

LIHEAP Home Energy Notebook

For Fiscal Year 2005

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Administration for Children and Families
Office of Community Services
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List of Acronyms and Abbreviations

ACF	Administration for Children and Families
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 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 Coats Human Services Act of 1998 (Public Law 105-285) reauthorized LIHEAP through FY 2005 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 2001 Residential Energy Consumption Survey (RECS). 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 space heating and cooling consumption and expenditures have been adjusted to reflect FY 2005 weather and fuel prices.

Residential energy data

In FY 2005, average energy expenditures for all households were \$1,736 and the mean individual energy burden was 6.8 percent of income.¹ Low income households had energy expenditures of \$1,480, about 15 percent lower than for all households.² The energy burden for low income households was 14.6 percent, more than twice the energy burden of all households. LIHEAP recipient households had energy expenditures of \$1,735, about 17 percent higher than for all low income households. The energy burden for LIHEAP recipients was 20.2 percent, more than 13 percentage points higher than for all households and more than 5 percentage points higher than for low income households.

Energy prices rose from FY 2004 to FY 2005, but change in weather was not a factor during this period. Residential energy expenditures rose considerably (close to 11 percent), from \$1,564 in FY 2004 to \$1,736 in FY 2005.

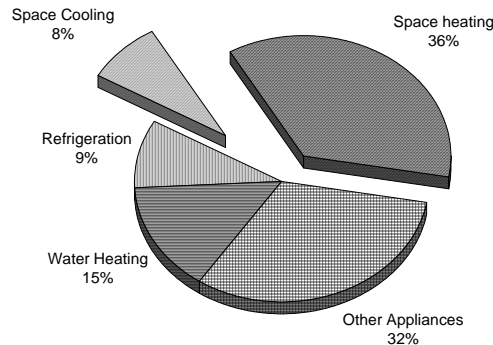
LIHEAP assists households with only that portion of residential energy costs that goes for home energy, i.e., home heating and home cooling. As shown in Figure 1, home heating and home cooling represents about 44 percent of residential energy expenditures for low income households.

¹ 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 level and 60 percent of State median income). The terms "low income" and LIHEAP eligible" are equivalent in this summary. "Non low income" refers to those households with incomes above the Federal maximum LIHEAP eligibility standard.

Refrigerators and freezers represent about 9 percent of residential energy expenditures, water heating represents about 15 percent of residential energy expenditures, and other appliances about 32 percent of residential energy expenditures.

Figure 1. Percent of U.S. residential energy expenditures by low income households, by end use, FY 2005



Home heating data

The three most common heating fuels in 2001 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 are only small differences in main heating fuel choice by income group.

For all households, average home heating expenditures were \$592 and the mean individual home heating burden was 2.5 percent. Low income households had home heating expenditures of \$534, about 10 percent lower than for all households. The mean individual home heating burden for low income households was 5.5 percent, more than twice as much as the home heating burden for all households. Home heating expenditures for LIHEAP recipient households were \$754, about 41 percent higher than the average for low income households and 27 percent higher than the average for all households. Mean individual home heating burden for LIHEAP recipient households was 9.4 percent, almost 7 percentage points higher than the average for all households and nearly 4 percentage points higher than the average for low income households. In part, LIHEAP heating assistance recipients have higher home energy expenditures because they live in colder climates than the average low income household. In addition, states are required to target households with high home energy bills.

Home cooling data

About 88 percent of households cool their homes. Low income and LIHEAP recipient households are less likely to cool their homes than are non low income households; 82 percent of low income households and 83 percent of LIHEAP cooling recipient households cool their homes.

For all households, average home cooling expenditures were \$209 and the mean individual home cooling burden was 0.7 percent. Low income households had home cooling expenditures of \$153, about 27 percent lower than for all households. The mean individual home cooling burden for low income households was 1.5 percent, more than twice as much as the home cooling burden for all households. Home cooling expenditures for LIHEAP recipient households were \$123, which was almost 20 percent lower than the average for low income households and over 41 percent lower than the average for all households. The mean individual home cooling burden for LIHEAP recipient

households was 1.3 percent, almost twice as high as the average for all households. LIHEAP cooling recipient households experienced over 19 percent fewer cooling degree days in FY 2005 than did low income households, accounting for their lower home cooling expenditures.

Figure 2. Mean home heating and home cooling expenditures by all households, non low income households, low income households, and LIHEAP recipient households, FY 2005

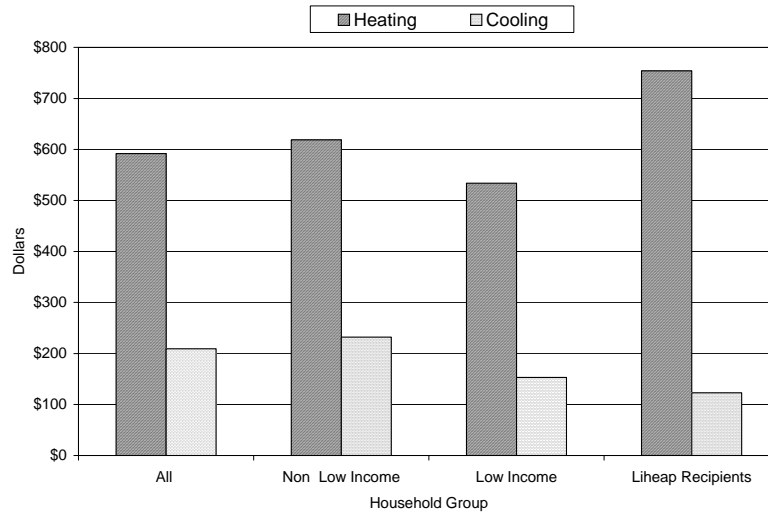
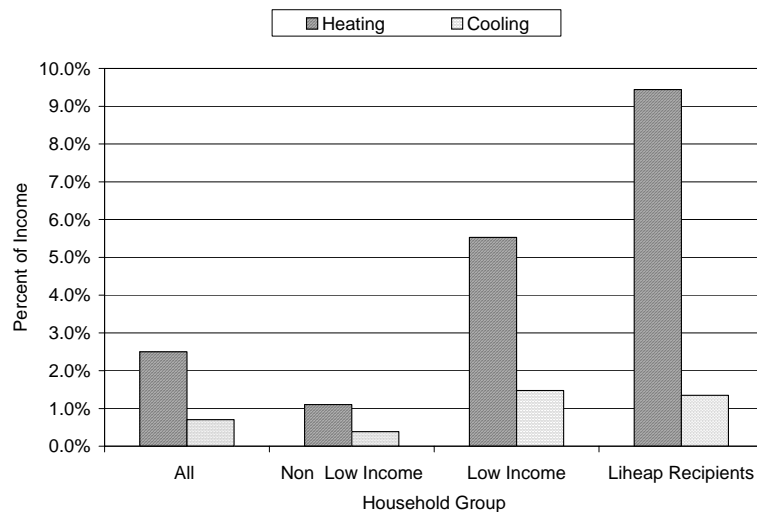


Figure 3. Mean individual burden of heating and cooling expenditures for all households, non low income households, low income households, and LIHEAP recipient households, FY 2005



Low income home energy trends

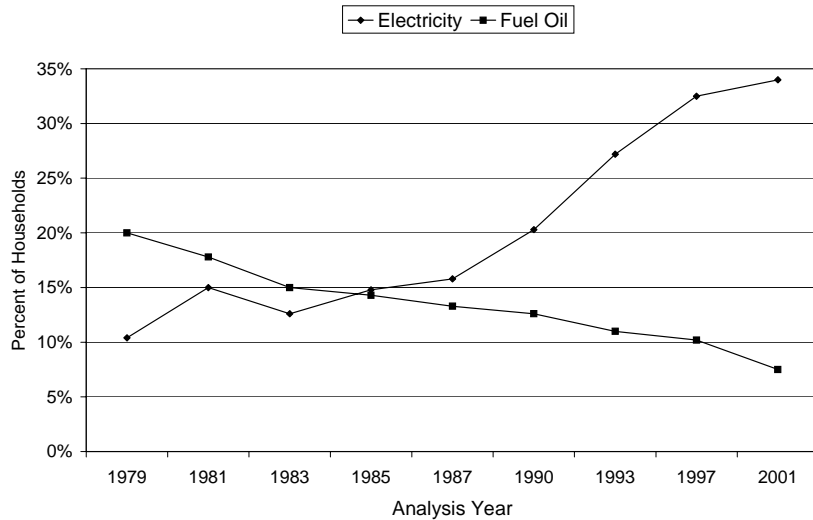
The section presents data on home energy trends for low income households from 1979 through FY 2005.³ Statistics are derived from the series of national residential energy consumption surveys and from HHS' administrative statistics. The analyses show significant shifts since 1979 in the types of energy and the amount of energy used by low income households.

³Here, low income households are defined as those households with incomes at or below 150 percent of poverty.

Home heating and cooling trends

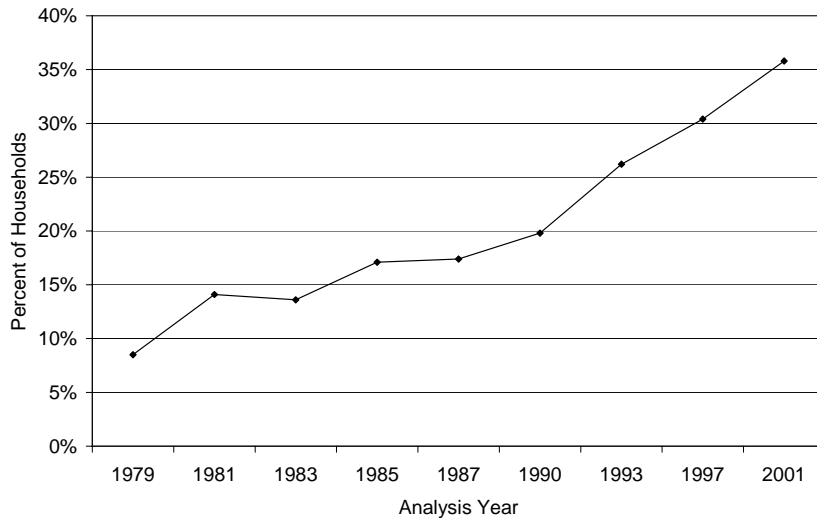
Figure 4 demonstrates that low income households increased their use of electricity as their main heating fuel from 10 percent in 1979 to 34 percent in 2001. In contrast, households using fuel oil as their main heating fuel declined from 20 percent in 1979 to 8 percent in 2001. Natural gas remained the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

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. Low income households increased their use of central air-conditioning 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 6.⁴ This suggests a significant increase in efficiency that resulted 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 2005, the use of energy for home heating and 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 2005

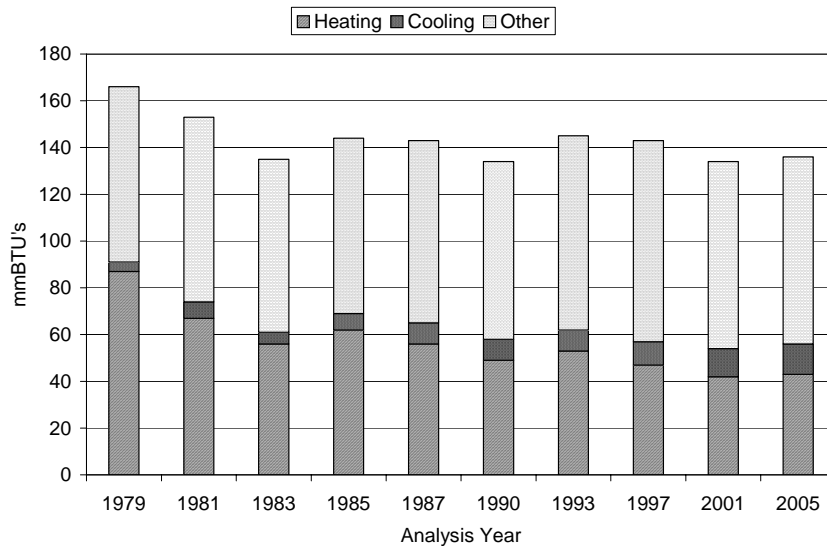
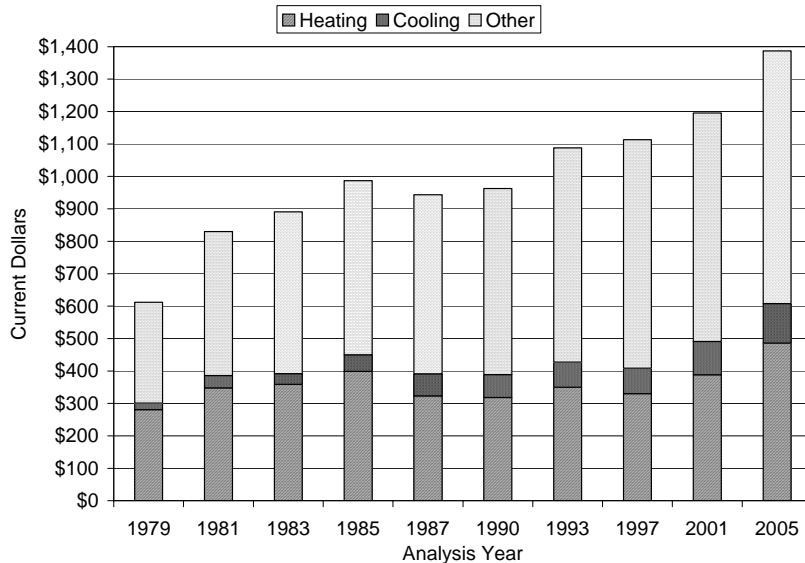


Figure 7. Mean residential energy expenditures for low income households, 1979 to FY 2005

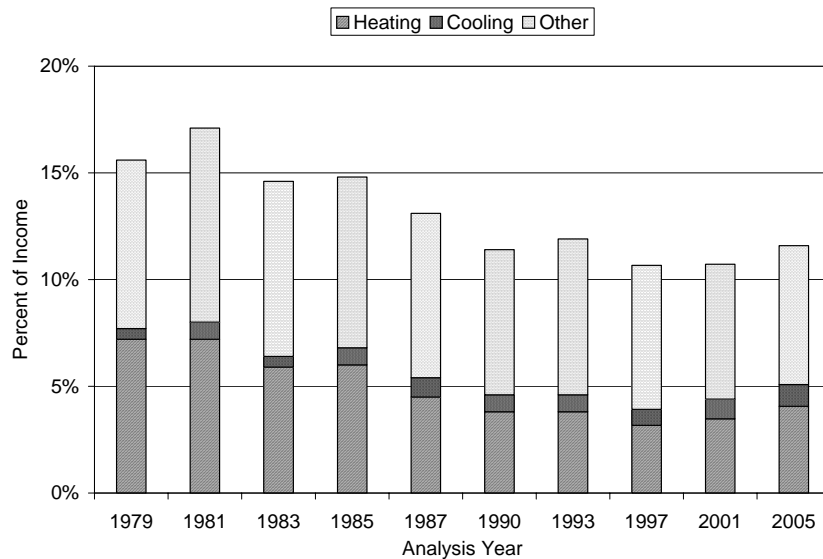


⁴The mean is the sum of all values divided by the number of values. The mean is also referred to as the average.

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. In FY 2005, expenditures for home heating rose by 11 percent, again due to higher fuel prices. Expenditures on uses other than home heating or home cooling rose continuously from 1979 to FY 2005. Expenditures on cooling rose from 1979 to 2001, and rose again by over 18 percent from 2001 to FY 2005.

As Figure 8 shows, mean group home energy burden declined from 7.7 percent in 1979 to 5.1 percent in FY 2005, a total of 2.6 percentage points. The decline in residential energy burden from 1979 to FY 2005 was 5.0 percentage points (from 15.6 percent to 11.6 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).

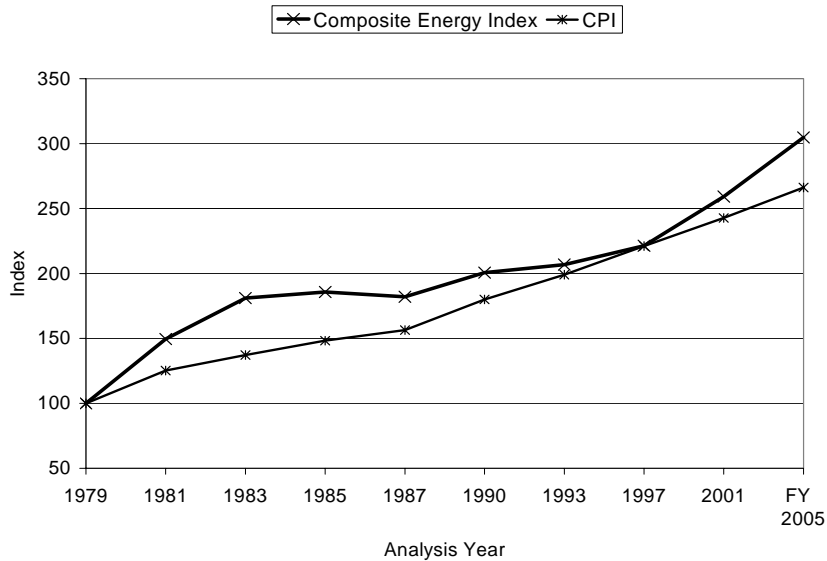
Figure 8. Mean group residential energy burden by end use for households with incomes at or below 150 percent of the poverty income guidelines, 1979 to FY 2005



Analysis of energy price and energy efficiency trends

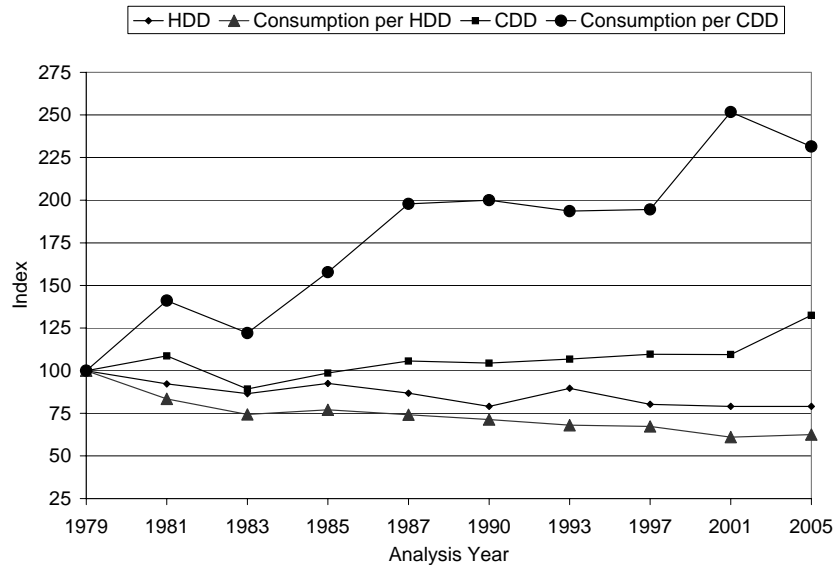
Trends in energy consumption and expenditure are dependent on factors such as energy prices, weather, and energy efficiency. Energy prices outpaced the Consumer Price Index (CPI) from 1979 through 1983, as shown in Figure 9 on the next page. While the CPI increased about 37 percent, the composite average of energy 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, energy 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, energy prices rose at a higher rate than did the prices of other goods. In 2001, the composite energy price index was 265 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 moderate growth in composite 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 19 percent over 1997 prices. In FY 2005, fuel prices increased again. FY 2005 prices were close to 18 percent higher than 2001 fuel prices. The increases in fuel prices from 2001 through FY 2005 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 2005



For low income households, Figure 10 shows energy consumption for heating and cooling compared to heating and cooling degree days from 1979 to FY 2005. As shown, heating consumption per heating degree day declined continuously from 1979 to FY 2004 as a result of energy conservation efforts, but increased very slightly (just over 3 percent) from FY 2004 to FY 2005. 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 households⁵, but declined over 8 percent from 2001 to FY 2005. Only 37 percent of low income households had air-conditioning equipment in 1979, but by 2001, the number had risen to 67 percent.

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 2005



⁵Air-conditioning equipment includes central air conditioners and window or wall units, ceiling fans, and evaporative coolers.

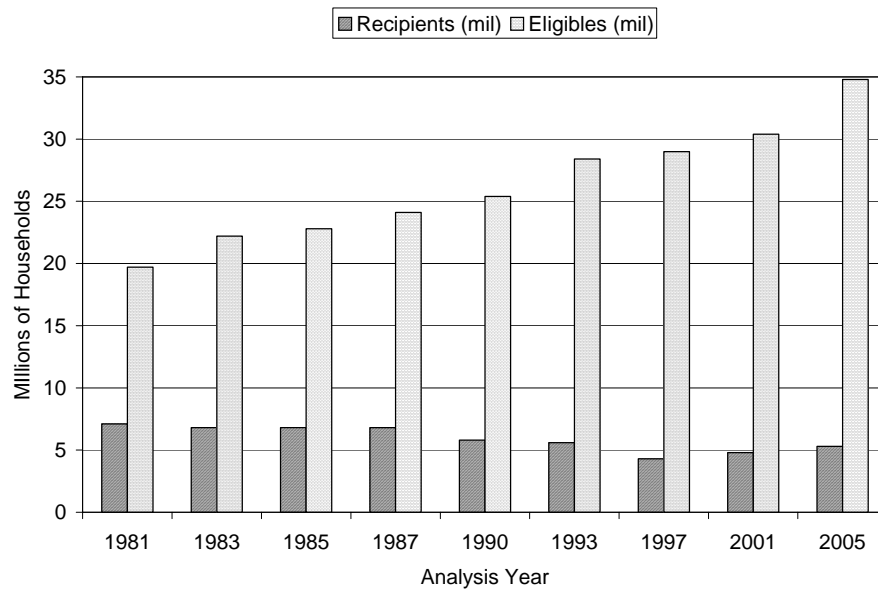
Mean group home energy burden for low income households has remained considerably higher than the burden for all households. In 1979, the mean group home energy burden of 8 percent for low income households was four times higher than the 2 percent burden for all households. In FY 2005, the mean group home energy burden for all income households was 1.3 percent, while for low income households it was just over 5 percent. Thus, in FY 2005, the mean group burden for low income households was still almost four times higher than that for all households.

