LIHEAP Home Energy Notebook
For Fiscal Year 2004

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Administration for Children and Families
Office of Community Services
Division of Energy Assistance
June 2006

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For Fiscal Year 2004

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June 2006

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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 2004 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 2004 weather and fuel prices.

Residential energy data

In FY 2004, average energy expenditures for all households were $1,564 and the mean individual energy burden was 6.4 percent of income.[1] Low income households had energy expenditures of $1,335, about 15 percent lower than for all households.[2] The energy burden for low income households was 13.7 percent, more than twice the energy burden of all households. LIHEAP recipient households had energy expenditures of $1,545, about 16 percent higher than for all low income households. The energy burden for LIHEAP recipients was 18.9 percent, more than 12 percentage points higher than for all households and more than 5 percentage points higher than for low income households.

Energy prices rose from FY 2003 to FY 2004. The weather in FY 2004 was 7 percent warmer than in FY 2003. As a result, energy expenditures rose moderately (around 2 percent), from $1,527 in FY 2003 to $1,564 in FY 2004.

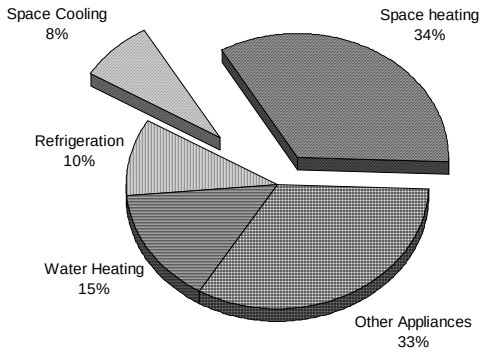
LIHEAP assists households with only that portion of residential energy costs that goes for home energy, i.e., home heating and home cooling. As shown in Figure 1, home heating and home cooling represents about 42 percent of residential energy expenditures for low income households.

[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 10 percent of residential energy expenditures, water heating represents about 15 percent of residential energy expenditures, and other appliances about 33 percent of residential energy expenditures.

Figure 1. Percent of U.S. residential energy expenditures by low income households, by end use, FY 2004



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 $511 and the mean individual home heating burden was 2.2 percent. Low income households had home heating expenditures of $463, about 9 percent lower than for all households. The mean individual home heating burden for low income households was 5.0 percent, more than twice as much as the home heating burden for all households. Home heating expenditures for LIHEAP households were $645, about 39 percent higher than the average for low income households and 26 percent higher than the average for all households. Mean individual home heating burden for LIHEAP households was 8.4 percent, more than 6 percentage points higher than the average for all households and more than 3 percentage points higher than the average for low income households. LIHEAP heating assistance recipients live in colder climates than does the average low income household, accounting for the higher home heating expenditures for LIHEAP households.

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 $172 and the mean individual home cooling burden was 0.6 percent. Low income households had home cooling expenditures of $124, about 28 percent lower than for all households. The mean individual home cooling burden for low income households was 1.2 percent, twice as much as the home cooling burden for all households. Home cooling expenditures for LIHEAP households were $91, which was 27 percent lower than the average for low income households and 47 percent lower than the average for all households. The mean individual home cooling burden for LIHEAP households was 1.0 percent, almost twice as high as the average for all households. LIHEAP cooling recipient households experienced approximately

26 percent fewer cooling degree days in FY 2004 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 2004

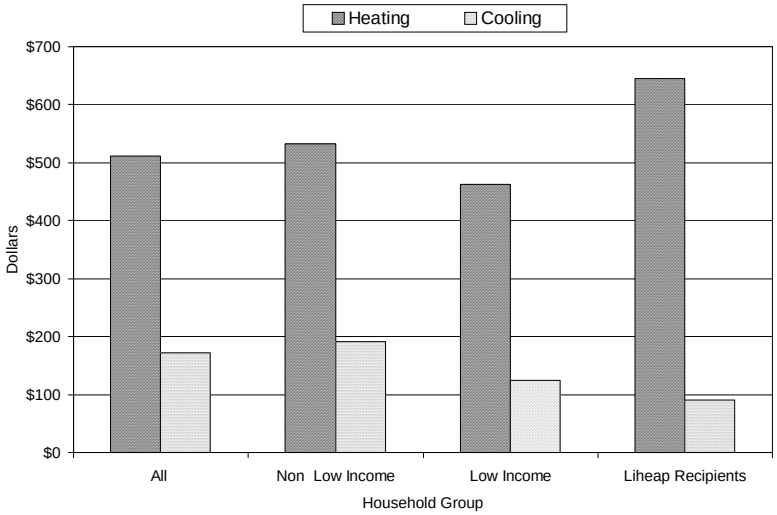
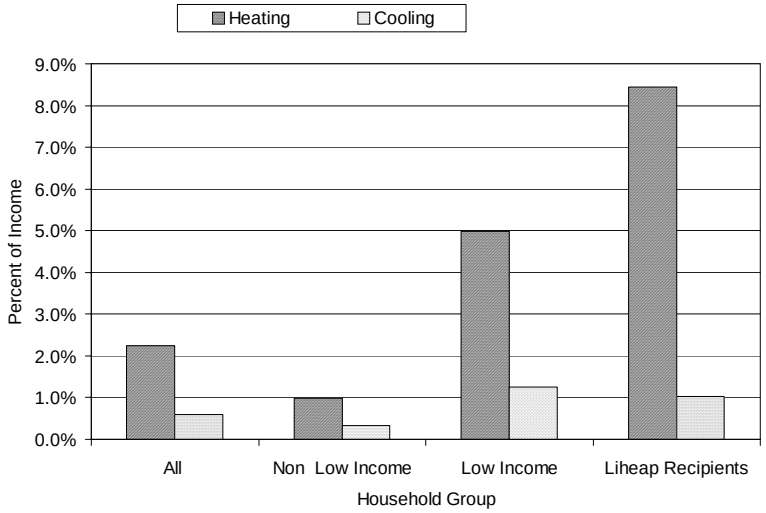


Figure 3. Mean individual burden of heating and cooling expenditures for all households, non low income households, low income households, and LIHEAP recipient households, FY 2004



Low income home energy trends

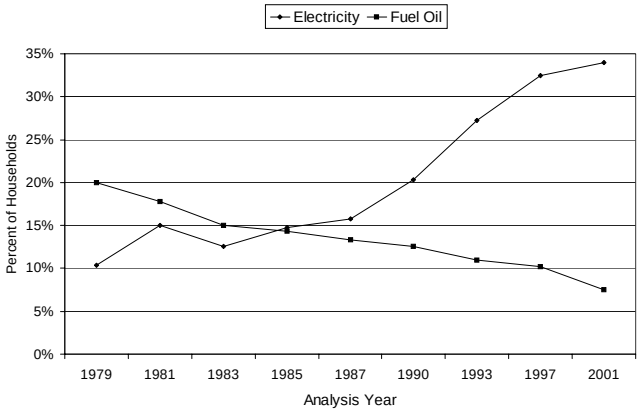
The section presents data on home energy trends for low income households from 1979 through FY 2004.[3] Statistics are derived from the series of national residential energy consumption surveys and from HHS' administrative statistics. The analyses show significant shifts since 1979 in the types of energy and the amount of energy used by low income households.

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

Home heating and cooling trends

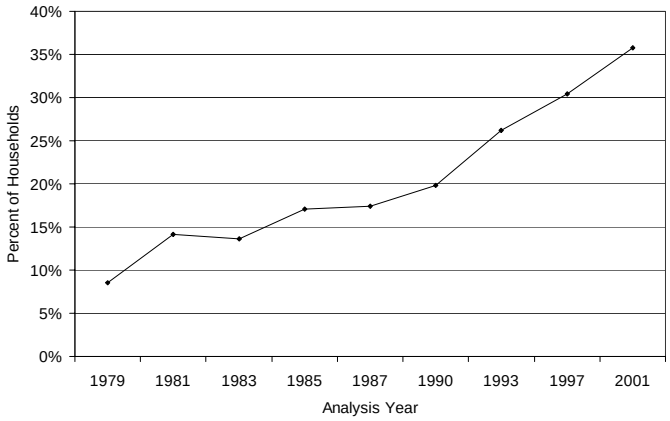
Figure 4 demonstrates that low income households increased their use of electricity as their main heating fuel from 10 percent in 1979 to 34 percent in 2001. In contrast, households using fuel oil as their main heating fuel declined from 20 percent in 1979 to 8 percent in 2001. Natural gas remained the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



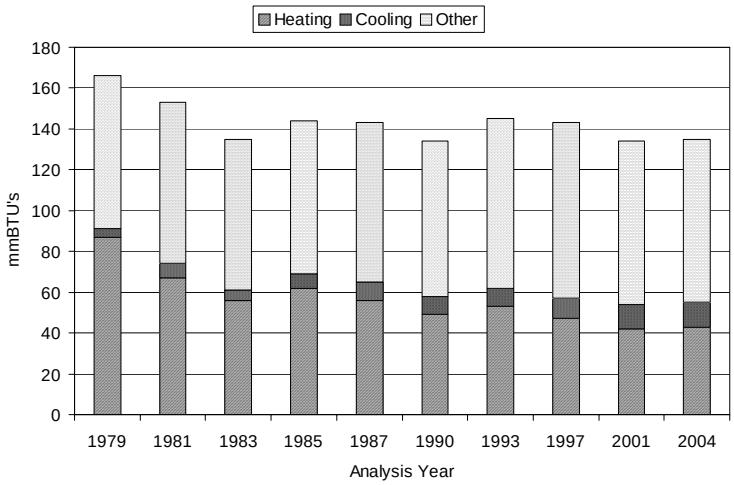
Trends in mean residential consumption, expenditures, and energy burden

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.

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

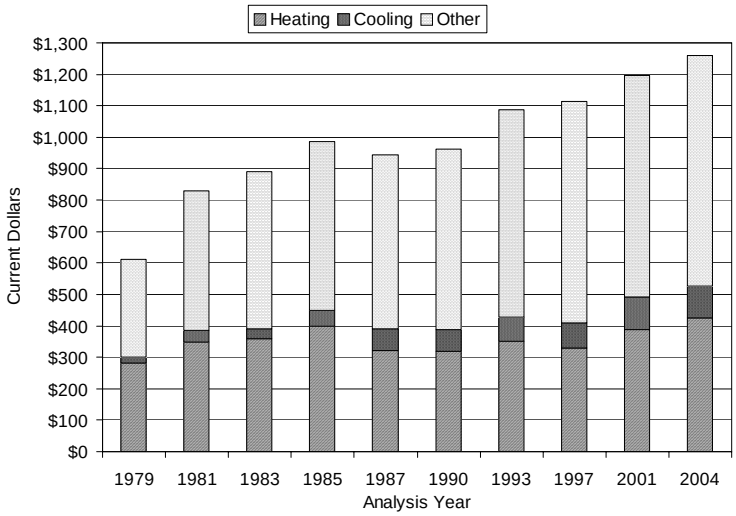
Between 2001 and FY 2004, the use of energy for home heating and home cooling, and for other purposes, appears to have remained stable.

Figure 6. Mean residential energy consumption (in mmBTUs) per low income household, 1979 to FY 2004



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 2004, expenditures for home heating rose by 10 percent, again due to higher fuel prices and colder winter weather. Expenditures on uses other than home heating or home cooling rose continuously from 1979 to FY 2004. Expenditures on cooling rose from 1979 to 2001, and remained relatively constant from 2001 to FY 2004.

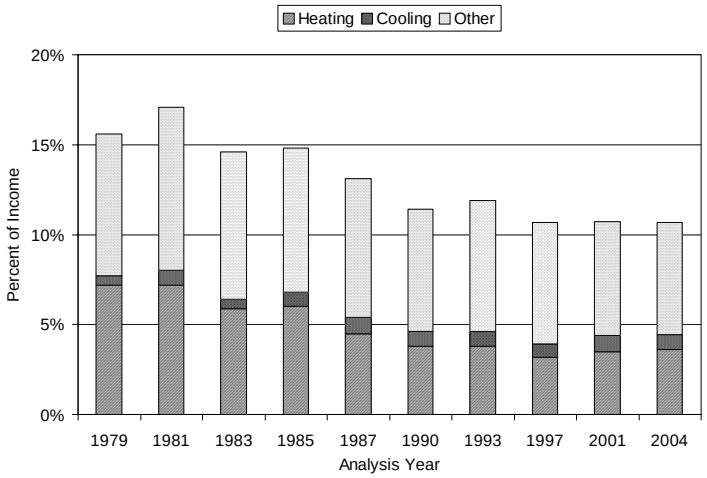
Figure 7. Mean residential energy expenditures for low income households, 1979 to FY 2004



As Figure 8 shows, mean group home energy burden declined from about 8 percent in 1979 to almost 5 percent in FY 2004, a total of over 3 percentage points. The decline in residential energy burden from 1979 to FY 2004 was 5 percentage points (from about 16 percent to about 11 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).

Data on aggregate residential expenditures show that the proportion of expenditures for home energy fell from 50 percent in 1979 to 42 percent in FY 2004. However, the total expenditures for home energy increased 169 percent over the same period, from $4.5 billion in 1979 to $12.1 billion in FY 2004.

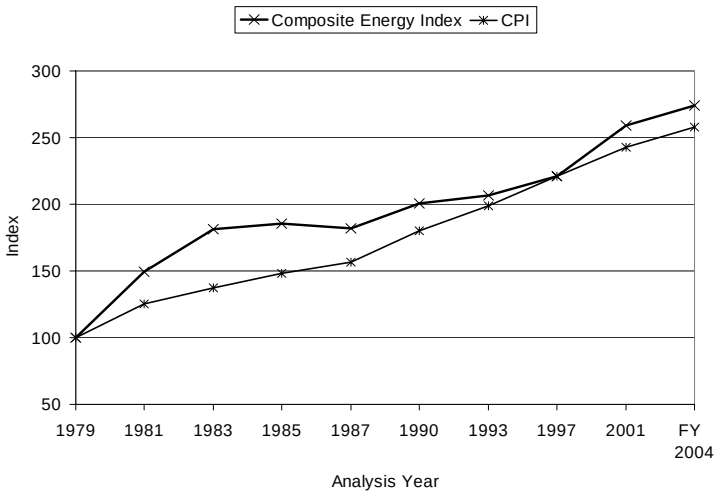
Figure 8. Mean group residential energy burden by end use for households with incomes at or below 150 percent of the poverty income guidelines, 1979 to FY 2004



Analysis of energy trends

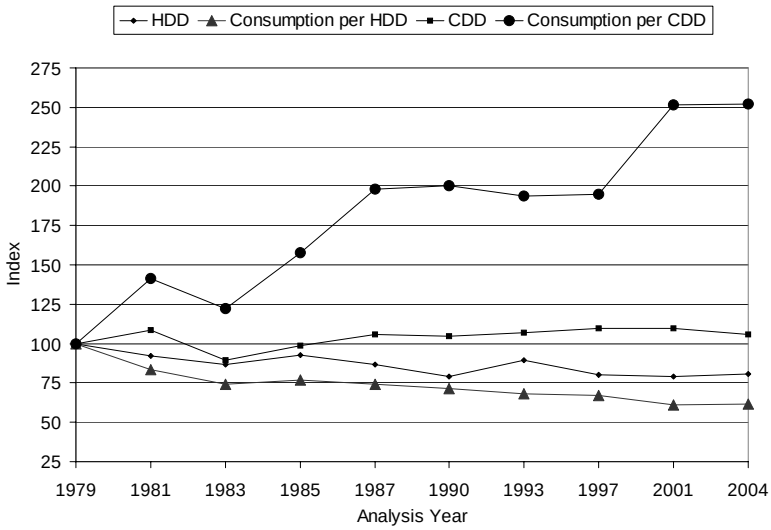
Trends in energy consumption and expenditure are dependent on factors such as energy prices, weather, and energy efficiency. Energy prices outpaced the Consumer Price Index (CPI) from 1979 through 1983, as shown in Figure 9 on the next page. While the CPI increased about 37 percent, the composite average 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 2004, fuel prices increased again. FY 2004 prices were 6 percent higher than 2001 fuel prices. The increases in fuel prices from 2001 through FY 2004 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 2004



For low income households, Figure 10 shows energy consumption for heating and cooling compared to heating and cooling degree days from 1979 to FY 2004. As shown, heating consumption per heating degree day declined continuously as a result of energy conservation efforts. In contrast, cooling consumption per cooling degree day rose sharply over the same period because of a large increase in the availability of air-conditioning to low income households.[5] 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 2004



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 2004,

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

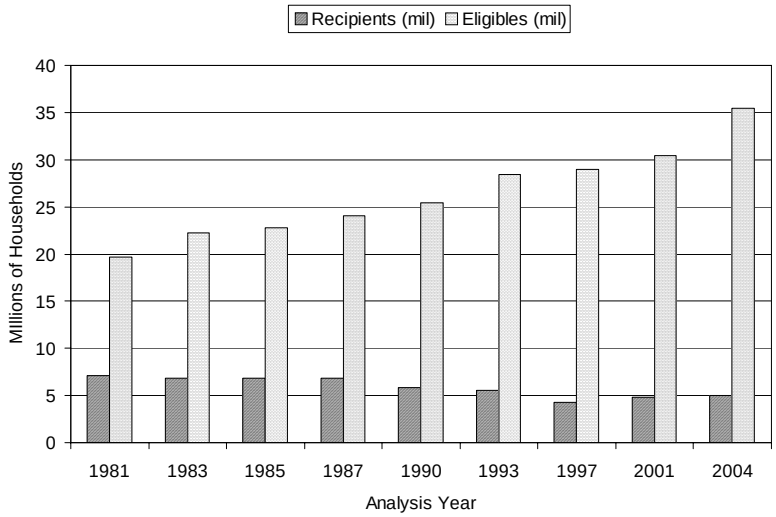
the mean group home energy burden for all income households was 1 percent, while for low income households it was almost 5 percent. Thus, in FY 2004, the mean group burden for low income households was still more than four times higher than that for all households.

Trends in LIHEAP

Between 1981 and FY 2004, as shown in Figure 11, the number of federally eligible households has risen 80 percent; however, Federal fuel assistance funds have declined by 6 percent. As a consequence, the percentage of federally eligible households assisted has declined sharply from 36 percent in 1981 to 14 percent in FY 2004. 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 2004. Cooling benefits per household actually fell until 1985, increased sharply in 1993 and 2001, but fell again in FY 2004. After adjusting for inflation, the mean value of combined Federal heating and winter crisis fell from $213 in 1981 to $132 in FY 2004. Cooling benefits fell from $129 in 1981 to $91 in FY 2004.

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 2004. The decrease resulted from the combination of a larger total home heating bill and a smaller amount of assistance benefits.

Figure 11. Number of LIEAP/LIHEAP eligible and recipient households, 1981 to FY 2004



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 approach to measuring 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. The GPRA performance plan for LIHEAP 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. Section IV of the *Notebook* describes the Federal LIHEAP performance plan.

LIHEAP program goals and performance goals

In FY 2004, 14 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.

- *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 performance goals and measurement on targeting income eligible vulnerable households and income eligible high burden households. In addition, ACF has set an efficiency goal for the LIHEAP program.

The first long term goal for the LIHEAP program is to increase the benefit targeting index score to 115 and the burden reduction targeting index score to 110 for high-energy burden LIHEAP recipient households. The annual 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.

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.

The efficiency measure for FY 2006 is:

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

Baseline data for these targeting performance goals have been measured to provide a picture of the current status of targeting performance across the country. 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.

Performance measures

Performance goals must be measurable in order to determine if the goals are being achieved. ACF has developed for its LIHEAP targeting goals a set of performance indicators that provide for the

collection of quantitative measures regarding the following aspects of LIHEAP targeting performance:

- The *recipiency 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.

Individual LIHEAP grantees can use targeting indexes to examine the effectiveness of targeting in their program. The recipiency targeting index can help them to assess the effectiveness of their outreach to households with vulnerable members. The benefit and burden reduction targeting indexes can assist in examining the results of their benefit determination procedures.

ACF is using national targeting indexes to examine the current targeting performance of the LIHEAP program, to identify specific groups and regions of the country to target outreach materials, and to measure changes in performance over time.

Performance measurement data

The computation of targeting indexes requires the collection of data elements on eligible and recipient households. The sources of data vary for each of the targeting indicators.

