

# **LIHEAP Home Energy Notebook**

## **For Fiscal Year 2010**



**U.S. DEPARTMENT OF  
HEALTH AND HUMAN SERVICES  
Administration for Children and Families  
Office of Community Services  
Division of Energy Assistance  
January 2013**

# **LIHEAP Home Energy Notebook**

## **For Fiscal Year 2010**

This document has been prepared for the Office of Community Services' Division of Energy Assistance by APPRISE Incorporated under contract #HHSP233201000237M. The statements, findings, conclusions, and recommendations are solely those of analysts from APPRISE and do not necessarily reflect the views of EIA or HHS.

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

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

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

January 2013

## Table of Contents

Figures and Tables

List of Acronyms and Abbreviations

<b>Executive Summary</b> .....	i
Home energy data .....	i
Low income home energy trends .....	iv
Trends in LIHEAP .....	x
Federal LIHEAP targeting performance.....	xi
<b>I. Introduction</b> .....	1
Purpose of Notebook.....	1
Organization of Notebook .....	2
<b>II. Home Energy Data</b> .....	3
Residential energy data .....	3
Home heating data .....	6
Home cooling data.....	9
<b>III. Low Income Home Energy Trends</b> .....	11
Trends in consumption, expenditures, and burden .....	13
Analysis of energy price and energy efficiency trends .....	25
Trends in LIHEAP.....	30
Analysis of LIHEAP benefits .....	34
<b>IV. Federal LIHEAP Targeting Performance</b> .....	37
LIHEAP program goals and performance goals .....	37
Targeting index performance measures .....	38
Outcome performance measures .....	40
Performance measurement research.....	40
Uses of LIHEAP performance data.....	46
Targeting performance measurement issues.....	48
<b>Appendix A: Home Energy Estimates</b> .....	49
Description of RECS.....	49
Strengths and limitations of RECS data.....	50
Average home energy consumption and expenditures .....	51
Energy burden.....	51
Projecting energy consumption and expenditures.....	54
<b>Appendix B: Income Eligible Household Estimates</b> .....	67

## Figures and Tables

Figure 1. Percent of U.S. residential energy expenditures by low income households, by end use, FY 2010.....	ii
Figure 2. Mean home heating and home cooling expenditures by all households, non low income households, low income households, and LIHEAP recipient households, FY 2010.....	iii
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 2010.....	iv
Figure 4. Percent of low income households using electricity and fuel oil as main heating fuels, 1979 to 2005.....	v
Figure 5. Percent of low income households using central air-conditioning, 1979 to 2005.....	v
Figure 6. Mean residential energy consumption (in MMBtus) per low income household, 1979 to FY 2010.....	vi
Figure 7. Mean residential energy expenditures for low income households, 1979 to FY 2010.....	vii
Figure 8. Mean group residential energy burden by end use for households with incomes at or below 150 percent of HHS' poverty guidelines, 1979 to FY 2010.....	viii
Figure 9. Shifts in composite energy price index and Consumer Price Index (CPI), 1979 to FY 2010.....	ix
Figure 10. Index of heating degree days (HDD), average heating consumption for low income households per HDD, cooling degree days (CDD), and average cooling consumption for low income households per CDD, 1979 to FY 2010.....	x
Figure 11. Number of LIHEAP/LIHEAP income eligible and heating and/or winter crisis assistance recipient households, FY 1981 to FY 2010.....	xi
Table 2-1a. Residential energy: Average annual household consumption, expenditures, and burden by all households, by main heating fuel type, United States, FY 2010 (See also Tables A-3a – A-3c, Appendix A).....	4
Table 2-1b. Residential energy: Average annual household consumption, expenditures, and burden by non low income households, by main heating fuel type, United States, FY 2010 (See also Tables A-3a – A-3c, Appendix A).....	4
Table 2-1c. Residential energy: Average annual household consumption, expenditures, and burden by low income households, by main heating fuel type, United States, FY 2010 (See also Tables A-3a – A-3c, Appendix A).....	4
Table 2-1d. Residential energy: Average annual household consumption, expenditures, and burden by LIHEAP recipient households, by main heating fuel type, United States, FY 2010 (See also Tables A-3a – A-3c, Appendix A).....	5
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 2010.....	5
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 2005 (See also Table A-4, Appendix A).....	6
Table 2-4a. Home heating: Average annual household consumption, expenditures, and burden by all households, by fuel type, United States, FY 2010 (See also Tables A-5, A-6a, A-6b, and A-6c, Appendix A).....	7
Table 2-4b. Home heating: Average annual household consumption, expenditures, and burden by non low income households, by fuel type, United States, FY 2010 (See also Tables A-5, A-6a, A-6b, and A-6c, Appendix A).....	8
Table 2-4c. Home heating: Average annual household consumption, expenditures, and burden by low income households, by fuel type, United States, FY 2010 (See also Tables A-5, A-6a, A-6b, and A-6c, Appendix A).....	8
Table 2-4d. Home heating: Average annual household consumption, expenditures, and burden by LIHEAP recipient households, by fuel type, United States, FY 2010 (See also Tables A-5, A-6a, A-6b, and A-6c, Appendix A).....	8
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 2005 (See also Table A-7, Appendix A).....	9
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 2010 (See also Table A-7, Appendix A).....	10
Table 3-1. Definition of special terms.....	12

**LIHEAP Home Energy Notebook for FY 2010: Table of Contents**

Table 3-2. Data used for the study of low income home energy trends ..... 13

Figure 3-1. Main heating fuel for households with incomes at or below 150 percent of HHS' poverty guidelines, 1979 to 2005 ..... 14

Figure 3-2. Air-conditioning type for households with incomes at or below 150 percent of HHS' poverty guidelines, 1979 to 2005 ..... 14

Figure 3-3. Mean residential energy consumption per household in MMBtus by end use for households with incomes at or below 150 percent of HHS' poverty guidelines, 1979 to FY 2010..... 15

Figure 3-4. Mean residential energy expenditures by end use for households with incomes at or below 150 percent of HHS' poverty guidelines, 1979 to FY 2010 ..... 16

Figure 3-5. Mean group residential energy burden by end use for households with incomes at or below 150 percent of HHS' poverty guidelines, 1979 to FY 2010 ..... 17

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 HHS' poverty guidelines, 1979 to FY 2010..... 18

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 HHS' poverty guidelines, 1979 to FY 2010 ..... 19

Figure 3-8. Number of low income households spending over 5 percent and 10 percent of income on home energy, 1979 to FY 2010 ..... 20

Figure 3-9. Percent of low income households spending over 5 percent and 10 percent of income on home energy, 1979 to FY 2010 ..... 20

Figure 3-10. Total fuel assistance dollars needed to reduce low income household spending on home energy to 5 percent and 10 percent of income, 1979 to FY 2010..... 21

Figure 3-11. Number of low income households spending over 15 percent and 25 percent of income on residential energy, 1979 to FY 2010 ..... 22

Figure 3-12. Total fuel assistance dollars needed to reduce low income household spending on residential energy to 15 percent and 25 percent of income, 1979 to FY 2010 ..... 23

Figure 3-13. Aggregated residential energy expenditures by end use for households with incomes at or below 150 percent of HHS' poverty guidelines, 1979 to FY 2010 ..... 24

Figure 3-14. Percentage of LIHEAP income eligible households with heat interruptions of two hours or more caused by an inability to pay for energy to run the household's main heating system, 1981-82 heating season to 2004-05 heating season..... 25

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 2010 ..... 26

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 HHS' poverty guidelines, 1979 to FY 2010 ..... 27

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 HHS' poverty guidelines, 1979 to FY 2010 ..... 28

Figure 3-18. Mean group home energy burden for all households and for households with incomes at or below 150 percent of HHS' poverty guidelines, 1979 to FY 2010 ..... 29

Figure 3-19. Mean group residential energy burden for all households and for households with incomes at or below 150 percent of HHS' poverty guidelines, 1979 to FY 2010 ..... 29

Figure 3-20. Percentage of LIEAP/LIHEAP Federally eligible households receiving LIEAP/LIHEAP heating and/or winter crisis assistance, FY 1981 to FY 2010 ..... 30

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 2010 ..... 31

Figure 3-22. Funds used for LIEAP/LIHEAP fuel assistance, FY 1981 to FY 2010 ..... 32

Figure 3-23. Mean combined LIEAP/LIHEAP heating and/or winter crisis benefits and mean cooling and/or summer crisis benefits, in nominal dollars, FY 1981 to FY 2010..... 33

Figure 3-24. Mean combined LIEAP/LIHEAP heating and/or winter crisis benefits and mean cooling benefits, in real 1981 dollars, FY 1981 to FY 2010 ..... 33

Figure 3-25. Amount and percentage of total home heating billed amounts for LIEAP/LIHEAP income eligible households covered by LIEAP/LIHEAP heating and winter crisis benefits, FY 1981 to FY 2010..... 35

Figure 3-26. Mean group home heating burden for all households and LIEAP/LIHEAP heating and winter crisis recipient households, FY 1981 to FY 2010 ..... 36

