%
Fuel oil	130.4	$3,718	4.4%	4.0%	3.7%
Kerosene	73.3	$2,387	4.6%	3.9%	2.4%
LPG[6/]	118.5	$3,372	5.1%	4.7%	3.3%

Table 1c. Residential energy: Average annual household consumption, expenditures, and burden by low income households, by main heating fuel type, United States, FY 2015[1/]

Main heating fuel	Fuel consumption (MMBtus)[2/]	Fuel expenditures	Mean individual burden[3/]	Median individual burden[4/]	Mean group burden[5/]
All fuels	79.1	$1,842	18.1%	8.8%	9.8%
Natural gas	101.4	$1,829	17.2%	8.4%	9.7%
Electricity	52.1	$1,639	18.5%	8.4%	8.7%
Fuel oil	107.3	$2,923	23.3%	12.9%	15.6%
Kerosene	65.0	$1,971	18.5%	11.0%	10.5%
LPG[6/]	96.6	$2,785	22.2%	13.3%	14.8%

Table 1d. Residential energy: Average annual household consumption, expenditures, and burden by LIHEAP recipient households, by main heating fuel type, United States, FY 2015[1/]

Main heating fuel	Fuel consumption (MMBtus)[2/]	Fuel expenditures	Mean individual burden[3/]	Median individual burden[4/]	Mean group burden[5/]
All fuels	93.2	$2,053	18.4%	9.2%	12.3%
Natural gas	112.7	$1,957	17.6%	8.3%	11.7%
Electricity	56.1	$1,673	17.6%	8.8%	10.0%
Fuel oil	115.7	$3,144	20.8%	12.4%	18.8%
Kerosene	85.1*	$2,714*	17.0%*	13.7%*	16.3%*
LPG[6/]	99.6	$2,929	26.3%	17.4%	17.5%

[1/] Data are derived from the 2009 RECS, adjusted to reflect FY 2015 heating degree days, cooling degree days, and fuel prices. Data represent residential energy used from October 2014 through September 2015. See also Tables A-3a – A-3c, Appendix A.
[2/] 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.
[3/] Mean individual burden is calculated by taking the mean, or average, of individual energy burdens, as calculated from FY 2015 adjusted RECS data. See Appendix A for information on calculation of energy burden.
[4/] Median individual burden is calculated by taking the median of individual energy burdens, as calculated from FY 2015 adjusted RECS data.
[5/] 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 2015; and (3) dividing the adjusted figures by the average income for each group of households from the 2015 CPS ASEC.

[6/] 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.

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 33 percent of their annual residential expenditures for space heating, 5 percentage points more than did the average low income household. LIHEAP recipient households spent 6 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 2015[1/]

End Use	All households	Non-low income households	Low income households	LIHEAP recipient households
Space heating	26%	25%	28%	33%
Space cooling	11%	12%	9%	6%
Water heating	13%	12%	14%	14%
Refrigeration	8%	8%	8%	8%
Appliances	42%	42%	40%	39%
All uses	100%	100%	100%	100%

[1/] Data are derived from the 2009 RECS. 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[1/]

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[2/]	2.9%	2.9%	3.0%	2.7%

[1/] Data are derived from the 2009 RECS. Percentages may not add to 100 percent due to rounding. See also Table 4.
[2/] 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.[5] 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 2015, average home heating consumption for all households was 37.7 MMBtus, average expenditures were $566, and mean individual home heating burden was 2.9 percent.

Low income households had average home heating consumption of 33.9 MMBtus (about 10 percent less than the average for all households) and average home heating expenditures of $525 (about 7 percent less than the average for all households). The mean individual home heating burden for low income households was 6.6 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.

[5] Findings from the 2009 RECS, Energy Information Administration, U.S. Department of Energy.

Average home heating consumption for LIHEAP recipient households was 45.2 MMBtus (about 20 percent higher than the average for all households), and average home heating expenditures were $690 (about 22 percent higher than the average for all households). Mean individual home heating burden for LIHEAP households was 7.7 percent, 1.1 percentage points 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 33 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 2015[1/]

Main heating fuel	Fuel consumpton (MMBtus)[2/]	Fuel expenditures	Mean individual burden[3/]	Median individual burden[4/]	Mean group burden[5/]
All fuels	37.7	$566	2.9%	0.9%	0.7%
Natural gas	53.4	$562	2.7%	0.9%	0.7%
Electricity	11.2	$359	2.4%	0.7%	0.5%
Fuel oil	76.4	$1,593	6.4%	2.5%	2.1%
Kerosene	36.1	$839	6.8%	3.3%	1.1%
LPG[6/]	53.9	$1,288	5.3%	2.5%	1.7%

Table 4b. Home heating: Average annual household consumption, expenditures, and burden by non-low income households, by fuel type, United States, FY 2015[1/]

Main heating fuel	Fuel consumpton (MMBtus)[2/]	Fuel expenditures	Mean individual burden[3/]	Median individual burden[4/]	Mean group burden[5/]
All fuels	39.7	$589	0.9%	0.6%	0.6%
Natural gas	53.9	$563	0.8%	0.6%	0.6%
Electricity	11.8	$372	0.6%	0.5%	0.4%
Fuel oil	81.0	$1,690	2.1%	1.7%	1.7%
Kerosene	36.5	$840	1.5%	1.2%	0.8%
LPG[6/]	56.6	$1,352	2.1%	1.7%	1.3%

Table 4c. Home heating: Average annual household consumption, expenditures, and burden by low income households, by fuel type, United States, FY 2015[1/]

Main heating fuel	Fuel consumpton (MMBtus)[2/]	Fuel expenditures	Mean individual burden[3/]	Median individual burden[4/]	Mean group burden[5/]
All fuels	33.9	$525	6.6%	2.2%	2.8%
Natural gas	52.3	$561	6.9%	2.5%	3.0%
Electricity	10.3	$337	5.4%	1.7%	1.8%
Fuel oil	67.9	$1,416	14.4%	6.7%	7.5%
Kerosene	36.0	$839	9.0%	5.3%	4.5%
LPG[6/]	48.2	$1,155	11.8%	5.2%	6.2%

Table 4d. Home heating: Average annual household consumption, expenditures, and burden by LIHEAP recipient households, by fuel type, United States, FY 2015[1/]

Main heating fuel	Fuel consumpton (MMBtus)[2/]	Fuel expenditures	Mean individual burden[3/]	Median individual burden[4/]	Mean group burden[5/]
All fuels	45.2	$690	7.7%	3.0%	4.1%
Natural gas	61.4	$661	8.2%	2.7%	4.0%
Electricity	11.8	$382	5.6%	2.4%	2.3%
Fuel oil	72.4	$1,527	11.9%	6.6%	9.1%
Kerosene	45.5*	$1,057*	7.0%*	4.8%*	6.3%*
LPG[6/]	51.4	$1,252	11.9%	8.2%	7.5%

[1/] Data are derived from the 2009 RECS, adjusted to reflect FY 2015 heating degree days and fuel prices. Data represent home energy used from October 2014 through September 2015. See also Tables A-5, A-6a – A-6c, Appendix A.
[2/] 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.
[3/] Mean individual burden is calculated by taking the mean, or average, of individual heating energy burdens, as calculated from FY 2015 adjusted RECS data. See Appendix A for information on energy burden calculation.
[4/] Median individual burden is calculated by taking the median of individual heating energy burdens, as calculated from FY 2015 adjusted RECS data
[5/] 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 2015; and (3) dividing the adjusted figures by the average income for each group of households from the 2015 CPS ASEC
[6/] 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[1/]

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

[1/] Data are derived from the 2009 RECS. See also Table A-7, Appendix A.
[2/] 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).
[3/] 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 2015, average home cooling consumption for all households that cooled was 6.8 MMBtus, average expenditures were $264, and mean individual home cooling burden was 1.1 percent.

For low income households that cooled, average home cooling energy consumption was 5.0 MMBtus (about 26 percent less than the average for all households) and average home cooling expenditures were $188 (about 29 percent less than the average for all households). The mean individual home cooling burden for low income households was 2.4 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 3.9 MMBtus (about 43 percent less than all households and 22 percent less than the average low income household), and average home cooling expenditures were $148 (about 44 percent less than all households and 21 percent less than the average low income household). Mean individual home cooling burden for LIHEAP recipient households was 1.6 percent, about 45 percent higher than the average for all households.