For the recipiency targeting indexes for vulnerable households, the data required are demographic characteristics of eligible and recipient households. Data on income eligible households are available from the Current Population Survey (CPS) Annual Social and Economic Supplement (ASEC). Data on recipient households are available from the *LIHEAP Household Reports*. The CPS ASEC and *LIHEAP Household Reports* are used to develop national and regional recipiency targeting indexes on an annual basis for vulnerable households. The data show current targeting rates and changes in targeting rates over time. Those targeting rates are used in the GPRA performance plan for the LIHEAP program.

For the recipiency targeting index for high burden households, the data required are the energy burden characteristics of eligible and heating recipient households. The most recent data on income eligible households are available from the 2001 Residential Energy Consumption Survey (RECS). The most recent data for computation of the recipiency targeting index for high burden households are available from the 2001 RECS LIHEAP Supplement. These data are used to develop national and regional recipiency targeting indexes for high burden households. Since the RECS is conducted every four years, data are not available on an annual basis to show current targeting rates and changes in targeting rates over time. Data will be available in 2007 to show the change in targeting rates for high burden households between 2001 and 2005. Section IV furnishes national and regional targeting indexes for high burden households for FY 2001.

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.

LIHEAP exploratory study

The Coats Human Services Reauthorization Act of 1998 (Public Law 105-285) reauthorized LIHEAP through FY 2004. As part of the subsequent reauthorization of LIHEAP, the Senate proposed in Title II of Senate Bill 1786 (the Poverty Reduction and Prevention Act) to have the Department of Health and Human Services conduct a LIHEAP study.[6] Although the Energy Policy Act (Public Law 109-58) reauthorized LIHEAP in 2005, the ACF's Office of Community Services (OCS) became interested in exploring the following energy-related aspects of the Senate bill's proposed study:

1. Develop a protocol for States to collect information from energy distribution companies, including electric, natural gas, heating oil, and propane companies, concerning residential energy customer statistics.

2. Analyze the effect of the standard of housing and housing age on energy costs to low income households.

3. Evaluate regional difference in cost of living and the ability of low income households to meet home energy requirements.

Consequently, OCS funded an exploratory study that sought to assess the viability of accomplishing the above activities. The exploratory study includes a review of the literature, an assessment of available public use databases, examination of EIA energy supplier surveys, and analysis of state-level procedures for collecting data on the affordability of home energy bills for low income and LIHEAP recipient households. It demonstrates that while valuable sources of data and models for data collection exist, there are important challenges in obtaining and utilizing these sources, noted as follows:

- State data collection protocol – The experiences in Pennsylvania illustrate that it is feasible to develop a standard data collection protocol. However, because state public utility commissions have varying missions and responsibilities, it may be challenging for many state LIHEAP offices and public utility commissions to establish such protocols.

- Public-use databases – The report found that there are many public-use data sources that can be used to examine the effects of housing quality on energy affordability. However, a sizable investment would be needed to extract and analyze data from these public-use databases to obtain the required information.

- National residential affordability database – Establishment of a national database would provide an instrument to compile the array of state-level affordability statistics. It would furnish a powerful tool to describe the energy needs of low income households and to measure the performance of the LIHEAP program. However, substantial resources would be needed over a number of years to develop such a database.

The exploratory study helps to anticipate the investments that would be required to develop statistics on low income energy needs and LIHEAP performance.

[6] Accessed on June 5, 2006, at the Library of Congress, THOMAS system at: http://thomas.loc.gov/cgi-bin/query/F?c108:4:./temp/~c1087yUhdH:e48980:

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 2004 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 2004 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 (EMEU) 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 2004. 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 2004. 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 exploratory study. This section summarizes the findings from an exploratory study that sought to assess the viability of meeting the information needs for a LIHEAP study proposed by Senate Bill 1786.

- Appendix A documents the procedures used to prepare the FY 2004 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 2003, 2004, and 2005 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 2004 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.[7] In FY 2004, average residential energy consumption for all households was 93.0 mmBTUs and average expenditures were $1,564. The mean individual energy burden for all households was 6.4 percent of income.

Low income households had average energy consumption of 80.8 mmBTUs (13 percent less than all households) and average energy expenditures of $1,335 (15 percent less than all households). Mean individual energy burden for low income households was 13.7 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 $1,545, about 16 percent higher than the average for all low income households. Mean individual energy burden was 18.9 percent, over 5 percentage points higher than the average for low income households.

Nationally, all households increased their average residential energy expenditures by 2 percent, from $1,527 in FY 2003 to $1,564 in FY 2004. Low income households increased their average residential energy expenditures by 2 percent, from $1,304 in FY 2003 to $1,335 in FY 2004. LIHEAP recipient households increased their average residential energy expenditures by 2 percent, from $1,515 in FY 2003 to $1,545 in FY 2004. The moderate increases in expenditures resulted from the combination of decreased consumption (due to warmer winter weather and cooler summer weather) and increased fuel prices in FY 2004 as compared to FY 2003.

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 2004, home heating was 34 percent of the residential energy bill for low income households and home cooling was 8 percent.

[7]Comparisons are made among the four income groups of all, non low income, low income, and LIHEAP recipient households. All households represent the total number of households in the U.S. Non low income households represent those households with annual incomes above the LIHEAP income maximum of the greater of 150 percent of 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.

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 2004[1/](See also Tables A-2a – A-2c, Appendix A)

Main heating fuel	Fuel consumpton (mmBTUs)[2/]	Fuel expenditures	Mean individual burden[3/]	Median individual burden[4/]	Mean group burden[5/]
			All households		
All fuels	93.0	$1,564	6.4%	3.4%	2.6%
Natural gas	109.0	$1,645	6.5%	3.4%	2.8%
Electricity	57.6	$1,312	5.7%	3.1%	2.2%
Fuel oil	123.4	$1,918	6.9%	3.8%	3.2%
Kerosene	76.6	$1,353	13.8%	8.1%	2.3%
LPG[6/]	98.4	$1,839	7.9%	5.2%	3.1%
			Non low income households		
All fuels	98.6	$1,670	3.0%	2.6%	2.1%
Natural gas	114.0	$1,738	3.0%	2.6%	2.2%
Electricity	63.5	$1,452	2.7%	2.4%	1.8%
Fuel oil	127.7	$1,976	3.4%	3.1%	2.5%
Kerosene	89.4	$1,505	3.4%	3.1%	1.9%
LPG[6/]	103.2	$1,927	4.1%	3.9%	2.4%
			Low income households		
All fuels	80.8	$1,335	13.7%	8.1%	8.3%
Natural gas	97.6	$1,433	14.5%	8.6%	8.9%
Electricity	45.9	$1,031	11.8%	6.5%	6.4%
Fuel oil	112.3	$1,771	16.0%	9.6%	11.0%
Kerosene	71.1	$1,288	18.3%	12.5%	8.0%
LPG[6/]	89.8	$1,682	14.8%	9.9%	10.5%
			LIHEAP recipient households		
All fuels	100.2	$1,545	18.9%	12.4%	11.5%
Natural gas	118.4	$1,598	19.8%	12.9%	11.9%
Electricity	54.0	$1,236	15.6%	10.6%	9.2%
Fuel oil	135.9	$1,988	20.5%	15.1%	14.8%
Kerosene	87.7	$1,544	25.1%	13.2%	11.5%
LPG[6/]	86.6	$1,645	21.5%	12.6%	12.2%

[1/]Data are derived from the 2001 RECS, adjusted to reflect FY 2004 heating degree days, cooling degree days, and fuel prices. Data represent residential energy used from October 2003 through September 2004.

[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 2004 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 2004 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 2004 by the average income for each group of households from the 2004 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 42 percent of their annual residential expenditures for space heating, 8 percentage points more than did the average low income household. LIHEAP recipient households spent 5 percent for space cooling, about 63 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 2004

End Use	All households	Non low income households	Low income households	LIHEAP recipient households
Space heating	33%	32%	34%	42%
Space cooling	10%	10%	8%	5%
Water heating	14%	14%	15%	14%
Refrigeration	9%	9%	10%	8%
Appliances	34%	35%	33%	31%
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.[8] 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 2004, average home heating consumption for all households was 44.2 mmBTUs, average expenditures were $511, and mean individual home heating burden was 2.2 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 $463 (9 percent less than the average for all households). The mean individual home heating burden for low income households was 5.0 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 57.4 mmBTUs (30 percent higher than the average for all households), and average home heating expenditures were $645 (26 percent higher than the average for all households). Mean individual home heating burden for LIHEAP households was 8.4 percent, 3.4 percentage points higher than the average for low income households and almost four times the average for all households. Average home heating consumption for LIHEAP recipient households was 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 2004 weather show that LIHEAP heating assistance recipient households experienced 22 percent more heating degree days than did low income households.

For FY 2004, the heating season was 6 percent warmer than the 30-year norm and 7 percent warmer than FY 2003. Between FY 2003 and FY 2004, home heating consumption decreased 8 percent for all households, 8 percent for low income households, and 8 percent for LIHEAP recipient households.

Compared to FY 2003, the FY 2004 prices for natural gas increased by 8 percent, fuel oil prices increased by 3 percent, and electricity prices increased by 2 percent.[9] As a result of the decrease in consumption (because of warmer weather) and the moderate increase in prices, average home heating expenditures remained about the same in FY 2004 as they were in FY 2003 for all households, low income households, and LIHEAP recipient households.

Home heating expenditures changed moderately for all of the three major home heating fuels. Expenditures for households heating with natural gas increased by 3 percent. Expenditures for households heating with electricity decreased by 5 percent. Expenditures for households heating with fuel oil also decreased by 5 percent.

[8]Findings from the 2001 RECS, Energy Information Administration, U.S. Department of Energy.

[9]Derived from: *Monthly Energy Review*, Energy Information Administration, U.S. Department of Energy, March, 2005, Table 9.8, for fuel oil and April, 2005, Tables 9.9 and 9.11 for electricity and natural gas, respectively.

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 2004[1/] (See also Tables A-4, A-5a, A-5b, and A-5c, Appendix A)

Main heating fuel	Fuel consumpton (mmBTUs)[2/]	Fuel expenditures	Mean individual burden[3/]	Median individual burden[4/]	Mean group burden[5/]
		All households			
All fuels	44.2	$511	2.2%	1.0%	0.9%
Natural gas	56.9	$587	2.6%	0.0%	1.0%
Electricity	13.5	$291	1.4%	0.6%	0.5%
Fuel oil	75.9	$769	2.7%	1.5%	1.3%
Kerosene	43.6	$545	6.0%	3.2%	0.9%
LPG[6/]	52.5	$773	3.2%	2.1%	1.3%
		Non low income households			
All fuels	46.2	$533	1.0%	0.7%	0.7%
Natural gas	58.6	$602	1.1%	0.9%	0.8%
Electricity	14.8	$316	0.6%	0.4%	0.4%
Fuel oil	78.3	$797	1.4%	1.1%	1.0%
Kerosene	53.2	$638	6.0%	3.2%	0.8%
LPG[6/]	55.9	$833	1.8%	1.5%	1.1%
		Low income households			
All fuels	39.8	$463	5.0%	2.4%	2.9%
Natural gas	53.3	$554	6.0%	2.8%	3.5%
Electricity	10.8	$241	3.0%	1.5%	1.5%
Fuel oil	69.7	$698	6.1%	4.0%	4.3%
Kerosene	39.6	$505	1.4%	1.2%	3.1%
LPG[6/]	46.4	$664	5.6%	4.2%	4.1%
		LIHEAP recipient households			
All fuels	57.4	$645	8.4%	4.9%	4.8%
Natural gas	72.7	$718	9.3%	5.8%	5.3%
Electricity	17.8	$402	5.4%	3.1%	3.0%
Fuel oil	95.0	$959	10.5%	6.9%	7.1%
Kerosene	58.2	$703	7.9%	4.3%	5.2%
LPG[6/]	42.8	$647	10.2%	4.9%	4.8%

[1/]Data are derived from the 2001 RECS, adjusted to reflect FY 2004 heating degree days and fuel prices. Data represent residential energy used from October 2003 through September 2004.

[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 2004 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 2004 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 2004 by the average income for each group of households from the 2004 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 2004, average home cooling consumption for households that cooled was 6.5 mmBTUs, average expenditures were $172, and mean individual home cooling burden was 0.6 percent.

Low income households had average home cooling energy consumption of 4.8 mmBTUs (26 percent less than the average for all households) and home cooling expenditures of $124 (28 percent less than the average for all households). The mean individual home cooling burden for low income households was 1.2 percent, twice the average home cooling burden for all households and four times the average home cooling burden for non low income households.

Average home cooling consumption for LIHEAP recipient households was 3.4 mmBTUs (48 percent less than all households), and home cooling expenditures were $91 (47 percent less than all households). Mean individual home cooling burden for LIHEAP recipient households was 1.0 percent, more than one and one half times the average for all households. On average, LIHEAP recipient households consumed 29 percent fewer BTUs for cooling than the average for all low income households. RECS data adjusted for FY 2004 weather show that LIHEAP cooling recipient households experienced approximately 26 percent fewer cooling degree days than did low income households because they are more heavily represented in the cooler climate regions.

The FY 2004 cooling season was 1 percent warmer than the 30-year norm and 2 percent cooler than FY 2003. From FY 2003 to FY 2004, home cooling consumption decreased by 2 percent for both all households and low income households, and decreased by almost 6 percent for LIHEAP recipient households.

Nationally, all households increased their average home cooling expenditures by 1 percent, low income households increased their average home cooling expenditures by less than 1 percent, and LIHEAP recipient households decreased their average home cooling expenditures by 1 percent. The changes in expenditures resulted from the combination of slightly cooler weather and moderately higher electricity prices in FY 2004 than in FY 2003.

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 2004[1/] (See also Table A-6, Appendix A)

Household group	Fuel consumpton (mmBTUs)[2/]	Fuel expenditures	Mean individual burden[3/]	Median individual burden[4/]	Mean group burden[5/]
All households	6.5	$172	0.6%	0.3%	0.3%
Non low income households	7.2	$192	0.3%	0.2%	0.2%
Low income households	4.8	$124	1.2%	0.5%	0.8%
LIHEAP recipient households	3.4	$91	1.0%	0.5%	0.7%

[1/]Data are derived from the 2001 RECS, adjusted to reflect FY 2004 cooling degree days, and fuel prices. Data represent residential energy used from October 2003 through September 2004.

[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 2004 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 2004 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 2004 by the average income for each group of households from the 2004 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 2004 CPS ASEC, the more restrictive definition excludes 12.0 million households of the 35.4 million households that meet the definition of LIHEAP eligible households. Therefore, differences in FY 2004 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."[10]

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.

[10]As 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 *Notebook*, 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 *Notebook*, 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 2004
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	10/03 to 9/04
Income data[6/]	1979	1981	1983	1985	1987	1990	1993	1997	2001	2004
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

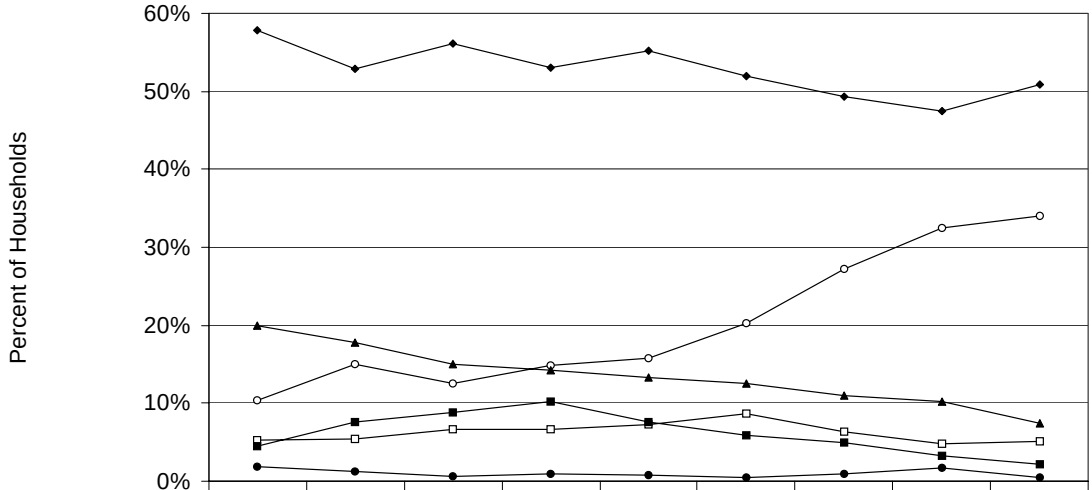
Since 1979, there have been important changes in the fuels used by households, the amount of energy consumed for specific residential end uses (i.e., home heating, water heating, home cooling, and other appliances), total residential energy expenditures, and the burden that residential energy expenditures 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.[11] 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.[12] 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.

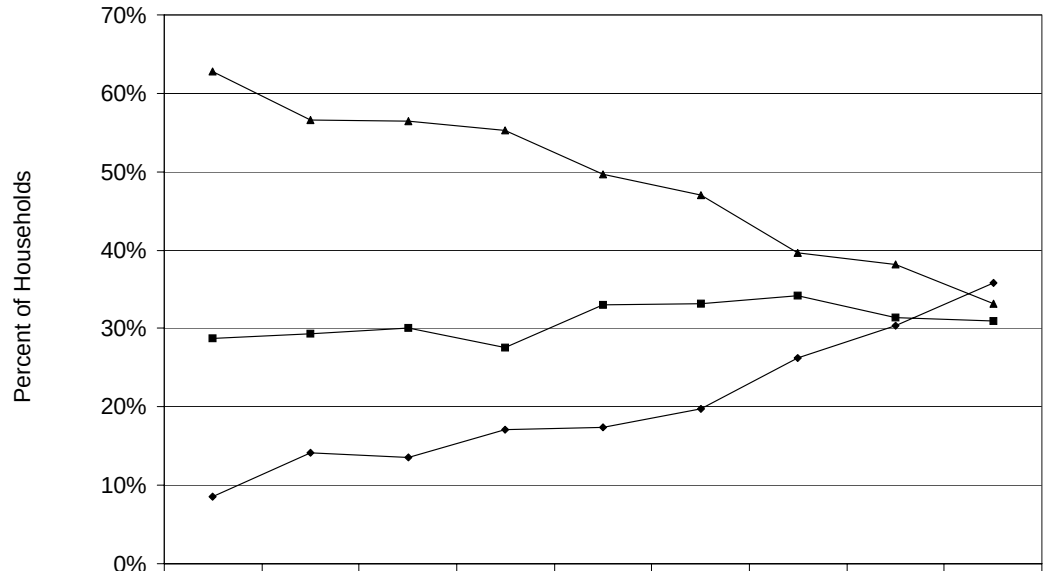
[11]For all households, the incidence of electric main heat grew from 15.8 percent in 1979 to 29.1 percent in 2001, and the incidence of fuel oil main heat fell from 22.1 percent to 8.3 percent.
[12]For all households, the incidence of electric central air-conditioning grew from 23.0 percent in 1979 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



	1979	1981	1983	1985	1987	1990	1993	1997	2001
Natural Gas	57.9	52.9	56.2	53.0	55.2	52.0	49.4	47.5	50.9
Electricity	10.4	15.0	12.6	14.8	15.8	20.3	27.2	32.5	34.0
Fuel Oil	20.0	17.8	15.0	14.3	13.3	12.6	11.0	10.2	7.5
LPG	5.2	5.4	6.7	6.7	7.3	8.6	6.4	4.8	5.1
Other	4.5	7.6	8.8	10.2	7.6	5.8	5.0	3.2	2.1
No Main Fuel	1.9	1.3	0.6	0.9	0.8	0.5	1.0	1.7	0.5