Trends in LIHEAP

Between 1981 and FY 2005, as shown in Figure 11, the number of Federally income eligible households has risen 80 percent; however, Federal fuel assistance funds have declined by 6 percent. As a consequence, the percentage of Federally income eligible households assisted has declined sharply from 36 percent in 1981 to 15 percent in FY 2005. Before adjusting for inflation, average winter crisis and heating benefits per household increased until 1985, fell in 1987 and stayed in the same range through 1997, increased significantly in 2001, and then fell significantly in FY 2005. Cooling benefits per household actually fell until 1985, increased sharply in 1993 and 2001, but fell again in FY 2005. After adjusting for inflation, the mean value of combined Federal heating and winter crisis benefits per household fell from \$213 in 1981 to \$140 in FY 2005. Cooling benefits per household fell from \$129 in 1981 to \$91 in FY 2005.

The percentage of the total home heating bill for LIEAP/LIHEAP eligible households covered by LIHEAP heating and winter crisis benefits decreased from 23 percent in 1981 to 8 percent in FY 2005. The decrease resulted from the combination of a larger aggregate home heating bill and a smaller amount of assistance benefits.

Figure 11. Number of LIEAP/LIHEAP income eligible and recipient households, 1981 to FY 2005



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 always remained 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 2005, 15 percent of Federally 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 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.
- Increase the ratio of LIHEAP households assisted (heating, cooling, crisis, and weatherization assistance) per \$100 of LIHEAP administrative costs.

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

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.⁶
- 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.⁷

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

The *Final FY 2006 Annual Performance Plan and FY 2004 Annual Performance Report* furnished measurements of targeting performance. The performance report showed the LIHEAP program target and performance result for FY 2004.

The ACS as a LIHEAP data tool

Every ten years, the Decennial Census furnishes data on the characteristics of population and housing the United States. The last Decennial Census was conducted in 2000. The next one will be conducted in 2010. Data from the Decennial Census are derived either from questions asked of the population (100-percent or short-form questionnaire) or from questions asked of a sample of the population (sample or long-form questionnaire). Approximately 18.3 million housing units were sampled with the long-form questionnaire in the 2000 Decennial Census. Beginning with the 2010 Decennial Census, the Census Bureau's American Community Survey (ACS) will replace the Decennial Census long form, and provide annual updates on the characteristics of population and housing in the United States.

⁶ *LIHEAP Targeting Performance Measurement Statistics: GPRA Validation of Estimation Procedures*, August 2004, Report prepared by APPRISE Incorporated under PSC Order No. 043Y00471301D.

⁷ *LIHEAP Energy Burden Evaluation Study*, March 2005, Report prepared by APPRISE Incorporated under PSC Order No. 043Y00471301D.

ACF has provided to LIHEAP grantees special tabulations of 2000 Decennial Census data concerning State-level data on low income households.⁸ However, in the past, the special tabulations were only updated once every ten years. The new ACS furnishes annual updates of data that can give grantees more current information. Section V of the Notebook furnishes information on the type of the information that is available, the geographic levels for which data can be developed, and the tools that are available for developing information from the ACS. LIHEAP program managers can obtain data for all households and subgroups of households directly from published ACS data. However, a LIHEAP program manager must develop special tabulations from the Public Use Microdata Sample (PUMS) data to obtain statistics for LIHEAP income eligible households.

American Community Survey

The ACS is an annual national survey of households and housing units. The ACS was implemented to its full sample size and design in 2005. The annual sample size is about 3 million addresses. The ACS includes information on the individuals in a household, as well as housing unit information. The ACS questions for individuals include: sex, age, race and ethnicity, marital status, education, disability status, employment, and income. The ACS questions for housing units include: type of housing unit, size of housing unit, age of housing unit, condition of housing unit, main heating fuel, residential energy costs, rental or mortgage costs, and other housing costs.

Published ACS Data

The Census Bureau publishes ACS data in three forms: Fact Sheets, Population Profiles, and Base Tables. Each of these publication forms delivers a different set of information to Census data users.

- Fact Sheets – These tables furnish a standard set of population and housing characteristics for 2005. The data are available for the nation and for individual states. Within States, the data are available for sub-State areas that have a population of at least 65,000 households.
- Population Profiles - These tables furnish demographic and housing characteristics for special population groups, including: various racial, ethnic, and ancestry groups, individuals 65 and over, and people at certain poverty levels.
- Base Tables – These tables are accessible through the Census Bureau website and allow the user to obtain a pre-defined data table for any available geographic level.

These data sources furnish LIHEAP program managers up-to-date information on the demographics of households in their jurisdictions.

ACS PUMS Files

In addition to published tables, the Census Bureau makes available PUMS files that contain the records for a sample of all housing units that responded to the survey.⁹ These files can be used to develop specialized tabulations for the population of a State or a Public Use Microdata Area (a geographic area with about 50,000 households). In addition, the data files can be used to develop information for a specialized subgroup. For example, using the PUMS files, one can identify all of the households that have incomes at or below the LIHEAP income standard and develop statistics for those households.

⁸ LIHEAP grantees received in June 2005 ACF's *2000 Decennial Census Tabulations of Households Estimated to be Income Eligible for LIHEAP*.

⁹ The PUMS files are microdata files. A computer program is needed to process the data and compute statistics.

To demonstrate how PUMS data analysis can expand on the ACS data available through the Census website, Section V of the Notebook presents statistics were developed from the ACS for New Jersey for 2005. Section V includes the following statistics for New Jersey for 2005:

- Income eligible population – The number of households income eligible for LIHEAP
- Main heating fuel – The distribution of income eligible households by main heating fuel
- Residential energy bills – The distribution of total residential energy bills for income eligible households
- Residential energy burden – The distribution of residential energy burden for income eligible households
- Vulnerable households – The number and percent of income eligible households by vulnerable group
- Linguistic isolation – The number and percent of income eligible households by linguistic isolation group
- Sub-State information – The number of income eligible households for important sub-State areas

These tables demonstrate how a State LIHEAP program manager could get updates on key information regarding the eligible population.

I. Introduction

The Administration for Children and Families (ACF) within the U.S. Department of Health and Human Services 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 Coats Human Services Act of 1998 (Public Law 105-285) reauthorized LIHEAP through FY 2005 without substantive changes.

For LIHEAP grantees to reassess their LIHEAP benefit structures, they need performance statistics on LIHEAP applicant 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 2005 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 CPS ASEC data files.
- National and state-level data on residential energy prices from the Energy Information Administration (EIA) 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 the Office of Energy Markets and End Use (EMEUE) of the Energy Information Administration (EIA).

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 2005. 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 2005. 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.
- Section V – A LIHEAP special study. This section summarizes the findings from a special study of how the American Community Survey can be used to furnish updated information on population and housing characteristics to LIHEAP program managers.
- Appendix A documents the procedures used to prepare the FY 2005 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 2004, 2005, and 2006 state-level estimates of the number of LIHEAP income eligible households by vulnerability group and by income group.

II. Home Energy Data

Section II presents home energy consumption and expenditure data. The primary information source for this section is the Department of Energy'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 2005 weather and fuel prices, as described in Appendix A.

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 household energy consumption, expenditures, and burden by fuel type for all, non low income, low income, and LIHEAP recipient households.¹⁰ In FY 2005, average residential energy consumption for all households was 94.1 mmBTUs and average expenditures were \$1,736. The mean individual energy burden for all households was 6.8 percent of income.

Low income households had average energy consumption of 81.6 mmBTUs (14 percent less than all households) and average energy expenditures of \$1,480 (almost 15 percent less than all households). Mean individual energy burden for low income households was 14.6 percent, more than twice the average for all households and more than four times the average for non low income households.

Average energy expenditures for LIHEAP recipient households were \$1,735, about 17 percent higher than the average for all low income households. Mean individual energy burden was 20.2 percent, over 5 percentage points higher than the average for low income households.

Nationally, all households increased their average residential energy expenditures by almost 11 percent, from \$1,564 in FY 2004 to \$1,736 in FY 2005. Low income households increased their average residential energy expenditures by just under 11 percent, from \$1,335 in FY 2004 to \$1,480 in FY 2005. LIHEAP recipient households increased their average residential energy expenditures by over 12 percent, from \$1,545 in FY 2004 to \$1,735 in FY 2005. The rises in expenditures resulted from the combination of increased consumption (due to warmer summer weather) and higher fuel prices in FY 2005 as compared to FY 2004.

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, on the second following page, 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 2005, home heating was 36 percent of the residential energy bill for low income households and home cooling was 8 percent.

¹⁰Comparisons 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 level 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 level or 60 percent of State median income. LIHEAP households represent those low income households that received Federal fuel assistance.

LIHEAP Home Energy Notebook for FY 2005: 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 2005^{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	94.1	\$1,736	6.8%	3.7%	2.9%
Natural gas	110.6	\$1,829	6.9%	3.7%	3.0%
Electricity	58.2	\$1,393	5.9%	3.2%	2.3%
Fuel oil	124.8	\$2,345	8.1%	4.5%	3.9%
Kerosene	76.8	\$1,593	15.9%	9.7%	2.6%
LPG ^{6/}	98.9	\$2,054	8.5%	5.6%	3.4%
<i>Non low income households</i>					
All fuels	100.0	\$1,854	3.2%	2.8%	2.3%
Natural gas	115.8	\$1,934	3.2%	2.8%	2.4%
Electricity	64.1	\$1,542	2.8%	2.5%	1.9%
Fuel oil	129.3	\$2,419	4.0%	3.7%	3.0%
Kerosene	89.3	\$1,783	3.9%	3.4%	2.2%
LPG ^{6/}	103.9	\$2,159	4.5%	4.2%	2.7%
<i>Low income households</i>					
All fuels	81.6	\$1,480	14.6%	8.6%	9.1%
Natural gas	98.6	\$1,591	15.4%	9.2%	9.8%
Electricity	46.3	\$1,095	12.2%	6.8%	6.8%
Fuel oil	113.3	\$2,155	18.6%	11.3%	13.3%
Kerosene	71.5	\$1,512	21.1%	13.8%	9.3%
LPG ^{6/}	89.9	\$1,866	15.7%	10.9%	11.5%
<i>LIHEAP recipient households</i>					
All fuels	101.2	\$1,735	20.2%	13.7%	12.8%
Natural gas	120.0	\$1,786	21.1%	13.8%	13.2%
Electricity	54.5	\$1,319	16.0%	10.8%	9.7%
Fuel oil	137.0	\$2,451	24.0%	18.5%	18.1%
Kerosene	88.1	\$1,860	27.3%	15.8%	13.7%
LPG ^{6/}	86.4	\$1,819	22.5%	13.5%	13.4%

^{1/}Data are derived from the 2001 RECS, adjusted to reflect FY 2005 heating degree days, cooling degree days, and fuel prices. Data represent residential energy used from October 2004 through September 2005.

^{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 2005 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 2005 adjusted RECS data.

^{5/}Mean group energy burden has been calculated by first calculating average residential energy expenditures from the 2001 RECS for each group of households and dividing the adjusted figures for FY 2005 by the average income for each group of households from the 2005 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 annual residential expenditures for space heating and a lower proportion for space cooling than other groups. LIHEAP recipient households spent 43 percent of their annual residential expenditures for space heating, 7 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. LIHEAP recipients are more likely than are other households to live in colder climates.

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 2005

End Use	All households	Non low income households	Low income households	LIHEAP recipient households
Space heating	34%	33%	36%	43%
Space cooling	11%	11%	8%	6%
Water heating	14%	14%	15%	14%
Refrigeration	9%	8%	9%	8%
Appliances	33%	33%	32%	29%
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 more than half of the households in each income group use natural gas as their main heating fuel. Non low income households use natural gas at the highest rate, 56.3 percent. Almost 30 percent of households in each group, except LIHEAP recipient households, use electricity as their main heating fuel. Low income households use electricity at the highest rate, 30.7 percent, and LIHEAP recipient households use electricity at the lowest rate, 21.3 percent. LIHEAP recipient households tend to use bulk fuels more frequently than do 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-2, 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 2001.¹¹ 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 the 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 2005, average home heating consumption for all households was 44.2 mmBTUs, average expenditures were \$592, and mean individual home heating burden was 2.5 percent.

Low income households had average home heating consumption of 39.8 mmBTUs (10 percent less than the average for all households) and average home heating expenditures of \$534 (just under 10 percent less than the average for all households). The mean individual home heating burden for low income households was 5.5 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 57.6 mmBTUs (over 30 percent higher than the average for all households), and average home heating expenditures were \$754 (more than 27 percent higher than the average for all households). Mean individual home heating burden for LIHEAP households was 9.4 percent, 3.9 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 over 44 percent greater than average home heating consumption for all low income households because LIHEAP heating assistance recipient households are more likely to live in colder climate regions. RECS data adjusted for FY 2005 weather show that LIHEAP heating assistance recipient households experienced over 21 percent more heating degree days than did low income households.

For FY 2005, the heating season was 6.1 percent warmer than the 30-year norm and virtually the same as that experienced in FY 2004. Between FY 2004 and FY 2005, home heating consumption remained unchanged for all households and low income households, but increased by under 1 percent for LIHEAP recipient households.

Compared to FY 2004, the FY 2005 prices for natural gas increased by 13.6 percent, fuel oil prices increased by 36.5 percent, and electricity prices increased by 4.3 percent.¹² Though consumption remained unchanged from FY 2004 to FY 2005, 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 2004 to FY 2005 varied notably among the three major home heating fuels. Expenditures for households heating with natural gas increased by almost 15 percent. Expenditures for households heating with electricity increased by just under 5 percent. Expenditures for households heating with fuel oil increased by over 37 percent.

¹¹Findings from the 2001 RECS, Energy Information Administration, U.S. Department of Energy.

¹²Derived from: *Monthly Energy Review*, Energy Information Administration, U.S. Department of Energy, August 2006, Tables 9.8 and 9.11, for fuel oil and natural gas, respectively, and June 2006, Table 9.9, for electricity.

LIHEAP Home Energy Notebook for FY 2005: 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 2005^{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	44.2	\$592	2.5%	1.1%	1.0%
Natural gas	57.4	\$673	2.9%	0.0%	1.1%
Electricity	13.4	\$305	1.4%	0.6%	0.5%
Fuel oil	76.3	\$1,055	3.6%	2.0%	1.7%
Kerosene	43.4	\$730	7.8%	4.3%	1.2%
LPG ^{6/}	51.8	\$893	3.5%	2.3%	1.5%
<i>Non low income households</i>					
All fuels	46.5	\$619	1.1%	0.8%	0.8%
Natural gas	59.1	\$691	1.2%	1.0%	0.9%
Electricity	14.7	\$332	0.6%	0.4%	0.4%
Fuel oil	78.8	\$1,092	1.9%	1.6%	1.4%
Kerosene	52.7	\$866	7.8%	4.3%	1.1%
LPG ^{6/}	55.2	\$965	2.0%	1.7%	1.2%
<i>Low income households</i>					
All fuels	39.8	\$534	5.5%	2.6%	3.3%
Natural gas	53.5	\$632	6.6%	3.2%	3.9%
Electricity	10.7	\$252	3.0%	1.5%	1.6%
Fuel oil	70.0	\$961	8.1%	5.4%	5.9%
Kerosene	39.4	\$672	1.9%	1.6%	4.2%
LPG ^{6/}	45.6	\$764	6.2%	4.6%	4.7%
<i>LIHEAP recipient households</i>					
All fuels	57.6	\$754	9.4%	5.5%	5.6%
Natural gas	73.4	\$820	10.2%	6.3%	6.1%
Electricity	17.5	\$425	5.5%	3.1%	3.1%
Fuel oil	95.5	\$1,314	13.7%	9.8%	9.7%
Kerosene	57.9	\$954	10.3%	5.1%	7.0%
LPG ^{6/}	41.5	\$733	11.1%	5.3%	5.4%

^{1/}Data are derived from the 2001 RECS, adjusted to reflect FY 2005 heating degree days and fuel prices. Data represent residential energy used from October 2004 through September 2005.

^{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 2005 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 2005 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 2005 by the average income for each group of households from the 2005 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 cool their homes. Low income households are less likely to cool their homes than are 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 2005, average home cooling consumption for households that cooled was 7.6 mmBTUs, average expenditures were \$209, and mean individual home cooling burden was 0.7 percent.

Low income households had average home cooling energy consumption of 5.6 mmBTUs (over 26 percent less than the average for all households) and home cooling expenditures of \$153 (almost 27 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 for all households and less than four times the average home cooling burden for non low income households.

Average home cooling consumption for LIHEAP recipient households was 4.4 mmBTUs (42 percent less than all households), and home cooling expenditures were \$123 (41 percent less than all households). Mean individual home cooling burden for LIHEAP recipient households was 1.3 percent, almost two and one half times the average for all households. On average, LIHEAP recipient households consumed over 21 percent fewer BTUs for cooling than the average for all low income households. RECS data adjusted for FY 2005 weather show that LIHEAP cooling recipient households experienced approximately 19 percent fewer cooling degree days than did low income households because they are more heavily represented in the cooler climate regions.

The FY 2005 cooling season was over 18 percent warmer than the 30-year norm and almost 17 percent warmer than FY 2004. From FY 2004 to FY 2005, home cooling consumption increased by nearly 17 percent for both all households and low income households, and by over 29 percent for LIHEAP recipient households.

Nationally, all households increased their average home cooling expenditures by 21.5 percent, low income households increased their average home cooling expenditures by over 23 percent, and LIHEAP recipient households increased their average home cooling expenditures by more than 35 percent. The changes in expenditures resulted from the combination of a moderate rise in electricity prices from FY 2004 to FY 2005 and appreciably warmer 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 2005^{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	7.6	\$209	0.7%	0.3%	0.3%
Non low income households	8.4	\$232	0.4%	0.3%	0.3%
Low income households	5.6	\$153	1.5%	0.7%	0.9%
LIHEAP recipient households	4.4	\$123	1.3%	0.7%	0.9%

^{1/}Data are derived from the 2001 RECS, adjusted to reflect FY 2005 cooling degree days, and fuel prices. Data represent residential energy used from October 2004 through September 2005.

^{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 2005 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 2005 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 2005 by the average income for each group of households from the 2005 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, both energy expenditures by low income households and the energy burden on low income households have changed significantly.

In the FY 1989 annual LIHEAP report to Congress, 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 *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 furnishes the reader with definitions of these special terms. One such term is "low income," which is defined as those households with incomes at or below 150 percent of the poverty level. Because of limitations on the availability of data, this definition is more restrictive than in other parts of the *Notebook* in which low income refers to LIHEAP eligible households, that is, those households with incomes below the greater of 150 percent of poverty or 60 percent of state median income. Based on estimates from the 2005 CPS ASEC, the more restrictive definition excludes 11.4 million households of the 34.8 million households that meet the definition of LIHEAP eligible households. Therefore, differences in FY 2005 home energy data reported in this section and in other parts of this *Notebook* are the result of the difference in definition of "low income."¹³

Unless indicated otherwise, the energy data in this section are based on eight national residential energy surveys of occupied residential housing units and their fuel suppliers. Table 3-2 on page 12 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.

¹³As noted in Table 3-2, the datafiles used in this study include surveys from 1979 and 1981. The variable that designates LIHEAP eligibility was not coded for those datafiles.

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.
Constant 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 comparing the mean temperature for a day to a base temperature (65 degrees). 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 computing the mean temperature for a day to a base temperature. 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 data 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 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 eligible households that receive heating 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 2005
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	10/04 to 9/05
Income data ^{6/}	1979	1981	1983	1985	1987	1990	1993	1997	2001	2005
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 other appliances), total residential energy expenditures, and the burden that residential energy expenditures represent for low income households. In this section, data that illustrate these changes are presented.

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 2001.¹⁴ 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 2001.¹⁵ 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.

¹⁴For all households, the incidence of electric main heat grew from 15.8 percent in 1979 to 29.1 percent in 2001, and the incidence of fuel oil main heat fell from 22.1 percent to 8.3 percent.

