

LIHEAP Home Energy Notebook

For Fiscal Year 2006



**U.S. DEPARTMENT OF
HEALTH AND HUMAN SERVICES
Administration for Children and Families
Office of Community Services
Division of Energy Assistance
August 2008**

LIHEAP Home Energy Notebook

For Fiscal Year 2006

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Copies of this document can be obtained by contacting Peter Edelman of the Division of Energy Assistance at the following address:

Administration for Children and Families
Office of Community Services
Division of Energy Assistance
370 L'Enfant Promenade SW
Washington, DC 20447

E-mail: peter.edelman@acf.hhs.gov
Web site: <http://www.acf.hhs.gov/programs/ocs/liheap/>

August 2008

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List of Acronyms and Abbreviations

ACF	The U.S. Department of Health and Human Services' Administration for Children and Families
ACS	American Community Survey
ASEC	CPS Annual Social and Economic Supplement
CDD	Cooling Degree Days
CPI	Consumer Price Index
CPS	Current Population Survey
DEA	Office of Community Services' Division of Energy Assistance
EIA	Energy Information Administration
FY	Fiscal Year
GPRA	Government Performances and Results Act
HDD	Heating Degree Days
HHS	U.S. Department of Health and Human Services
LIHEAP	Low Income Home Energy Assistance Program
LIEAP	Low Income Energy Assistance Program
mmBTUs	Million British Thermal Units
NC	No cases in sample
OCS	Administration for Children and Families' Office of Community Services
RECS	Residential Energy Consumption Survey

Executive Summary

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 the Low Income Home Energy Assistance Program at the Federal level.

In 1994, Congress amended the purpose of LIHEAP to clarify that LIHEAP is “to assist low income households, particularly those with the lowest income, 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, Public Law 103-252, Sec. 2602(a) as amended.) The Energy Policy Act of 2005 (Public Law 109-58) reauthorized LIHEAP through Fiscal Year (FY) 2007 without substantive changes.

The *LIHEAP Home Energy Notebook* 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; low income home energy trends; and the LIHEAP program performance measurement system. This summary highlights information presented in the *Notebook*.

Home energy data

The primary information source for the data on residential energy is the Department of Energy's (DOE's) 2001 Residential Energy Consumption Survey (RECS). 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 2001. RECS residential energy consumption and expenditures data have been adjusted to reflect FY 2006 weather and fuel prices.

Residential energy data

In FY 2006, average energy expenditures for all households were \$1,982, and the mean individual energy burden was 7.4 percent of income.¹ Low income households had average energy expenditures of \$1,690, about 15 percent lower than the average for all households.² The mean individual energy burden for low income households was 16.0 percent, more than twice the mean individual energy burden of all households. LIHEAP recipient households had average energy expenditures of \$1,992, about 18 percent higher than the average for all low income households. The mean individual energy burden for LIHEAP recipients was 22.1 percent, almost 15 percentage points higher than the mean individual energy burden for all households and more than 6 percentage points higher than the mean individual energy burden for low income households.

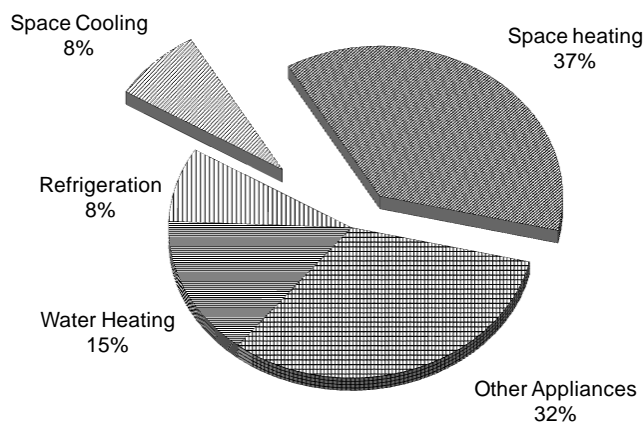
Energy prices rose from FY 2005 to FY 2006. Weather during the heating season was not a factor during this period, and a cooler FY 2006 cooling season caused a reduction in cooling consumption. Despite the reduction in consumption, average residential energy expenditures for all households rose considerably from \$1,736 in FY 2005 to \$1,982 in FY 2006 (over 14 percent) due to the energy price increases.

¹ The mean is the sum of all values divided by the number of values. The mean is also referred to as the average. See Appendix A for a discussion of the computation of energy burden statistics.

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 the poverty income guidelines and 60 percent of State median income). The terms “low income” and “LIHEAP income eligible” are equivalent in the Executive Summary. “Non low income” refers to those households with incomes above the Federal maximum LIHEAP eligibility standard.

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 represent about 45 percent of residential energy expenditures for low income households. Refrigerators and freezers represent about 8 percent of residential energy expenditures, water heating represents about 15 percent of residential energy expenditures, and other appliances represent about 32 percent of residential energy expenditures.

Figure 1. Percent of U.S. residential energy expenditures by low income households, by end use, FY 2006



Home heating data

The three most common heating fuels in 2001, the most recent year for which household heating fuel usage data are available, were natural gas (55 percent), electricity (29 percent), and fuel oil (8 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 differences in main heating fuel choice by income group.

In FY 2006, average home heating expenditures for all households were \$696, and the mean individual home heating burden was 2.9 percent. Low income households had average home heating expenditures of \$635; this average was about 9 percent lower than for all households. The mean individual home heating burden for low income households was 6.3 percent, more than twice as much as the mean individual home heating burden for all households. The average home heating expenditures for LIHEAP households was \$922, about 45 percent higher than the average for low income households and 32 percent higher than the average for all households. Mean individual home heating burden for LIHEAP households was 11.2 percent, more than 8 percentage points higher than the mean individual home heating burden for all households and almost 5 percentage points higher than that for low income households.

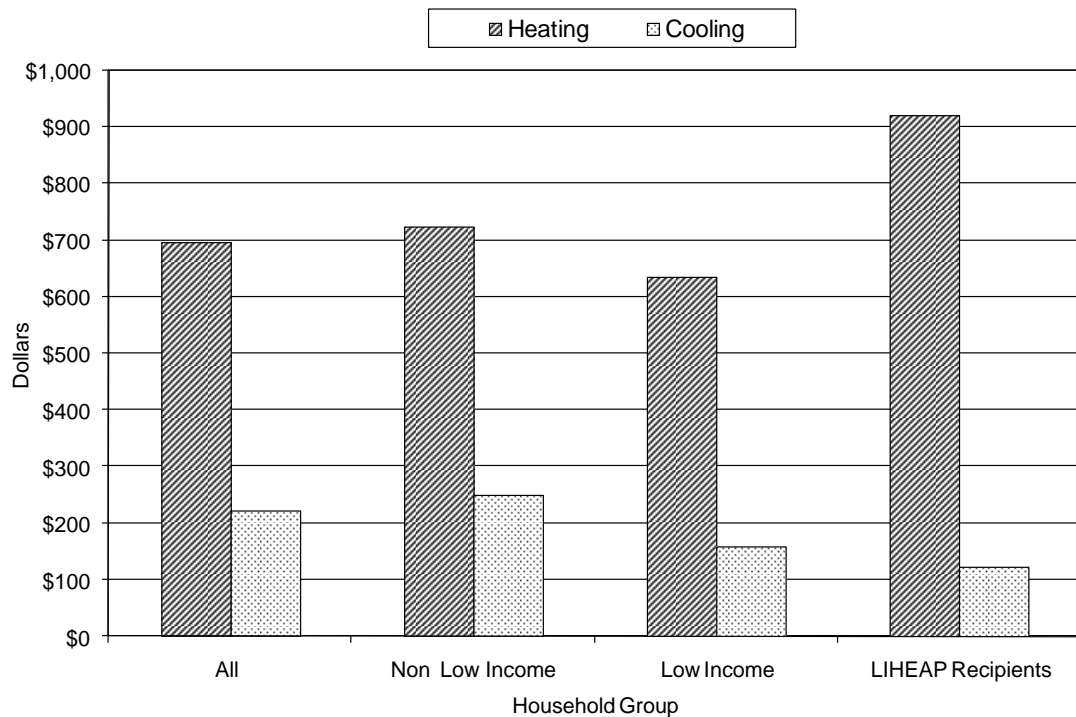
Home cooling data

In 2001, about 88 percent of all households cooled their homes. Low income and LIHEAP recipient households were less likely to cool their homes than were non low income households; 82 percent of

low income households and 83 percent of LIHEAP cooling recipient households cooled their homes using one of the methods recorded by the RECS.³

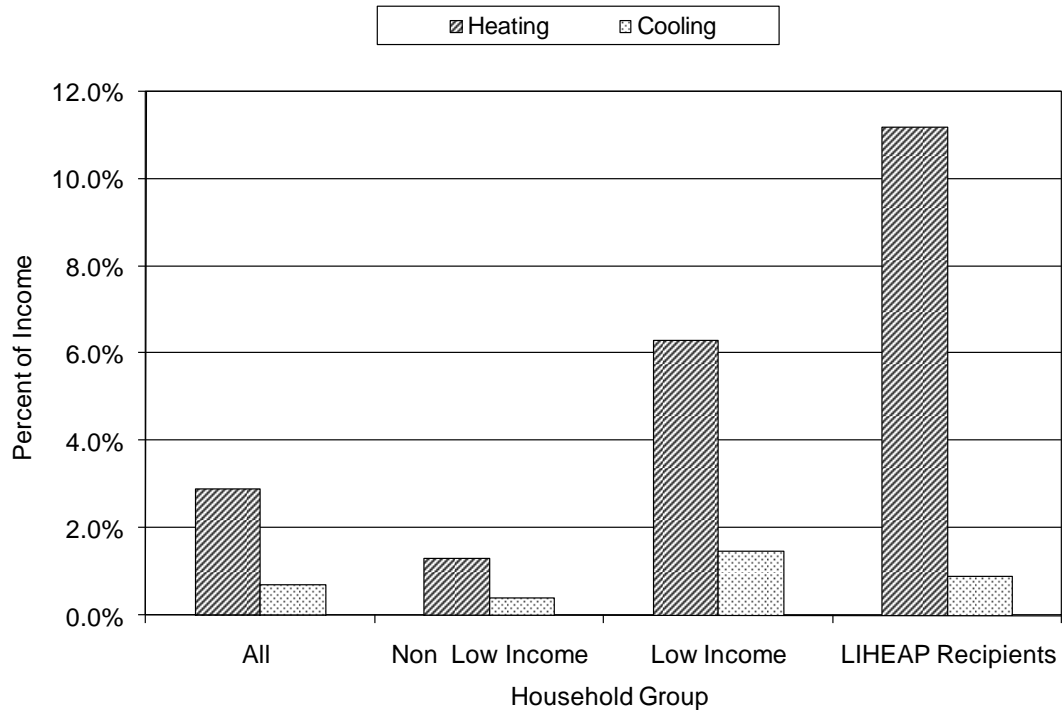
In FY 2006, average home cooling expenditures for all households were \$222, and the mean individual home cooling burden was 0.7 percent. Low income households had average home cooling expenditures of \$159; this average was about 28 percent lower than that for all households. The mean individual home cooling burden for low income households was 1.5 percent, more than twice as much as the mean individual home cooling burden for all households. The average home cooling expenditures for LIHEAP recipient households was \$123, almost 23 percent lower than the average for low income households and over 44 percent lower than the average for all households. The mean individual home cooling burden for LIHEAP recipient households was 0.9 percent, close to 29 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 2006



³ The 2001 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 2001 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 2006



Low income home energy trends

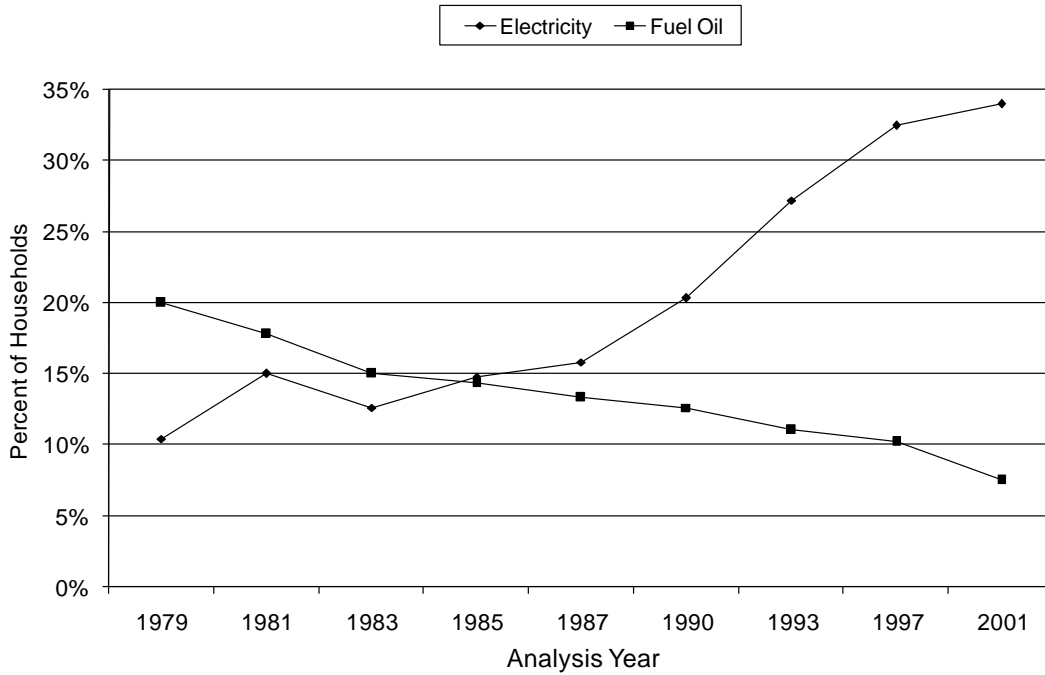
This section presents data on home energy trends for low income households from 1979 through FY 2001 or FY 2006, depending upon the latest year of availability.⁴ Statistics are derived from a series of national residential energy consumption surveys (including the RECS) and from HHS’ administrative statistics. The analyses show significant shifts since 1979 in the types and amounts of energy used by low income households.

Home heating and cooling trends

Figure 4 demonstrates that the share of low income households that used electricity as their main heating fuel increased from 10 percent in 1979 to 34 percent in 2001. In contrast, the share of low income households that used fuel oil as their main heating fuel declined from 20 percent in 1979 to 8 percent in 2001. Natural gas remained the dominant type of space heating fuel used over the 22-year period.

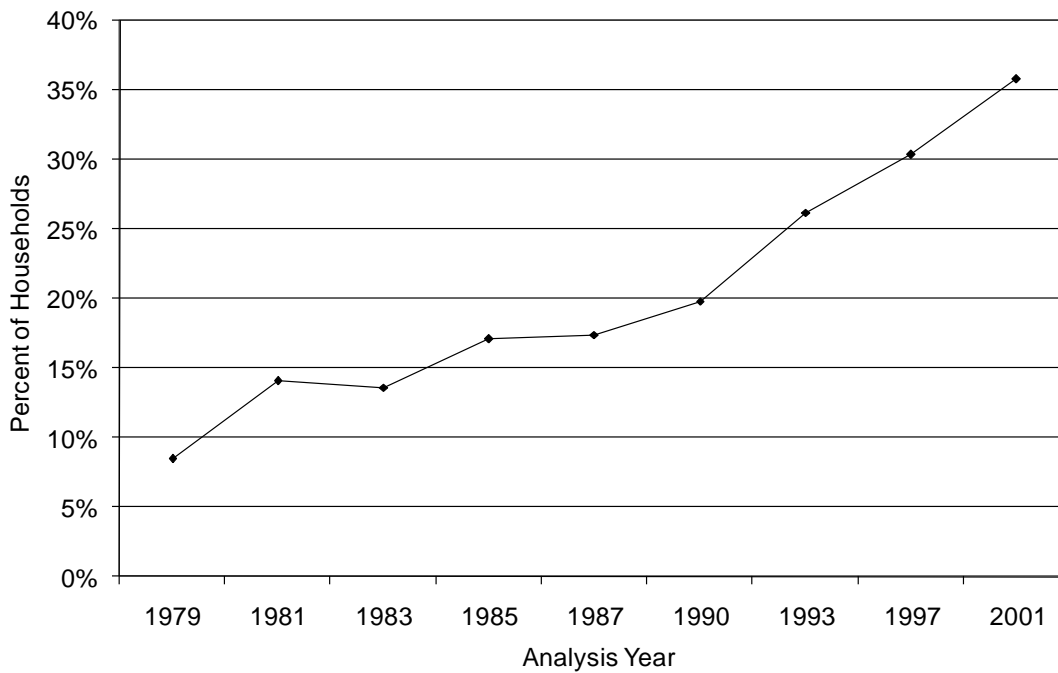
⁴In this section, low income households are defined as those households with incomes at or below 150 percent of poverty.

Figure 4. Percent of low income households using electricity and fuel oil as main heating fuels, 1979 to 2001



As shown in Figure 5, the most important change in home cooling has been in the percent of households with central air-conditioning. The share of low income households who use central air-conditioning increased from 8.5 percent in 1979 to over 35 percent in 2001.

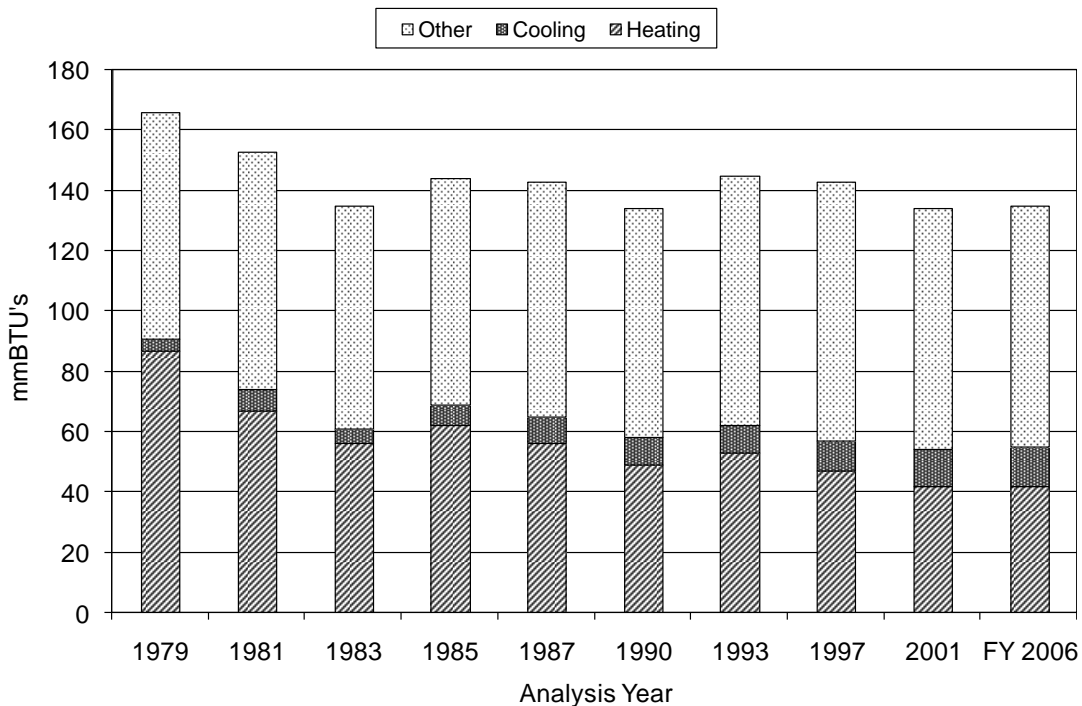
Figure 5. Percent of low income households using central air-conditioning, 1979 to 2001



Trends in mean residential consumption, expenditures, and energy burden

Low income households substantially decreased their mean residential energy consumption between 1979 and 1983, as shown in Figure 6. This suggests a significant increase in efficiency resulting from conservation measures or actions. From 1983 to 1990, mean residential energy consumption fluctuated from year to year, corresponding to expected changes in heating and cooling consumption because of changes in heating and cooling degree days. For 1993 through 2001, there appears to have been an increase in the use of energy for purposes other than home heating and home cooling. Between 2001 and FY 2006, the use of energy for home heating, home cooling, and for other purposes, appears to have remained stable.

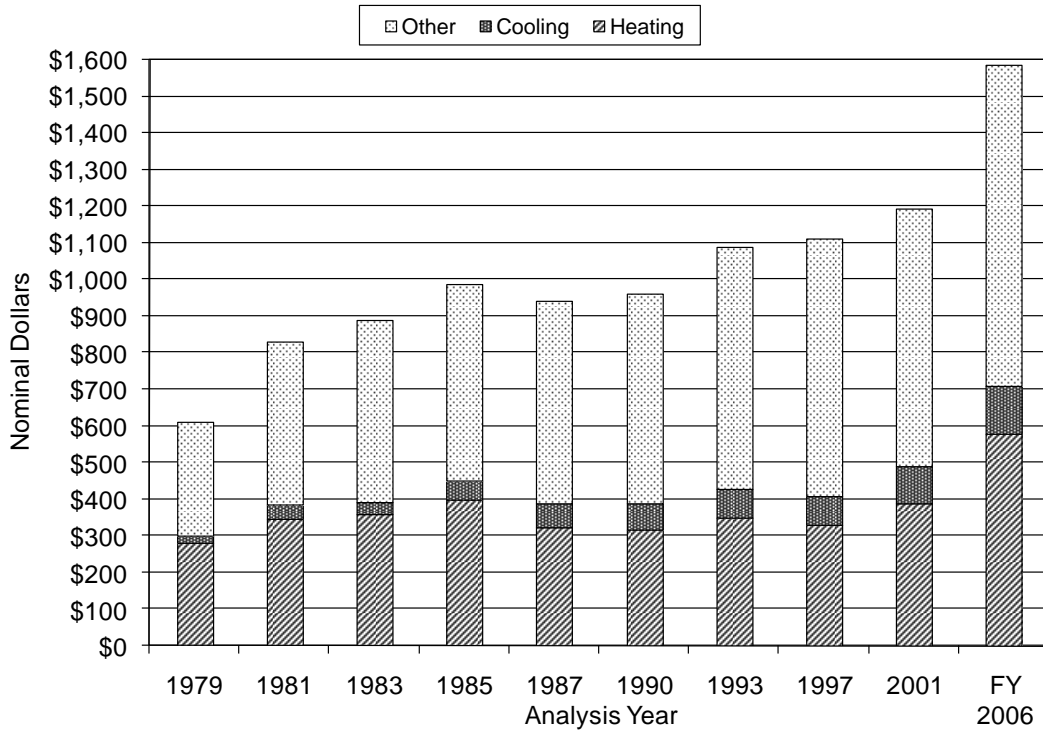
Figure 6. Mean residential energy consumption (in mmBTUs) per low income household, 1979 to FY 2006^{1/}



^{1/} A British Thermal Unit (BTU) is the amount of energy necessary to raise the temperature of one pound of water one degree Fahrenheit. MmBTUs or mmBTUs refer to values in millions of BTUs.

Residential energy expenditures increased rapidly between 1979 and 1985 because of fuel price increases, as shown in Figure 7. From 1987 through 1997, expenditures rose moderately; however in 2001, expenditures on heating increased dramatically as the result of fuel price increases and colder winter weather. Between 2001 and FY 2006, expenditures for home heating rose by almost 49 percent, again due to higher fuel prices. Expenditures on uses other than home heating or home cooling rose continuously from 1979 to FY 2006. Expenditures on cooling rose from 1979 to 2001, and rose again by over 27 percent from 2001 to FY 2006.

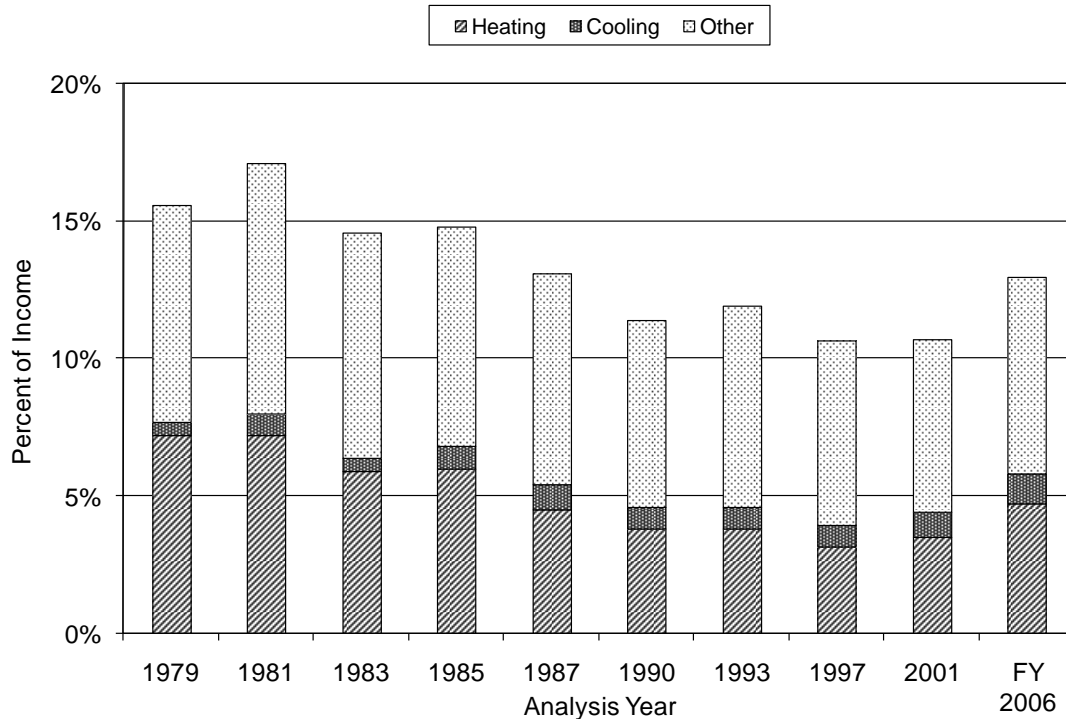
Figure 7. Mean residential energy expenditures for low income households, 1979 to FY 2006



As Figure 8 shows, the mean group home energy burden declined from about 8 percent in 1979 to just under 6 percent in FY 2006; this represented a decline of 1.9 percentage points.⁵ The decline in mean group residential energy burden from 1979 to FY 2006 was 2.6 percentage points (from 15.6 percent to 13.0 percent). Most of the decline in residential energy burden is associated with a decline in home energy burden (i.e., burden associated with home heating and home cooling) rather than a decline in the burden associated with energy use for other purposes (i.e., water heating, appliances, and refrigeration).

⁵ Mean group burden is defined in Appendix A.

Figure 8. Mean group residential energy burden by end use for households with incomes at or below 150 percent of the poverty income guidelines, 1979 to FY 2006



Analysis of fuel price and energy efficiency trends

Trends in energy consumption and expenditures are dependent on factors such as energy prices, weather, and energy efficiency. Fuel prices outpaced the Consumer Price Index (CPI) from 1979 through 1983, as shown in Figure 9 on the next page. While the CPI increased about 37 percent, the composite average of fuel prices (a weighted average of electric, natural gas, and fuel oil prices) increased by about 81 percent between 1979 and 1983. From 1985 through 1993, fuel prices rose at a slower rate than did the CPI (i.e., at a slower rate than the cost of other goods). In 2001 however, fuel prices rose at a higher rate than did the prices of other goods. In 2001, the composite energy price index was 259 while the CPI was 243. The impact of energy prices on energy expenditures resulted in low income household energy expenditures surging upward until 1985 even though energy consumption for these households declined over the same period. The 19 percent growth in composite fuel prices from 1985 to 1997 explains why residential energy expenditures per low income household rose slightly during that period. In 2001, fuel prices increased 17 percent over 1997 prices. In FY 2006, fuel prices sharply increased. FY 2006 prices were close to 40 percent higher than 2001 fuel prices. The increases in fuel prices from 2001 through FY 2006 contributed to the rise in expenditures during that period.

Figure 9. Shifts in composite energy price index and Consumer Price Index (CPI), 1979 to FY 2006

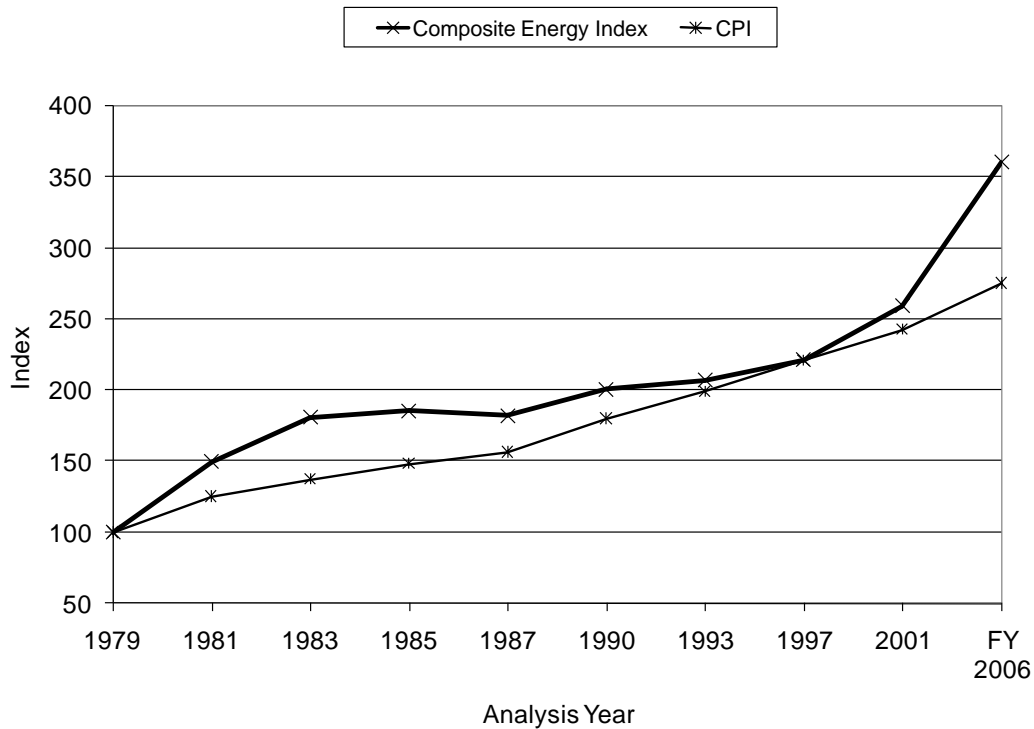
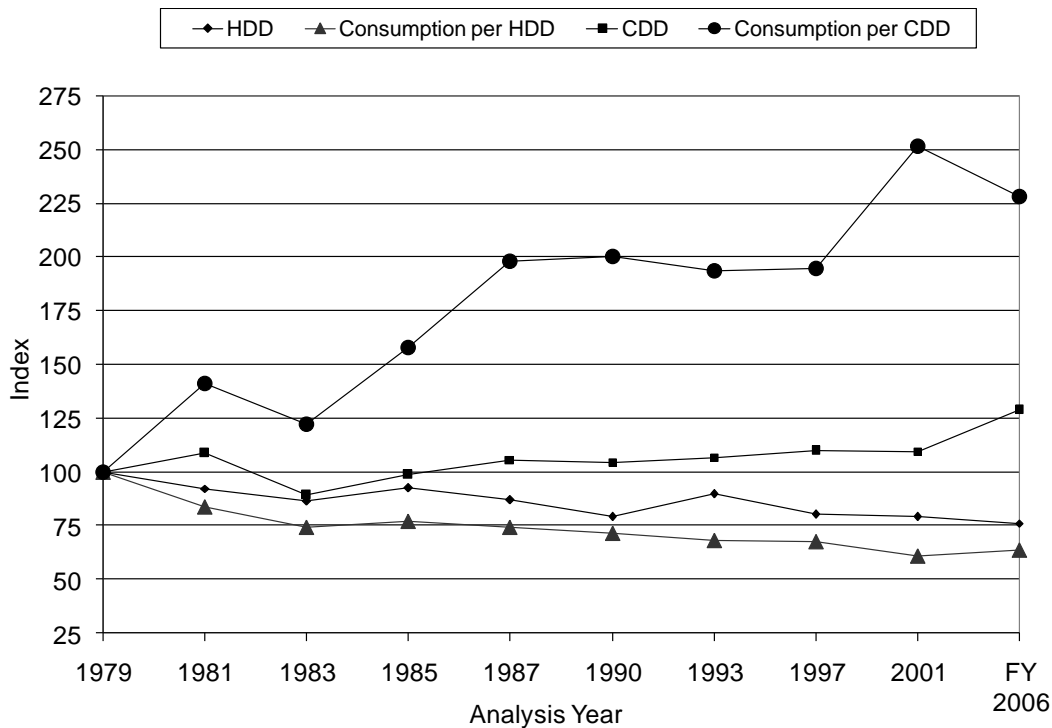


Figure 10 shows energy consumption for heating and cooling compared to heating and cooling degree days from 1979 to FY 2006 for low income households. As shown, heating consumption per heating degree day declined continuously from 1979 to 2001 as a result of energy conservation efforts, but rose slightly from 2001 to FY 2006. In contrast, cooling consumption per cooling degree day rose sharply through 2001 because of a large increase in the availability of air-conditioning to low income households,⁶ but declined over 9 percent from 2001 to FY 2006. Only 37 percent of low income households had air-conditioning equipment in 1979, but by 2001 the number had risen to 67 percent.