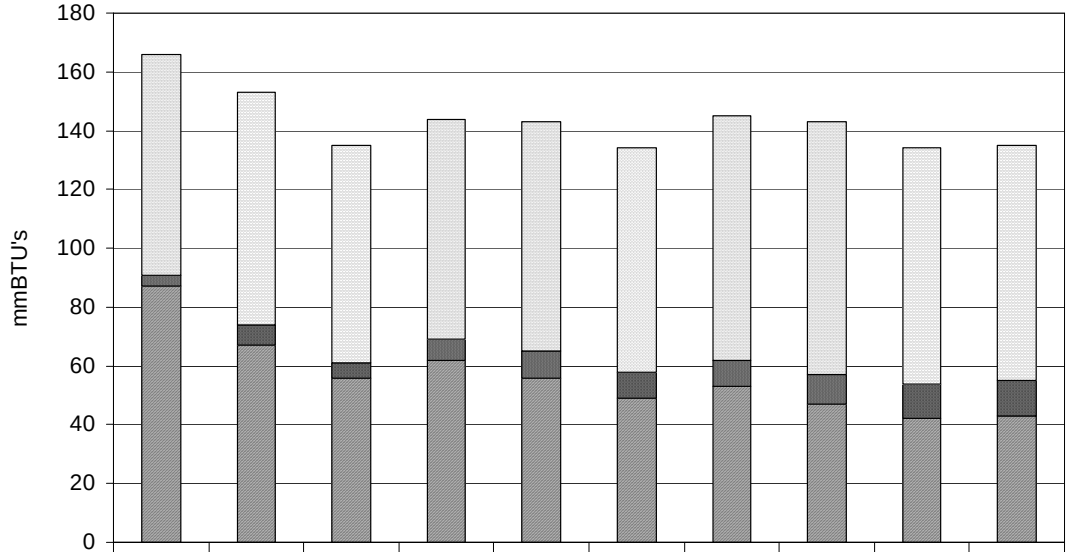
Figure 3-2. Air-conditioning type for households with incomes at or below 150 percent of the poverty income guidelines, 1979 to 2001



	1979	1981	1983	1985	1987	1990	1993	1997	2001
Central AC	8.5	14.1	13.6	17.1	17.4	19.8	26.2	30.4	35.8
Room AC	28.7	29.3	30.0	27.6	33.0	33.2	34.2	31.4	31.0
None	62.8	56.6	56.4	55.3	49.6	47.0	39.6	38.1	33.2

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 2004. 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.[13] 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 2004, 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 2004



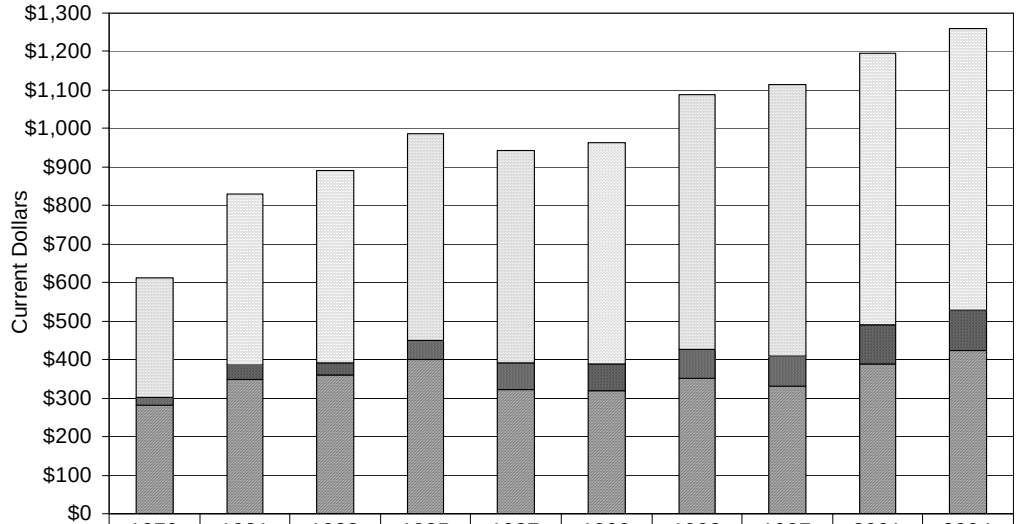
	1979	1981	1983	1985	1987	1990	1993	1997	2001	2004
Total	166	153	135	144	143	134	145	143	134	135
Other	75	79	74	75	78	76	83	86	80	80
Cooling	4	7	5	7	9	9	9	10	12	12
Heating	87	67	56	62	56	49	53	47	42	43

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 $1,113 in 1997. From 1997 to 2001 residential energy expenditures increased by 7 percent to $1,196. In FY 2004, mean residential energy expenditures rose by 5 percent to $1,259. 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 10 percent in FY 2004. The increase in expenditures in 2001 was the result of

[13]The 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.

higher fuel prices. The increase in expenditures in FY 2004 was the result of higher fuel prices and colder winter weather. Mean home cooling expenditures rose continuously from $51 in 1985 to $103 in 2001. In FY 2004 mean home cooling expenditures were $102.

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 2004



	1979	1981	1983	1985	1987	1990	1993	1997	2001	2004
Total	$612	$830	$891	$987	$943	$963	$1,088	$1,113	$1,196	$1,259
Other	$311	$444	$499	$537	$552	$574	$661	$705	$705	$732
Cooling	$20	$38	$33	$51	$68	$71	$77	$78	$103	$102
Heating	$281	$348	$359	$399	$323	$318	$350	$330	$388	$425

The next series of Figures, 3-5 through 3-7, furnishes information on energy burden for low income households.[14] 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.[15] 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.

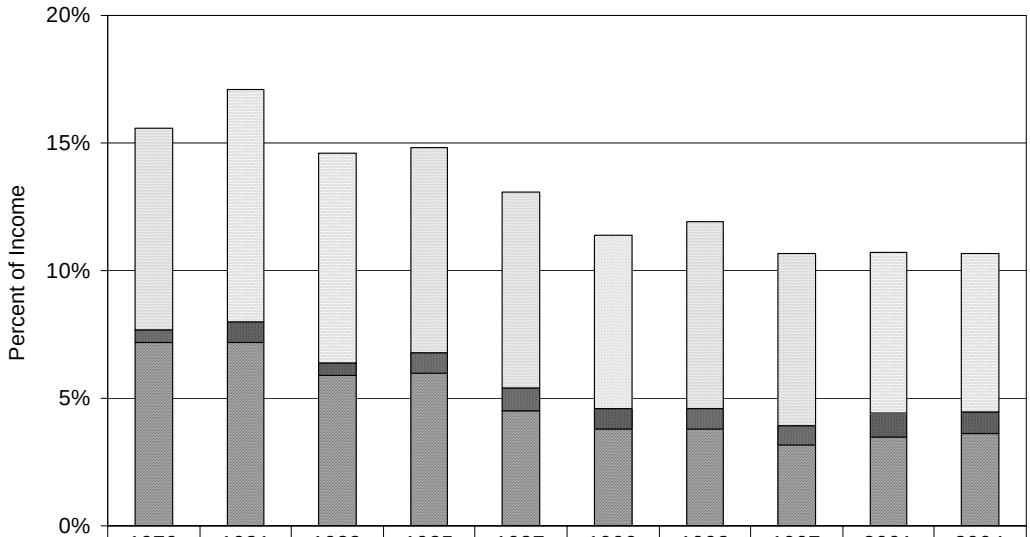
[14]These figures present gross burden statistics; they do not account for the reduction in burden attributable to the receipt of LIHEAP benefits. Figure 3-26 compares gross burden and net burden for LIHEAP recipient households.

[15]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.

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 2004, burden rose slightly to 4.5 percent because expenditures rose. Home energy burden for FY 2004 was 15 percent higher than in 1997, 2 percent higher than in 2001, but it was 44 percent below the level in 1981.

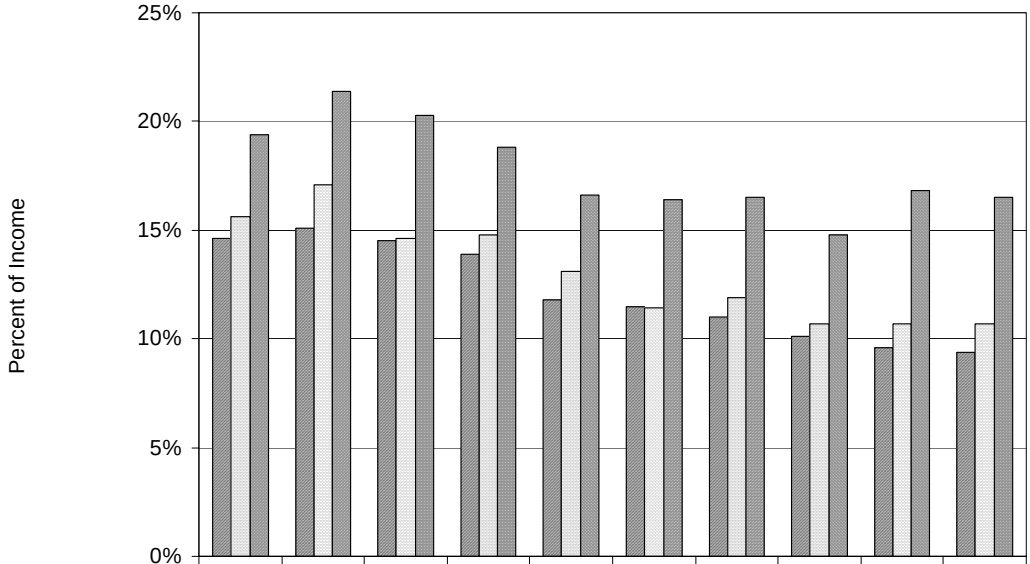
Figure 3-5. Mean group residential energy burden by end use for households with incomes at or below 150 percent of the poverty income guidelines, 1979 to FY 2004



	1979	1981	1983	1985	1987	1990	1993	1997	2001	2004
Total	15.6	17.1	14.6	14.8	13.1	11.4	11.9	10.7	10.7	10.7
Other	7.9	9.1	8.2	8.0	7.7	6.8	7.3	6.8	6.3	6.2
Cooling	0.5	0.8	0.5	0.8	0.9	0.8	0.8	0.7	0.9	0.9
Heating	7.2	7.2	5.9	6.0	4.5	3.8	3.8	3.2	3.5	3.6

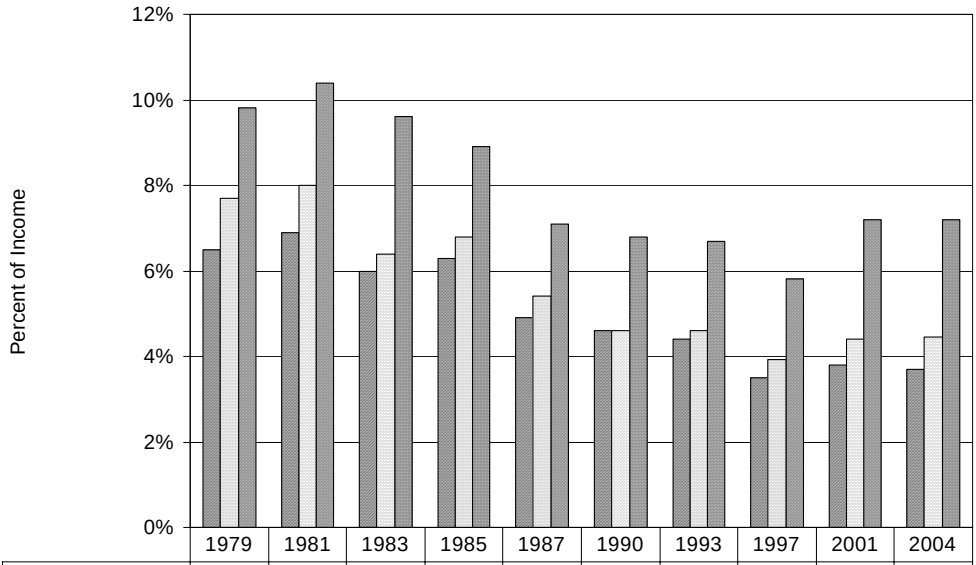
Figures 3-6 and 3-7 show how the mean individual and median individual energy burden statistics compare to the group energy burden statistics. Figure 3-6 shows the trends in residential energy burden for low income households, and Figure 3-7 shows the trends in home energy burden for low income households. 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 2004, median individual burden and group mean burden were around 45 percent lower than the 1981 peak, while the mean individual burden was 29 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 2004



	1979	1981	1983	1985	1987	1990	1993	1997	2001	2004
Individual Median	14.6	15.1	14.5	13.9	11.8	11.5	11.0	10.1	9.6	9.4
Group Mean	15.6	17.1	14.6	14.8	13.1	11.4	11.9	10.7	10.7	10.7
Individual Mean	19.4	21.4	20.3	18.8	16.6	16.4	16.5	14.8	16.8	16.5

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 2004



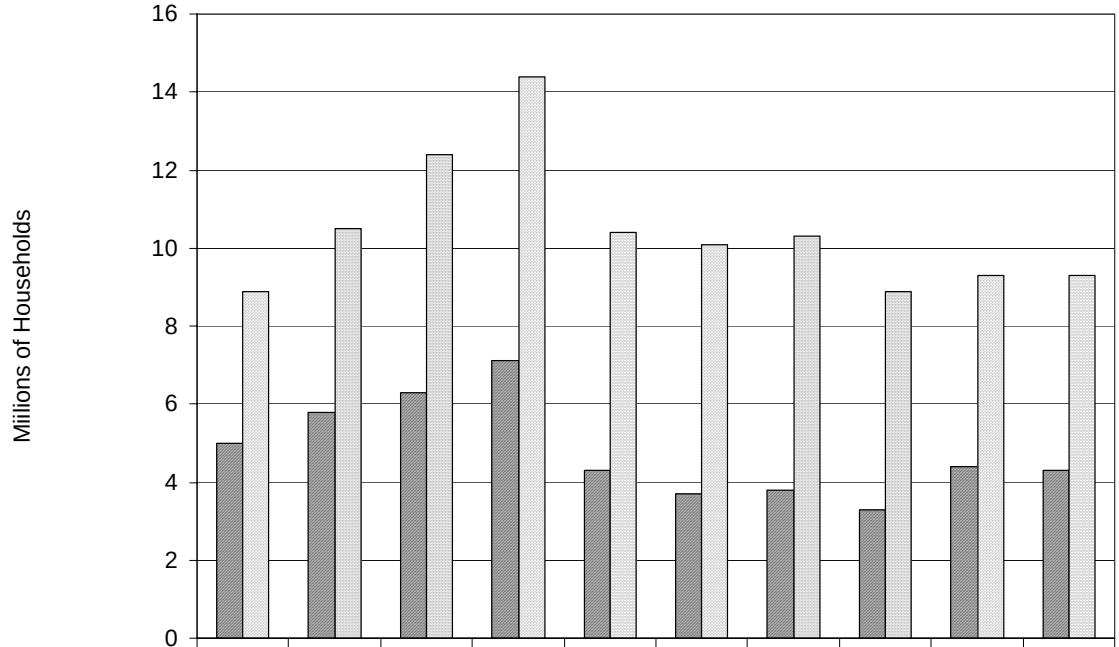
	1979	1981	1983	1985	1987	1990	1993	1997	2001	2004
Individual Median	6.5	6.9	6.0	6.3	4.9	4.6	4.4	3.5	3.8	3.7
Group Mean	7.7	8.0	6.4	6.8	5.4	4.6	4.6	3.9	4.4	4.5
Individual Mean	9.8	10.4	9.6	8.9	7.1	6.8	6.7	5.8	7.2	7.2

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 remained stable in FY 2004. The number of low income households with home energy burdens exceeding 10 percent of income in FY 2004 was 39 percent less than the 1985 level and 12 percent less than the 1979 level.

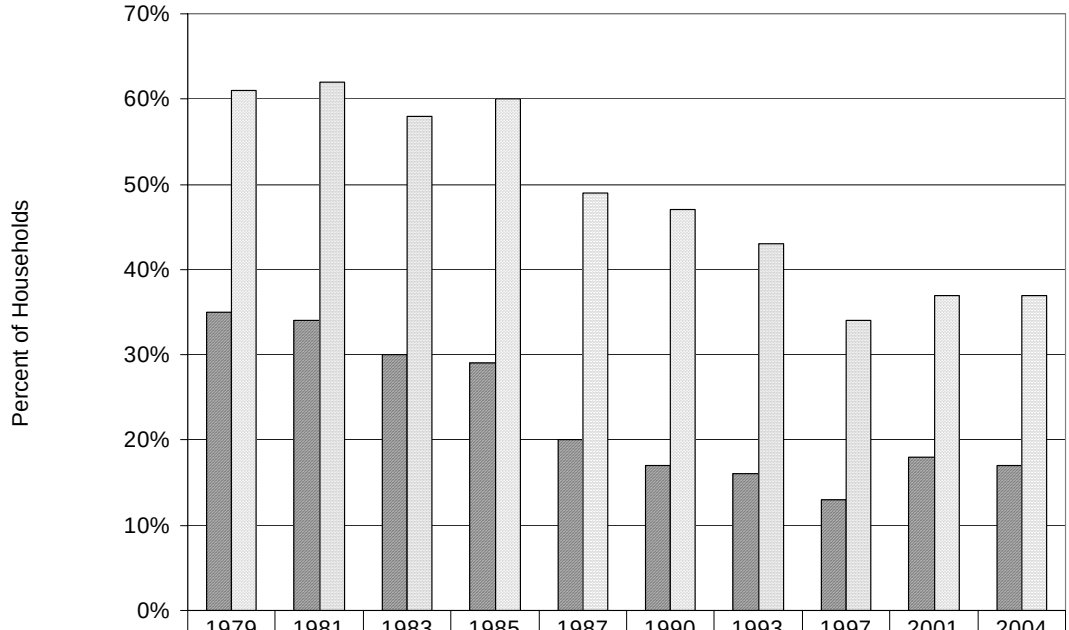
Figure 3-10, on the next page, shows the total assistance funding that would be required to reduce the home energy burden for all low income households to 10 percent of income and 5 percent of income. The amount required for 5 percent of income was $2.2 billion in 1979, $4.6 billion by 1985, $3.3 billion in 2001, and $3.6 billion in FY 2004. 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 2004, while the number of low income households exceeding the percent of income reference points remained stable, their average expenditures increased. Therefore, total dollars of assistance funding required to reduce home energy burden rose.