¹⁵For all households, the incidence of 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

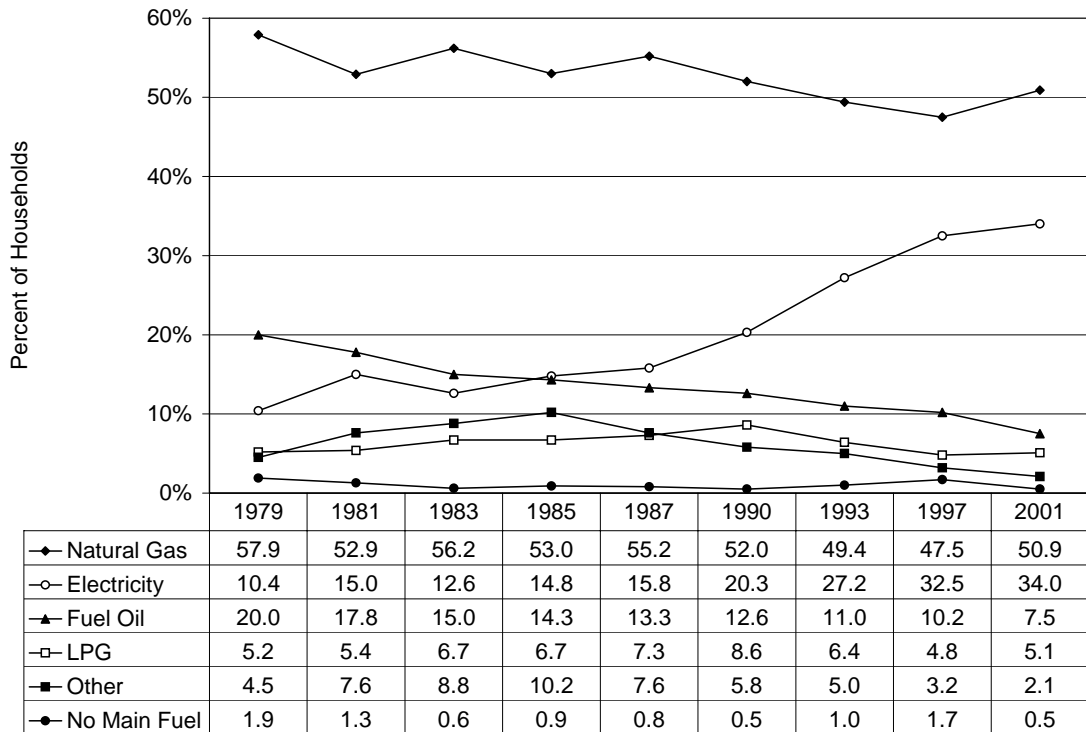
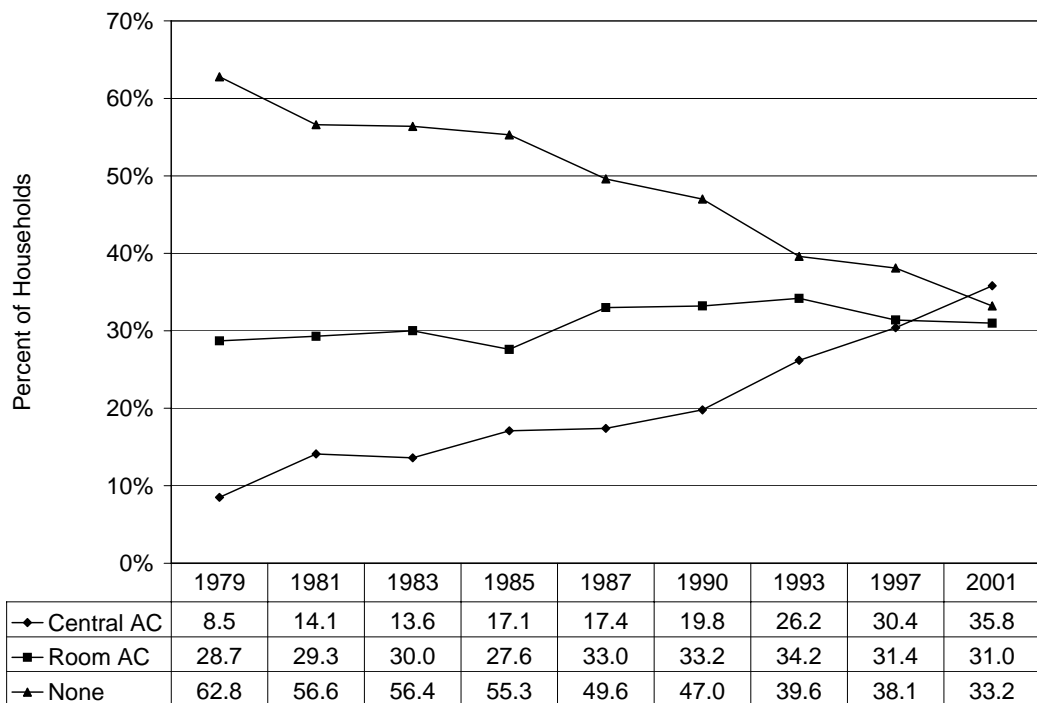


Figure 3-2. Air-conditioning type for households with incomes at or below 150 percent of the poverty income guidelines, 1979 to 2001



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 2005. Figure 3-3 shows that low income households substantially reduced their residential energy consumption between 1979 and 1983. 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.¹⁶ 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 2005, 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 2005

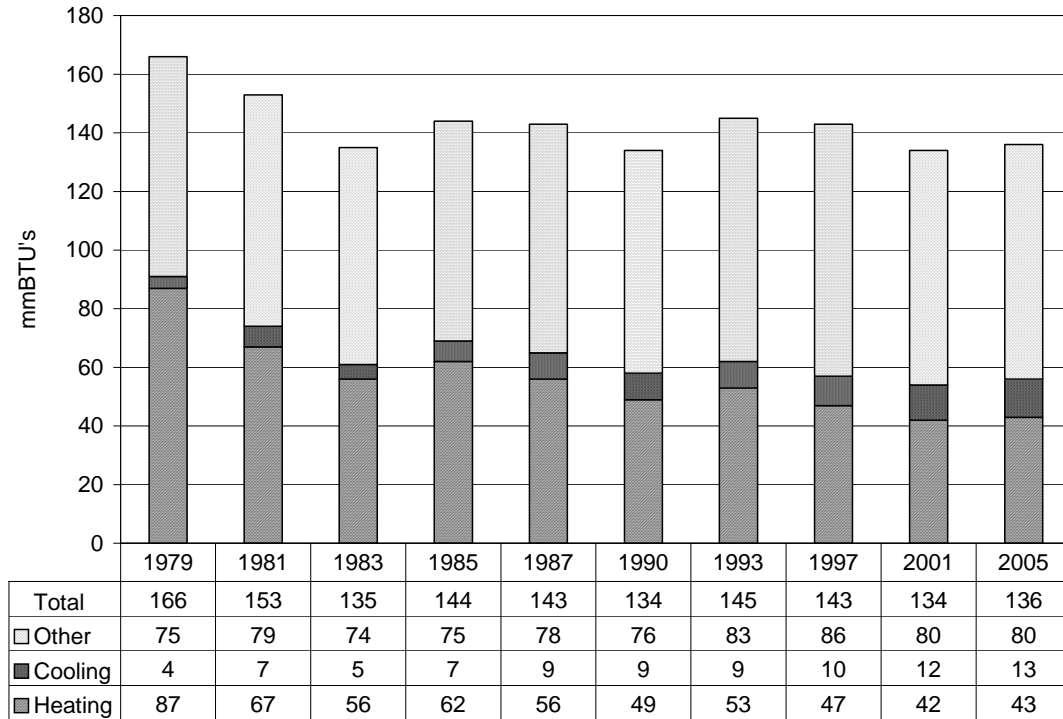
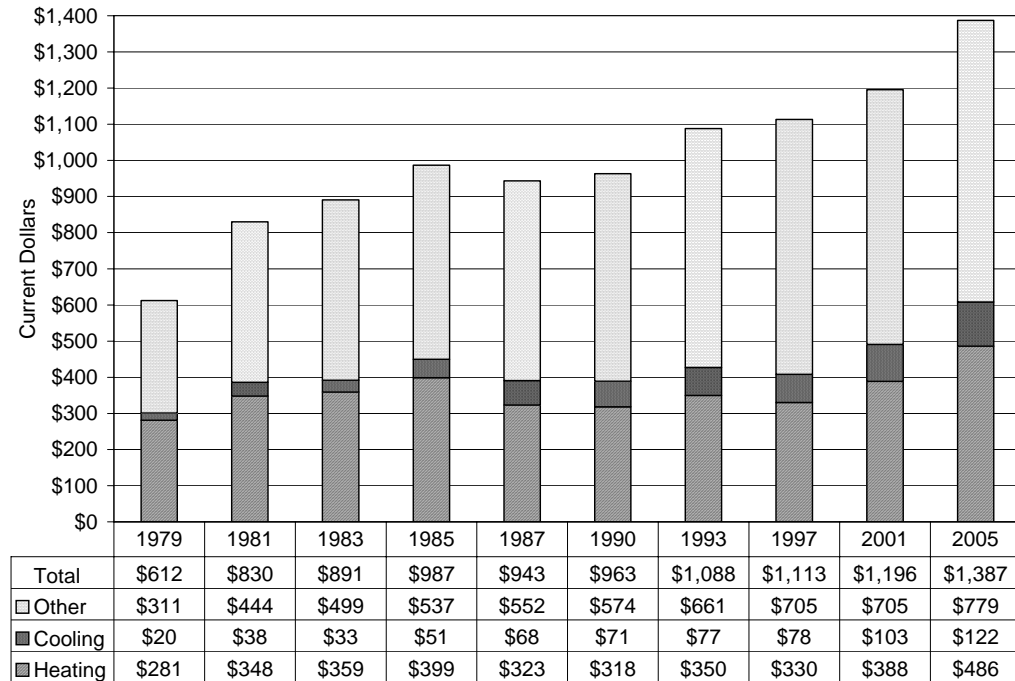


Figure 3-4, on the next page, shows that residential energy expenditures for low income households increased rapidly from 1979 to 1985, the result of fuel price increases. Examination of the components of energy expenditures indicates that the greatest increases were in home cooling and other residential 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 \$1,196 in 1997. From 1997 to 2001 residential energy expenditures increased by 7 percent to \$1,196. In FY 2005, mean residential energy expenditures rose by over 10 percent to \$1,387. Mean home heating expenditures fell from \$399 in 1985 to \$318 in 1990, then rose and fell moderately until 1997. In 2001 home heating expenditures saw an 18 percent increase over 1997. Mean home heating expenditures rose by more than 14 percent in FY 2005. The increase in expenditures in 2001 was the

¹⁶The 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.

result of higher fuel prices. The increase in expenditures in FY 2005 was the result of higher fuel prices. Mean home cooling expenditures rose continuously from \$51 in 1985 to \$103 in 2001. In FY 2005 mean home cooling expenditures were \$122.

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 2005



The next series of Figures, 3-5 through 3-7, furnishes information on energy burden for low income households.¹⁷ 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.¹⁸ 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 low income households. Energy expenditures are computed from RECS and income is derived from the CPS ASEC.
- *Mean Individual Burden:* Computed by first computing the energy burden for each individual low income household from the RECS and then taking the mean of the energy burden statistic for all low income households.
- *Median Individual Burden:* Computed by computing the energy burden for each individual low income household from RECS and finding the median, or middle point, of the distribution of household-level energy burdens.

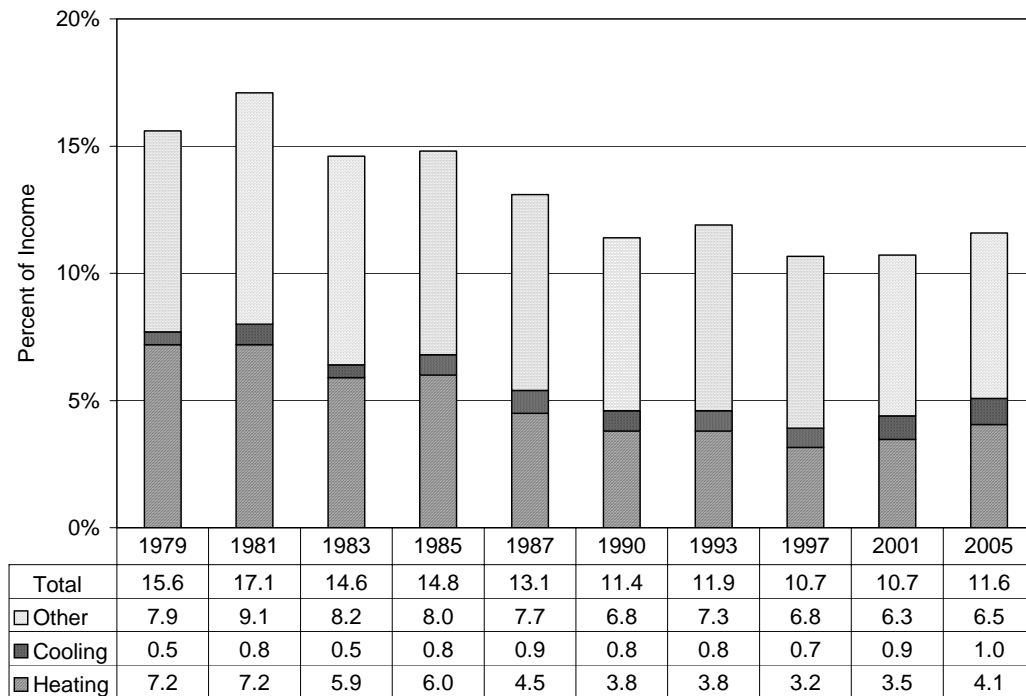
¹⁷These figures present gross burden statistics; they do not account for the reduction in burden attributable to the receipt of LIHEAP benefits. Figure 3-26 compares gross burden and net burden for LIHEAP recipient households.

¹⁸The 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.

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

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 2005, burden rose slightly to 5.1 percent because expenditures rose. Home energy burden for FY 2005 was almost 31 percent higher than in 1997, just under 16 percent higher than in 2001, but it was 36 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 2005



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, 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 2005, median individual burden was 42 percent lower, group mean burden was 36 percent lower, and individual mean burden was 24 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 2005

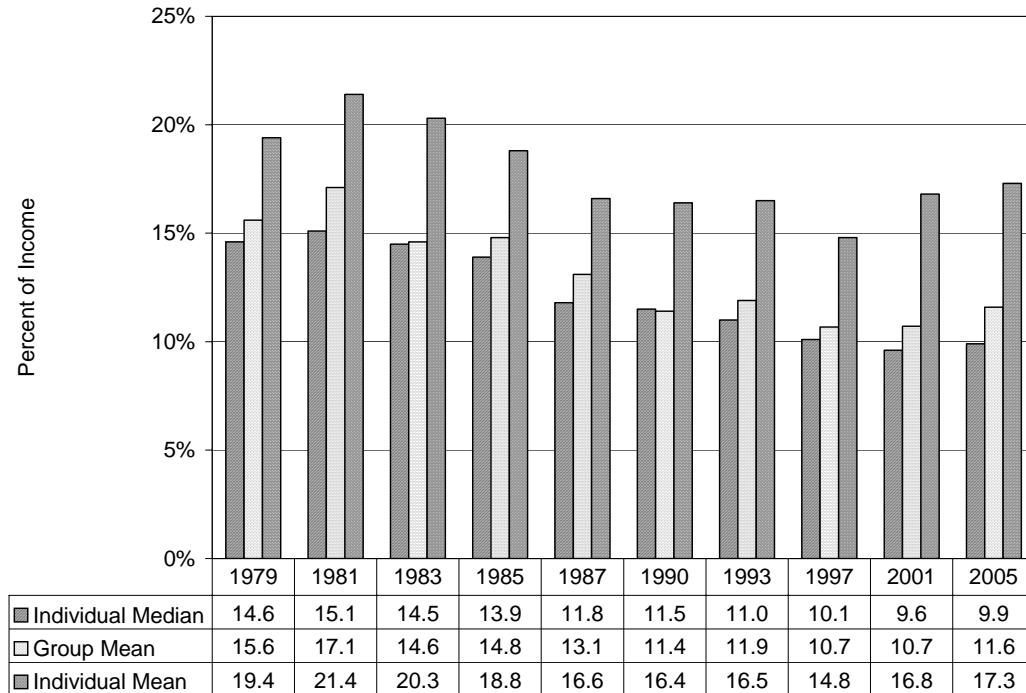
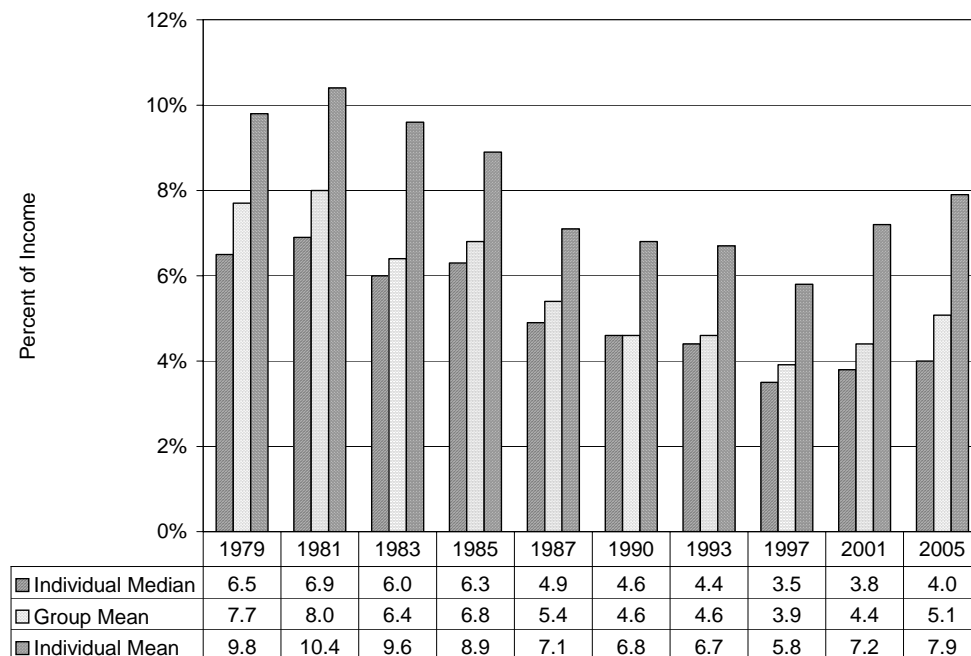


Figure 3-7. Comparison of mean group, mean individual, and median individual home energy burden for households with incomes at or below 150 percent of the poverty income guidelines, 1979 to FY 2005



Figures 3-8, 3-9, and 3-10 present information on the number and percent of low income households that had 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 2005. The number of low income households with home energy burdens exceeding 10 percent of income in FY 2005 was 31 percent less than the 1985 level and 2 percent less than the 1979 level.

Figure 3-10, on the next page, 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. The amount required for 5 percent of income was \$2.2 billion in 1979, \$4.6 billion by 1985, \$3.3 billion in 2001, and \$4.8 billion in FY 2005. 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 home energy burden 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 home energy burden to 5 percent also rose substantially. In FY 2005, 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 burden 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 2005

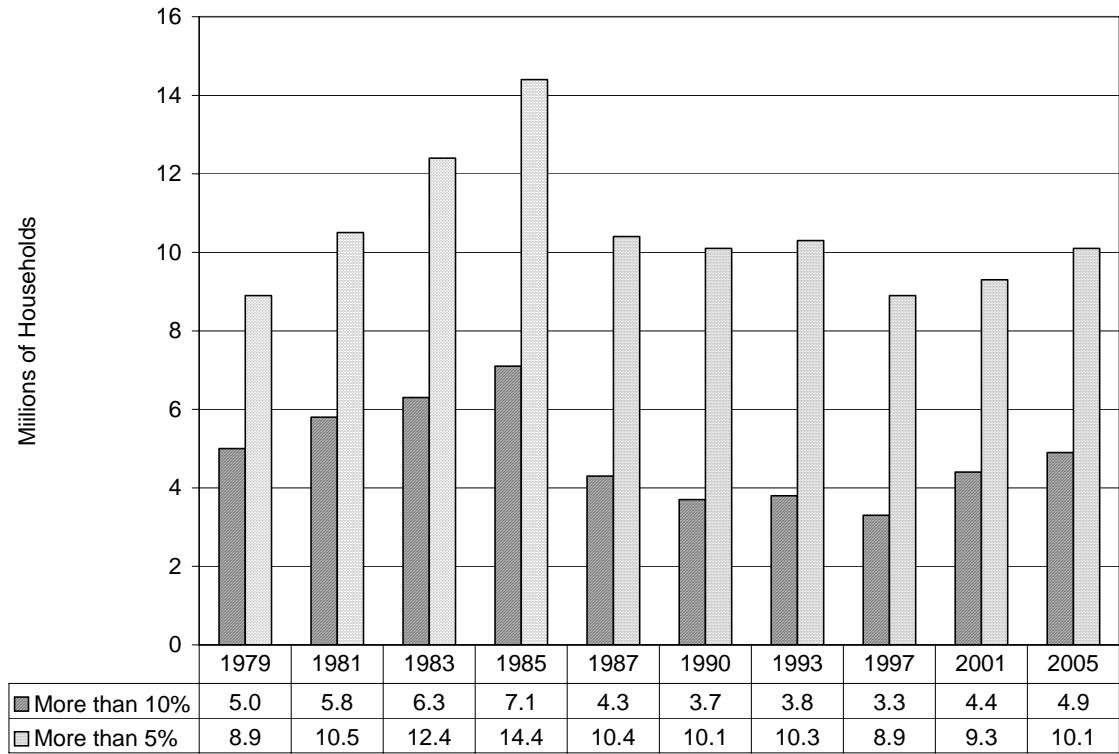


Figure 3-9. Percent of low income households spending over 5 percent and 10 percent of income on home energy, 1979 to FY 2005

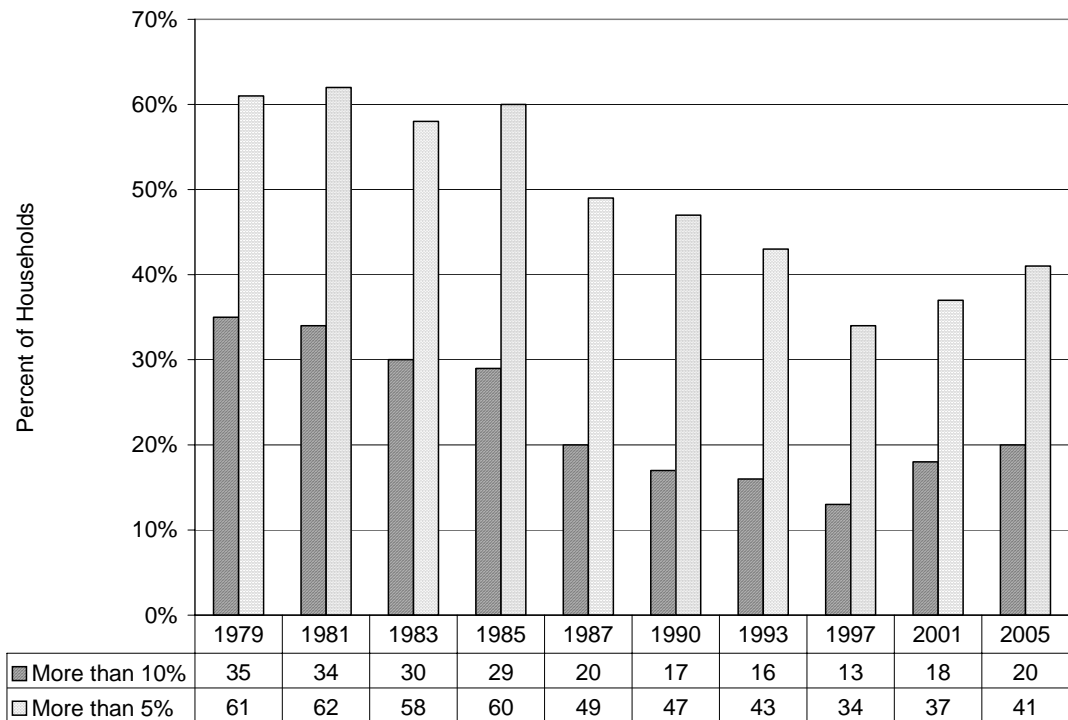
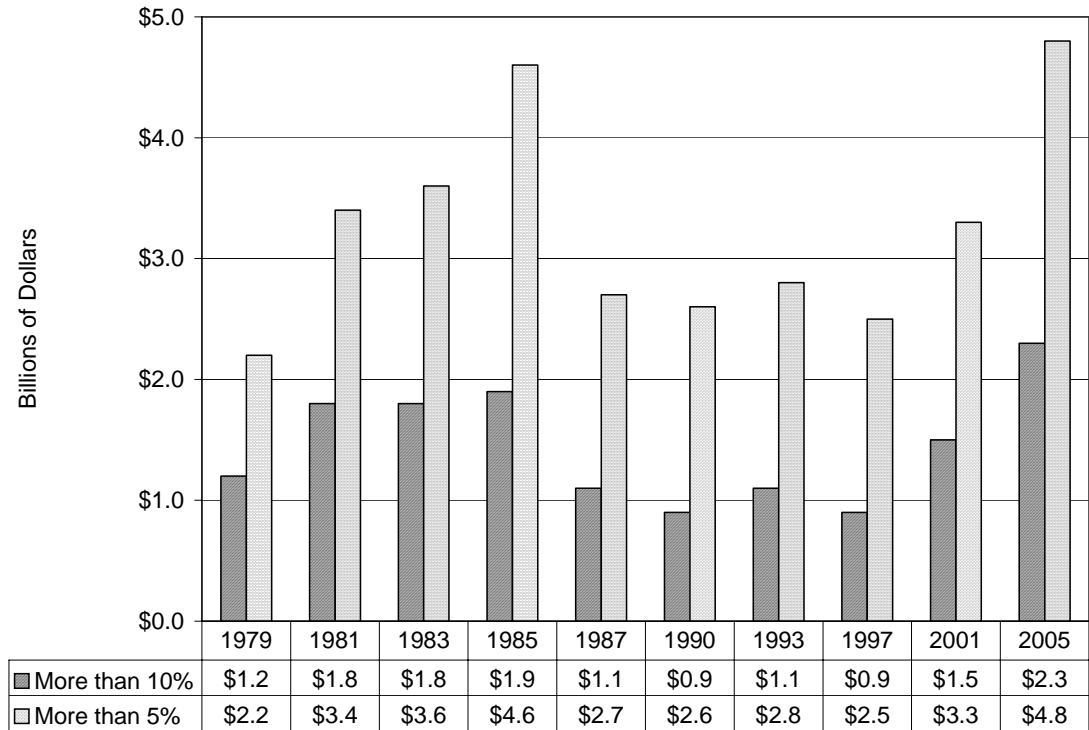


Figure 3-10. Total dollar need for LIHEAP funding for low income households spending over 5 percent and 10 percent of income on home energy, 1979 to FY 2005



Figures 3-11 and 3-12 furnish statistics for residential energy expenditures. Figure 3-11 shows that the number of households spending over the specified percentages for residential energy (15 percent and 25 percent), 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 2005 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 2005.