⁶Air-conditioning equipment includes central air conditioners and window or wall units, ceiling fans, and evaporative coolers. The availability of all household appliances increased for low income households over this period due to the overall increase in the wealth of the nation and to the decrease in the cost of older technologies.

Figure 10. Index of heating degree days (HDD), heating consumption for low income households per HDD, cooling degree days (CDD), and cooling consumption for low income households per CDD, 1979 to FY 2006



The mean group home energy burden for low income households has remained considerably higher than the burden for all households. In 1979, the mean group home energy burden of 8 percent for low income households was just over four times higher than the 2 percent burden for all households. In FY 2006, the mean group home energy burden for all income households was 1.4 percent. That year, the mean group home energy burden for low income households was almost 6 percent, again over four times higher than that for all households.

Trends in LIHEAP

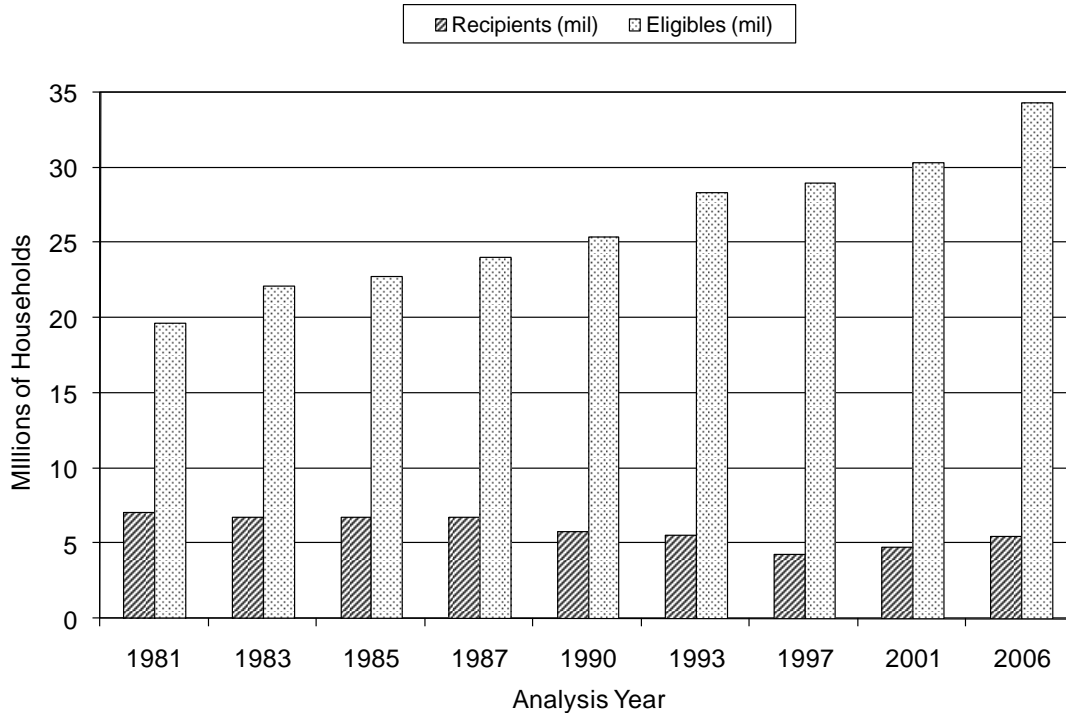
Between 1981 and FY 2006, as shown in Figure 11, the number of income eligible households has risen more than 74 percent, during which time Federal fuel assistance funds have increased by less than 47 percent.⁷ Also during this period, the percentage of income eligible households receiving heating and/or winter crisis assistance has declined sharply from 36 percent in 1981 to 16 percent in FY 2006. Before adjusting for inflation, average winter crisis and heating benefits per household increased until 1985, fell in 1987, stayed in the same range through 1997, and increased significantly in 2001 and FY 2006. Cooling benefits per household actually fell until 1985 and increased sharply from 1993 through FY 2006. After adjusting for inflation, the mean value of combined federal heating and winter crisis fell from \$213 in 1981 to \$171 in FY 2006. Cooling benefits fell from \$129 in 1981 to \$105 in FY 2006.

The percentage of the total home heating bill for LIHEAP/LIHEAP income eligible households covered by LIHEAP/LIHEAP heating and winter crisis benefits decreased from 23 percent in 1981 to 10

⁷ Income eligible household estimates do not include those households with incomes greater than the statutory income standards but who may still qualify for LIHEAP benefits because they are categorically eligible for LIHEAP under section 2605(b)(2)(A)) of the LIHEAP statute.

percent in FY 2006. The decrease resulted from the combination of higher home heating bills and a smaller per-household amount of assistance benefits.

Figure 11. Number of LIEAP/LIHEAP income eligible and heating and/or winter crisis assistance recipient households, FY 1981 to FY 2006



The mean group home heating burden for LIEAP/LIHEAP assisted households is substantially reduced because of the LIHEAP benefits, but even with the assistance, it has historically been about twice the burden of all households.

Federal LIHEAP targeting performance

The Government Performance and Results Act (GPRA) focuses on program results to provide Congress with objective information on the achievement of statutory objectives or program goals. The resulting performance data are to be used in making decisions on budget and appropriation levels.

ACF's LIHEAP performance plan must take into account that the Federal government does not provide LIHEAP assistance to the public. Instead, the Federal government provides funds to States, Federal or State-recognized Indian Tribes and Tribal Organizations, and Insular Areas to administer LIHEAP at the local level. The LIHEAP performance plan also must take into account that LIHEAP is a block grant whereby LIHEAP grantees have broad flexibility to design their programs, within very broad Federal guidelines, to meet the needs of their citizens.

LIHEAP program goals and performance goals

In FY 2006, 16 percent of federally income eligible households received assistance with their heating costs.⁸ Given that limitation, the LIHEAP statute requires LIHEAP grantees to provide, in a timely manner, that the highest level of assistance will be furnished to those households that have the lowest incomes and the highest energy costs or needs in relation to income, taking into account family size. The LIHEAP statute identifies two groups of low income households as having the highest needs:

- *Vulnerable Households*: Vulnerable households are those with at least one member that is a young child, an individual with disabilities, or a frail older individual.
- *High Burden Households*: High burden households are those households with the lowest incomes and highest home energy costs.

Based on the national LIHEAP program goals, ACF has focused its annual performance goals and measurement on targeting income eligible vulnerable households. In addition, ACF has established an annual efficiency goal for the LIHEAP program. Subject to the availability of data, ACF also is interested in the performance of the LIHEAP program with respect to targeting to the highest burden households with the lowest income.

Performance measures

Performance goals must be measurable in order to determine if the goals are being achieved. ACF has developed a set of performance measures (i.e., targeting indexes) that provide for the collection of quantitative measures regarding the following aspects of LIHEAP targeting performance:

- The *reciency targeting index* quantifies targeting with respect to receipt of LIHEAP benefits.
- The *benefit targeting index* quantifies targeting with respect to the level of LIHEAP benefits.
- The *burden reduction targeting index* quantifies targeting with respect to the burden reduction resulting from LIHEAP benefits.

The development of these indexes facilitates tracking of reciency, benefit, and burden reduction performance for vulnerable and high burden households. Using these indexes, ACF established the following LIHEAP performance measures

- Increase the recipient targeting index score of LIHEAP households having at least one member 60 years or older.
- Maintain the recipient targeting index score of LIHEAP households having at least one member 5 years or younger.

There is no annual measure for the benefit targeting or burden reduction targeting indexes because the data are not available annually.

⁸ States are not required to report an unduplicated count of assisted households that receive LIHEAP assistance regardless of the type(s) of assistance provided to recipient households. Therefore this percentage does not provide a complete picture to those household that may have received other types of LHEAP assistance. Additionally, income eligible household estimates do not include those households with incomes greater than the statutory income standards but who may still qualify for LIHEAP benefits because they are categorically eligible for LIHEAP under section 2605((b)(2)(A)) of the LIHEAP statute.

Performance measurement research

ACF has funded several studies to develop a better understanding of LIHEAP targeting performance measurement. Two of these studies recommended that ACF consider making changes in the performance measurement plan for LIHEAP.

- Validation Study – The performance measurement validation study examined the available data sources for estimating the targeting indexes required by the performance measurement plan for LIHEAP and identified the data sources that furnished the most reliable data.⁹
- Energy Burden Study – The energy burden evaluation study used the 2001 RECS LIHEAP Supplement to measure the baseline performance of the LIHEAP program in serving high burden households and to examine the competing demands associated with targeting vulnerable and high burden households.¹⁰

ACF has implemented the recommendations from the Validation Study. Additional resources would be required to implement the recommendations from the Energy Burden Study.

Performance measurement statistics

ACF's *Final FY 2008 Annual Performance Plan and FY 2008 Annual Performance Report* furnished measurements of targeting performance. The performance report showed the LIHEAP program target and performance results for FY 2006.

⁹ *LIHEAP Targeting Performance Measurement Statistics: GPRA Validation of Estimation Procedures*, August 2004, Report prepared by APPRISE Incorporated under PSC Order No. 043Y00471301D.

¹⁰ *LIHEAP Energy Burden Evaluation Study*, March 2005, Report prepared by APPRISE Incorporated under PSC Order No. 043Y00471301D.

I. Introduction

The Administration for Children and Families (ACF) within the U.S. Department of Health and Human Services (HHS) administers at the Federal level the Low Income Home Energy Assistance Program (LIHEAP). ACF awards annual LIHEAP block grants to the 50 States and the District of Columbia, Indian Tribes and the Tribal organizations, and the insular areas to assist eligible low income households in meeting their home energy costs.

In 1994, Congress amended the purpose of LIHEAP to clarify that LIHEAP is “to assist low income households, particularly those with the lowest income, 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, Public Law 103-252, Sec. 2602(a) as amended). 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 (Public Law 109-58) reauthorized LIHEAP through FY 2007 without substantive changes.

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.

Purpose of Notebook

ACF furnishes information and technical assistance to LIHEAP grantees. As part of that mission, ACF funded the development of this *Notebook* to assist LIHEAP grantees in meeting the requirements established by the 1994 amendments.

The *LIHEAP Home Energy Notebook* 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; low income home energy trends; and the LIHEAP program performance measurement system.

The FY 2006 home energy data presented in this *Notebook* were derived from existing data sources and analytic procedures, including:

- Household-level data on home energy available from the national Residential Energy Consumption Surveys (RECS) and household-level data on income available from the national Current Population Survey (CPS) Annual Social and Economic Supplement (ASEC) data files.
- National and State-level data on residential energy prices from the Energy Information Administration’s (EIA’s) publications *Monthly Energy Review* and *Petroleum Marketing Monthly*.
- Other publicly available sources of data such as weather data from National Oceanographic and Atmospheric Administration (NOAA).
- End use disaggregation procedures developed by EIA’s Office of Energy Markets and End Use (EMEU).

Organization of Notebook

The remaining sections in this *Notebook* are organized as follows.

- Section II – Home energy data. This section presents national energy statistics and analyses for FY 2006. Tabulations are presented for all, low income, non low income, and LIHEAP recipient households. Statistics are developed for residential energy consumption, home heating, and home cooling. Statistics include estimates of home energy consumption, expenditures, and energy burden.
- Section III – Low income home energy trends. This section furnishes data and analyses on low income home energy trends for the period from 1979 to FY 2006. Subsections include trends in consumption, expenditures, and burden; analysis of energy trends; trends in LIHEAP; and analysis of LIHEAP benefits.
- Section IV – A Federal approach to measuring LIHEAP targeting performance. This section describes ACF’s approach to LIHEAP performance measurement. It describes the performance measurement procedures and furnishes baseline data on targeting performance for the LIHEAP program.
- Appendix A documents the procedures used to prepare the FY 2006 energy statistics. Procedures reviewed include: projecting changes in energy consumption and expenditures, disaggregating energy consumption and expenditures into end use components, and computing energy burden statistics. Appendix A also includes detailed tabulations on residential energy use, expenditures, and burden at the national and regional level by main heating fuel for all, low income, non low income, and LIHEAP recipient households.
- Appendix B furnishes averages of State-level estimates of the numbers of households that are eligible for LIHEAP at both the Federal and State income standards. These averages are presented by vulnerability and income group.

II. Home Energy Data

Section II presents home energy consumption and expenditure data. The primary data source for this section is the Department of Energy's (DOE's) 2001 Residential Energy Consumption Survey (RECS), which has energy consumption and expenditures data for calendar year 2001. For this *Notebook*, the 2001 space heating and cooling consumption and expenditures have been adjusted to reflect FY 2006 weather and fuel prices, as described in Appendix A. Therefore, any residential energy or home energy consumption and expenditure data presented in this section for years after 2001 have been adjusted from the 2001 RECS.

National data on total residential energy, home heating, and home cooling are presented below. Regional variations in the national data are included in Appendix A. Home energy trend data are presented in Section III.

Residential energy data

Table 2-1, on the next page, presents data on average annual residential energy consumption, expenditures, and burden by fuel type for all, non low income, low income, and LIHEAP recipient households.¹¹ In FY 2006, average residential energy consumption for all households was 92.1 million British Thermal Units (mmBTUs) and average expenditures were \$1,982. The mean individual residential energy burden for all households was 7.4 percent of income.

Low income households had average residential energy consumption of 79.7 mmBTUs (13.5 percent less than all households) and average energy expenditures of \$1,690 (almost 15 percent less than all households). Their mean individual residential energy burden was 16 percent, more than twice that for all households and more than four times that for non low income households.

Average residential energy expenditures for LIHEAP recipient households were \$1,992, about 18 percent higher than that for all low income households. The mean individual residential energy burden was 22.1 percent, over 6 percentage points higher than that for low income households.

Nationally, all households increased their average residential energy expenditures by almost 14.2 percent, from \$1,736 in FY 2005 to \$1,982 in FY 2006. Low income households increased theirs by almost 14 percent, from \$1,480 in FY 2005 to \$1,690 in FY 2006. LIHEAP recipient households increased theirs by almost 15 percent, from \$1,735 in FY 2005 to \$1,992 in FY 2006. The rise in expenditures in these years, despite decreased consumption, is due to a significant rise in fuel prices.

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 2-2 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 2006, home heating was 37 percent of the residential energy bill for low income households, and home cooling made up 8 percent.

¹¹Comparisons 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 the poverty income guidelines or 60 percent of State median income. Low income households represent those households with annual incomes under the LIHEAP income maximum of the greater of 150 percent of the poverty income guidelines or 60 percent of State median income. LIHEAP recipient households represent those low income households that received Federal fuel assistance.

LIHEAP Home Energy Notebook for FY 2006: II. Home Energy Data

Table 2-1. Residential energy: Average annual household consumption, expenditures, and burden by all, non low income, low income, and LIHEAP recipient households, by main heating fuel type, United States, FY 2006^{1/} (See also Tables A-2a – A-2c, Appendix A)

Main heating fuel	Fuel consumption (mmBTUs) ^{2/}	Fuel expenditures	Mean individual burden ^{3/}	Median individual burden ^{4/}	Mean group burden ^{5/}
<i>All households</i>					
All fuels	92.1	\$1,982	7.4%	4.1%	3.1%
Natural gas	107.9	\$2,112	7.6%	4.2%	3.3%
Electricity	58.5	\$1,563	6.4%	3.5%	2.5%
Fuel oil	119.4	\$2,683	8.9%	5.0%	4.2%
Kerosene	74.7	\$1,824	17.7%	10.6%	2.9%
LPG ^{6/}	99.1	\$2,351	9.3%	6.4%	3.7%
<i>Non low income households</i>					
All fuels	97.8	\$2,117	3.5%	3.1%	2.5%
Natural gas	112.9	\$2,229	3.6%	3.2%	2.7%
Electricity	64.3	\$1,728	3.1%	2.7%	2.1%
Fuel oil	123.8	\$2,770	4.5%	4.1%	3.3%
Kerosene	86.1	\$2,027	4.3%	3.8%	2.4%
LPG ^{6/}	104.6	\$2,480	5.0%	4.7%	3.0%
<i>Low income households</i>					
All fuels	79.7	\$1,690	16.0%	9.5%	10.1%
Natural gas	96.3	\$1,843	16.9%	10.2%	11.0%
Electricity	46.7	\$1,231	13.2%	7.6%	7.3%
Fuel oil	08.3	\$2,460	20.1%	12.9%	14.7%
Kerosene	69.8	\$1,737	23.4%	15.8%	10.3%
LPG ^{6/}	89.4	\$2,123	16.9%	11.7%	12.6%
<i>LIHEAP recipient households</i>					
All fuels	98.8	\$1,992	22.1%	15.3%	14.6%
Natural gas	117.2	\$2,062	23.1%	16.0%	15.1%
Electricity	55.0	\$1,492	17.4%	12.2%	11.0%
Fuel oil	131.0	\$2,804	26.1%	21.0%	20.6%
Kerosene	86.0	\$2,060	29.5%	17.0%	15.1%
LPG ^{6/}	85.9	\$2,070	24.2%	16.5%	15.2%

^{1/}Data are derived from the 2001 RECS, adjusted to reflect FY 2006 heating degree days, cooling degree days, and fuel prices. Data represent residential energy used from October 2005 through September 2006.

^{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 or 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 2006 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 2006 adjusted RECS data.

^{5/}Mean group energy burden was calculated by first calculating average residential energy expenditures from the 2001 RECS for each group of households and dividing the adjusted figures for FY 2006 by the average income for each group of households from the 2006 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.

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 45 percent of their annual residential expenditures for space heating, 8 percentage points more than did the average low income household. LIHEAP recipient households spent 6 percent for space cooling, about 75 percent of the proportion spent by low income households.

Table 2-2. 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 2006

End Use	All households	Non low income households	Low income households	LIHEAP recipient households
Space heating	35%	34%	37%	45%
Space cooling	10%	11%	8%	6%
Water heating	14%	14%	15%	14%
Refrigeration	8%	8%	8%	7%
Appliances	33%	33%	32%	28%
All uses	100%	100%	100%	100%

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 2-3 shows that, in 2001, more than 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, 56.3 percent. Almost 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, 30.7 percent, and LIHEAP recipient households used electricity at the lowest rate, 21.3 percent. LIHEAP recipient households tended to use bulk fuels more frequently than did households in other groups.

Table 2-3. Home heating: Percent of households using major types of heating fuels by all, non low income, low income, and LIHEAP recipient households, United States, April 2001^{1/} (See also Table A-3, Appendix A)

Heating fuel	All households	Non low income households	Low income households	LIHEAP recipient households
Natural gas	55.4%	56.3%	53.4%	52.4%
Electricity	29.1%	28.3%	30.7%	21.3%
Fuel oil	7.5%	7.9%	6.7%	10.0%
Kerosene	0.8%	0.3%	1.7%	2.2%
LPG	4.7%	4.4%	5.3%	11.0%
Other ^{2/}	2.1%	2.2%	1.8%	2.8%

^{1/}Data are derived from the 2001 RECS. Percentages may not add to 100 percent due to rounding.

^{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 24.1 percent of households in September 1990 to 28.3 percent in April 2001.¹² Low income households increased their use of electricity as the main heat source from 20.0 percent in September 1990 to 30.7 percent in April 2001. LIHEAP recipient households' use of electricity as their main heat source rose from 14.4 percent in September 1990 to 21.3 percent in April 2001.

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 Table 2-4. In FY 2006, average home heating consumption for all households was 42.6 mmBTUs, average expenditures were \$696, and mean individual home heating burden was 2.9 percent.

Low income households had average home heating consumption of 38.4 mmBTUs (9.9 percent less than the average for all households) and average home heating expenditures of \$635 (just under 9 percent less than the average for all households). The mean individual home heating burden for low income households was 6.3 percent, more than twice as much as the average home heating burden for all households and five times the average home heating burden for non low income households.

Average home heating consumption for LIHEAP households was 57.2 mmBTUs (34.3 percent higher than the average for all households), and average home heating expenditures were \$922 (over 35 percent higher than the average for all households). Mean individual home heating burden for LIHEAP households was 11.2 percent, 4.9 percentage points higher than the average for low income households and close to four times the average for all households. Average home heating consumption for LIHEAP recipient households was close to 49 percent greater than that for all low income households, because LIHEAP heating assistance recipient households tend to live in colder climate regions.¹³

For FY 2006, the heating season was 9.6 percent warmer than the FY 2005 heating season. Between FY 2005 and FY 2006, home heating consumption dropped 4 percent for all households and low income households, but only dropped less than 1 percent for LIHEAP recipient households.

Compared to FY 2005, the FY 2006 prices for natural gas increased by 11.0 percent, fuel oil prices increased by 20.7 percent, and electricity prices increased by 11.1 percent in nominal terms.¹⁴ Despite the decrease in consumption from FY 2005 to FY 2006, average home heating expenditures for all households, low income households, and LIHEAP recipient households increased as a result of large rises in fuel prices during this period.

The increases in home heating expenditures from FY 2005 to FY 2006 were relatively consistent among the three major home heating fuels. Expenditures for households heating with natural gas increased by 19 percent. Expenditures for households heating with electricity increased by almost 16 percent, while expenditures for households heating with fuel oil increased by 16.5 percent.

¹²Findings from the 2001 RECS, Energy Information Administration, U.S. Department of Energy.

¹³LIHEAP Home Energy Notebook for FY 2005.

¹⁴Price data obtained from the Energy Information Administration's Monthly Energy Review, September 2007, for all fuels.

LIHEAP Home Energy Notebook for FY 2006: II. Home Energy Data

Table 2-4. Home heating: Average annual household consumption, expenditures, and burden by all, non low income, low income, and LIHEAP recipient households, by fuel type, United States, FY 2006^{1/} (See also Tables A-4, A-5a, A-5b, and A-5c, Appendix A)

Main heating fuel	Fuel consumption (mmBTUs) ^{2/}	Fuel expenditures	Mean individual burden ^{3/}	Median individual burden ^{4/}	Mean group burden ^{5/}
<i>All households</i>					
All fuels	42.6	\$696	2.9%	1.3%	1.1%
Natural gas	54.9	\$801	3.3%	1.5%	1.3%
Electricity	13.8	\$353	1.6%	0.7%	0.6%
Fuel oil	71.4	\$1,229	4.1%	2.3%	1.9%
Kerosene	40.8	\$853	8.9%	4.1%	1.3%
LPG ^{6/}	51.5	\$1,041	3.9%	2.7%	1.6%
<i>Non low income households</i>					
All fuels	44.6	\$725	1.3%	0.9%	0.9%
Natural gas	56.5	\$821	1.4%	1.1%	1.0%
Electricity	14.7	\$373	0.7%	0.5%	0.4%
Fuel oil	73.7	\$1,272	2.1%	1.8%	1.5%
Kerosene	50.2	\$1,029	2.2%	1.9%	1.2%
LPG ^{6/}	55.2	\$1,132	2.3%	1.9%	1.4%
<i>Low income households</i>					
All fuels	38.4	\$635	6.3%	3.0%	3.8%
Natural gas	51.4	\$755	7.6%	3.7%	4.5%
Electricity	11.9	\$313	3.6%	1.8%	1.9%
Fuel oil	65.4	\$1,118	9.2%	5.9%	6.7%
Kerosene	36.8	\$777	11.8%	6.3%	4.6%
LPG ^{6/}	44.7	\$880	6.8%	5.0%	5.2%
<i>LIHEAP recipient households</i>					
All fuels	57.2	\$922	11.2%	7.1%	6.8%
Natural gas	70.0	\$973	11.8%	7.4%	7.1%
Electricity	19.8	\$537	6.6%	4.4%	3.9%
Fuel oil	88.7	\$1,522	15.4%	11.5%	11.2%
Kerosene	54.5	\$1,118	15.8%	11.8%	8.2%
LPG ^{6/}	40.7	\$844	12.2%	6.5%	6.2%

^{1/}Data are derived from the 2001 RECS, adjusted to reflect FY 2006 heating degree days and fuel prices. Data represent home energy used from October 2005 through September 2006.

^{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 or 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 2006 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 2006 adjusted RECS data.

^{5/}Mean group heating energy burden has been calculated by first calculating average home heating energy expenditures from the 2001 RECS for each group of households and dividing the adjusted figures for FY 2006 by the average income for each group of households from the 2006 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.

Home cooling data

This section presents data on home cooling type, home cooling consumption, home cooling expenditures, and home cooling burden. In general, the home cooling data are less reliable than the home heating data for LIHEAP recipient households because there are fewer LIHEAP cooling recipient households in the RECS sample.

Cooling type

As shown in Table 2-5, about 88 percent of households in 2001 cooled their homes. Low income households were less likely to cool their homes than were non low income households.

Table 2-5. Home cooling: Percent of households with home cooling by all, non low income, low income, and LIHEAP recipient households, United States, April 2001^{1/} (See also Table A-6, Appendix A)

Presence of Cooling	All Households	Non low income households	Low income households	LIHEAP recipient households
Cooling ^{2/}	88%	91%	82%	83%
None ^{3/}	12%	9%	18%	17%

^{1/}Data are derived from the 2001 RECS.

^{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 defined by the 2001 RECS (e.g., 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 2-6. In FY 2006, average home cooling consumption for households that cooled was 7.3 mmBTUs, average expenditures were \$222, and mean individual home cooling burden was 0.7 percent.

Low income households had average home cooling energy consumption of 5.3 mmBTUs (over 27 percent less than the average for all households) and average home cooling expenditures of \$159 (more than 28 percent less than the average for all households). The mean individual home cooling burden for low income households was 1.5 percent, twice the average home cooling burden of all households and less than four times that of non low income households.

Average home cooling consumption for LIHEAP recipient households was 4.0 mmBTUs (45 percent less than all households), and average home cooling expenditures were \$123 (45 percent less than all households). Mean individual home cooling burden for LIHEAP recipient households was 0.9 percent, over 1¼ times the average for all households. On average, LIHEAP recipient households consumed over 25 percent fewer BTUs for cooling than did all low income households.

The FY 2006 cooling season was almost 3 percent cooler than FY 2005. From FY 2005 to FY 2006, home cooling consumption decreased by nearly 4 percent for all households, by 5.4 percent for low income households, and by over 9 percent for LIHEAP recipient households.

Nationally, all households increased their average home cooling expenditures by 6.2 percent, and low income households increased their average home cooling expenditures by almost 4 percent. Average home cooling expenditures for LIHEAP recipient households were static. The changes in expenditures resulted from the combination of a moderate rise in electricity prices from FY 2005 to FY 2006 and slightly cooler weather during that period.

Table 2-6. Home cooling: Average annual household consumption, expenditures, and percent of income by all, non low income, low income and LIHEAP recipient households that cooled, by fuel type, United States, FY 2006^{1/} (See also Table A-6, Appendix A)

Household group	Fuel consumption (mmBTUs) ^{2/}	Fuel expenditures	Mean individual burden ^{3/}	Median individual burden ^{4/}	Mean group burden ^{5/}
All households	7.3	\$222	0.7%	0.3%	0.4%
Non low income households	8.1	\$249	0.4%	0.3%	0.3%
Low income households	5.3	\$159	1.5%	0.7%	0.9%
LIHEAP recipient households	4.0	\$123	0.9%	0.8%	0.9%

^{1/}Data are derived from the 2001 RECS, adjusted to reflect FY 2006 cooling degree days and fuel prices. Data represent residential energy used from October 2005 through September 2006.

^{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 or 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 2006 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 2006 adjusted RECS data.

^{5/}Mean group heating energy burden has been calculated by first calculating average home cooling energy expenditures from the 2001 RECS for each group of households and dividing the adjusted figures for FY 2006 by the average income for each group of households from the 2006 CPS ASEC.

III. Low Income Home Energy Trends

Important shifts in energy prices and consumption have occurred since the 1973 oil embargo. As a result, the energy expenditures and energy burdens of low income households have changed significantly.

In the *LIHEAP Report to Congress for FY 1989*, Appendix K presented the results of a national study of residential energy consumption, expenditures, and burden for low income households from 1973 to 1989. Selected tables from that study were updated and published as a regular appendix in annual LIHEAP reports to Congress for FY 1991 through FY 1996. Beginning with the FY 1997-FY 1999 report, the tables are only published in the annual *LIHEAP Home Energy Notebook*. The tables present data for low income households and, for comparison purposes, include statistics on all households. Beginning with 1979, the year before HHS' first energy assistance program was enacted, trend data are furnished on the following:

- Home energy consumption, expenditures, and burden.
- Factors affecting consumption, expenditures, and burden.
- The impact of LIHEAP assistance on net home energy expenditures.

A number of special terms are used throughout this section. Table 3-1 on the next page defines these special terms. One such term is “low income,” which is defined as having income at or below 150 percent of the poverty income guidelines. Because of limitations on the availability of data, this definition is more restrictive than that used in other parts of the *Notebook*. In those sections, “low income” refers to LIHEAP income eligible households, which are households with incomes below the greater of 150 percent of poverty or 60 percent of State median income. Based on estimates from the 2006 CPS ASEC, the more restrictive definition excludes 11.0 million households of the 34.4 million households that meet the definition of LIHEAP income eligible households. Therefore, differences in FY 2006 home energy data reported in this section and that reported in other parts of this *Notebook* are the result of the difference in definition of “low income.”¹⁵

Unless indicated otherwise, the energy data in this section are based on nine national residential energy surveys of occupied residential housing units and their fuel suppliers. Table 3-2 identifies the surveys used, the date on which household interviews began, the time period in which residential energy bills were collected from fuel suppliers, the time frame for household income, and the number of households included in the survey.

For each survey, a national sample of residential housing units was selected, and interviewers attempted personal contacts with the householder. For those housing units where an authorization form was completed, the household's fuel supplier was contacted and asked to supply fuel costs and consumption data.

The collection of income data is not a primary focus of the residential energy surveys. Income statistics from the CPS ASEC are used to improve income data.

¹⁵As noted in Table 3-2, the data files used in this study include surveys from 1979 and 1981. The variable that designates LIHEAP eligibility was not coded for those data files.

Table 3-1. Definition of special terms

Term	Definition
Billing data	Energy costs and consumption data furnished by the household's fuel supplier.
Composite price	The weighted average price of electricity, natural gas, and fuel oil used for residential purposes.
Real dollar expenditures	Costs adjusted for changes in the price of a market basket of consumer goods between two years (adjusted for inflation or deflation).
Cooling degree days	Daily cooling degree days are computed by subtracting a base temperature (65 degrees Fahrenheit) from a day's mean temperature when it exceeds 65 degrees Fahrenheit. If the mean temperature on a day is 70, the number of cooling degree days experienced on that day is 5 (70 minus 65). In this <i>Notebook</i> , we refer to annual cooling degree days, or the sum of all cooling degree days experienced during a year.
Dollar expenditures	Actual costs as reported in the year of the energy survey (unadjusted for inflation or deflation). Unless noted otherwise all dollar expenditures are unadjusted.
Energy burden	The share or percentage of annual household income that is used to pay annual energy bills. ^{1/}
Energy end uses	The specific use of energy in the home for home heating, home cooling or ventilation, water heating, and appliances.
Fuel assistance	LIHEAP heating, cooling, and crisis assistance.
Heating degree days	Daily heating degree days are computed by subtracting the mean temperature for a day, when that temperature falls below 65 degrees Fahrenheit, from a base temperature (65 degrees Fahrenheit). For example, if the mean temperature on a day is 60 and the base temperature is 65, the number of heating degree days experienced on that day is 5 (65 minus 60). In this <i>Notebook</i> , we refer to annual heating degree days, or the sum of all heating degree days experienced during a year.
Home energy expenditures	Expenditures for home space heating and home space cooling and ventilation.
LIHEAP coverage rate	The percentage of the aggregate home energy bills for low income households that is covered by LIHEAP fuel assistance.
LIHEAP income eligible households	Households with incomes below the Federal maximum LIHEAP income standard – below the greater of 150 percent of the Federal poverty income guidelines or 60 percent of State median income.
LIHEAP participation rate	The percentage of LIHEAP income eligible households that receive fuel assistance.
LIHEAP recipient households	Households that indicated receiving home heating, cooling, or energy crisis benefits during the 12 months prior to a particular household survey.
Low income households	Households with incomes at or below 150 percent of the Federal poverty income guidelines.
MmBTUs	A British Thermal Unit (BTU) is the amount of energy necessary to raise the temperature of one pound of water one degree Fahrenheit. MmBTUs refers to millions of BTUs. An average household uses about 100 mmBTUs per year.
Residential energy expenditures	Fuel expenditures for all residential uses, including home heating, home cooling or ventilation, water heating, refrigeration, clothes drying, etc.