Figure 3-8. Number of low income households spending over 5 percent and 10 percent of income on home energy, 1979 to FY 2004



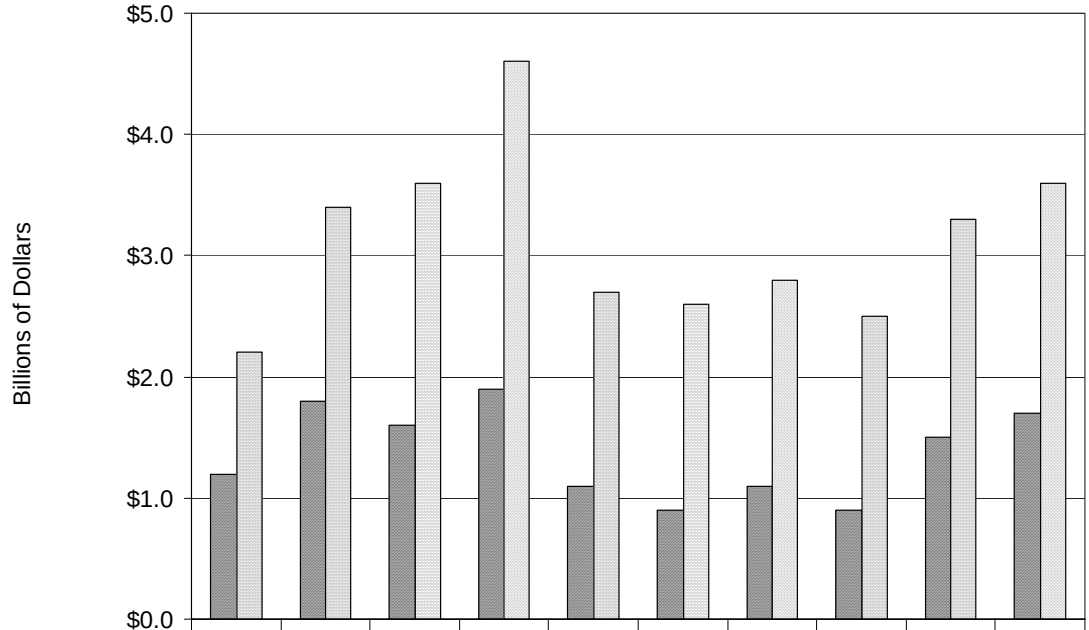
	1979	1981	1983	1985	1987	1990	1993	1997	2001	2004
More than 10%	5.0	5.8	6.3	7.1	4.3	3.7	3.8	3.3	4.4	4.3
More than 5%	8.9	10.5	12.4	14.4	10.4	10.1	10.3	8.9	9.3	9.3

Figure 3-9. Percent of low income households spending over 5 percent and 10 percent of income on home energy, 1979 to FY 2004



	1979	1981	1983	1985	1987	1990	1993	1997	2001	2004
More than 10%	35	34	30	29	20	17	16	13	18	17
More than 5%	61	62	58	60	49	47	43	34	37	37

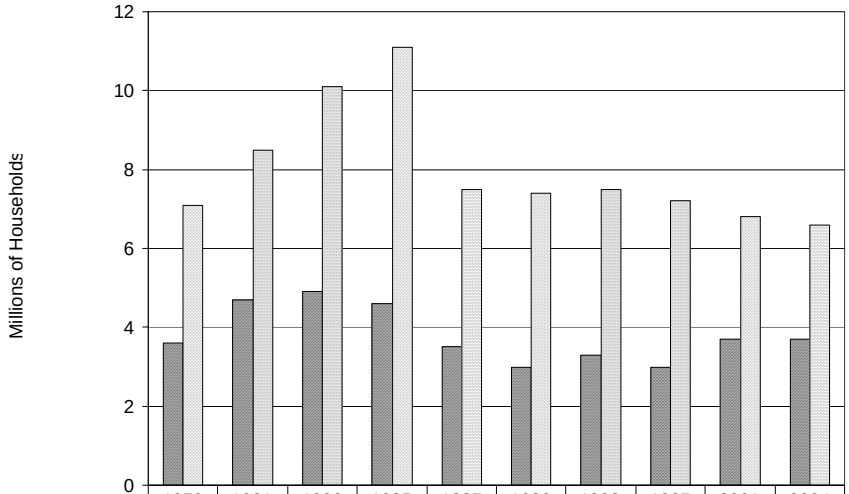
Figure 3-10. Total dollar need for LIHEAP funding for low income households spending over 5 percent and 10 percent of income on home energy, 1979 to FY 2004



	1979	1981	1983	1985	1987	1990	1993	1997	2001	2004
More than 10%	$1.2	$1.8	$1.6	$1.9	$1.1	$0.9	$1.1	$0.9	$1.5	$1.7
More than 5%	$2.2	$3.4	$3.6	$4.6	$2.7	$2.6	$2.8	$2.5	$3.3	$3.6

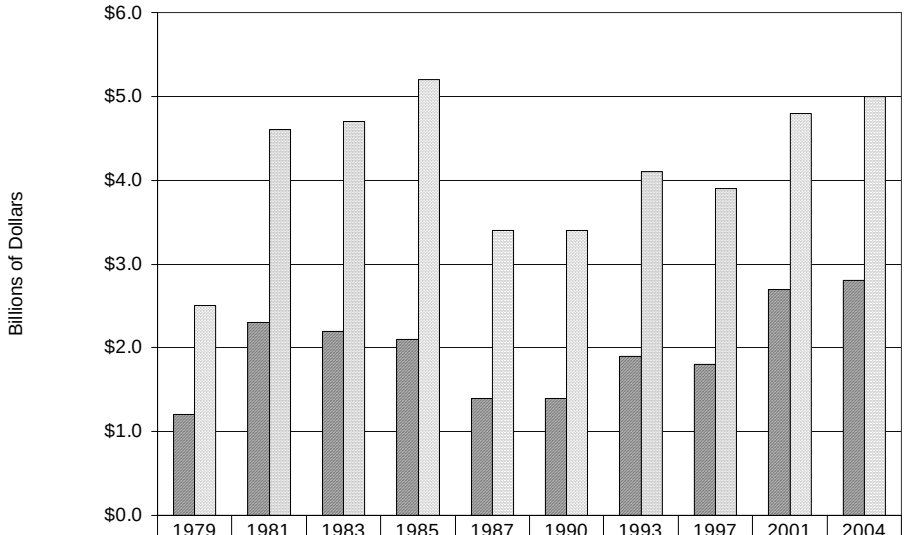
Figures 3-11 and 3-12 furnish statistics for residential energy expenditures. Figure 3-11 shows that the number of households spending over the specified percentages for residential energy (15 percent and 25 percent), followed a pattern similar to that observed in Figure 3-8. The largest number of households exceeded the specified percentages in 1983 and 1985. While the numbers exceeding 15 and 25 percent of income were lower in FY 2004 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 remained quite high.

Figure 3-11. Number of low income households spending over 15 percent and 25 percent of income on residential energy, 1979 to FY 2004



	1979	1981	1983	1985	1987	1990	1993	1997	2001	2004
More than 25%	3.6	4.7	4.9	4.6	3.5	3.0	3.3	3.0	3.7	3.7
More than 15%	7.1	8.5	10.1	11.1	7.5	7.4	7.5	7.2	6.8	6.6

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 2004

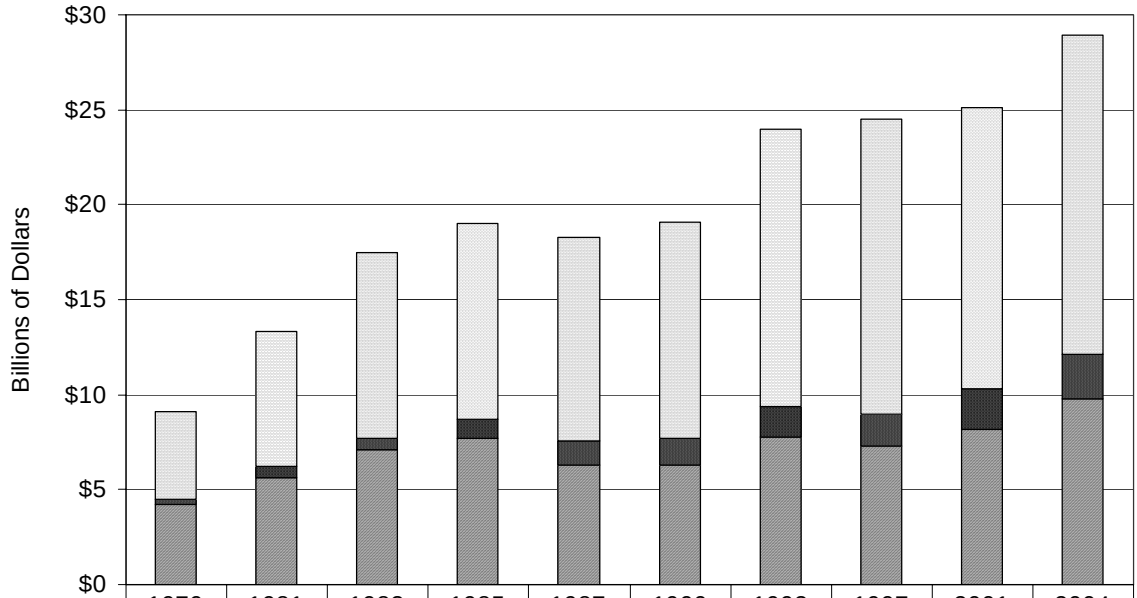


	1979	1981	1983	1985	1987	1990	1993	1997	2001	2004
More than 25%	$1.2	$2.3	$2.2	$2.1	$1.4	$1.4	$1.9	$1.8	$2.7	$2.8
More than 15%	$2.5	$4.6	$4.7	$5.2	$3.4	$3.4	$4.1	$3.9	$4.8	$5.0

Figure 3-13 shows how the aggregated residential energy bill for all low income households has changed from 1979 to FY 2004. In 1979, the aggregated home energy bill for low income households was $4.5 billion. By FY 2004, the aggregated home energy bill had grown to $12.1 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 2004, home energy accounted for 42 percent of the total low income residential energy bill.

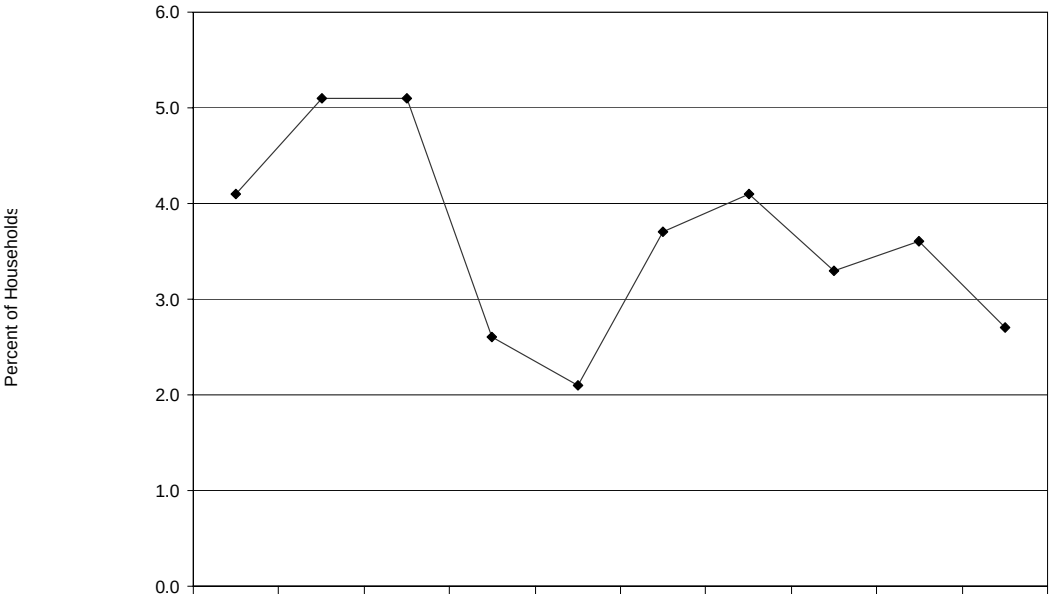
Figure 3-13. Aggregated residential energy expenditures by end use for households with incomes at or below 150 percent of the poverty income guidelines, 1979 to FY 2004



	1979	1981	1983	1985	1987	1990	1993	1997	2001	2004
Total	$9.1	$13.3	$17.5	$19.0	$18.3	$19.1	$24.0	$24.5	$25.1	$29.0
Other	$4.6	$7.1	$9.8	$10.3	$10.7	$11.4	$14.6	$15.5	$14.8	$16.8
Cooling	$0.3	$0.6	$0.6	$1.0	$1.3	$1.4	$1.6	$1.7	$2.2	$2.3
Heating	$4.2	$5.6	$7.1	$7.7	$6.3	$6.3	$7.8	$7.3	$8.2	$9.8

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 season[16]



	1981-1982	1983-1984	1984-1985	1986-1987	1987-1988	1989-1990	1990-1991	1992-1993	1996-1997	2000-2001
Rate (%)	4.1	5.1	5.1	2.6	2.1	3.7	4.1	3.3	3.6	2.7
Number(000)	984	1,343	1,333	678	547	1,001	1,110	1,023	1,223	904

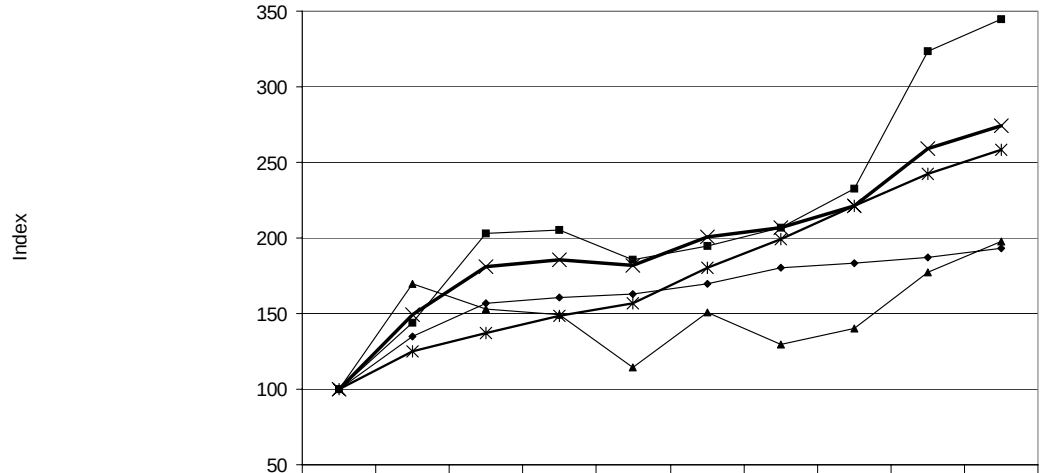
Analysis of energy trends

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 2004. 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 2004 prices increased again and once more contributed to an increase in expenditures.

[16]Data 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.

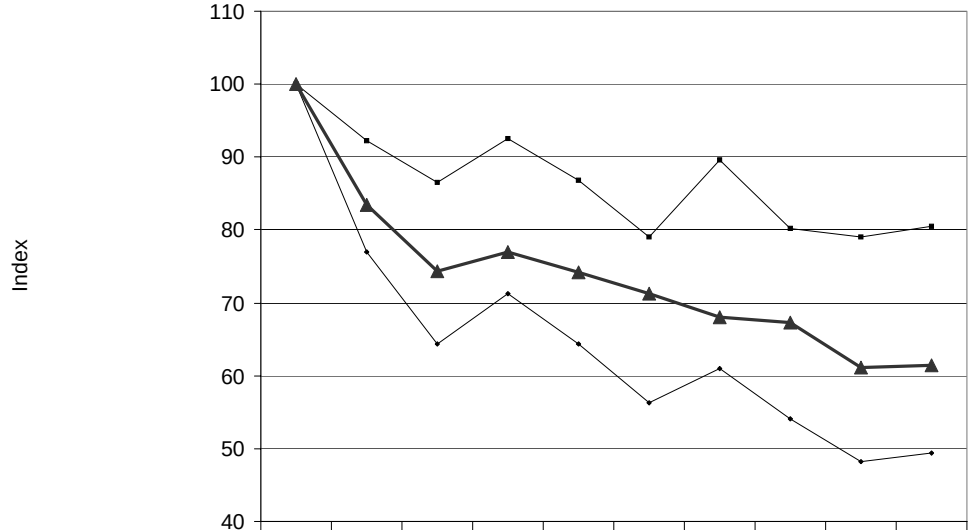
Figure 3-15. Index of dollar prices for fuel oil, natural gas, electricity, and a composite compared to the Consumer Price Index (CPI), 1979 to FY 2004



	1979	1981	1983	1985	1987	1990	1993	1997	2001	FY 2004
Electricity	100	135	157	161	163	170	180	183	187	193
Natural Gas	100	144	203	205	186	195	207	233	323	345
Fuel Oil	100	170	153	150	114	151	129	140	178	197
Composite Energy Index	100	150	181	186	182	201	207	221	259	274
CPI	100	125	137	148	156	180	199	221	243	258

Figure 3-16 demonstrates how changes in heating energy consumption from 1979 to FY 2004 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 2004, consumption and heating degree days rose at the same rate and consumption per degree day remained steady.

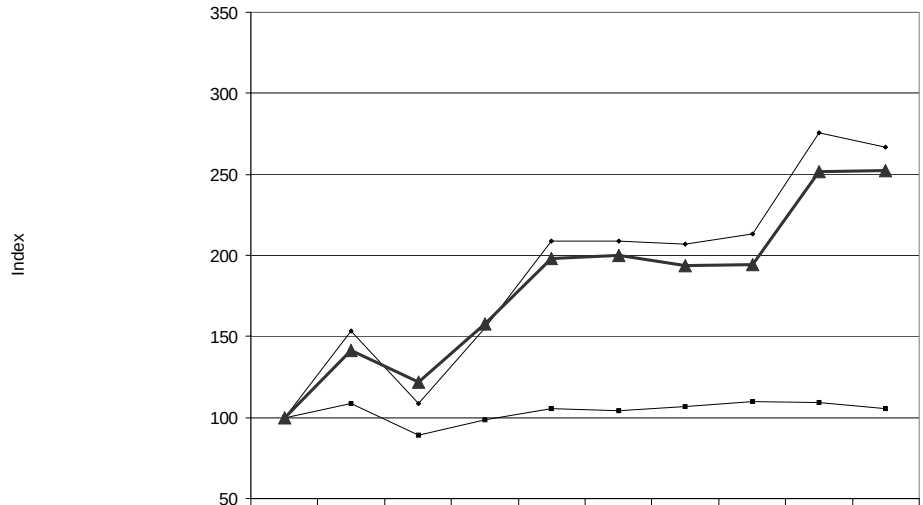
Figure 3-16. Index of heating consumption, heating degree days, and heating consumption per heating degree day for households with incomes at or below 150 percent of the poverty income guidelines, 1979 to FY 2004



	1979	1981	1983	1985	1987	1990	1993	1997	2001	2004
Consumption	100	77	64	71	64	56	61	54	48	49
HDD	100	92	87	93	87	79	90	80	79	81
Consumption per HDD	100	83	74	77	74	71	68	67	61	61

Figure 3-17 shows that home cooling consumption trends are somewhat more complex than are home heating consumption trends. In FY 2004, 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 2004, 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 2004 or year-to-year changes in consumption in response to changes in cooling degree days.

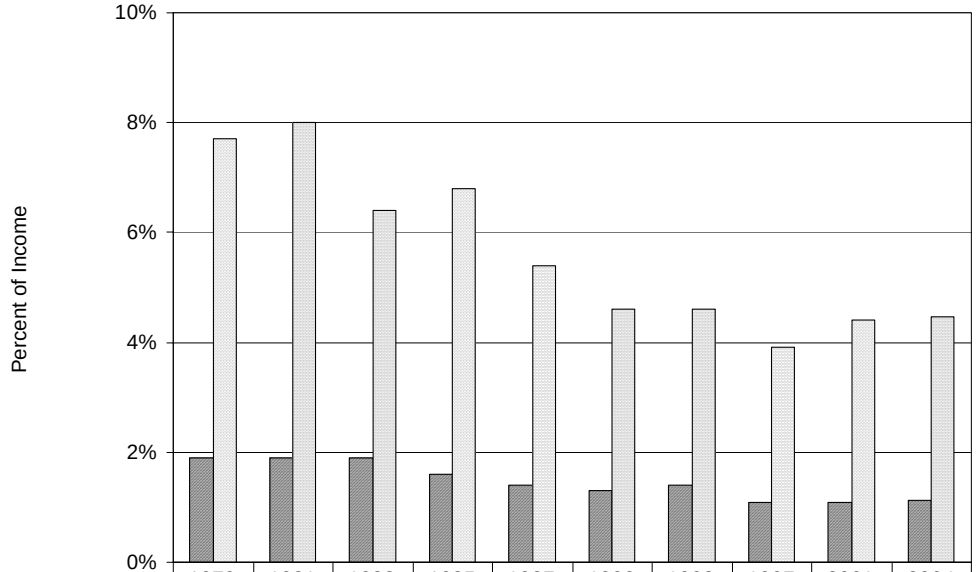
Figure 3-17. Index of cooling consumption, cooling degree days, and cooling consumption per cooling degree day for households with incomes at or below 150 percent of the poverty income guidelines, 1979 to FY 2004



	1979	1981	1983	1985	1987	1990	1993	1997	2001	2004
Consumption	100	153	109	156	209	209	207	213	276	267
CDD	100	109	89	99	106	104	107	110	109	106
Consumption per CDD	100	141	122	158	198	200	194	195	252	252

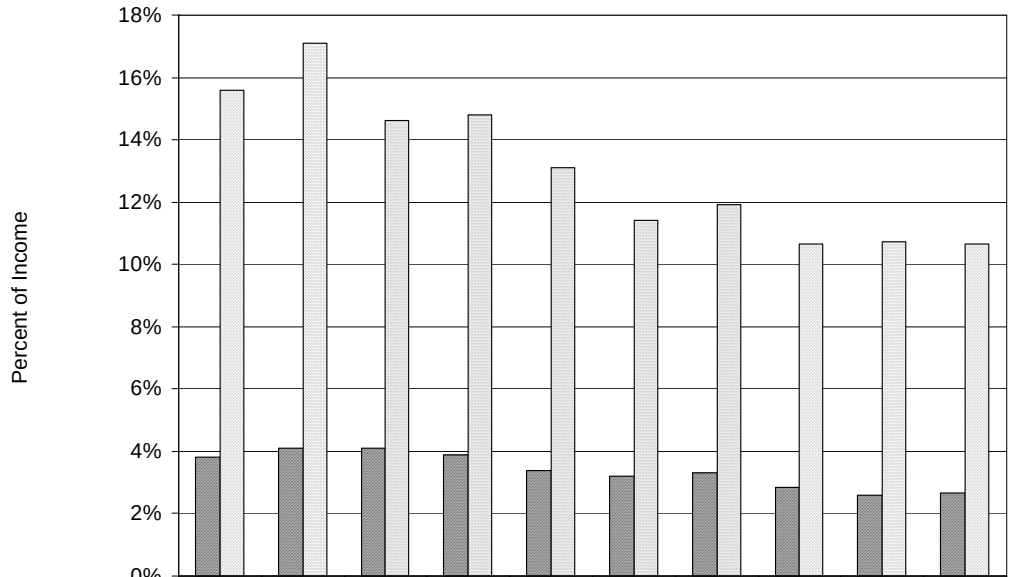
Figures 3-18 and 3-19, on the next page, show that mean group energy burdens for low income households are substantially higher than the mean for all households. In FY 2004, the mean group home energy burden for all households was 1.1 percent and it was 4.5 percent for low income households. In FY 2004, the mean group residential burden was 2.6 percent for all households and it was 10.7 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 2004, the mean group burden for low income households was again over 4 times that of all households.