Figure 3-11. Number of low income households spending over 15 percent and 25 percent of income on residential energy, 1979 to FY 2005

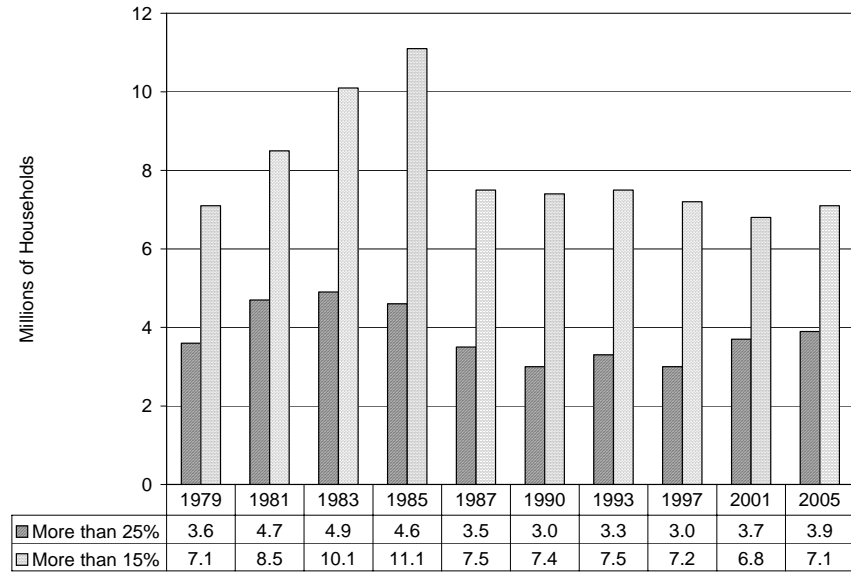


Figure 3-12. Total dollar need for LIHEAP funding for low income households spending over 15 percent and 25 percent of income on residential energy, 1979 to FY 2005

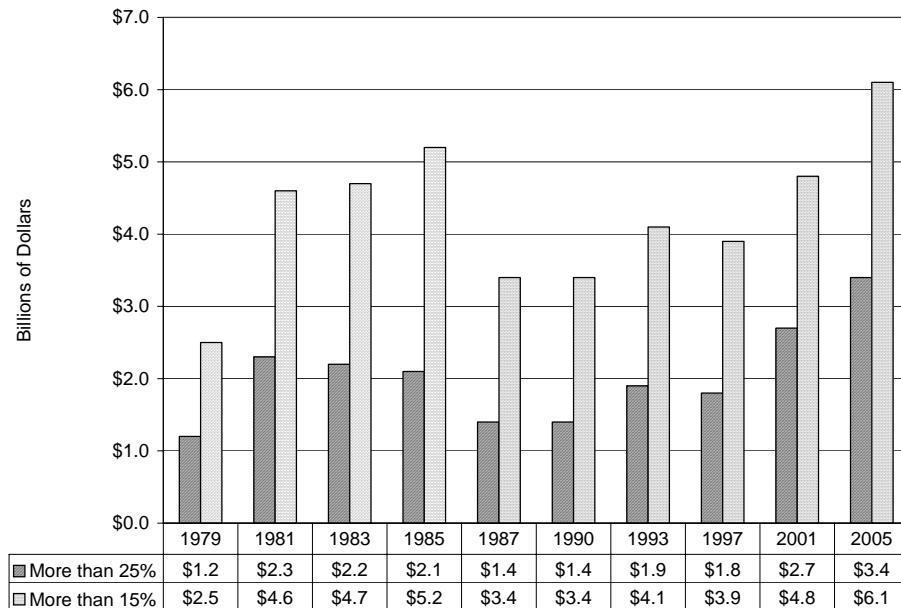


Figure 3-13 shows how the aggregated residential energy bill for all low income households has changed from 1979 to FY 2005. In 1979, the aggregated home energy bill for low income households was \$4.5 billion. By FY 2005, the aggregated home energy bill had grown to \$14.0 billion. This growth results 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 2005, home energy accounted for 43.9 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 2005

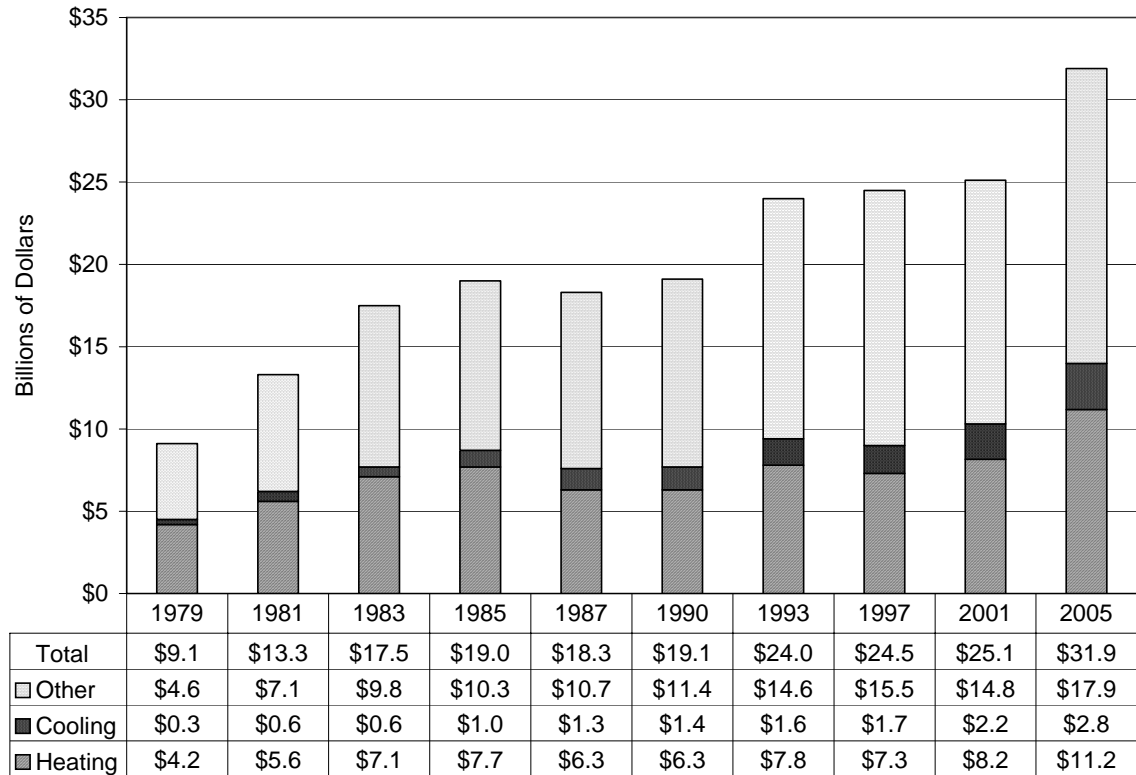
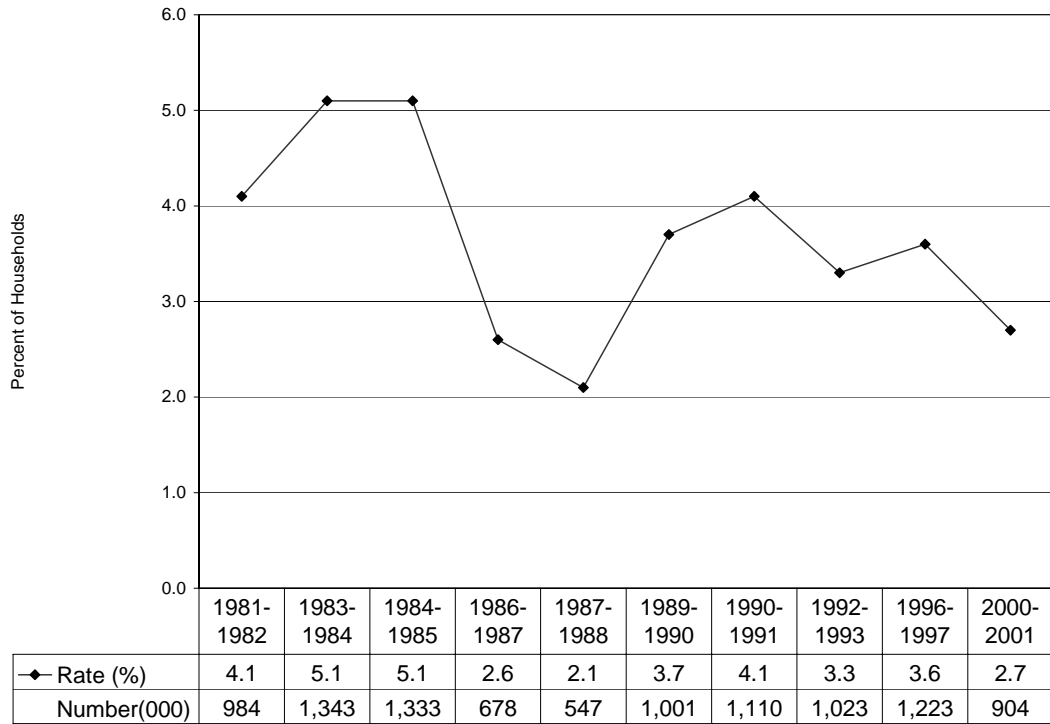


Figure 3-14, on the next page, presents an indicator of the impact of energy burden on LIHEAP eligible households. It shows the number of LIHEAP eligible households that reported that they were unable to use their main source of heat for a period of two hours or more during the heating season because they were unable to pay for their main heating fuel. During 1981-82, 984,000 LIHEAP eligible households (4.1 percent of LIHEAP 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 547,000 (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 eligible households had heat interruptions and in 1992-93 when 1.0 million (3.3 percent) LIHEAP 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 eligible households with heat interruptions decreased to 904,000 (2.7 percent).

Figure 3-14. Percentage of LIHEAP 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 season¹⁹



Analysis of energy 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 2005. 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. Since 1983, the increase in the composite average of fuel prices has moderated somewhat and has generally grown 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 explains why expenditures also rose. In FY 2005 prices increased again and once more contributed to an increase in expenditures.

¹⁹Data 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 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 Annual Report for FY 1993. The heat interruption rates for 1983-84 through 1987-88 are slightly higher with this new analysis.

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 2005

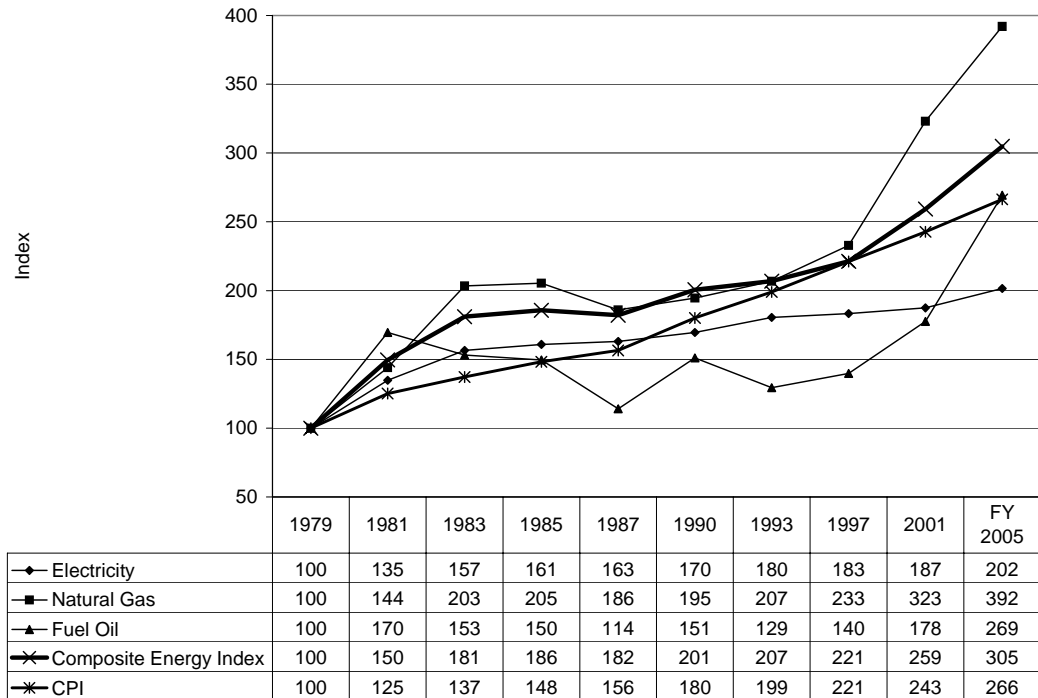


Figure 3-16 demonstrates how changes in heating energy consumption from 1979 to FY 2005 compared to changes in heating degree days for the same period. From 1979 to 1983, home heating consumption fell more rapidly than did heating degree days, suggesting a significant increase in efficiency as a result of conservation measures and/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 and/or actions. This was perhaps driven by the high fuel prices experienced in 2001. In FY 2005, consumption rose marginally while heating degree days remained unchanged, 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 2005

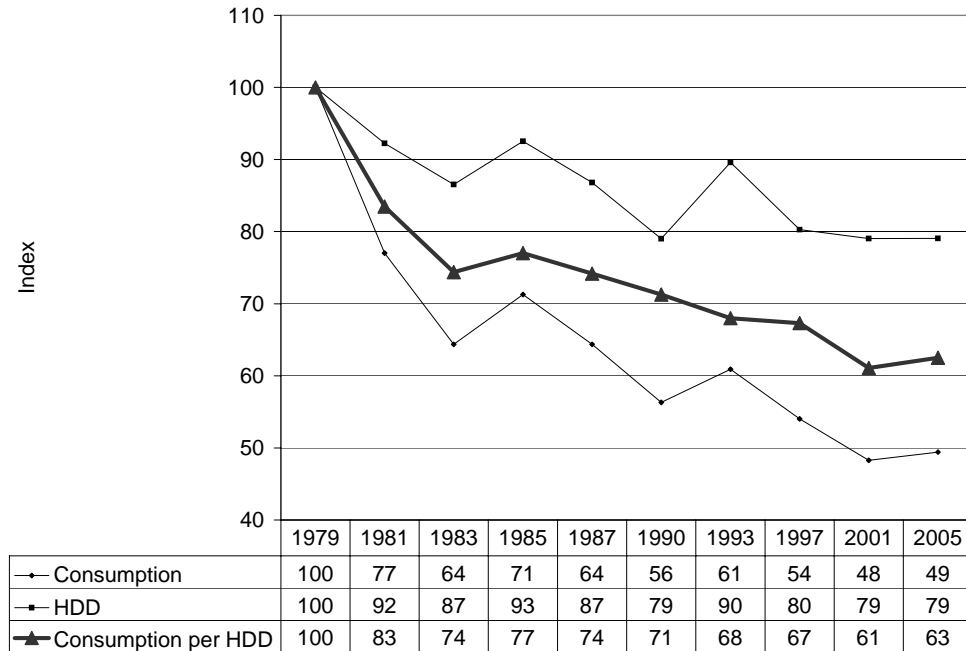
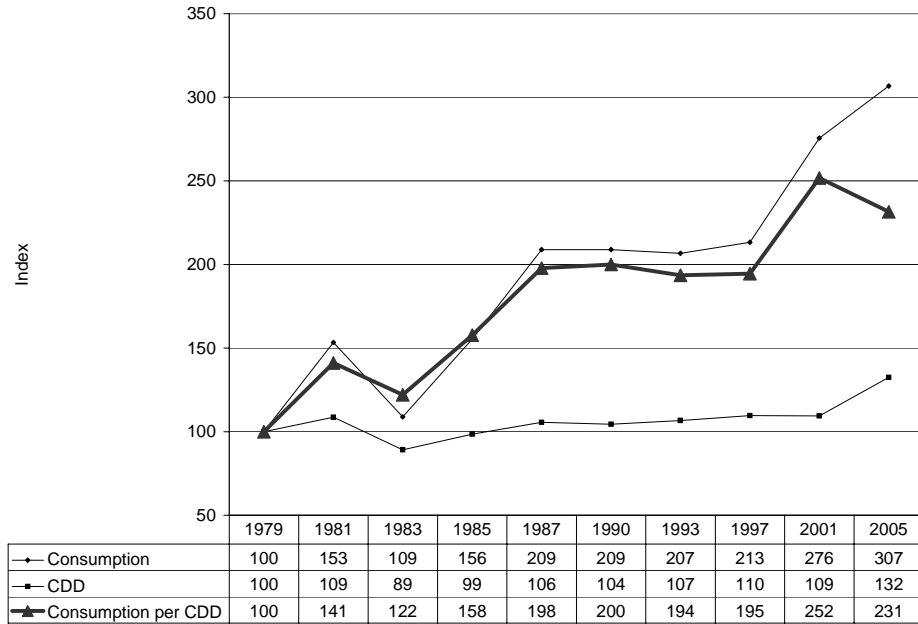


Figure 3-17 shows that home cooling consumption trends are somewhat more complex than are home heating consumption trends. In FY 2005, mean home cooling consumption was much higher than it was in 1979, even though households experienced only slightly more cooling degree days. Thus, mean consumption per cooling degree day increased substantially from 1979 to FY 2005, making it appear that 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. 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 2005 or year-to-year changes in consumption in response to changes in cooling degree days.