**LIHEAP Home Energy Notebook for FY 2010: Table of Contents**

---

Table 4-1a. LIHEAP reciprocity targeting performance measure 1A: Increase the reciprocity targeting index score of LIHEAP households having at least one member 60 years or older (reported for FY 2003 – FY 2010) .....	44
Table 4-1b. LIHEAP reciprocity targeting performance measure 1B: Maintain the reciprocity targeting index score of LIHEAP households having at least one member five years or younger (reported for FY 2003 – FY 2010) .....	44
Table 4-2. LIHEAP reciprocity targeting index for high burden households by region for FY 2001 from the 2001 RECS and the 2001 RECS LIHEAP Supplement, and for FY 2005 from the 2005 RECS.....	45
Table 4-3. LIHEAP benefit targeting index for high burden households by region for FY 2001 from the 2001 RECS and the 2001 RECS LIHEAP Supplement, and for FY 2005 from the 2005 RECS .....	46
Table 4-4. LIHEAP burden reduction targeting index for high burden households by region for FY 2001 from the 2001 RECS and the 2001 RECS LIHEAP Supplement, and for FY 2005 from the 2005 RECS.....	46
Figure A-1. Distribution of LIHEAP income eligible households by home energy burden, 2005 .....	53
Table A-1. National price factors for FY 2010 .....	55
Table A-2. Residential energy: Average consumption in MMBtus per household, by all fuels and specified fuels, by all, non low income, low income and LIHEAP recipient households, by Census region, FY 2010 .....	57
Table A-3a. Residential energy: Average annual expenditures, by amount (dollars) and mean group burden (percent of income), for all, non low income, low income, and LIHEAP recipient households, by Census region and main heating fuel, FY 2010.....	58
Table A-3b. Residential energy: Average annual expenditures, by amount (dollars) and mean individual burden (percent of income), for all, non low income, low income, and LIHEAP recipient households, by Census region and main heating fuel, FY 2010.....	59
Table A-3c. Residential energy: Average annual expenditures, by amount (dollars) and median individual burden (percent of income), for all, non low income, low income, and LIHEAP recipient households, by Census region and main heating fuel, FY 2010.....	60
Table A-4. Home heating: Percent of households using major types of heating fuels, by all, non low income, low income, and LIHEAP recipient households, by Census region and main heating fuel type, April 2005 .....	61
Table A-5. Home heating: Average consumption in MMBtus per household, by all fuels and specified fuels, by all, non low income, low income and LIHEAP recipient households, by Census region, FY 2010.....	62
Table A-6a. Home heating: Average annual expenditures by amount and mean group burden, by all, non low income, low income, and LIHEAP recipient households, by Census region and main heating fuel type, FY 2010.....	63
Table A-6b. Home heating: Average annual expenditures by amount and mean individual burden, by all, non low income, low income, and LIHEAP recipient households, by Census region and main heating fuel type, FY 2010.....	64
Table A-6c. Home heating: Average annual expenditures by amount and median individual burden, by all, non low income, low income, and LIHEAP recipient households, by Census region and main heating fuel type, FY 2010.....	65
Table A-7. Home cooling: Percent of households that cool, average annual consumption per household, average annual expenditures per household, mean group burden, mean individual burden, and median individual burden for households that cooled, by all, non low income, low income, and LIHEAP recipient households, by Census region, FY 2010 .....	66
Table B-1. State-level estimates of the number of LIHEAP income eligible households using the new (75% of SMI) Federal maximum LIHEAP income standard by vulnerability category .....	68
Table B-2. State-level estimates of the number of LIHEAP income eligible households using the previous (60% of SMI) Federal maximum LIHEAP income standard by vulnerability category.....	69
Table B-3. State-level estimates of the number of LIHEAP income eligible households using State LIHEAP income standards by vulnerability category.....	70
Table B-4. State-level estimates of the number of LIHEAP income eligible households using the new (75% of SMI) Federal maximum LIHEAP income standard categorized by income as a percentage of HHS poverty guidelines.....	71

**LIHEAP Home Energy Notebook for FY 2010: Table of Contents**

---

Table B-5. State-level estimates of the number of LIHEAP income eligible households using the previous (60% of SMI) Federal maximum LIHEAP income standard categorized by income as a percentage of HHS poverty guidelines.....	72
Table B-6. State-level estimates of the number of LIHEAP income eligible households using the State maximum LIHEAP income standards categorized by income as a percentage of HHS poverty guidelines .....	73

## **List of Acronyms and Abbreviations**

ACF	HHS' Administration for Children and Families
ACS	American Community Survey
ASEC	CPS Annual Social and Economic Supplement
Btu	British Thermal Unit
CDD	Cooling Degree Day
CPI	Consumer Price Index
CPS	Current Population Survey
DEA	OCS' Division of Energy Assistance\
DOE	U.S. Department of Energy
EIA	DOE's Energy Information Administration
FY	Fiscal Year
GPRA	Government Performances and Results Act of 1993 (Public Law 103-62)
HDD	Heating Degree Day
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	ACF's Office of Community Services
RECS	Residential Energy Consumption Survey



# Executive Summary

The Low Income Home Energy Assistance Program (LIHEAP) is authorized by Title XXVI of the Omnibus Budget Reconciliation Act of 1981 (OBRA), Public Law 97-35, as amended. The Administration for Children and Families (ACF) within the U.S. Department of Health and Human Services (HHS) administers LIHEAP at the Federal level.

In 1994, Congress amended the purpose of LIHEAP to clarify that LIHEAP is “to assist low income households, particularly those with the lowest income, that pay a high proportion of household income for home energy, primarily in meeting their immediate home energy needs.” (The Human Services Amendments of 1994, Public Law 103-252, Sec. 2602(a) as amended.) The Energy Policy Act of 2005 (Public Law 109-58) reauthorized LIHEAP through Fiscal Year (FY) 2007 without substantive changes. Reauthorization of LIHEAP is currently pending.

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 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 2005 Residential Energy Consumption Survey (RECS), which is administered by the Department of Energy’s (DOE’s) Energy Information Administration (EIA). The RECS covers all residential housing units that are primary residences in the United States and contains data for consumption and expenditures for calendar year 2005. All FY 2010 residential energy consumption and expenditures figures for this report have been derived from the 2005 RECS data that were adjusted to reflect FY 2010 weather and fuel prices.

### Residential energy data

In FY 2010, average residential energy expenditures for all households were \$2,120, and the mean individual energy burden was 6.9 percent of income.<sup>1</sup> Low income households had average energy expenditures of \$1,830, about 13.7 percent lower than the average for all households.<sup>2 3</sup> The mean individual energy burden for low income households was 13.2 percent, nearly twice the mean individual energy burden of all households. LIHEAP recipient households had average residential energy expenditures of \$1,986, almost nine percent higher than the average for all low income households. The mean individual energy burden for LIHEAP recipients was 15.4 percent, 8.5 percentage points higher than the mean individual energy burden for all households and 2.2 percentage points higher than the mean individual energy burden for low income households.

---

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

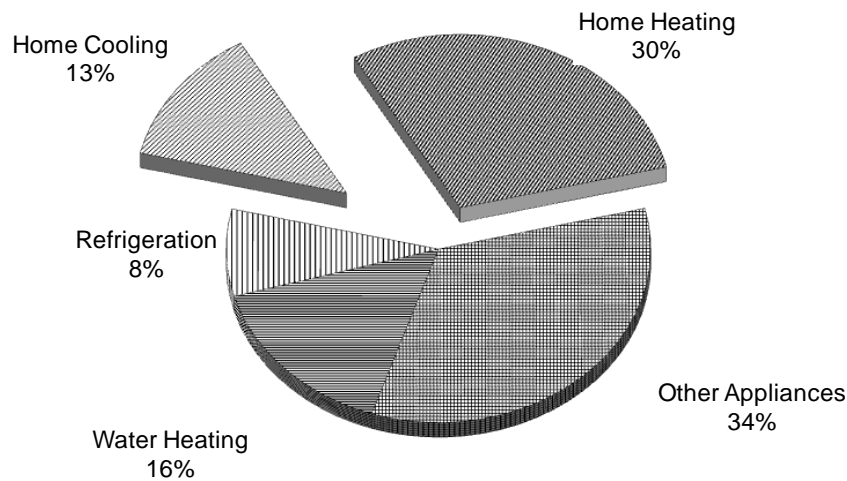
<sup>2</sup> Unless otherwise indicated, “low income” refers to households with income at or below the Federal maximum LIHEAP eligibility standard (i.e., the greater of 150 percent of HHS Poverty Guidelines and 60 percent of State median income). The terms “low income” and “LIHEAP income eligible” are,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

<sup>3</sup> For fiscal year 2009 and 2010, the Congress raised the Federal maximum LIHEAP eligibility standard from the greater of 60% State median income and 150% of HHS Poverty Guidelines to the greater of 75% State median eligibility and 150% of HHS Poverty Guidelines. To maintain comparability with the previous *Notebooks*, low income definition was kept the same as before.

Nationally, all households decreased their average energy expenditures by 2.8 percent, from \$2,180 in FY 2009 to \$2,120 in FY 2010. Low income households decreased theirs by 2.9 percent, from \$1,885 in FY 2009 to \$1,830 in FY 2010. LIHEAP recipient households decreased theirs by 4.8 percent, from \$2,087 in FY 2009 to \$1,986 in FY 2010. The decline in expenditures in FY 2010 is due to a significant decline in natural gas prices.

LIHEAP assists households with only that portion of residential energy costs that goes for home energy, i.e., home heating and home cooling. As shown in Figure 1, home heating and home cooling represent about 43 percent of residential energy expenditures for low income households. Refrigerators and freezers represent about 8 percent of residential energy expenditures, water heating represents about 16 percent of residential energy expenditures, and other appliances represent about 34 percent of residential energy expenditures.

**Figure 1. Percent of U.S. residential energy expenditures by low income households, by end use, FY 2010**



### **Home heating data**

The three most common heating fuels in 2005, the most recent year for which household heating fuel usage data are available, were natural gas (53 percent), electricity (30 percent), and fuel oil (7 percent). Over the last decade, the share of households using electricity as a main heating fuel has increased significantly, while the share using fuel oil has declined. There were only small deviations from this pattern in main heating fuel choice by income group.

In FY 2010, as shown in Figures 2 and 3, average home heating expenditures for all households were \$569, and the mean individual home heating burden was 2.1 percent. Low income households had average home heating expenditures of \$541; this average was about 4.9 percent lower than that for all households. The mean individual home heating burden for low income households was 4.2 percent, twice as much as the mean individual home heating burden for all households. The average home heating expenditures for LIHEAP recipient households was \$714, about 32 percent higher than the average for low income households and about 25 percent higher than the average for all households.