Figure 3-18. Mean group home energy burden for all households and for households with incomes at or below 150 percent of the poverty income guidelines, 1979 to FY 2004



	1979	1981	1983	1985	1987	1990	1993	1997	2001	2004
All Households	1.9	1.9	1.9	1.6	1.4	1.3	1.4	1.1	1.1	1.1
Low-Income	7.7	8.0	6.4	6.8	5.4	4.6	4.6	3.9	4.4	4.5

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 2004



	1979	1981	1983	1985	1987	1990	1993	1997	2001	2004
All Households	3.8	4.1	4.1	3.9	3.4	3.2	3.3	2.8	2.6	2.6
Low-Income	15.6	17.1	14.6	14.8	13.1	11.4	11.9	10.7	10.7	10.7

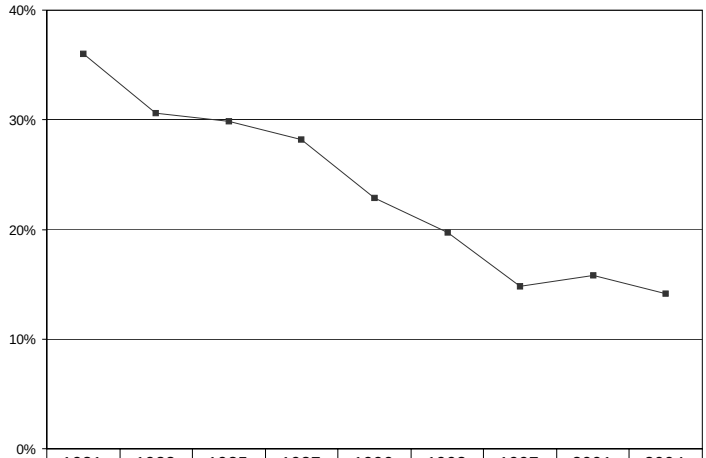
Trends in LIHEAP

Figures 3-20 through 3-24 furnish information on trends for HHS' energy assistance programs from FY 1981 through FY 2004. 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.[17] By FY 2004, 14 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 2004, funding for cooling assistance reached its highest level to date. Funding for heating assistance benefits was $1.38 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 in FY 2004. 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 $132 in FY 2004. 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 2004, 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 2004

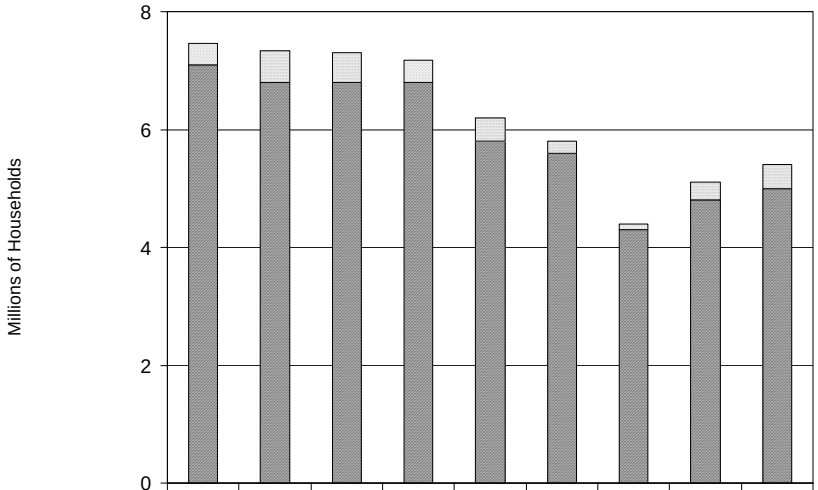


	1981	1983	1985	1987	1990	1993	1997	2001	2004
Recipients (mil)	7.1	6.8	6.8	6.8	5.8	5.6	4.3	4.8	5.0
Eligibles (mil)	19.7	22.2	22.8	24.1	25.4	28.4	29.0	30.4	35.4
Rate (%)	36%	31%	30%	28%	23%	20%	15%	16%	14%

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

[17]Note 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.

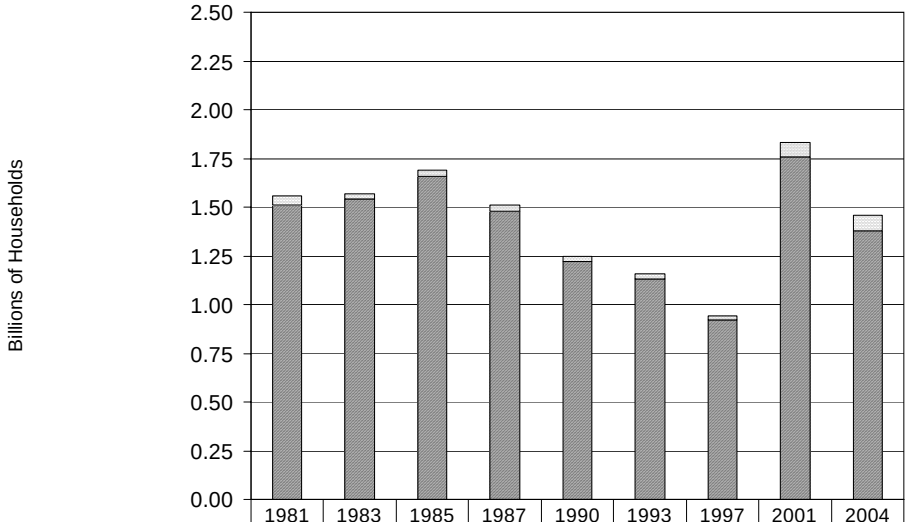
Figure 3-21. Number of households receiving LIEAP/LIHEAP heating and/or winter crisis assistance or cooling and/or summer crisis assistance, FY 1981 to FY 2004



	1981	1983	1985	1987	1990	1993	1997	2001	2004
Cooling/Crisis	0.4	0.5	0.5	0.4	0.4	0.2	0.1	0.3	0.4
Heating/Crisis	7.1	6.8	6.8	6.8	5.8	5.6	4.3	4.8	5.0

SOURCE: HHS Administrative Data

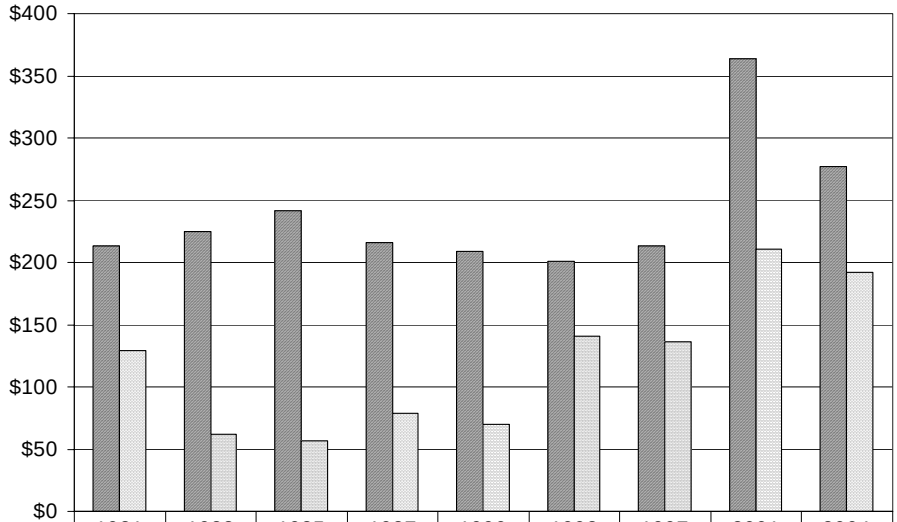
Figure 3-22. Funds used for LIEAP/LIHEAP fuel assistance, FY 1981 to FY 2004



	1981	1983	1985	1987	1990	1993	1997	2001	2004
Total Fuel Assistance	$1.56	$1.57	$1.69	$1.51	$1.25	$1.16	$0.94	$1.83	$1.46
Cooling/Crisis	$0.05	$0.03	$0.03	$0.03	$0.03	$0.03	$0.02	$0.07	$0.08
Heating/Crisis	$1.51	$1.54	$1.66	$1.48	$1.22	$1.13	$0.92	$1.76	$1.38

SOURCE: HHS Administrative Data

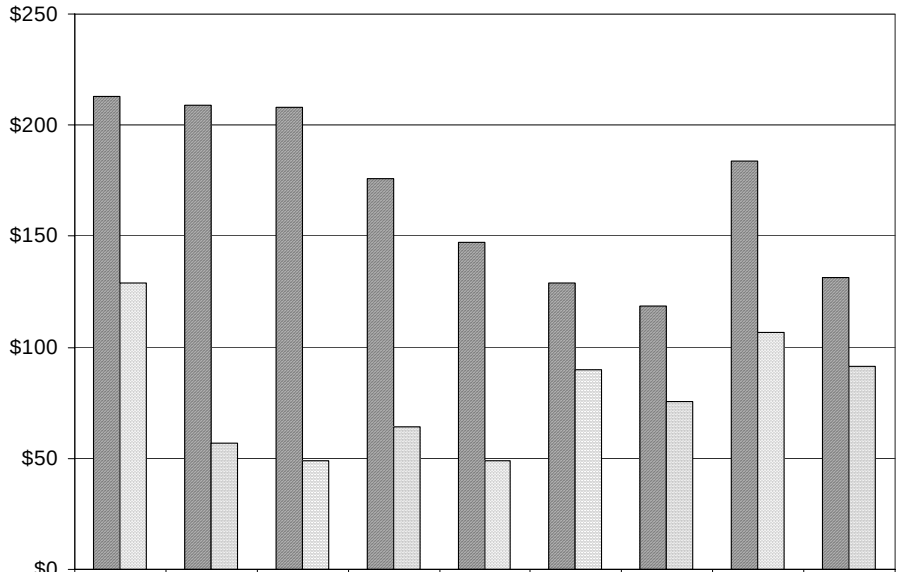
Figure 3-23. Mean combined LIEAP/LIHEAP heating and/or winter crisis benefits and mean cooling and/or summer crisis benefits, in dollars, FY 1981 to FY 2004



	1981	1983	1985	1987	1990	1993	1997	2001	2004
Heating/Crisis	$213	$225	$242	$216	$209	$201	$213	$364	$277
Cooling /Crisis	$129	$62	$57	$79	$70	$141	$136	$211	$192

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 2004



	1981	1983	1985	1987	1990	1993	1997	2001	2004
Heating/Crisis	$213	$209	$208	$176	$147	$129	$118	$184	$132
Cooling /Crisis	$129	$57	$49	$64	$49	$90	$76	$107	$91

SOURCE: HHS Administrative Data

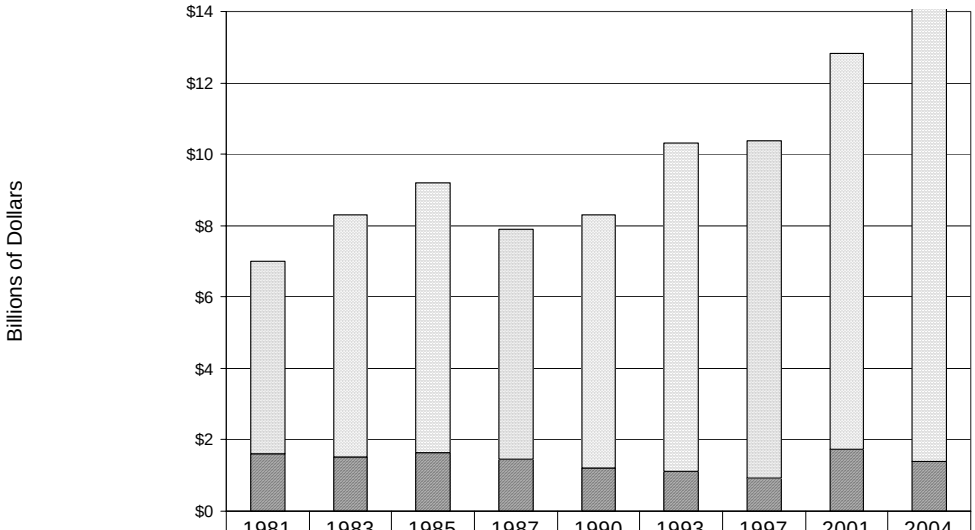
Analysis of LIHEAP benefits

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 2004. 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 LIEAP recipients were 8.5 percent, while net mean group home heating burdens (home heating expenditures minus LIEAP benefits) were 2.9 percent. In FY 2004, gross mean group home heating burdens for LIHEAP recipients were 4.8 percent, while net mean group home heating burdens were 2.7 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 2004, the mean heating benefit decreased by about 24 percent, and mean net group home heating burden increased by 59 percent. The effect of the reduced heating benefit in FY 2004 was intensified by higher mean home heating expenditures due to colder winter weather coupled with increased fuel prices in FY 2004.

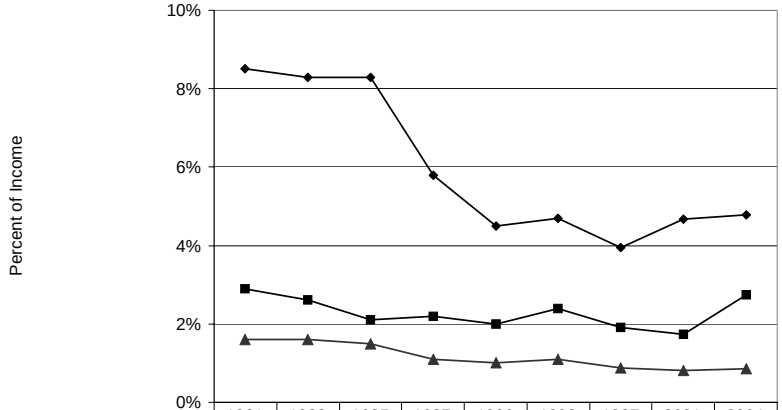
Figure 3-25. Amount and percentage of total home heating bill for LIEAP/LIHEAP eligible households covered by LIHEAP heating and winter crisis benefits, FY 1981 to FY 2004



	1981	1983	1985	1987	1990	1993	1997	2001	2004
Percent Covered	23%	18%	18%	19%	15%	11%	9%	14%	8%
Total Bill	$7.0	$8.3	$9.2	$7.9	$8.3	$10.3	$10.4	$12.8	$16.4
Not Assisted	$5.4	$6.8	$7.6	$6.4	$7.1	$9.2	$9.5	$11.1	$15.0
Assisted	$1.6	$1.5	$1.6	$1.5	$1.2	$1.1	$0.9	$1.7	$1.4

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 2004



	1981	1983	1985	1987	1990	1993	1997	2001	2004
Gross (Recipients)	8.5%	8.3%	8.3%	5.8%	4.5%	4.7%	4.0%	4.7%	4.8%
Net (Recipients)	2.9%	2.6%	2.1%	2.2%	2.0%	2.4%	1.9%	1.7%	2.7%
Gross (All Households)	1.6%	1.6%	1.5%	1.1%	1.0%	1.1%	0.9%	0.8%	0.9%

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. The GPRA performance plan for LIHEAP 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 research that ACF has commissioned on performance measurement for the LIHEAP program, including:

- LIHEAP Performance Plan – Review of national LIHEAP program goals, national LIHEAP performance goals, and LIHEAP performance indicators.
- Performance Measurement Research – Discussion of the findings from studies commissioned by ACF to assess the validity of performance measurement estimation procedures.
- Energy Burden Evaluation Study – Summary of 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 vulnerable and high burden households.

National LIHEAP program goal

LIHEAP is not an entitlement program. The amount of LIHEAP funding varies by State. 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 2004, 14 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 recipiency to income eligible vulnerable and high burden households, and to design benefit computation procedures that target higher LIHEAP benefits to higher burden households.

National LIHEAP performance goals

Based on the national LIHEAP program goals, ACF has focused its performance goals and measurement on targeting income eligible vulnerable households and income eligible high burden households. In addition, ACF has set an efficiency goal for the LIHEAP program.

The first long-term goal for the LIHEAP program is to increase the benefit targeting index score to 115 and the burden reduction targeting index score to 110 for high-energy burden LIHEAP recipient households. The annual 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.

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 and the 2009 RECS LIHEAP Supplement.

The efficiency measure for FY 2006 is:

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

Baseline data for these targeting performance goals have been measured to provide a picture of the current status of targeting performance across the country. 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 recipiency performance standards (a quantitative statement of the degree of desired change) for those parts of the country in which targeting performance can be improved.

Performance measures

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

- The **recipiency targeting index** quantifies recipiency 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 recipiency 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.[18] For example, if high burden recipients have their energy burden reduced by 25 percent (e.g., from 8 percent of income to 6 percent of income) and all recipient households have their energy burden reduced by 20 percent (e.g., from 5 percent of income to 4 percent of income), the burden reduction targeting index is 125 (100 times 25 divided by 20).

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

- The recipiency performance data allow for outreach initiatives to improve recipiency 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 targeting performance.

The benefit targeting index and the burden reduction targeting index are both useful indicators, 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 LIHEAP performance measurement plan has established performance goals only for recipiency targeting performance. Further, baseline performance statistics have been developed only for targeting to vulnerable households.

LIHEAP grantee use of targeting indexes

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

- In absolute terms, if a group has a recipiency 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

[18] In 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.

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 indicators 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 recipiency targeting indicators among groups of households and identify which groups are not effectively targeted by LIHEAP. For example, if the national LIHEAP recipiency targeting index for elderly households is 85 and the national LIHEAP recipiency 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 recipiency targeting indicators 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 recipiency targeting index for elderly households in the New England Census Division is 75, while the recipiency 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 indicators 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.

Performance measurement research

ACF has commissioned a number of 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. [19]

- 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. [20]

Copies of these studies are available on OCS' LIHEAP web site.

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 recipiency 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 - The CPS ASEC furnishes the most reliable estimates of the number of income eligible households.

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

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

- 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 the ACF furnish the most reliable estimates of the number of recipient households.

- Vulnerable household heating recipients – The annual State *LIHEAP Household Reports* 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.

While these are the most reliable data sources, not all of the data are produced in a way that is timely with respect to the development of an annual performance measurement plan for LIHEAP. For example, ACF had a goal of preparing the *Final FY 2006 Annual Performance Plan and FY 2005 Annual Performance Report* in the first quarter of 2006. In order for a data source to be used for development of the plan, it needed to be available no later than the end of CY 2005. The following discussion reviews each of the data sources and the timeliness of the data source in being able to meet the requirements for the development of annual performance measurement plan.

- CPS - The CPS is a national household sample survey that is conducted monthly by the Bureau of the Census. The ASEC includes a series of energy assistance questions, as well as other data that allow one to characterize household demographic characteristics. The CPS ASEC is the best national source of annual 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 the plan noted above were available in October 2005. That schedule meets the plan development requirements.

- LIHEAP Household Reports – The preliminary LIHEAP Household Reports for FY 2005 were due on September 1, 2005. ACF set a goal for the States to complete the final LIHEAP Household Reports for FY 2005 by December 2005. The 2005 LIHEAP household reports needed to be received, reviewed, and processed by November 2005 to prepare the FY 2005 Annual Performance Report by February 2006. The current schedule does not allow the final Household Reports to be used to meet the plan development requirements. Rather, the preliminary LIHEAP Household Reports would be used to meet the current plan development schedule.

- RECS – The RECS is a national household sample survey that is conducted once every four years by the U.S. Department of Energy. The most recent survey was conducted in 2005. The 2005 survey data will be available in late 2006. RECS data were used for baseline measurement (2001) of targeting performance for high 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 burden households.