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 2005



Figures 3-18 and 3-19, on the next page, show that mean group energy burdens for low income households are substantially higher than the mean for all households. In FY 2005, the mean group home energy burden for all households was 1.3 percent and it was 5.1 percent for low income households. In FY 2005, the mean group residential burden was 2.9 percent for all households and it was 11.6 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 about 4 times that of all households, while in 1993, the mean group burden for low income households was just over 3 times that of all households. However in FY 2005, the mean group burden for low income households was 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 2005

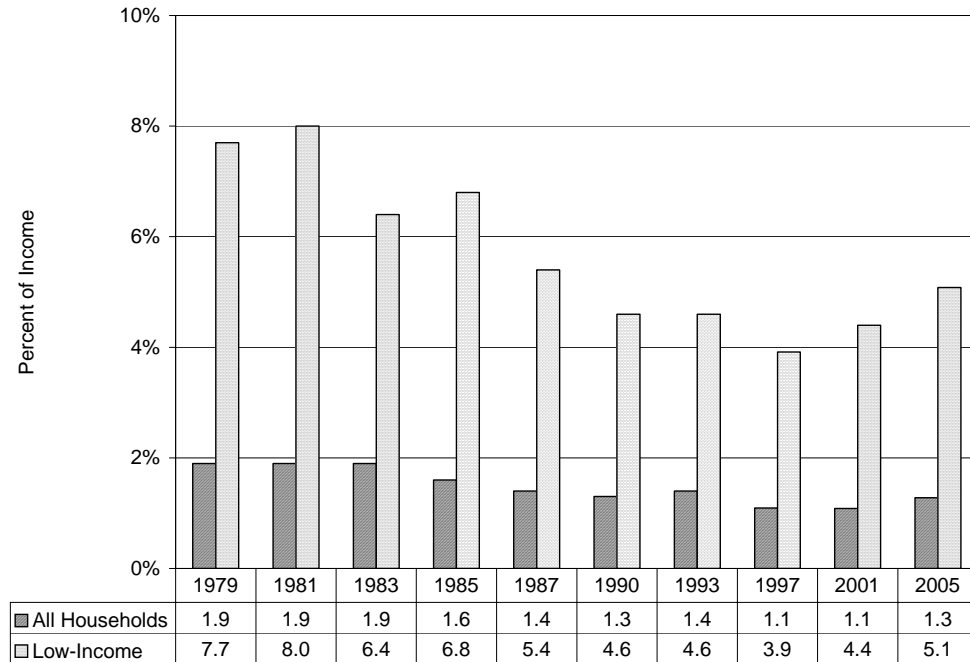
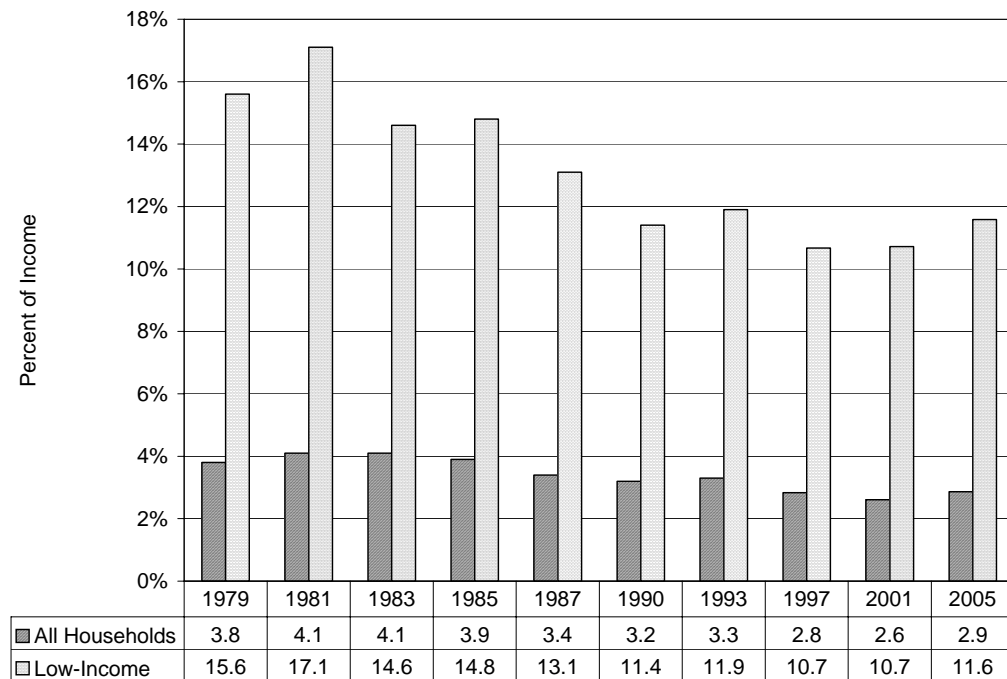


Figure 3-19. Mean group residential energy burden for all households and for households with incomes at or below 150 percent of the poverty income guidelines, 1979 to FY 2005



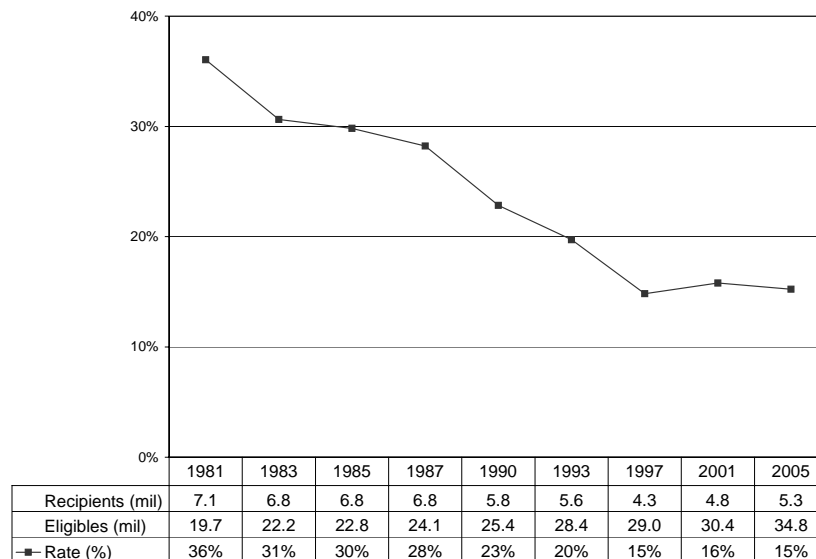
Trends in LIHEAP

Figures 3-20 through 3-24 furnish information on trends for HHS' energy assistance programs from FY 1981 through FY 2005. Figure 3-20 shows that the percentage of Federally eligible households assisted has fallen significantly over time. In FY 1981, 36 percent of eligible households received heating and/or winter crisis assistance benefits.²⁰ By FY 2005, 15 percent of eligible households received those benefits. Figure 3-21, on the next page, furnishes statistics on the count of recipients by benefit type.

Figure 3-22, on page 29, shows that the total funds used for fuel assistance benefits have fluctuated over time. For the years shown, funding was highest in FY 2001, when \$1.83 billion dollars were used for assistance benefits, and lowest in FY 1997 when \$0.94 billion dollars were used for assistance benefits. The large funding increase for FY 2001 is due in part to the substantial increase in funds for cooling assistance benefits. In FY 2005, funding for cooling assistance reached its highest level to date. Funding for heating assistance benefits was \$1.60 billion dollars.

Figure 3-23, on page 30, shows that the mean heating/winter crisis benefits received by LIHEAP recipients were highest in FY 2001. 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, rose to \$364 in FY 2001, and then fell significantly, to \$304, in FY 2005. Figure 3-24, on page 30, shows that, after adjusting for inflation, the mean value of benefits has fallen substantially. The inflation-adjusted mean value of benefits fell from \$213 in FY 1981 to \$140 in FY 2005. 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 2005, mean cooling benefits fell considerably to \$91. In FY 1993, one state made program changes that significantly increased the mean benefit and decreased the total number of recipients.

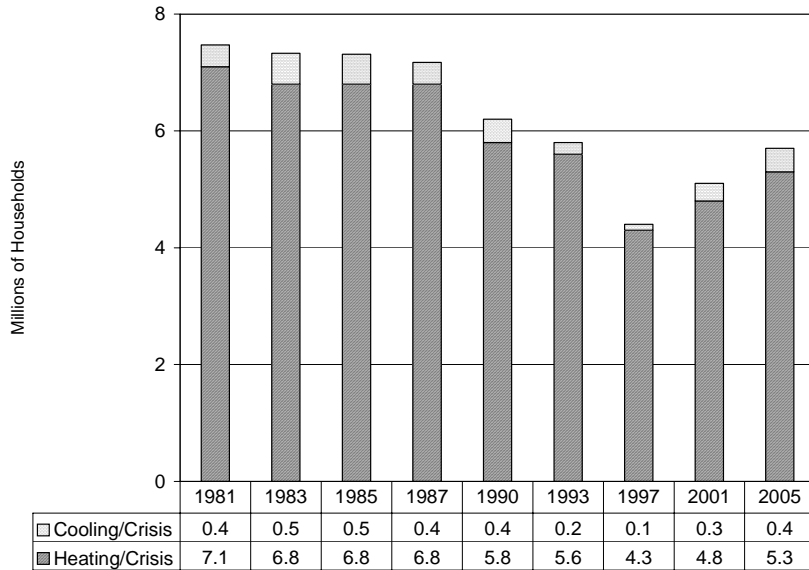
Figure 3-20. Percentage of LIEAP/LIHEAP Federally eligible households receiving LIEAP/LIHEAP heating and/or winter crisis assistance, FY 1981 to FY 2005



NOTE: 1981 Estimate of eligible households not directly comparable
SOURCE: HHS Administrative Data

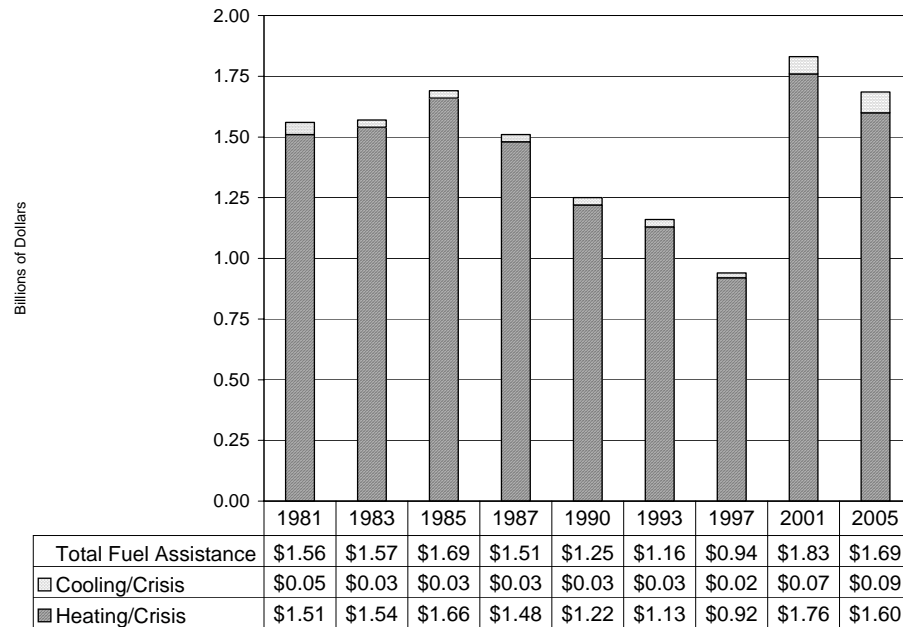
²⁰Note that the Federal income eligibility guidelines for the FY 1981 Low Income Energy Assistance Program (LIEAP) were different from those for subsequent LIHEAP programs included in the table.

Figure 3-21. Number of households receiving LIEAP/LIHEAP heating and/or winter crisis assistance or cooling and/or summer crisis assistance, FY 1981 to FY 2005



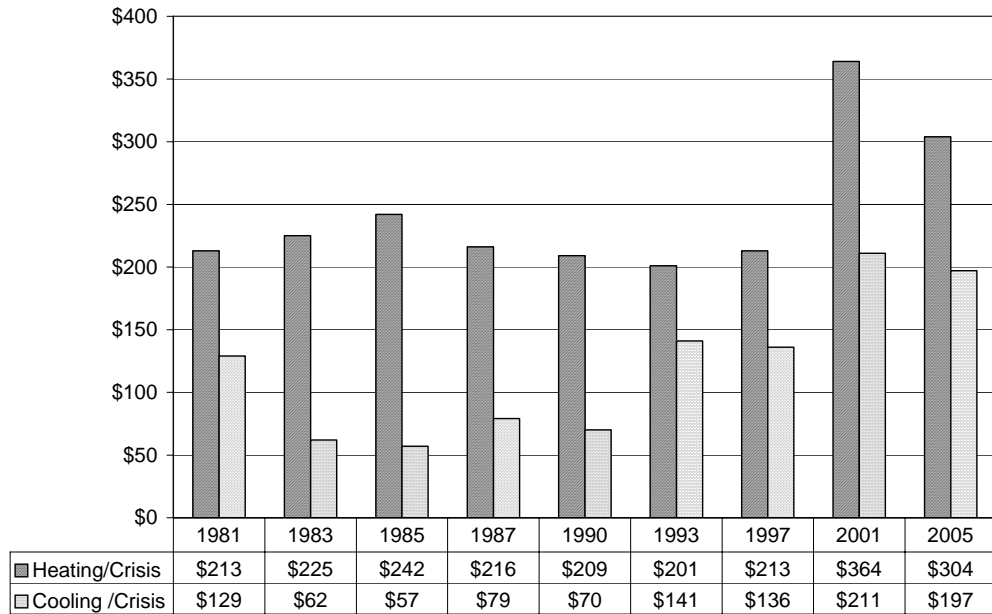
SOURCE: HHS Administrative Data

Figure 3-22. Funds used for LIEAP/LIHEAP fuel assistance, FY 1981 to FY 2005



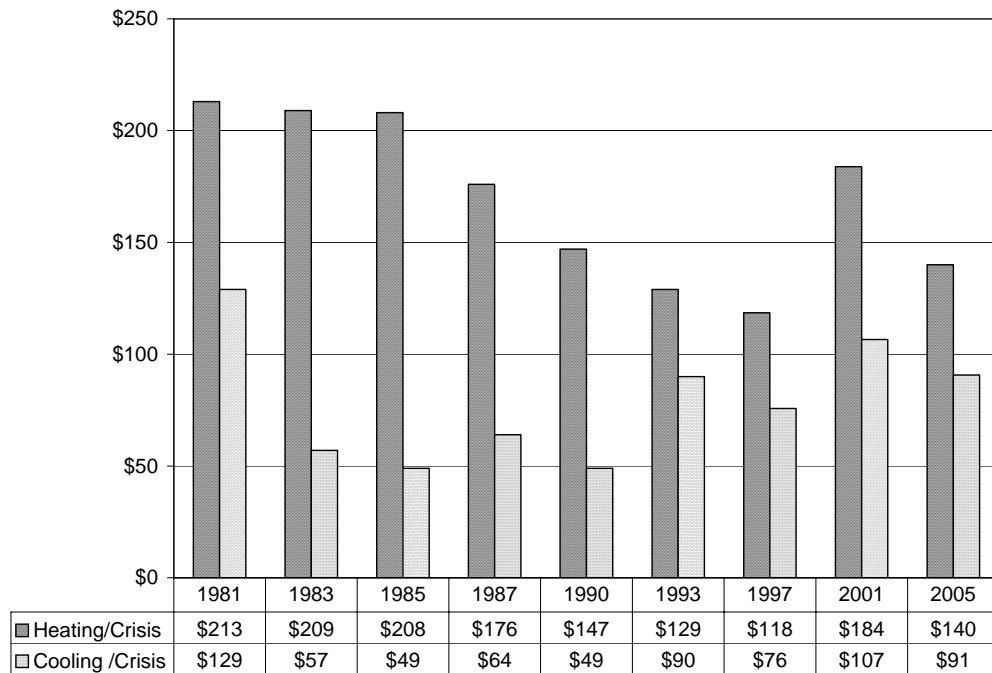
SOURCE: HHS Administrative Data

Figure 3-23. Mean combined LIEAP/LIHEAP heating and/or winter crisis benefits and mean cooling and/or summer crisis benefits, in dollars, FY 1981 to FY 2005



SOURCE: HHS Administrative Data

Figure 3-24. Mean combined LIEAP/LIHEAP heating and/or winter crisis benefits and mean cooling benefits, in constant 1981 dollars, FY 1981 to FY 2005



SOURCE: HHS Administrative Data

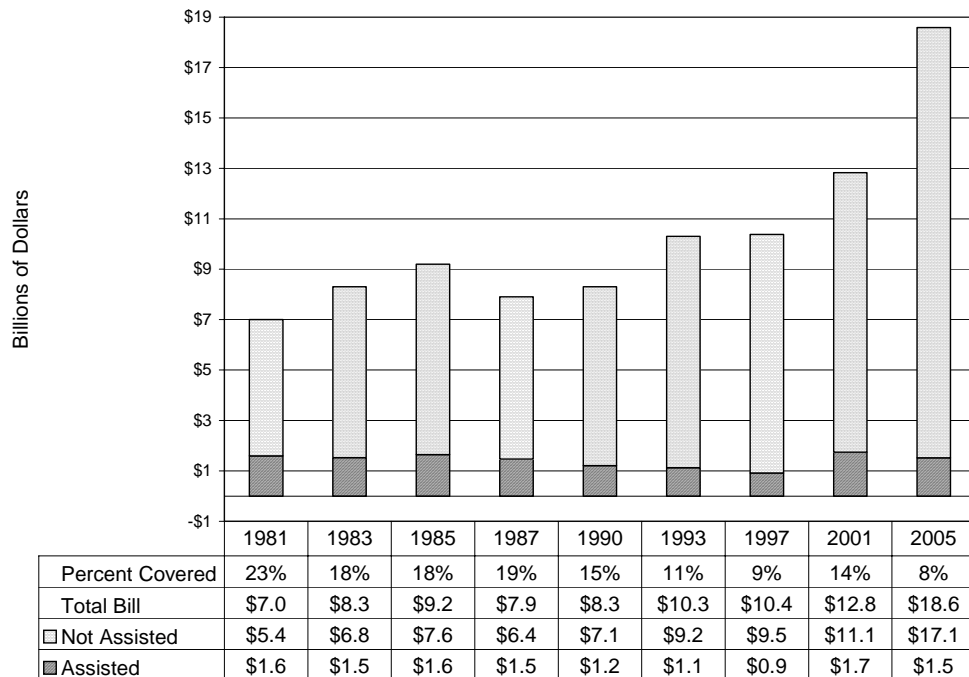
Analysis of LIHEAP benefits

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 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 8 percent in FY 2005. An increase in the size of the total bill and an increase in the number of households eligible for assistance benefits caused this reduction.

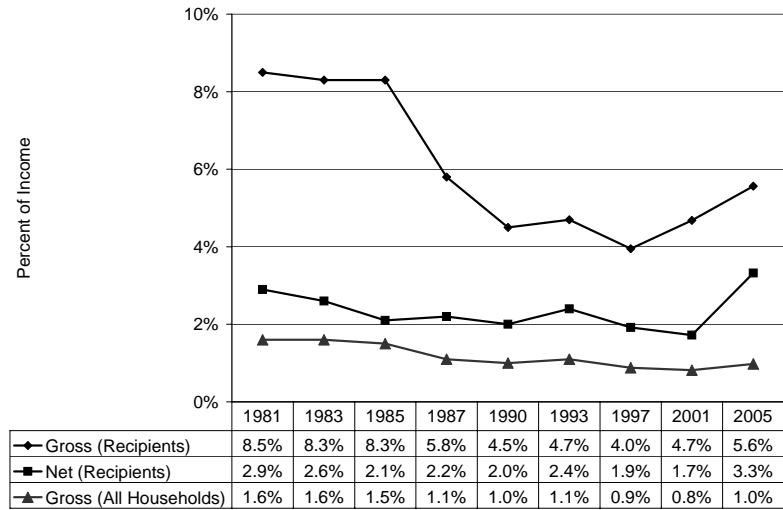
Figure 3-26 shows that the net effect of LIHEAP has been to lower recipient group home heating burdens to levels that are much closer to the levels of the average household. In FY 1981, gross mean group home heating burdens for LIHEAP recipients were 8.5 percent, while net mean group home heating burdens (home heating expenditures minus LIHEAP benefits) were 2.9 percent. In FY 2005, gross mean group home heating burdens for LIHEAP recipients were 5.6 percent, while net mean group home heating burdens were 3.3 percent. It is interesting to note that, while mean gross home heating burdens for LIHEAP recipients fell from 8.5 percent in FY 1981 to 4.0 percent in FY 1997, decreases in mean LIHEAP benefits caused mean net home heating burdens to remain twice as high as the burdens for all households. In FY 2001, significant increases in the mean heating benefit caused 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 2005, the mean heating benefit decreased by 16.5 percent, and mean net group home heating burden almost doubled, increasing by 94.1 percent. The effect of the reduced heating benefit in FY 2005 was intensified by higher mean home heating expenditures due to much higher fuel prices in FY 2005.

Figure 3-25. Amount and percentage of total home heating bill for LIHEAP/LIHEAP eligible households covered by LIHEAP heating and winter crisis benefits, FY 1981 to FY 2005



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 2005



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 2005, 15 percent of Federally 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 households that are members of the target group by the percent of all income eligible households that are members of the target group. 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).
- 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. 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).
- 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 for a target group of recipients by the percent reduction in the median individual energy burden for all recipients.²¹ 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

²¹In 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.

income to 4 percent of income), the burden reduction targeting index is 125 (100 times 25 divided by 20).

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.
- Increase the ratio of LIHEAP households assisted (heating, cooling, crisis, and weatherization assistance) per \$100 of LIHEAP administrative costs.

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.²²
- 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.²³

These studies are available on the web at www.acf.hhs.gov/programs/LIHEAP/library/index.html.

Performance measurement data sources

The ACF performance measurement plan for LIHEAP requires the development of 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:

- Target group 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.
- Income eligible population – The number of all LIHEAP income eligible households.
- LIHEAP recipients – The number of all LIHEAP heating 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:

- 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.
- Income eligible vulnerable households – The 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.

²² *LIHEAP Targeting Performance Measurement Statistics: GPRA Validation of Estimation Procedures*, August 2004, prepared by APPRISE Incorporated under PSC Order No. 043Y00471301D.

²³ *LIHEAP Energy Burden Evaluation Study*, March 2005, prepared by APPRISE Incorporated under PSC Order No. 043Y00471301D.

- 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 – The CPS 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 national 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 2005 were available in October 2005.
- Federal LIHEAP Household Report – The preliminary LIHEAP Household Reports for FY 2005 were due from the States by September 1, 2005, when the States' LIHEAP block grant applications for FY 2006 were due. ACF set a goal for the States to submit their final LIHEAP Household Report for FY 2005 by December 2005. Each LIHEAP Household Report needs to be received, reviewed, processed, and compared against data from each State's Federal LIHEAP Grantee Survey for FY 2005, which was conducted in February 2006. The data on the number of LIHEAP households assisted in FY 2005 were available in August 2006.
- Residential Energy Consumption Survey (RECS) – The RECS is a national household sample survey that is conducted once every four years by the U.S. Department of Energy's Energy Information Administration (EIA). The most recent survey was conducted in 2001. The availability of data from the 2005 RECS is scheduled for later in 2007. 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 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.

- 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 are served at a significantly higher rate than are other households. The study furnishes 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 those indicators, discussed the value of including those benefit and burden reduction targeting indicators in the performance plan for LIHEAP, and identified the challenges of including those 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 2005. The first column in the table restates the performance goal. The second column shows performance targets (to be reached), and the third column shows the targeting index score that was 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 eligible population of elderly households in FY 2003. Both the FY 2004 and FY 2005 targeting index scores indicate that there was basically no improvement in targeting the elderly. 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 eligible population of households with young children in FY 2003. Both the FY 2004 and FY 2005 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 2005.

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 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 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 is targeting high burden households.²⁴

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 are consistent with the statutory mandate to “furnish the highest benefits to lowest income households with the highest home energy needs.”

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 receive slightly higher average benefits than do households that do not

²⁴ 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. The null hypothesis that high burden households and households that are not high burden are served at the same rate can be rejected. However, 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.

have high burden. However, Table 4-4 shows that at the national level and for most regions, high burden households experience slightly lower burden reduction than do households that do 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.

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.

- 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 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, 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, 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.

- In absolute terms, if a group has a benefit or burden reduction targeting index greater than 100, the group receives higher 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 25 percent 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, that group has been targeted. For example, if the benefit targeting index for elderly households is 90 and the targeting index for households with no vulnerable members is 75, this indicates that elderly households have higher benefits. If the burden reduction targeting index for elderly households is 90 and the targeting index for households with no vulnerable members is 75, 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, to identify specific groups for whom Federal outreach materials should be provided, to identify regions of the country to target outreach materials, and to measure changes in performance over time. Specifically, ACF is examining the feasibility, 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 targeting index for households with young children is 110, 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, 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 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, 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. ACF is using targeting performance statistics to assist in determining the best allocation of Federal LIHEAP outreach efforts to improve LIHEAP targeting to vulnerable and high burden households.

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 and thereby furnish a more comprehensive picture of the targeting of LIHEAP benefits that just heating assistance.