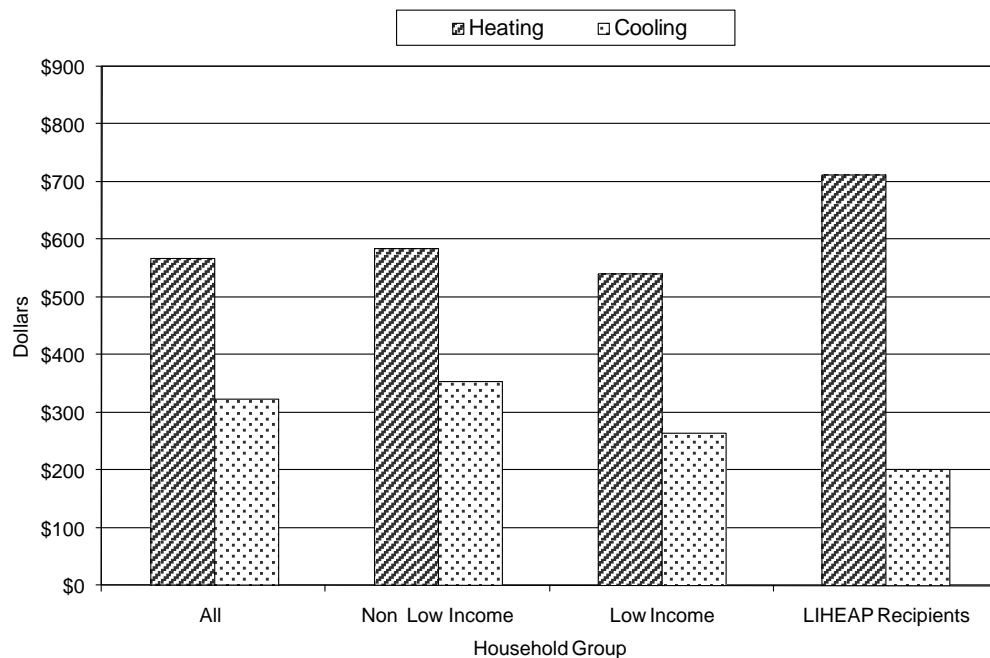
Mean individual home heating burden for LIHEAP recipient households was 5.9 percent, nearly three times the average for all households, and 1.7 percentage points higher than that for low income households. Average home heating expenditures (and consumption) for LIHEAP recipient households were greater than that for all low income households because LIHEAP heating assistance recipient households tend to live in colder climate regions.<sup>4</sup>

### Home cooling data

In 2005, about 92 percent of all households cooled their homes using one of the methods recorded by the RECS.<sup>5</sup> Low income and LIHEAP recipient households were less likely to cool their homes than were non low income households; 89 percent of low income households and 86 percent of LIHEAP recipient households cooled their homes using one of these methods.

As Figures 2 and 3 show, in FY 2010, for households that cooled, average home cooling expenditures for all households were \$324, and the mean individual home cooling burden was 1.1 percent. Low income households had average home cooling expenditures of \$266; this average was about 18 percent lower than that for all households. The mean individual home cooling burden for low income households was 2.3 percent, more than twice as much as the mean individual home cooling burden for all households. Average home cooling expenditures for LIHEAP recipient households were \$202, about 24 percent lower than the average for low income households and almost 38 percent lower than the average for all households. The mean individual home cooling burden for LIHEAP recipient households was 1.5 percent, about 36 percent higher than the mean individual home cooling burden for all households.

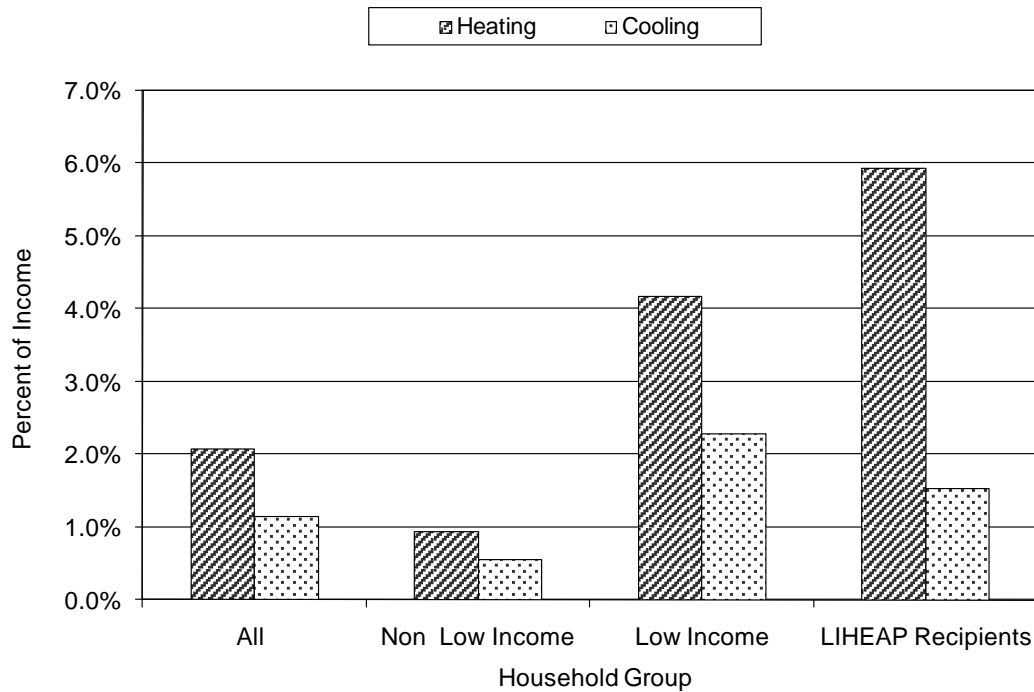
**Figure 2. Mean home heating and home cooling expenditures by all households, non low income households, low income households, and LIHEAP recipient households, FY 2010**



<sup>4</sup> LIHEAP Home Energy Notebook for FY 2009

<sup>5</sup> The 2005 RECS records cooling methods such as central or room air-conditioning as well as non air-conditioning cooling devices (e.g., ceiling fans and evaporative coolers). The 2005 RECS excludes several types of cooling, such as table and window fans.

**Figure 3. Mean individual burden of heating and cooling expenditures for all households, non low income households, low income households, and LIHEAP recipient households, FY 2010**



## Low income home energy trends

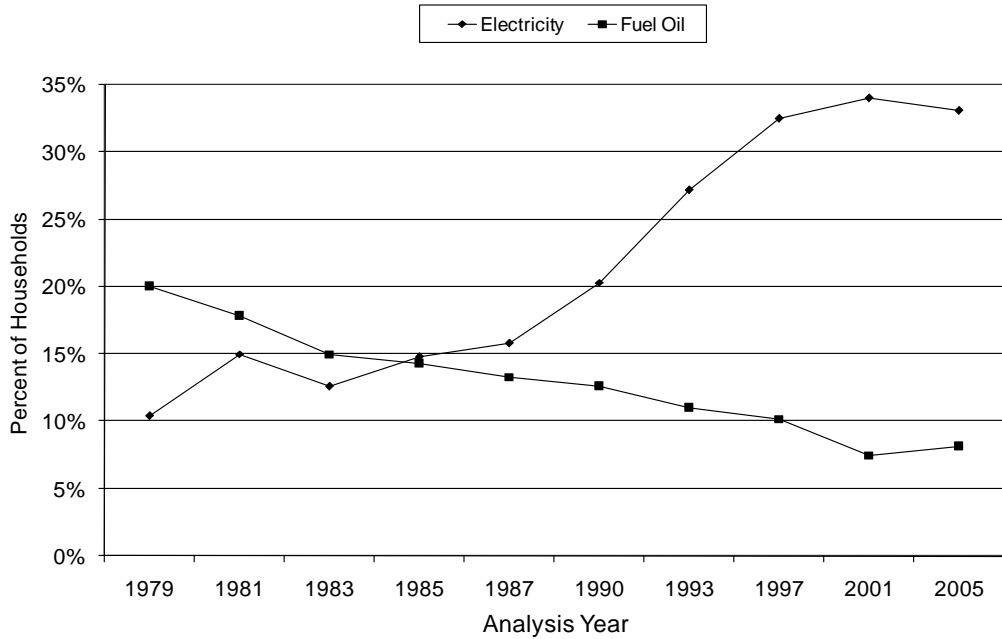
This section presents data on home energy trends for low income households from 1979 through 2005 or FY 2010, depending upon the latest year of availability.<sup>6</sup> Statistics are derived from a series of national residential energy consumption surveys (including the RECS) and from HHS’ administrative statistics. The analyses show significant shifts since 1979 in the types and amounts of energy used by low income households.

### Home heating and cooling trends

Figure 4 demonstrates that the share of low income households that used electricity as their main heating fuel increased from 10 percent in 1979 to 34 percent in 2001 and dropped slightly to 33 percent in 2005. In contrast, the share of low income households that used fuel oil as their main heating fuel declined from 20 percent in 1979 to 8.1 percent in 2005. Natural gas remained the dominant type of space heating fuel used over the 26-year period.

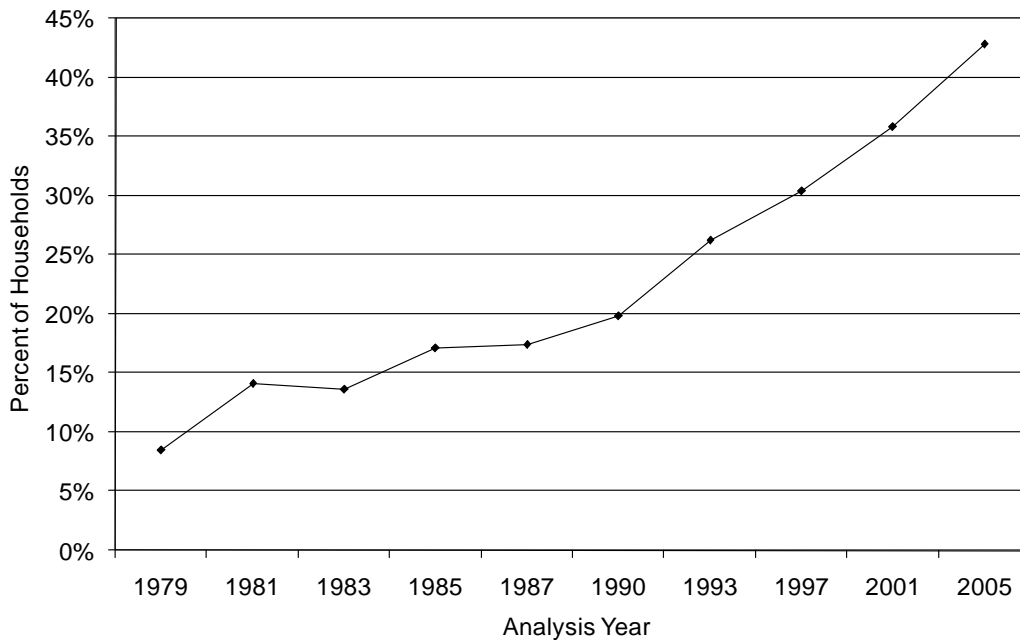
<sup>6</sup>In this section, low income households are defined as those households with incomes at or below 150 percent of HHS’ poverty guidelines.