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 2015[1/]

Household group	Fuel consumption (MMBtus)[2/]	Fuel expenditures	Mean individual burden[3/]	Median individual burden[4/]	Mean group burden[5/]
All households	6.8	$264	1.1%	0.3%	0.3%
Non-low income households	7.8	$302	0.4%	0.2%	0.3%
Low income households	5.0	$188	2.4%	0.6%	1.0%
LIHEAP recipient households	3.9	$148	1.6%	0.4%	0.9%

[1/] Data are derived from the 2009 RECS, adjusted to reflect FY 2015 cooling degree days and fuel prices. Data represent residential energy used from October 2014 through September 2015. See also Table A-7, Appendix A.
[2/] 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.
[3/] Mean individual burden is calculated by taking the mean, or average, of individual cooling energy burdens, as calculated from FY 2015 adjusted RECS data. See Appendix A for information on energy burden calculation.
[4/] Median individual burden is calculated by taking the median of individual cooling energy burdens, as calculated from FY 2015 adjusted RECS data.
[5/] 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 2015; and (3) dividing the adjusted figures by the average income for each group of households from the 2015 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 2015. 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. Currently, this survey is conducted every four years.

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.[6]

The 2009 RECS is the thirteenth survey in the series of surveys.[7] For the 2009 RECS, 12,083 households were interviewed, including 724 verified LIHEAP recipient households. For the tabulations in this report, 2009 RECS consumption and expenditure data were updated using price and weather data to represent consumption and expenditures for FY 2015.

[6] 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).

[7] 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/

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 current and comprehensive data on residential energy use by low income households, several significant limitations must be addressed:[8]

- The 2009 RECS data for calendar year 2009 were updated to FY 2015 (October 1, 2014 to September 30, 2015), using procedures that adjust the 2009 data to reflect the weather and fuel prices for FY 2015. These procedures are comparable to those used for the FY 1986 - FY 2014 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 2015

[8] 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.

CPS ASEC 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.[9]

- 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 2015 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 2015 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.[10]

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).

[9] Note that household-level energy and income data from RECS are used to calculate mean and median individual energy burden.
[10] 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.[11] 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.[12] 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.[13] 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

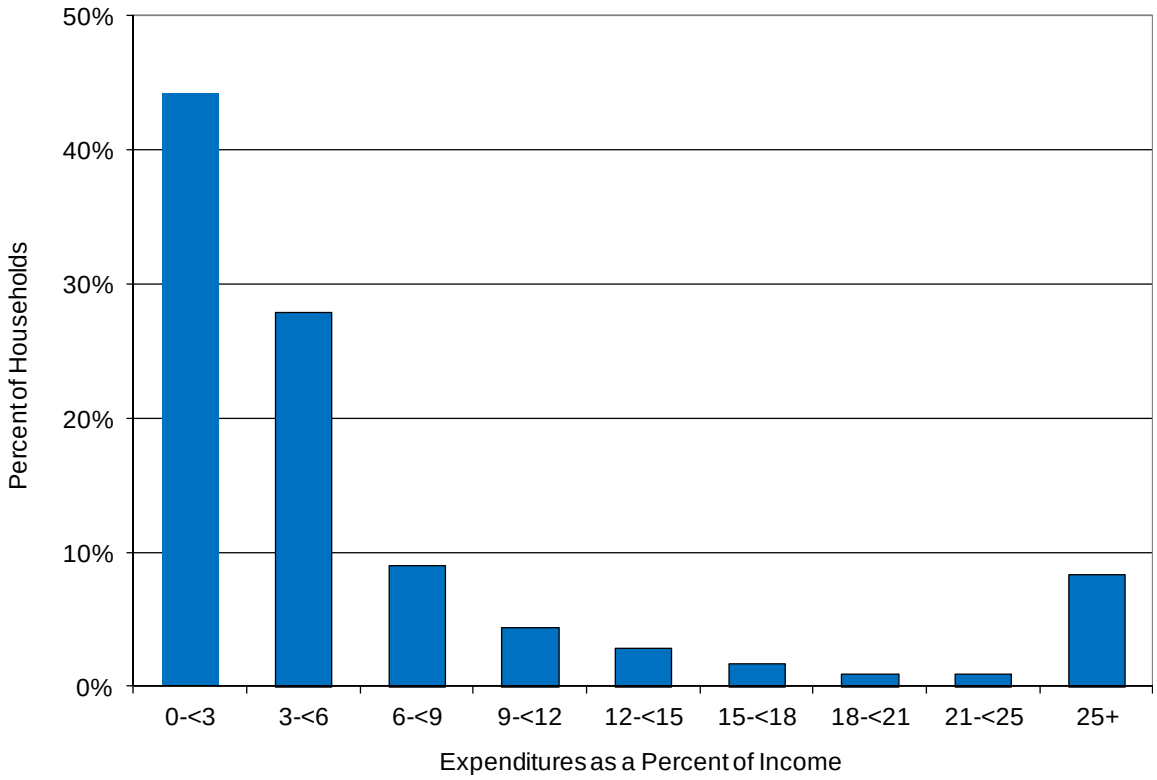
[11] The mean is the sum of all values divided by the number of values. The mean is also referred to as the average.

[12] 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.

[13] 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.

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 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.[14]

[14]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 *FY 1992 LIHEAP Report to Congress*, 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 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 Fiscal Year 2015. The following equation was applied to each household in the microsimulation data file.

FY 2015 Projected Btus = (2009 estimated heat use * HDD change) + (2009 estimated cooling use * CDD change) + (2009 estimated water heat use + 2009 estimated appliance use)

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

Preliminary Expenditures = 2009 Expenditures *

(FY 2015 Projected Usage/2009 Actual Usage)

Final Expenditures = Preliminary Expenditures * 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 2015. For example, electricity prices increased by about 9.7 percent from 2009 to FY 2015.

Table A-1. National price factors for FY 2015

Fuel	Price Factors for FY 2015 Projections
Electricity	1.0970
Natural gas	0.8623
Fuel oil / kerosene	1.1702
Liquefied petroleum gas (LPG)	1.0767

Expenditure data were adjusted using national price factors for FY 2015. 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

[15] 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*, December 2015, and electricity consumption data is from the *Electric Power Monthly*, November 2015. Natural gas price and consumption data used for calculating price factors are from the *Monthly Energy Review*, December 2015. Fuel oil/kerosene price data for calculating prices 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*, December 2015.

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.

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 2015[1/]

Census Region	All Fuels[2/] (MMBtus)[3/]	Natural Gas (MMBtus)	Electricity (MMBtus)	Fuel Oil (MMBtus)	Kerosene (MMBtus)	LPG (MMBtus)
US - All households	90.8	110.4	60.9	122.3	67.4	111.4
US - Non-low income households	97.1	114.5	66.4	130.4	73.3	118.5
US - Low income households[4/]	79.1	101.4	52.1	107.3	65.0	96.6
US - LIHEAP recipient households[5/]	93.2	112.7	56.1	115.7	85.1*	99.6
Northeast - All households	111.7	121.6	52.2	124.6	72.6	118.1
Northeast - Non-low income households	119.0	128.1	57.6	133.6	78.8	127.0
Northeast - Low income households	98.6	110.5	43.5	107.0	69.8	94.1
Northeast - LIHEAP recipient households	102.9	109.0	46.3	117.4	88.7*	97.4*
Midwest - All households	114.7	127.9	67.3	110.0	NC	127.5
Midwest - Non-low income households	121.0	132.5	77.0	111.7	NC	131.1
Midwest - Low income households	103.4	119.0	53.4	108.7	NC	119.4
Midwest - LIHEAP recipient households	108.8	123.4	59.4	96.3*	NC	104.4
South - All households	78.1	106.8	62.5	114.7	60.9	97.3
South - Non-low income households	84.8	114.1	66.9	117.7	69.2*	107.4
South - Low income households	65.8	90.5	54.6	108.3	58.8*	80.0
South - LIHEAP recipient households	77.1	113.9	60.3	119.3*	63.7*	105.9*
West - All households	69.9	81.9	54.6	103.5	46.8*	96.4
West - Non-low income households	75.6	85.2	60.6	102.6	48.3*	101.0
West - Low income households	58.4	72.2	46.6	106.0*	45.2*	87.5
West - LIHEAP recipient households	63.9	86.0	44.0	105.0*	NC	55.9*

[1] Developed from the 2009 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy, and adjusted for FY 2015 for heating and cooling degree days.
[2] Weighted average of natural gas, electricity, fuel oil, kerosene, and liquefied petroleum gas consumption. RECS consumption data are not collected for other fuels.
[3] 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.
[4] Households with income at or below the maximum in section 2605(b)(2)(B) of Public Law 97-35.
[5] Includes verified LIHEAP recipient households from the 2009 RECS.
* = This figure should be viewed with caution because of the small number of sample cases.
NC = No cases in the 2009 RECS household sample.