V. The ACS as a LIHEAP Data Tool

Every ten years, the Decennial Census furnishes data on the characteristics of population and housing in the United States. The last Decennial Census was conducted in 2000. The next one will be conducted in 2010. Data from the Decennial Census are derived either from questions asked of the population (100-percent or short-form questionnaire) or from questions asked of a sample of the population (sample or long-form questionnaire). Approximately 18.3 million housing units were sampled with the long-form questionnaire in the 2000 Decennial Census.

Beginning with the 2010 Decennial Census, the Census Bureau's American Community Survey (ACS) will replace the Decennial Census long form, and provide annual updates on the characteristics of population and housing in the United States. The ACS began to be tested in 1996 and has expanded each subsequent year.²⁵

ACF has provided to LIHEAP grantees special tabulations of 2000 Decennial Census data concerning State-level data on low income households.²⁶ However, in the past, the special tabulations were only updated once every ten years. The new ACS furnishes annual updates of data that can give grantees more current information. This section of the Notebook furnishes information on the type of the information that is available, the geographic levels for which data can be developed, and the tools that are available for developing information from the ACS. LIHEAP program managers can obtain data for all households and subgroups of households directly from published ACS data. However, a LIHEAP program manager must develop special tabulations from the Public Use Microdata Sample (PUMS) data to obtain statistics for LIHEAP eligible households.

American Community Survey

The ACS is an annual national survey of households and housing units. The ACS was implemented to its full sample size and design in 2005. The annual sample size is about 3 million addresses. The ACS includes information on the individuals in a household, as well as housing unit information.

The ACS questions for individuals include:

- Sex
- Age
- Race and ethnicity
- Marital status
- Education
- Language
- Disability status
- Employment
- Income

The ACS questions for housing units include:

- Type of housing unit

²⁵ Further information about the ACS is available from the Census Bureau's web site at: <http://www.census.gov/acs/www/index.html>

²⁶ LIHEAP grantees received in June 2005 ACF's *2000 Decennial Census Tabulations of Households Estimated to be Income Eligible for LIHEAP*.

- Size of housing unit
- Age of housing unit
- Condition of housing unit
- Main heating fuel
- Annual cost of residential energy
- Rental or mortgage costs
- Other housing costs

The ACS data can furnish valuable information to LIHEAP program managers. In particular, it can furnish updated information on the main heating fuel for low income households, as well updated information on income, residential energy costs, and residential energy burden.

Published ACS Data

The Census Bureau website www.census.gov furnishes statistics from the Decennial Census and the ACS. The Census Bureau has developed a system called “American Factfinder” that gives users the ability to obtain statistics in several different ways. One can access the system by going to the Census Bureau home page and clicking on the American Factfinder icon.

Fact Sheets

The first way to obtain published data from the ACS and the Decennial Census is to click on the “Fact Sheet” icon. The “Fact Sheet” system furnishes a standard set of population and housing characteristics for 2005 (ACS data) and for 2000 (Decennial Census data). The system allows the user to select different geographic levels, including the nation, an individual state, a city, a county, or a ZIP code. [Note: The ACS data are available for geographic areas with 65,000 or more households. The Decennial Census data are available for all geographic areas.]

The Fact Sheet furnishes information on general characteristics, social characteristics, economic characteristics, and housing characteristics for all households. Information of interest to LIHEAP program managers might include:

- Percent of people 65 and over
- Percent of people under 5
- Percent of people by race
- Percent of people of Hispanic origin
- Average household size
- Percent of people disabled
- Percent of people speaking a language other than English at home
- Median household income
- Number of owners

The Fact Sheets for the ACS furnish information on the margin of error for each statistic. These should be used to assess whether the differences between two groups are statistically significant.

The Fact Sheet allows one to compare one geographic area to another. For households and housing units, it also allows one to compare statistics from 2000 to those for 2005. [Note: The Decennial Census covers all people, while the ACS only covers the noninstitutional population (i.e., it excludes individuals in group quarters such as dormitories, prisons, and nursing homes). Therefore, one cannot compare statistics for people from 2000 to those for 2005.]

In each topic area (i.e., general characteristics, social characteristics, economic characteristics, and housing characteristics), the Fact Sheets furnish supplemental tables. Information of interest to LIHEAP program managers might include:

- General characteristics\
 - Distribution of household type (e.g., two parent vs. single parent)
 - Distribution of the population by age
- Social characteristics
 - Educational attainment
 - Marital status
- Economic characteristics
 - Employment status
 - Distribution of household income
- Housing characteristics
 - Main heating fuel
 - Selected monthly owner costs as a percent of household income
 - Gross rent as a percentage of household income

Population Profiles

Another way that the Census Bureau makes information available through American Factfinder is with population profiles for selected groups. Some groups of interest to LIHEAP program managers for which profiles have been developed include:

- Various race, ethnic, and ancestry groups
- Population 60 years and over
- Population 65 years and over
- Children
- People at specified levels of poverty

As with the Fact Sheets, the population profiles can be obtained for many different geographic levels.

Base Tables

The “Base Tables” furnished by the Census Bureau are the foundation for all other statistics presented by the Census Bureau on the ACS. The tables cover a wide range of topics and are available at a number of geographic levels.

To illustrate the data accessible through the Census Bureau website, the following statistics were developed for New Jersey.

- In 2005, 14.5 percent of individuals characterized themselves as being of Hispanic origin
- In 2005, 27.4 (+/- 0.1)²⁷ percent of individuals spoke a language other than English at home, including:
 - 13.5 (+/- 0.1) percent spoke Spanish
 - 8.4 (+/- 0.3) percent spoke other Indo-European languages
 - 4.2 (+/- 0.2) percent spoke Asian languages

²⁷ The ACS collects information for a sample of the total population. Since the statistics are developed from a sample rather than the entire population, it is important to know how precisely the sample represents the population. Each statistic supplied in this report includes a margin of error that is computed using formulas furnished by the Census Bureau. The margin of error used is a 90 percent confidence interval for the selected statistic.

- 1.2 (+/- 0.1) percent spoke other languages
- In 2005, 621,000 (+/- 22,000) households had incomes below \$25,000. This is a statistically significant decline from 2000 when 646,000 households had income below \$25,000.
- In 2005, 556,000 (+/-9,700) households reported retirement income. This is a statistically significant increase from 2000 when 525,000 households reported retirement income.
- In 2005, the median home value was \$334,000 (+/- \$2,000). This is a statistically significant increase from 2000 when the median home value was \$170,800.
- In 2005, 74 (+/- 1) percent of households used electricity or natural gas as their main heat. This is a statistically significant increase from 2000 when 71 percent of households used electricity or natural gas as their main heat.

Many LIHEAP program managers may be aware of the general direction of the statistics outlined above. However, it may be useful to quantify the change for program planning purposes.

ACS PUMS Files

In addition to published files, the Census Bureau makes available PUMS files that contain the records for a sample of all housing units that responded to the survey.²⁸ These files can be used to develop specialized tabulations for the population of a State or a Public Use Microdata Area (a geographic area with about 50,000 households). In addition, the data files can be used to develop information for a specialized subgroup. For example, using the PUMS files, one can identify all of the households that have incomes at or below the LIHEAP income standard and develop statistics for those households.

To demonstrate how PUMS data analysis can expand on the ACS data available through the Census website, statistics were developed for New Jersey for 2005. Statistics also were developed from the PUMS file from the Decennial Census to compare the statistics for 2005 to those from 2000.

Income Eligible Population

The 2000 Decennial Census shows that there were 3,065,000 households in New Jersey. The ACS shows that the number of households had grown to 3,142,000 (+/- 10,000) by 2005. The maximum income standard for LIHEAP in New Jersey for FY 2005 was 175 percent of poverty. The 5 percent PUMS file from the Decennial Census shows that 507,000 (+/- 4,000) households had incomes at or below 175 percent of poverty in 2000. The 5 percent PUMS file from the 2005 ACS shows that 570,000 (+/- 19,000) households had incomes at or below 175 percent of poverty in FY 2005. Overall, the LIHEAP income eligible population in New Jersey grew by about 12 percent.

Residential Energy Bills and Burden for Income Eligible Households

One important set of information available from the ACS is the household's self-reported estimate of residential energy bills.²⁹ These data show the types of residential energy bills a household had and

²⁸ The PUMS files are microdata files. A computer program is needed to process the data and compute statistics.

²⁹ Home energy expenditures are defined by the LIHEAP program as expenditures for home heating and home cooling. Information on home energy bills and energy burden can not be obtained from the ACS.

the amount of those energy bills. By comparing the amount of the residential energy bills to self-reported income, the distribution of energy burden also can be examined.³⁰

The PUMS can be used to show the number of LIHEAP income eligible households that use each type of main heating fuel and to assess whether the household pays for their main heating fuel directly to the energy supplier. Table 5.1a furnishes information on main heating fuel for 2000 and 2005. Table 5.1b furnishes information on main heating fuel for those households that pay directly for their heating fuel.

Table 5.1a. Number and percent of New Jersey LIHEAP income eligible households by main heating fuel, 2000 and 2005

Main Heating Fuel	2005		2000	
	Number	Percent	Number	Percent
Natural Gas	362,413 (± 12,006)	63.5% (± 1.3%)	303,388 (± 4,499)	59.9% (± 0.5%)
Electricity	98,338 (± 7,545)	17.2% (± 1.2%)	80,712 (± 2,412)	15.9% (± 0.4%)
Fuel Oil	88,280 (± 7,464)	15.5% (± 1.2%)	94,180 (± 2,600)	18.6% (± 0.4%)
LPG	14,658 (± 1,894)	2.6% (± 0.3%)	17,725 (± 1,142)	3.5% (± 0.2%)
Other	4,320 (± 1,218)	0.8% (± 0.2%)	5,828 (± 656)	1.2% (± 0.1%)
No Fuel Used	2,382 (± 828)	0.4% (± 0.1%)	4,786 (± 595)	0.9% (± 0.1%)
TOTAL	570,391	100%	506,619	100%

Table 5.1b. Number and percent of New Jersey LIHEAP income eligible households that pay directly for heat by main heating fuel, 2000 and 2005

Main Heating Fuel	2005		2000	
	Number	Percent	Number	Percent
Natural Gas	268,608 (± 10,947)	66.6% (± 1.6%)	221,594 (± 3,901)	62.8% (± 0.6%)
Electricity	78,050 (± 6,337)	19.4% (± 1.5%)	63,155 (± 2,140)	17.9% (± 0.5%)
Fuel Oil	43,711 (± 4,581)	10.8% (± 1.1%)	53,478 (± 1,972)	15.2% (± 0.4%)
LPG	11,509 (± 1,613)	2.9% (± 0.4%)	13,346 (± 992)	3.8% (± 0.2%)
Other	1,471 (± 677)	0.4% (± 0.2%)	4,060 (± 241)	1.6% (± 0.1%)
No Fuel Used	-	-	46 (± 0)	<0.1% (± 0%)
TOTAL	403,349 (± 12,759)	100%	352,679 (± 4,805)	100%

The PUMS also can be used to show the distribution of residential energy bills for LIHEAP income eligible households that pay directly for their heating bill. Table 5.2 furnishes this information. The table shows that the percentage of households with energy bills less than \$1,000 fell from about 46 percent in 2000 to 39 percent in 2005.

³⁰ Survey respondents self-report on household income and residential energy expenditures on the ACS. Since these data are self-reported, they are only precise if the respondent has good information on total household income and energy expenditures.

Table 5.2. Number and percent of New Jersey LIHEAP income eligible households by total residential energy bill(s), 2000 and 2005

Total Residential Energy Bills	2005		2000	
	Number	Percent	Number	Percent
\$0-<\$500	139,887 (± 12,535)	24.5% (± 1.7%)	156,489 (± 3,316)	30.9% (± 0.5%)
\$500-<\$1,000	82,276 (± 7,929)	14.4% (± 1.1%)	76,646 (± 2,352)	15.1% (± 0.4%)
\$1,000-<1,500	73,428 (± 6,783)	12.9% (± 0.9%)	79,672 (± 2,397)	15.7% (± 0.4%)
\$1,500-<\$2,000	61,854 (± 6,590)	10.8% (± 0.9%)	67,200 (± 2,206)	13.3% (± 0.3%)
\$2,000-<\$2,500	57,097 (± 5,560)	10.0% (± 0.8%)	50,454 (± 1,917)	10.0% (± 0.3%)
\$2,500 or more	155,849 (± 11,454)	27.3% (± 1.5%)	76,158 (± 2,345)	15.0% (± 0.4%)
TOTAL	570,391	100%	506,619	100%

The PUMS also can be used to show the distribution of total residential energy burden for LIHEAP income eligible households that pay directly for their heating bill. Table 5.3 furnishes this information. The table shows that the share of households with energy burdens of 15 percent or more increased from 33 percent of the population in 2000 to 40 percent of the population in 2005.

Table 5.3. Number and percent of New Jersey LIHEAP income eligible households by total residential energy burden, 2000 and 2005

Total Residential Energy Burden	2005		2000	
	Number	Percent	Number	Percent
0%-<5%	154,663 (± 11,565)	27.1% (± 1.5%)	167,019 (± 3,419)	33.0% (± 0.5%)
5%-<10%	104,222 (± 9,088)	18.3% (± 1.2%)	97,947 (± 2,650)	19.3% (± 0.4%)
10%-<15%	83,400 (± 8,974)	14.6% (± 1.3%)	72,566 (± 2,290)	14.3% (± 0.4%)
15%-<20%	52,795 (± 5,390)	9.3% (± 0.8%)	40,697 (± 1,724)	8.0% (± 0.3%)
20%-<25%	41,492 (± 5,824)	7.3% (± 0.8%)	25,493 (± 1,368)	5.0% (± 0.2%)
25% or more	133,819 (± 9,535)	23.5% (± 1.2%)	102,897 (± 2,713)	20.3% (± 0.4%)
TOTAL	570,391	100%	506,619	100%

The PUMS can be used to show how the median energy bill for LIHEAP income eligible households varies by main heating fuel. Table 5.4 furnishes this information. The median energy bill increased by 31 percent, from \$1,100 in 2000 to \$1,440 in 2005.

Table 5.4. Median total residential energy bill(s) by main heating fuel for New Jersey LIHEAP income eligible households, 2000 and 2005

Median Total Residential Energy Bills	2005	2000
Natural Gas	\$1,560 (± \$69)	\$1,190 (± \$24)
Electricity	\$960 (± \$0)	\$720 (± \$45)
Fuel Oil	\$1,560 (± \$137)	\$1,300 (± \$50)
LPG	\$1,970 (± \$440)	\$1,200 (± \$105)
Other	\$930 (± \$944)	\$480 (± \$86)
No Fuel Used	\$600 (± \$234)	\$100 (± \$45)
TOTAL	\$1,440 (± \$19)	\$1,100 (± \$19)

These statistics can be useful in helping LIHEAP program managers to consider how to distribute LIHEAP benefits among different population groups. Those States that have total residential energy bills for LIHAP recipients can calculate a benefit targeting index and a burden reduction targeting index to measure the effectiveness of benefit targeting.

Targeting LIHEAP Benefits to Vulnerable Groups

The PUMS data also furnish estimates of the percent of income eligible households with vulnerable household members. The data can be used to identify households with a member who is 60 years or older, households with a member who is 5 years or younger, and households with a member who is disabled.³¹ Table 5.5 furnishes information for households in New Jersey for 2005 and 2000. The statistics show that the share of income eligible households that are elderly and the share of income eligible households that have a young child did not change between 2000 and 2005.

Table 5.5. Number and percent of New Jersey LIHEAP income eligible households by vulnerable group, 2000 and 2005

Vulnerable Group	2005		2000	
	Number	Percent	Number	Percent
Elderly	250,182 (± 9,740)	43.9% (± 1.7%)	220,786 (± 4,219)	43.6% (± 0.5%)
Young Child	108,624 (± 9,526)	19.0% (± 1.7%)	100,984 (± 2,913)	19.9% (± 0.4%)
Disabled	226,810 (± 11,615)	39.8% (± 2.0%)	248,557 (± 4,798)	49.1% (± 0.5%)
No Vulnerable	147,104 (± 9,326)	25.8% (± 6.3%)	106,549 (± 3,218)	21.0% (± 0.4%)
TOTAL	570,391	100%	506,619	100%

LIHEAP program managers might also want to examine whether the program is effectively serving other target groups. For example, it may be difficult to communicate with households that are linguistically isolated.³² Table 5.6 furnishes information for income eligible households in New Jersey for 2005 and 2000 that are linguistically isolated. By comparing the share of income eligible households that are linguistically isolated in a certain language to the share of recipient households

³¹ The ACS considers a disability to be a long-lasting physical, mental, or emotional condition.

³²A household is considered to be linguistically isolated if no one age 14 or older living in that household speaks only English or speaks a non-English language and speaks English “very well.” In other words, all members of the household age 14 years and older have at least some difficulty with English.

that are noted to speak a certain language, a LIHEAP program manager can consider ways that the program might need to be changed to communicate effectively with certain groups of households. The statistics show that there was a small increase in the percent of households that are Spanish language linguistically isolated between 2000 and 2005.

Table 5.6. Number and percent of New Jersey LIHEAP income eligible households by linguistic isolation group, 2000 and 2005

Linguistic Isolation Group	2005		2000	
	Number	Percent	Number	Percent
Not Isolated	483,472 (± 17,884)	84.8% (± 3.0%)	436,235 (± 7,018)	86.1% (± 0.3%)
Spanish	58,496 (± 5,857)	10.3% (± 1.0)	42,714 (± 2,355)	8.4% (± 0.3%)
Indo-European	19,165 (± 3,883)	3.36% (± 0.66%)	18,481 (± 1,555)	3.65% (± 0.2%)
Asian	6,924 (± 1,456)	1.2% (± 0.3%)	6,682 (± 937)	1.3% (± 0.1%)
Other	2,334 (± 1,092)	0.4% (± 0.2%)	2,507 (± 574)	0.5% (± 0.1%)
TOTAL	570,391	100%	506,619	100%

Information on Sub-State Areas

In addition to State-level data, the PUMS data can furnish information for sub-State areas. Using information on the locations of PUMAs, one can develop statistics for geographic areas of interest to a LIHEAP program manager. For example, the New Jersey program manager might be interested in learning whether the LIHEAP income eligible population is growing at different rates in different parts of the State. Table 5.7 furnishes information on the number and percent of income eligible households in target sub-State areas for New Jersey. The statistics show that there was little or no change in the distribution of LIHEAP income eligible households between 2000 and 2005.

Table 5.7. Number and percent of New Jersey LIHEAP income eligible households by linguistic isolation group, 2000 and 2005

Region	2005		2000	
	Number	Percent	Number	Percent
Northern	340,122 (± 15,525)	59.6% (± 2.7%)	300,353 (± 4,479)	59.3% (± 0.5%)
Central	124,678 (± 6,809)	21.9% (± 1.2%)	109,860 (± 2,800)	21.7% (± 0.4%)
Southern	105,591 (± 7,779)	18.5% (± 1.4%)	96,406 (± 2,629)	19.0% (± 0.4%)
TOTAL	570,391	100%	506,619	100%

Currently, the Census Bureau reports data for geographic areas with 65,000 or more housing units. In later years, the Census Bureau reports that it plans to develop statistics for smaller geographic areas using three-year and five-year averages of the ACS data. In the future, one will be able to use several years of ACS PUMS data to develop statistics for PUMAs that have smaller variances than those identified here.

Summary

The ACS furnishes a powerful new data tool for LIHEAP program managers. Annually, it gives LIHEAP program managers new information that was previously available only once every ten years. The benefits include:

- Published ACS Data – With published ACS data, a LIHEAP program manager can identify changes in the characteristics of households in their State that have occurred since 2000. In addition, population profiles prepared by the Census Bureau can furnish information about important population groups, including individuals over 60 and individuals under 5.
- ACS PUMS Data – With computerized PUMS data files, a LIHEAP program manager can develop more detailed information about a number of issues that are important to the LIHEAP program, including:
 - Vulnerable Groups – The percentage of income eligible households that have a vulnerable member.
 - Geographic Groups – The distribution of income eligible households to important sub-State areas.

The most important limitation of the ACS data is that survey sample sizes are small for some States and for some sub-State geographic areas. For that reason, a LIHEAP program manager must use caution when reporting statistics and should include estimates of the margin of error of any survey estimate. However, subject to those limitations, the ACS furnishes LIHEAP program managers with data resources for managing their programs.

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 2005. 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

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 since 1978. It is designed to provide reliable data at the national and Census regional level. 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 fuels 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 those 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.³³

The 2001 RECS is the eleventh survey in the series of surveys.³⁴ For the 2001 RECS, approximately 4,822 households were interviewed in the core sample. In addition, a supplemental sample of 496 LIHEAP recipient households were interviewed for the first time as part of the RECS.³⁵ For the

³³Regression 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).

³⁴For 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.

³⁵The data collected from the 2001 RECS are available on the EIA website: *RECS homepage*, Energy Information Administration, March 9, 2004, <http://www.eia.doe.gov/emeu/recs/contents.html>.

tabulations in this *Notebook*, 2001 RECS consumption and expenditure data were updated for FY 2005.

Strengths and limitations of RECS data

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.
- RECS includes use of all residential fuels.
- Energy suppliers provide information on actual residential energy consumption and expenditures of RECS sample households.
- 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 2005 using procedures that adjust the 2001 data to reflect the weather and fuel prices for FY 2005 (October 1, 2004 to September 30, 2005). The methodology for the tabulations in this *Notebook* is comparable to that used for the FY 1986 - FY 2003 *Annual LIHEAP Reports to Congress*. 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 on the EIA website: Energy Information Administration, March 9, 2004, <http://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 total household income as a specific dollar amount at the national and regional levels. CPS' larger sample size and method of collecting income data result in more accurate income data compared to RECS income data. Therefore, the 2004 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 level or 60 percent of state median income). These estimates do not include households that were categorically eligible for LIHEAP under section 2605(b)(2) (A) of the LIHEAP statute, whose incomes may have exceeded the statutory income standards. 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 2005 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 2005 heating degree days, cooling degree days, and price inflators applied to the original expenditure data, and 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 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 LIHEAP 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 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 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.