Given the availability of data sources, in the first quarter of 2006, ACS is able to prepare an Annual Performance Report for FY 2004 for annual measures 1A and 1B. ACS is able to furnish information on the burden reduction targeting index score for FY 2005 in the first quarter of 2007, and for FY 2009 in the first quarter of 2011.

Performance measurement indicators

With the available data, the annual performance plan for LIHEAP includes updates on targeting to vulnerable households, but not on targeting to high burden households. To develop a better understanding of the value of performance data on high burden households, ACF commissioned the *LIHEAP Energy Burden Evaluation Study*. 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 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 as significantly higher rate than other households. The study furnishes a baseline statistic from which changes in targeting for high burden households can be compared.

- Performance goals – The study demonstrated that it is important to include a goal of targeting high 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 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 burden households that do not have a vulnerable household member.

- Measurement – The study identified options for collecting annual data on high 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. The statistics can be updated in the first quarter of 2007 for FY 2005.

Performance measurement statistics

The *Final FY 2006 Annual Performance Plan and FY 2004 Annual Performance Report* furnished measurements of targeting performance using the CPS-based procedures for computing targeting indexes for vulnerable households. That report did not include any measure of targeting performance for high burden households.

Table 4-1 shows the performance measures that were included in that report. The first column in the table restates the performance goal. The second column in the report shows the performance target and the third column shows the performance result. FY 2003 was the baseline year for both measures. For FY 2004, the performance target for measure 1A was 82 and the actual performance

was 78. For FY 2004, the performance target for measure 1B was 122 and the actual performance was 115.

Table 4-1. LIHEAP recipiency targeting performance measures reported in the *Final FY 2005 Annual Performance Plan, Final Revised FY 2004 Performance Plan, and FY 2003 Annual Performance Report*

Performance Measures	Fiscal Year	Target	Result
1A. Increase the recipiency targeting index score of LIHEAP households having at least one member 60 years or older.	FY 04 FY 03	82 Baseline	78 79
1B. Maintain the recipiency targeting index score of LIHEAP households having at least one member 5 years or younger.	FY 04 FY 03	122 Baseline	115 122

The *Final FY 2006 Annual Performance Plan and FY 2004 Annual Performance Report* did not furnish information on targeting high burden households. However, baseline statistics on high burden household targeting were developed by the energy burden evaluation study. That study recommended that measurement of targeting to high 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 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.[21]

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

Region	Recipiency targeting index for high burden households – residential energy	Recipiency 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."

[21] 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 LHEAP Supplement has been revised so that appropriate variance models can be developed.

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 households that do not 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 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	Benfit 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 reducton targeting index for high burden households - residential energy	Burden redcution targeting index for high burden households – home energy
Northeast	99	96
Midwest	95	93
South	108	98
West	86	86
United States	97	94

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 materials 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.

V. LIHEAP exploratory study

The Coats Human Services Reauthorization Act of 1998 (Public Law 105-285) reauthorized LIHEAP through FY 2004. As part of the subsequent reauthorization of LIHEAP, the Senate proposed in Title II of Senate Bill 1786 (the Poverty Reduction and Prevention Act) to have the Department of Health and Human Services conduct a LIHEAP study.[22] Although the Energy Policy Act (Public Law 109-58) reauthorized LIHEAP in 2005, the Office of Community Services (OCS) became interested in exploring the following energy-related aspects of the Senate bill's proposed study:

1. Develop a protocol for States to collect information from energy distribution companies, including electric, natural gas, heating oil, and propane companies, concerning the following residential energy customer statistics:

    a. the number of accounts certified as eligible for energy assistance;

    b. the number of accounts certified as eligible for energy assistance and that are past due;

    c. the total revenue owed on accounts eligible for energy assistance and that are past due;

    d. the number of disconnection notices issued on accounts eligible for energy assistance;

    e. the number of disconnections for nonpayment;

    f. the number of reconnections;

    g. the number of accounts eligible for energy assistance and determined uncollectible;

    h. the energy burden of accounts eligible for energy assistance.

2. Analyze the effect of the standard of housing and housing age on energy costs to low income households.

3. Evaluate regional difference in cost of living and the ability of low income households to meet home energy requirements.

Consequently, OCS funded an exploratory study to assess the viability of accomplishing the above activities. In addition, the study examines how individual State data on home energy affordability could potentially be combined into a *national database*.[23]

[22] Accessed on June 5, 2006 at the Library of Congress, THOMAS system at: http://thomas.loc.gov/cgi-bin/query/F?c108:4:./temp/~c1087yUhdH:e48980:

[23] The complete report, *LIHEAP Exploratory Study: Final Report* (May 2006) is available from the Office of Community Services. The report was funded through contract #DE-AM01-04-EI41006.

More specifically, the objectives of the exploratory study covered the following topics:

- *Affordability Data Protocol* – Develop a protocol for States to collect information from energy distribution companies, including electric, natural gas, heating oil, and propane companies, concerning *payment and affordability issues* for households that are eligible for energy assistance. Customer data would include payment, collections, and energy burden statistics for accounts eligible for energy assistance.

- *Determinants of Home Energy Costs* – Analyze the effect of *the standard of housing and housing age* on home energy costs to low income households, and regional differences in *cost of living* on the ability of low income households to meet home energy requirements.

- *National Home Energy Affordability Database* – Evaluate how state-level data on home energy affordability could be combined into a national database and resulting report.

Components of the study

The components of the exploratory study include reviews of literature, public-use datasets, residential energy supplier surveys, and state data collection methods regarding the affordability of energy bills for low income and LIHEAP-recipient households.

Using key descriptors, which included *affordability statistics*, *determinants of energy cost*, *cost-of-living effects*, and the *concept of a national database* as a guide, research was conducted on policy and programmatic resources. This research included a literature review of published materials—such as journals, energy conference proceedings, public utility commission and state energy agency documents, and resources posted by advocacy, trade, and other organizations. The review also assessed data available from energy supplier surveys and public-use databases, as well as prior research on the feasibility of uniform state data collection regarding the affordability of energy bills for low income and LIHEAP recipient households.

The reviews are broad scans, rather than in-depth analyses, of resources pertinent to the study topics. For each study topic, information is presented with basic descriptive information or titles and citations. The study does not assess the quality of the data available or analyze the value of a document or resource to the development of a full LIHEAP study. Instead, this study serves as an inventory and a basic description of the resources available regarding the topics.

Literature review

Evaluation reports, the text of legislation and state regulations, and state public utility commission orders provide information on the depth and breadth of information that are able to be collected regarding low income and LIHEAP-eligible households. In a few states, state regulation and agency policy specifically delineate the variables that utilities must furnish. For example, Pennsylvania regulation specifies the type of information that must be collected by electric and natural gas distribution companies with customers receiving Universal Service Program benefits. Data provided by utilities are published by the Pennsylvania Bureau of Consumer Services within the Public Utility Commission in annual reports. In the state of New Jersey, the New Jersey Board of Public Utilities instructs regulated utilities with customers receiving Universal Service Fund benefits to provide quarterly reports and publishes this information in board orders. Independent evaluation reports for bill payment assistance programs also indicate the type and quality of information that utilities are able to furnish and how transaction, usage, and collections data can be used to describe both how affordable energy bills are for low income households and how these programs may be affecting household outcomes. However, many states do not have energy bill payment assistance programs

that compel regulating agencies to stringently monitor outcomes for low income households. Additionally, states are not apt to collect data on low income customers with energy bills from unregulated utilities.

Annual conferences, such as the National Low Income Energy Consortium (NLIEC) and Affordable Comfort, have provided administrators, researchers, and consultants with a forum to examine and share data collection and analysis strategies for households served by state and national energy assistance, education, and efficiency programs. Apart from program outcomes, these conferences have disseminated information on how technology can be used to warehouse and analyze utility data for low income customers. At recent conferences, information has been presented on how data have been used to monitor and improve programs in some states including New York, Ohio, and Pennsylvania.

Trade and advocacy organizations have published resources that help inform stakeholders' understanding of the needs of low income households. Staff and consultants to organizations such as the National Regulatory Research Institute (NRRI) and the National Consumer Law Center (NCLC) have conducted research and surveys analyzing consumers' ability to pay their energy bills. In 2004, NCLC conducted a seminal piece of research on state data collection strategies relating to energy bill payment and developed a hierarchy of data elements that could be collected from state public utility commissions and aggregated for national analysis on trends among low income households.

Public use databases

The review also assessed data available from energy supplier surveys and public-use databases, as well as reviewed prior research on the feasibility of uniform state data collection regarding the affordability of energy bills for low income and LIHEAP-recipient households.

Several national public-use databases contain information on the residential energy consumption of households and their receipt of energy assistance. The Current Population Survey - Annual Social and Economic Supplement (CPS ASEC) captures information on receipt of energy assistance. The American Community Survey (ACS) captures information on households' main heating fuel and monthly expenditures for electricity, gas, and other fuels. The American Housing Survey (AHS) captures information on monthly expenditures for gas and electricity, annual cost for fuel oil and other fuels, and the type of fuel used by heating, air conditioning, and various appliances. The Survey of Income and Program Participation (SIPP) captures information about receipt of energy assistance benefits and any energy assistance from Federal, state or local government within reference months, as well as payment of utility bills and combined monthly expenditures. The SIPP also gives respondents a series of questions regarding household health, safety, and satisfaction that address heating and cooling. Each of these surveys also collects demographic information which facilitates analysis of the characteristics of households.

However, these surveys' sampling methodology, characterization of the data elements, and the comprehensiveness of questioning influence their reliability and validity, effecting how they can be used to provide information about the affordability of energy bills for low income households. OCS currently uses data from the Census, CPS ASEC, and the Residential Energy Consumption Survey (RECS). OCS must thoroughly investigate the limitations in sampling methodology and content before it incorporates additional elements from other public-use datasets into its analyses.

Energy supplier surveys

The U.S. Department of Energy (DOE) conducts a series of energy supplier surveys that track the prices of electricity, natural gas, fuel oil, and propane between states and Census regions. These surveys provide an indication of the geographic variation in the affordability of these different types

of energy. Similar to the use of national public-use databases, the use of these surveys is influenced by factors such as the frequency with which they are conducted and the characteristics of the sample completing the survey.

The Energy Information Administration (EIA) produces state-level price estimates for all four fuels at least monthly. However, these surveys typically have small sample sizes within states and, therefore, may be unreliable estimates.

EIA also produces annual State Energy Data estimates, which are compiled from the EIA energy supplier surveys, as well as all other available data sources. As a result, these data are considered to be more reliable and consistent over time in comparison to the individual supplier surveys. However, there is a considerable time lag for the State Energy Data. For example, 2001 data were not made publicly available until January 2005, and the release of 2002 data is planned for the summer of 2006.

State data collection

In May 2004, the National Consumer Law Center (NCLC) prepared a document for the National Energy Assistance Directors' Association (NEADA) entitled, *Tracking the Home Energy Needs of Low Income Households Through Trend Data on Arrearages and Disconnections.*[24] This document reviewed state public utility commission mandates and policies regarding utility reporting of residential customer statistics, which describe the payment problems of customers, especially among low income households. The report examined data collection practices in five states: Iowa, Massachusetts, Ohio, Pennsylvania, and Rhode Island. This report summarizes the availability of a set of relevant data (relating to accounts, revenues, arrears, disconnections, reconnections, uncollectibles, payment plans, deposits, and usage) for key subgroups (general residential, payment assistance, elderly, disabled, commercial/industrial, and fuel type). The following section provides a synopsis of these findings:

- *Iowa* – Iowa Administrative Code (199-19.2(5)j and 199-20.2(5)j) requires monthly reporting to the Iowa Utilities Board by investor-owned electric and gas utilities of the number of accounts, number of accounts in arrears, dollar amounts in arrears, disconnection notice issues, number of disconnections, number of reconnections, and uncollectible accounts. Arrearage data are reported for residential customers and customers eligible for energy assistance.

- *Massachusetts* – The Massachusetts Department of Telecommunications and Energy directed (but does not require through order, regulation, or statute) investor-owned electric and natural gas utilities to report monthly on the number of accounts, bill amounts, number of customers with accounts in arrears, dollar value of arrears, and the dollar value of uncollectible account write-offs. It also attempts to collect the number of payment plans made, number of customers receiving LIHEAP, number of customers receiving the low income discount, numbers of termination notices sent, number of accounts terminated for nonpayment, number of accounts restored, and average duration of termination.

- *Ohio* – A stipulation generated during the adoption of the Percentage of Income Payment Program (PIP) requires that all regulated companies report data on: the number of residential customers, the number of low income customers receiving payment assistance through the PIP program, the number of account in arrears, the number of customers in key categories of arrears, the number of termination notices, the number of disconnections, the number of

[24] This document can be accessed at the National Consumer Law Center website at: http://www.consumerlaw.org/action_agenda/energy_and_utility/content/PubsTrackingNeed.pdf.

reconnections, the duration of disconnections, the number of reconnections, the dollar amount of required deposits, the number and dollar amount of uncollectible accounts, and energy usage and revenue.

- *Pennsylvania* – The Pennsylvania Public Utility Commission (PUC) has regulations (52 PA Code § 56.231, 52 PA Code § 62.5, and 52 PA Code § 54.75) mandating monthly reporting from electric, natural gas, and "steam heat" utilities on arrearages, the number of termination notices sent, the number of personal contacts made prior to termination, and reconnections. It also requires annual reporting of the number of payment arrangements made, annual collection expenses incurred, the amount of uncollectible write-offs, the number of residential customers without payment arrangements in arrears, and the number of low income households served.

  Annual reports published by the Bureau of Consumer Services (BCS) within the Pennsylvania PUC provide data from several electric and gas utilities at both the aggregate level and for "confirmed low income" customers. For example, the *Report on 2004 Universal Service Programs and Collections Performance of the Pennsylvania Electric Distribution Companies and Natural Gas Distribution Companies* provided data on the dollar value of write-offs and collection operating expenses, and the number of payment arrangements for the aggregate population of residential customers as well as "confirmed low income" customers. Utilities also provide the BCS with the estimates of the number of low income customers and the BCS calculates the penetration of utilities' Customer Assistance Program based on the number of "confirmed low income" and estimated low income customers in their service territories.

- *Rhode Island* – Monthly reporting of the number of residential customer terminations and reconnections are made to the Rhode Island Public Utilities Commission (RIPUC) and information regarding terminations and reconnections is provided on an as-requested basis to RIPUC and advocates.

The NCLC report created a hierarchy of "data points" as described below. Public utility commissions can collect information with varying degree of effort and resources that will inform policymakers, advocates, and HHS, in particular, about the extent of energy needs amongst low income populations. The authors acknowledged that utility and state variation in defining these data points may challenge their aggregate analysis.

- Tier 1 elements are the total number of residential accounts, the total number of residential accounts in arrears, the total dollar amount of accounts in arrears, and the total number of residential disconnections. The authors expected that "commissions should be able to gather [these data] immediately and on a monthly basis from electric and natural gas utilities."

- Tier 2 elements include the total number of low income residential accounts, the total number of low income residential accounts in arrears, the total dollar amount of low income accounts in arrears, and the total number of low income residential disconnections. These elements are judged by authors to be "additional data that commissions should gather but that may take some time and resources in some states."

- Tier 3 elements (described as "additional data points for tracking the well-being of low income customers, in states where these data are available) are rated as optional. Tier 3 elements include: dollar value of residential accounts written off as uncollectible, dollar value of low income residential accounts written off as uncollectible, total number of residential accounts having service restored, total number of low income residential accounts

having service restored, total number of residential accounts sent notice of disconnection, total number of low income residential accounts sent notice of disconnection, and total number of low income customer Deferred Payment Arrangements (DPAs).

The report cautions about the challenges that state PUCs may encounter in synthesizing data, including the consistency with which utilities define key data elements such as arrears, and the effect that utility-specific policies on collections and credit will have on the number of customers entering into payment arrangements. The report also highlighted the barriers that state PUCs may anticipate in the basic collection of the aforementioned data elements, including the cost of altering information systems and hiring staff to facilitate more comprehensive data collection and reporting, and the identification of low income customers. However, the authors prioritized data elements into tiers and provided information on how utility personnel and PUC leadership can address these issues.

Findings and recommendations

Exploratory research demonstrates that while valuable sources of data and models for data collection exist, there are several challenges in obtaining and utilizing these sources.

Developing a protocol for uniform state data collection

Several states have models that allow for the collection of affordability statistics from utility companies. Iowa, Massachusetts, Ohio, Pennsylvania, and Rhode Island all have mechanisms to collect data on low income households from regulated utilities, including arrearages, terminations and reconnections, and collections actions. However, there are significant barriers to implementing complete data collection models. No state currently requires data collection from unregulated fuel suppliers. Developing data reporting systems is costly, and states often do not have the resources to develop and maintain these systems. Collecting a complete and uniform set of data would likely require regulation from state public utility commissions. Due to the varying missions and responsibilities of state public utility commissions across the county, some commissions may be reluctant to adopt new regulatory responsibilities related to low income energy affordability.

Regulations in Pennsylvania provide a comprehensive model for how PUCs can collect uniform data from natural gas and electric distribution companies. Regulations require monthly reporting on arrearages, the number of termination notices sent, the number of personal contacts made prior to termination, and reconnections, as well as annual reporting on the number of payment arrangements made, annual collection expenses incurred, the amount of uncollectible write-offs, the number of residential customers without payment arrangements in arrears, and the number of low income households served. The ability of PUCs in states such as Pennsylvania to collect data and conduct state-level analysis on how affordable energy bills are for low income customers indicates that, despite the significant barriers, standardizing a state-level protocol is a viable way to track outcomes.

Using public-use databases to analyze determinants of energy cost and cost-of-living effects

This report revealed that there are many public-use data sources that can be used to examine the effects of housing quality on energy affordability and cost-of-living effects. The public-use databases discussed in this report – the Current Population Survey Annual Social and Economic Supplement (CPS ASEC), American Community Survey, American Housing Survey, Survey of Income and Program Participation, and National Survey of American Families – collect relevant data on low income households.

OCS currently makes use of data from the Decennial Census, CPS ASEC, and Residential Energy Consumption Survey (RECS) to provide information on these issues. However, additional data are

available from the sources discussed in this report, as well as from the Consumer Expenditure Survey, National Health Interview Survey, and other public-use data. Before resorting to collecting data directly, resources would need to be invested in extracting and utilizing existing data.

Creating a national residential energy affordability database

A national database would provide an instrument to compile state-level affordability statistics collected from the states via utilities and public utility commissions, data on LIHEAP recipients, and available data from public-use databases. The database would provide a powerful tool to describe the energy needs of low income households and to measure the performance of LIHEAP. This study demonstrates that there are useful resources that can address the key research topics, and compiling those resources can assist OCS in exploring those issues.

However, the development of a *national* data collection system would require all states to collect the same set of data elements for identified low income[25] and LIHEAP-recipient households. Again, this presents a challenge for states because each fuel supplier typically has a unique data management system, many of which, especially those for small non-regulated utilities, are not kept electronically.

In synthesizing data from each of the three sources, several barriers would need to be addressed. In assimilating data from *utilities and public utility commissions*, there would be a need to prioritize of which data elements are necessary, develop strategies to address the consistency of data elements among the fifty states and the District of Columbia, and develop the administrative procedures for such data collection.

Collection of additional data elements from state LIHEAP offices on identified low income and LIHEAP-eligible households would either require voluntary submissions or a report form request from the Secretary that is approved by the Office of Management and Budget (OMB). Data elements currently collected from state LIHEAP grantees include those relating to fiscal data (sources of LIHEAP funds, uses of LIHEAP funds, average household benefits for fuel assistance, and maximum income cutoffs chosen by states for 4-person households) and household data (the number and income levels of LIHEAP-eligible and assisted households, the number of assisted households with at least one or more individuals who are 60 or older, disabled, or 5 or younger, and the number and income levels of households applying for LIHEAP assistance). Home energy data from the Residential Energy Consumption Survey (RECS) also is currently used as a source of information on the characteristics of households that are income eligible for LIHEAP and households receiving assistance.

A substantial investment of resources will be needed to further explore the data elements currently available in *public-use databases*. It would need to investigate how effectively each survey's sampling methodology, characterization of the data elements, and comprehensiveness of questioning provide information about the affordability of energy bills for low income households. Significant resources would be required to evaluate the reliability and validity of public-use databases and develop an information system to house this data.

[25] Identified low income households are those that have participated in means-tested program.