**Figure 4. Percent of low income households using electricity and fuel oil as main heating fuels, 1979 to 2005**



As shown in Figure 5, the most important change in home cooling on the part of low income households has been in the percentage of households with central air-conditioning. The share of low income households who use central air-conditioning increased from 8.5 percent in 1979 to almost 43 percent in 2005.

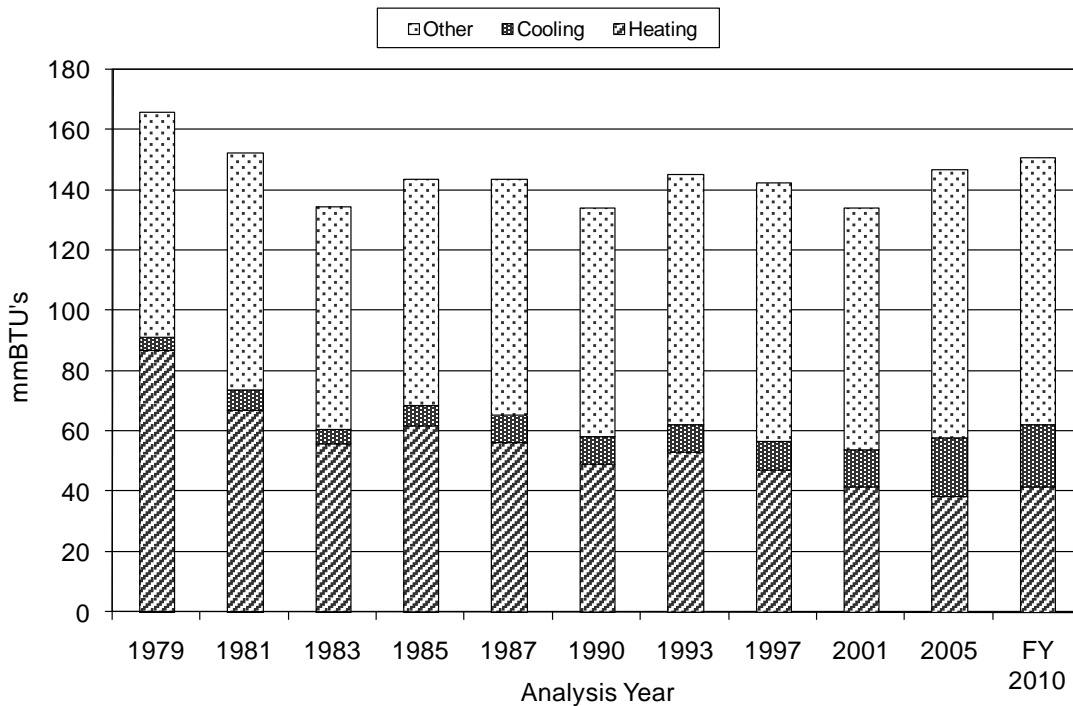
**Figure 5. Percent of low income households using central air-conditioning, 1979 to 2005**



### Trends in mean residential consumption, expenditures, and energy burden

Low income households substantially decreased their mean residential energy consumption between 1979 and 1983, as shown in Figure 6. This suggests a significant increase in efficiency resulting from conservation measures or actions. From 1983 to 1990, mean residential energy consumption fluctuated from year to year, corresponding to expected changes in heating and cooling consumption because of changes in heating and cooling degree days. For 1993 through 2005, there appears to have been an increase in the use of energy for purposes other than home heating and home cooling. Between 2005 and FY 2010, the use of energy for home heating, home cooling, and for other purposes, appears to have remained stable.

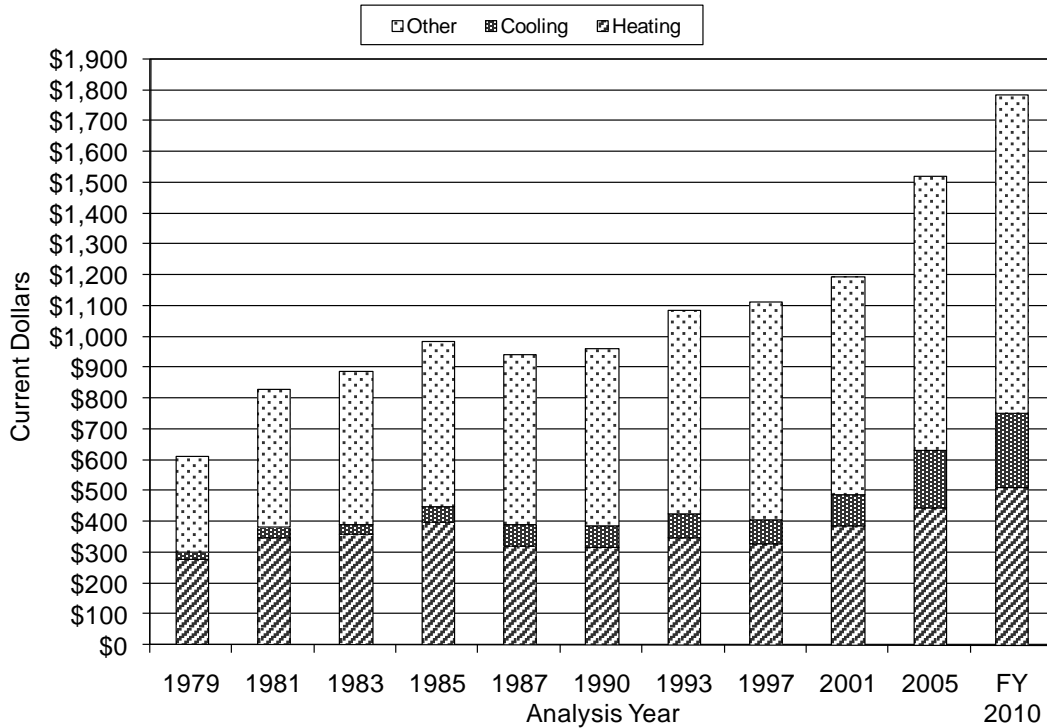
**Figure 6. Mean residential energy consumption (in MMBtus) per low income household, 1979 to FY 2010<sup>11</sup>**



<sup>11</sup> A British Thermal Unit (Btu) is the amount of energy necessary to raise the temperature of one pound of water one degree Fahrenheit. MMBtus, MmBTUs or mMBTU's refer to values in millions of Btus.

Mean residential energy expenditures increased rapidly between 1979 and 1985 because of fuel price increases, as shown in Figure 7. From 1987 through 1997, these expenditures rose moderately; however from 2001 through 2005, mean expenditures on heating increased dramatically as the result of fuel price increases and colder winter weather. Between 2005 and FY 2010, mean expenditures for home heating rose by over 14 percent, again due to higher fuel prices. Mean expenditures on uses other than home heating or home cooling rose continuously from 1979 to FY 2010. Mean expenditures on cooling rose from 1979 to 2005, and rose again by nearly 30 percent from 2005 to FY 2010.

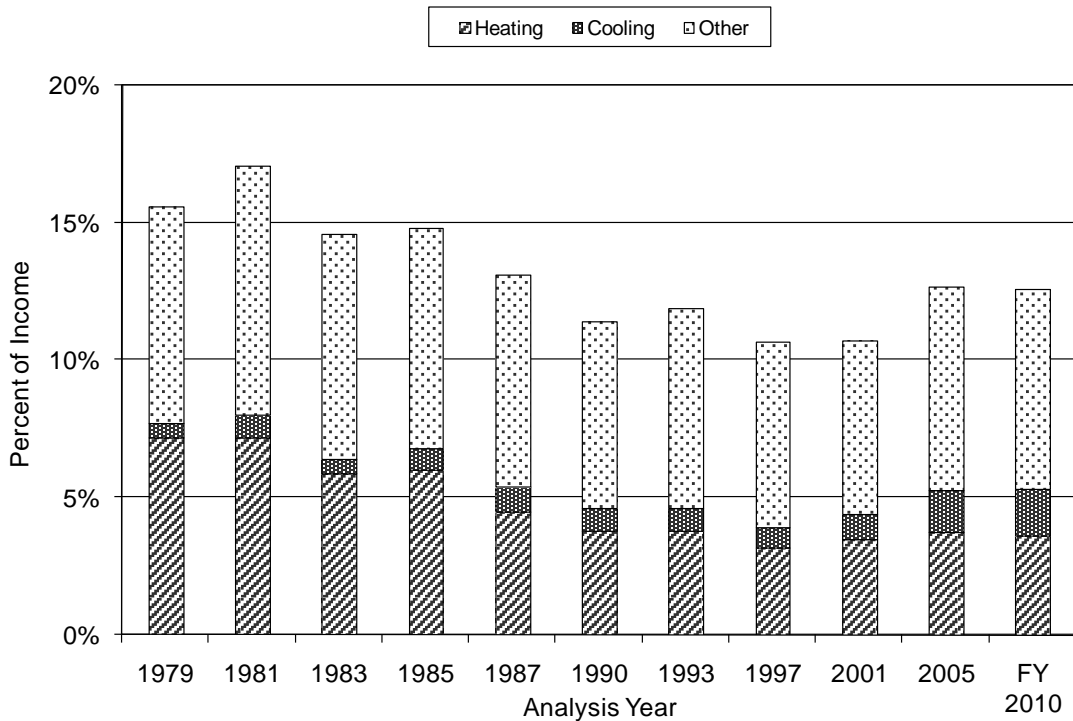
Figure 7. Mean residential energy expenditures for low income households, 1979 to FY 2010



As Figure 8 shows, the mean group home energy burden (i.e., burden associated with home heating and home cooling) declined from 7.7 percent in 1979 to 5.3 percent in FY 2010; this represented a decline of 2.4 percentage points.<sup>7</sup> The decline in mean group residential energy burden from 1979 to FY 2010 was 3.0 percentage points (from 15.6 percent to 12.6 percent). Most of the decline in residential energy burden is associated with a decline in home energy burden rather than a decline in the burden associated with energy use for other purposes (i.e., water heating, appliances, and refrigeration).

<sup>7</sup> Mean group burden is defined in Appendix A.