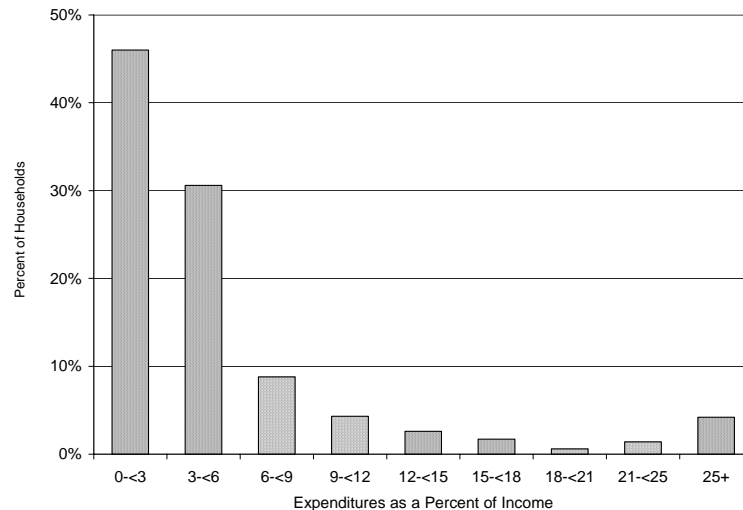
⁴⁰For example, 2001 RECS households with incomes of \$10,000 or less had average residential energy expenditures of \$1,042, while those with incomes between \$20,000 - \$35,000 had average residential energy expenditures of \$1,315. Thus, households which had more than twice as much income spent only 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 are estimated to be LIHEAP eligible households. Based on the 2001 CPS ASEC, the estimate of LIHEAP eligible households for calendar year 2001, is 30.4 million households. Since some households, which are not LIHEAP eligible, are categorized by RECS as LIHEAP eligible, the RECS overestimates the average energy expenditures for LIHEAP eligible households.⁴¹

Figure A-1. Distribution of LIHEAP 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 households and the second on the experience of a group of households. The "mean individual burden" furnishes more information on how individual households are affected by energy burden (i.e., it computes a mean by using each household's burden). The "mean group burden" furnishes more information on group burden (i.e., it computes the share of all income earned by LIHEAP 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.

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 eligible households from the 1990 RECS and the March 1991 CPS suggest that the probable range of the overestimate in average group energy burden is from 5-10 percent.

The key difference between the "mean individual burden" and the "median individual burden" is that the first statistic furnishes information on all LIHEAP eligible households at the expense of "overstating" what is happening to the "average" LIHEAP eligible household. The second statistic furnishes information on the "average" LIHEAP 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 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 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. This statistic furnishes information on the distribution of burdens among households in a group. Using this statistic 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. It was assumed that households had not changed their behavior as a result of weather and price 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 degree estimates of end use for the Calendar Year 2001 were adjusted for weather differences between 2001 and Fiscal Year 2005. The following equation was applied to each household in the microsimulation data file.

$$\begin{aligned} \text{2005 Projected BTUs} &= (2001 \text{ estimated heat use} * \text{HDD change}) + \\ & (2001 \text{ estimated cooling use} * \text{CDD change}) + \\ & (2001 \text{ estimated water use} + 2001 \text{ estimated appliance use}) \end{aligned}$$

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

$$\text{Preliminary Expenditures} = 2001 \text{ Expenditures} * (2005 \text{ Projected Usage}/2001 \text{ Actual Usage})$$

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

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 2005. (For example, electricity prices increased by 7 percent from 2001 to FY 2005.)

Table A-1. National price factors for FY 2005

Fuel	Price Factors for FY 2005 Projections
Electricity	1.0754
Natural gas	1.2128
Fuel oil / kerosene	1.5231
Liquefied petroleum gas (LPG)	1.2243

Expenditure data were adjusted using national price factors for FY 2005. 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 obtained from the Energy Information Administration's Monthly Energy Review, May 2006 for electricity, June 2006 for LPG, and August 2006 for natural gas and fuel oil/kerosene.

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 2005

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	\$1,736	2.9%	\$1,829	3.0%	\$1,393	2.3%	\$2,345	3.9%	\$1,593	2.6%	\$2,054	3.4%
Non low income households	\$1,854	2.3%	\$1,934	2.4%	\$1,542	1.9%	\$2,419	3.0%	\$1,783	2.2%	\$2,159	2.7%
Low income households ^{3/}	\$1,480	9.1%	\$1,591	9.8%	\$1,095	6.8%	\$2,155	13.3%	\$1,512	9.3%	\$1,866	11.5%
LIHEAP recipient households ^{4/}	\$1,735	12.8%	\$1,786	13.2%	\$1,319	9.7%	\$2,451	18.1%	\$1,860	13.7%	\$1,819	13.4%
Northeast												
All households	\$2,171	3.3%	\$2,195	3.3%	\$1,607	2.4%	\$2,395	3.6%	\$1,896	2.9%	\$2,434	3.7%
Non low income households	\$2,356	2.6%	\$2,422	2.7%	\$1,846	2.0%	\$2,488	2.8%	\$2,274	2.5%	\$2,653	2.9%
Low income households	\$1,808	10.6%	\$1,814	10.7%	\$1,209	7.1%	\$2,144	12.6%	\$1,637	9.6%	\$1,566*	9.2%
LIHEAP recipient households	\$2,134	15.0%	\$2,107	14.8%	\$1,783	12.6%	\$2,509	17.7%	\$1,890*	13.3%	\$1,856*	13.1%
Midwest												
All households	\$1,806	3.1%	\$1,840	3.1%	\$1,233	2.1%	\$2,063	3.5%	NC	NC	\$2,192	3.7%
Non low income households	\$1,874	2.4%	\$1,887	2.4%	\$1,471	1.9%	\$2,204	2.9%	NC	NC	\$2,208	2.9%
Low income households	\$1,649	10.0%	\$1,717	10.4%	\$860	5.2%	\$1,928	11.7%	NC	NC	\$2,160	13.1%
LIHEAP recipient households	\$1,699	12.6%	\$1,741	12.9%	\$1,255	9.3%	\$1,784*	13.2%	NC	NC	\$2,124	15.7%
South												
All households	\$1,726	3.0%	\$1,937	3.4%	\$1,524	2.7%	\$2,346	4.1%	\$1,395	2.5%	\$1,919	3.4%
Non low income households	\$1,847	2.5%	\$2,087	2.8%	\$1,633	2.2%	\$2,225	3.0%	\$899*	1.2%	\$2,088	2.8%
Low income households	\$1,457	9.9%	\$1,603	10.9%	\$1,269	8.6%	\$2,823*	19.2%	\$1,507	10.3%	\$1,655	11.3%
LIHEAP recipient households	\$1,541	13.4%	\$1,589	13.8%	\$1,430	12.4%	\$2,647*	23.0%	\$1,167*	10.1%	\$1,566	13.6%
West												
All households	\$1,301	2.0%	\$1,421	2.2%	\$1,014	1.6%	\$1,827*	2.8%	\$1,436*	2.2%	\$1,901	3.0%
Non low income households	\$1,420	1.7%	\$1,513	1.8%	\$1,171	1.4%	\$1,827*	2.2%	\$1,768*	2.1%	\$1,922	2.3%
Low income households	\$1,049	6.0%	\$1,188	6.8%	\$768	4.4%	NC	NC	\$1,227	7.0%	\$1,865	10.6%
LIHEAP recipient households	\$1,120	7.3%	\$1,192	7.8%	\$728	4.8%	\$1,540*	10.1%	NC	NC	\$1,942*	12.7%

^{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 2005. 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 2005 CPS ASEC, which reports income for calendar year 2004. 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 2506(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 2005

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	\$1,736	6.8%	\$1,829	6.9%	\$1,393	5.9%	\$2,345	8.1%	\$1,593	15.9%	\$2,054	8.5%
Non low income households	\$1,854	3.2%	\$1,934	3.2%	\$1,542	2.8%	\$2,419	4.0%	\$1,783	3.9%	\$2,159	4.5%
Low income households ^{3/}	\$1,480	14.6%	\$1,591	15.4%	\$1,095	12.2%	\$2,155	18.6%	\$1,512	21.1%	\$1,866	15.7%
LIHEAP recipient households ^{4/}	\$1,735	20.2%	\$1,786	21.1%	\$1,319	16.0%	\$2,451	24.0%	\$1,860	27.3%	\$1,819	22.5%
Northeast												
All households	\$2,171	8.9%	\$2,195	10.1%	\$1,607	6.1%	\$2,395	8.0%	\$1,896	16.8%	\$2,434	6.4%
Non low income households	\$2,356	3.8%	\$2,422	3.8%	\$1,846	3.0%	\$2,488	4.2%	\$2,274	4.8%	\$2,653	3.9%
Low income households	\$1,808	18.9%	\$1,814	20.7%	\$1,209	11.3%	\$2,144	18.2%	\$1,637	24.9%	\$1,566*	16.1%
LIHEAP recipient households	\$2,134	24.8%	\$2,107	26.2%	\$1,783	23.8%	\$2,509	23.9%	\$1,890*	28.1%	\$1,856*	13.3%
Midwest												
All households	\$1,806	6.6%	\$1,840	6.2%	\$1,233	6.8%	\$2,063	12.2%	NC	NC	\$2,192	8.4%
Non low income households	\$1,874	3.3%	\$1,887	3.2%	\$1,471	2.6%	\$2,204	4.0%	NC	NC	\$2,208	4.7%
Low income households	\$1,649	14.3%	\$1,717	14.0%	\$860	13.4%	\$1,928	20.1%	NC	NC	\$2,160	15.2%
LIHEAP recipient households	\$1,699	17.4%	\$1,741	16.9%	\$1,255	11.6%	\$1,784*	14.7%	NC	NC	\$2,124	28.1%
South												
All households	\$1,726	7.1%	\$1,937	7.6%	\$1,524	6.3%	\$2,346	6.3%	\$1,395	15.8%	\$1,919	9.3%
Non low income households	\$1,847	3.2%	\$2,087	3.5%	\$1,633	3.0%	\$2,225	3.1%	\$899*	2.5%	\$2,088	4.6%
Low income households	\$1,457	15.7%	\$1,603	16.8%	\$1,269	14.2%	\$2,823*	18.7%	\$1,507	18.8%	\$1,655	16.6%
LIHEAP recipient households	\$1,541	20.3%	\$1,589	24.2%	\$1,430	17.7%	\$2,647*	31.7%	\$1,167*	10.6%	\$1,566	18.8%
West												
All households	\$1,301	4.7%	\$1,421	4.8%	\$1,014	4.3%	\$1,827*	3.7%	\$1,436*	14.1%	\$1,901	7.6%
Non low income households	\$1,420	2.5%	\$1,513	2.5%	\$1,171	2.2%	\$1,827*	3.7%	\$1,768*	3.5%	\$1,922	3.8%
Low income households	\$1,049	9.4%	\$1,188	10.4%	\$768	7.6%	NC	NC	\$1,227	20.7%	\$1,865	14.2%
LIHEAP recipient households	\$1,120	14.5%	\$1,192	16.0%	\$728	9.9%	\$1,540*	18.5%	NC	NC	\$1,942*	23.0%

^{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 2005. 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 2005 income is estimated by inflating income reported in the 2001 RECS by the consumer price index (CPI) and FY 2005 energy expenditures are estimated by adjusting energy expenditures reported in the 2001 RECS for changes in weather and energy prices. FY 2005 residential energy burden for each household is computed as estimated FY 2005 residential energy expenditures divided by estimated FY 2005 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 2506(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 2005

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	\$1,736	3.7%	\$1,829	3.7%	\$1,393	3.2%	\$2,345	4.5%	\$1,593	9.7%	\$2,054	5.6%
Non low income households	\$1,854	2.8%	\$1,934	2.8%	\$1,542	2.5%	\$2,419	3.7%	\$1,783	3.4%	\$2,159	4.2%
Low income households ^{3/}	\$1,480	8.6%	\$1,591	9.2%	\$1,095	6.8%	\$2,155	11.3%	\$1,512	13.8%	\$1,866	10.9%
LIHEAP recipient households ^{4/}	\$1,735	13.7%	\$1,786	13.8%	\$1,319	10.8%	\$2,451	18.5%	\$1,860	15.8%	\$1,819	13.5%
Northeast												
All households	\$2,171	4.6%	\$2,195	4.8%	\$1,607	3.6%	\$2,395	4.8%	\$1,896	9.7%	\$2,434	3.2%
Non low income households	\$2,356	3.4%	\$2,422	3.3%	\$1,846	2.6%	\$2,488	3.8%	\$2,274	4.4%	\$2,653	3.1%
Low income households	\$1,808	10.2%	\$1,814	10.9%	\$1,209	6.1%	\$2,144	10.8%	\$1,637	10.2%	\$1,566*	10.7%
LIHEAP recipient households	\$2,134	16.2%	\$2,107	17.2%	\$1,783	12.7%	\$2,509	17.3%	\$1,890*	15.8%	\$1,856*	12.3%
Midwest												
All households	\$1,806	3.8%	\$1,840	3.7%	\$1,233	3.2%	\$2,063	6.7%	NC	NC	\$2,192	5.9%
Non low income households	\$1,874	3.0%	\$1,887	2.9%	\$1,471	2.5%	\$2,204	3.6%	NC	NC	\$2,208	4.3%
Low income households	\$1,649	8.9%	\$1,717	8.2%	\$860	6.0%	\$1,928	13.1%	NC	NC	\$2,160	12.3%
LIHEAP recipient households	\$1,699	12.1%	\$1,741	12.5%	\$1,255	9.6%	\$1,784*	14.0%	NC	NC	\$2,124	17.0%
South												
All households	\$1,726	3.9%	\$1,937	4.0%	\$1,524	3.5%	\$2,346	3.7%	\$1,395	11.1%	\$1,919	6.1%
Non low income households	\$1,847	2.9%	\$2,087	3.1%	\$1,633	2.6%	\$2,225	3.4%	\$899*	2.1%	\$2,088	4.6%
Low income households	\$1,457	9.6%	\$1,603	10.4%	\$1,269	8.1%	\$2,823*	13.7%	\$1,507	13.3%	\$1,655	10.8%
LIHEAP recipient households	\$1,541	13.7%	\$1,589	14.0%	\$1,430	11.9%	\$2,647*	31.7%	\$1,167*	10.2%	\$1,566	12.1%
West												
All households	\$1,301	2.8%	\$1,421	2.8%	\$1,014	2.6%	\$1,827*	3.8%	\$1,436*	5.0%	\$1,901	4.9%
Non low income households	\$1,420	2.2%	\$1,513	2.2%	\$1,171	2.0%	\$1,827*	3.8%	\$1,768*	3.4%	\$1,922	3.6%
Low income households	\$1,049	5.4%	\$1,188	6.1%	\$768	4.3%	NC	NC	\$1,227	15.9%	\$1,865	9.0%
LIHEAP recipient households	\$1,120	9.4%	\$1,192	12.6%	\$728	6.7%	\$1,540*	18.5%	NC	NC	\$1,942*	32.9%

^{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 2005. 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 2005 income is estimated by inflating income reported in the 2001 RECS by the consumer price index (CPI) and FY 2005 energy expenditures are estimated by adjusting energy expenditures reported in the 2001 RECS for changes in weather and energy prices. FY 2005 residential energy burden for each household is computed as estimated FY 2005 residential energy expenditures divided by estimated FY 2005 annual income. Median burden is computed by computing the median of the individual values.

^{3/}Households with annual incomes under the maximum in section 2506(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 2005^{1/}

	All Fuels ^{2/}	Natural Gas	Electricity	Fuel Oil	Kerosene	LPG
(In MmBTUs) ^{3/}						
United States						
All households	44.2	57.4	13.4	76.3	43.4	51.8
Non low income households	46.5	59.1	14.7	78.8	52.7	55.2
Low income households ^{4/}	39.8	53.5	10.7	70.0	39.4	45.6
LIHEAP recipient households ^{5/}	57.6	73.4	17.5	95.5	57.9	41.5
Northeast						
All households	67.3	73.4	20.5	78.4	61.4	68.9
Non low income households	72.9	80.6	25.0	81.7	71.8	72.6
Low income households	56.4	61.2	12.9	69.5	54.4	54.0*
LIHEAP recipient households	73.3	79.1	22.0	93.9	59.7*	30.9*
Midwest						
All households	68.2	75.5	22.8	73.0	NC	63.2
Non low income households	69.8	75.8	29.1	73.2	NC	63.6
Low income households	64.6	75.0	12.9	72.8	NC	62.4
LIHEAP recipient households	70.8	86.1	18.0	97.7*	NC	59.8
South						
All households	27.3	43.1	12.0	69.0	29.0	40.4
Non low income households	28.3	44.6	12.4	69.0	23.4*	46.8
Low income households	25.2	39.8	11.0	69.1*	30.3	30.2
LIHEAP recipient households	33.7	50.4	18.9	121.1*	18.2*	25.6
West						
All households	28.0	36.8	11.3	51.2*	42.2*	46.8
Non low income households	30.0	38.0	13.2	51.2*	45.1*	45.6
Low income households	23.6	33.9	8.4	NC	40.3	48.9
LIHEAP recipient households	30.1	37.9	10.0	78.7*	NC	58.4*

^{1/}Developed from the 2001 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy, for FY 2005.

^{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 2005

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	\$592	1.0%	\$673	1.1%	\$305	0.5%	\$1,055	1.7%	\$730	1.2%	\$893	1.5%
Non low income households	\$619	0.8%	\$691	0.9%	\$332	0.4%	\$1,092	1.4%	\$866	1.1%	\$965	1.2%
Low income households ^{3/}	\$534	3.3%	\$632	3.9%	\$252	1.6%	\$961	5.9%	\$672	4.2%	\$764	4.7%
LIHEAP recipient households ^{4/}	\$754	5.6%	\$820	6.1%	\$425	3.1%	\$1,314	9.7%	\$954	7.0%	\$733	5.4%
Northeast												
All households	\$969	1.5%	\$1,002	1.5%	\$618	0.9%	\$1,078	1.6%	\$982	1.5%	\$1,299	2.0%
Non low income households	\$1,044	1.2%	\$1,087	1.2%	\$726	0.8%	\$1,126	1.2%	\$1,159	1.3%	\$1,409	1.6%
Low income households	\$821	4.8%	\$858	5.0%	\$438	2.6%	\$950	5.6%	\$861	5.1%	\$862*	5.1%
LIHEAP recipient households	\$1,054	7.4%	\$1,074	7.6%	\$716	5.0%	\$1,289	9.1%	\$983*	6.9%	\$676*	4.8%
Midwest												
All households	\$763	1.3%	\$780	1.3%	\$470	0.8%	\$980	1.7%	NC	NC	\$986	1.7%
Non low income households	\$773	1.0%	\$778	1.0%	\$570	0.7%	\$988	1.3%	NC	NC	\$1,002	1.3%
Low income households	\$738	4.5%	\$785	4.8%	\$313	1.9%	\$972	5.9%	NC	NC	\$956	5.8%
LIHEAP recipient households	\$745	5.5%	\$794	5.9%	\$410	3.0%	\$1,270*	9.4%	NC	NC	\$966	7.1%
South												
All households	\$427	0.8%	\$555	1.0%	\$270	0.5%	\$1,026	1.8%	\$525	0.9%	\$762	1.3%
Non low income households	\$442	0.6%	\$575	0.8%	\$280	0.4%	\$1,020	1.4%	\$411*	0.5%	\$877	1.2%
Low income households	\$394	2.7%	\$510	3.5%	\$248	1.7%	\$1,049*	7.1%	\$551	3.7%	\$582	4.0%
LIHEAP recipient households	\$536	4.7%	\$584	5.1%	\$421	3.7%	\$1,723*	15.0%	\$313*	2.7%	\$528	4.6%
West												
All households	\$360	0.6%	\$413	0.6%	\$237	0.4%	\$703*	1.1%	\$722*	1.1%	\$828	1.3%
Non low income households	\$390	0.5%	\$436	0.5%	\$276	0.3%	\$703*	0.8%	\$748*	0.9%	\$834	1.0%
Low income households	\$295	1.7%	\$354	2.0%	\$177	1.0%	NC	NC	\$706	4.0%	\$818	4.7%
LIHEAP recipient households	\$396	2.6%	\$428	2.8%	\$214	1.4%	\$1,086*	7.1%	NC	NC	\$931*	6.1%

^{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 2005. 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 2005 CPS ASEC, which reports income for calendar year 2004. 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 2506(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 2005

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	\$592	2.5%	\$673	2.9%	\$305	1.4%	\$1,055	3.6%	\$730	7.8%	\$893	3.5%
Non low income households	\$619	1.1%	\$691	1.2%	\$332	0.6%	\$1,092	1.9%	\$866	1.9%	\$965	2.0%
Low income households ^{3/}	\$534	5.5%	\$632	6.6%	\$252	3.0%	\$961	8.1%	\$672	10.3%	\$764	6.2%
LIHEAP recipient households ^{4/}	\$754	9.4%	\$820	10.2%	\$425	5.5%	\$1,314	13.7%	\$954	13.9%	\$733	11.1%
Northeast												
All households	\$969	4.3%	\$1,002	5.2%	\$618	2.4%	\$1,078	3.5%	\$982	10.0%	\$1,299	3.3%
Non low income households	\$1,044	1.7%	\$1,087	1.7%	\$726	1.2%	\$1,126	2.0%	\$1,159	2.6%	\$1,409	2.1%
Low income households	\$821	9.2%	\$858	10.9%	\$438	4.2%	\$950	7.6%	\$861	15.1%	\$862*	7.7%
LIHEAP recipient households	\$1,054	13.1%	\$1,074	13.9%	\$716	12.5%	\$1,289	13.2%	\$983*	14.4%	\$676*	3.2%
Midwest												
All households	\$763	3.0%	\$780	2.9%	\$470	2.3%	\$980	6.1%	NC	NC	\$986	3.7%
Non low income households	\$773	1.4%	\$778	1.4%	\$570	1.0%	\$988	1.8%	NC	NC	\$1,002	2.3%
Low income households	\$738	6.4%	\$785	6.7%	\$313	4.3%	\$972	10.2%	NC	NC	\$956	6.3%
LIHEAP recipient households	\$745	8.1%	\$794	8.0%	\$410	3.7%	\$1,270*	10.5%	NC	NC	\$966	14.7%
South												
All households	\$427	2.0%	\$555	2.5%	\$270	1.3%	\$1,026	2.8%	\$525	6.3%	\$762	3.5%
Non low income households	\$442	0.8%	\$575	1.0%	\$280	0.5%	\$1,020	1.4%	\$411*	1.0%	\$877	1.9%
Low income households	\$394	4.6%	\$510	5.7%	\$248	3.2%	\$1,049*	8.1%	\$551	7.5%	\$582	6.0%
LIHEAP recipient households	\$536	8.3%	\$584	11.0%	\$421	5.0%	\$1,723*	20.6%	\$313*	2.4%	\$528	9.0%
West												
All households	\$360	1.4%	\$413	1.5%	\$237	1.0%	\$703*	1.5%	\$722*	6.8%	\$828	3.3%
Non low income households	\$390	0.7%	\$436	0.8%	\$276	0.5%	\$703*	1.5%	\$748*	1.5%	\$834	1.7%
Low income households	\$295	2.8%	\$354	3.3%	\$177	1.8%	NC	NC	\$706	10.2%	\$818	6.1%
LIHEAP recipient households	\$396	5.1%	\$428	5.7%	\$214	2.8%	\$1,086*	13.0%	NC	NC	\$931*	10.8%