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 2015

Census Region	All Fuels[1/]	All Fuels[2/]	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	$2,146	2.8%	$2,087	2.8%	$1,939	2.6%	$3,439	4.5%	$2,090	2.8%	$3,180	4.2%
US - Non-low income households	$2,309	2.3%	$2,207	2.2%	$2,124	2.1%	$3,718	3.7%	$2,387	2.4%	$3,372	3.3%
US - Low income households[3/]	$1,842	9.8%	$1,829	9.7%	$1,639	8.7%	$2,923	15.6%	$1,971	10.5%	$2,785	14.8%
US - LIHEAP recipient households[4/]	$2,053	12.3%	$1,957	11.7%	$1,673	10.0%	$3,144	18.8%	$2,714*	16.3%*	$2,929	17.5%
Northeast - All households	$2,796	3.3%	$2,545	3.0%	$1,975	2.4%	$3,531	4.2%	$2,263	2.7%	$3,983	4.8%
Northeast - Non-low income households	$3,032	2.6%	$2,733	2.4%	$2,159	1.9%	$3,829	3.3%	$2,594	2.2%	$4,259	3.7%
Northeast - Low income households	$2,375	11.1%	$2,226	10.4%	$1,675	7.8%	$2,955	13.8%	$2,117	9.9%	$3,242	15.1%
Northeast - LIHEAP recipient households	$2,450	13.6%	$2,167	12.0%	$1,642	9.1%	$3,165	17.5%	$2,817*	15.6%*	$3,185*	17.6%*
Midwest - All households	$2,051	2.8%	$1,988	2.7%	$1,688	2.3%	$2,751	3.7%	NC	NC	$3,303	4.5%
Midwest - Non-low income households	$2,163	2.3%	$2,080	2.2%	$1,853	1.9%	$2,839	3.0%	NC	NC	$3,402	3.5%
Midwest - Low income households	$1,847	9.9%	$1,810	9.7%	$1,449	7.7%	$2,679	14.3%	NC	NC	$3,080	16.5%
Midwest - LIHEAP recipient households	$1,933	11.8%	$1,822	11.2%	$1,560	9.6%	$2,579*	15.8%*	NC	NC	$2,829	17.3%
South - All households	$2,211	3.1%	$2,323	3.3%	$2,112	3.0%	$3,241	4.6%	$1,847	2.6%	$2,933	4.1%
South - Non-low income households	$2,398	2.5%	$2,514	2.7%	$2,283	2.4%	$3,384	3.6%	$1,998*	2.1%*	$3,156	3.3%
South - Low income households	$1,867	11.0%	$1,896	11.2%	$1,813	10.7%	$2,941	17.4%	$1,809*	10.7%*	$2,549	15.1%
South - LIHEAP recipient households	$2,024	14.4%	$2,220	15.8%	$1,852	13.2%	$3,650*	26.0%*	$2,096*	14.9%*	$3,566*	25.4%*
West - All households	$1,590	2.0%	$1,623	2.0%	$1,492	1.9%	$2,796	3.5%	$1,539*	1.9%*	$2,711	3.4%
West - Non-low income households	$1,730	1.6%	$1,724	1.6%	$1,682	1.6%	$2,761	2.6%	$1,899*	1.8%*	$2,889	2.7%
West - Low income households	$1,308	6.7%	$1,319	6.8%	$1,237	6.3%	$2,894*	14.8%*	$1,155*	5.9%*	$2,364	12.1%
West - LIHEAP recipient households	$1,234	6.9%	$1,336	7.5%	$1,124	6.3%	$2,224*	12.4%*	NC	NC	$1,499*	8.4%*

[1/] 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 2015. 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.
[2/] Represents the percent of household's income used for residential energy expenditures. National and regional mean incomes are calculated from the 2015 CPS ASEC, which reports income for calendar year 2014. 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.
[3/] Households with annual incomes at or below the maximum in section 2605(b)(2)(B) of Public Law 97-35.
[4/] Includes verified LIHEAP recipient households from the 2009 RECS.
* = This figure should be viewed with caution because of the small number of sample cases.
NC = No cases in the 2009 RECS household sample.

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 2015

Census Region	All Fuels[1/]	All Fuels[2/]	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	$2,146	8.4%	$2,087	7.4%	$1,939	9.1%	$3,439	11.0%	$2,090	14.5%	$3,180	10.7%
US - Non-low income households	$2,309	3.2%	$2,207	2.9%	$2,124	3.3%	$3,718	4.4%	$2,387	4.6%	$3,372	5.1%
US - Low income households[3/]	$1,842	18.1%	$1,829	17.2%	$1,639	18.5%	$2,923	23.3%	$1,971	18.5%	$2,785	22.2%
US - LIHEAP recipient households[4/]	$2,053	18.4%	$1,957	17.6%	$1,673	17.6%	$3,144	20.8%	$2,714*	17.0%*	$2,929	26.3%
Northeast - All households	$2,796	9.5%	$2,545	8.3%	$1,975	10.0%	$3,531	11.2%	$2,263	17.4%	$3,983	9.7%
Northeast - Non-low income households	$3,032	3.6%	$2,733	3.2%	$2,159	2.8%	$3,829	4.5%	$2,594	4.8%	$4,259	5.1%
Northeast - Low income households	$2,375	19.9%	$2,226	17.0%	$1,675	21.7%	$2,955	24.2%	$2,117	22.9%	$3,242	22.1%
Northeast - LIHEAP recipient households	$2,450	17.8%	$2,167	15.5%	$1,642	17.8%	$3,165	21.9%	$2,817*	18.4%*	$3,185*	20.9%*
Midwest - All households	$2,051	8.6%	$1,988	8.1%	$1,688	9.2%	$2,751	13.7%	NC	NC	$3,303	9.9%
Midwest - Non-low income households	$2,163	3.2%	$2,080	3.0%	$1,853	2.8%	$2,839	4.7%	NC	NC	$3,402	4.7%
Midwest - Low income households	$1,847	18.4%	$1,810	17.9%	$1,449	18.4%	$2,679	21.0%	NC	NC	$3,080	21.8%
Midwest - LIHEAP recipient households	$1,933	20.9%	$1,822	20.4%	$1,560	19.9%	$2,579*	16.8%*	NC	NC	$2,829	23.5%
South - All households	$2,211	9.6%	$2,323	8.9%	$2,112	9.9%	$3,241	7.0%	$1,847	10.6%	$2,933	12.0%
South - Non-low income households	$2,398	3.6%	$2,514	3.4%	$2,283	3.6%	$3,384	3.9%	$1,998*	5.4%*	$3,156	6.0%
South - Low income households	$1,867	20.5%	$1,896	21.2%	$1,813	20.9%	$2,941	13.7%	$1,809*	12.0%*	$2,549	22.4%
South - LIHEAP recipient households	$2,024	20.1%	$2,220	20.3%	$1,852	19.2%	$3,650*	14.4%*	$2,096*	8.4%*	$3,566*	56.4%*
West - All households	$1,590	5.4%	$1,623	4.4%	$1,492	6.0%	$2,796	14.0%	$1,539*	4.3%*	$2,711	10.7%
West - Non-low income households	$1,730	2.2%	$1,724	2.1%	$1,682	2.3%	$2,761	4.1%	$1,899*	1.9%*	$2,889	4.4%
West - Low income households	$1,308	11.6%	$1,319	11.3%	$1,237	10.8%	$2,894*	41.8%*	$1,155*	6.9%*	$2,364	23.1%
West - LIHEAP recipient households	$1,234	9.6%	$1,336	10.7%	$1,124	8.6%	$2,224*	8.9%*	NC	NC	$1,499*	18.1%*

[1/] 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 2015. 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.