**Figure 8. Mean group residential energy burden by end use for households with incomes at or below 150 percent of HHS' poverty guidelines, 1979 to FY 2010**



### Analysis of fuel price and energy efficiency trends

Trends in energy consumption and expenditures are dependent on factors such as energy prices, weather, and energy efficiency. Fuel prices outpaced the Consumer Price Index (CPI) from 1979 through 1983, as shown in Figure 9 on the next page. While the CPI increased about 37 percent, the composite average of fuel prices (a weighted average of electric, natural gas, and fuel oil prices) increased by about 81 percent between 1979 and 1983. From 1985 through 1993, fuel prices rose at a slower rate than did the CPI (i.e., at a slower rate than the cost of other goods). From 1997 to through 2005 however, fuel prices rose at a higher rate than did the prices of other goods. In 2005, the composite energy price index was 321 while the CPI was 269. The impact of energy prices on energy expenditures resulted in low income household energy expenditures surging upward until 1985 even though energy consumption for these households declined over the same period. The 19 percent growth in composite fuel prices from 1985 to 1997 explains why residential energy expenditures per low income household rose slightly during that period. In 2001, fuel prices increased 17 percent over 1997 prices and in 2005, fuel prices increased by another 24 percent over 2001 prices. In FY 2010, fuel prices increased again. FY 2010 fuel prices were nearly 15 percent higher than 2005 fuel prices. The increases in fuel prices from 2005 through FY 2010 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 2010

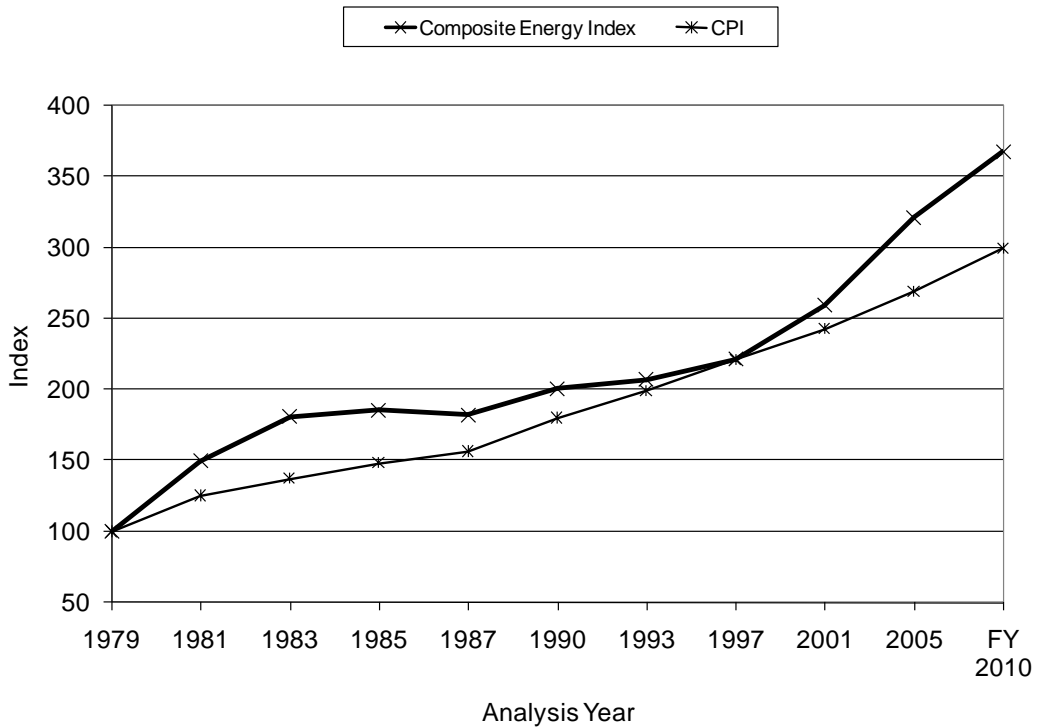
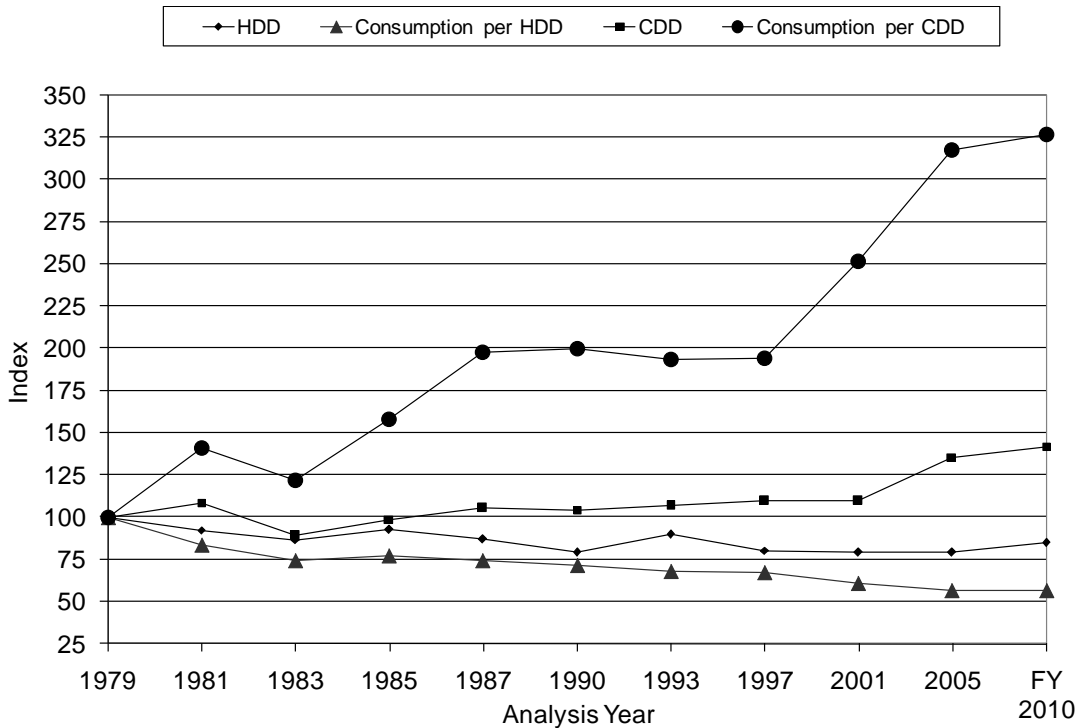


Figure 10 shows average energy consumption for heating and cooling compared to heating and cooling degree days from 1979 to FY 2010 for low income households. As shown, heating consumption per heating degree day generally declined from 1979 to FY 2010 probably at least in large part due to energy conservation efforts. In contrast, cooling consumption per cooling degree day rose sharply through FY 2010 because of a large increase in the availability of air-conditioning to low income households.<sup>8</sup> Only 37 percent of low income households had air-conditioning equipment in 1979, but by 2005 the number had risen to 80 percent.

<sup>8</sup>Air-conditioning equipment includes central air conditioners and window or wall units, ceiling fans, and evaporative coolers. The availability of all household appliances increased for low income households over this period due to the overall increase in the wealth of the nation and to the decrease in the cost of older technologies.

**Figure 10. Index of heating degree days (HDD), average heating consumption for low income households per HDD, cooling degree days (CDD), and average cooling consumption for low income households per CDD, 1979 to FY 2010**



The mean group home energy burden for low income households has remained considerably higher than the burden for all households. In 1979, the mean group home energy burden of 7.7 percent for low income households was just over four times higher than the 1.9 percent burden for all households. In FY 2010, the mean group home energy burden for all households was 1.3 percent. That year, the mean group home energy burden for low income households was 5.3 percent, again over four times higher than that for all households.

## Trends in LIHEAP

Between 1981 and FY 2010, as shown in Figure 11, the number of income eligible households has risen 142 percent, during which time Federal fuel assistance funds have increased by 164 percent.<sup>9</sup> Also during this period, the percentage of income eligible households receiving heating and/or winter crisis assistance has declined from 36 percent in 1981 to 17 percent in FY 2010 – though this figure has remained steady since 1997.<sup>10</sup> Before adjusting for inflation, average winter crisis and heating benefits per household increased until 1985, fell in 1987, stayed in the same range through 1997, increased significantly in 2001, dropped by over 16 percent in 2005, and then rose by nearly 54

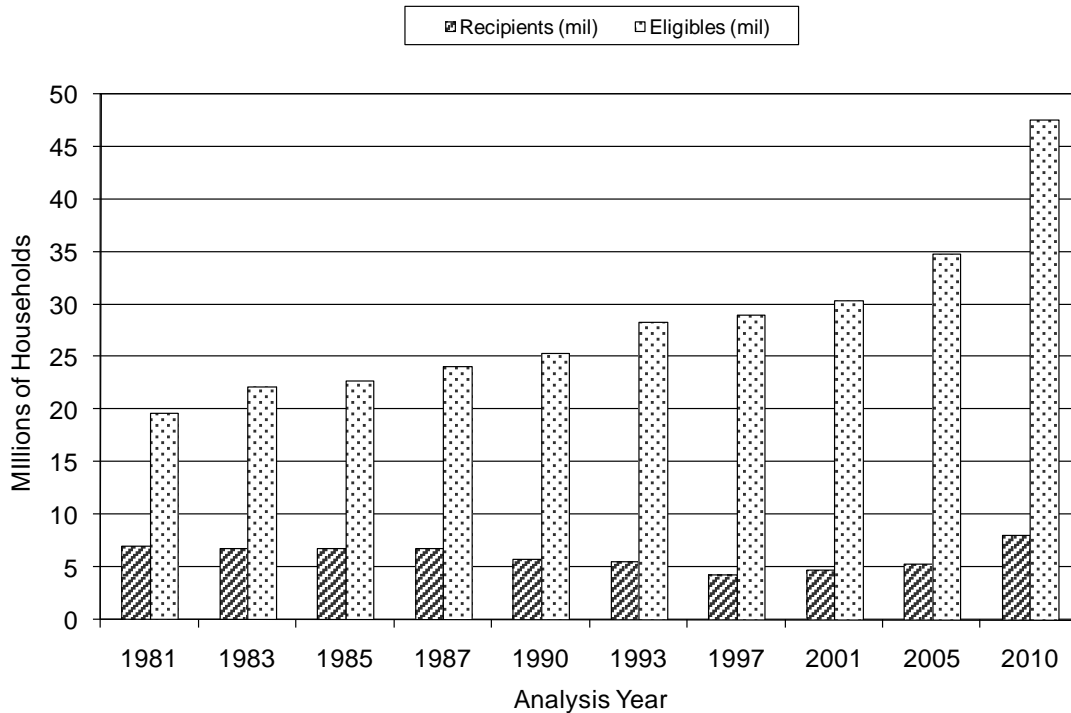
<sup>9</sup> Income eligible household estimates do not include those households with incomes greater than the statutory income standards but who may still qualify for LIHEAP benefits because they are categorically eligible for LIHEAP under section 8624 (b)(2)(A) of the LIHEAP statute. The sharp increase in eligibility was due to an increase in Federal maximum LIHEAP income standard in FY 2009 and FY 2010. In FY 2009 and 2010, Congress provided LIHEAP with \$5.1 billion in funding which is the highest level of funding the program has received.