^{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 2005. 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 2005 income is estimated by inflating income reported in the 2001 RECS by the consumer price index (CPI) and FY 2005 energy expenditures are estimated by adjusting energy expenditures reported in the 2001 RECS for changes in weather and energy prices. FY 2005 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 2506(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 2005

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	\$592	1.1%	\$673	1.3%	\$305	0.6%	\$1,055	2.0%	\$730	4.3%	\$893	2.3%
Non low income households	\$619	0.8%	\$691	1.0%	\$332	0.4%	\$1,092	1.6%	\$866	1.6%	\$965	1.7%
Low income households ^{3/}	\$534	2.6%	\$632	3.2%	\$252	1.5%	\$961	5.4%	\$672	5.1%	\$764	4.6%
LIHEAP recipient households ^{4/}	\$754	5.5%	\$820	6.3%	\$425	3.1%	\$1,314	9.8%	\$954	10.8%	\$733	5.3%
Northeast												
All households	\$969	1.9%	\$1,002	2.1%	\$618	1.3%	\$1,078	2.0%	\$982	4.3%	\$1,299	2.0%
Non low income households	\$1,044	1.4%	\$1,087	1.4%	\$726	0.9%	\$1,126	1.6%	\$1,159	2.0%	\$1,409	1.8%
Low income households	\$821	4.6%	\$858	5.0%	\$438	2.1%	\$950	5.3%	\$861	6.3%	\$862*	7.0%
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Midwest												
All households	\$763	1.5%	\$780	1.5%	\$470	1.1%	\$980	3.1%	NC	NC	\$986	2.5%
Non low income households	\$773	1.2%	\$778	1.2%	\$570	0.8%	\$988	1.8%	NC	NC	\$1,002	1.7%
Low income households	\$738	3.7%	\$785	3.6%	\$313	2.2%	\$972	5.6%	NC	NC	\$956	5.0%
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South												
All households	\$427	0.8%	\$555	1.1%	\$270	0.5%	\$1,026	1.7%	\$525	4.7%	\$762	2.2%
Non low income households	\$442	0.5%	\$575	0.8%	\$280	0.4%	\$1,020	1.3%	\$411*	0.4%	\$877	1.7%
Low income households	\$394	2.3%	\$510	3.2%	\$248	1.4%	\$1,049*	4.3%	\$551	5.0%	\$582	3.8%
LIHEAP recipient households	\$536	4.1%	\$584	6.1%	\$421	3.2%	\$1,723*	20.6%	\$313*	0.7%	\$528	4.4%
West												
All households	\$360	0.6%	\$413	0.7%	\$237	0.5%	\$703*	1.3%	\$722*	2.2%	\$828	2.2%
Non low income households	\$390	0.5%	\$436	0.5%	\$276	0.4%	\$703*	1.3%	\$748*	1.2%	\$834	1.2%
Low income households	\$295	1.3%	\$354	1.6%	\$177	0.8%	NC	NC	\$706	12.3%	\$818	3.8%
LIHEAP recipient households	\$396	2.4%	\$428	3.9%	\$214	1.6%	\$1,086*	13.0%	NC	NC	\$931*	17.2%

^{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 2005. 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 2005 income is estimated by inflating income reported in the 2001 RECS by the consumer price index (CPI) and FY 2005 energy expenditures are estimated by adjusting energy expenditures reported in the 2001 RECS for changes in weather and energy prices. FY 2005 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 2506(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 2005

	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%	7.6	\$209	0.3%	0.7%	0.3%
Non low income households	90.6%	8.4	\$232	0.3%	0.4%	0.3%
Low income households ^{4/}	81.5%	5.6	\$153	0.9%	1.5%	0.7%
LIHEAP recipient households ^{5/}	83.0%	4.4	\$123	0.9%	1.3%	0.7%
Northeast						
All households	83.5%	3.7	\$135	0.2%	0.4%	0.2%
Non low income households	87.1%	4.3	\$155	0.2%	0.2%	0.1%
Low income households	76.3%	2.4	\$91	0.5%	0.9%	0.4%
LIHEAP recipient households	72.6%	2.4	\$88	0.6%	0.9%	0.3%
Midwest						
All households	92.3%	5.6	\$146	0.2%	0.4%	0.3%
Non low income households	95.0%	6.3	\$163	0.2%	0.3%	0.2%
Low income households	86.2%	3.9	\$102	0.6%	0.9%	0.4%
LIHEAP recipient households	87.2%	4.3	\$116	0.9%	1.1%	0.5%
South						
All households	97.8%	12.3	\$323	0.6%	1.2%	0.6%
Non low income households	99.3%	13.6	\$357	0.5%	0.6%	0.5%
Low income households	94.5%	9.4	\$242	1.6%	2.5%	1.4%
LIHEAP recipient households	97.3%	7.4	\$194	1.7%	2.3%	1.8%
West						
All households	69.6%	3.4	\$105	0.2%	0.3%	0.1%
Non low income households	73.8%	3.7	\$118	0.1%	0.2%	0.1%
Low income households	60.6%	2.5	\$73	0.4%	0.6%	0.2%
LIHEAP recipient households	71.6%	1.7	\$41	0.3%	0.6%	0.2%

^{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 2005. 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 2506(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. ACF has further developed targeting performance indicators to support measurement of LIHEAP targeting at the grantee level. For the last five 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 2005 were developed using the CPS ASEC. 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 2005 numbers of LIHEAP income eligible households in the population and eligible households in various vulnerability and poverty groups, averages derived from the 2004, 2005, and 2006 CPS ASEC were used.

Table B-1, on the next page, shows the number of LIHEAP income eligible households (Federal Maximum Income Standard) by vulnerability group for each state. For example, it shows that 600,734 households in Alabama were eligible for the LIHEAP program and that 217,069 of those households had an elderly member. Table B-2, on the second page following, shows the number of LIHEAP income eligible households (State Income Standards) by vulnerability group for each state. Table B-3, on the third page following, shows the number of LIHEAP income eligible households (Federal Maximum Income Standard) by poverty level for each state. Table B-4, on the fourth page following, shows the number of LIHEAP income eligible households (State Income Standards) by poverty level for each state.

LIHEAP Home Energy Notebook for FY 2005: Appendix B: Income Eligible Household Estimates

Table B-1. Average of 2004, 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/}

(Three-year Average of the CPS ASEC 2004-2006.)

State	Total number of LIHEAP eligible households	LIHEAP eligible households by vulnerability category ^{3/}			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 ^{4/}	
Alabama	600,734	217,069	105,236	238,709	167,062
Alaska	66,252	16,340	17,349	20,275	21,580
Arizona	630,952	200,925	174,240	141,827	187,273
Arkansas	317,014	129,556	61,122	108,666	77,603
California	3,958,490	1,347,769	886,401	1,056,836	1,231,682
Colorado	517,736	162,473	109,620	96,613	191,809
Connecticut	484,460	211,070	71,091	136,348	132,769
Delaware	93,727	37,236	18,134	26,027	26,142
District of Columbia	73,715	25,846	10,894	23,386	23,916
Florida	2,018,167	894,859	300,946	469,257	584,488
Georgia	982,007	304,195	224,299	290,714	314,995
Hawaii	113,530	50,120	22,445	27,149	29,668
Idaho	119,667	41,024	31,612	26,542	33,999
Illinois	1,558,115	628,540	299,628	330,977	440,355
Indiana	759,509	286,276	157,112	197,342	211,218
Iowa	342,939	143,685	59,305	79,513	98,469
Kansas	327,574	120,928	60,682	81,354	102,453
Kentucky	538,702	207,854	100,144	208,458	126,622
Louisiana	524,000	190,553	112,708	162,430	150,342
Maine	163,751	72,184	20,381	55,509	37,804
Maryland	672,601	272,138	117,258	148,587	205,034
Massachusetts	875,467	381,457	111,862	257,279	239,524
Michigan	1,298,359	484,877	246,970	368,809	383,381
Minnesota	541,085	231,042	80,979	108,990	163,535
Mississippi	323,616	129,833	67,069	137,534	67,122
Missouri	693,746	301,131	113,298	200,005	177,042
Montana	112,292	37,300	19,157	31,172	38,317
Nebraska	202,317	83,021	36,708	39,534	63,818
Nevada	240,158	88,904	47,928	56,181	72,358
New Hampshire	137,076	67,681	17,609	28,759	37,408
New Jersey	1,071,029	484,503	169,468	220,179	302,374
New Mexico	207,303	66,119	45,941	62,612	62,870
New York	2,547,099	1,013,347	409,670	718,158	740,909
North Carolina	1,074,401	433,059	206,292	333,404	294,791
North Dakota	71,862	27,497	11,561	12,418	25,323
Ohio	1,401,663	531,712	262,647	400,635	398,374
Oklahoma	411,074	157,694	85,541	116,670	113,284
Oregon	430,675	170,535	81,916	102,923	130,007
Pennsylvania	1,570,151	738,060	227,809	407,031	401,872
Rhode Island	137,883	55,869	22,586	42,609	34,533
South Carolina	511,577	210,129	93,436	174,128	128,872
South Dakota	88,670	38,778	14,496	19,177	27,067
Tennessee	750,840	298,983	128,804	268,815	189,891
Texas	2,587,585	825,691	681,520	662,850	802,090
Utah	181,429	47,907	57,997	32,063	56,492
Vermont	69,773	30,129	9,905	21,119	19,003
Virginia	805,657	312,999	144,937	209,531	248,601
Washington	715,966	261,684	142,671	176,592	218,295
West Virginia	212,648	94,280	33,171	93,004	42,446
Wisconsin	665,793	277,244	110,785	144,683	202,684
Wyoming	49,305	19,490	9,868	12,045	14,476
All States	34,850,141	13,461,595	6,653,208	9,385,428	10,092,042

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

^{4/}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, Supplemental Security 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 Medicare benefits during the past year.

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Table B-2. Average of 2004, 2005, and 2006 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 2004-2006.)

State	State Income Guidelines for 4-Person Household as % of HHS Poverty Guidelines	Total number of LIHEAP eligible households	LIHEAP eligible households by vulnerability category ^{3/}			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 ^{4/}	
Alabama	125	401,390	128,154	84,540	174,989	102,911
Alaska	150	50,064	11,311	14,319	16,137	15,494
Arizona	150	467,041	151,668	132,093	109,577	133,202
Arkansas	125	227,072	88,654	47,119	82,326	53,017
California	^{5/} 209	3,958,490	1,347,769	886,401	1,056,836	1,231,682
Colorado	185	395,076	123,610	88,146	82,022	137,984
Connecticut	^{6/} 150	299,093	149,829	42,474	107,452	53,621
Delaware	200	74,458	29,222	15,697	21,712	18,966
District of Columbia	150	60,255	20,351	9,544	20,392	18,655
Florida	150	1,474,279	625,939	240,865	367,748	423,796
Georgia	150	670,013	212,012	165,959	228,829	183,254
Hawaii	150	84,403	38,037	15,870	23,001	20,835
Idaho	150	92,196	29,336	26,319	21,804	25,876
Illinois	150	912,503	353,438	189,600	226,734	241,977
Indiana	125	372,993	119,772	91,049	122,592	95,180
Iowa	150	218,233	87,267	41,604	61,634	58,677
Kansas	130	168,805	54,055	34,194	53,163	51,199
Kentucky	110	297,827	100,030	61,530	132,835	67,985
Louisiana	^{5/} 166	524,000	190,553	112,708	162,430	150,342
Maine	^{7/} 150	133,051	63,896	16,477	47,000	26,109
Maryland	150	332,592	147,100	56,290	92,024	80,544
Massachusetts	^{8/} 200	662,618	301,132	83,467	218,015	155,512
Michigan	110	499,991	141,887	111,425	199,104	135,519
Minnesota	^{5/} 192	422,042	187,550	58,594	99,159	115,121
Mississippi	150	310,935	123,882	66,336	133,323	62,791
Missouri	125	348,840	130,403	67,953	119,850	83,381
Montana	150	97,697	32,569	17,286	27,966	31,484
Nebraska	116	87,928	29,431	17,847	22,961	29,215
Nevada	150	161,510	56,765	35,977	40,008	46,527
New Hampshire	185	89,219	46,533	11,274	19,849	20,607
New Jersey	175	596,873	284,084	100,831	147,353	140,359
New Mexico	150	199,807	62,282	45,295	60,783	60,127
New York	^{5/} 208	2,547,099	1,013,347	409,670	718,158	740,909
North Carolina	110	537,182	189,119	113,506	197,566	149,819
North Dakota	^{5/} 182	71,862	27,497	11,561	12,418	25,323
Ohio	150	880,632	299,158	193,271	294,039	234,847
Oklahoma	110	206,186	67,670	50,910	73,179	50,644
Oregon	^{5/} 192	430,675	170,535	81,916	102,923	130,007
Pennsylvania	135	807,490	336,859	137,574	256,008	195,888
Rhode Island	^{5/} 215	137,883	55,869	22,586	42,609	34,533
South Carolina	150	395,176	161,857	78,334	145,328	88,395
South Dakota	160	71,042	31,106	12,030	16,414	20,657
Tennessee	125	456,228	166,386	84,160	173,713	116,954
Texas	125	1,638,299	479,826	457,723	471,015	488,000
Utah	125	82,614	16,798	29,530	19,784	25,229
Vermont	125	31,556	12,735	4,787	10,746	7,804
Virginia	130	365,519	145,179	68,798	113,946	97,453
Washington	125	325,365	106,590	79,511	96,458	85,337
West Virginia	130	162,833	64,520	27,424	74,651	34,958
Wisconsin	150	390,522	149,120	69,636	97,812	120,769
Wyoming	150	34,932	13,225	7,221	9,341	9,664
All States	Not applicable	24,264,389	8,975,917	4,929,231	7,225,716	6,729,139

^{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 were obtained from DEA/OCS/ACF.

^{3/}A household can be counted under more than one vulnerability category.

^{4/}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, Supplemental Security 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 Medicare benefits in the past year.

^{5/}These States use a percent of state median income. The figures reported are the conversion to a percent of the HHS poverty guidelines.

^{6/}200 percent of the HHS Poverty Guidelines if someone in the household is disabled or a senior.

^{7/}55 percent of the State Median income 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 exceeds 60 percent of the state median income.

LIHEAP Home Energy Notebook for FY 2005: Appendix B: Income Eligible Household Estimates

Table B-3. Average of 2004, 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/}

(Three-year Average of CPS ASEC 2004-2006.)

State	Total number of LIHEAP eligible households	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	600,734	296,541	104,849	82,391	116,953
Alaska	66,252	27,215	10,342	12,506	16,188
Arizona	630,952	251,845	110,990	104,206	163,911
Arkansas	317,014	155,999	71,073	65,449	24,493
California	3,958,490	1,279,948	662,683	641,026	1,374,834
Colorado	517,736	164,636	64,470	75,076	213,554
Connecticut	484,460	127,959	56,107	53,125	247,268
Delaware	93,727	22,355	11,380	12,183	47,810
District of Columbia	73,715	37,919	12,464	9,872	13,460
Florida	2,018,167	772,872	329,721	371,686	543,887
Georgia	982,007	389,828	136,334	143,850	311,994
Hawaii	113,530	47,561	19,381	17,460	29,127
Idaho	119,667	41,888	24,214	26,095	27,471
Illinois	1,558,115	510,201	202,017	200,284	645,612
Indiana	759,509	260,257	112,736	123,311	263,205
Iowa	342,939	112,757	51,881	53,595	124,706
Kansas	327,574	120,355	37,302	55,224	114,693
Kentucky	538,702	256,882	101,464	97,816	82,540
Louisiana	524,000	266,644	96,598	96,864	63,894
Maine	163,751	58,336	28,686	29,194	47,535
Maryland	672,601	190,016	65,143	77,433	340,009
Massachusetts	875,467	255,899	103,798	115,325	400,445
Michigan	1,298,359	440,274	160,888	182,789	514,408
Minnesota	541,085	137,924	63,730	62,215	277,215
Mississippi	323,616	179,242	60,994	70,699	12,680
Missouri	693,746	233,370	115,470	117,961	226,944
Montana	112,292	52,435	22,961	22,300	14,596
Nebraska	202,317	66,624	31,109	35,330	69,253
Nevada	240,158	81,799	35,827	43,884	78,648
New Hampshire	137,076	30,109	16,840	16,269	73,857
New Jersey	1,071,029	254,038	104,373	121,498	591,119
New Mexico	207,303	112,211	43,410	44,186	7,496
New York	2,547,099	1,016,900	334,080	327,163	868,957
North Carolina	1,074,401	462,329	210,043	162,825	239,205
North Dakota	71,862	27,981	13,106	13,972	16,803
Ohio	1,401,663	488,923	189,242	202,466	521,031
Oklahoma	411,074	177,038	78,338	82,143	73,554
Oregon	430,675	152,257	73,883	82,347	122,188
Pennsylvania	1,570,151	505,836	206,480	233,991	623,844
Rhode Island	137,883	46,990	18,356	20,253	52,284
South Carolina	511,577	227,198	86,781	81,197	116,400
South Dakota	88,670	33,271	15,507	16,225	23,667
Tennessee	750,840	329,341	126,887	124,959	169,653
Texas	2,587,585	1,184,660	453,639	418,473	530,814
Utah	181,429	59,983	22,631	32,368	66,447
Vermont	69,773	20,244	11,312	12,427	25,790
Virginia	805,657	242,403	100,043	104,962	358,250
Washington	715,966	232,230	93,135	104,452	286,150
West Virginia	212,648	109,023	43,798	46,311	13,516
Wisconsin	665,793	205,285	86,593	98,644	275,271
Wyoming	49,305	17,925	8,449	8,558	14,373
All States	34,850,141	12,775,756	5,241,538	5,354,838	11,478,002

^{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.

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Table B-4. Average of 2004, 2005, and 2006 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 2004-2006.)

State	State Income Guidelines for 4-Person Household as % of HHS Poverty Guidelines	Total number of LIHEAP eligible Households	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	401,390	296,541	104,849	0	0
Alaska	150	50,064	27,215	10,342	12,506	0
Arizona	150	467,041	251,845	110,990	104,206	0
Arkansas	125	227,072	155,999	71,073	0	0
California	^{3/} 209	3,958,490	1,279,948	662,683	641,026	1,374,834
Colorado	185	395,076	164,636	64,470	75,076	90,894
Connecticut	^{4/} 150	299,093	127,959	56,107	53,125	61,901
Delaware	200	74,458	22,355	11,380	12,183	28,540
District of Columbia	150	60,255	37,919	12,464	9,872	0
Florida	150	1,474,279	772,872	329,721	371,686	0
Georgia	150	670,013	389,828	136,334	143,850	0
Hawaii	150	84,403	47,561	19,381	17,460	0
Idaho	150	92,196	41,888	24,214	26,095	0
Illinois	150	912,503	510,201	202,017	200,284	0
Indiana	125	372,993	260,257	112,736	0	0
Iowa	150	218,233	112,757	51,881	53,595	0
Kansas	130	168,805	120,355	37,302	11,148	0
Kentucky	110	297,827	256,882	40,945	0	0
Louisiana	^{3/} 166	524,000	266,644	96,598	96,864	63,894
Maine	^{5/} 150	133,051	58,336	28,686	29,194	16,834
Maryland	150	332,592	190,016	65,143	77,433	0
Massachusetts	^{6/} 200	662,618	255,899	103,798	115,325	187,596
Michigan	110	499,991	440,274	59,717	0	0
Minnesota	^{3/} 192	422,042	137,924	63,730	61,404	158,984
Mississippi	150	310,935	179,242	60,994	70,699	0
Missouri	125	348,840	233,370	115,470	0	0
Montana	150	97,697	52,435	22,961	22,300	0
Nebraska	116	87,928	66,624	21,304	0	0
Nevada	150	161,510	81,799	35,827	43,884	0
New Hampshire	185	89,219	30,109	16,840	16,269	26,000
New Jersey	175	596,873	254,038	104,373	121,498	116,964
New Mexico	150	199,807	112,211	43,410	44,186	0
New York	^{3/} 208	2,547,099	1,016,900	334,080	327,163	868,957
North Carolina	110	537,182	462,329	74,854	0	0
North Dakota	^{3/} 182	71,862	27,981	13,106	13,972	16,803
Ohio	150	880,632	488,923	189,242	202,466	0
Oklahoma	110	206,186	177,038	29,147	0	0
Oregon	^{3/} 192	430,675	152,257	73,883	82,347	122,188
Pennsylvania	135	807,490	505,836	206,480	95,175	0
Rhode Island	^{3/} 215	137,883	46,990	18,356	20,253	52,284
South Carolina	150	395,176	227,198	86,781	81,197	0
South Dakota	160	71,042	33,271	15,507	16,225	6,039
Tennessee	125	456,228	329,341	126,887	0	0
Texas	125	1,638,299	1,184,660	453,639	0	0
Utah	125	82,614	59,983	22,631	0	0
Vermont	125	31,556	20,244	11,312	0	0
Virginia	130	365,519	242,403	100,043	23,074	0
Washington	125	325,365	232,230	93,135	0	0
West Virginia	130	162,833	109,023	43,798	10,013	0
Wisconsin	150	390,522	205,285	86,593	98,644	0
Wyoming	150	34,932	17,925	8,449	8,558	0
Entire U.S.	Not applicable	24,264,389	12,775,756	4,885,663	3,410,255	3,192,712

^{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 were obtained from DEA/OCS/ACF.

^{3/}These States use a percent of state median income. The figures reported are the conversion to a percent of the HHS poverty guidelines.

^{4/}200 percent of the HHS Poverty Guidelines if someone in the household is disabled or a senior.

^{5/}55 percent of the State Median income 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 exceeds 60 percent of the state median income.