[2/] Represents the percent of household income used for residential energy expenditures. For individual households, FY 2015 income is estimated by inflating income reported in the 2009 RECS by the consumer price index (CPI) and FY 2015 energy expenditures are estimated by adjusting energy expenditures reported in the 2009 RECS for changes in weather and energy prices. FY 2015 residential energy burden for each household is computed as estimated FY 2015 residential energy expenditures divided by estimated FY 2015 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.

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

[4/] Includes verified LIHEAP recipient households from the 2009 RECS.

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

NC = No cases in the 2009 RECS household sample.

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 2015

Census Region	All Fuels[1/]	All Fuels[2/]	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	$2,146	3.8%	$2,087	3.4%	$1,939	4.0%	$3,439	5.6%	$2,090	9.7%	$3,180	6.2%
US - Non-low income households	$2,309	2.8%	$2,207	2.6%	$2,124	2.8%	$3,718	4.0%	$2,387	3.9%	$3,372	4.7%
US - Low income households[3/]	$1,842	8.8%	$1,829	8.4%	$1,639	8.4%	$2,923	12.9%	$1,971	11.0%	$2,785	13.3%
US - LIHEAP recipient households[4/]	$2,053	9.2%	$1,957	8.3%	$1,673	8.8%	$3,144	12.4%	$2,714*	13.7%*	$2,929	17.4%
Northeast - All households	$2,796	4.4%	$2,545	4.1%	$1,975	3.7%	$3,531	5.5%	$2,263	9.7%	$3,983	5.2%
Northeast - Non-low income households	$3,032	3.1%	$2,733	2.8%	$2,159	2.4%	$3,829	4.0%	$2,594	3.8%	$4,259	4.4%
Northeast - Low income households	$2,375	10.5%	$2,226	9.6%	$1,675	8.1%	$2,955	13.7%	$2,117	11.8%	$3,242	10.9%
Northeast - LIHEAP recipient households	$2,450	10.1%	$2,167	8.3%	$1,642	6.2%	$3,165	13.9%	$2,817*	13.7%*	$3,185*	12.0%*
Midwest - All households	$2,051	3.8%	$1,988	3.6%	$1,688	3.6%	$2,751	7.6%	NC	NC	$3,303	5.3%
Midwest - Non-low income households	$2,163	2.7%	$2,080	2.7%	$1,853	2.5%	$2,839	4.7%	NC	NC	$3,402	4.4%
Midwest - Low income households	$1,847	8.9%	$1,810	8.5%	$1,449	7.0%	$2,679	11.8%	NC	NC	$3,080	16.3%
Midwest - LIHEAP recipient households	$1,933	9.2%	$1,822	8.8%	$1,560	8.8%	$2,579*	7.6%*	NC	NC	$2,829	17.4%
South - All households	$2,211	4.5%	$2,323	3.9%	$2,112	4.5%	$3,241	4.9%	$1,847	9.9%	$2,933	7.1%
South - Non-low income households	$2,398	3.2%	$2,514	3.0%	$2,283	3.2%	$3,384	3.5%	$1,998*	4.6%*	$3,156	5.7%
South - Low income households	$1,867	9.9%	$1,896	10.6%	$1,813	9.4%	$2,941	8.6%	$1,809*	10.0%*	$2,549	14.2%
South - LIHEAP recipient households	$2,024	10.0%	$2,220	12.2%	$1,852	9.2%	$3,650*	6.8%*	$2,096*	8.4%*	$3,566*	16.7%*
West - All households	$1,590	2.5%	$1,623	2.2%	$1,492	2.8%	$2,796	5.0%	$1,539*	2.0%*	$2,711	6.4%
West - Non-low income households	$1,730	1.9%	$1,724	1.9%	$1,682	1.9%	$2,761	3.5%	$1,899*	2.0%*	$2,889	4.0%
West - Low income households	$1,308	5.4%	$1,319	5.3%	$1,237	5.5%	$2,894*	48.8%*	$1,155*	6.8%*	$2,364	9.6%
West - LIHEAP recipient households	$1,234	6.3%	$1,336	5.9%	$1,124	5.5%	$2,224*	8.9%*	NC	NC	$1,499*	9.3%*

[1/] 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 2015. 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.

[2/] Represents the percent of household income used for residential energy expenditures. For individual households, FY 2015 income is estimated by inflating income reported in the 2009 RECS by the consumer price index (CPI) and FY 2015 energy expenditures are estimated by adjusting energy expenditures reported in the 2009 RECS for changes in weather and energy prices. FY 2015 residential energy burden for each household is computed as estimated FY 2015 residential energy expenditures divided by estimated FY 2015 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.

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

[4/] Includes verified LIHEAP recipient households from the 2009 RECS.

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

NC = No cases in the 2009 RECS household sample.

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[1/]

Census Region	Natural Gas[2/]	Electricity	Fuel Oil	Kerosene	LPG	Other[3/]
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[4/]	44.4%	36.7%	6.1%	0.9%	4.6%	3.0%
US - LIHEAP recipient households[5/]	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	33.8%	56.4%	1.5%	0.1%	4.4%	1.8%
South - Low income households	27.9%	59.3%	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	61.5%	24.2%	0.6%	0.1%	3.3%	3.0%
West - Low income households	41.2%	36.4%	0.4%	0.2%	3.4%	3.8%
West - LIHEAP recipient households	45.9%	37.7%	0.8%	NC	2.8%	3.8%

[1/] 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.
[2/] The sum of percentages across fuel types may not equal 100%, due to rounding.
[3/] This category includes households using wood, coal, and other minor fuels as a main heating source and households reporting no main fuel.
[4/] Households with income at or below the maximum in section 2605(b)(2)(B) of Public Law 97-35.
[5/] Includes verified LIHEAP recipient households from the 2009 RECS.
NC = No cases in the 2009 RECS household sample.

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 2015[1/]

Census Region	All Fuels[2/] (MMBtus)[3/]	Natural Gas (MMBtus)	Electricity (MMBtus)	Fuel Oil (MMBtus)	Kerosene (MMBtus)	LPG (MMBtus)
US - All households	37.7	53.4	11.2	76.4	36.1	53.9
US - Non-low income households	39.7	53.9	11.8	81.0	36.5	56.6
US - Low income households[4/]	33.9	52.3	10.3	67.9	36.0	48.2
US - LIHEAP recipient households[5/]	45.2	61.4	11.8	72.4	45.5*	51.4
Northeast - All households	62.1	67.5	15.1	79.0	43.1	60.4
Northeast - Non-low income households	64.6	69.0	16.3	83.8	44.9	62.4
Northeast - Low income households	57.5	65.1	13.0	69.5	42.4	55.0
Northeast - LIHEAP recipient households	60.1	63.4	11.7	75.2	51.2*	55.7*
Midwest - All households	58.9	70.4	17.0	65.7	NC	68.8
Midwest - Non-low income households	61.2	71.9	18.9	65.3	NC	69.7
Midwest - Low income households	54.6	67.5	14.4	66.1	NC	66.6
Midwest - LIHEAP recipient households	58.0	72.3	15.3	52.9*	NC	53.8
South - All households	22.1	41.5	10.6	66.3	25.3	39.0
South - Non-low income households	24.0	43.5	11.0	70.2	23.4*	43.5
South - Low income households	18.8	37.2	9.8	58.1	25.7*	31.2
South - LIHEAP recipient households	23.3	46.3	11.9	62.5*	11.3*	44.6*
West - All households	21.6	31.6	8.4	46.9	18.7*	44.4
West - Non-low income households	24.1	32.6	8.6	48.2	12.0*	44.8
West - Low income households	16.7	28.6	8.1	43.4*	25.9*	43.5
West - LIHEAP recipient households	21.3	37.5	7.5	55.5*	NC	25.0*

[1/] Developed from the 2009 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy, and adjusted for FY 2015 for heating degree days.
[2/] Weighted average of natural gas, electricity, fuel oil, kerosene, and liquefied petroleum gas space heating consumption. Consumption data are not collected for other fuels.
[3/] 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.
[4/] Households with income at or below the maximum in section 2605(b)(2)(B) of Public Law 97-35.
[5/] Includes verified LIHEAP recipient households from the 2009 RECS.
* = This figure should be viewed with caution because of the small number of sample cases.
NC = No cases in the 2009 RECS household sample.