<sup>10</sup> Note that The FY 1981 and FY 2010 estimate of income eligible households are not directly comparable to those of the other years because the income eligibility guidelines for the FY 1981 and FY 2010 programs differed from those of other years.

percent in FY 2010. Cooling benefits per household actually fell until 1985 and increased sharply from 1993 through 2001, and then fell by over 6 percent in 2005, and then increased by 50 percent in FY 2010. After adjusting for inflation, the mean value of combined Federal heating and winter crisis benefits fell (in 1981 dollars) from \$213 in 1981 to \$191 in FY 2010. Cooling benefits increased (in 1981 dollars) from \$129 in 1981 to \$121 in FY 2010.

The percentage of the total home heating bill for LIEAP/LIHEAP income eligible households covered by LIEAP/LIHEAP heating and winter crisis benefits decreased from 23 percent in 1981 to 15 percent in FY 2010. The decrease resulted from the combination of higher home heating bills, a slightly smaller per-household amount of assistance benefits, and a rise in the size of income eligible population.

**Figure 11. Number of LIEAP/LIHEAP income eligible and heating and/or winter crisis assistance recipient households, FY 1981 to FY 2010**



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

## Federal LIHEAP targeting performance

The Government Performance and Results Act of 1993 (GPRA) focuses on program results to provide Congress with objective information on the achievement of statutory objectives or program goals. The resulting performance data are to be used in making decisions on budget and appropriation levels.

ACF’s budget justification for Congress, which contains the LIHEAP performance plan, takes into account the fact 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 takes into account the fact that LIHEAP is a block grant whereby LIHEAP grantees have broad flexibility to design their programs, within very broad Federal guidelines, to meet the needs of their citizens.

### **LIHEAP program goals and performance goals**

In FY 2010, 16 percent of federally income eligible households received assistance with their heating costs.<sup>11</sup> Given that limitation, the LIHEAP statute requires LIHEAP grantees to provide, in a timely manner, that the highest level of assistance will be furnished to those households that have the lowest incomes and the highest energy costs or needs in relation to income, taking into account family size. The LIHEAP statute identifies two groups of low income households as having the highest needs:

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

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

### **Targeting Index performance measures**

Performance goals must be measurable in order to determine if the goals are being achieved. ACF has developed a set of performance measures (i.e., targeting indexes) that show the extent to which LIHEAP meets its performance goals. These measures, which are presented below, show LIHEAP's performance in targeting vulnerable and high-burden households:

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

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

---

<sup>11</sup> For FY 2010, States were not required to report an unduplicated count of assisted households that receive LIHEAP assistance regardless of the type(s) of assistance provided to recipient households. Therefore this percentage does not provide a complete picture to those household that may have received other types of LHEAP assistance. Additionally, income eligible household estimates do not include those households with incomes greater than the statutory income standards but who may still qualify for LIHEAP benefits because they are categorically eligible for LIHEAP under section 8624 (b)(2)(A) of the LIHEAP statute. Note that the Federal LIHEAP maximum income standard – the greater of 150 percent of HHS Poverty Guidelines or 75 percent of State median income – that was in effect in FY 2010 is used in the estimation of the number income eligible households.

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

There are no annual measures for the benefit targeting or burden reduction targeting indexes because the data that enter into these indexes are not available annually.

## **Outcome performance measures**

ACF seeks to improve the way in which it measures LIHEAP's performance. The indicators that ACF uses to measure LIHEAP's performance, the young child and elderly reciprocity targeting indexes, serve only as proxies for LIHEAP's outcomes. ACF intended these proxies to be replaced by more outcome-focused measures.

In June 2008, ACF established the LIHEAP Performance Measures Planning Work Group, consisting of state LIHEAP Directors and ACF staff. The Work Group drafted a set of potential LIHEAP performance measures that could be useful to both the states and ACF.

In April 2010, ACF established a follow-up group, the LIHEAP Performance Measures Implementation Work Group, consisting of state LIHEAP Directors and ACF staff. The Work Group will be active through at least 2014 in overseeing the selection and implementation of the first Work Group's proposed LIHEAP outcome measures.

## **Performance measurement research**

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

- Validation Study – The performance measurement validation study examined the available data sources for estimating the targeting indexes required by the performance measurement plan for LIHEAP and identified the data sources that furnished the most reliable data.<sup>12</sup>
- Energy Burden Study – The energy burden evaluation study used the 2001 RECS LIHEAP Supplement to measure the baseline performance of LIHEAP in serving high burden households and to examine the competing demands associated with targeting vulnerable and high burden households.<sup>13</sup>

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

## **Performance measurement statistics**

HHS' *Fiscal Year 2013 Annual Performance Report and Performance Plan* furnished measurements of targeting performance. The performance report showed the LIHEAP targets and performance results for FY 2010.

---

<sup>12</sup> *LIHEAP Targeting Performance Measurement Statistics: GPRA Validation of Estimation Procedures*, September 2004, Report prepared by APPRISE Incorporated under PSC Order No. 043Y00471301D.

<sup>13</sup> *LIHEAP Energy Burden Evaluation Study*, July 2005, Report prepared by APPRISE Incorporated under PSC Order No. 043Y00471301D.

# I. Introduction

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

In 1994, Congress amended the purpose of LIHEAP to clarify that LIHEAP is “to assist low income households, particularly those with the lowest 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, P.L. 103-252, Sec. 302). Congress further indicated that LIHEAP grantees need to reassess their LIHEAP benefit structures to ensure that they are actually targeting those low income households that have the highest energy costs or needs. The Energy Policy Act of 2005 (P.L. 109-58) reauthorized LIHEAP through FY 2007 without substantive changes. Reauthorization of LIHEAP is currently pending.

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

## 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 performance measurement system.

The FY 2010 home energy data presented in this *Notebook* were derived from existing data sources and analytic procedures. These include the following:

- For household-level data on home energy: the national Residential Energy Consumption Surveys (RECS) for 2005, which is administered by the Department of Energy (DOE), Energy Information Administration (EIA).
- For household-level data on income: the national Current Population Survey’s (CPS’s) Annual Social and Economic Supplement (ASEC), which is administered by the Department of Commerce, Bureau of the Census (Census).
- For national and State-level data on residential energy prices: EIA’s publications *Monthly Energy Review* and *Petroleum Marketing Monthly*.
- Other publicly available sources of data such as weather data from the Department of Commerce, National Oceanographic and Atmospheric Administration (NOAA).

- End use disaggregation procedures developed by EIA's Office of Energy Markets and End Use (EMEU).
- Data on States' expenditure of funds by component and numbers of households served by type: DEA's administrative data from the *LIHEAP Household Report--Federal Fiscal Year 2010* and the *LIHEAP Grantee Survey for Federal Fiscal Year (FFY) 2010*.

## **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 2010. 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 2010. Subsections include trends in consumption, expenditures, and burden; analysis of energy price and energy efficiency trends; trends in LIHEAP; and analysis of LIHEAP benefits.
- Section IV –Federal 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 LIHEAP.
- Appendix A documents the procedures used to prepare the FY 2010 energy statistics; these include projecting changes in energy consumption and expenditures, disaggregating energy consumption and expenditures into end use components, and computing energy burden statistics. Appendix A also includes detailed tabulations on residential energy use, expenditures, and burden at the national and regional level by main heating fuel for all, low income, non low income, and LIHEAP recipient households.
- Appendix B furnishes averages of State-level estimates of the numbers of households that are eligible for LIHEAP at both the Federal and State income standards. These averages are presented by vulnerability and income group.

## II. Home Energy Data

Section II presents home energy consumption and expenditure data. The primary data source for this section is the 2005 RECS, which has energy consumption and expenditures data for calendar year 2005. For this *Notebook*, the 2005 space heating and cooling consumption and expenditures have been adjusted to reflect FY 2010 weather and fuel prices, as described in Appendix A. Therefore, any residential energy or home energy consumption and expenditure data presented in this section for years after 2005 have been adjusted from the 2005 RECS.

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

### Residential energy data

Tables 2-1a to 2-1d, on the next page, present data on average annual residential energy consumption, expenditures, and burden by fuel type for all, non low income, low income, and LIHEAP recipient households.<sup>14 15</sup> In FY 2010, average residential energy consumption for all households was 97.8 million British Thermal Units (MMBtus) and average expenditures were \$2,120. The mean individual residential energy burden for all households was 6.9 percent of income.

Low income households had average residential energy consumption of 86.1 MMBtus (12.0 percent less than all households) and average energy expenditures of \$1,830 (13.7 percent less than all households). Their mean individual residential energy burden was 13.2 percent, nearly twice that for all households and nearly four times that for non low income households.

Average residential energy expenditures for LIHEAP recipient households were \$1,986, almost nine percent higher than that for all low income households. The mean individual residential energy burden was 15.4 percent, 2.2 percentage points higher than that for low income households.

Nationally, all households decreased their average energy expenditures by 2.8 percent, from \$2,180 in FY 2009 to \$2,120 in FY 2010. Low income households decreased theirs by 2.9 percent, from \$1,885 in FY 2009 to \$1,830 in FY 2010. LIHEAP recipient households decreased theirs by 4.8 percent, from \$2,087 in FY 2009 to \$1,986 in FY 2010. The decline in expenditures in FY 2010 is due to a significant decline in natural gas prices.

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

---

<sup>14</sup>Comparisons are made among the four income groups of all, non low income, low income, and LIHEAP recipient households. All households represent the total number of households in the U.S. Non low income households represent those households with annual incomes above the LIHEAP income maximum of the greater of 150 percent of HHS Poverty Guidelines and 60 percent of State median income. Low income households represent those households with annual incomes at or under the LIHEAP income maximum of the greater of 150 percent of HHS Poverty Guidelines and 60 percent of State median income. LIHEAP recipient households represent those low income households that received Federal fuel assistance.

<sup>15</sup>For fiscal year 2009 and 2010, the Congress raised the Federal maximum LIHEAP eligibility standard from the greater of 60% State median income and 150% of HHS Poverty Guidelines to the greater of 75% State median eligibility and 150% of HHS Poverty Guidelines. To maintain comparability with the previous *Notebooks*, low income definition was kept the same as before.