^{1/}Three different energy burden statistics are used in this section: mean group burden, mean individual burden, and median individual burden. The definitions of these statistics are presented on page 15.

Table 3-2 presents information on the series of surveys that were used to prepare this *Notebook*. The reader should note that the in-home interview dates lag behind the analysis year for the years 1979 through 1985. In those years, the energy supplier survey included data from the year following the in-home interview. In all cases, the analysis year coincides with the end of the energy consumption history.

Table 3-2. Data used for the study of low income home energy trends

	Analysis Year ^{1/}									
	1979	1981	1983	1985	1987	1990	1993	1997	2001	FY 2006
Survey ^{2/}	NIECS	RECS	RECS	RECS	RECS	RECS	RECS	RECS	RECS	RECS
Interview date ^{3/}	9/78	9/80	9/82	9/84	9/87	9/90	10/93	5/97	5/01	^{4/}
Billing data ^{5/}	4/78 to 3/79	4/80 to 3/81	4/82 to 3/83	4/84 to 3/85	1/87 to 12/87	1/90 to 12/90	1/93 to 12/93	1/97 to 12/97	1/01 to 12/01	1/01 to 12/01
Income data ^{6/}	1979	1981	1983	1985	1987	1990	1993	1997	2001	2006
Sample size	4,081	6,051	4,724	5,682	6,229	5,095	7,111	5,900	5,318	5,318

- ^{1/}Represents the year that includes the last month for which billing data were collected from fuel suppliers.
- ^{2/}Surveys include the National Interim Energy Consumption Survey (NIECS) and the RECS.
- ^{3/}Month and year in which household interviews began.
- ^{4/}Data projected from the 2001 RECS using changes in weather and prices. See Appendix A for the procedure used to calculate the projections.
- ^{5/}Time period in which residential energy bills were collected from fuel suppliers.
- ^{6/}Mean income computed using calendar year data from the CPS ASEC.

Trends in consumption, expenditures, and burden

Since 1979, there have been important changes in the fuels used by households, the amount of energy consumed for specific residential end uses (i.e., home heating, water heating, home cooling, and for other appliances), total residential energy expenditures, and the burden that residential energy expenditures represent for low income households. This section presents data that illustrate these changes.

Figures 3-1 and 3-2, on the next page, furnish information on the fuel choices by low income households. Figure 3-1 shows that low income households have increased their use of electricity as a main heating fuel, from 10.4 percent in 1979 to 34.0 percent in 2001, while they have reduced their use of fuel oil as a main heating fuel, from 20.0 percent in 1979 to 7.5 percent in 2001.¹⁶ In addition, the use of wood or coal as a main heating fuel (included under “Other”) peaked in 1985 but has declined substantially since.

Figure 3-2 shows that low income households increased their use of central air-conditioning systems from 8.5 percent in 1979 to 35.8 percent in 2001.¹⁷ The proportion of low income households with no air-conditioning fell from 62.8 percent in 1979 to 33.2 percent in 2001. Other things being equal, increased use of air-conditioning equipment among low income households can be expected to increase home cooling expenditures.

¹⁶For all households, the share using electricity as their main heating fuel grew from 15.8 percent in 1979 to 29.1 percent in 2001, and the share using fuel oil as their main heat fell from 22.1 percent to 7.5 percent.

¹⁷For all households, the share using electric central air-conditioning grew from 23.0 percent in 1979 to 54.8 percent in 2001.

Figure 3-1. Main heating fuel for households with incomes at or below 150 percent of the poverty income guidelines, 1979 to 2001

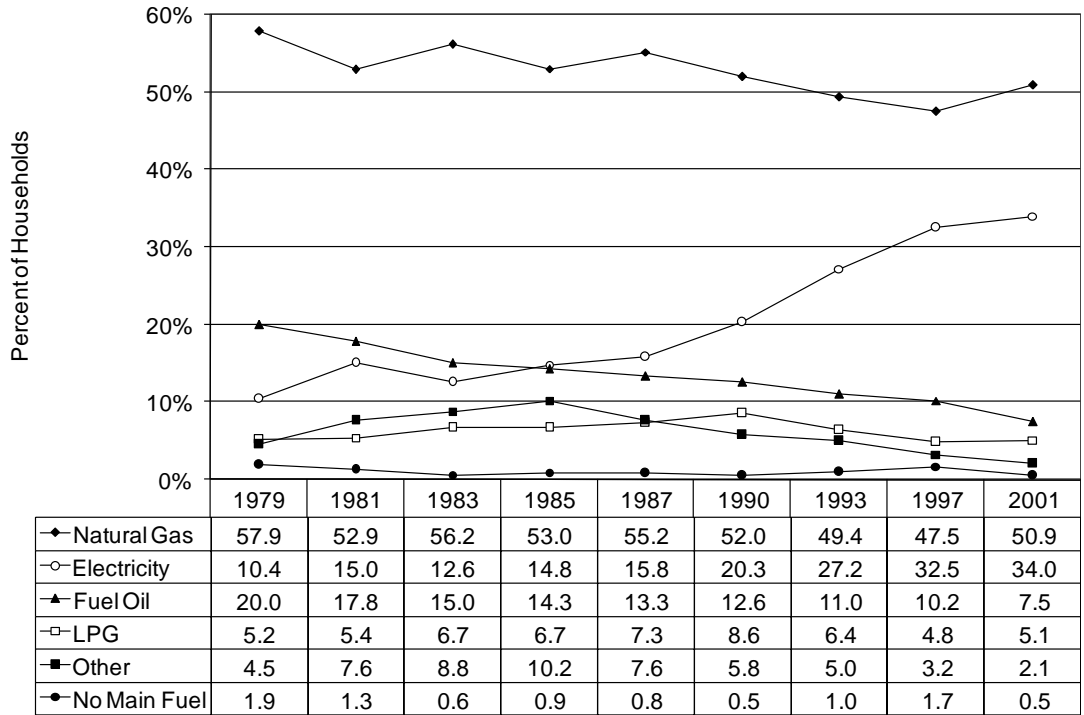
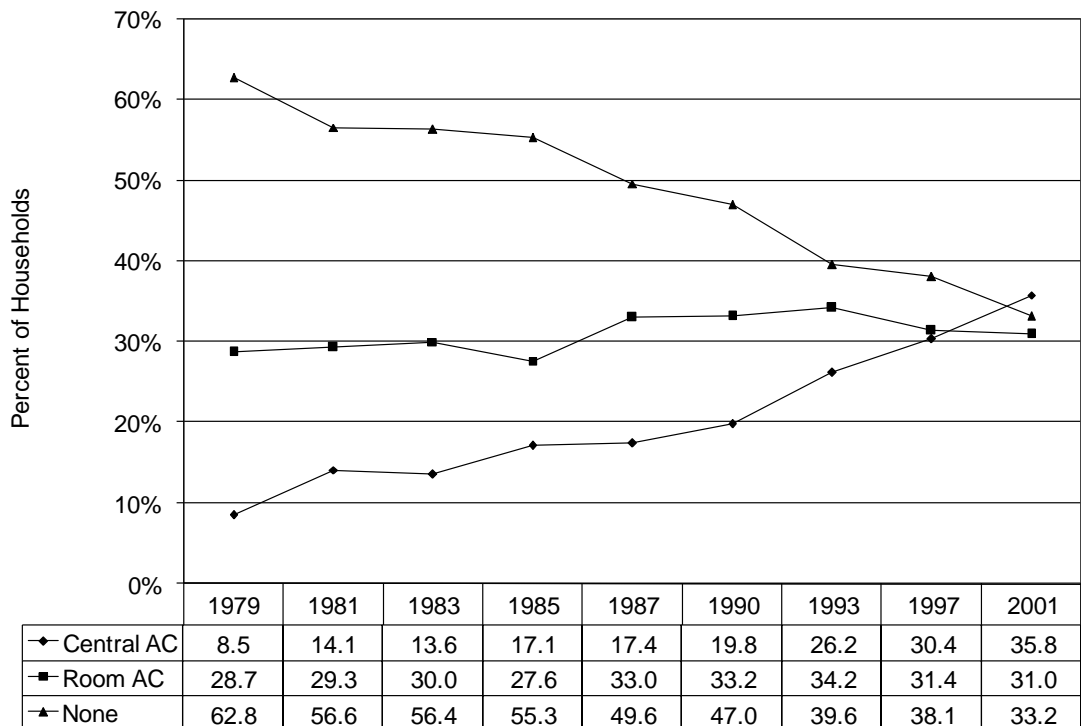


Figure 3-2. Air-conditioning type for households with incomes at or below 150 percent of the poverty income guidelines, 1979 to 2001



Figures 3-3 and 3-4 furnish information on the trends in mean residential energy consumption and expenditures for low income households from 1979 to FY 2006. Figure 3-3 shows that low income households substantially reduced their residential energy consumption between 1979 and 1983. This suggests a significant increase in efficiency resulting from conservation measures or actions. Examination of the components of residential energy consumption indicates that the reduction was the result of reductions in home heating consumption. From 1983 to 1990, mean residential energy consumption fluctuated from year to year, corresponding to expected changes in heating and cooling consumption that resulted from changes in heating and cooling degree days.¹⁸ For 1993 through 1997, there appears to have been a significant increase in the use of energy for purposes other than home heating and home cooling. In 2001 through FY 2006, the use of energy for purposes other than heating and cooling was lower than it was in 1997.

Figure 3-3. Mean residential energy consumption per household in mmBTUs by end use for households with incomes at or below 150 percent of the poverty income guidelines, 1979 to FY 2006

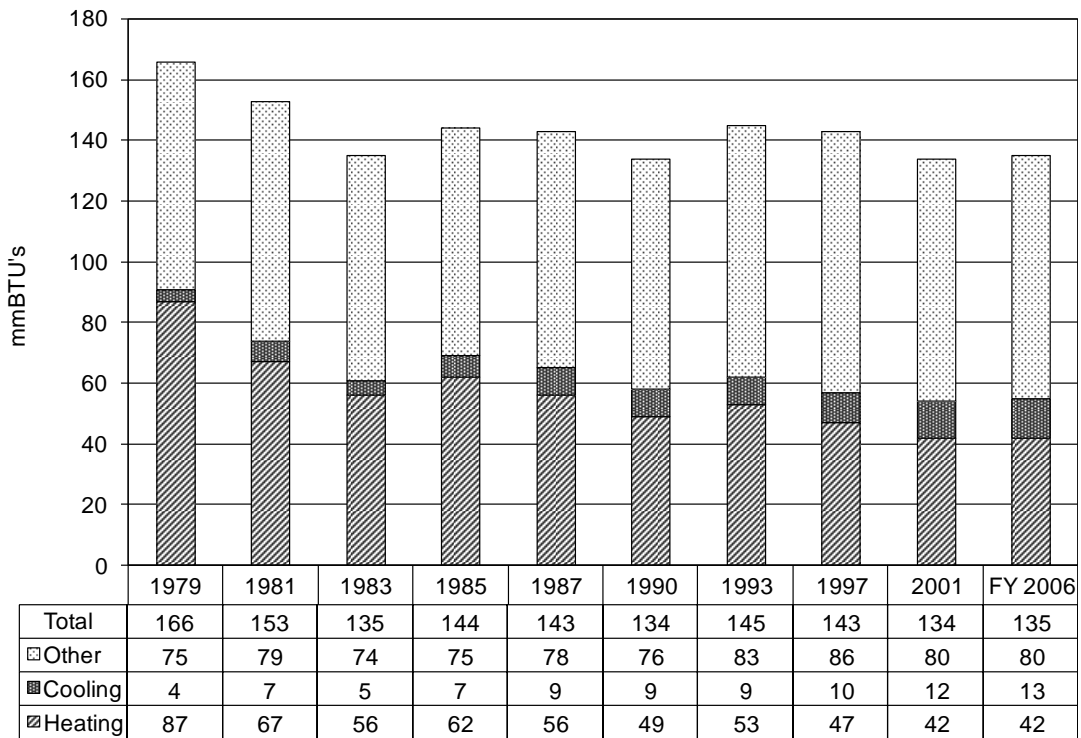
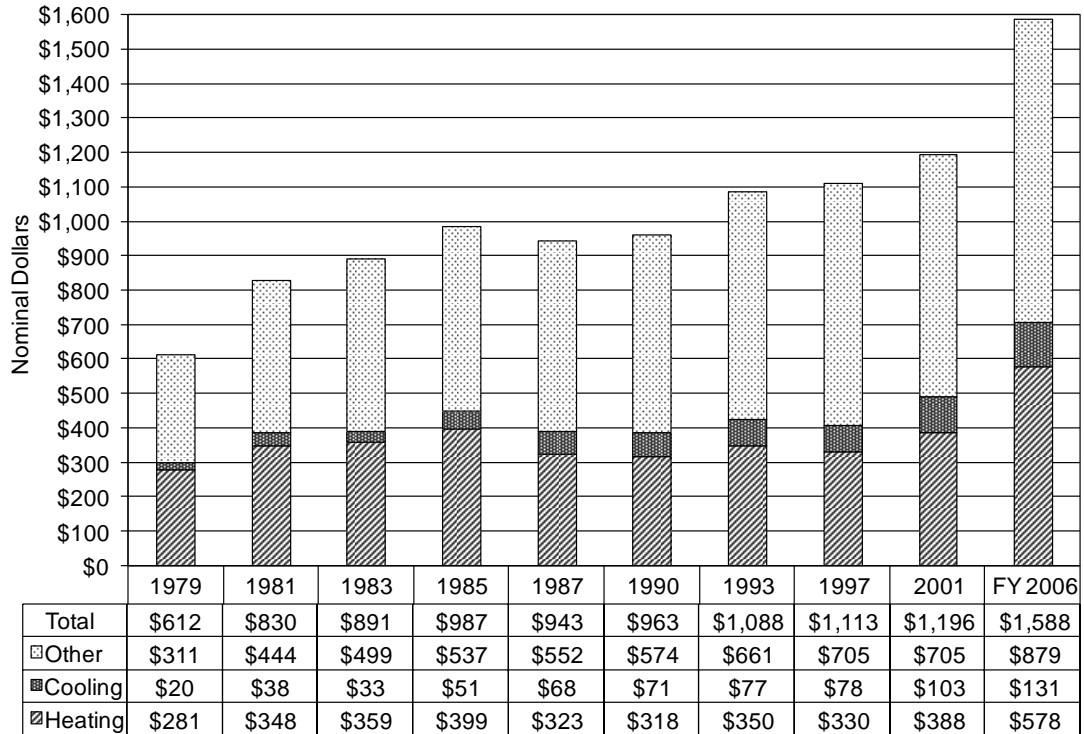


Figure 3-4, on the next page, shows that residential energy expenditures for low income households increased rapidly from 1979 to 1985; the increases were the result of fuel price increases. Examination of the components of energy expenditures indicates that the greatest increases were in home cooling and other residential expenditures, while increases in home heating expenditures were more moderate until 2001. Mean residential energy expenditures increased at a moderate rate from \$943 in 1987 to \$1,113 in 1997. From 1997 to 2001 residential energy expenditures increased by 7 percent to \$1,196. In FY 2006, mean residential energy expenditures rose by over 32 percent to \$1,588. Mean home heating expenditures fell from \$399 in 1985 to \$318 in 1990, then rose and fell

¹⁸The numbers presented in this table are not directly comparable to the statistics that appear in Appendix A. In this figure, electricity BTUs have been adjusted to be comparable to BTUs for other fuels. This adjustment procedure is used to account for BTUs lost in the generation and transmission of electricity to the housing unit and to thereby furnish a better picture of changes in energy efficiency over time.

moderately until 1997. In 2001 home heating expenditures saw an 18 percent increase over 1997. Mean home heating expenditures rose by more than 48 percent in FY 2006. The increase in expenditures in 2001 and FY 2006 were the result of higher fuel prices. Mean home cooling expenditures rose continuously from \$51 in 1985 to \$103 in 2001. In FY 2006 mean home cooling expenditures were \$131.

Figure 3-4. Mean residential energy expenditures by end use for households with incomes at or below 150 percent of the poverty income guidelines, 1979 to FY 2006



The next series of Figures, 3-5 through 3-7, furnishes information on energy burden for low income households.¹⁹ Three different energy burden summary statistics are presented in the three figures; mean group energy burden, mean individual energy burden, and median individual energy burden.²⁰ Each of the statistics offers somewhat different information and gives somewhat different results. All three are valid from a statistical perspective. The statistics are defined as follows.

- *Mean Group Burden:* Computed as the ratio between mean energy expenditures and mean income for a given set of households, such as low income households. Energy expenditures are computed from RECS and income is derived from the CPS ASEC.
- *Mean Individual Burden:* Computed by finding, using RECS and CPS ASEC data, the energy burden for each individual household in a given set (such as low income households) and then taking the mean of these energy burdens for all households in that set.

¹⁹These figures present gross burden statistics; they do not account for the reduction in burden attributable to the receipt of LIHEAP benefits. Figure 3-26 compares gross burden and net burden for LIHEAP recipient households.

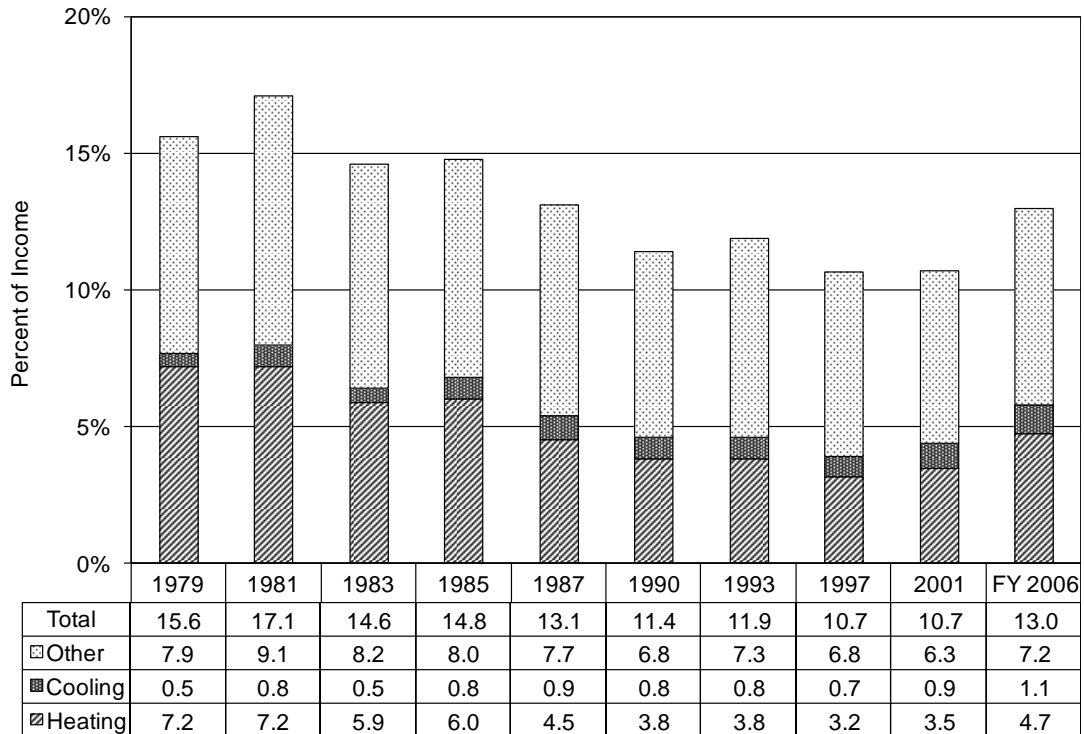
²⁰The mean is the sum of all values divided by the number of values, or what is commonly called the average. The median is the value at the midpoint in the distribution of values.

- **Median Individual Burden:** Computed by finding, using RECS and CPS ASEC data, the energy burden for each individual household in a given set (such as low income households) and finding the median, or middle point, of the distribution of these household-level energy burdens in the set.

Mean group burden is the burden statistic that has been used in the series of *LIHEAP Annual Reports to Congress*. Recent technical research has furnished additional insights on the range of alternative burden summary statistics.²¹

Figure 3-5 shows the time series for mean group energy burdens by end use for low income households. Mean group home energy burden, the sum of mean heating and cooling burden from Figure 3-5, grew from 7.7 percent of income in 1979 to 8.0 percent in 1981, and then fell considerably after 1981 to 3.9 percent in 1997. From 1981 through 1997 mean group home energy burdens declined because mean home energy expenditures for low income households fell, while mean incomes for low income households rose. In 2001, mean group home energy burden rose to 4.4 percent. This increase in home energy burden was the result of the dramatic increase in expenditures for home energy due to higher prices. In FY 2006, burden rose slightly to 5.8 percent because expenditures rose. Home energy burden for FY 2006 was almost 49 percent higher than in 1997, just under 32 percent higher than in 2001, but was 28 percent below the level in 1981.

Figure 3-5. Mean group residential energy burden by end use for households with incomes at or below 150 percent of the poverty income guidelines, 1979 to FY 2006



Figures 3-6 and 3-7 show how the mean individual and median individual energy burden statistics compare to the group energy burden statistics. Figure 3-6 shows the trends in residential energy burden for low income households, and Figure 3-7 shows the trends in home energy burden for low income households. In 2001, the mean individual residential energy burden was 16.8 percent,

²¹ See Appendix A for additional information on the interpretation of alternative burden statistics.

significantly higher than the median individual burden of 9.6 percent and the group burden of 10.7 percent. In 2001, the mean individual home energy burden was 7.2 percent, the median individual burden was 3.8 percent, and the mean group burden was 4.4 percent. For all three summary statistics, the highest home energy burden occurred in 1981 and the lowest home energy burden occurred in 1997. For FY 2006, median individual residential energy burden was 29 percent lower, group mean burden was 24 percent lower, and individual mean burden was 11 percent lower than the 1981 peak.

Figure 3-6. Comparison of mean group, mean individual, and median individual residential energy burden for households with incomes at or below 150 percent of the poverty income guidelines, 1979 to FY 2006

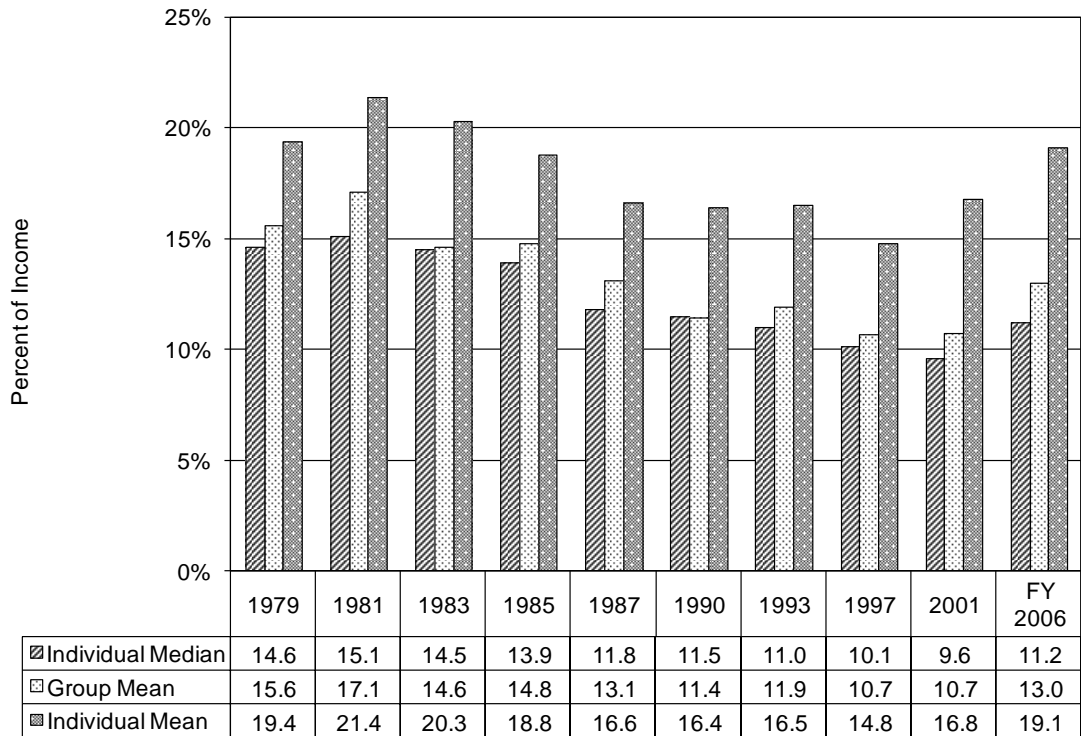
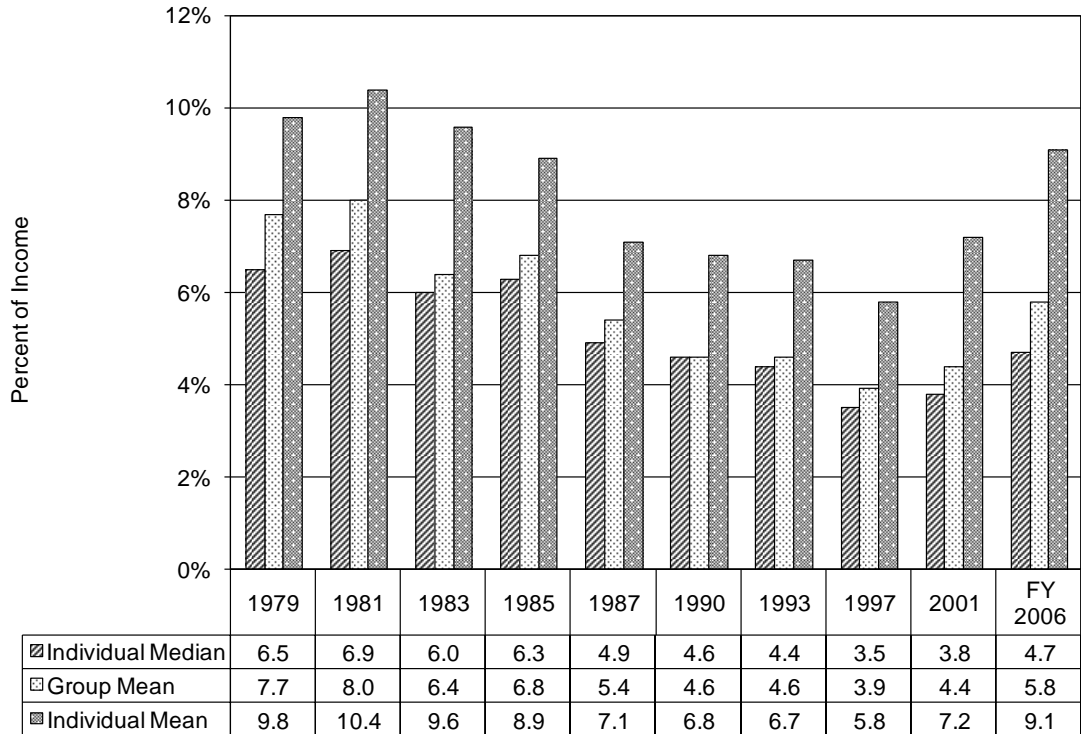


Figure 3-7. Comparison of mean group, mean individual, and median individual home energy burden for households with incomes at or below 150 percent of the poverty income guidelines, 1979 to FY 2006



Figures 3-8 and 3-9 present information on the number and percent of low income households that had home energy burdens that exceeded specified levels. The levels are reference points and do not represent any judgment regarding an “affordable” level of energy burden.

As shown in Figure 3-8, the number of low income households with home energy burdens exceeding 10 percent of income grew from 5.0 million in 1979 to 7.1 million in 1985, an increase of 42 percent. The number of low income households with home energy burdens exceeding 5 percent of income grew by 62 percent from 1979 to 1985. These increases were primarily the result of growth in the total number of low income households. As Figure 3-9 shows, the percentage of low income households with home energy burdens exceeding specified levels remained quite stable from 1979 through 1985. For the period 1985 through 1997, however, both the number and percentage of low income households exceeding specified levels fell significantly from previous levels. For these years, both a reduction in home energy expenditures and increased incomes caused burden to decrease for low income households. In 2001, both the number and percent of households exceeding the specified levels rose, and then rose again slightly in FY 2006. The number of low income households with home energy burdens exceeding 10 percent of income in FY 2006 was 23 percent less than the 1985 level and 10 percent more than the 1979 level.

Figure 3-10 shows the total assistance funding that would be required to reduce the home energy burden for all low income households to 10 percent of income and 5 percent of income.²² The

²² This is calculated first by finding the amount of funding for each low income household that would be required to reduce its home energy burden to the specified percent of income. This amount is the difference between the household’s actual home energy burden and the specified home energy burden (the dollar amount of the specified percent of household income). Then the household amounts are aggregated to produce the total assistance funding that is needed for all low income households.

amount required for a reduction in the home energy burden of low income households to 5 percent of income was \$2.2 billion in 1979, \$4.6 billion by 1985, \$3.3 billion in 2001, and \$6.2 billion in FY 2006. The number of households with home energy burdens exceeding 5 percent of income fell between 1985 and 1997. The total dollars of assistance funding required to reduce the home energy burden of low income households to 5 percent also fell through 1997. In 2001, increased expenditures caused the number of low income households exceeding the percent of income reference points to rise. Accordingly, the total dollars of assistance funding required to reduce the home energy burden to 5 percent also rose substantially. In FY 2006, while the number of low income households exceeding the percent of income reference points increased, their average expenditures increased. Therefore, total dollars of assistance funding required to reduce home energy burdens rose substantially.