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 2004. 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.[26]

The 2001 RECS is the eleventh survey in the series of surveys.[27] 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.[28] For the

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

[27]For 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.

[28]The 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 2004.

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:[29]

- The 2001 RECS data for calendar year 2001 were updated to FY 2004 using procedures that adjust the 2001 data to reflect the weather and fuel prices for FY 2004 (October 1, 2003 to September 30, 2004). 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.

[29]Information 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 2004 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 2004 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.[30]

[30]More 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.[31] 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.[32] 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.[33] 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.

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

[32]For 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.

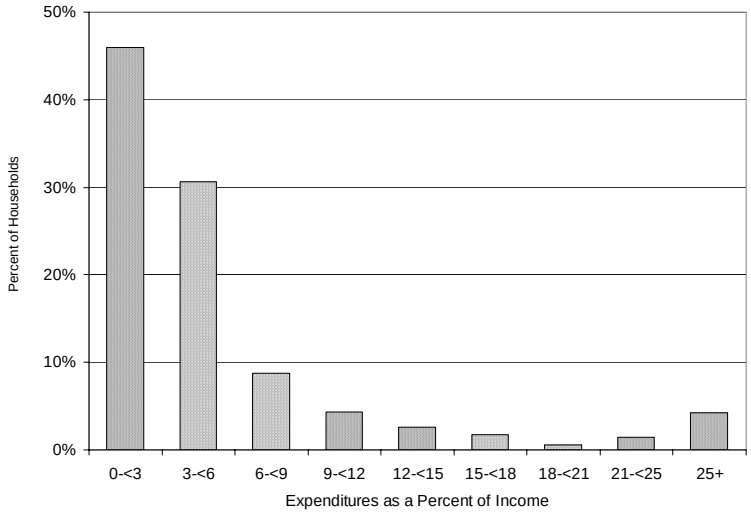
[33]For example, 2001 RECS households with incomes of $10,000 or less had average residential energy expenditures of $1042, while those with incomes between $20,000 - $35,000 had average residential energy expenditures of $1,315. Thus, households which had more than twice as much income spent only 26 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.[34]

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.

[34]The estimates of average energy burden may be overstated since RECS, like other surveys, understates income. Comparisons between the estimates of the number of LIHEAP 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 2004. The following equation was applied to each household in the microsimulation data file.

2004 Projected BTUs = (2001 estimated heat use * HDD change) +
(2001 estimated cooling use * CDD change) +
(2001 estimated water use + 2001 estimated appliance use)

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

Preliminary Expenditures = 2001 Expenditures * (2004 Projected Usage/2001 Actual Usage)

Final Expenditures = Preliminary Expenditures * Price Change[35]

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 2004. (For example, electricity prices increased by 3 percent from 2001 to FY 2004.)

Table A-1. National price factors for FY 2004

Fuel	Price Factors for FY 2004 Projections
Electricity	1.0310
Natural gas	1.0671
Fuel oil / kerosene	1.1108
Liquefied petroleum gas (LPG)	1.0468

Expenditure data were adjusted using national price factors for FY 2004. 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.

[35]Price factors were obtained from the Energy Information Administration's Monthly Energy Review, March 2005 for fuel oil/kerosene and April 2005 for electricity and natural gas. Prices for LPG were obtained from Petroleum Marketing Monthly, April 2002 and September 2005.

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 2004

Census Region	All fuels		Main heating fuel									
			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	$1,564	2.6%	$1,645	2.8%	$1,312	2.2%	$1,918	3.2%	$1,353	2.3%	$1,839	3.1%
Non low income households	$1,670	2.1%	$1,738	2.2%	$1,452	1.8%	$1,976	2.5%	$1,505	1.9%	$1,927	2.4%
Low income households[3]	$1,335	8.3%	$1,433	8.9%	$1,031	6.4%	$1,771	11.0%	$1,288	8.0%	$1,682	10.5%
LIHEAP recipient households[4]	$1,545	11.5%	$1,598	11.9%	$1,236	9.2%	$1,988	14.8%	$1,544	11.5%	$1,645	12.2%
Northeast												
All households	$1,876	2.9%	$1,948	3.0%	$1,480	2.3%	$1,948	3.0%	$1,563	2.4%	$2,131	3.3%
Non low income households	$2,029	2.3%	$2,143	2.4%	$1,693	1.9%	$2,022	2.3%	$1,903	2.1%	$2,326	2.6%
Low income households	$1,575	9.2%	$1,620	9.4%	$1,126	6.6%	$1,747	10.2%	$1,329	7.8%	$1,358*	7.9%
LIHEAP recipient households	$1,857	13.2%	$1,883	13.4%	$1,671	11.9%	$2,038	14.5%	$1,566*	11.1%	$1,662*	11.8%
Midwest												
All households	$1,612	2.8%	$1,640	2.8%	$1,148	2.0%	$1,743	3.0%	NC	NC	$1,949	3.3%
Non low income households	$1,671	2.2%	$1,681	2.2%	$1,366	1.8%	$1,868	2.4%	NC	NC	$1,957	2.5%
Low income households	$1,476	8.9%	$1,536	9.3%	$806	4.9%	$1,623	9.8%	NC	NC	$1,935	11.7%
LIHEAP recipient households	$1,514	10.5%	$1,547	10.7%	$1,159	8.0%	$1,418*	9.8%	NC	NC	$1,879	13.1%
South												
All households	$1,595	2.9%	$1,771	3.3%	$1,439	2.6%	$1,936	3.6%	$1,229	2.3%	$1,744	3.2%
Non low income households	$1,707	2.3%	$1,906	2.6%	$1,543	2.1%	$1,822	2.5%	$776*	1.1%	$1,888	2.6%
Low income households	$1,346	9.2%	$1,467	10.0%	$1,197	8.1%	$2,382*	16.2%	$1,330	9.0%	$1,517	10.3%
LIHEAP recipient households	$1,415	13.3%	$1,455	13.6%	$1,345	12.6%	$2,065*	19.4%	$1,056*	9.9%	$1,441	13.5%
West												
All households	$1,190	1.9%	$1,285	2.0%	$960	1.5%	$1,575*	2.5%	$1,205*	1.9%	$1,688	2.7%
Non low income households	$1,300	1.6%	$1,370	1.6%	$1,108	1.3%	$1,575*	1.9%	$1,510*	1.8%	$1,708	2.1%
Low income households	$959	5.7%	$1,071	6.4%	$727	4.3%	NC	NC	$1,013	6.0%	$1,653	9.9%
LIHEAP recipient households	$1,026	6.9%	$1,071	7.3%	$687	4.7%	$1,362*	9.2%	NC	NC	$1,804*	12.2%

[1]Estimates are derived from the 2001 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy. The 2001 RECS data have been adjusted for heating degree days, cooling degree days, and fuel price estimates for FY 2004. 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 2004 CPS ASEC, which reports income for calendar year 2003. 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 2004

Census Region	All fuels		Main heating fuel: 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	$1,564	6.4%	$1,645	6.5%	$1,312	5.7%	$1,918	6.9%	$1,353	13.8%	$1,839	7.9%
Non low income households	$1,670	3.0%	$1,738	3.0%	$1,452	2.7%	$1,976	3.4%	$1,505	3.4%	$1,927	4.1%
Low income households[3]	$1,335	13.7%	$1,433	14.5%	$1,031	11.8%	$1,771	16.0%	$1,288	18.3%	$1,682	14.8%
LIHEAP recipient households[4]	$1,545	18.9%	$1,598	19.8%	$1,236	15.6%	$1,988	20.5%	$1,544	25.1%	$1,645	21.5%
Northeast												
All households	$1,876	8.1%	$1,948	9.4%	$1,480	5.8%	$1,948	6.8%	$1,563	14.0%	$2,131	5.8%
Non low income households	$2,029	3.4%	$2,143	3.5%	$1,693	2.8%	$2,022	3.5%	$1,903	4.1%	$2,326	3.6%
Low income households	$1,575	17.3%	$1,620	19.5%	$1,126	10.9%	$1,747	15.7%	$1,329	20.7%	$1,358*	14.8%
LIHEAP recipient households	$1,857	23.0%	$1,883	24.7%	$1,671	23.3%	$2,038	20.5%	$1,566*	25.8%	$1,662*	12.4%
Midwest												
All households	$1,612	6.2%	$1,640	5.8%	$1,148	6.6%	$1,743	10.6%	NC	NC	$1,949	7.7%
Non low income households	$1,671	3.0%	$1,681	3.0%	$1,366	2.5%	$1,868	3.5%	NC	NC	$1,957	4.3%
Low income households	$1,476	13.3%	$1,536	13.1%	$806	12.9%	$1,623	17.4%	NC	NC	$1,935	14.1%
LIHEAP recipient households	$1,514	16.2%	$1,547	15.6%	$1,159	11.1%	$1,418*	12.0%	NC	NC	$1,879	26.8%
South												
All households	$1,595	6.8%	$1,771	7.2%	$1,439	6.2%	$1,936	5.4%	$1,229	14.3%	$1,744	8.8%
Non low income households	$1,707	3.1%	$1,906	3.3%	$1,543	2.9%	$1,822	2.6%	$776*	2.2%	$1,888	4.3%
Low income households	$1,346	15.0%	$1,467	16.0%	$1,197	13.8%	$2,382*	16.0%	$1,330	17.0%	$1,517	15.8%
LIHEAP recipient households	$1,415	19.3%	$1,455	22.9%	$1,345	17.2%	$2,065*	25.5%	$1,056*	10.0%	$1,441	18.0%
West												
All households	$1,190	4.4%	$1,285	4.4%	$960	4.2%	$1,575*	3.3%	$1,205*	12.0%	$1,688	7.1%
Non low income households	$1,300	2.3%	$1,370	2.4%	$1,108	2.1%	$1,575*	3.3%	$1,510*	3.1%	$1,708	3.4%
Low income households	$959	8.8%	$1,071	9.6%	$727	7.4%	NC	NC	$1,013	17.7%	$1,653	13.4%
LIHEAP recipient households	$1,026	13.7%	$1,071	14.8%	$687	9.5%	$1,362*	16.8%	NC	NC	$1,804*	22.0%

[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 2004. 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 2004 income is estimated by inflating income reported in the 2001 RECS by the consumer price index (CPI) and FY 2004 energy expenditures are estimated by adjusting energy expenditures reported in the 2001 RECS for changes in weather and energy prices. FY 2004 residential energy burden for each household is computed as estimated FY 2004 residential energy expenditures divided by estimated FY 2004 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 2004

Census Region	All fuels		Main heating fuel									
			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	$1,564	3.4%	$1,645	3.4%	$1,312	3.1%	$1,918	3.8%	$1,353	8.1%	$1,839	5.2%
Non low income households	$1,670	2.6%	$1,738	2.6%	$1,452	2.4%	$1,976	3.1%	$1,505	3.1%	$1,927	3.9%
Low income households[3/]	$1,335	8.1%	$1,433	8.6%	$1,031	6.5%	$1,771	9.6%	$1,288	12.5%	$1,682	9.9%
LIHEAP recipient households[4/]	$1,545	12.4%	$1,598	12.9%	$1,236	10.6%	$1,988	15.1%	$1,544	13.2%	$1,645	12.6%
Northeast												
All households	$1,876	4.0%	$1,948	4.4%	$1,480	3.4%	$1,948	4.0%	$1,563	7.9%	$2,131	2.9%
Non low income households	$2,029	3.0%	$2,143	3.1%	$1,693	2.4%	$2,022	3.2%	$1,903	3.9%	$2,326	2.9%
Low income households	$1,575	9.1%	$1,620	10.0%	$1,126	6.1%	$1,747	9.0%	$1,329	8.7%	$1,358*	9.4%
LIHEAP recipient households	$1,857	14.2%	$1,883	16.0%	$1,671	12.3%	$2,038	14.9%	$1,566*	13.2%	$1,662*	11.0%
Midwest												
All households	$1,612	3.5%	$1,640	3.4%	$1,148	3.0%	$1,743	5.8%	NC	NC	$1,949	5.3%
Non low income households	$1,671	2.7%	$1,681	2.7%	$1,366	2.3%	$1,868	3.1%	NC	NC	$1,957	4.0%
Low income households	$1,476	8.2%	$1,536	7.6%	$806	5.7%	$1,623	11.5%	NC	NC	$1,935	11.5%
LIHEAP recipient households	$1,514	11.2%	$1,547	11.2%	$1,159	9.4%	$1,418*	11.3%	NC	NC	$1,879	15.5%
South												
All households	$1,595	3.7%	$1,771	3.7%	$1,439	3.4%	$1,936	3.1%	$1,229	9.6%	$1,744	5.6%
Non low income households	$1,707	2.8%	$1,906	2.9%	$1,543	2.6%	$1,822	2.8%	$776*	2.0%	$1,888	4.4%
Low income households	$1,346	9.1%	$1,467	9.9%	$1,197	7.8%	$2,382*	11.5%	$1,330	12.5%	$1,517	9.8%
LIHEAP recipient households	$1,415	12.9%	$1,455	13.0%	$1,345	11.8%	$2,065*	25.5%	$1,056*	9.8%	$1,441	11.5%
West												
All households	$1,190	2.6%	$1,285	2.6%	$960	2.5%	$1,575*	3.3%	$1,205*	4.4%	$1,688	4.6%
Non low income households	$1,300	2.1%	$1,370	2.0%	$1,108	1.9%	$1,575*	3.3%	$1,510*	3.1%	$1,708	3.2%
Low income households	$959	5.3%	$1,071	5.6%	$727	4.1%	NC	NC	$1,013	13.1%	$1,653	8.3%
LIHEAP recipient households	$1,026	8.5%	$1,071	11.5%	$687	6.3%	$1,362*	16.8%	NC	NC	$1,804*	31.6%

[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 2004. 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 2004 income is estimated by inflating income reported in the 2001 RECS by the consumer price index (CPI) and FY 2004 energy expenditures are estimated by adjusting energy expenditures reported in the 2001 RECS for changes in weather and energy prices. FY 2004 residential energy burden for each household is computed as estimated FY 2004 residential energy expenditures divided by estimated FY 2004 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 2004[1/]

	All Fuels[2/]	Natural Gas	Electricity	Fuel Oil	Kerosene	LPG
			(In MmBTUs)[3/]			
United States						
All households	44.2	56.9	13.5	75.9	43.6	52.5
Non low income households	46.2	58.6	14.8	78.3	53.2	55.9
Low income households[4/]	39.8	53.3	10.8	69.7	39.6	46.4
LIHEAP recipient households[5/]	57.4	72.7	17.8	95.0	58.2	42.8
Northeast						
All households	66.7	72.5	20.1	77.8	61.6	68.6
Non low income households	72.1	79.6	24.6	81.1	72.4	72.6
Low income households	55.9	60.7	12.7	68.9	54.2	52.6*
LIHEAP recipient households	72.9	78.8	21.9	93.1	60.0*	30.6*
Midwest						
All households	68.9	76.2	23.0	74.2	NC	64.4
Non low income households	70.6	76.5	29.3	74.4	NC	64.6
Low income households	65.0	75.2	13.2	74.0	NC	63.9
LIHEAP recipient households	70.1	84.9	18.2	99.0*	NC	60.4
South						
All households	27.8	43.7	12.3	68.3	29.7	41.5
Non low income households	28.7	45.0	12.7	68.4	24.4*	47.9
Low income households	25.8	40.9	11.2	67.5*	30.9	31.3
LIHEAP recipient households	34.3	51.0	19.6	117.6*	19.1*	26.8
West						
All households	26.2	34.1	11.1	49.9*	41.0*	45.8
Non low income households	28.0	35.0	12.8	49.9*	43.9*	44.6
Low income households	22.5	31.8	8.5	NC	39.2	47.7
LIHEAP recipient households	30.1	37.9	9.8	87.0*	NC	63.8*

[1/]Developed from the 2001 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy, for FY 2004.
[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 2004

Census Region	All fuels		Main heating fuel									
			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	$511	0.9%	$587	1.0%	$291	0.5%	$769	1.3%	$545	0.9%	$773	1.3%
Non low income households	$533	0.7%	$602	0.8%	$316	0.4%	$797	1.0%	$638	0.8%	$833	1.1%
Low income households[3/]	$463	2.9%	$554	3.5%	$241	1.5%	$698	4.3%	$505	3.1%	$664	4.1%
LIHEAP recipient households[4/]	$645	4.8%	$718	5.3%	$402	3.0%	$959	7.1%	$703	5.2%	$647	4.8%
Northeast												
All households	$797	1.2%	$872	1.4%	$577	0.9%	$784	1.2%	$722	1.1%	$1,105	1.7%
Non low income households	$856	1.0%	$945	1.1%	$676	0.8%	$820	0.9%	$857	1.0%	$1,205	1.4%
Low income households	$681	4.0%	$749	4.4%	$413	2.4%	$687	4.0%	$629	3.7%	$710*	4.1%
LIHEAP recipient households	$870	6.2%	$942	6.7%	$675	4.8%	$934	6.6%	$724*	5.1%	$576*	4.1%
Midwest												
All households	$676	1.2%	$694	1.2%	$452	0.8%	$735	1.3%	NC	NC	$857	1.5%
Non low income households	$688	0.9%	$694	0.9%	$546	0.7%	$746	1.0%	NC	NC	$869	1.1%
Low income households	$648	3.9%	$693	4.2%	$305	1.8%	$725	4.4%	NC	NC	$835	5.0%
LIHEAP recipient households	$652	4.5%	$692	4.8%	$396	2.8%	$938*	6.5%	NC	NC	$836	5.8%
South												
All households	$387	0.7%	$495	0.9%	$261	0.5%	$745	1.4%	$407	0.7%	$667	1.2%
Non low income households	$399	0.5%	$510	0.7%	$271	0.4%	$744	1.0%	$314*	0.4%	$764	1.0%
Low income households	$358	2.4%	$461	3.1%	$239	1.6%	$750*	5.1%	$428	2.9%	$516	3.5%
LIHEAP recipient households	$479	4.5%	$526	4.9%	$398	3.7%	$1,224*	11.5%	$246*	2.3%	$473	4.4%
West												
All households	$298	0.5%	$333	0.5%	$218	0.3%	$515*	0.8%	$522*	0.8%	$691	1.1%
Non low income households	$321	0.4%	$350	0.4%	$251	0.3%	$515*	0.6%	$531*	0.6%	$696	0.8%
Low income households	$249	1.5%	$290	1.7%	$165	1.0%	NC	NC	$516	3.1%	$682	4.1%
LIHEAP recipient households	$347	2.4%	$360	2.4%	$199	1.3%	$927*	6.3%	NC	NC	$870*	5.9%

[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 2004. 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 2004 CPS ASEC, which reports income for calendar year 2003. 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 2004

Census Region	All fuels		Main heating fuel									
			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	$511	2.2%	$587	2.6%	$291	1.4%	$769	2.7%	$545	6.0%	$773	3.2%
Non low income households	$533	1.0%	$602	1.1%	$316	0.6%	$797	1.4%	$638	1.4%	$833	1.8%
Low income households[3/]	$463	5.0%	$554	6.0%	$241	3.0%	$698	6.1%	$505	7.9%	$664	5.6%
LIHEAP recipient households[4/]	$645	8.4%	$718	9.3%	$402	5.4%	$959	10.5%	$703	10.6%	$647	10.2%
Northeast												
All households	$797	3.7%	$872	4.7%	$577	2.3%	$784	2.6%	$722	7.6%	$1,105	2.9%
Non low income households	$856	1.5%	$945	1.6%	$676	1.2%	$820	1.5%	$857	1.9%	$1,205	1.9%
Low income households	$681	8.1%	$749	9.9%	$413	4.1%	$687	5.7%	$629	11.4%	$710*	6.7%
LIHEAP recipient households	$870	11.4%	$942	12.7%	$675	12.3%	$934	10.0%	$724*	11.0%	$576*	2.8%
Midwest												
All households	$676	2.7%	$694	2.6%	$452	2.3%	$735	4.7%	NC	NC	$857	3.3%
Non low income households	$688	1.3%	$694	1.3%	$546	1.0%	$746	1.4%	NC	NC	$869	2.0%
Low income households	$648	5.9%	$693	6.1%	$305	4.3%	$725	7.9%	NC	NC	$835	5.7%
LIHEAP recipient households	$652	7.3%	$692	7.2%	$396	3.7%	$938*	8.0%	NC	NC	$836	13.2%
South												
All households	$387	1.9%	$495	2.3%	$261	1.3%	$745	2.1%	$407	5.0%	$667	3.2%
Non low income households	$399	0.8%	$510	1.0%	$271	0.5%	$744	1.1%	$314*	0.8%	$764	1.7%
Low income households	$358	4.3%	$461	5.4%	$239	3.1%	$750*	6.0%	$428	6.0%	$516	5.5%
LIHEAP recipient households	$479	7.7%	$526	10.5%	$398	5.0%	$1,224*	15.1%	$246*	2.0%	$473	8.3%
West												
All households	$298	1.2%	$333	1.3%	$218	1.0%	$515*	1.1%	$522*	5.0%	$691	2.9%
Non low income households	$321	0.6%	$350	0.6%	$251	0.5%	$515*	1.1%	$531*	1.1%	$696	1.5%
Low income households	$249	2.4%	$290	2.8%	$165	1.7%	NC	NC	$516	7.5%	$682	5.3%
LIHEAP recipient households	$347	4.6%	$360	4.9%	$199	2.7%	$927*	11.5%	NC	NC	$870*	10.5%