**LIHEAP Home Energy Notebook for FY 2010: II. Home Energy Data**

and home cooling expenditures. In FY 2010, home heating was 30 percent of the residential energy bill for low income households, and home cooling made up 13 percent.

**Table 2-1a. Residential energy: Average annual household consumption, expenditures, and burden by all households, by main heating fuel type, United States, FY 2010<sup>1/</sup> (See also Tables A-3a – A-3c, Appendix A)**

Main heating fuel	Fuel consumption (MMBtus) <sup>2/</sup>	Fuel expenditures	Mean individual burden <sup>3/</sup>	Median individual burden <sup>4/</sup>	Mean group burden <sup>5/</sup>
All fuels	97.8	\$2,120	6.9%	4.1%	3.1%
Natural gas	113.8	\$1,993	5.7%	3.6%	2.9%
Electricity	63.2	\$1,908	7.1%	4.0%	2.8%
Fuel oil	143.9	\$3,570	12.1%	7.3%	5.3%
Kerosene	55.3	\$1,553	9.8%	7.0%	2.3%
LPG <sup>6/</sup>	112.9	\$3,029	9.8%	6.7%	4.5%

**Table 2-1b. Residential energy: Average annual household consumption, expenditures, and burden by non low income households, by main heating fuel type, United States, FY 2010<sup>1/</sup> (See also Tables A-3a – A-3c, Appendix A)**

Main heating fuel	Fuel consumption (MMBtus) <sup>2/</sup>	Fuel expenditures	Mean individual burden <sup>3/</sup>	Median individual burden <sup>4/</sup>	Mean group burden <sup>5/</sup>
All fuels	104.1	\$2,277	3.5%	3.0%	2.5%
Natural gas	118.7	\$2,149	3.1%	2.7%	2.4%
Electricity	68.1	\$2,059	3.4%	3.0%	2.3%
Fuel oil	152.8	\$3,841	5.5%	4.9%	4.2%
Kerosene	61.3*	\$1,575*	4.3%	4.6%	1.7%
LPG <sup>6/</sup>	119.8	\$3,133	5.3%	4.6%	3.5%

**Table 2-1c. Residential energy: Average annual household consumption, expenditures, and burden by low income households, by main heating fuel type, United States, FY 2010<sup>1/</sup> (See also Tables A-3a – A-3c, Appendix A)**

Main heating fuel	Fuel consumption (MMBtus) <sup>2/</sup>	Fuel expenditures	Mean individual burden <sup>3/</sup>	Median individual burden <sup>4/</sup>	Mean group burden <sup>5/</sup>
All fuels	86.1	\$1,830	13.2%	9.0%	9.7%
Natural gas	103.5	\$1,663	11.2%	8.0%	8.8%
Electricity	54.7	\$1,653	13.4%	8.5%	8.8%
Fuel oil	130.1	\$3,155	22.3%	16.1%	16.7%
Kerosene	54.2	\$1,549	10.8%	8.6%	8.2%
LPG <sup>6/</sup>	99.8	\$2,832	18.5%	15.0%	15.0%

**Table 2-1d. Residential energy: Average annual household consumption, expenditures, and burden by LIHEAP recipient households, by main heating fuel type, United States, FY 2010<sup>1/</sup>**  
**(See also Tables A-3a – A-3c, Appendix A)**

Main heating fuel	Fuel consumption (MMBtus) <sup>2/</sup>	Fuel expenditures	Mean individual burden <sup>3/</sup>	Median individual burden <sup>4/</sup>	Mean group burden <sup>5/</sup>
All fuels	104.6	\$1,986	15.4%	9.9%	12.4%
Natural gas	114.7	\$1,762	13.4%	9.3%	11.0%
Electricity	50.7	\$1,346	15.1%	8.9%	8.4%
Fuel oil	147.4	\$3,596	24.9%	22.6%	22.5%
Kerosene	77.9*	\$1,764*	18.6%	14.1%	11.0%
LPG <sup>6/</sup>	113.7	\$3,451	18.1%	11.8%	21.6%

<sup>1/</sup>Data are derived from the 2005 RECS, adjusted to reflect FY 2010 heating degree days, cooling degree days, and fuel prices. Data represent residential energy used from October 2009 through September 2010.

<sup>2/</sup>A British Thermal Unit (Btu) is the amount of energy necessary to raise the temperature of one pound of water one degree Fahrenheit. MMBtus, MmBTUs or mmbTUs refer to values in millions of Btus.

<sup>3/</sup>Mean individual burden is calculated by taking the mean, or average, of individual energy burdens, as calculated from FY 2010 adjusted RECS data. See Appendix A for information on calculation of energy burden.

<sup>4/</sup>Median individual burden is calculated by taking the median of individual energy burdens, as calculated from FY 2010 adjusted RECS data.

<sup>5/</sup>Mean group energy burden has been calculated by (1) calculating average residential energy expenditures from the 2005 RECS for each group of households; (2) adjusting those figures for FY 2010; and (3) dividing the adjusted figures by the average income for each group of households from the 2010 CPS ASEC.

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

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

Residential energy expenditures of low income households are distributed in roughly the same way as those of all households. However, LIHEAP recipients spent a higher proportion of their annual residential expenditures for space heating and a lower proportion for space cooling than did other groups. LIHEAP recipient households spent 36 percent of their annual residential expenditures for space heating, 6 percentage points more than did the average low income household. LIHEAP recipient households spent 9 percent for space cooling, about 69 percent of the proportion spent by low income households.

**Table 2-2. Residential energy: Percent of residential energy expenditures for each of the major end uses by all, non low income, low income, and LIHEAP recipient households, United States, FY 2010**

End Use	All households	Non low income households	Low income households	LIHEAP recipient households
Space heating	27%	26%	30%	36%
Space cooling	14%	15%	13%	9%
Water heating	14%	14%	16%	15%
Refrigeration	8%	8%	8%	8%
Appliances	36%	38%	34%	33%
All uses	100%	100%	100%	100%

## Home heating data

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

### Main heating fuel type

Table 2-3 shows that, in 2005, about half of the households in each income group used natural gas as their main heating fuel. LIHEAP recipient households used natural gas at the highest rate, 60.0 percent. Almost 30 percent of households in each group, except LIHEAP recipient households, used electricity as their main heating fuel. Low income households used electricity at the highest rate of all fuels, 31.8 percent, and LIHEAP recipient households used electricity at the lowest rate of all fuels, 19.0 percent. LIHEAP recipient households tended to use fuel oil and kerosene more frequently than did households in other groups.

**Table 2-3. Home heating: Percent of households using major types of heating fuels by all, non low income, low income, and LIHEAP recipient households, United States, April 2005<sup>1/</sup> (See also Table A-4, Appendix A)**

Heating fuel	All households	Non low income households	Low income households	LIHEAP recipient households
Natural gas	52.6%	55.0%	48.1%	60.0%
Electricity	30.1%	29.2%	31.8%	19.0%
Fuel oil	6.9%	6.5%	7.8%	12.0%
Kerosene	0.6%	0.1%	1.5%	2.4%
LPG	5.5%	5.5%	5.4%	5.2%
Other <sup>2/</sup>	3.2%	2.9%	3.7%	1.2%

<sup>1/</sup>Data are derived from the 2005 RECS. Percentages may not add to 100 percent due to rounding.

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

Non low income households increased their use of electricity for home heating from 24.1 percent of households in September 1990 to 29.2 percent in April 2005.<sup>16</sup> Low income households increased their use of electricity as the main heat source from 20.0 percent in September 1990 to 31.8 percent in April 2005. LIHEAP recipient households' use of electricity as their main heat source rose from 14.4 percent in September 1990 to 19.0 percent in April 2005.

### Home heating consumption, expenditures, and burden

Average annual home heating consumption, expenditures, and burden by fuel type for all, non low income, low income, and LIHEAP recipient households are presented in Tables 2-4a to 2-4d. In FY 2010, average home heating consumption for all households was 40.4 MMBtus, average expenditures were \$569, and mean individual home heating burden was 2.1 percent.

Low income households had average home heating consumption of 38.1 MMBtus (5.7 percent less than the average for all households) and average home heating expenditures of \$541 (4.9 percent less than the average for all households). The mean individual home heating burden for low income households was 4.2 percent, twice as much as the average home heating burden for all households and more than four times the average home heating burden for non low income households.

<sup>16</sup>Findings from the 2005 RECS, Energy Information Administration, U.S. Department of Energy.

Average home heating consumption for LIHEAP recipient households was 53.8 MMBtus (33 percent higher than the average for all households), and average home heating expenditures were \$714 (about 25 percent higher than the average for all households). Mean individual home heating burden for LIHEAP households was 5.9 percent, 1.7 percentage points higher than the average for low income households and nearly three times the average for all households. Average home heating consumption for LIHEAP recipient households was 41 percent greater than that for all low income households, because LIHEAP heating assistance recipient households tend to live in colder climate regions.<sup>17</sup>

FY 2010 heating season was slightly warmer than the FY 2009 heating season. Between FY 2009 and FY 2010, home heating consumption decreased by 3.1 percent for all households, 2.8 percent for low income households, and 5.8 percent for LIHEAP recipient households.

Compared to FY 2009, the FY 2010 prices for natural gas decreased by 18.9 percent, while electricity prices increased by 3.3 percent, fuel oil/kerosene prices increased by 2.2 percent, and LPG prices increased by 9.9 percent in nominal terms.<sup>18</sup> Average home heating expenditures for all households, low income households, and LIHEAP recipient households heating with natural gas decreased as a result of a decline in natural gas prices and a warmer heating season. However, the expenditures for households heating with electric and LPG have increased because the increase in fuel prices more than offset the decline in consumption to a warmer heating season.

The change in home heating expenditures from FY 2009 to FY 2010 varied considerably across the three major home heating fuels. Expenditures for households heating with natural gas decreased by almost 21 percent. Expenditures for households heating with electricity increased by almost 8 percent, while expenditures for households heating with fuel oil stayed about the same.