Figure 3-8. Number of low income households spending over 5 percent and 10 percent of income on home energy, 1979 to FY 2006

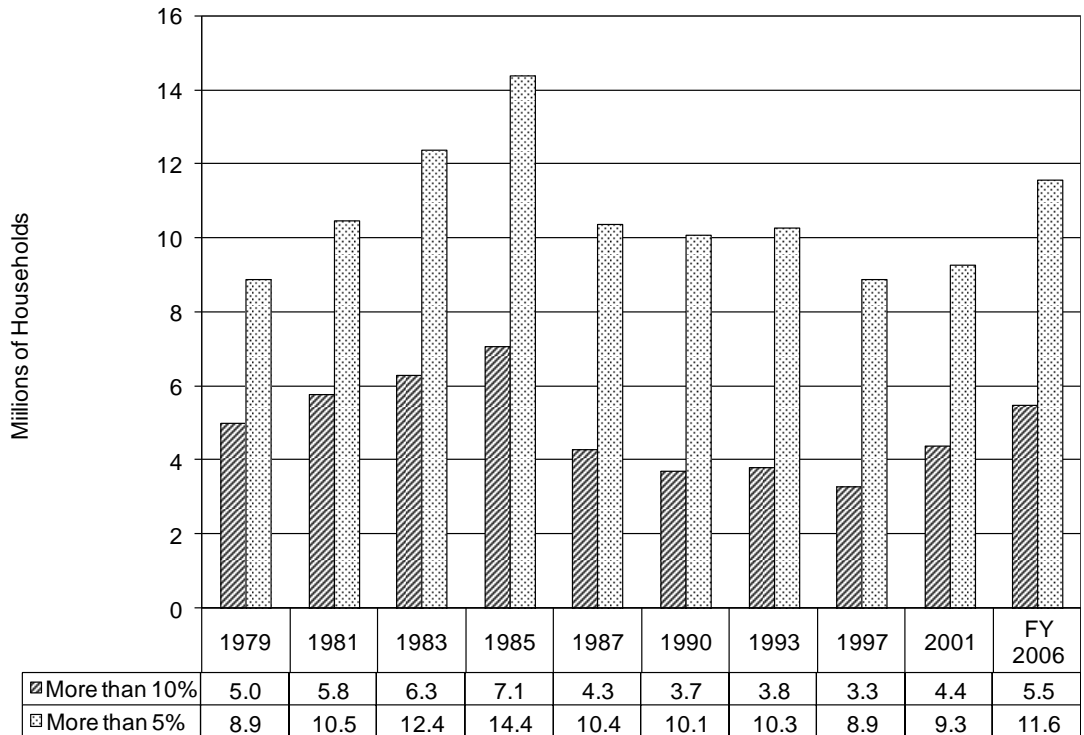


Figure 3-9. Percent of low income households spending over 5 percent and 10 percent of income on home energy, 1979 to FY 2006

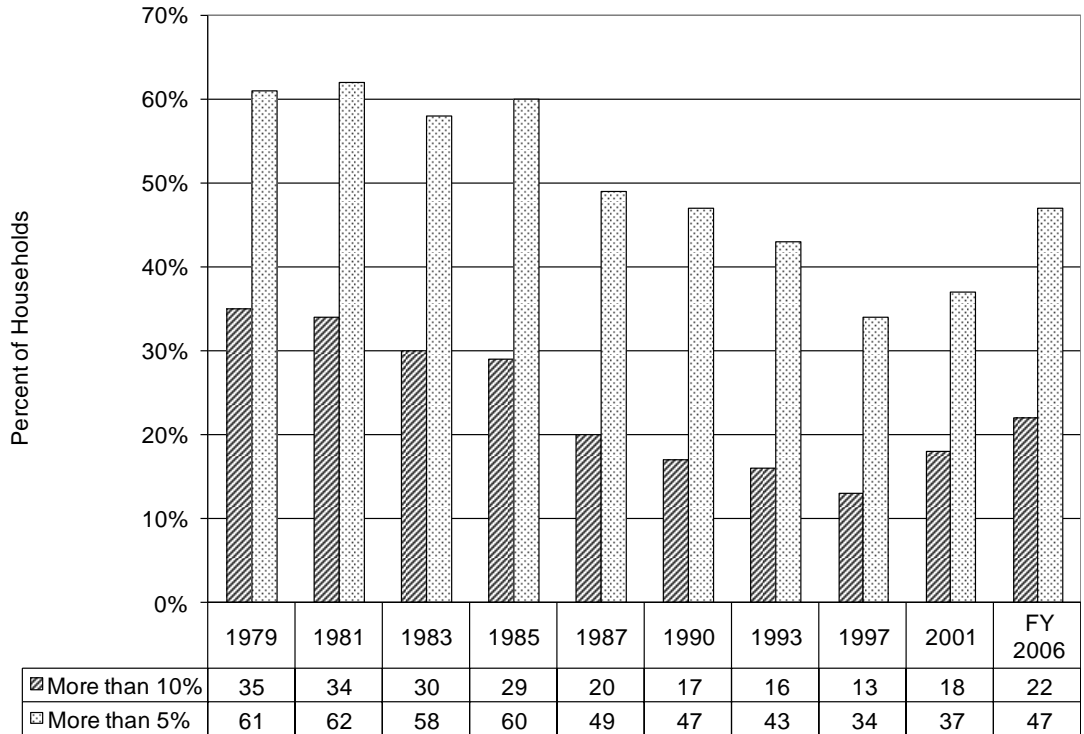
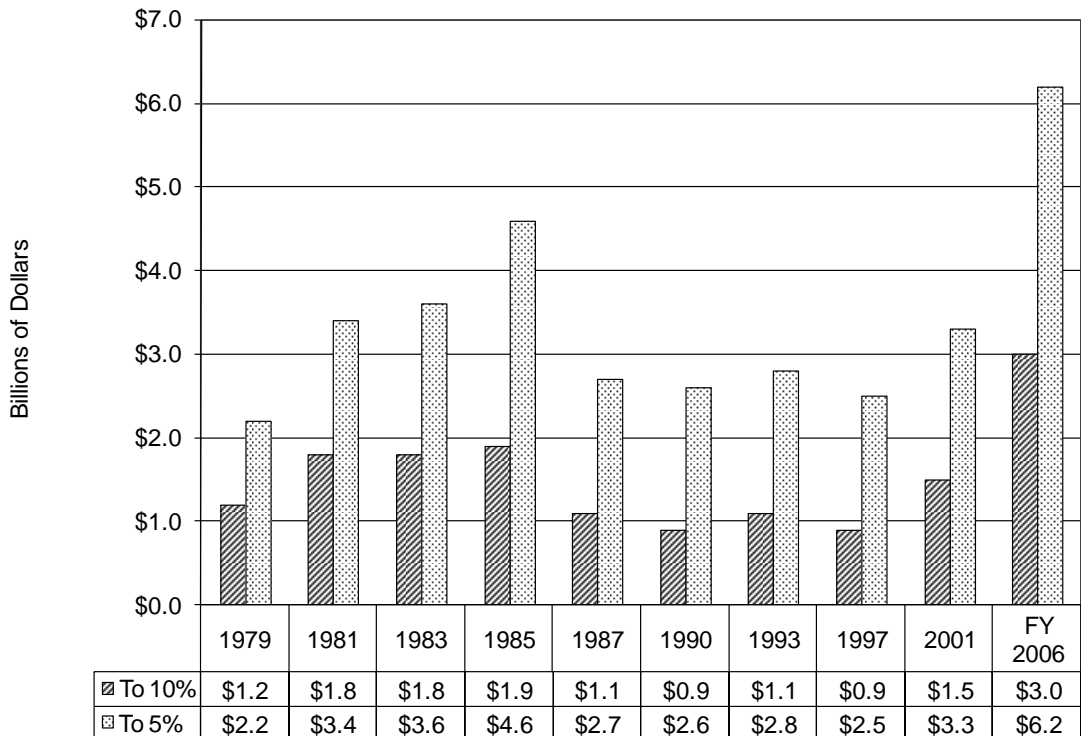


Figure 3-10. Total fuel assistance dollars needed to reduce low income household spending on home energy to 5 percent and 10 percent of income, 1979 to FY 2006



Figures 3-11 and 3-12 furnish statistics for residential energy expenditures. Figure 3-11 shows that the number of households spending over 15 and 25 percent of their income on residential energy followed a pattern similar to that observed in Figure 3-8. The largest number of households exceeded the specified percentages in 1983 and 1985. While the numbers exceeding 15 and 25 percent of income were lower in FY 2006 than during the peak years, they remained high. Figure 3-12 demonstrates that the funds required to reduce all low income households to the specified percentages reached their highest levels in FY 2006.

Figure 3-11. Number of low income households spending over 15 percent and 25 percent of income on residential energy, 1979 to FY 2006

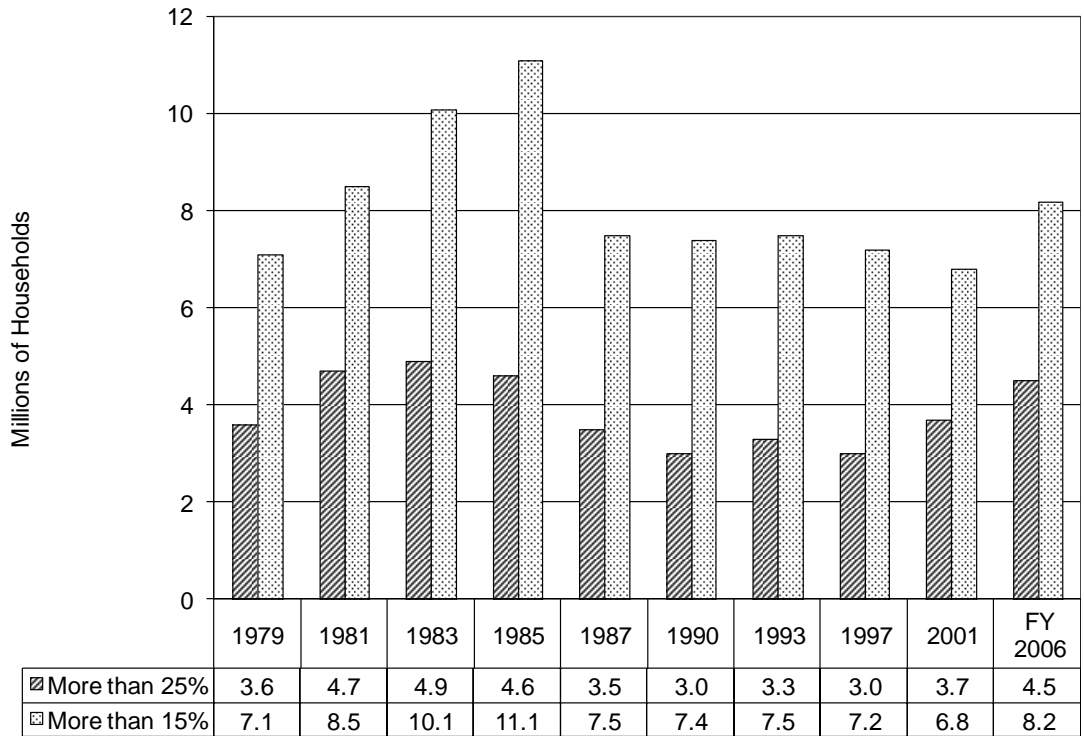


Figure 3-12. Total fuel assistance dollars needed to reduce low income household spending on residential energy to 15 percent and 25 percent of income, 1979 to FY 2006

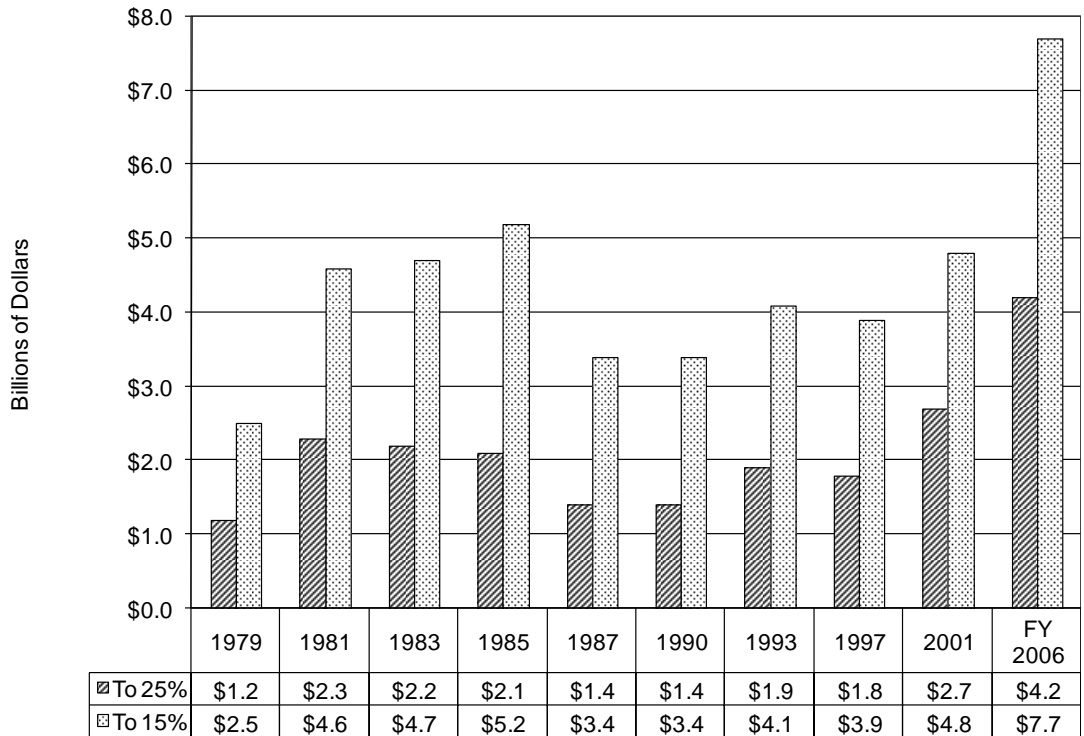


Figure 3-13 shows how the aggregated residential energy bill for all low income households has changed from 1979 to FY 2006. In 1979, the aggregated home energy bill for low income households was \$4.5 billion. By FY 2006, the aggregated home energy bill had grown to \$16.3 billion. This growth results from both the increase in average home energy bills and growth in the size of the low income population.

Figure 3-13 also shows that in 1979, home energy accounted for about half of the total low income residential energy bill. In FY 2006, home energy accounted for 44.7 percent of the total low income residential energy bill.

Figure 3-13. Aggregated residential energy expenditures by end use for households with incomes at or below 150 percent of the poverty income guidelines, 1979 to FY 2006

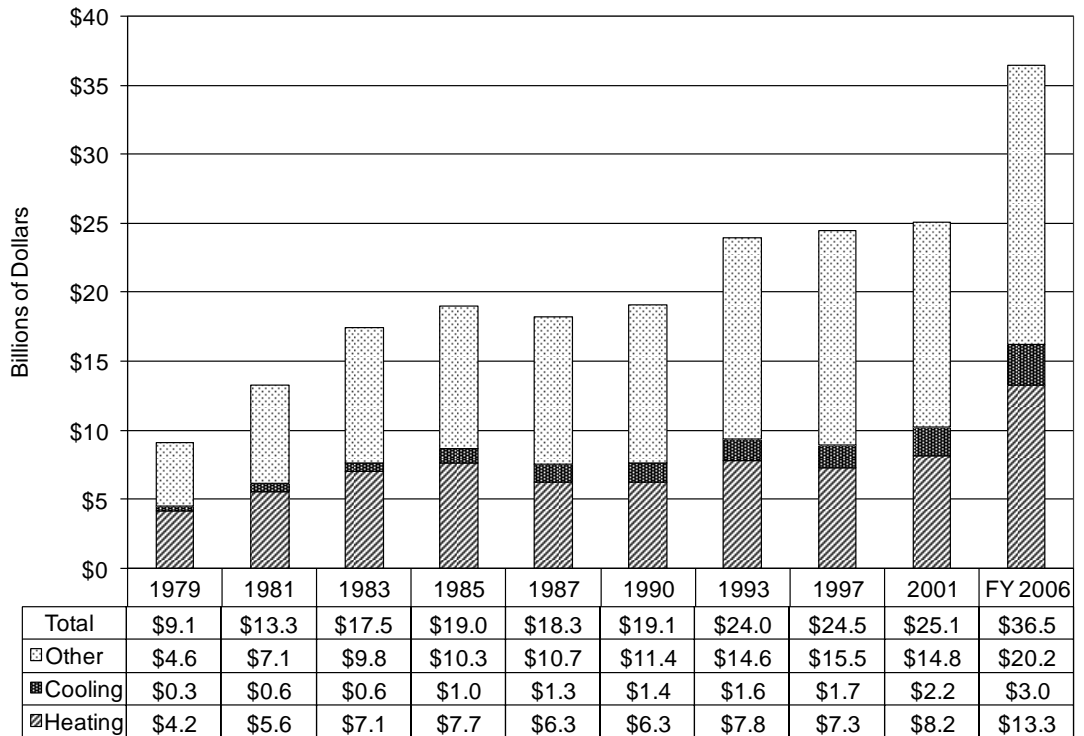
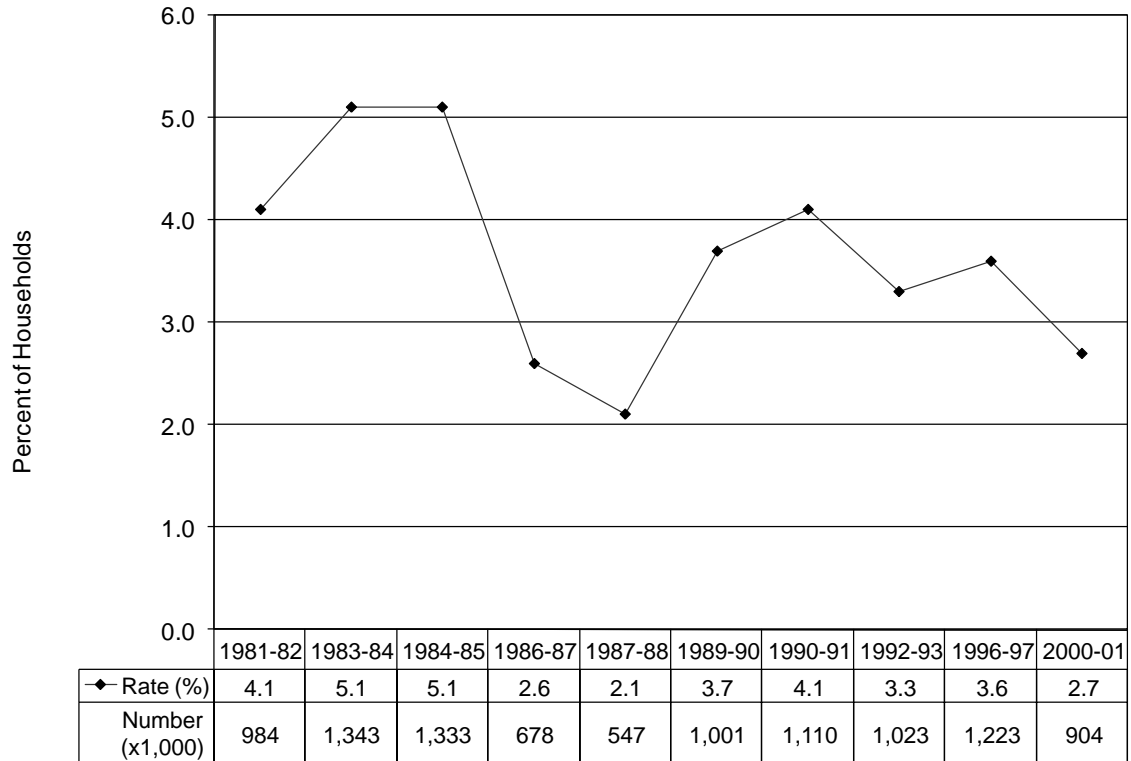


Figure 3-14, on the next page, demonstrates the impact of energy burden on LIHEAP income eligible households. It shows the number of LIHEAP income eligible households that reported that they were unable to use their main source of heat for a period of two hours or more during the heating season because they were unable to pay for their main heating fuel. During 1981-82, 984 thousand LIHEAP income eligible households (4.1 percent of LIHEAP income eligible households) had heat interruptions during the heating season. The number and percentage grew to 1.34 million (5.1 percent) in 1983-84 and then fell consistently to 547 thousand (2.1 percent) in 1987-1988. In 1989-90 there was a sharp increase to 1.0 million (3.7 percent). This higher level of heat interruptions was sustained in 1990-91 when 1.1 million (4.1 percent) LIHEAP income eligible households had heat interruptions and in 1992-93 when 1.0 million (3.3 percent) LIHEAP income eligible households had heat interruptions. The number and percentage increased to 1.2 million (3.6 percent) in 1996-97. In 2000-01, the number and percentage of LIHEAP income eligible households with heat interruptions decreased to 904 thousand (2.7 percent).

Figure 3-14. Percentage of LIHEAP income eligible households with heat interruptions of two hours or more caused by an inability to pay for energy to run the household's main heating system, 1981-82 heating season to 2000-01 heating season²³



Analysis of energy price and energy efficiency trends

A number of factors underlie the energy consumption and expenditures trends. Three of the most important factors are fuel prices, weather, and energy efficiency. Figures 3-15, 3-16, and 3-17 furnish information on trends in these factors.

Figure 3-15, on the next page, furnishes an index of average fuel prices compared to the consumer price index. The index shows the percentage change from 1979 to FY 2006. For example, the index for the Consumer Price Index (CPI) grew from 100 in 1979 to 125 in 1981, indicating a 25 percent increase in consumer prices. Figure 3-15 shows that fuel prices outpaced the overall level of inflation from 1979 through 1983. The CPI increased by about 37 percent during that period, while the composite average of fuel prices increased by 81 percent. From 1983 through 1997, the increase in the composite average of fuel prices moderated somewhat and generally grew more slowly than the CPI. However, in 2001, the pattern was reversed; the composite average fuel price index was 259 while the CPI index was 243. The rapid growth of prices from 1979 through 1983 explains why residential energy expenditures per low income household rose so rapidly (Figure 3-4) while consumption was declining (Figure 3-3). The moderate growth in fuel prices from 1985 to 1997 (19 percent) explains why residential energy expenditures per low income household rose slightly during that period. In 2001, fuel prices increased 17 percent over 1997 prices. The increase in fuel prices

²³Data for the 1981-82 heating season refer to heat interruptions of one day or more. Between 10 and 15 percent of heat interruptions for LIHEAP income eligible households last at least 2 hours but less than 24 hours. The procedures for analyzing heat interruption data have changed since the issuance of the *LIHEAP Report to Congress for FY 1993*. The heat interruption rates for 1983-84 through 1987-88 are slightly higher with this new analysis.

explains why expenditures also rose. In FY 2006 prices increased again and once more contributed to an increase in expenditures.

Figure 3-15. Index of dollar prices for fuel oil, natural gas, electricity, and a composite compared to the Consumer Price Index (CPI), 1979 to FY 2006

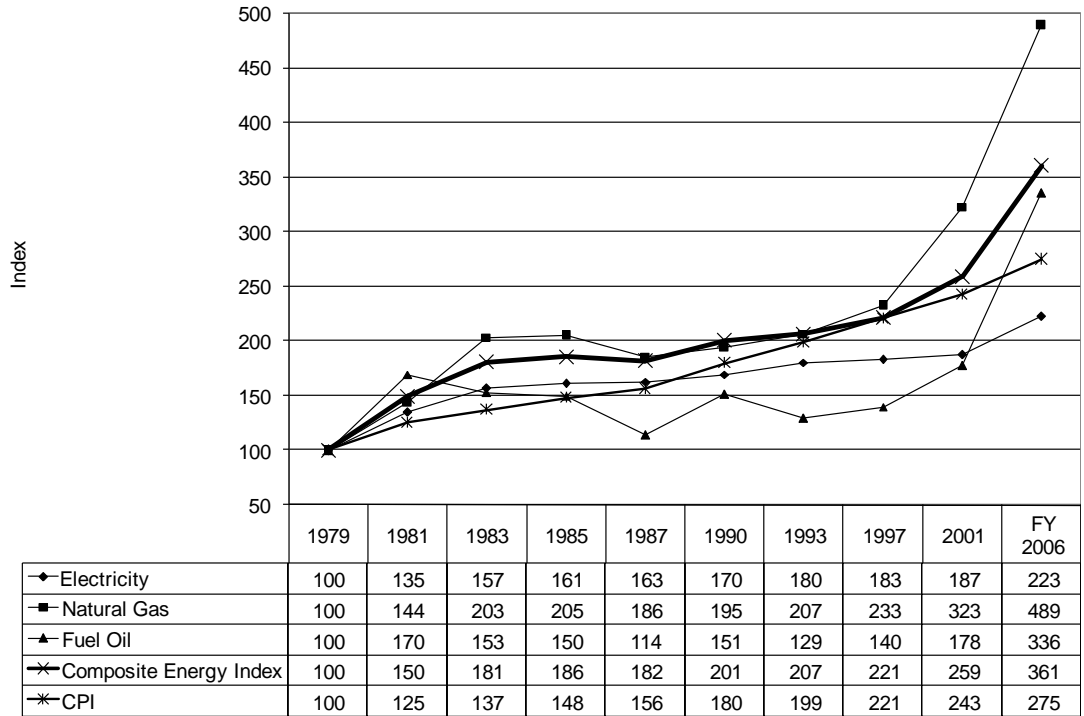


Figure 3-16 demonstrates how changes in heating energy consumption from 1979 to FY 2006 compared to changes in heating degree days for the same period. From 1979 to 1983, home heating consumption fell more rapidly than did heating degree days, suggesting a significant increase in efficiency as a result of conservation measures or actions. Consumption per heating degree day dropped rapidly for that period. From 1983 to 1997, there was only a moderate reduction in consumption per heating degree day. Thus, heating consumption fluctuations appear to be primarily a result of the changes in the weather for those years. In 2001, home heating consumption again fell more rapidly than did heating degree days, suggesting a moderate increase in efficiency as a result of conservation measures or actions. This was perhaps driven by the high fuel prices experienced in 2001. In FY 2006, consumption remained unchanged while heating days decreased, resulting in a slight increase in consumption per heating degree day.

Figure 3-16. Index of heating consumption, heating degree days, and heating consumption per heating degree day for households with incomes at or below 150 percent of the poverty income guidelines, 1979 to FY 2006

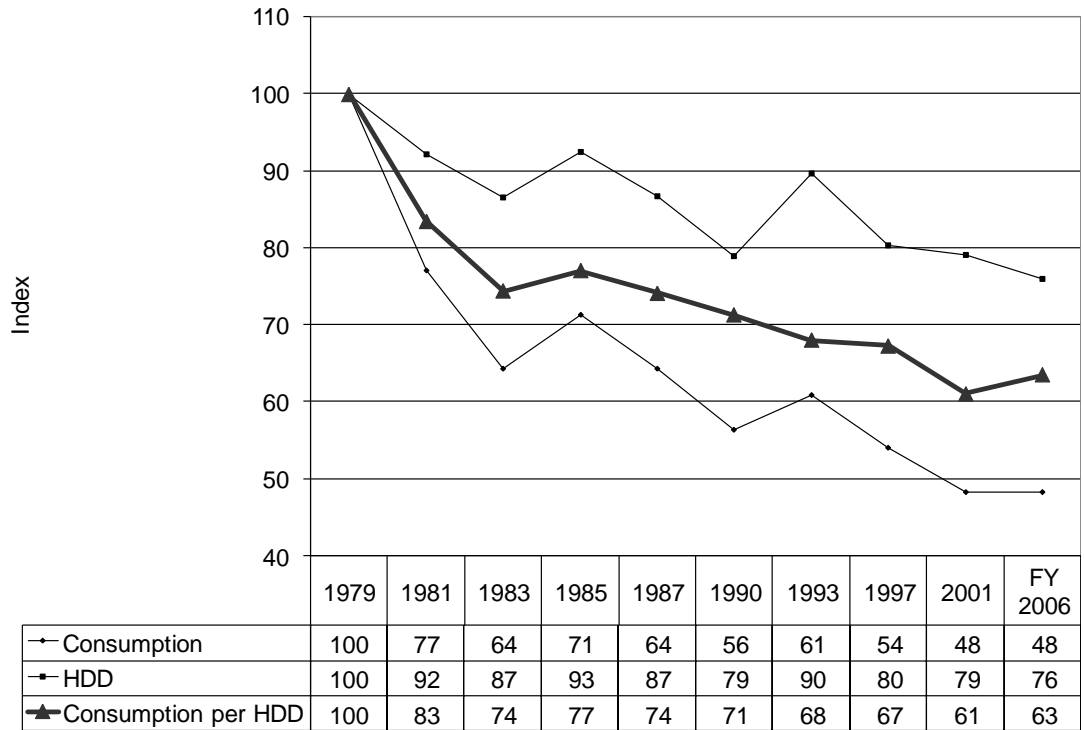
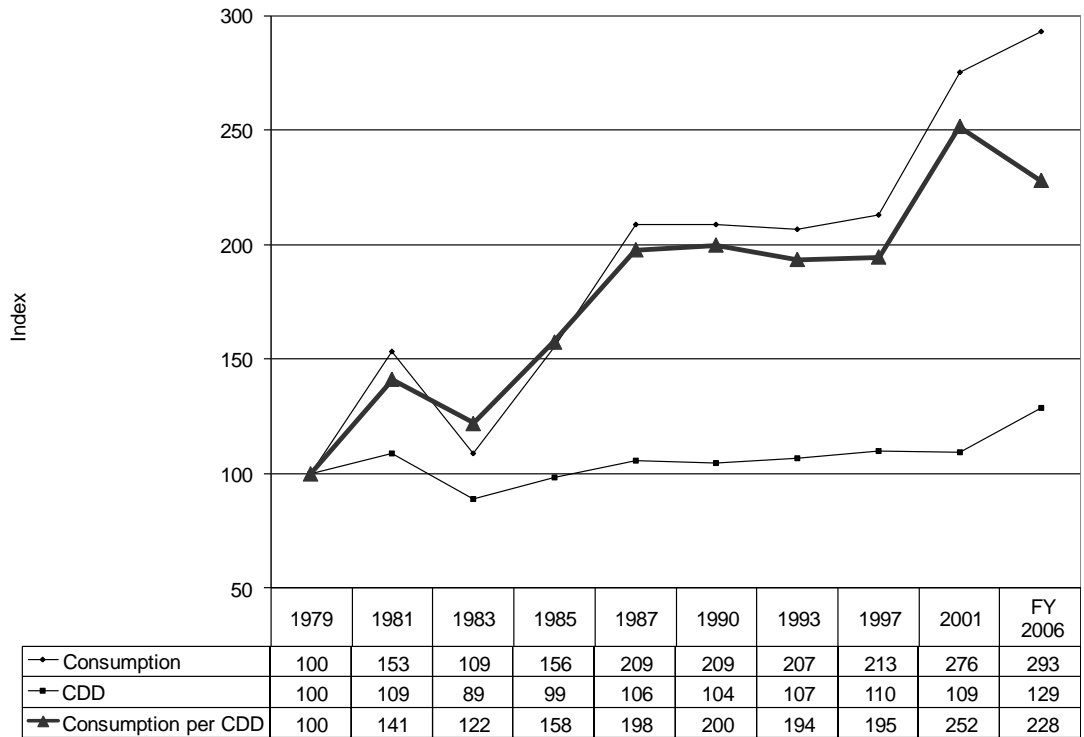


Figure 3-17 shows that home cooling consumption trends are somewhat more complex than are home heating consumption trends. In FY 2006, mean home cooling consumption was much higher than it was in 1979, even though households experienced only slightly more cooling degree days. Thus, mean consumption per cooling degree day increased substantially from 1979 to FY 2006, making it appear as though there was a reduction in efficiency. However, the primary cause of the increase in mean home cooling consumption was the large increase in the availability of air-conditioning among low income households.²⁴ As shown in Figure 3-2, only 37 percent of low income households had air-conditioning in 1979, while in 2001, 67 percent of low income households had air-conditioning. Because of this fundamental change in the way households use air-conditioning, it is very difficult to assess either changes in efficiency from 1979 to FY 2006 or year-to-year changes in consumption in response to changes in cooling degree days.

²⁴Air-conditioning equipment includes central air conditioners and window or wall units, ceiling fans, and evaporative coolers. The availability of all household appliances increased for low income households over this period due to the overall increase in the wealth of the nation and to the decrease in the cost of older technologies.

Figure 3-17. Index of cooling consumption, cooling degree days, and cooling consumption per cooling degree day for households with incomes at or below 150 percent of the poverty income guidelines, 1979 to FY 2006



Figures 3-18 and 3-19, on the next page, show that the mean group energy burden for low income households is substantially higher than that for all households. In FY 2006, the mean group home energy burden for all households was 1.4 percent, and that for low income households was 5.8 percent. In FY 2006, the mean group residential burden was 3.1 percent for all households and 13.0 percent for low income households. Over time, the gap between the burden for low income and all households has diminished somewhat. Figure 3-18 shows that in 1979, the mean group home energy burden for low income households was just over 4 times that of all households, while in 1993, the mean group burden for low income households was close to 3.5 times that of all households. However in FY 2006, the mean group burden for low income households was over 4 times that of all households.