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 2015

Census Region	All Fuels[1/]	All Fuels[2/]	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	$566	0.7%	$562	0.7%	$359	0.5%	$1,593	2.1%	$839	1.1%	$1,288	1.7%
US - Non-low income households	$589	0.6%	$563	0.6%	$372	0.4%	$1,690	1.7%	$840	0.8%	$1,352	1.3%
US - Low income households[3/]	$525	2.8%	$561	3.0%	$337	1.8%	$1,416	7.5%	$839	4.5%	$1,155	6.2%
US - LIHEAP recipient households[4/]	$690	4.1%	$661	4.0%	$382	2.3%	$1,527	9.1%	$1,057*	6.3%*	$1,252	7.5%
Northeast - All households	$1,064	1.3%	$861	1.0%	$620	0.7%	$1,649	2.0%	$985	1.2%	$1,730	2.1%
Northeast - Non-low income households	$1,116	1.0%	$883	0.8%	$647	0.6%	$1,747	1.5%	$1,054	0.9%	$1,758	1.5%
Northeast - Low income households	$970	4.5%	$825	3.8%	$576	2.7%	$1,460	6.8%	$955	4.4%	$1,655	7.7%
Northeast - LIHEAP recipient households	$1,022	5.7%	$789	4.4%	$486	2.7%	$1,581	8.8%	$1,186*	6.6%*	$1,616*	8.9%*
Midwest - All households	$685	0.9%	$650	0.9%	$471	0.6%	$1,282	1.7%	NC	NC	$1,483	2.0%
Midwest - Non-low income households	$702	0.7%	$657	0.7%	$496	0.5%	$1,305	1.4%	NC	NC	$1,510	1.6%
Midwest - Low income households	$653	3.5%	$637	3.4%	$433	2.3%	$1,264	6.8%	NC	NC	$1,421	7.6%
Midwest - LIHEAP recipient households	$690	4.2%	$688	4.2%	$459	2.8%	$1,012*	6.2%*	NC	NC	$1,171	7.2%
South - All households	$421	0.6%	$479	0.7%	$344	0.5%	$1,439	2.0%	$621	0.9%	$1,023	1.4%
South - Non-low income households	$443	0.5%	$498	0.5%	$354	0.4%	$1,521	1.6%	$474*	0.5%*	$1,123	1.2%
South - Low income households	$381	2.3%	$437	2.6%	$326	1.9%	$1,267	7.5%	$658*	3.9%*	$852	5.0%
South - LIHEAP recipient households	$453	3.2%	$525	3.7%	$377	2.7%	$1,519*	10.8%*	$282*	2.0%*	$1,155*	8.2%*
West - All households	$273	0.3%	$290	0.4%	$247	0.3%	$977	1.2%	$428*	0.5%*	$998	1.2%
West - Non-low income households	$292	0.3%	$300	0.3%	$254	0.2%	$995	0.9%	$264*	0.2%*	$1,029	1.0%
West - Low income households	$236	1.2%	$262	1.3%	$237	1.2%	$927*	4.8%*	$602*	3.1%*	$938	4.8%
West - LIHEAP recipient households	$264	1.5%	$323	1.8%	$229	1.3%	$1,073*	6.0%*	NC	NC	$556*	3.1%*

[1/] 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 2015. 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.
[2/] Represents the percent of household income used for home heating energy expenditures. National and regional mean incomes are calculated from the 2015 CPS ASEC, which reports income for calendar year 2014. 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.
[3/] Households with annual incomes at or below the maximum in section 2605(b)(2)(B) of Public Law 97-35.
[4/] Includes verified LIHEAP recipient households from the 2009 RECS.
* = This figure should be viewed with caution because of the small number of sample cases.
NC = No cases in the 2009 RECS household sample.

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 2015

Census Region	All Fuels[1/]	All Fuels[2/]	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	$566	2.9%	$562	2.7%	$359	2.4%	$1,593	6.4%	$839	6.8%	$1,288	5.3%
US - Non-low income households	$589	0.9%	$563	0.8%	$372	0.6%	$1,690	2.1%	$840	1.5%	$1,352	2.1%
US - Low income households[3/]	$525	6.6%	$561	6.9%	$337	5.4%	$1,416	14.4%	$839	9.0%	$1,155	11.8%
US - LIHEAP recipient households[4/]	$690	7.7%	$661	8.2%	$382	5.6%	$1,527	11.9%	$1,057*	7.0%*	$1,252	11.9%
Northeast - All households	$1,064	4.7%	$861	3.8%	$620	4.4%	$1,649	6.6%	$985	8.8%	$1,730	5.3%
Northeast - Non-low income households	$1,116	1.4%	$883	1.1%	$647	0.9%	$1,747	2.1%	$1,054	1.8%	$1,758	2.2%
Northeast - Low income households	$970	10.5%	$825	8.4%	$576	10.1%	$1,460	15.2%	$955	11.8%	$1,655	13.8%
Northeast - LIHEAP recipient households	$1,022	9.3%	$789	8.2%	$486	5.6%	$1,581	12.9%	$1,186*	8.0%*	$1,616*	10.1%*
Midwest - All households	$685	3.8%	$650	3.5%	$471	4.1%	$1,282	7.2%	NC	NC	$1,483	5.3%
Midwest - Non-low income households	$702	1.1%	$657	1.0%	$496	0.8%	$1,305	2.3%	NC	NC	$1,510	2.3%
Midwest - Low income households	$653	8.6%	$637	8.4%	$433	8.9%	$1,264	11.3%	NC	NC	$1,421	12.1%
Midwest - LIHEAP recipient households	$690	9.7%	$688	10.1%	$459	9.3%	$1,012*	7.2%*	NC	NC	$1,171	12.1%
South - All households	$421	2.4%	$479	2.5%	$344	2.2%	$1,439	3.3%	$621	3.9%	$1,023	4.9%
South - Non-low income households	$443	0.7%	$498	0.7%	$354	0.6%	$1,521	1.8%	$474*	1.3%*	$1,123	2.2%
South - Low income households	$381	5.5%	$437	6.6%	$326	5.1%	$1,267	6.6%	$658*	4.5%*	$852	9.5%
South - LIHEAP recipient households	$453	6.1%	$525	7.5%	$377	5.4%	$1,519*	6.6%*	$282*	1.1%*	$1,155*	17.7%*
West - All households	$273	1.2%	$290	1.0%	$247	1.3%	$977	9.7%	$428*	1.8%*	$998	6.2%
West - Non-low income households	$292	0.4%	$300	0.4%	$254	0.4%	$995	1.5%	$264*	0.3%*	$1,029	1.6%
West - Low income households	$236	2.8%	$262	2.8%	$237	2.5%	$927*	32.8%*	$602*	3.4%*	$938	15.2%
West - LIHEAP recipient households	$264	2.1%	$323	2.5%	$229	1.9%	$1,073*	4.3%*	NC	NC	$556*	6.9%*

[1/] 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 2015. 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.

[2/] Represents the percent of household income used for home heating energy expenditures. For individual households, FY 2015 income is estimated by inflating income reported in the 2009 RECS by the consumer price index (CPI) and FY 2015 energy expenditures are estimated by adjusting energy expenditures reported in the 2009 RECS for changes in weather and energy prices. FY 2015 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.