[1/]Expenditures shown in this table are derived from the 2001 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy. The 2001 RECS data have been adjusted for heating degree days, cooling degree days, and fuel price estimates for FY 2004. 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 2004 income is estimated by inflating income reported in the 2001 RECS by the consumer price index (CPI) and FY 2004 energy expenditures are estimated by adjusting energy expenditures reported in the 2001 RECS for changes in weather and energy prices. FY 2004 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 2004

Census Region	All fuels		Main heating fuel									
			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	$511	1.0%	$587	1.1%	$291	0.6%	$769	1.5%	$545	3.2%	$773	2.1%
Non low income households	$533	0.7%	$602	0.9%	$316	0.4%	$797	1.1%	$638	1.2%	$833	1.5%
Low income households[3]	$463	2.4%	$554	2.8%	$241	1.5%	$698	4.0%	$505	4.3%	$664	4.2%
LIHEAP recipient households[4]	$645	4.9%	$718	5.8%	$402	3.1%	$959	6.9%	$703	8.3%	$647	4.9%
Northeast												
All households	$797	1.6%	$872	1.9%	$577	1.3%	$784	1.5%	$722	3.2%	$1,105	1.8%
Non low income households	$856	1.2%	$945	1.3%	$676	0.8%	$820	1.2%	$857	1.5%	$1,205	1.5%
Low income households	$681	3.8%	$749	4.5%	$413	2.0%	$687	3.8%	$629	4.7%	$710*	5.8%
LIHEAP recipient households	$870	6.9%	$942	7.5%	$675	5.5%	$934	6.7%	$724*	8.3%	$576*	3.8%
Midwest												
All households	$676	1.4%	$694	1.3%	$452	1.1%	$735	2.4%	NC	NC	$857	2.2%
Non low income households	$688	1.1%	$694	1.1%	$546	0.8%	$746	1.4%	NC	NC	$869	1.6%
Low income households	$648	3.3%	$693	3.3%	$305	2.2%	$725	4.5%	NC	NC	$835	4.5%
LIHEAP recipient households	$652	4.7%	$692	4.9%	$396	2.7%	$938*	7.9%	NC	NC	$836	5.1%
South												
All households	$387	0.7%	$495	1.0%	$261	0.5%	$745	1.2%	$407	3.7%	$667	2.1%
Non low income households	$399	0.5%	$510	0.7%	$271	0.4%	$744	1.0%	$314*	0.3%	$764	1.6%
Low income households	$358	2.3%	$461	3.0%	$239	1.5%	$750*	3.0%	$428	4.3%	$516	3.6%
LIHEAP recipient households	$479	4.1%	$526	5.4%	$398	3.2%	$1,224*	15.1%	$246*	0.6%	$473	4.5%
West												
All households	$298	0.5%	$333	0.6%	$218	0.5%	$515*	0.9%	$522*	1.6%	$691	1.9%
Non low income households	$321	0.4%	$350	0.4%	$251	0.3%	$515*	0.9%	$531*	0.9%	$696	1.0%
Low income households	$249	1.1%	$290	1.3%	$165	0.8%	NC	NC	$516	9.5%	$682	3.3%
LIHEAP recipient households	$347	2.1%	$360	3.3%	$199	1.5%	$927*	11.5%	NC	NC	$870*	16.8%

[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 2004. 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 2004 income is estimated by inflating income reported in the 2001 RECS by the consumer price index (CPI) and FY 2004 energy expenditures are estimated by adjusting energy expenditures reported in the 2001 RECS for changes in weather and energy prices. FY 2004 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 2004

	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%	6.5	$172	0.3%	0.6%	0.3%
Non low income households	90.6%	7.2	$192	0.2%	0.3%	0.2%
Low income households[4/]	81.5%	4.8	$124	0.8%	1.2%	0.5%
LIHEAP recipient households[5/]	83.0%	3.4	$91	0.7%	1.0%	0.5%
Northeast						
All households	83.5%	2.5	$86	0.1%	0.3%	0.1%
Non low income households	87.1%	2.9	$99	0.1%	0.2%	0.1%
Low income households	76.3%	1.6	$57	0.3%	0.6%	0.3%
LIHEAP recipient households	72.6%	1.6	$55	0.4%	0.6%	0.2%
Midwest						
All households	92.3%	3.6	$89	0.2%	0.3%	0.2%
Non low income households	95.0%	4.0	$100	0.1%	0.2%	0.1%
Low income households	86.2%	2.4	$61	0.4%	0.5%	0.3%
LIHEAP recipient households	87.2%	2.7	$70	0.5%	0.7%	0.3%
South						
All households	97.8%	11.3	$285	0.5%	1.1%	0.6%
Non low income households	99.3%	12.5	$317	0.4%	0.6%	0.5%
Low income households	94.5%	8.5	$211	1.4%	2.2%	1.2%
LIHEAP recipient households	97.3%	6.6	$167	1.6%	2.1%	1.6%
West						
All households	69.6%	3.6	$110	0.2%	0.3%	0.1%
Non low income households	73.8%	4.0	$125	0.2%	0.2%	0.1%
Low income households	60.6%	2.5	$73	0.4%	0.6%	0.2%
LIHEAP recipient households	71.6%	1.6	$37	0.3%	0.5%	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 2004. 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: Estimates of eligible households

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 four 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 2004 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 2004 numbers of LIHEAP income eligible households in the population and eligible households in various vulnerability and poverty groups, averages derived from the 2003, 2004, and 2005 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 589,042 households in Alabama were eligible for the LIHEAP program and that 222,671 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.

Table B-1. Average of 2003, 2004, and 2005 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 2003-2005.)

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	589,042	222,671	103,741	234,492	156,488
Alaska	62,655	16,269	16,367	18,499	21,178
Arizona	619,574	225,593	160,459	141,486	178,500
Arkansas	329,207	136,594	70,404	117,989	74,634
California	3,995,588	1,419,785	917,173	1,053,817	1,241,030
Colorado	497,706	163,718	103,515	94,800	184,961
Connecticut	478,600	221,092	69,395	127,073	129,462
Delaware	90,486	36,160	17,081	24,574	26,623
District of Columbia	78,032	28,422	12,127	22,505	25,803
Florida	2,062,363	961,887	303,995	511,257	580,906
Georgia	951,357	309,954	207,479	266,265	315,877
Hawaii	118,247	52,156	24,289	25,347	33,908
Idaho	119,295	39,450	33,869	22,104	37,792
Illinois	1,585,698	671,151	299,581	335,782	468,872
Indiana	753,417	321,483	141,351	191,650	205,089
Iowa	338,803	140,728	59,738	74,755	100,076
Kansas	319,791	123,346	58,619	78,909	96,240
Kentucky	535,448	211,471	100,824	200,520	130,211
Louisiana	554,177	219,294	129,790	180,088	138,272
Maine	170,172	79,142	21,250	56,421	39,344
Maryland	659,377	283,044	108,053	136,850	205,714
Massachusetts	892,840	400,757	120,533	239,313	250,807
Michigan	1,376,703	517,816	258,054	370,308	427,185
Minnesota	524,492	220,335	83,832	106,465	160,849
Mississippi	346,337	139,130	73,413	144,083	67,786
Missouri	656,388	287,384	107,326	163,895	185,147
Montana	115,005	39,994	19,915	32,438	38,302
Nebraska	195,440	83,177	37,270	34,605	58,408
Nevada	226,692	87,391	49,663	47,337	70,511
New Hampshire	133,552	66,259	18,152	27,901	35,788
New Jersey	1,100,117	539,685	161,595	225,413	311,082
New Mexico	203,338	69,441	48,407	59,109	59,685
New York	2,578,493	1,088,612	425,598	721,078	738,826
North Carolina	1,095,278	442,491	216,483	347,753	304,315
North Dakota	72,509	29,122	11,529	12,762	24,756
Ohio	1,363,645	552,149	236,307	369,631	401,650
Oklahoma	397,574	159,626	81,296	111,443	106,636
Oregon	421,327	161,999	81,045	112,260	123,299
Pennsylvania	1,605,088	781,317	226,978	416,689	413,215
Rhode Island	146,267	65,878	23,990	44,204	34,418
South Carolina	505,270	224,327	88,930	179,626	127,042
South Dakota	89,130	41,177	14,054	19,576	25,177
Tennessee	760,921	304,751	150,804	252,137	187,439
Texas	2,549,209	863,479	689,566	633,163	798,129
Utah	179,409	49,957	57,909	33,437	54,598
Vermont	72,038	30,479	10,160	20,960	20,870
Virginia	795,870	307,710	142,869	208,802	251,072
Washington	725,633	257,121	142,539	171,146	243,088
West Virginia	223,491	103,832	33,685	94,490	47,141
Wisconsin	633,979	269,363	109,410	134,232	197,390
Wyoming	52,236	20,691	10,190	12,628	15,426
All States	34,947,306	14,088,859	6,690,604	9,262,067	10,171,017

[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.

Table B-2. Average of 2003, 2004, and 2005 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 2003-2005.)

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	128	409,838	135,801	87,456	176,190	101,722
Alaska	150	45,817	11,208	12,687	14,323	14,759
Arizona	154	477,477	169,791	131,585	113,996	130,261
Arkansas	128	246,488	96,415	56,733	93,259	54,462
California	[5/]208	3,995,588	1,419,785	917,173	1,053,817	1,241,030
Colorado	185	379,551	123,995	84,629	79,169	132,286
Connecticut	[5/]269	478,600	221,092	69,395	127,073	129,462
Delaware	200	72,559	29,540	14,755	20,016	19,468
District of Columbia	150	59,100	20,650	9,639	18,886	18,741
Florida	150	1,511,129	660,752	242,457	418,216	427,790
Georgia	150	637,827	212,840	145,142	202,178	189,533
Hawaii	154	91,941	39,821	18,506	21,820	26,220
Idaho	150	87,008	25,679	25,909	18,078	28,044
Illinois	154	982,011	395,318	202,919	245,544	277,424
Indiana	125	351,485	131,972	77,525	113,830	85,609
Iowa	150	218,004	88,659	41,303	56,560	57,696
Kansas	130	170,687	57,281	34,492	51,981	49,982
Kentucky	110	293,388	99,789	61,087	129,375	68,786
Louisiana	[5/]167	554,177	219,294	129,790	180,088	138,272
Maine	150	121,114	54,341	15,786	45,193	26,521
Maryland	150	305,286	143,391	41,068	80,121	82,550
Massachusetts	200	670,866	316,640	92,434	202,466	157,421
Michigan	110	517,152	147,995	111,065	184,863	157,271
Minnesota	[5/]197	409,505	179,483	62,035	94,772	111,877
Mississippi	150	323,269	129,479	71,350	135,675	61,264
Missouri	125	326,810	122,148	62,300	97,590	91,746
Montana	150	99,817	34,853	18,083	29,367	30,934
Nebraska	116	88,375	32,249	19,637	20,502	26,698
Nevada	150	148,246	53,592	36,231	32,841	43,974
New Hampshire	[5/]237	133,552	66,259	18,152	27,901	35,788
New Jersey	175	628,690	310,664	99,736	152,551	155,469
New Mexico	150	191,933	64,061	47,552	56,100	55,546
New York	[5/]217	2,578,493	1,088,612	425,598	721,078	738,826
North Carolina	113	554,665	197,991	120,980	201,958	160,156
North Dakota	[5/]180	72,509	29,122	11,529	12,762	24,756
Ohio	150	856,146	316,368	170,321	265,612	240,098
Oklahoma	110	198,080	69,192	44,142	67,569	51,809
Oregon	[5/]192	421,327	161,999	81,045	112,260	123,299
Pennsylvania	135	800,341	347,419	133,382	266,343	190,186
Rhode Island	[5/]230	146,267	65,878	23,990	44,204	34,418
South Carolina	150	386,608	170,546	74,191	150,822	87,108
South Dakota	160	70,480	32,379	11,126	16,711	19,527
Tennessee	102	344,333	116,199	76,172	138,630	83,254
Texas	125	1,559,358	490,872	453,574	440,046	465,914
Utah	125	88,624	20,999	31,025	20,180	27,009
Vermont	125	34,451	13,663	5,377	10,991	9,395
Virginia	130	373,771	146,753	76,287	118,460	94,704
Washington	125	330,973	107,606	83,888	94,619	91,353
West Virginia	130	167,379	71,557	27,391	78,051	34,952
Wisconsin	150	361,573	139,133	67,188	93,420	112,155
Wyoming	150	35,959	14,099	7,009	9,538	10,079
All States	not applicable	24,408,629	9,415,227	4,982,826	7,157,595	6,827,607

[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 during 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.

Table B-3. Average of 2003, 2004, and 2005 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 2003-2005.)

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	589,042	291,952	102,947	92,047	102,096
Alaska	62,655	24,644	9,988	11,185	16,838
Arizona	619,574	233,976	99,553	126,609	159,436
Arkansas	329,207	175,056	66,636	63,744	23,771
California	3,995,588	1,297,495	660,710	674,460	1,362,923
Colorado	497,706	156,071	59,533	72,525	209,577
Connecticut	478,600	123,228	54,263	52,248	248,862
Delaware	90,486	21,587	11,639	12,251	45,009
District of Columbia	78,032	36,934	12,268	9,898	18,932
Florida	2,062,363	792,169	346,036	372,924	551,234
Georgia	951,357	363,662	130,940	143,224	313,530
Hawaii	118,247	50,763	18,490	19,000	29,995
Idaho	119,295	40,232	21,681	25,095	32,287
Illinois	1,585,698	531,353	202,733	202,527	649,086
Indiana	753,417	237,863	113,622	129,474	272,458
Iowa	338,803	107,804	57,794	52,407	120,799
Kansas	319,791	118,830	43,000	53,388	104,572
Kentucky	535,448	253,544	94,037	99,160	88,707
Louisiana	554,177	277,240	102,619	108,121	66,197
Maine	170,172	62,550	29,155	29,409	49,058
Maryland	659,377	175,636	67,337	62,313	354,090
Massachusetts	892,840	260,811	95,295	117,044	419,689
Michigan	1,376,703	460,076	155,459	187,435	573,732
Minnesota	524,492	130,862	60,171	68,345	265,115
Mississippi	346,337	181,783	63,110	78,376	23,069
Missouri	656,388	219,342	107,468	114,839	214,738
Montana	115,005	51,521	23,558	24,739	15,187
Nebraska	195,440	67,197	31,137	32,968	64,138
Nevada	226,692	72,111	35,150	40,985	78,445
New Hampshire	133,552	29,520	14,907	18,117	71,008
New Jersey	1,100,117	271,549	114,263	119,271	595,035
New Mexico	203,338	109,638	40,961	41,334	11,406
New York	2,578,493	1,014,011	330,256	350,895	883,331
North Carolina	1,095,278	458,495	190,101	180,127	266,555
North Dakota	72,509	27,814	12,752	12,755	19,187
Ohio	1,363,645	457,871	184,463	213,813	507,499
Oklahoma	397,574	170,186	74,068	76,247	77,073
Oregon	421,327	150,996	66,676	77,814	125,841
Pennsylvania	1,605,088	490,645	216,018	240,174	658,250
Rhode Island	146,267	48,862	19,151	21,747	56,506
South Carolina	505,270	219,809	79,129	87,670	118,662
South Dakota	89,130	33,732	14,044	16,029	25,325
Tennessee	760,921	333,737	132,203	115,010	179,971
Texas	2,549,209	1,132,646	426,713	420,287	569,564
Utah	179,409	62,389	26,235	33,769	57,016
Vermont	72,038	21,857	12,593	12,038	25,549
Virginia	795,870	250,518	99,692	101,007	344,652
Washington	725,633	241,488	89,485	113,376	281,283
West Virginia	223,491	112,345	45,662	47,084	18,400
Wisconsin	633,979	191,195	74,998	95,380	272,406
Wyoming	52,236	17,550	8,503	9,907	16,277
All States	34,947,306	12,663,149	5,149,195	5,480,593	11,654,368

[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.

Table B-4. Average of 2003, 2004, and 2005 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 2003-2005.)

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	128	409,838	291,952	102,947	14,938	0
Alaska	150	45,817	24,644	9,988	11,185	0
Arizona	154	477,477	233,976	99,553	126,609	17,339
Arkansas	128	246,488	175,056	66,636	4,796	0
California	[3/]208	3,995,588	1,297,495	660,710	674,460	1,362,923
Colorado	185	379,551	156,071	59,533	72,525	91,421
Connecticut	[3/]269	478,600	123,228	54,263	52,248	248,862
Delaware	200	72,559	21,587	11,639	12,251	27,081
District of Columbia	150	59,100	36,934	12,268	9,898	0
Florida	150	1,511,129	792,169	346,036	372,924	0
Georgia	150	637,827	363,662	130,940	143,224	0
Hawaii	154	91,941	50,763	18,490	19,000	3,689
Idaho	150	87,008	40,232	21,681	25,095	0
Illinois	154	982,011	531,353	202,733	202,527	45,399
Indiana	125	351,485	237,863	113,622	0	0
Iowa	150	218,004	107,804	57,794	52,407	0
Kansas	130	170,687	118,830	43,000	8,857	0
Kentucky	110	293,388	253,544	39,845	0	0
Louisiana	[3/]167	554,177	277,240	102,619	108,121	66,197
Maine	150	121,114	62,550	29,155	29,409	0
Maryland	150	305,286	175,636	67,337	62,313	0
Massachusetts	200	670,866	260,811	95,295	117,044	197,715
Michigan	110	517,152	460,076	57,076	0	0
Minnesota	[3/]197	409,505	130,862	60,171	68,077	150,395
Mississippi	150	323,269	181,783	63,110	78,376	0
Missouri	125	326,810	219,342	107,468	0	0
Montana	150	99,817	51,521	23,558	24,739	0
Nebraska	116	88,375	67,197	21,178	0	0
Nevada	150	148,246	72,111	35,150	40,985	0
New Hampshire	[3/]237	133,552	29,520	14,907	18,117	71,008
New Jersey	175	628,690	271,549	114,263	119,271	123,608
New Mexico	150	191,933	109,638	40,961	41,334	0
New York	[3/]217	2,578,493	1,014,011	330,256	350,895	883,331
North Carolina	113	554,665	458,495	96,170	0	0
North Dakota	[3/]180	72,509	27,814	12,752	12,755	19,187
Ohio	150	856,146	457,871	184,463	213,813	0
Oklahoma	110	198,080	170,186	27,893	0	0
Oregon	[3/]192	421,327	150,996	66,676	77,814	125,841
Pennsylvania	135	800,341	490,645	216,018	93,678	0
Rhode Island	[3/]230	146,267	48,862	19,151	21,747	56,506
South Carolina	150	386,608	219,809	79,129	87,670	0
South Dakota	160	70,480	33,732	14,044	16,029	6,675
Tennessee	102	344,333	333,737	10,595	0	0
Texas	125	1,559,358	1,132,646	426,713	0	0
Utah	125	88,624	62,389	26,235	0	0
Vermont	125	34,451	21,857	12,593	0	0
Virginia	130	373,771	250,518	99,692	23,560	0
Washington	125	330,973	241,488	89,485	0	0
West Virginia	130	167,379	112,345	45,662	9,373	0
Wisconsin	150	361,573	191,195	74,998	95,380	0
Wyoming	150	35,959	17,550	8,503	9,907	0
Entire U.S.	not applicable	24,408,629	12,663,149	4,724,948	3,523,353	3,497,179

[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.