Figure 3-18. Mean group home energy burden for all households and for households with incomes at or below 150 percent of the poverty income guidelines, 1979 to FY 2006

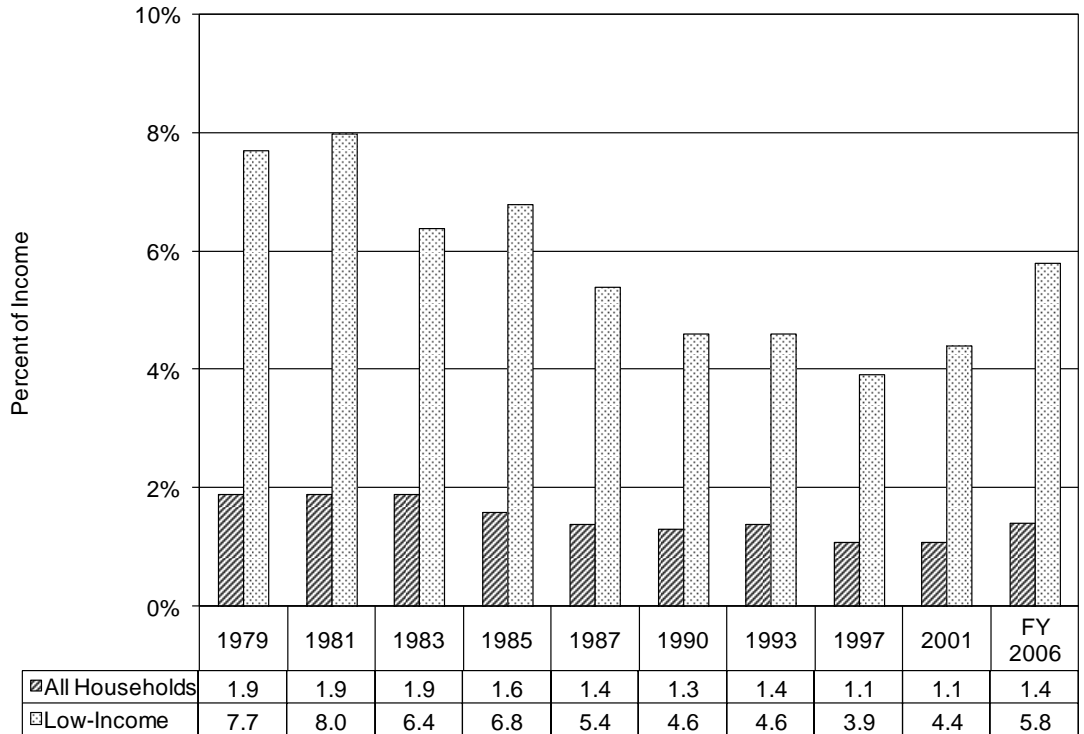
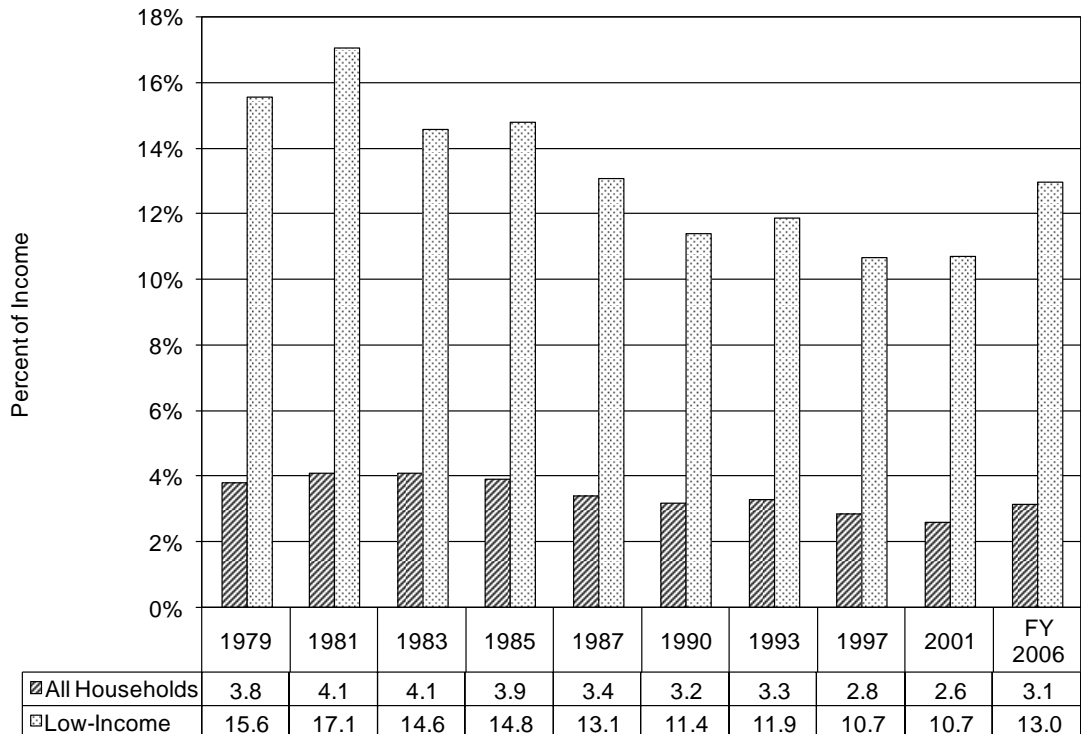


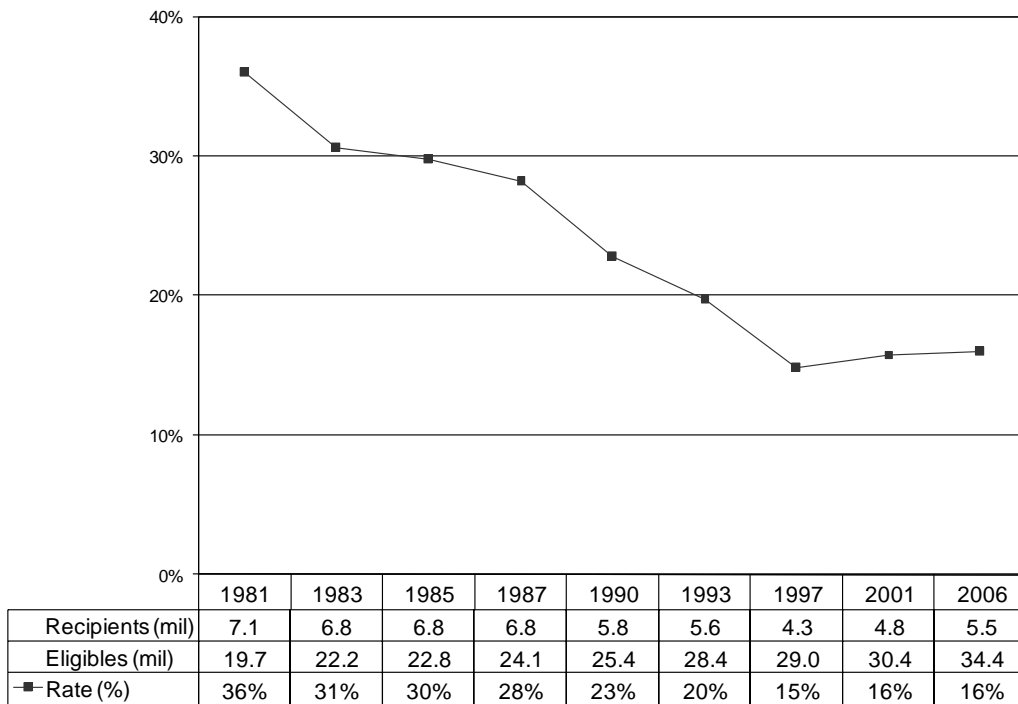
Figure 3-19. Mean group residential energy burden for all households and for households with incomes at or below 150 percent of the poverty income guidelines, 1979 to FY 2006



Trends in LIHEAP

Figures 3-20 through 3-24 furnish information on trends for HHS' energy assistance programs from FY 1981 through FY 2006. Figure 3-20 shows that the percentage of LIHEAP income eligible households that has been assisted has fallen significantly over time but has been steadily climbing in recent years. In FY 1981, 36 percent of eligible households received heating and/or winter crisis assistance benefits, but this number fell to 15% in 1997.²⁵ By FY 2006, 16 percent of LIHEAP income eligible households received those benefits. Figure 3-21, on the next page, furnishes statistics on the count of recipients by benefit type.

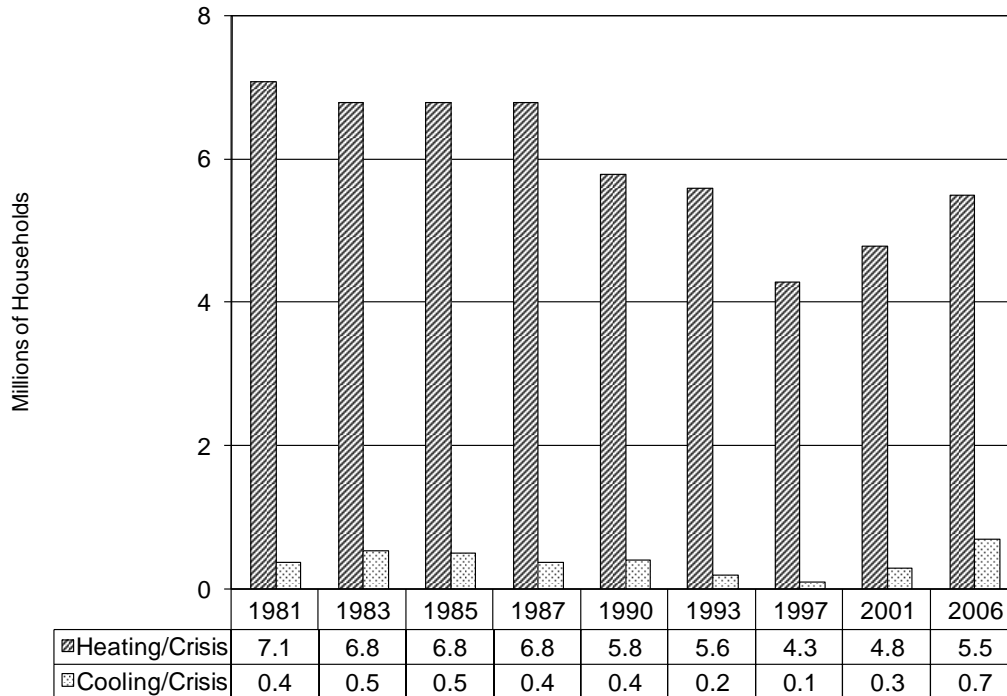
Figure 3-20. Percentage of LIHEAP/LIHEAP Federally eligible households receiving LIHEAP/LIHEAP heating and/or winter crisis assistance, FY 1981 to FY 2006



NOTE: 1981 estimate of LIHEAP income eligible households not directly comparable
 SOURCE: HHS Administrative Data

²⁵Note that the Federal income eligibility guidelines for the FY 1981 Low Income Energy Assistance Program (LIEAP) were different from those for subsequent LIHEAP programs included in the table.

Figure 3-21. Number of households receiving LIHEAP/LIHEAP heating and/or winter crisis assistance or cooling and/or summer crisis assistance, FY 1981 to FY 2006^{1/}

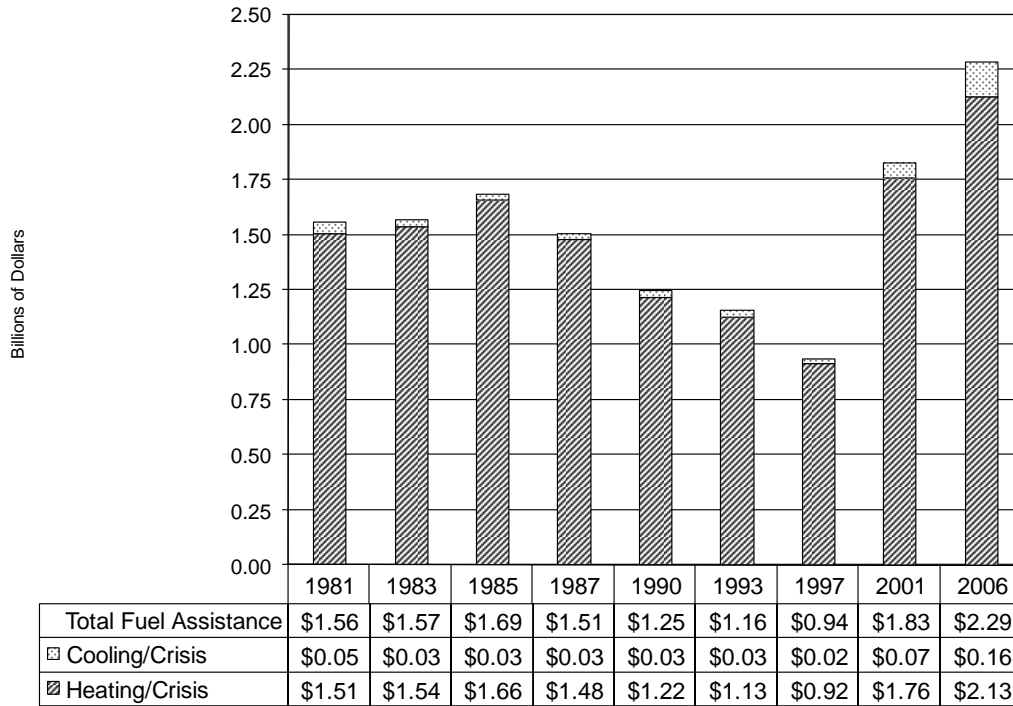


SOURCE: HHS Administrative Data

^{1/}Cooling assistance/summer crisis figures cannot be added to heating assistance/winter crisis figures for each year because households can receive more than one type of assistance.

Figure 3-22, on the following page, shows that the total funds used for fuel assistance benefits have fluctuated over time. For the years shown, funding was highest in FY 2006, when \$2.29 billion dollars were used for heating and cooling assistance benefits, and lowest in FY 1997 when \$0.94 billion dollars were used for assistance benefits. The large funding increase for FY 2001 was due in part to the substantial increase in funds for cooling assistance benefits. In FY 2006, funding for cooling assistance reached its highest level to date. Funding for heating assistance benefits was \$2.13 billion dollars.

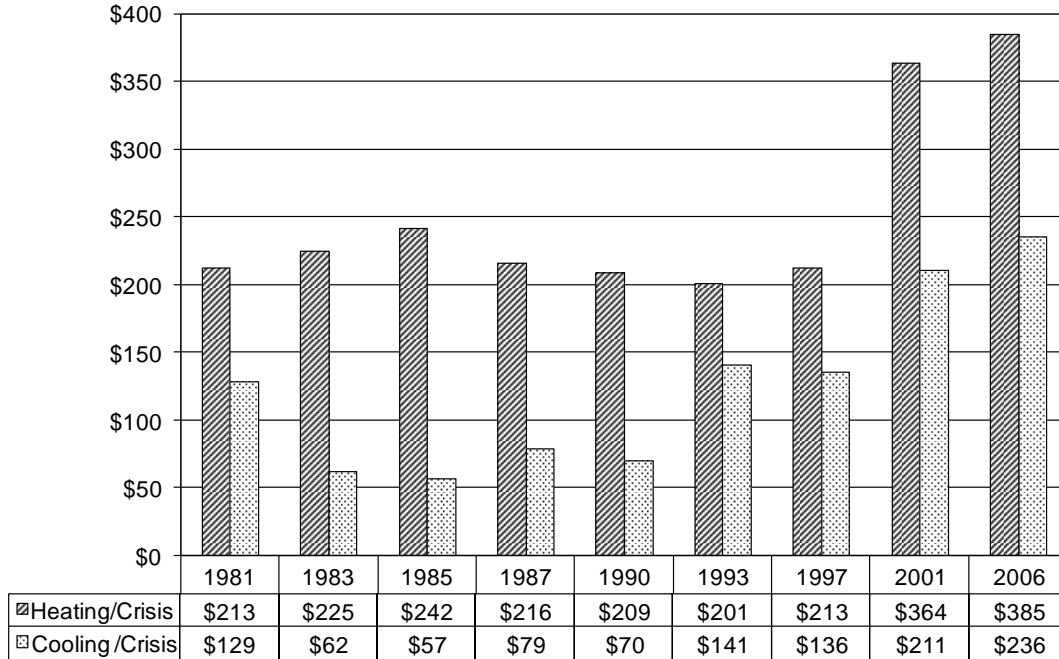
Figure 3-22. Funds used for LIHEAP/LIHEAP fuel assistance, FY 1981 to FY 2006



SOURCE: HHS Administrative Data

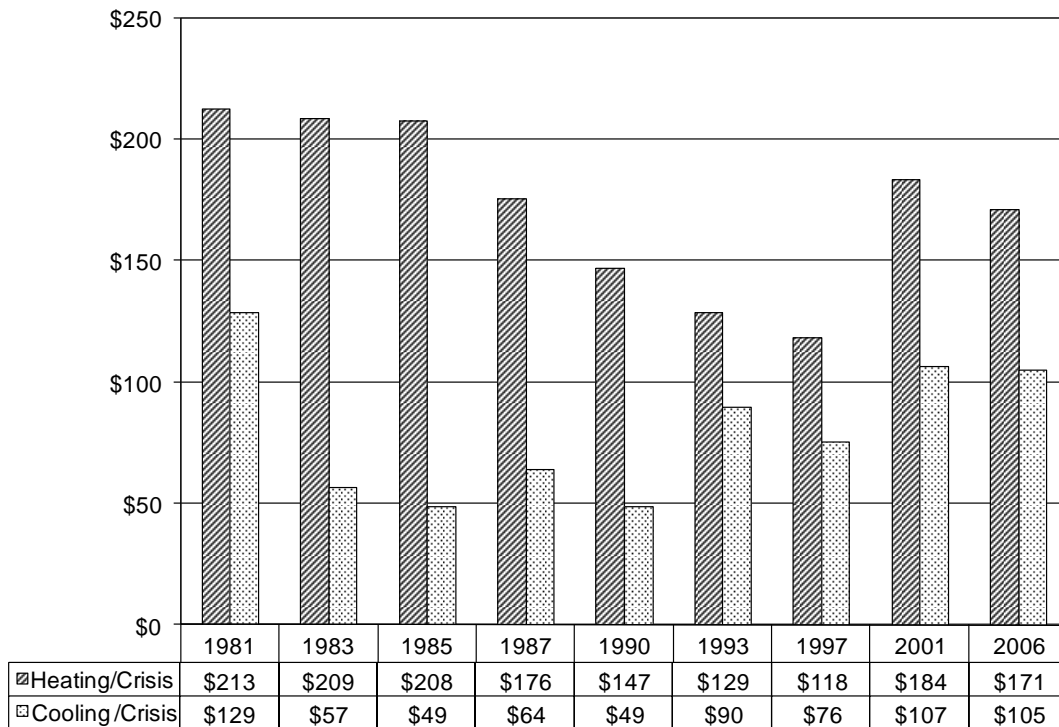
Figure 3-23 on the following page shows that the mean heating/winter crisis benefits received by LIHEAP recipients were highest in FY 2006. For the years shown, mean heating/winter crisis benefits were \$213 in FY 1981, grew to \$242 in FY 1985, fell slightly to \$213 in 1997, and rose to \$385 in FY 2006. Figure 3-24 shows that, after adjusting for inflation, the mean value of benefits has fallen substantially. The mean value of heating and/or winter crisis benefits fell from \$213 in FY 1981 to \$171 in FY 2006. With the exception of FY 1981, mean cooling benefits ranged from \$57 to \$90 through FY 1997, and then rose to \$107 in FY 2001. In FY 2006, mean cooling benefits fell slightly to \$105. In FY 1993, one State made program changes that significantly increased the mean benefit and decreased the total number of recipients.

Figure 3-23. Mean combined LIEAP/LIHEAP heating and/or winter crisis benefits and mean cooling and/or summer crisis benefits, in nominal dollars, FY 1981 to FY 2006



SOURCE: HHS Administrative Data

Figure 3-24. Mean combined LIEAP/LIHEAP heating and/or winter crisis benefits and mean cooling benefits, in real 1981 dollars, FY 1981 to FY 2006



SOURCE: HHS Administrative Data

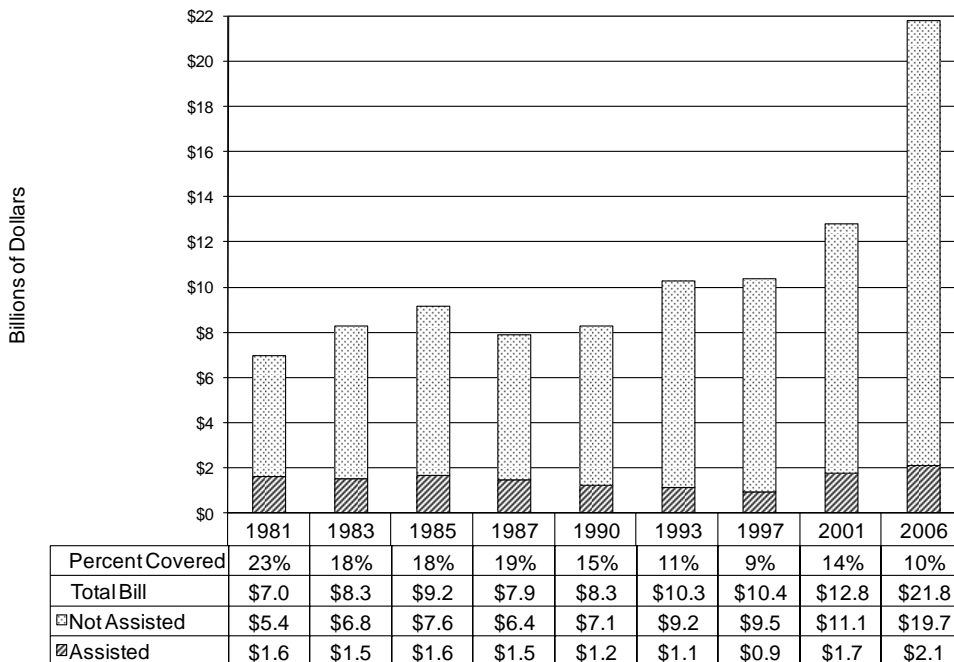
Analysis of LIHEAP benefits

The impact of LIHEAP heating benefits can be examined in at least two ways. Figure 3-25 shows the share of the aggregated total low income home heating costs covered by LIHEAP heating and winter crisis benefits (LIHEAP heating coverage). Figure 3-26, on the next page, shows the reduction in mean group home heating burden as a result of LIHEAP benefits (LIHEAP burden offset).

Figure 3-25 shows that the LIHEAP heating coverage rate fell from 23 percent in FY 1981 to 10 percent in FY 2006. An increase in the size of the total bill and an increase in the number of households eligible for assistance benefits caused this reduction.

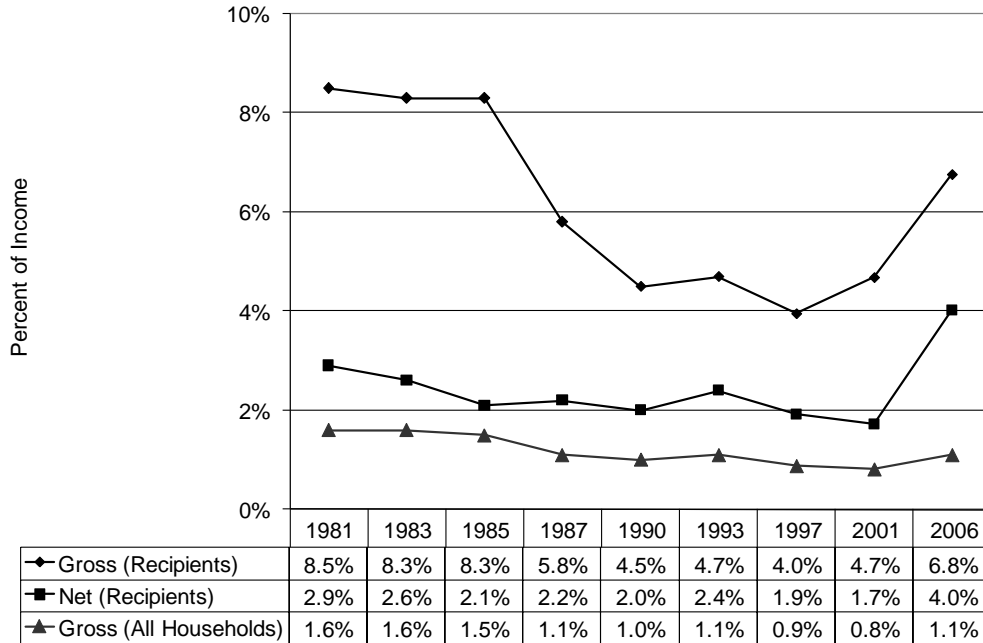
Figure 3-26 shows that the net effect of LIHEAP has been to lower recipient group home heating burdens to levels that are much closer to the levels of the average household. In FY 1981, the gross mean group home heating burden for LIHEAP recipients was 8.5 percent, while the net mean group home heating burden (home heating expenditures minus LIHEAP benefits) was 2.9 percent. In FY 2006, the gross mean group home heating burden for LIHEAP recipients was 6.8 percent, while the net mean group home heating burden was 4.0 percent. It is interesting to note that, while the gross mean group home heating burden for LIHEAP recipients fell from 8.5 percent in FY 1981 to 4.0 percent in FY 1997, decreases in mean LIHEAP benefits in relation to household income caused the net mean group home heating burden to remain approximately twice as high as the gross mean group home heating burden for all households. In FY 2001, significant increases in the mean heating benefit caused the net mean group home heating burden for LIHEAP recipients to fall to 1.7 percent, however it remained twice as high as the mean group burden for all households. In FY 2006, the mean heating benefit increased by 3 percent, and net mean group home heating burden more than doubled, increasing by 135.3 percent. The effect of the slight increase in average heating benefits in FY 2006 was offset by higher mean home heating expenditures due to much higher fuel prices in FY 2006.

Figure 3-25. Amount and percentage of total home heating billed amounts for LIHEAP/LIHEAP income eligible households covered by LIHEAP/LIHEAP heating and winter crisis benefits, FY 1981 to FY 2006



SOURCE: Assistance number from HHS data and heating bill estimates from RECS

Figure 3-26. Mean group home heating burden for all households and LIEAP/LIHEAP heating and winter crisis recipient households, FY 1981 to FY 2006



SOURCE: Mean burden uses expenditures from RECS and income from CPS ASEC.
 Net Burden = (Mean Expenditures - Mean Benefit) / Mean Income

IV. Federal LIHEAP Targeting Performance

The Government Performance and Results Act (GPRA) focuses on program results to provide Congress with objective information on the achievement of statutory objectives or program goals. The resulting performance data are to be used in making decisions on budget and appropriation levels.

ACF's LIHEAP performance plan must take into account that the Federal government does not provide LIHEAP assistance to the public. Instead, the Federal government provides funds to States, Federal or State-recognized Indian Tribes and Tribal Organizations, and Insular Areas to administer LIHEAP at the local level. The LIHEAP performance plan also must take into account that LIHEAP is a block grant whereby LIHEAP grantees have broad flexibility to design their programs, within very broad Federal guidelines, to meet the needs of their citizens.

This Section of the *Notebook* describes ACF's approach to LIHEAP performance measurement and discusses the findings from ACF-funded research on performance measurement for the LIHEAP program, including:

- LIHEAP Performance Plan – Review of national LIHEAP program goals, national LIHEAP performance goals, and LIHEAP performance measures.
- Performance Measurement Research – Discussion of the findings from a study to assess the validity of performance measurement estimation procedures and from an evaluation of the performance of the LIHEAP program with respect to serving the lowest income households with the highest energy burdens.
- LIHEAP Performance Statistics – Statistics that document the performance of the LIHEAP program in serving low income vulnerable and high burden households.

LIHEAP program goals and performance goals

LIHEAP is not an entitlement program. Therefore, the LIHEAP program is unable to serve all of the households that are income eligible under the Federal maximum income eligibility standard. In FY 2006, 16 percent of income eligible households received assistance with their heating costs. Given that limitation, the LIHEAP statute requires LIHEAP grantees to provide, in a timely manner, that the highest level of assistance will be furnished to those households that have the lowest incomes and the highest energy costs or needs in relation to income, taking into account family size. The LIHEAP statute identifies two groups of low income households as having the highest home energy needs:

- *Vulnerable Households*: Vulnerable households are those with at least one member that is a young child, an individual with disabilities, or a frail older individual. The statute does not define the terms "young children," "individuals with disabilities," and "frail older individuals." The primary concern is that such households face serious health risks if they do not have adequate heating or cooling in their homes. Health risks can include death from hypothermia or hyperthermia, and increased susceptibility to other health conditions such as stroke and heart attacks.
- *High Burden Households*: High burden households are those households with the lowest incomes and highest home energy costs. The primary concern is that such households will face safety risks in trying to heat or cool their home if they cannot pay their heating or

cooling bills. Safety risks can include use of makeshift heating sources or inoperative/faulty heating or cooling equipment that can lead to indoor fires, sickness, or asphyxiation.

The authorizing legislation requires States to design outreach procedures that target LIHEAP reciprocity to income eligible vulnerable and high burden households, and to design benefit computation procedures that target higher LIHEAP benefits to higher burden households.

Based on the authorizing legislation, the LIHEAP program goal is to provide LIHEAP assistance to vulnerable households (with at least one member that is a young child, an individual with disabilities, or a frail older individual) and high-energy burden households (with the lowest incomes and highest home energy costs) whose health and/or safety are endangered by living in homes without sufficient heating or cooling.

Based on the national LIHEAP program goals, ACF has focused its annual performance goals on targeting the availability of LIHEAP heating assistance to vulnerable low income households. In addition, ACF has set an annual efficiency goal for the LIHEAP program. Subject to the availability of data, ACF also is interested in the performance of the LIHEAP program with respect to targeting benefits to the highest burden households with the lowest income.

Performance measures

Performance goals must be measurable in order to determine if the goals are being achieved. ACF has developed a set of performance measures (i.e., targeting indexes) that provide for the collection of quantitative measures regarding the following aspects of LIHEAP targeting performance:

- The **reciprocity targeting index** quantifies reciprocity targeting performance. The index is computed for a specific group of households by dividing the percent of LIHEAP recipient households that are members of the target group by the percent of all income eligible households that are members of the target group and then multiplying the result by 100. For example, if 25 percent of LIHEAP recipients are high burden households and 20 percent of all income eligible households are high burden, the reciprocity targeting index for high burden households is 125 (100 times 25 divided by 20).

An index greater than 100 indicates that the target group is participating at a rate higher than the overall income eligible population. An index less than 100 indicates that the target group is participating at a lower rate than the overall income eligible population.

- The **benefit targeting index** quantifies benefit targeting performance. The index is computed by dividing the mean LIHEAP benefit for a target group of recipients by the mean LIHEAP benefit for all recipient households and then multiplying the result by 100. For example, if high burden household recipients have a mean benefit of \$250 and the mean benefit for all households is \$200, the benefit targeting index is 125 (100 times \$250 divided by \$200).

An index greater than 100 indicates that the target group is, on average, receiving more benefits than the overall recipient population. An index less than 100 indicates that the target group is, on average, receiving fewer benefits than the overall recipient population.

- The **burden reduction targeting index** quantifies burden reduction targeting performance. The index is computed by dividing the percent reduction in the median individual energy burden due to LIHEAP for a specified group of recipients by the percent reduction in the

median individual energy burden due to LIHEAP for all recipients and then multiplying the result by 100.²⁶ For example, if high burden recipients have their energy burden reduced by 25 percent (e.g., from 8 percent of income to 6 percent of income) and all recipient households have their energy burden reduced by 20 percent (e.g., from 5 percent of income to 4 percent of income), the burden reduction targeting index is 125 (100 times 25 divided by 20).

An index greater than 100 indicates that the specified group experiences, on average, a greater energy burden reduction than the overall recipient population. An index less than 100 indicates that the specified group experiences, on average, a smaller energy reduction than the overall recipient population.

The development of these indexes facilitates tracking of reciprocity, benefit, and burden reduction performance for vulnerable and high burden households.

- The reciprocity performance data allow for outreach initiatives to improve reciprocity targeting performance.
- The benefit and burden reduction performance data facilitate analysis of how different kinds of benefit determination procedures lead to different levels of benefit and burden reduction targeting performance.

The benefit targeting index and the burden reduction targeting index are both useful measures, but they measure the different aspects of benefit targeting.

- The benefit targeting index requires fewer data elements; it is a simple measure of how benefits for a particular group of recipient households compare to benefits for all recipient households.
- The burden reduction index is more comprehensive; it accounts for differences in both energy costs and benefit levels for the group of recipient households compared to energy costs and benefit levels for all recipient households.

The baseline data serve as a starting point against which the degree of change in LIHEAP targeting can be measured, analyzed, and attributed to Federal performance enhancement initiatives. The baseline data also provide a roadmap from which ACF can set realistic reciprocity performance targets (a quantitative statement of the degree of desired change) for those parts of the country in which targeting performance can be improved.

ACF's annual LIHEAP performance measures are:

- Increase the recipient targeting index score of LIHEAP households having at least one member 60 years or older.
- Maintain the recipient targeting index score of LIHEAP households having at least one member 5 years or younger.

²⁶In general, the mean (or average) is preferred to the median (or midpoint), as it is more informative. The mean is the sum of all values divided by the number of values, or what is commonly called the average. The median is the value at the midpoint in the distribution of values. LIHEAP benefits are not highly skewed (or distorted) variables; therefore, mean benefits are used to compute the benefit targeting index. Because energy burden is a highly skewed statistic, the median energy burden, which is less affected by extreme values, is used to calculate the burden reduction index.