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

[4/] Includes verified LIHEAP recipient households from the 2009 RECS.

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

NC = No cases in the 2009 RECS household sample.

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 2015

Census Region	All Fuels[1/]	All Fuels[2/]	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	$566	0.9%	$562	0.9%	$359	0.7%	$1,593	2.5%	$839	3.3%	$1,288	2.5%
US - Non-low income households	$589	0.6%	$563	0.6%	$372	0.5%	$1,690	1.7%	$840	1.2%	$1,352	1.7%
US - Low income households[3/]	$525	2.2%	$561	2.5%	$337	1.7%	$1,416	6.7%	$839	5.3%	$1,155	5.2%
US - LIHEAP recipient households[4/]	$690	3.0%	$661	2.7%	$382	2.4%	$1,527	6.6%	$1,057*	4.8%*	$1,252	8.2%
Northeast - All households	$1,064	1.6%	$861	1.3%	$620	1.3%	$1,649	2.5%	$985	4.1%	$1,730	2.2%
Northeast - Non-low income households	$1,116	1.1%	$883	0.9%	$647	0.7%	$1,747	1.7%	$1,054	1.7%	$1,758	1.6%
Northeast - Low income households	$970	4.2%	$825	3.4%	$576	3.0%	$1,460	7.4%	$955	5.8%	$1,655	5.6%
Northeast - LIHEAP recipient households	$1,022	4.2%	$789	2.7%	$486	2.2%	$1,581	7.9%	$1,186*	4.8%*	$1,616*	7.6%*
Midwest - All households	$685	1.2%	$650	1.2%	$471	1.0%	$1,282	4.1%	NC	NC	$1,483	2.9%
Midwest - Non-low income households	$702	0.8%	$657	0.8%	$496	0.7%	$1,305	2.3%	NC	NC	$1,510	1.9%
Midwest - Low income households	$653	3.0%	$637	3.0%	$433	2.3%	$1,264	6.0%	NC	NC	$1,421	7.7%
Midwest - LIHEAP recipient households	$690	3.4%	$688	3.5%	$459	2.6%	$1,012*	3.8%*	NC	NC	$1,171	8.2%
South - All households	$421	0.8%	$479	0.8%	$344	0.7%	$1,439	2.0%	$621	1.8%	$1,023	2.4%
South - Non-low income households	$443	0.5%	$498	0.5%	$354	0.5%	$1,521	1.6%	$474*	1.2%*	$1,123	1.8%
South - Low income households	$381	1.9%	$437	2.3%	$326	1.8%	$1,267	4.2%	$658*	3.3%*	$852	4.6%
South - LIHEAP recipient households	$453	2.5%	$525	2.9%	$377	2.4%	$1,519*	2.9%*	$282*	1.1%*	$1,155*	10.9%*
West - All households	$273	0.4%	$290	0.4%	$247	0.5%	$977	1.6%	$428*	0.4%*	$998	1.7%
West - Non-low income households	$292	0.3%	$300	0.3%	$254	0.3%	$995	1.4%	$264*	0.4%*	$1,029	1.2%
West - Low income households	$236	0.8%	$262	1.0%	$237	1.0%	$927*	19.9%*	$602*	4.8%*	$938	4.2%
West - LIHEAP recipient households	$264	1.4%	$323	1.7%	$229	1.3%	$1,073*	4.3%*	NC	NC	$556*	3.2%*

[1/] 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 2015. 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.

[2/] Represents the percent of household income used for home heating energy expenditures. For individual households, FY 2015 income is estimated by inflating income reported in the 2009 RECS by the consumer price index (CPI) and FY 2015 energy expenditures are estimated by adjusting energy expenditures reported in the 2009 RECS for changes in weather and energy prices. FY 2015 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.

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

[4/] Includes verified LIHEAP recipient households from the 2009 RECS.

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

NC = No cases in the 2009 RECS household sample.

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 2015

Census Region	Percent that cool[1/]	Consumption[2/] *(in MMBtus)*	Expenditures[2/]	Mean group burden[3/]	Mean individual burden[3/]	Median individual burden[3/]
US - All households	92.5%	6.8	$264	0.3%	1.1%	0.3%
US - Non-low income households	94.3%	7.8	$302	0.3%	0.4%	0.2%
US - Low income households[4/]	89.1%	5.0	$188	1.0%	2.4%	0.6%
US - LIHEAP recipient households[5/]	88.6%	3.9	$148	0.9%	1.6%	0.4%
Northeast - All households	89.0%	3.0	$156	0.2%	0.6%	0.2%
Northeast - Non-low income households	93.4%	3.3	$175	0.2%	0.2%	0.1%
Northeast - Low income households	81.1%	2.2	$117	0.5%	1.3%	0.4%
Northeast - LIHEAP recipient households	79.9%	2.6	$131	0.7%	1.1%	0.4%
Midwest - All households	95.0%	3.6	$120	0.2%	0.5%	0.2%
Midwest - Non-low income households	97.1%	4.1	$136	0.1%	0.2%	0.1%
Midwest - Low income households	91.3%	2.6	$88	0.5%	1.1%	0.3%
Midwest - LIHEAP recipient households	91.2%	2.3	$77	0.5%	1.0%	0.2%
South - All households	98.7%	11.5	$429	0.6%	1.9%	0.7%
South - Non-low income households	99.4%	13.3	$499	0.5%	0.7%	0.6%
South - Low income households	97.3%	8.1	$298	1.8%	4.2%	1.4%
South - LIHEAP recipient households	99.5%	7.0	$244	1.7%	2.8%	1.0%
West - All households	82.2%	4.8	$198	0.2%	0.6%	0.1%
West - Non-low income households	83.7%	5.4	$225	0.2%	0.3%	0.1%
West - Low income households	79.3%	3.5	$139	0.7%	1.3%	0.3%
West - LIHEAP recipient households	81.8%	3.2	$113	0.6%	0.9%	0.3%

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[1/] 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.)

[2/] 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 2015. Expenditures represent billed costs for electricity used

[3/] Represents the percent of household income used for home cooling energy expenditures.

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

[5/] 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 recipiency targeting performance statistics.

State-level estimates of the number of income eligible households for FY 2015 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.[16] 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 three-year average of the 2012-2014 single-year ("3-year average") ACS Public Use Microdata Sample (PUMS) data are used to develop more precise estimates of the number of income eligible households than those that would have been obtained using the 2014 single-year ACS PUMS data.[17]

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,[18] derived from the 3-year average of the 2012-2014 ACS, using the federal maximum income standard and the FY 2015 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 3-year average of the 2012-2014 ACS, using the using the federal maximum income standard and the FY 2015 state income standards, respectively.

[16] For an explanation, and to better understand the differences between the ACS and CPS ASEC, please visit "Guidance about Income Sources" at http://www.census.gov/hhes/www/income/method/guidance/index.html.

[17] The Census Bureau recommends multi-year data estimates from the ACS instead of estimates from the one-year ACS when precision of the estimates are of primary importance. (See http://www.census.gov/acs/www/guidance_for_data_users/estimates/.) In prior *Notebooks*, state-level estimates of the 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*, the methodology chosen to develop state-level estimates of the eligible population was the three-year average of the 2012-2014 1-year ACS PUMS files was chosen to maintain consistency with prior *Notebooks* and because the 5-year (2010-2014) ACS PUMS file would have a lag affect from earlier years.

[18] 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*.