There is no annual measure for the burden reduction targeting index. The baseline value for the burden reduction targeting index was computed for 2001 using the Residential Energy Consumption Survey (RECS) LIHEAP Supplement. Updates of the burden reduction targeting index will be available from the 2005 RECS LIHEAP Supplement.

Performance measurement research

ACF has funded several studies to develop a better understanding of LIHEAP targeting performance measurement. Two of these studies recommended that ACF consider making changes in the performance measurement plan for LIHEAP.

- Validation Study – The performance measurement validation study examined the available data sources for estimating the targeting indexes required by the performance measurement plan for LIHEAP and identified the data sources that furnished the most reliable data.²⁷
- Energy Burden Study – The energy burden evaluation study used the 2001 RECS LIHEAP Supplement to measure the baseline performance of the LIHEAP program in serving high burden households and to examine the competing demands associated with targeting vulnerable and high burden households.²⁸

These studies are available on the web at
<http://www.acf.hhs.gov/programs/ocs/liheap/publications/index.html#DEA_documents>.

Performance measurement data sources

The ACF performance measurement plan for LIHEAP requires the development of reciprocity targeting indexes for elderly households (i.e., households having at least one member age 60 years or older), young child households (i.e., households having at least one member age 5 years or younger), and high burden households (i.e., households having an energy burden that exceeds an energy burden threshold). Data elements needed to compute the reciprocity targeting indexes are:

- The target group's income eligible population – The number of elderly, young child, and high burden households that are income eligible for LIHEAP.
- Target group recipients – The number of elderly, young child, and high burden households that are LIHEAP heating recipients.
- The income eligible population – The number of all LIHEAP income eligible households.
- LIHEAP heating recipients – The number of all LIHEAP heating assistance recipients.

The performance measurement validation study and the energy burden study identified the most reliable data sources for the required data elements. The studies found that a number of different data sources were needed to furnish the most reliable data for the computation of targeting indexes, including:

²⁷ *LIHEAP Targeting Performance Measurement Statistics: GPRA Validation of Estimation Procedures*, August 2004, prepared by APPRISE Incorporated under PSC Order No. 043Y00471301D.

²⁸ *LIHEAP Energy Burden Evaluation Study*, March 2005, prepared by APPRISE Incorporated under PSC Order No. 043Y00471301D.

- The income eligible population – According to the Census Bureau, the CPS ASEC furnishes the most reliable national and regional estimates of the number of income eligible households.²⁹
- Income eligible vulnerable households – The CPS ASEC furnishes the most reliable estimates of the number of income eligible vulnerable households (i.e., elderly households and young child households).
- LIHEAP heating recipients – The annual State *LIHEAP Household Reports* furnished by State LIHEAP administrators to ACF furnish the most reliable estimates of the number of recipient households.
- Vulnerable household heating recipients – The annual State *LIHEAP Household Reports* furnished by State LIHEAP administrators to ACF furnish the most reliable estimates of the number of vulnerable recipient households.
- Income eligible high burden households – The Residential Energy Consumption Survey (RECS) furnishes the most reliable estimates of the number of income eligible high burden households.
- High burden heating recipients – The RECS LIHEAP Supplement furnishes the most reliable estimates of the number of high burden recipient households.

The following data sources are used in reporting on LIHEAP targeting performance for this Notebook:

- CPS ASEC – The CPS ASEC is a national household sample survey that is conducted monthly by the Bureau of the Census. The CPS ASEC includes data that allow one to characterize household demographic characteristics. The CPS ASEC is the best source of annual national data for estimating the number of income eligible households and the number of income eligible vulnerable households. The CPS ASEC data needed to prepare performance statistics for FY 2006 were available in October 2006.
- Federal LIHEAP Household Report – The preliminary LIHEAP Household Reports for FY 2006 were due from the States by September 1, 2006, when the States' LIHEAP block grant applications for FY 2007 were due. ACF set a goal for the States to submit their final LIHEAP Household Report for FY 2006 by December 2006. Each LIHEAP Household Report needs to be received, reviewed, processed, and compared against data from each State's Federal LIHEAP Grantee Survey for FY 2006 that was conducted in February 2007. The data on the number of LIHEAP households assisted in FY 2006 will be included in the *LIHEAP Report to Congress* for FY 2006.
- Residential Energy Consumption Survey (RECS) – The EIA's RECS is a national household sample survey that is conducted once every four years. The most recent survey was conducted in 2001, and though the availability of data from the 2005 RECS was scheduled for later in 2007, the data release has been delayed. The RECS data were used for baseline measurement (2001) of targeting performance for high energy burden households and can track longer-term changes in performance over time (2001 to 2005). However, the RECS

²⁹ "Guidance on Income and Poverty Estimates From Different Sources." U.S. Census Bureau. Housing and Household Economic Statistics Division. 6 Nov. 2006 <<http://www.census.gov/hhes/www/income/newguidance.html#summary>>.

currently cannot furnish annual updates on LIHEAP targeting performance for high energy burden households.

Targeting performance for high burden households

With the available data, the annual reporting of LIHEAP reciprocity targeting index scores includes updates for vulnerable households but not for high energy burden households. To develop a better understanding of the value of targeting performance data on high energy burden households, ACF commissioned the LIHEAP Energy Burden Evaluation Study (2005). The purposes of that study included:

- Targeting – Measure the extent to which the LIHEAP program is serving the lowest income households that have the highest energy burdens.
- Performance goals – Assessment of the importance of the performance goal of increasing the percent of LIHEAP recipient households having the lowest incomes and the highest energy costs.
- Measurement – Identification of procedures that can be used to measure performance of the LIHEAP program with respect to the goal of increasing the percent of LIHEAP recipient households having the lowest incomes and the highest energy costs.

The study furnished the following information to ACF with respect to targeting of high energy burden households.³⁰

- Targeting – The study found that, for FY 2001, the targeting index for high home energy burden households was 170, indicating that households with a high home energy burden were served at a significantly higher rate than are other households. The study furnished a baseline statistic from which changes in targeting to high energy burden households can be compared.
- Performance goals – The study demonstrated that it is important to include a goal of targeting high energy burden households in the performance plan for the LIHEAP program. The LIHEAP statute gives equal status to the goals of targeting vulnerable households and high energy burden households. Performance goals that are limited to targeting of elderly and young child households encourage LIHEAP grantees to give preference to low burden vulnerable households over high energy burden households that do not have a vulnerable household member.
- Measurement – The study identified options for collecting annual data on high energy burden recipient households.

In addition, the LIHEAP Energy Burden Evaluation Study examined two other performance indicators – the benefit targeting index and the burden reduction targeting index. The study furnished baseline measures for these indicators and discussed the value and challenges of including those benefit and burden reduction targeting indicators in the performance plan for LIHEAP. Once EIA makes the 2005 RECS data available, the indexes will be updated.

Performance measurement statistics

Table 4-1 shows the LIHEAP reciprocity targeting performance measures from FY 2003 through FY 2006. The first column in the table restates the performance goal. The second column shows

³⁰ The study developed a definition of “high burden,” though the statute offers no such definition.

performance targets (to be reached), and the third column shows the targeting index scores that were achieved. FY 2003 was the baseline year for both measures.

For measure 1A, the baseline targeting index score of 79 indicates that income eligible elderly households were not being effectively targeted within the income eligible population of elderly households in FY 2003. The FY 2004 and FY 2005 targeting index scores indicate that there was basically no improvement in targeting the elderly in those years, and the FY 2006 drop in the targeting index score indicates a worsening in targeting households with elderly members. ACF is attempting to increase the targeting of eligible elderly households through a national LIHEAP outreach campaign.

For measure 1B, the baseline targeting index score of 122 for households with a young child indicates that such households were being effectively targeted within the income eligible population of households with young children in FY 2003. The FY 2004, FY 2005, and FY 2006 targeting index scores indicate a decrease in targeting households with young children. However, the scores indicate that LIHEAP grantees still are effectively targeting households with younger children although to a lesser degree for unknown reasons.

Table 4-1. LIHEAP reciprocity targeting performance measures reported for FY 2003 – FY 2006.

Performance Measures	Fiscal Year	Target	Result
1A. Increase the targeting index of LIHEAP recipient households having at least one member 60 years or older compared to non-vulnerable LIHEAP recipient households	FY 06	92	74
	FY 05	84	79
	FY 04	82	78
	FY 03	Baseline	79
1B. Increase the targeting index of LIHEAP recipient households having at least one member 5 years or younger compared to non-vulnerable LIHEAP recipient households	FY 06	122	115
	FY 05	122	113
	FY 04	122	115
	FY 03	Baseline	122

As noted above, the *LIHEAP Energy Burden Evaluation Study* developed baseline statistics on high energy burden household targeting. That study recommended that measurement of targeting to high energy burden households is important since the LIHEAP program’s statutory mandate is to serve the households with the “lowest incomes and highest energy needs.”

Table 4-2 shows the national and regional targeting indexes for high energy burden households for FY 2001. The 2001 RECS and the 2001 RECS LIHEAP Supplement were used to develop these statistics. These statistics demonstrate that the LIHEAP program was targeting high burden households.³¹

³¹ The RECS LIHEAP Supplement was first introduced into the RECS in 2001. Because the design was experimental, no variance models were developed for the data file. As a result, it is difficult to develop a precise estimate of variances for statistics developed from the RECS LIHEAP Supplement. Preliminary analysis indicates that the targeting indexes in Table 4-2 are statistically significant while the targeting indexes shown in Tables 4-3 and 4-4 are not statistically significant. Therefore, the null hypothesis that high burden households and households that are not high burden are served at the same rate can be rejected, while the null hypothesis that LIHEAP benefits and burden reduction are the same for high burden households and households that are not high burden cannot be rejected. The design of the 2005 RECS LIHEAP Supplement has been revised so that appropriate variance models can be developed.

Table 4-2. LIHEAP reciprocity targeting of high burden households by region for FY 2001 from the 2001 RECS Survey and the 2001 RECS LIHEAP Supplement

Region	Reciprocity targeting index for high burden households – residential energy	Reciprocity targeting index for high burden households – home energy
Northeast	185	163
Midwest	155	132
South	165	155
West	264	293
United States	184	170

The energy burden evaluation study also furnished estimates of the benefit and burden reduction targeting indexes for FY 2001. Benefit and burden reduction targeting are not part of the performance plan for LIHEAP. However, the study concluded that those indexes were consistent with the statutory mandate to furnish the highest benefits “to those households which have the lowest incomes and the highest energy costs or needs in relation to income.”

Table 4-3 shows national and regional benefit targeting indexes and Table 4-4 shows national and regional burden reduction targeting indexes. At the national level and in all regions, Table 4-3 shows that high burden households received slightly higher average benefits than did households that did not have high burdens. However, Table 4-4 shows that at the national level and for most regions, high burden households experienced slightly lower burden reductions than did households that did not have a high burden.

Table 4-3. LIHEAP benefit targeting of high burden households by region for FY 2001 from the 2001 RECS Survey and the 2001 RECS LIHEAP Supplement

Region	Benefit targeting index for high burden households – residential energy	Benefit targeting index for high burden households – home energy
Northeast	103	103
Midwest	109	108
South	111	110
West	115	124
United States	108	109

Table 4-4. LIHEAP burden reduction targeting of high burden households by region for FY 2001 from the 2001 RECS Survey and the 2001 RECS LIHEAP Supplement

Region	Burden reduction targeting index for high burden households – residential energy	Burden reduction targeting index for high burden households – home energy
Northeast	99	96
Midwest	95	93
South	108	98
West	86	86
United States	97	94

Uses of LIHEAP performance data

Performance targeting index data can be useful for both LIHEAP grantees and ACF, as described below.

LIHEAP grantee use of targeting indexes

Individual LIHEAP grantees can use the reciprocity targeting indexes to examine the effectiveness of their outreach to households with vulnerable members.³²

- In absolute terms, if a group has a reciprocity targeting index over 100, it means that the group receives benefits at a rate higher than the group's incidence in the income-eligible household population.
- In relative terms, if a group of vulnerable households is served at a higher rate than are households with no vulnerable members, then that group has been targeted. For example, if the targeting index for elderly households is 90 and the index for households with no vulnerable members is 75, then elderly households are served at a higher rate than are households with no vulnerable members.

Individual LIHEAP grantees can use the benefit and burden reduction targeting indexes to examine the effectiveness of their benefit determination procedures in serving households with vulnerable members and households with high energy burdens.³³

- In absolute terms, if a group has a benefit or burden reduction targeting index greater than 100, then the group receives more benefits (benefit targeting index) or experiences a greater burden reduction (burden reduction index) than the average for the recipient population. If a group has a benefit or burden reduction targeting index less than 100, the group receives lower benefits (benefit targeting index) or experiences a smaller burden reduction (burden reduction index) than the average for the recipient population. For example, if the benefit targeting index for elderly households is 125, this indicates that elderly households receive an average benefit that is higher than the average for all recipients.
- In relative terms, if a group of vulnerable households has a higher targeting index than households with no vulnerable members, then that group has been targeted. For example, if the benefit targeting index for elderly households is 90 and that for households with no vulnerable members is 75, then this indicates that elderly households have higher benefits. Likewise, if the burden reduction targeting index for elderly households is 90 and that for households with no vulnerable members is 75, then this indicates that elderly households have a greater percentage reduction in energy burden.

Grantees can use the targeting measures to gauge their current targeting performance and to track changes in targeting performance over time.

ACF's use of targeting indexes

ACF is using national targeting indexes to examine the targeting performance of the LIHEAP program and to measure changes in performance over time. Specifically, ACF is continuing to examine the reliability and validity of targeting indexes in making the following comparisons:

- ACF can compare reciprocity targeting measures among groups of households and identify which groups are not effectively targeted by LIHEAP. For example, if the national LIHEAP reciprocity targeting index for elderly households is 85 and the national LIHEAP reciprocity

³² LIHEAP grantees have the ability to create these reciprocity targeting indexes using recipient counts from the State Household Reports and the estimated income eligibility counts provided in Appendix B of this report.

³³ LIHEAP grantees have the benefit data needed to create benefit targeting indexes. If they calculate household energy burdens for their recipients, LIHEAP grantees can also create burden reduction indexes.

targeting index for households with young children is 110, then households with young children are targeted at a higher rate than are elderly households. ACF might conclude from these statistics that a greater share of the technical assistance efforts should be allocated to increasing targeting to elderly households.

- ACF can compare reciprocity targeting measures among areas of the country to assess which areas are in greatest need of technical assistance and to determine the type of technical assistance that is required. For example, if the reciprocity targeting index for elderly households in the New England Census Division is 75, while the reciprocity indexes for elderly households in all other regions are over 100, then elderly households are served at a lower rate in New England than in other parts of the country. ACF might conclude from these statistics that a greater share of the technical assistance efforts should be allocated to increasing targeting to elderly households among one or more grantees in New England.
- ACF can compare national targeting measures over time to measure changes in targeting performance. For example, if the targeting indicator for elderly households was 75 in one fiscal year and was 85 in a later fiscal year, then it would demonstrate that the LIHEAP program served elderly households at a higher rate over time.

Targeting performance measurement issues

As presented above, targeting indexes are statistical tools that allow ACF to examine targeting across groups of households, across regions of the country, and over time. It is reasonable to expect that the greatest increases in targeting performance can be realized by supporting the targeting efforts for those areas of the country that are currently serving targeted households at the lowest rate.

The major challenge is in finding an effective way to measure targeting indexes for vulnerable and high burden households in a timely way. In order to meet the information requirements for the ACF performance plan for the LIHEAP program, data need to be collected more frequently and delivered in a more timely way. The final *LIHEAP Household Report* needs to be made available to ACF earlier in the year. The RECS and the RECS LIHEAP Supplement need to be conducted more regularly and processed more quickly. In addition, the *LIHEAP Household Report* needs to be revised in a way that furnishes an unduplicated count of households receiving all types of LIHEAP assistance benefits, thereby furnishing a more comprehensive picture of the targeting of LIHEAP benefits than just heating assistance.

Appendix A: Home Energy Estimates

Appendix A provides information on how estimates of home energy data were derived from the 2001 Residential Energy Consumption Survey (RECS) and updated for FY 2006. 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 level. 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.³⁴

The 2001 RECS is the eleventh survey in the series of surveys.³⁵ For the 2001 RECS, approximately 4,822 households were interviewed in the core sample. In addition, a supplemental sample of 496 LIHEAP recipient households was interviewed for the first time as part of the RECS. For the

³⁴Regression 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).

³⁵For 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 2001 RECS are available from the EIA website: *Residential Energy Consumption Survey – home energy uses and costs*, Energy Information Administration, <www.eia.doe.gov/emeu/recs/contents.html>.

tabulations in this *Notebook*, 2001 RECS consumption and expenditure data were updated using price and weather data to represent consumption and expenditures for FY 2006.

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 2001 RECS included a supplemental sample 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 2001 RECS data provide the most current and comprehensive data on residential energy use by low income households, several significant limitations must be addressed:³⁶

- The 2001 RECS data for calendar year 2001 were updated to FY 2006 (October 1, 2005 to September 30, 2006), using procedures that adjust the 2001 data to reflect the weather and fuel prices for FY 2006. These procedures are comparable to those used for the FY 1986 - FY 2003 annual LIHEAP Reports to Congress. However, the reader should exercise caution in comparing the data in this *Notebook* with data in annual LIHEAP Reports to Congress prior to FY 1986, in which consumption and expenditure data were predicted on 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 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 employs the Bureau of the Census' definition of household, i.e., a household includes 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.

³⁶Information about the quality of RECS data is available from the EIA website: *Residential Energy Consumption Survey – home energy uses and costs*, Energy Information Administration, <www.eia.doe.gov/emeu/recs/contents.html>.

- 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 2006 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 *Notebook*.
- Households were classified in the 2001 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 the poverty income guidelines or 60 percent of 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 were categorically eligible for LIHEAP under section 2605(b)(2) (A) of the LIHEAP statute. However, the tabulations of LIHEAP households include survey respondents who were reported as LIHEAP recipients by 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 2006 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 2001 RECS sample case using FY 2006 heating degree days, cooling degree days, and price inflators applied to the original expenditure data, as well as the regression formula developed from the 2001 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-2a through A-2c display national and regional expenditure data for residential energy (including energy used for space heating, water heating, space cooling, and appliances). Tables A-3 through A-5c display national and regional usage, consumption, and expenditure data for home heating. Table A-6 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 of this *Notebook*.

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 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.³⁷

³⁷More 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.³⁸ 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. First, the ratio of energy expenditures to annual income for each household in a specified population is computed. Then, the mean of these energy burden ratios is computed for the population.³⁹ For example, consider the situation where there are four households with energy burdens of 4, 5, 7, and 8 percent. 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. First, total energy expenditures for households and total annual income for households in a specified population are computed. 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. Dividing the \$4,000 in total energy bills by \$100,000 in total income results in a mean group burden of 4 percent.

Using the 2001 RECS, the mean residential energy burden for all LIHEAP Federally eligible households using the first approach is 19.1 percent and using the second approach is 11.8 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.⁴⁰ 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.

Statistical measures

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 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).

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 19.1 percent. The median of the distribution of residential energy burdens from the 2001 RECS survey was 12.6 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.

³⁸The mean is the sum of all values divided by the number of values. The mean is also referred to as the average.

³⁹For some households, residential energy expenditures appear to exceed income. Elderly households living on their savings are an example of such households. For such households, the energy burden has been limited to 100 percent.

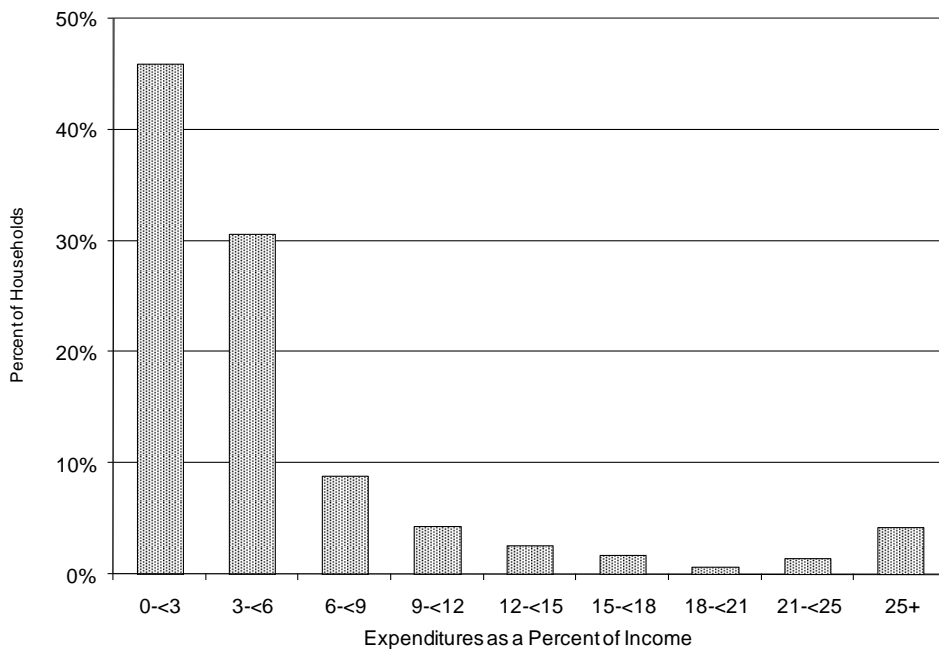
⁴⁰For example, 2001 RECS households with incomes of \$10,000 or less had average residential energy expenditures of \$1,042, while those with incomes between \$20,000 - \$35,000 had average residential energy expenditures of \$1,315. Thus, households which had more than twice as much income spent only 26 percent more on energy.

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, RECS collects income data less precisely through the use of income intervals. Finally, the CPS ASEC collects income more precisely than RECS does and also has a larger sample size than RECS.

As a result, the RECS categorizes too many households as income eligible for LIHEAP. Based on the 2001 RECS, in calendar year 2001, 33.8 million households were estimated to be LIHEAP income eligible households. Based on the 2001 CPS ASEC, the estimate of LIHEAP income eligible households for calendar year 2001, was 30.4 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.⁴¹

Figure A-1. Distribution of LIHEAP income eligible households by home energy burden, 2001



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

⁴¹The 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.

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 *Notebook's* tables to fully inform the reader. Beginning with the *FY 1992 LIHEAP Report to Congress*, both mean individual energy burden and mean group burden statistics are now furnished in the reports. Previous reports to Congress presented only the mean group burden. The text of this *Notebook* 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 as a result of weather, price, or other changes.

Consumption projections utilized end use consumption estimates that were developed with the 2001 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 2001 were adjusted for weather differences between 2001 and Fiscal Year 2006. The following equation was applied to each household in the microsimulation data file.

$$\text{FY 2006 Projected BTUs} = (2001 \text{ estimated heat use} * \text{HDD change}) + (2001 \text{ estimated cooling use} * \text{CDD change}) + (2001 \text{ estimated water use} + 2001 \text{ estimated appliance use})$$

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

$$\text{Preliminary Expenditures} = 2001 \text{ Expenditures} * (\text{FY 2006 Projected Usage} / 2001 \text{ Actual Usage})$$

$$\text{Final Expenditures} = \text{Preliminary Expenditures} * \text{Price Change}^{42}$$

The following chart 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 2001 to FY 2006. For example, electricity prices increased by 19 percent from 2001 to FY 2006.

Table A-1. National price factors for FY 2006

Fuel	Price Factors for FY 2006 Projections
Electricity	1.1904
Natural gas	1.5132
Fuel oil / kerosene	1.8999
Liquefied petroleum gas (LPG)	1.4389

Expenditure data were adjusted using national price factors for FY 2006. Earlier *Notebooks* used State-level price factor data. For FY 1993/1994, State-level data did not vary much from the national average for electricity and natural gas. For electricity, price changes varied between 0.3 percent and 1.2 percent; the national average was 0.8 percent. For natural gas, price changes varied between 1.7 percent and 2.8 percent; the national average was 2 percent. Expenditure projections using national price data do not appear to be significantly different from those obtained using State price data.

⁴²Price factors were developed using price data obtained from the Energy Information Administration's Monthly Energy Review, September 2007, for all fuels. Electricity and natural gas consumption data used for calculating price factors are from the Energy Information Administration website (www.eia.doe.gov). Fuel Oil and LPG consumption data used for calculating price factors are from the Monthly Energy Review, September 2007.

Table A-2a. 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 2006

Census Region	Main heating fuel											
	All fuels		Natural gas		Electricity		Fuel oil		Kerosene		LPG	
	Dollars ^{1/}	Percent ^{2/}	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent
United States												
All households	\$1,982	3.1%	\$2,112	3.3%	\$1,563	2.5%	\$2,683	4.2%	\$1,824	2.9%	\$2,351	3.7%
Non low income households	\$2,117	2.5%	\$2,229	2.7%	\$1,728	2.1%	\$2,770	3.3%	\$2,027	2.4%	\$2,480	3.0%
Low income households ^{3/}	\$1,690	10.1%	\$1,843	11.0%	\$1,231	7.3%	\$2,460	14.7%	\$1,737	10.3%	\$2,123	12.6%
LIHEAP recipient households ^{4/}	\$1,992	14.6%	\$2,062	15.1%	\$1,492	11.0%	\$2,804	20.6%	\$2,060	15.1%	\$2,070	15.2%
Northeast												
All households	\$2,460	3.5%	\$2,494	3.5%	\$1,794	2.5%	\$2,754	3.9%	\$2,105	3.0%	\$2,669	3.8%
Non low income households	\$2,668	2.8%	\$2,738	2.9%	\$2,024	2.1%	\$2,863	3.0%	\$2,534	2.6%	\$2,912	3.0%
Low income households	\$2,049	11.0%	\$2,076	11.2%	\$1,397	7.5%	\$2,458	13.2%	\$1,811	9.8%	\$1,703*	9.2%
LIHEAP recipient households	\$2,440	16.6%	\$2,411	16.4%	\$2,060	14.0%	\$2,876	19.5%	\$2,091*	14.2%	\$2,018*	13.7%
Midwest												
All households	\$2,075	3.4%	\$2,129	3.5%	\$1,366	2.3%	\$2,327	3.8%	NC	NC	\$2,476	4.1%
Non low income households	\$2,150	2.7%	\$2,181	2.7%	\$1,602	2.0%	\$2,473	3.1%	NC	NC	\$2,505	3.1%
Low income households	\$1,905	11.0%	\$1,995	11.5%	\$996	5.8%	\$2,188	12.6%	NC	NC	\$2,422	14.0%
LIHEAP recipient households	\$1,960	14.2%	\$2,023	14.7%	\$1,453	10.6%	\$2,025*	14.7%	NC	NC	\$2,382	17.3%
South												
All households	\$1,954	3.3%	\$2,222	3.8%	\$1,702	2.9%	\$2,597	4.4%	\$1,645	2.8%	\$2,228	3.8%
Non low income households	\$2,093	2.7%	\$2,395	3.1%	\$1,827	2.4%	\$2,457	3.2%	\$1,106*	1.4%	\$2,433	3.2%
Low income households	\$1,644	11.1%	\$1,834	12.4%	\$1,411	9.5%	\$3,151*	21.2%	\$1,766	11.9%	\$1,915	12.9%
LIHEAP recipient households	\$1,751	15.5%	\$1,818	16.1%	\$1,590	14.0%	\$2,955*	26.1%	\$1,368*	12.1%	\$1,812	16.0%
West												
All households	\$1,516	2.2%	\$1,679	2.5%	\$1,164	1.7%	\$2,147*	3.2%	\$1,665*	2.5%	\$2,221	3.3%
Non low income households	\$1,654	1.9%	\$1,779	2.0%	\$1,349	1.5%	\$2,147*	2.4%	\$2,023*	2.3%	\$2,271	2.6%
Low income households	\$1,223	6.8%	\$1,419	7.9%	\$873	4.9%	NC	NC	\$1,440	8.0%	\$2,135	11.9%
LIHEAP recipient households	\$1,315	9.0%	\$1,424	9.7%	\$828	5.7%	\$1,810*	NC	NC	NC	\$2,223*	15.2%

^{1/}Estimates are derived from the 2001 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy. The 2001 RECS data have been adjusted for heating degree days, cooling degree days, and fuel price estimates for FY 2006. Expenditures represent the cost for fuel oil, kerosene, and LPG delivered and billed costs for natural gas and electricity. 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 2006 CPS ASEC, which reports income for calendar year 2005. Mean group residential burden is computed as mean group energy expenditures (from RECS) by mean group income (from CPS ASEC). See text in Appendix A for a discussion of energy burden.

^{3/}Households with annual incomes under the maximum in section 2605(b)(2)(B) of Public Law 97-35.

^{4/}Includes households from the 2001 RECS LIHEAP supplemental sample.

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

NC = No cases in the 2001 RECS household sample.

Table A-2b. 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 2006

Census Region	Main heating fuel											
	All fuels		Natural gas		Electricity		Fuel oil		Kerosene		LPG	
	Dollars ^{1/}	Percent ^{2/}	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent
United States												
All households	\$1,982	7.4%	\$2,112	7.6%	\$1,563	6.4%	\$2,683	8.9%	\$1,824	17.7%	\$2,351	9.3%
Non low income households	\$2,117	3.5%	\$2,229	3.6%	\$1,728	3.1%	\$2,770	4.5%	\$2,027	4.3%	\$2,480	5.0%
Low income households ^{3/}	\$1,690	16.0%	\$1,843	16.9%	\$1,231	13.2%	\$2,460	20.1%	\$1,737	23.4%	\$2,123	16.9%
LIHEAP recipient households ^{4/}	\$1,992	22.1%	\$2,062	23.1%	\$1,492	17.4%	\$2,804	26.1%	\$2,060	29.5%	\$2,070	24.2%
Northeast												
All households	\$2,460	9.6%	\$2,494	10.8%	\$1,794	6.5%	\$2,754	8.7%	\$2,105	18.1%	\$2,669	6.8%
Non low income households	\$2,668	4.2%	\$2,738	4.1%	\$2,024	3.2%	\$2,863	4.7%	\$2,534	5.2%	\$2,912	4.2%
Low income households	\$2,049	20.3%	\$2,076	22.3%	\$1,397	12.3%	\$2,458	19.7%	\$1,811	26.9%	\$1,703*	17.0%
LIHEAP recipient households	\$2,440	26.8%	\$2,411	28.1%	\$2,060	26.0%	\$2,876	25.8%	\$2,091*	30.3%	\$2,018*	14.1%
Midwest												
All households	\$2,075	7.4%	\$2,129	7.0%	\$1,366	7.8%	\$2,327	13.2%	NC	NC	\$2,476	9.0%
Non low income households	\$2,150	3.7%	\$2,181	3.6%	\$1,602	2.8%	\$2,473	4.3%	NC	NC	\$2,505	5.2%
Low income households	\$1,905	15.8%	\$1,995	15.5%	\$996	15.6%	\$2,188	21.7%	NC	NC	\$2,422	16.2%
LIHEAP recipient households	\$1,960	19.1%	\$2,023	18.7%	\$1,453	13.5%	\$2,025*	15.9%	NC	NC	\$2,382	30.0%
South												
All households	\$1,954	7.7%	\$2,222	8.4%	\$1,702	6.8%	\$2,597	6.8%	\$1,645	17.9%	\$2,228	10.4%
Non low income households	\$2,093	3.6%	\$2,395	3.9%	\$1,827	3.3%	\$2,457	3.3%	\$1,106*	2.9%	\$2,433	5.3%
Low income households	\$1,644	16.9%	\$1,834	18.4%	\$1,411	15.0%	\$3,151*	20.6%	\$1,766	21.4%	\$1,915	18.2%
LIHEAP recipient households	\$1,751	22.1%	\$1,818	26.5%	\$1,590	18.7%	\$2,955*	34.9%	\$1,368*	12.1%	\$1,812	20.6%
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All households	\$1,516	5.2%	\$1,679	5.4%	\$1,164	4.8%	\$2,147*	4.3%	\$1,665*	15.8%	\$2,221	8.2%
Non low income households	\$1,654	2.8%	\$1,779	2.9%	\$1,349	2.4%	\$2,147*	4.3%	\$2,023*	3.9%	\$2,271	4.2%
Low income households	\$1,223	10.5%	\$1,419	11.7%	\$873	8.5%	NC	NC	\$1,440	23.3%	\$2,135	15.0%
LIHEAP recipient households	\$1,315	16.3%	\$1,424	18.1%	\$828	11.0%	\$1,810*	\$21	NC	NC	\$2,223*	24.3%

^{1/}Estimates are derived from the 2001 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy. The 2001 RECS data have been adjusted for heating degree days, cooling degree days, and fuel price estimates for FY 2006. Expenditures represent the cost for fuel oil, kerosene, and LPG delivered and billed costs for natural gas and electricity. Expenditure data are not collected for other fuels.