Table B-1. State-level estimates of the number of LIHEAP income eligible households using the federal maximum LIHEAP income standard by vulnerability category[1/] [2/] [3/]

(Three-Year Average of the 2012-2014 ACS)

State	Total number of LIHEAP eligible households[4/]	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[5/]	LIHEAP eligible households with no vulnerable members
Alabama	598,659	223,825	106,919	270,266	163,311
Alaska	63,236	20,273	15,282	21,281	21,110
Arizona	664,660	240,228	138,688	225,122	212,642
Arkansas	336,564	123,044	66,132	157,978	84,724
California	3,882,439	1,400,580	837,560	1,303,473	1,272,841
Colorado	592,337	200,130	111,700	188,177	211,699
Connecticut	436,824	183,373	68,468	156,793	129,828
Delaware	98,932	41,034	17,038	36,732	28,878
District of Columbia	80,213	27,564	11,887	31,782	27,454
Florida	2,086,727	901,011	337,032	738,876	622,021
Georgia	1,097,605	363,788	233,291	408,004	350,634
Hawaii	117,901	50,325	23,360	39,119	34,925
Idaho	154,542	53,295	33,143	58,045	45,061
Illinois	1,491,484	568,629	263,059	517,318	485,666
Indiana	741,875	259,118	144,009	291,500	224,700
Iowa	359,096	144,126	58,189	131,672	108,911
Kansas	321,227	114,510	66,849	120,734	96,142
Kentucky	560,390	209,563	96,286	279,660	134,601
Louisiana	598,119	217,322	106,340	250,935	179,755
Maine	172,745	74,395	22,931	80,064	42,130
Maryland	664,597	264,054	120,239	225,764	209,474
Massachusetts	860,902	382,323	119,203	354,583	235,245
Michigan	1,200,571	437,243	206,885	498,057	349,174
Minnesota	615,404	241,842	106,100	220,361	185,703
Mississippi	370,953	138,994	72,411	172,889	99,039
Missouri	721,486	269,157	122,432	306,789	203,619
Montana	123,536	47,488	18,945	46,416	38,756
Nebraska	206,556	75,988	41,109	72,121	64,615
Nevada	279,630	95,529	59,414	97,154	89,774
New Hampshire	149,967	63,298	20,979	60,845	41,850
New Jersey	1,056,363	450,710	177,021	358,999	324,644
New Mexico	223,211	80,684	43,742	87,799	68,166
New York	2,366,440	967,197	399,609	868,247	709,834
North Carolina	1,154,478	421,551	213,724	455,323	353,881
North Dakota	83,100	30,763	12,931	27,145	30,050
Ohio	1,439,003	543,607	244,916	598,643	404,907
Oklahoma	416,828	146,259	86,028	178,685	114,992
Oregon	442,307	163,166	80,972	176,968	130,357
Pennsylvania	1,580,756	695,137	228,490	660,833	418,730
Rhode Island	138,059	55,524	20,256	57,221	39,686
South Carolina	536,658	201,616	100,548	222,416	153,934
South Dakota	91,481	37,380	16,519	33,554	25,888
Tennessee	762,148	282,104	141,174	342,074	201,381
Texas	2,628,679	841,221	626,890	921,775	852,677
Utah	210,535	61,327	58,546	67,067	65,983
Vermont	79,185	35,248	10,266	33,895	20,619
Virginia	921,760	356,889	168,414	336,458	282,018
Washington	770,534	279,773	144,966	291,615	236,110
West Virginia	239,673	100,037	34,197	126,913	52,777
Wisconsin	687,112	272,829	110,781	255,642	207,159
Wyoming	60,252	22,189	10,667	20,444	20,289
All States	35,537,741	13,477,262	6,576,536	13,484,223	10,708,363

[1/] State estimates are subject to sampling error, and may not sum to U.S. total due to rounding.
[2/] 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.
[3/] A household can be counted under more than one vulnerability category.
[4/] The three-year average of the 2012-2014 ACS estimate of the total number of all U.S. households is 116,506,659.
[5/] 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*.

Table B-2. State-level estimates of the number of LIHEAP income eligible households using state maximum LIHEAP income standards by vulnerability category[1/] [2/] [3/]

(Three-Year Average of the 2012-2014 ACS)

State	State Income Guidelines for 4-Person Household as % of HHS Poverty Guidelines	Total number of LIHEAP eligible households[4/]	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[5/]	LIHEAP eligible households with no vulnerable members
Alabama	150%	528,181	190,402	100,626	239,197	142,954
Alaska	150%	49,494	15,836	12,292	18,127	15,432
Arizona	162%[6/7/]	664,660	240,228	138,688	225,122	212,642
Arkansas	143%[7/8]	327,829	120,434	62,975	153,695	82,496
California	195%[7/8/]	3,879,141	1,399,459	834,884	1,302,167	1,272,639
Colorado	150%	369,804	116,701	77,370	124,923	125,316
Connecticut	260%[7/8/]	436,824	183,373	68,468	156,793	129,828
Delaware	200%	89,850	36,533	16,266	33,368	26,143
District of Columbia	221%[7/8/]	80,213	27,564	11,887	31,782	27,454
Florida	150%	1,793,553	750,324	306,737	642,836	530,894
Georgia	170%[7/8/]	1,096,190	363,277	232,153	407,423	350,530
Hawaii	150%	87,557	37,146	17,602	30,992	24,796
Idaho	150%	142,986	47,098	31,683	54,049	41,664
Illinois	150%	1,005,477	345,599	197,315	363,720	323,789
Indiana	150%	573,993	183,147	120,701	228,626	173,611
Iowa	150%	242,696	90,662	42,741	93,807	72,326
Kansas	130%	189,203	58,490	43,121	73,494	56,218
Kentucky	130%	413,602	142,857	77,608	215,141	94,958
Louisiana	173%[7/8/]	597,690	217,244	105,910	250,747	179,755
Maine	170%	147,610	62,158	20,781	70,449	34,165
Maryland	175%	387,329	150,011	74,384	148,496	109,914
Massachusetts	259%[7/8/]	860,902	382,323	119,203	354,583	235,245
Michigan	110%	617,346	175,584	124,954	271,493	182,405
Minnesota	183%[7/9]	484,192	187,592	85,555	181,760	139,366
Mississippi	145%[7/8/]	364,648	138,013	69,414	170,541	97,467
Missouri	135%	499,382	168,867	93,491	217,792	138,922
Montana	173%[7/10]	123,536	47,488	18,945	46,416	38,756
Nebraska	116%	101,361	33,515	22,336	38,921	30,082
Nevada	150%	220,266	71,378	49,698	80,131	68,540
New Hampshire	200%	115,101	47,425	16,771	49,157	30,825
New Jersey	200%	762,041	317,542	138,550	274,259	220,475
New Mexico	150%	221,698	79,819	43,742	87,078	67,718
New York	210%[7/11]	2,366,440	967,197	399,609	868,247	709,834
North Carolina	130%	811,986	272,640	165,909	329,941	241,784
North Dakota	208%[7/8/]	83,100	30,763	12,931	27,145	30,050
Ohio	175%	1,293,255	467,665	233,382	546,132	360,296
Oklahoma	110%	245,548	73,536	53,960	107,866	69,157
Oregon	175%[7/8/]	441,565	163,004	80,427	176,847	130,240
Pennsylvania	150%	1,046,795	417,901	169,899	460,186	270,814
Rhode Island	221%[7/8/]	138,059	55,524	20,256	57,221	39,686
South Carolina	150%	485,651	175,865	94,976	202,114	139,192
South Dakota	175%	85,003	34,161	16,116	31,348	23,672
Tennessee	150%	676,730	240,000	131,420	307,269	177,889
Texas	125%	1,784,090	534,057	460,942	639,168	560,500
Utah	150%	171,574	47,205	49,109	56,331	53,315
Vermont	185%	66,264	28,840	8,889	29,505	16,673
Virginia	130%	453,550	159,852	88,801	181,028	131,626
Washington	125%	391,728	123,839	78,754	159,479	118,436
West Virginia	130%	178,430	65,780	27,720	97,141	39,949
Wisconsin	199%[7/8/]	686,905	272,829	110,614	255,506	207,159
Wyoming	193%[7/8/]	60,237	22,189	10,662	20,439	20,279
All States	Not applicable	28,941,263	10,580,936	5,591,226	11,189,997	8,617,874

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

[2/] 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 Grantee Survey* and confirmed with other program resources.

[3/] A household can be counted under more than one vulnerability category.

[4/] The three-year average of the 2012-2014 ACS estimate of the total number of all U.S. households is 116,506,659.

[5/] 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.*

[6/] 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.
[7/] 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.
[8/] These states use 60 percent of the state median income as the state income guideline for all household sizes.
[9/] 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.
[10/] 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.
[11/] 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.