^{2/}Represents the percent of household income used for residential energy expenditures. For individual households, FY 2006 income is estimated by inflating income reported in the 2001 RECS by the consumer price index (CPI) and FY 2006 energy expenditures are estimated by adjusting energy expenditures reported in the 2001 RECS for changes in weather and energy prices. FY 2006 residential energy burden for each household is computed as estimated FY 2006 residential energy expenditures divided by estimated FY 2006 annual income. Mean 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 under the maximum in section 2605(b)(2)(B) of Public Law 97-35.

^{4/} Includes households from the 2001 RECS LIHEAP supplemental sample.

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

NC = No cases in 2001 RECS household sample.

Table A-2c. 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 2006

Census Region	Main heating fuel											
	All fuels		Natural gas		Electricity		Fuel oil		Kerosene		LPG	
	Dollars ^{1/}	Percent ^{2/}	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent
United States												
All households	\$1,982	4.1%	\$2,112	4.2%	\$1,563	3.5%	\$2,683	5.0%	\$1,824	10.6%	\$2,351	6.4%
Non low income households	\$2,117	3.1%	\$2,229	3.2%	\$1,728	2.7%	\$2,770	4.1%	\$2,027	3.8%	\$2,480	4.7%
Low income households ^{3/}	\$1,690	9.5%	\$1,843	10.2%	\$1,231	7.6%	\$2,460	12.9%	\$1,737	15.8%	\$2,123	11.7%
LIHEAP recipient households ^{4/}	\$1,992	15.3%	\$2,062	16.0%	\$1,492	12.2%	\$2,804	21.0%	\$2,060	17.0%	\$2,070	16.5%
Northeast												
All households	\$2,460	5.0%	\$2,494	5.2%	\$1,794	4.0%	\$2,754	5.2%	\$2,105	9.7%	\$2,669	3.5%
Non low income households	\$2,668	3.7%	\$2,738	3.7%	\$2,024	2.9%	\$2,863	4.2%	\$2,534	4.8%	\$2,912	3.4%
Low income households	\$2,049	11.0%	\$2,076	12.1%	\$1,397	7.9%	\$2,458	12.4%	\$1,811	11.1%	\$1,703*	11.2%
LIHEAP recipient households	\$2,440	18.3%	\$2,411	19.0%	\$2,060	16.4%	\$2,876	19.8%	\$2,091*	17.2%	\$2,018*	12.9%
Midwest												
All households	\$2,075	4.3%	\$2,129	4.2%	\$1,366	3.4%	\$2,327	7.4%	NC	NC	\$2,476	6.4%
Non low income households	\$2,150	3.3%	\$2,181	3.3%	\$1,602	2.6%	\$2,473	3.9%	NC	NC	\$2,505	4.7%
Low income households	\$1,905	10.1%	\$1,995	9.1%	\$996	7.8%	\$2,188	14.7%	NC	NC	\$2,422	12.3%
LIHEAP recipient households	\$1,960	13.6%	\$2,023	13.8%	\$1,453	12.4%	\$2,025*	15.7%	NC	NC	\$2,382	17.0%
South												
All households	\$1,954	4.3%	\$2,222	4.5%	\$1,702	3.8%	\$2,597	3.4%	\$1,645	12.3%	\$2,228	6.7%
Non low income households	\$2,093	3.1%	\$2,395	3.4%	\$1,827	2.9%	\$2,457	3.2%	\$1,106*	2.3%	\$2,433	5.3%
Low income households	\$1,644	10.6%	\$1,834	11.7%	\$1,411	8.6%	\$3,151*	15.0%	\$1,766	15.5%	\$1,915	12.5%
LIHEAP recipient households	\$1,751	14.6%	\$1,818	15.8%	\$1,590	12.7%	\$2,955*	34.0%	\$1,368*	11.9%	\$1,812	14.0%
West												
All households	\$1,516	3.1%	\$1,679	3.2%	\$1,164	2.8%	\$2,147*	4.5%	\$1,665*	5.5%	\$2,221	5.4%
Non low income households	\$1,654	2.4%	\$1,779	2.5%	\$1,349	2.2%	\$2,147*	4.5%	\$2,023*	3.8%	\$2,271	4.0%
Low income households	\$1,223	6.1%	\$1,419	7.0%	\$873	4.8%	NC	NC	\$1,440	18.6%	\$2,135	8.5%
LIHEAP recipient households	\$1,315	13.0%	\$1,424	14.6%	\$828	7.5%	\$1,810*	\$22	NC	NC	\$2,223*	31.2%

^{1/}Estimates are derived from the 2001 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy. The 2001 RECS data have been adjusted for heating degree days, cooling degree days, and fuel price estimates for FY 2006. Expenditures represent the cost for fuel oil, kerosene, and LPG delivered and billed costs for natural gas and electricity. Expenditure data are not collected for other fuels.

^{2/}Represents the percent of household income used for residential energy expenditures. For individual households, FY 2006 income is estimated by inflating income reported in the 2001 RECS by the consumer price index (CPI) and FY 2006 energy expenditures are estimated by adjusting energy expenditures reported in the 2001 RECS for changes in weather and energy prices. FY 2006 residential energy burden for each household is computed as estimated FY 2006 residential energy expenditures divided by estimated FY 2006 annual income. Median burden is computed by computing the median of the individual values.

^{3/}Households with annual incomes under the maximum in section 2605(b)(2)(B) of Public Law 97-35.

^{4/}Includes households from the 2001 RECS LIHEAP supplemental sample.

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

NC = No cases in the 2001 RECS household sample.

Table A-3. 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, April 2001^{1/}

	Natural Gas ^{2/}	Electricity	Fuel Oil	Kerosene	LPG	Other ^{3/}
United States						
All households	55.4%	29.1%	7.5%	0.8%	4.7%	2.1%
Non low income households	56.3%	28.3%	7.9%	0.3%	4.4%	2.2%
Low income households ^{4/}	53.4%	30.7%	6.7%	1.7%	5.3%	1.8%
LIHEAP recipient households ^{5/}	52.4%	21.3%	10.0%	2.2%	11.0%	2.8%
Northeast						
All households	52.2%	11.4%	30.9%	1.6%	1.7%	2.2%
Non low income households	49.4%	10.7%	34.0%	1.0%	2.1%	2.8%
Low income households	57.8%	12.7%	24.7%	2.7%	1.0%	1.0%
LIHEAP recipient households	54.5%	9.8%	25.4%	6.4%	1.1%	2.7%
Midwest						
All households	77.4%	10.3%	3.2%	NC	7.5%	1.5%
Non low income households	80.1%	9.1%	2.3%	NC	7.1%	1.4%
Low income households	71.1%	13.3%	5.5%	NC	8.6%	1.5%
LIHEAP recipient households	68.9%	12.7%	0.9%	NC	13.7%	3.8%
South						
All households	40.2%	49.7%	2.1%	1.0%	5.2%	1.5%
Non low income households	40.3%	50.4%	2.4%	0.3%	4.6%	1.6%
Low income households	40.0%	48.2%	1.4%	2.6%	6.6%	1.3%
LIHEAP recipient households	31.8%	41.0%	3.4%	0.4%	22.2%	0.7%
West						
All households	60.4%	29.6%	0.7%	0.5%	3.1%	3.6%
Non low income households	63.7%	26.6%	1.1%	0.3%	2.9%	3.7%
Low income households	53.5%	36.1%	NC	1.0%	3.6%	3.5%
LIHEAP recipient households	47.0%	34.3%	4.5%	NC	7.8%	5.1%

^{1/}Data derived from the 2001 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy. Represents main heating fuel used in April 2001.

^{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 under the maximum in section 2605(b)(2)(B) of Public Law 97-35.

^{5/} Includes households from the 2001 RECS LIHEAP supplemental sample.

NC = No cases in the 2001 RECS household sample.

Table A-4. 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 2006^{1/}

	All Fuels ^{2/}	Natural Gas	Electricity	Fuel Oil	Kerosene	LPG
(In MmBTUs) ^{3/}						
United States						
All households	42.6	54.9	13.8	71.4	40.8	51.5
Non low income households	44.6	56.5	14.7	73.7	50.2	55.2
Low income households ^{4/}	38.4	51.4	11.9	65.4	36.8	44.7
LIHEAP recipient households ^{5/}	57.2	70.0	19.8	88.7	54.5	40.7
Northeast						
All households	62.3	67.8	21.5	72.9	57.7	63.8
Non low income households	67.4	74.0	24.5	76.2	67.2	67.5
Low income households	52.4	57.3	16.3	64.1	51.2	49.4*
LIHEAP recipient households	71.0	74.1	27.8	86.6	56.2*	28.3*
Midwest						
All households	66.3	73.2	23.4	70.6	NC	62.5
Non low income households	67.7	73.5	28.4	70.2	NC	63.2
Low income households	63.0	72.5	15.6	71.1	NC	61.2
LIHEAP recipient households	71.7	83.2	21.8	95.4*	NC	58.7
South						
All households	26.5	41.2	12.0	64.5	27.0	40.8
Non low income households	27.3	42.5	12.2	64.5	24.0*	48.3
Low income households	24.6	38.2	11.5	64.8*	27.7	29.4
LIHEAP recipient households	33.4	48.4	19.8	113.6*	16.6*	24.9
West						
All households	27.6	36.0	12.5	51.7*	40.3*	46.8
Non low income households	29.5	37.0	14.1	51.7*	43.0*	45.4
Low income households	23.4	33.3	9.9	NC	38.5	49.2
LIHEAP recipient households	31.7	37.2	11.8	79.5*	NC	58.8*

^{1/}Developed from the 2001 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy, for FY 2006.

^{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 under the maximum in section 2605(b)(2)(B) of Public Law 97-35.

^{5/} Includes households from the 2001 RECS LIHEAP supplemental sample.

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

NC = No cases in the 2001 RECS household sample.

Table A-5a. 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 2006

Census Region	Main heating fuel											
	All fuels		Natural gas		Electricity		Fuel oil		Kerosene		LPG	
	Dollars ^{1/}	Percent ^{2/}	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent
United States												
All households	\$696	1.1%	\$801	1.3%	\$353	0.6%	\$1,229	1.9%	\$853	1.3%	\$1,041	1.6%
Non low income households	\$725	0.9%	\$821	1.0%	\$373	0.4%	\$1,272	1.5%	\$1,029	1.2%	\$1,132	1.4%
Low income households ^{3/}	\$635	3.8%	\$755	4.5%	\$313	1.9%	\$1,118	6.7%	\$777	4.6%	\$880	5.2%
LIHEAP recipient households ^{4/}	\$922	6.8%	\$973	7.1%	\$537	3.9%	\$1,522	11.2%	\$1,118	8.2%	\$844	6.2%
Northeast												
All households	\$1,112	1.6%	\$1,153	1.6%	\$726	1.0%	\$1,250	1.8%	\$1,150	1.6%	\$1,417	2.0%
Non low income households	\$1,195	1.2%	\$1,243	1.3%	\$804	0.8%	\$1,306	1.4%	\$1,358	1.4%	\$1,540	1.6%
Low income households	\$948	5.1%	\$998	5.4%	\$593	3.2%	\$1,092	5.9%	\$1,009	5.4%	\$931*	5.0%
LIHEAP recipient households	\$1,269	8.6%	\$1,249	8.5%	\$969	6.6%	\$1,482	10.1%	\$1,152*	7.8%	\$730*	5.0%
Midwest												
All households	\$915	1.5%	\$944	1.6%	\$547	0.9%	\$1,176	1.9%	NC	NC	\$1,145	1.9%
Non low income households	\$925	1.2%	\$942	1.2%	\$626	0.8%	\$1,168	1.5%	NC	NC	\$1,168	1.5%
Low income households	\$893	5.2%	\$948	5.5%	\$424	2.4%	\$1,183	6.8%	NC	NC	\$1,101	6.4%
LIHEAP recipient households	\$933	6.8%	\$959	7.0%	\$555	4.0%	\$1,546*	11.2%	NC	NC	\$1,113	8.1%
South												
All households	\$498	0.8%	\$659	1.1%	\$304	0.5%	\$1,192	2.0%	\$607	1.0%	\$905	1.5%
Non low income households	\$513	0.7%	\$682	0.9%	\$310	0.4%	\$1,184	1.5%	\$526*	0.7%	\$1,060	1.4%
Low income households	\$464	3.1%	\$608	4.1%	\$291	2.0%	\$1,222*	8.2%	\$625	4.2%	\$667	4.5%
LIHEAP recipient households	\$636	5.6%	\$696	6.1%	\$494	4.4%	\$2,007*	17.7%	\$355*	3.1%	\$605	5.3%
West												
All households	\$433	0.6%	\$501	0.7%	\$294	0.4%	\$887*	1.3%	\$854*	1.3%	\$973	1.4%
Non low income households	\$469	0.5%	\$527	0.6%	\$334	0.4%	\$887*	1.0%	\$892*	1.0%	\$975	1.1%
Low income households	\$357	2.0%	\$433	2.4%	\$231	1.3%	NC	NC	\$831	4.6%	\$970	5.4%
LIHEAP recipient households	\$523	3.6%	\$524	3.6%	\$279	1.9%	\$1,370*	9.4%	NC	NC	\$1,104*	7.5%

^{1/}Expenditures shown in this table are derived from the 2001 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy. The 2001 RECS data have been adjusted for heating degree days and fuel price estimates for FY 2006. Expenditures represent delivered cost for fuel oil, kerosene, and LPG, and billed costs for natural gas and electricity used. 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 2006 CPS ASEC, which reports income for calendar year 2005. Mean group home heating burden is computed as mean group energy expenditures (from RECS) divided by mean group income (from CPS ASEC). See Appendix A for a discussion of energy burden.

^{3/}Households with annual incomes under the maximum in section 2605(b)(2)(B) of Public Law 97-35.

^{4/}Includes households from the 2001 RECS LIHEAP supplemental sample.

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

NC = No cases in the 2001 RECS household sample.

Table A-5b. 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 2006

Census Region	Main heating fuel											
	All fuels		Natural gas		Electricity		Fuel oil		Kerosene		LPG	
	Dollars ^{1/}	Percent ^{2/}	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent
United States												
All households	\$696	2.9%	\$801	3.3%	\$353	1.6%	\$1,229	4.1%	\$853	8.9%	\$1,041	3.9%
Non low income households	\$725	1.3%	\$821	1.4%	\$373	0.7%	\$1,272	2.1%	\$1,029	2.2%	\$1,132	2.3%
Low income households ^{3/}	\$635	6.3%	\$755	7.6%	\$313	3.6%	\$1,118	9.2%	\$777	11.8%	\$880	6.8%
LIHEAP recipient households ^{4/}	\$922	11.2%	\$973	11.8%	\$537	6.6%	\$1,522	15.4%	\$1,118	15.8%	\$844	12.2%
Northeast												
All households	\$1,112	4.7%	\$1,153	5.8%	\$726	2.7%	\$1,250	3.9%	\$1,150	11.3%	\$1,417	3.4%
Non low income households	\$1,195	1.9%	\$1,243	1.9%	\$804	1.3%	\$1,306	2.2%	\$1,358	2.9%	\$1,540	2.3%
Low income households	\$948	10.3%	\$998	12.3%	\$593	5.2%	\$1,092	8.4%	\$1,009	17.1%	\$931*	8.0%
LIHEAP recipient households	\$1,269	15.2%	\$1,249	15.6%	\$969	15.4%	\$1,482	14.6%	\$1,152*	16.3%	\$730*	3.3%
Midwest												
All households	\$915	3.5%	\$944	3.4%	\$547	3.1%	\$1,176	7.2%	NC	NC	\$1,145	4.1%
Non low income households	\$925	1.7%	\$942	1.6%	\$626	1.1%	\$1,168	2.1%	NC	NC	\$1,168	2.5%
Low income households	\$893	7.7%	\$948	7.9%	\$424	6.3%	\$1,183	12.2%	NC	NC	\$1,101	6.9%
LIHEAP recipient households	\$933	9.9%	\$959	9.4%	\$555	5.5%	\$1,546*	12.5%	NC	NC	\$1,113	16.1%
South												
All households	\$498	2.2%	\$659	2.9%	\$304	1.5%	\$1,192*	3.1%	\$607	7.3%	\$905	4.0%
Non low income households	\$513	0.9%	\$682	1.2%	\$310	0.6%	\$1,184*	1.6%	\$526*	1.2%	\$1,060	2.3%
Low income households	\$464	5.2%	\$608	6.6%	\$291	3.5%	\$1,222	9.3%	\$625	8.6%	\$667	6.6%
LIHEAP recipient households	\$636	9.4%	\$696	12.7%	\$494	5.5%	\$2,007	23.8%	\$355*	2.8%	\$605	9.9%
West												
All households	\$433	1.6%	\$501	1.7%	\$294	1.3%	\$887*	1.9%	\$854*	7.8%	\$973	3.7%
Non low income households	\$469	0.8%	\$527	0.9%	\$334	0.6%	\$887*	1.9%	\$892*	1.7%	\$975	1.9%
Low income households	\$357	3.3%	\$433	4.0%	\$231	2.3%	NC	NC	\$831	11.7%	\$970	6.8%
LIHEAP recipient households	\$523	6.5%	\$524	6.8%	\$279	3.5%	\$1,370*	\$16	NC	NC	\$1,104*	12.2%

^{1/}Expenditures shown in this table are derived from the 2001 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy. The 2001 RECS data have been adjusted for heating degree days, cooling degree days, and fuel price estimates for FY 2006. Expenditures represent delivered cost for fuel oil, kerosene, and LPG, and billed costs for natural gas and electricity used. 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 2006 income is estimated by inflating income reported in the 2001 RECS by the consumer price index (CPI) and FY 2006 energy expenditures are estimated by adjusting energy expenditures reported in the 2001 RECS for changes in weather and energy prices. FY 2006 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 under the maximum in section 2605(b)(2)(B) of Public Law 97-35.

^{4/}Includes households from the 2001 RECS LIHEAP supplemental sample.

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

NC = No cases in the 2001 RECS household sample.

Table A-5c. 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 2006

Census Region	Main heating fuel											
	All fuels		Natural gas		Electricity		Fuel oil		Kerosene		LPG	
	Dollars ^{1/}	Percent ^{2/}	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent
United States												
All households	\$696	1.3%	\$801	1.5%	\$353	0.7%	\$1,229	2.3%	\$853	4.1%	\$1,041	2.7%
Non low income households	\$725	0.9%	\$821	1.1%	\$373	0.5%	\$1,272	1.8%	\$1,029	1.9%	\$1,132	1.9%
Low income households ^{3/}	\$635	3.0%	\$755	3.7%	\$313	1.8%	\$1,118	5.9%	\$777	6.3%	\$880	5.0%
LIHEAP recipient households ^{4/}	\$922	7.1%	\$973	7.4%	\$537	4.4%	\$1,522	11.5%	\$1,118	11.8%	\$844	6.5%
Northeast												
All households	\$1,112	2.2%	\$1,153	2.3%	\$726	1.7%	\$1,250	2.3%	\$1,150	4.9%	\$1,417	2.1%
Non low income households	\$1,195	1.5%	\$1,243	1.6%	\$804	1.1%	\$1,306	1.8%	\$1,358	2.3%	\$1,540	2.0%
Low income households	\$948	5.1%	\$998	5.7%	\$593	3.2%	\$1,092	5.8%	\$1,009	7.2%	\$931*	7.2%
LIHEAP recipient households	\$1,269	9.6%	\$1,249	9.4%	\$969	9.0%	\$1,482	10.0%	\$1,152*	12.3%	\$730*	4.5%
Midwest												
All households	\$915	1.8%	\$944	1.7%	\$547	1.5%	\$1,176	3.5%	NC	NC	\$1,145	2.8%
Non low income households	\$925	1.3%	\$942	1.4%	\$626	1.0%	\$1,168	2.0%	NC	NC	\$1,168	1.9%
Low income households	\$893	4.3%	\$948	4.2%	\$424	3.3%	\$1,183	6.8%	NC	NC	\$1,101	5.6%
LIHEAP recipient households	\$933	6.3%	\$959	6.5%	\$555	4.3%	\$1,546*	12.6%	NC	NC	\$1,113	6.5%
South												
All households	\$498	0.9%	\$659	1.3%	\$304	0.6%	\$1,192	1.9%	\$607	2.7%	\$905	2.7%
Non low income households	\$513	0.6%	\$682	0.9%	\$310	0.4%	\$1,184	1.5%	\$526*	0.5%	\$1,060	2.0%
Low income households	\$464	2.7%	\$608	3.8%	\$291	1.7%	\$1,222*	4.9%	\$625	5.3%	\$667	4.0%
LIHEAP recipient households	\$636	5.7%	\$696	7.1%	\$494	3.8%	\$2,007*	23.6%	\$355*	0.8%	\$605	4.5%
West												
All households	\$433	0.8%	\$501	0.8%	\$294	0.7%	\$887*	1.5%	\$854*	2.5%	\$973	2.4%
Non low income households	\$469	0.6%	\$527	0.6%	\$334	0.5%	\$887*	1.5%	\$892*	1.4%	\$975	1.9%
Low income households	\$357	1.6%	\$433	1.9%	\$231	1.2%	NC	NC	\$831	13.9%	\$970	4.3%
LIHEAP recipient households	\$523	5.5%	\$524	4.6%	\$279	2.3%	\$1,370*	15.3%	NC	NC	\$1,104*	19.4%

^{1/} Expenditures shown in this table are derived from the 2001 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy. The 2001 RECS data have been adjusted for heating degree days, cooling degree days, and fuel price estimates for FY 2006. Expenditures represent delivered cost for fuel oil, kerosene, and LPG, and billed costs for natural gas and electricity used. 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 2006 income is estimated by inflating income reported in the 2001 RECS by the consumer price index (CPI) and FY 2006 energy expenditures are estimated by adjusting energy expenditures reported in the 2001 RECS for changes in weather and energy prices. FY 2006 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 under the maximum in section 2605(b)(2)(B) of Public Law 97-35.

^{4/} Includes households from the 2001 RECS LIHEAP supplemental sample.

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

NC = No cases in the 2001 RECS household sample.

Table A-6. 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 2006

	Percent that cool ^{1/}	Consumption ^{2/} (in mmBTUs)	Expenditures ^{2/}	Mean group burden ^{3/}	Mean individual burden ^{3/}	Median individual burden ^{3/}
United States						
All households	87.7%	7.3	\$222	0.4%	0.7%	0.3%
Non low income households	90.6%	8.1	\$249	0.3%	0.4%	0.3%
Low income households ^{4/}	81.5%	5.3	\$159	0.9%	1.5%	0.7%
LIHEAP recipient households ^{5/}	83.0%	4	\$123	0.9%	0.9%	0.8%
Northeast						
All households	83.5%	3.0	\$121	0.2%	0.4%	0.2%
Non low income households	87.1%	3.4	\$139	0.1%	0.2%	0.1%
Low income households	76.3%	1.9	\$82	0.4%	0.8%	0.4%
LIHEAP recipient households	72.6%	1.9	\$79	0.5%	0.9%	0.3%
Midwest						
All households	92.3%	4.7	\$136	0.2%	0.4%	0.2%
Non low income households	95.0%	5.3	\$153	0.2%	0.2%	0.2%
Low income households	86.2%	3.3	\$96	0.6%	0.8%	0.4%
LIHEAP recipient households	87.2%	3.6	\$109	0.8%	1.0%	0.5%
South						
All households	97.8%	12.1	\$353	0.6%	1.2%	0.7%
Non low income households	99.3%	13.5	\$395	0.5%	0.7%	0.5%
Low income households	94.5%	8.9	\$255	1.7%	2.5%	1.4%
LIHEAP recipient households	97.3%	7.0	\$204	1.8%	2.3%	1.8%
West						
All households	69.6%	4.0	\$141	0.2%	0.4%	0.1%
Non low income households	73.8%	4.4	\$158	0.2%	0.3%	0.1%
Low income households	60.6%	3.0	\$97	0.5%	0.8%	0.3%
LIHEAP recipient households	71.6%	2.0	\$55	0.4%	0.8%	0.3%

^{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 defined by the 2001 RECS (e.g., table and window fans.)

^{2/}Consumption and expenditures are derived from the 2001 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy. The 2001 RECS data have been adjusted for heating degree days, cooling degree days, and fuel price estimates for FY 2006. Expenditures represent delivered cost for fuel oil, kerosene, and LPG, and billed costs for natural gas and electricity used. Expenditure data are not collected for other fuels.

^{3/}Represents the percent of household income used for home cooling energy expenditures. See text in Appendix A for definitions of different energy burden statistics.

^{4/}Households with annual incomes under the maximum in section 2605(b)(2)(B) of Public Law 97-35.

^{5/}Includes households from the 2001 RECS LIHEAP supplemental sample.

Appendix B: Income Eligible Household Estimates

ACF encourages LIHEAP grantees to use performance measurement systems to manage LIHEAP programs. With extensive input from LIHEAP grantees, local administering agencies, and other interested parties, ACF developed model LIHEAP performance goals and measures in 1995. ACF has further developed targeting performance indicators to support measurement of LIHEAP targeting at the grantee level. For the last six 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 target performance measurement statistics.

State-level estimates of the number of income eligible households for FY 2006 were developed using both the CPS ASEC and the ACS. While the CPS ASEC file can be used to make State-level estimates, the statistical variances for many States are too large for the data to be useful for analysis. The U.S. Bureau of the Census uses averages derived from three consecutive years of CPS ASEC data to develop State-level estimates of poverty for the school lunch program. This method reduces the variances of the estimates and improves confidence in the data. To estimate the FY 2006 numbers of LIHEAP income eligible households in the population and in various vulnerability and poverty groups, averages derived from the 2005, 2006, and 2007 CPS ASEC were used. Averages derived from the 2005 and 2006 ACS were used as well, for similar statistical reasons.⁴³

The ACS and CPS ASEC differ in their measurement of income and disability, and despite the fact that both use the same Census definition of a household, the ACS data yield a lower estimate of the total number of households in the United States than do the CPS ASEC data.⁴⁴ Estimates from both ACS and CPS ASEC data are presented to show the differences between the two data sources so that readers can assess which changes have resulted from a change in methodology and which changes are actual increases or decreases in the numbers of income eligible households.

Two sets of tables follow. Tables B-1 through B-4 show estimates produced using the averages derived from the 2005, 2006, and 2007 CPS ASEC. Tables B-5 through B-8 show estimates produced using the averages derived from the 2005 and 2006 ACS.

Odd-numbered tables show the number of LIHEAP income eligible households, calculated using the Federal Maximum Income Standard, by vulnerability or poverty group for each State. Even-numbered tables show the number of LIHEAP income eligible households, calculated using the State Income Standards, by vulnerability or poverty group for each State.

⁴³ Two years of the ACS are able to be used, rather than three years, due to the ACS's larger sample size and consequent smaller sampling variances.

⁴⁴ Though the ACS and CPS ASEC use a common definition of a household, the two differ in terms of who is considered to be a member of the household. For an explanation, and to better understand the differences between the two surveys, please visit "Guidance on Income and Poverty Estimates from Different Sources" at <<http://www.census.gov/hhes/www/income/newguidance.html>>. With the two-year average of the ACS, there are an estimated 111,343,274 households, while with the three-year average of the CPS ASEC, there are an estimated 114,514,052 households.

It should also be noted that the definition of a household in the ACS and CPS ASEC data differs subtly from that defined in Section 2603(5) of the LIHEAP statute: "The term 'household' means any individual or group of individuals who are living together as one economic unit or for whom residential energy is customarily purchased in common or who make undesignated payments for energy in the form of rent." The ACS and CPS ASEC use the Census definition of a household, which is, "A household includes all the persons who occupy a housing unit. A housing unit is a house, an apartment, a mobile home, a group of rooms, or a single room that is occupied (or if vacant, is intended for occupancy) as separate living quarters. Separate living quarters are those in which the occupants live and eat separately from any other persons in the building and which have direct access from the outside of the building or through a common hall."

LIHEAP Home Energy Notebook for FY 2006: Appendix B: Income Eligible Household Estimates

Table B-1. Average of 2005, 2006, and 2007 State-level estimates of the number of LIHEAP income eligible households using the Federal maximum LIHEAP income standard by vulnerability category^{1/2/}

(Three-Year Average of the CPS ASEC 2005-2007)

State	Total number of LIHEAP eligible households ^{3/}	LIHEAP eligible households by vulnerability category ^{4/}			LIHEAP eligible households with no vulnerable members
		At least one person 60+ years	At least one child less than 6 yrs. old	At least one person with a disability ^{5/}	
Alabama	600,231	236,304	105,188	242,688	152,730
Alaska	68,894	17,022	17,147	20,666	22,932
Arizona	610,903	188,020	178,014	144,346	183,086
Arkansas	313,901	127,103	58,009	101,953	86,660
California	3,887,213	1,424,938	889,676	925,217	1,190,125
Colorado	518,590	167,102	115,582	91,283	187,954
Connecticut	476,444	210,973	73,862	118,656	137,389
Delaware	92,885	38,597	19,936	24,909	24,054
District of Columbia	72,275	27,233	10,141	21,780	24,240
Florida	1,996,307	931,973	308,693	448,556	566,060
Georgia	990,693	310,584	240,120	282,944	321,844
Hawaii	110,337	51,127	19,988	25,319	29,996
Idaho	127,869	47,147	33,440	30,884	32,386
Illinois	1,541,835	656,927	289,395	319,221	438,466
Indiana	751,167	268,756	156,386	199,089	213,180
Iowa	335,034	133,449	63,374	73,611	98,056
Kansas	321,428	118,291	63,861	74,206	101,278
Kentucky	528,108	207,145	93,232	206,077	125,812
Louisiana	503,250	186,849	104,605	152,373	146,307
Maine	158,283	72,391	18,349	53,473	36,570
Maryland	623,095	277,022	115,860	143,095	174,440
Massachusetts	884,734	388,013	115,465	250,272	248,100
Michigan	1,272,090	497,019	236,776	362,355	367,984
Minnesota	551,512	235,423	84,353	110,134	170,247
Mississippi	337,260	136,739	69,107	139,324	77,559
Missouri	699,837	296,920	125,329	220,985	172,351
Montana	107,563	39,941	18,458	26,313	33,638
Nebraska	200,801	80,519	36,098	38,885	64,519
Nevada	229,796	90,426	45,341	50,687	70,115
New Hampshire	138,221	68,561	18,037	27,985	38,736
New Jersey	1,034,679	492,480	164,010	218,788	284,833
New Mexico	207,201	73,149	37,516	55,905	70,096
New York	2,460,196	1,023,281	400,044	648,228	726,124
North Carolina	1,065,168	442,919	202,963	322,411	295,766
North Dakota	78,322	29,537	12,654	11,985	29,380
Ohio	1,383,656	527,302	282,435	393,034	386,239
Oklahoma	408,791	157,424	88,202	115,284	119,305
Oregon	423,191	169,644	80,546	97,188	126,790
Pennsylvania	1,515,543	713,950	232,197	389,962	389,779
Rhode Island	130,759	52,654	20,632	38,166	35,327
South Carolina	497,725	212,165	84,599	167,914	126,592
South Dakota	86,235	37,773	15,797	16,370	25,724
Tennessee	716,431	296,232	117,263	242,759	178,003
Texas	2,483,185	868,235	643,554	642,932	738,716
Utah	193,455	56,388	59,984	35,858	58,175
Vermont	67,983	30,898	8,576	19,073	18,823
Virginia	813,701	336,209	157,103	204,595	237,599
Washington	688,829	277,280	130,542	174,195	195,244
West Virginia	206,522	92,273	32,214	88,248	41,720
Wisconsin	679,145	297,124	108,647	149,977	200,717
Wyoming	52,640	22,303	9,440	10,957	16,158
All States	34,243,912	13,741,738	6,612,742	8,971,116	9,837,927

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

^{2/}The greater of 60 percent of State median income estimates or 150 percent of the poverty guidelines.