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[1/] [2/]

(Three-Year Average of the 2012-2014 ACS)

State	Total number of LIHEAP eligible households[3/]	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	598,659	317,999	105,842	104,340	70,478
Alaska	63,236	29,004	10,685	9,805	13,743
Arizona	664,660	341,922	124,207	122,716	75,815
Arkansas	336,564	189,403	73,399	72,204	1,557
California	3,882,439	1,666,243	592,502	570,828	1,052,866
Colorado	592,337	210,386	78,283	81,135	222,533
Connecticut	436,824	129,316	44,593	46,672	216,243
Delaware	98,932	35,099	12,499	13,718	37,616
District of Columbia	80,213	39,538	9,785	8,085	22,805
Florida	2,086,727	1,017,623	382,995	392,934	293,174
Georgia	1,097,605	563,889	187,124	179,228	167,364
Hawaii	117,901	52,861	18,696	16,000	30,344
Idaho	154,542	76,001	32,760	34,226	11,556
Illinois	1,491,484	600,170	197,383	207,925	486,007
Indiana	741,875	328,454	121,680	123,859	167,882
Iowa	359,096	131,814	51,918	58,964	116,401
Kansas	321,227	128,385	48,130	54,117	90,595
Kentucky	560,390	290,005	103,123	94,174	73,088
Louisiana	598,119	304,918	98,606	92,205	102,391
Maine	172,745	68,984	28,630	27,115	48,016
Maryland	664,597	187,548	65,660	66,098	345,291
Massachusetts	860,902	276,658	97,020	90,726	396,497
Michigan	1,200,571	542,421	178,483	185,585	294,082
Minnesota	615,404	203,157	77,083	77,845	257,319
Mississippi	370,953	230,115	72,570	65,645	2,623
Missouri	721,486	328,043	118,482	118,370	156,591
Montana	123,536	55,095	22,501	21,072	24,868
Nebraska	206,556	77,325	37,370	32,826	59,035
Nevada	279,630	122,739	49,792	47,735	59,365
New Hampshire	149,967	39,937	16,821	18,390	74,819
New Jersey	1,056,363	311,165	109,003	112,387	523,808
New Mexico	223,211	136,387	46,246	39,065	1,513
New York	2,366,440	993,894	311,944	310,782	749,820
North Carolina	1,154,478	560,114	209,555	199,449	185,361
North Dakota	83,100	30,896	10,996	11,968	29,241
Ohio	1,439,003	632,889	222,101	219,996	364,018
Oklahoma	416,828	209,406	80,234	80,738	46,449
Oregon	442,307	200,940	75,682	72,797	92,888
Pennsylvania	1,580,756	592,487	222,286	232,022	533,962
Rhode Island	138,059	51,883	18,813	18,418	48,945
South Carolina	536,658	280,464	102,768	102,419	51,006
South Dakota	91,481	37,471	16,517	17,051	20,442
Tennessee	762,148	393,855	142,772	140,103	85,418
Texas	2,628,679	1,322,740	461,349	452,234	392,355
Utah	210,535	92,626	38,146	40,802	38,961
Vermont	79,185	23,709	12,309	12,961	30,207
Virginia	921,760	313,171	115,264	115,058	378,267
Washington	770,534	287,084	104,644	105,249	273,557
West Virginia	239,673	121,958	45,823	45,060	26,833
Wisconsin	687,112	251,836	98,910	107,884	228,482
Wyoming	60,252	21,122	9,567	10,147	19,416
All States	35,537,741	15,451,149	5,513,550	5,481,130	9,091,912

[1/] State estimates are subject to sampling error, and may not sum to U.S. total due to rounding.
[2/] 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.
[3/] The three-year average of the 2012-2014 ACS estimate of the total number of all U.S. households is 116,506,659.

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[1/ 2/]
(Three-Year Average of the 2012-2014 ACS)

State	State Income Guidelines for 4-Person Household as % of HHS Poverty Guidelines	Total number of LIHEAP eligible households[3/]	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%	528,181	317,999	105,842	104,340	0
Alaska	150%	49,494	29,004	10,685	9,805	0
Arizona	162%[4/5]	664,660	341,922	124,207	122,716	75,815
Arkansas	143%[5/6]	327,829	189,403	73,142	63,727	1,557
California	195%[5/6/]	3,879,141	1,666,243	592,131	567,901	1,052,866
Colorado	150%	369,804	210,386	78,283	81,135	0
Connecticut	260%[5/6/]	436,824	129,316	44,593	46,672	216,243
Delaware	200%	89,850	35,099	12,499	13,718	28,535
District of Columbia	221%[5/6/]	80,213	39,538	9,785	8,085	22,805
Florida	150%	1,793,553	1,017,623	382,995	392,934	0
Georgia	170%[5/6/]	1,096,190	563,889	187,101	177,835	167,364
Hawaii	150%	87,557	52,861	18,696	16,000	0
Idaho	150%	142,986	76,001	32,760	34,226	0
Illinois	150%	1,005,477	600,170	197,383	207,925	0
Indiana	150%	573,993	328,454	121,680	123,859	0
Iowa	150%	242,696	131,814	51,918	58,964	0
Kansas	130%	189,203	128,385	48,130	12,688	0
Kentucky	130%	413,602	290,005	103,123	20,474	0
Louisiana	173%[5/6/]	597,690	304,918	98,580	91,801	102,391
Maine	170%	147,610	68,984	28,630	27,115	22,881
Maryland	175%	387,329	187,548	65,660	66,098	68,022
Massachusetts	259%[5/6/]	860,902	276,658	97,020	90,726	396,497
Michigan	110%	617,346	542,421	74,925	0	0
Minnesota	183%[5/7]	484,192	203,157	77,040	77,597	126,398
Mississippi	145%[5/6/]	364,648	230,115	72,124	59,787	2,623
Missouri	135%	499,382	328,043	118,482	52,858	0
Montana	173%[5/8]	123,536	55,095	22,501	21,072	24,868
Nebraska	116%	101,361	77,325	24,035	0	0
Nevada	150%	220,266	122,739	49,792	47,735	0
New Hampshire	200%	115,101	39,937	16,821	18,390	39,953
New Jersey	200%	762,041	311,165	109,003	112,387	229,486
New Mexico	150%	221,698	136,387	46,246	39,065	0
New York	210%[5/9]	2,366,440	993,894	311,944	310,782	749,820
North Carolina	130%	811,986	560,114	209,555	42,318	0
North Dakota	208%[5/6/]	83,100	30,896	10,996	11,968	29,241
Ohio	175%	1,293,255	632,889	222,101	219,996	218,270
Oklahoma	110%	245,548	209,406	36,142	0	0
Oregon	175%[5/6/]	441,565	200,940	75,674	72,063	92,888
Pennsylvania	150%	1,046,795	592,487	222,286	232,022	0
Rhode Island	221%[5/6/]	138,059	51,883	18,813	18,418	48,945
South Carolina	150%	485,651	280,464	102,768	102,419	0
South Dakota	175%	85,003	37,471	16,517	17,051	13,964
Tennessee	150%	676,730	393,855	142,772	140,103	0
Texas	125%	1,784,090	1,322,740	461,349	0	0
Utah	150%	171,574	92,626	38,146	40,802	0
Vermont	185%	66,264	23,709	12,309	12,961	17,286
Virginia	130%	453,550	313,171	115,264	25,115	0
Washington	125%	391,728	287,084	104,644	0	0
West Virginia	130%	178,430	121,958	45,823	10,649	0
Wisconsin	199%[5/6/]	686,905	251,836	98,910	107,677	228,482
Wyoming	193%[5/6/]	60,237	21,122	9,567	10,132	19,416
All States	Not applicable	28,941,263	15,451,149	5,351,390	4,142,109	3,996,615

[1/] State estimates are subject to sampling error, and may not sum to U.S. total due to rounding.
[2/] 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 Grantee Survey.*
[3/] The three-year average of the 2012-2014 ACS estimate of the total number of all U.S. households is 116,506,659.
[4/] 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.
[5/] 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.
[6/] These states use 60 percent of the state median income as the state income guideline for all household sizes.

[7/] 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.
[8/] 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.
[9/] 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.