^{3/}The three year CPS ASEC average estimate of the total number of all U.S. households is 114,514,052.

^{4/}A household can be counted under more than one vulnerability category.

^{5/}A person with a disability is defined as anyone 15 years or older who had limited work opportunities during the past year due to a disability, as reported on the CPS ASEC. The definition also includes individuals who received Veteran's Disability income or Social Security Disability income for themselves or for a surviving, dependent, or disabled child, as well as individuals under age 65 who received Supplemental Security Income or Medicare benefits in the past year.

LIHEAP Home Energy Notebook for FY 2006: Appendix B: Income Eligible Household Estimates

Table B-2. Average of 2005, 2006, and 2007 State-level estimates of the number of LIHEAP income eligible households using State LIHEAP income standards by vulnerability category^{1/ 2/}

(Three-Year Average of CPS ASEC 2005-2007)

State	State Income Guidelines for 4-Person Household as % of HHS Poverty Guidelines	Total number of LIHEAP eligible households ^{2/}	LIHEAP eligible households by vulnerability category ^{4/}			LIHEAP eligible households with no vulnerable members
			At least one person 60+	At least one child less than 6 yrs. old	At least one person with a disability ^{5/}	
Alabama	125	390,650	136,380	83,860	171,599	87,653
Alaska	150	52,564	11,238	14,102	16,850	17,269
Arizona	150	460,399	133,218	141,331	113,130	137,077
Arkansas	125	223,836	84,809	46,753	74,863	59,964
California	^{6/} 210	3,886,230	1,424,938	888,693	925,217	1,190,125
Colorado	185	405,302	129,662	94,594	80,017	138,988
Connecticut	^{6/} 267	476,444	210,973	73,862	118,656	137,389
Delaware	200	75,844	30,703	17,631	21,112	18,251
District of Columbia	150	58,759	21,485	9,040	18,686	18,761
Florida	150	1,460,057	655,758	249,170	348,965	405,718
Georgia	150	694,553	213,412	185,934	226,577	200,200
Hawaii	150	81,419	36,679	14,953	20,226	21,639
Idaho	150	100,860	36,560	27,444	25,144	24,307
Illinois	150	886,492	354,599	188,893	215,613	233,456
Indiana	150	491,808	163,669	114,513	150,831	127,396
Iowa	150	216,344	79,041	45,179	55,945	61,189
Kansas	130	166,953	51,961	37,111	52,478	49,841
Kentucky	110	299,141	103,921	60,918	130,713	69,366
Louisiana	^{6/} 157	502,710	186,849	104,065	152,373	146,307
Maine	^{7/} 150	123,894	59,421	14,611	44,832	24,000
Maryland	150	308,853	139,929	62,228	90,083	67,846
Massachusetts	^{8/} 200	669,435	291,834	86,579	205,717	173,971
Michigan	110	518,689	159,942	123,557	203,449	127,929
Minnesota	150	271,672	110,131	44,368	70,849	74,305
Mississippi	150	321,400	130,590	68,729	136,585	69,145
Missouri	125	362,257	129,326	75,609	125,041	92,380
Montana	150	91,295	33,712	15,356	22,146	28,295
Nebraska	116	83,639	26,952	16,159	20,523	28,193
Nevada	150	153,730	56,198	33,466	35,999	45,639
New Hampshire	185	88,590	46,368	11,549	20,836	19,927
New Jersey	175	567,856	275,765	91,652	138,924	138,454
New Mexico	150	194,300	69,104	36,916	54,577	62,109
New York	^{6/ 9/} 215	2,460,196	1,023,281	400,044	648,228	726,124
North Carolina	110	521,565	192,049	110,092	178,054	146,006
North Dakota	135	47,367	16,939	8,861	8,463	16,716
Ohio	175	1,123,648	417,997	250,246	331,374	294,824
Oklahoma	110	216,294	71,636	51,553	65,954	63,152
Oregon	^{6/} 191	423,191	169,644	80,546	97,188	126,790
Pennsylvania	150	935,991	405,953	162,144	280,358	222,384
Rhode Island	^{6/} 220	130,759	52,654	20,632	38,166	35,327
South Carolina	150	393,740	165,367	74,420	143,135	88,503
South Dakota	160	70,786	30,924	13,517	14,408	20,073
Tennessee	125	454,666	172,545	75,008	165,205	114,528
Texas	125	1,644,501	530,598	442,123	472,572	478,070
Utah	125	89,189	22,820	27,708	21,558	26,895
Vermont	125	31,255	13,493	3,707	10,272	7,916
Virginia	130	346,789	140,904	70,932	101,803	92,741
Washington	125	313,332	112,411	66,574	90,496	78,792
West Virginia	130	160,922	65,065	25,861	71,095	35,255
Wisconsin	150	402,859	164,761	67,234	96,239	122,106
Wyoming	^{6/} 174	52,595	22,303	9,395	10,957	16,158
All States	Not applicable	24,505,618	9,386,471	5,039,425	6,934,080	6,809,448

^{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. The State maximum LIHEAP income standards for a family of four were obtained from ACF's LIHEAP grantee survey.

^{3/} The three year CPS ASEC average estimate of the total number of all U.S. households is 114,514,052.

^{4/} A household can be counted under more than one vulnerability category.

^{5/} A person with a disability is defined as anyone 15 years or older who had limited work opportunities during the past year due to a disability, as reported on the CPS ASEC. The definition also includes individuals who received Veteran's Disability Income or Social Security Disability Income for themselves or for a surviving, dependent, or disabled child, as well as individuals under age 65 who received Supplemental Security Income or Medicare benefits in the past year.

^{6/} These States use a percent of State median income. The figures reported are the conversion to a percent of the HHS poverty guidelines.

^{7/} 170 percent of the HHS Poverty Guidelines if a household member is susceptible to hypothermia (elderly over 60 or children under 2).

^{8/} 150 percent of the HHS Poverty Guidelines whenever 200 percent of the HHS Poverty Guidelines exceeds 60 percent of the State median income.

^{9/} 150 percent of the HHS Poverty Guidelines for a family size of 11 or more.

LIHEAP Home Energy Notebook for FY 2006: Appendix B: Income Eligible Household Estimates

Table B-3. Average of 2005, 2006, and 2007 State-level estimates of the number of LIHEAP income eligible households using the Federal maximum LIHEAP income standard classified by HHS poverty guidelines^{1/2/}

(Three-Year Average of CPS ASEC 2005-2007)

State	Total number of LIHEAP eligible households ^{3/}	Number of LIHEAP eligible households by intervals of HHS Poverty Guidelines			
		At or below poverty guidelines	>100% - 125% poverty guidelines	>125% - 150% poverty guidelines	Over 150% poverty guidelines
Alabama	600,231	289,720	100,930	86,668	122,913
Alaska	68,894	28,490	10,906	13,168	16,330
Arizona	610,903	264,089	107,523	88,787	150,504
Arkansas	313,901	153,837	69,999	69,778	20,287
California	3,887,213	1,233,229	653,019	612,985	1,387,979
Colorado	518,590	167,767	72,449	71,848	206,527
Connecticut	476,444	126,450	51,919	53,649	244,427
Delaware	92,885	25,478	9,868	11,288	46,252
District of Columbia	72,275	38,000	11,857	8,902	13,516
Florida	1,996,307	761,589	327,374	371,094	536,250
Georgia	990,693	400,752	143,061	150,740	296,141
Hawaii	110,337	47,513	18,928	14,978	28,919
Idaho	127,869	44,474	27,321	29,065	27,009
Illinois	1,541,835	505,783	191,935	188,775	655,342
Indiana	751,167	273,556	97,802	120,451	259,359
Iowa	335,034	118,049	46,475	51,819	118,690
Kansas	321,428	120,204	37,697	52,598	110,929
Kentucky	528,108	258,080	97,541	91,428	81,058
Louisiana	503,250	261,707	93,617	91,684	56,242
Maine	158,283	56,570	25,302	28,489	47,921
Maryland	623,095	181,877	61,045	65,931	314,242
Massachusetts	884,734	271,948	105,890	97,272	409,624
Michigan	1,272,090	453,226	163,110	176,448	479,306
Minnesota	551,512	132,163	73,207	66,302	279,841
Mississippi	337,260	194,198	64,413	62,789	15,859
Missouri	699,837	246,503	115,754	116,751	220,830
Montana	107,563	49,436	23,595	18,264	16,269
Nebraska	200,801	62,639	33,790	33,997	70,376
Nevada	229,796	78,975	31,981	42,774	76,066
New Hampshire	138,221	29,835	16,693	16,639	75,053
New Jersey	1,034,679	249,851	104,097	109,584	571,147
New Mexico	207,201	110,335	42,587	41,377	12,901
New York	2,460,196	989,760	316,659	320,709	833,068
North Carolina	1,065,168	448,936	202,251	172,154	241,828
North Dakota	78,322	29,351	12,729	12,802	23,439
Ohio	1,383,656	517,872	187,195	191,243	487,346
Oklahoma	408,791	184,371	85,407	78,079	60,934
Oregon	423,191	151,278	78,293	76,291	117,330
Pennsylvania	1,515,543	516,738	192,111	227,142	579,551
Rhode Island	130,759	45,536	18,128	17,140	49,956
South Carolina	497,725	215,946	90,795	86,999	103,984
South Dakota	86,235	32,860	15,720	15,620	22,035
Tennessee	716,431	330,129	124,537	123,207	138,558
Texas	2,483,185	1,177,348	467,152	400,898	437,786
Utah	193,455	61,964	27,224	35,129	69,137
Vermont	67,983	20,059	11,196	12,441	24,286
Virginia	813,701	221,628	102,395	110,766	378,912
Washington	688,829	205,009	108,323	96,159	279,339
West Virginia	206,522	107,621	41,975	46,141	10,785
Wisconsin	679,145	210,893	99,588	92,378	276,285
Wyoming	52,640	17,952	9,204	8,501	16,984
All States	34,243,912	12,721,574	5,222,568	5,180,119	11,119,652

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

^{2/}The greater of 60 percent of State median income estimates or 150 percent of the poverty guidelines.

^{3/}The three year CPS ASEC average estimate of the total number of all U.S. households is 114,514,052.

LIHEAP Home Energy Notebook for FY 2006: Appendix B: Income Eligible Household Estimates

Table B-4. Average of 2005, 2006, and 2007 State-level estimates of the number of LIHEAP income eligible households using the State maximum LIHEAP income standards^{1/ 2/}

(Three-Year Average of CPS ASEC 2005-2007)

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 by HHS poverty intervals			
			At or below poverty guidelines	>100%-125% poverty guidelines	>125%-150% poverty guidelines	Over 150% poverty guidelines
Alabama	125	390,650	289,720	100,930	0	0
Alaska	150	52,564	28,490	10,906	13,168	0
Arizona	150	460,399	264,089	107,523	88,787	0
Arkansas	125	223,836	153,837	69,999	0	0
California	^{4/} 210	3,886,230	1,233,229	653,019	612,002	1,387,979
Colorado	185	405,302	167,767	72,449	71,848	93,239
Connecticut	^{4/} 267	476,444	126,450	51,919	53,649	244,427
Delaware	200	75,844	25,478	9,868	11,288	29,210
District of Columbia	150	58,759	38,000	11,857	8,902	0
Florida	150	1,460,057	761,589	327,374	371,094	0
Georgia	150	694,553	400,752	143,061	150,740	0
Hawaii	150	81,419	47,513	18,928	14,978	0
Idaho	150	100,860	44,474	27,321	29,065	0
Illinois	150	886,492	505,783	191,935	188,775	0
Indiana	150	491,808	273,556	97,802	120,451	0
Iowa	150	216,344	118,049	46,475	51,819	0
Kansas	130	166,953	120,204	37,697	9,052	0
Kentucky	110	299,141	258,080	41,061	0	0
Louisiana	^{4/} 157	502,710	261,707	93,617	91,145	56,242
Maine	^{5/} 150	123,894	56,570	25,302	28,489	13,532
Maryland	150	308,853	181,877	61,045	65,931	0
Massachusetts	^{6/} 200	669,435	271,948	105,890	97,272	194,325
Michigan	110	518,689	453,226	65,463	0	0
Minnesota	150	271,672	132,163	73,207	66,302	0
Mississippi	150	321,400	194,198	64,413	62,789	0
Missouri	125	362,257	246,503	115,754	0	0
Montana	150	91,295	49,436	23,595	18,264	0
Nebraska	116	83,639	62,639	21,000	0	0
Nevada	150	153,730	78,975	31,981	42,774	0
New Hampshire	185	88,590	29,835	16,693	16,639	25,422
New Jersey	175	567,856	249,851	104,097	109,584	104,324
New Mexico	150	194,300	110,335	42,587	41,377	0
New York	^{4/ 7/} 215	2,460,196	989,760	316,659	320,709	833,068
North Carolina	110	521,565	448,936	72,629	0	0
North Dakota	135	47,367	29,351	12,729	5,287	0
Ohio	175	1,123,648	517,872	187,195	191,243	227,338
Oklahoma	110	216,294	184,371	31,923	0	0
Oregon	^{4/} 191	423,191	151,278	78,293	76,291	117,330
Pennsylvania	150	935,991	516,738	192,111	227,142	0
Rhode Island	^{4/} 220	130,759	45,536	18,128	17,140	49,956
South Carolina	150	393,740	215,946	90,795	86,999	0
South Dakota	160	70,786	32,860	15,720	15,620	6,585
Tennessee	125	454,666	330,129	124,537	0	0
Texas	125	1,644,501	1,177,348	467,152	0	0
Utah	125	89,189	61,964	27,224	0	0
Vermont	125	31,255	20,059	11,196	0	0
Virginia	130	346,789	221,628	102,395	22,765	0
Washington	125	313,332	205,009	108,323	0	0
West Virginia	130	160,922	107,621	41,975	11,326	0
Wisconsin	150	402,859	210,893	99,588	92,378	0
Wyoming	^{4/} 174	52,595	17,952	9,158	8,501	16,984
All States	Not applicable	24,505,618	12,721,574	4,872,500	3,511,583	3,399,961

^{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. The State maximum LIHEAP income standards for a family of four were obtained from ACF's LIHEAP grantee survey.

^{3/}The three year CPS ASEC average estimate of the total number of all U.S. households is 114,514,052.

^{4/}These States use a percent of State median income. The figures reported are the conversion to a percent of the HHS poverty guidelines.

^{5/}170 percent of the HHS Poverty Guidelines if a household member is susceptible to hypothermia (elderly over 60 or children under 2).

^{6/}150 percent of the HHS Poverty Guidelines whenever 200 percent of the HHS Poverty Guidelines exceeds 60 percent of the State median income.

^{7/}150 percent of the HHS Poverty Guidelines for a family size of 11 or more.

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Table B-5. Average of 2005 and 2006 State-level estimates of the number of LIHEAP income eligible households using the Federal maximum LIHEAP income standard by vulnerability category^{1/2/}

(Two-Year Average of the ACS 2005-2006)

State	Total number of LIHEAP eligible households ^{2/}	LIHEAP eligible households by vulnerability category ^{4/}			LIHEAP eligible households with no vulnerable members
		At least one person 60+ years	At least one child less than 6 yrs. old	At least one person with a disability ^{5/}	
Alabama	578,399	212,166	106,818	230,014	173,595
Alaska	59,798	14,723	15,371	15,380	23,570
Arizona	571,789	192,075	137,197	151,998	190,415
Arkansas	321,517	116,093	63,284	135,038	87,673
California	3,449,607	1,142,810	824,759	935,884	1,197,499
Colorado	516,354	151,835	108,933	120,687	207,207
Connecticut	377,347	163,244	57,104	110,275	117,624
Delaware	86,347	35,459	17,188	24,040	24,724
District of Columbia	63,796	22,277	10,479	20,129	23,846
Florida	1,873,040	812,894	322,126	568,058	565,680
Georgia	981,849	312,951	217,642	320,471	338,177
Hawaii	106,510	42,776	20,960	28,168	34,935
Idaho	139,711	42,266	34,688	40,802	45,208
Illinois	1,419,684	524,782	285,003	393,636	485,591
Indiana	712,787	253,035	143,807	223,577	229,643
Iowa	339,104	129,042	59,674	98,748	113,062
Kansas	317,441	107,137	66,845	88,954	111,618
Kentucky	508,743	181,872	86,752	231,471	135,921
Louisiana	507,114	181,621	99,090	182,180	162,801
Maine	148,013	61,781	20,532	58,574	38,744
Maryland	537,967	208,134	99,905	145,679	184,334
Massachusetts	741,928	323,840	109,118	244,711	221,577
Michigan	1,202,113	440,249	215,052	389,856	398,493
Minnesota	556,785	214,281	99,611	144,055	187,027
Mississippi	353,120	124,506	71,626	154,389	100,831
Missouri	701,040	255,811	135,937	244,995	216,963
Montana	92,708	31,570	14,247	28,068	34,747
Nebraska	196,679	70,503	40,931	53,985	65,258
Nevada	215,542	74,561	49,013	51,072	74,722
New Hampshire	125,554	53,229	16,362	39,855	39,101
New Jersey	936,191	411,273	162,869	255,984	294,202
New Mexico	198,204	61,175	44,044	56,917	70,460
New York	2,163,973	865,699	378,562	671,691	690,941
North Carolina	1,012,686	351,891	202,168	348,207	331,770
North Dakota	70,825	29,499	10,042	19,996	24,987
Ohio	1,386,873	513,702	257,221	461,584	430,360
Oklahoma	394,757	130,716	86,173	141,928	121,395
Oregon	410,161	135,178	75,957	121,374	148,374
Pennsylvania	1,497,596	660,692	218,077	507,001	436,184
Rhode Island	118,307	49,883	18,342	39,969	34,504
South Carolina	494,608	182,106	93,117	178,319	153,592
South Dakota	90,755	34,946	15,973	25,094	30,403
Tennessee	720,796	260,709	137,757	284,718	215,013
Texas	2,367,527	699,008	627,532	648,291	835,971
Utah	207,779	51,903	69,590	48,238	68,435
Vermont	66,175	24,745	8,503	23,844	21,700
Virginia	749,149	282,311	134,774	240,044	249,841
Washington	676,950	215,763	133,387	207,824	236,336
West Virginia	218,394	81,244	33,005	103,611	55,246
Wisconsin	634,390	240,972	109,363	178,593	214,240
Wyoming	46,412	16,578	8,469	13,363	16,042
All States	32,264,882	11,797,504	6,374,965	10,051,325	10,510,569

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

^{2/}The greater of 60 percent of State median income estimates or 150 percent of the poverty guidelines.

^{3/}The two year ACS average estimate of the total number of all U.S. households is 111,343,274.

^{4/}A household can be counted under more than one vulnerability category.

^{5/}A person with a disability is defined as anyone 16 years or older who reported having difficulty working due to a "physical, mental, or emotional condition lasting 6 months or more," as reported on the ACS. The definition also includes 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.

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Table B-6. Average of 2005 and 2006 State-level estimates of the number of LIHEAP income eligible households using State LIHEAP income standards by vulnerability category^{1/ 2/}

(Two-Year Average of the ACS 2005-2006)

State	State Income Guidelines for 4-Person Household as % of HHS Poverty Guidelines	Total number of LIHEAP eligible households ^{3/}	LIHEAP eligible households by vulnerability category ^{4/}			LIHEAP eligible households with no vulnerable members
			At least one person 60+	At least one child less than 6 yrs. old	At least one person with a disability ^{5/}	
Alabama	125	383,276	129,582	78,365	157,649	112,613
Alaska	150	33,859	7,888	8,606	10,512	12,610
Arizona	150	432,348	137,795	110,223	119,259	141,227
Arkansas	125	233,380	80,196	50,045	100,676	60,095
California	^{6/} 210	3,448,137	1,142,306	823,417	935,252	1,197,499
Colorado	185	402,657	117,325	90,412	100,451	153,095
Connecticut	^{6/} 267	377,347	163,244	57,104	110,275	117,624
Delaware	200	72,825	28,843	15,211	21,446	20,479
District of Columbia	150	54,055	17,973	9,733	18,141	19,590
Florida	150	1,394,046	589,296	252,126	445,562	407,298
Georgia	150	715,252	225,797	166,190	249,734	231,140
Hawaii	150	63,003	24,396	12,211	18,744	20,237
Idaho	150	113,571	33,965	28,915	34,950	34,987
Illinois	150	854,751	288,756	187,105	255,831	284,964
Indiana	150	459,536	150,177	99,312	157,616	143,209
Iowa	150	227,417	82,037	42,765	72,798	73,024
Kansas	130	170,951	53,063	38,101	53,609	57,678
Kentucky	110	295,061	87,847	55,829	141,087	78,215
Louisiana	^{6/} 157	506,610	181,370	98,605	182,022	162,801
Maine	^{7/} 150	118,993	53,489	16,473	50,155	27,450
Maryland	150	260,469	101,299	47,310	85,436	79,847
Massachusetts	^{8/} 200	549,458	241,087	80,277	197,938	153,293
Michigan	110	506,621	139,050	106,343	178,246	173,424
Minnesota	150	297,787	111,903	57,143	92,491	88,731
Mississippi	150	345,874	121,229	71,199	151,533	98,309
Missouri	125	383,508	124,095	81,771	147,303	112,777
Montana	150	81,132	27,260	12,500	25,130	30,060
Nebraska	116	90,472	28,811	20,943	28,357	27,872
Nevada	150	145,855	48,103	35,557	37,090	48,178
New Hampshire	185	84,119	35,590	11,372	30,103	22,990
New Jersey	175	545,128	237,745	99,793	169,739	157,613
New Mexico	150	191,180	58,242	43,500	54,946	67,317
New York	^{6/ 9/} 215	2,163,973	865,699	378,562	671,691	690,941
North Carolina	110	519,846	155,957	113,073	189,945	169,666
North Dakota	135	47,991	20,193	6,397	15,299	16,192
Ohio	175	1,112,844	390,859	218,885	388,384	338,247
Oklahoma	110	234,092	65,246	55,340	87,775	72,507
Oregon	^{6/} 191	409,997	135,178	75,792	121,221	148,374
Pennsylvania	150	939,294	385,684	148,470	350,707	261,238
Rhode Island	^{6/} 220	118,307	49,883	18,342	39,969	34,504
South Carolina	150	398,102	142,619	78,270	150,427	119,110
South Dakota	160	73,661	29,167	13,019	21,454	23,280
Tennessee	125	463,958	157,563	93,892	198,935	129,413
Texas	125	1,547,459	427,479	443,883	444,179	523,698
Utah	125	100,183	22,484	33,472	26,758	32,121
Vermont	125	32,690	11,036	4,637	13,284	9,647
Virginia	130	375,117	142,636	64,296	137,185	117,343
Washington	125	327,571	91,923	66,309	119,465	107,428
West Virginia	130	180,014	59,915	29,801	85,594	47,266
Wisconsin	150	376,718	135,380	67,470	121,267	120,865
Wyoming	^{6/} 174	46,412	16,578	8,469	13,363	16,042
All States	Not applicable	23,306,895	8,175,225	4,826,822	7,630,968	7,394,113

^{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. The State maximum LIHEAP income standards for a family of four were obtained from ACF's LIHEAP grantee survey.

^{3/}The two year ACS average estimate of the total number of all U.S. households is 111,343,274.

^{4/}A household can be counted under more than one vulnerability category.

^{5/}A person with a disability is defined as anyone 16 years or older who reported having difficulty working due to a "physical, mental, or emotional condition lasting 6 months or more," as reported on the ACS. The definition also includes 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.

^{6/}These States use a percent of State median income. The figures reported are the conversion to a percent of the HHS poverty guidelines.

^{7/}170 percent of the HHS Poverty Guidelines if a household member is susceptible to hypothermia (elderly over 60 or children under 2).

^{8/}150 percent of the HHS Poverty Guidelines whenever 200 percent of the HHS Poverty Guidelines exceeds 60 percent of the State median income.

^{9/}150 percent of the HHS Poverty Guidelines for a family size of 11 or more.

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Table B-7. Average of 2005 and 2006 State-level estimates of the number of LIHEAP income eligible households using the Federal maximum LIHEAP income standard classified by HHS poverty guidelines^{1/2/}

(Two-Year Average of the ACS 2005-2006)

State	Total number of LIHEAP eligible households ^{3/}	Number of LIHEAP eligible households by intervals of HHS Poverty Guidelines			
		At or below poverty guidelines	>100% - 125% poverty guidelines	>125% - 150% poverty guidelines	Over 150% poverty guidelines
Alabama	578,399	283,091	100,185	100,567	94,556
Alaska	59,798	18,421	6,435	9,004	25,939
Arizona	571,789	236,967	94,614	100,767	139,441
Arkansas	321,517	167,861	65,520	69,120	19,018
California	3,449,607	1,165,440	570,348	511,695	1,202,125
Colorado	516,354	173,551	66,967	64,081	211,755
Connecticut	377,347	100,708	37,963	39,408	199,269
Delaware	86,347	26,021	10,459	11,457	38,411
District of Columbia	63,796	38,663	7,708	7,684	9,742
Florida	1,873,040	760,195	305,993	327,859	478,994
Georgia	981,849	422,741	147,196	145,315	266,598
Hawaii	106,510	38,579	12,389	12,036	43,507
Idaho	139,711	58,861	26,761	27,949	26,141
Illinois	1,419,684	495,990	172,071	186,691	564,933
Indiana	712,787	254,668	97,550	107,318	253,252
Iowa	339,104	118,853	50,126	58,438	111,688
Kansas	317,441	110,085	48,136	48,946	110,275
Kentucky	508,743	256,803	89,749	85,987	76,204
Louisiana	507,114	279,778	90,613	83,452	53,272
Maine	148,013	57,218	26,119	24,573	40,104
Maryland	537,967	143,416	57,024	60,030	277,498
Massachusetts	741,928	238,972	83,293	80,949	338,715
Michigan	1,202,113	440,880	153,747	160,322	447,165
Minnesota	556,785	160,125	66,401	71,261	258,998
Mississippi	353,120	206,223	74,314	65,337	7,246
Missouri	701,040	276,413	107,096	105,327	212,205
Montana	92,708	43,849	18,020	19,263	11,577
Nebraska	196,679	71,951	28,904	31,357	64,468
Nevada	215,542	80,652	30,807	34,396	69,688
New Hampshire	125,554	33,960	13,603	14,024	63,967
New Jersey	936,191	246,421	93,350	102,708	493,712
New Mexico	198,204	112,058	39,770	39,353	7,024
New York	2,163,973	885,755	272,498	289,481	716,240
North Carolina	1,012,686	451,018	167,449	170,982	223,238
North Dakota	70,825	28,174	12,096	15,838	14,718
Ohio	1,386,873	524,221	186,558	203,515	472,580
Oklahoma	394,757	204,032	74,495	74,637	41,594
Oregon	410,161	157,935	64,030	66,061	122,136
Pennsylvania	1,497,596	521,361	202,395	215,539	558,302
Rhode Island	118,307	41,476	16,519	16,419	43,894
South Carolina	494,608	226,233	88,064	83,805	96,506
South Dakota	90,755	38,279	13,730	15,305	23,442
Tennessee	720,796	341,953	122,005	122,941	133,897
Texas	2,367,527	1,151,427	396,032	405,903	414,165
Utah	207,779	70,593	29,590	36,739	70,857
Vermont	66,175	23,966	8,724	11,473	22,012
Virginia	749,149	255,244	94,823	95,623	303,460
Washington	676,950	239,895	87,676	93,046	256,334
West Virginia	218,394	121,700	46,249	44,166	6,280
Wisconsin	634,390	195,594	86,686	94,439	257,672
Wyoming	46,412	16,914	7,340	9,286	12,873
All States	32,264,882	12,615,173	4,770,177	4,871,859	10,007,673

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

^{2/}The greater of 60 percent of State median income estimates or 150 percent of the poverty guidelines.

^{3/}The two year ACS average estimate of the total number of all U.S. households is 111,343,274.

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Table B-8. Average of 2005 and 2006 State-level estimates of the number of LIHEAP income eligible households using the State maximum LIHEAP income standards^{1/2/}

(Two-Year Average of the ACS 2005-2006)

State	State Income Guidelines for 4-Person Household as % of HHS Poverty Guidelines	Total number of LIHEAP eligible Households ²	Number of LIHEAP eligible households by HHS poverty intervals			
			At or below poverty guidelines	>100%-125% poverty guidelines	>125%-150% poverty guidelines	Over 150% poverty guidelines
Alabama	125	383,276	283,091	100,185	0	0
Alaska	150	33,859	18,421	6,435	9,004	0
Arizona	150	432,348	236,967	94,614	100,767	0
Arkansas	125	233,380	167,861	65,520	0	0
California	^{4/} 210	3,448,137	1,165,440	570,048	510,525	1,202,125
Colorado	185	402,657	173,551	66,967	64,081	98,058
Connecticut	^{4/} 267	377,347	100,708	37,963	39,408	199,269
Delaware	200	72,825	26,021	10,459	11,457	24,889
District of Columbia	150	54,055	38,663	7,708	7,684	0
Florida	150	1,394,046	760,195	305,993	327,859	0
Georgia	150	715,252	422,741	147,196	145,315	0
Hawaii	150	63,003	38,579	12,389	12,036	0
Idaho	150	113,571	58,861	26,761	27,949	0
Illinois	150	854,751	495,990	172,071	186,691	0
Indiana	150	459,536	254,668	97,550	107,318	0
Iowa	150	227,417	118,853	50,126	58,438	0
Kansas	130	170,951	110,085	48,136	12,730	0
Kentucky	110	295,061	256,803	38,258	0	0
Louisiana	^{4/} 157	506,610	279,778	90,583	82,977	53,272
Maine	^{5/} 150	118,993	57,218	26,119	24,573	11,084
Maryland	150	260,469	143,416	57,024	60,030	0
Massachusetts	^{6/} 200	549,458	238,972	83,293	80,949	146,244
Michigan	110	506,621	440,880	65,741	0	0
Minnesota	150	297,787	160,125	66,401	71,261	0
Mississippi	150	345,874	206,223	74,314	65,337	0
Missouri	125	383,508	276,413	107,096	0	0
Montana	150	81,132	43,849	18,020	19,263	0
Nebraska	116	90,472	71,951	18,522	0	0
Nevada	150	145,855	80,652	30,807	34,396	0
New Hampshire	185	84,119	33,960	13,603	14,024	22,533
New Jersey	175	545,128	246,421	93,350	102,708	102,649
New Mexico	150	191,180	112,058	39,770	39,353	0
New York	^{4/ 7/} 215	2,163,973	885,755	272,498	289,481	716,240
North Carolina	110	519,846	451,018	68,828	0	0
North Dakota	135	47,991	28,174	12,096	7,722	0
Ohio	175	1,112,844	524,221	186,558	203,515	198,551
Oklahoma	110	234,092	204,032	30,061	0	0
Oregon	^{4/} 191	409,997	157,935	64,030	65,896	122,136
Pennsylvania	150	939,294	521,361	202,395	215,539	0
Rhode Island	^{4/} 220	118,307	41,476	16,519	16,419	43,894
South Carolina	150	398,102	226,233	88,064	83,805	0
South Dakota	160	73,661	38,279	13,730	15,305	6,348
Tennessee	125	463,958	341,953	122,005	0	0
Texas	125	1,547,459	1,151,427	396,032	0	0
Utah	125	100,183	70,593	29,590	0	0
Vermont	125	32,690	23,966	8,724	0	0
Virginia	130	375,117	255,244	94,823	25,051	0
Washington	125	327,571	239,895	87,676	0	0
West Virginia	130	180,014	121,700	46,249	12,066	0
Wisconsin	150	376,718	195,594	86,686	94,439	0
Wyoming	^{4/} 174	46,412	16,914	7,340	9,286	12,873
All States	Not applicable	23,306,895	12,615,173	4,476,913	3,254,648	2,960,162

^{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. The State maximum LIHEAP income standards for a family of four were obtained from ACF's LIHEAP grantee survey.

^{3/}The two year ACS average estimate of the total number of all U.S. households is 111,343,274.

^{4/}These States use a percent of State median income. The figures reported are the conversion to a percent of the HHS poverty guidelines.

^{5/}170 percent of the HHS Poverty Guidelines if a household member is susceptible to hypothermia (elderly over 60 or children under 2).

^{6/}150 percent of the HHS Poverty Guidelines whenever 200 percent of the HHS Poverty Guidelines exceeds 60 percent of the State median income.

^{7/}150 percent of the HHS Poverty Guidelines for a family size of 11 or more.