**Table 2-4a. Home heating: Average annual household consumption, expenditures, and burden by all households, by fuel type, United States, FY 2010<sup>17</sup> (See also Tables A-5, A-6a, A-6b, and A-6c, Appendix A)**

Main heating fuel	Fuel consumption (MMBtus) <sup>2/</sup>	Fuel expenditures	Mean individual burden <sup>3/</sup>	Median individual burden <sup>4/</sup>	Mean group burden <sup>5/</sup>
All fuels	40.4	\$569	2.1%	0.9%	0.8%
Natural gas	52.4	\$514	1.8%	0.9%	0.8%
Electricity	9.7	\$306	1.2%	0.6%	0.4%
Fuel oil	92.7	\$1,803	7.2%	3.6%	2.7%
Kerosene	21.5	\$400	2.3%	1.8%	0.6%
LPG <sup>6/</sup>	55.6	\$1,326	4.4%	2.5%	2.0%

<sup>17</sup>LIHEAP Home Energy Notebook for FY 2009.

<sup>18</sup>Price data obtained from the Energy Information Administration's Monthly Energy Review, September 2011, for all fuels.

**LIHEAP Home Energy Notebook for FY 2010: II. Home Energy Data**

**Table 2-4b. Home heating: Average annual household consumption, expenditures, and burden by non low income households, by fuel type, United States, FY 2010<sup>1/</sup> (See also Tables A-5, A-6a, A-6b, and A-6c, Appendix A)**

Main heating fuel	Fuel consumption (MMBtus) <sup>2/</sup>	Fuel expenditures	Mean individual burden <sup>3/</sup>	Median individual burden <sup>4/</sup>	Mean group burden <sup>5/</sup>
All fuels	41.6	\$585	0.9%	0.6%	0.6%
Natural gas	52.1	\$515	0.8%	0.6%	0.6%
Electricity	10.3	\$323	0.6%	0.4%	0.4%
Fuel oil	96.1	\$1,875	2.8%	2.4%	2.1%
Kerosene	25.5*	\$468*	1.5%	0.8%	0.5%
LPG <sup>6/</sup>	60.9	\$1,405	2.4%	2.0%	1.5%

**Table 2-4c. Home heating: Average annual household consumption, expenditures, and burden by low income households, by fuel type, United States, FY 2010<sup>1/</sup> (See also Tables A-5, A-6a, A-6b, and A-6c, Appendix A)**

Main heating fuel	Fuel consumption (MMBtus) <sup>2/</sup>	Fuel expenditures	Mean individual burden <sup>3/</sup>	Median individual burden <sup>4/</sup>	Mean group burden <sup>5/</sup>
All fuels	38.1	\$541	4.2%	2.1%	2.9%
Natural gas	53.1	\$510	3.7%	2.3%	2.7%
Electricity	8.7	\$276	2.4%	1.3%	1.5%
Fuel oil	87.4	\$1,692	13.8%	9.4%	9.0%
Kerosene	20.7	\$387	2.5%	1.8%	2.1%
LPG <sup>6/</sup>	45.6	\$1,177	8.3%	6.9%	6.2%

**Table 2-4d. Home heating: Average annual household consumption, expenditures, and burden by LIHEAP recipient households, by fuel type, United States, FY 2010<sup>1/</sup> (See also Tables A-5, A-6a, A-6b, and A-6c, Appendix A)**

Main heating fuel	Fuel consumption (MMBtus) <sup>2/</sup>	Fuel expenditures	Mean individual burden <sup>3/</sup>	Median individual burden <sup>4/</sup>	Mean group burden <sup>5/</sup>
All fuels	53.8	\$714	5.9%	3.0%	4.5%
Natural gas	62.5	\$604	5.4%	2.9%	3.8%
Electricity	9.4	\$277	3.6%	1.9%	1.7%
Fuel oil	93.6	\$1,814	12.4%	9.9%	11.3%
Kerosene	25.5*	\$448*	4.4%	4.6%	2.8%
LPG <sup>6/</sup>	50.2	\$1,309	7.7%	4.6%	8.2%

<sup>1/</sup>Data are derived from the 2005 RECS, adjusted to reflect FY 2010 heating degree days and fuel prices. Data represent home energy used from October 2009 through September 2010.

<sup>2/</sup>A British Thermal Unit (Btu) is the amount of energy necessary to raise the temperature of one pound of water one degree Fahrenheit. MMBtus, MmBTUs or mmbTUs refer to values in millions of Btus.

<sup>3/</sup>Mean individual burden is calculated by taking the mean, or average, of individual heating energy burdens, as calculated from FY 2010 adjusted RECS data. See Appendix A for information on energy burden calculation.

<sup>4/</sup>Median individual burden is calculated by taking the median of individual heating energy burdens, as calculated from FY 2010 adjusted RECS data.

<sup>5/</sup>Mean group heating energy burden has been calculated by (1) calculating average home heating energy expenditures from the 2005 RECS for each group of households; (2) adjusting those figures for FY 2010; and (3) dividing the adjusted figures by the average income for each group of households from the 2010 CPS ASEC.

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

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

## Home cooling data

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

### Cooling type

As shown in Table 2-5, about 92 percent of households in 2005 cooled their homes in ways recorded by the 2005 RECS (i.e. with air-conditioners or with non air-conditioning cooling devices such as ceiling fans and evaporative coolers). Low income households were less likely to cool their homes than were non low income households.

**Table 2-5. Home cooling: Percent of households with home cooling by all, non low income, low income, and LIHEAP recipient households, United States, April 2005<sup>1/</sup> (See also Table A-7, Appendix A)**

Presence of Cooling	All Households	Non low income households	Low income households	LIHEAP recipient households
Cooling <sup>2/</sup>	92%	94%	89%	86%
None <sup>3/</sup>	8%	6%	11%	14%

<sup>1/</sup>Data are derived from the 2005 RECS.

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

<sup>3/</sup>Represents households that do not cool or cool in ways other than those recorded by the 2005 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 2010, average home cooling consumption for households that cooled was 9.3 MMBtus, average expenditures were \$324, and mean individual home cooling burden was 1.1 percent.

For households that cooled, low income households had average home cooling energy consumption of 7.6 MMBtus (about 18 percent less than the average for all households) and average home cooling expenditures of \$266 (about 18 percent less than the average for all households). The mean individual home cooling burden for low income households was 2.3 percent, more than twice the average home cooling burden of all households and nearly four times that of non low income households.

For households that cooled, average home cooling consumption for LIHEAP recipient households was 5.7 MMBtus (about 39 percent less than all households), and average home cooling expenditures were \$202 (about 38 percent less than all households). Mean individual home cooling burden for LIHEAP recipient households was 1.5 percent, 36 percent higher than the average for all households. On average, LIHEAP recipient households consumed 25 percent fewer Btus for cooling than did all low income households.

The FY 2010 cooling season was warmer than FY 2009 cooling season. From FY 2009 to FY 2010, home cooling consumption increased by 19.2 percent for all households, by 20.6 percent for low income households, and by 32.6 percent for LIHEAP recipient households.

Nationally, average home cooling expenditures for all households and low income households increased by about 18 percent. Average home cooling expenditures for LIHEAP recipient households increased by about 34 percent. The cooling expenditures increased between FY 2009 and FY 2010 due to an increased in cooling consumption as a result of a warmer cooling season.

**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 2010<sup>1/</sup> (See also Table A-7, Appendix A)**

Household group	Fuel consumption (MMBtus) <sup>2/</sup>	Fuel expenditures	Mean individual burden <sup>3/</sup>	Median individual burden <sup>4/</sup>	Mean group burden <sup>5/</sup>
All households	9.3	\$324	1.1%	0.5%	0.5%
Non low income households	10.2	\$354	0.6%	0.3%	0.4%
Low income households	7.6	\$266	2.3%	1.0%	1.4%
LIHEAP recipient households	5.7	\$202	1.5%	0.6%	1.3%

<sup>1/</sup>Data are derived from the 2005 RECS, adjusted to reflect FY 2010 cooling degree days and fuel prices. Data represent residential energy used from October 2009 through September 2010.

<sup>2/</sup>A British Thermal Unit (Btu) is the amount of energy necessary to raise the temperature of one pound of water one degree Fahrenheit. MMBtus, MmBTUs or mmBTUs refer to values in millions of Btus.

<sup>3/</sup>Mean individual burden is calculated by taking the mean, or average, of individual cooling energy burdens, as calculated from FY 2010 adjusted RECS data. See Appendix A for information on energy burden calculation.

<sup>4/</sup>Median individual burden is calculated by taking the median of individual cooling energy burdens, as calculated from FY 2010 adjusted RECS data.

<sup>5/</sup> Mean group cooling energy burden has been calculated by (1) calculating average home cooling energy expenditures from the 2005 RECS for each group of households; (2) adjusting those figures for FY 2010; and (3) dividing the adjusted figures by the average income for each group of households from the 2010 CPS ASEC.

## III. Low Income Home Energy Trends

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

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

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

A number of special terms are used throughout this section. Table 3-1 on the next page defines these special terms. One such term is “low income,” which is defined as having income at or below 150 percent of HHS’ poverty guidelines. Because of limitations on the availability of data, this definition is more restrictive than that used in other parts of the *Notebook*. In those sections, “low income” refers to LIHEAP income eligible households, which are households that would be income-eligible for LIHEAP if their States set the income-eligibility guidelines at the Federal maximum (the greater of 150 percent of HHS’ poverty guidelines or 60 percent of State median income). Based on estimates from the 2010 CPS ASEC, the definition based solely on 150 percent of HHS’ poverty guidelines excludes 11 million households of the 37 million households that meet the definition of LIHEAP income eligible households. Therefore, differences in FY 2010 home energy data reported in this section and that reported in other parts of this *Notebook* are the result of the difference in the definition of “low income.”<sup>19</sup> Unless indicated otherwise, the energy data in this section are based on ten national residential energy surveys of occupied residential housing units and their fuel suppliers. Table 3-2 identifies the surveys used, the date on which household interviews began, the time period in which residential energy bills were collected from fuel suppliers, the time frame for household income, and the number of households included in the survey.

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

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

---

<sup>19</sup>As noted in Table 3-2, the data files used in this study include surveys from 1979 and 1981. The variable that designates LIHEAP eligibility was not coded for those data files.



**Table 3-1. Definition of special terms**

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

<sup>1/</sup>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 <sup>1/</sup>	1979	1981	1983	1985	1987	1990	1993	1997	2001	2005	FY 2010
Survey <sup>2/</sup>	NIECS	RECS	RECS	RECS	RECS	RECS	RECS	RECS	RECS	RECS	RECS
Interview date <sup>3/</sup>	9/78	9/80	9/82	9/84	9/87	9/90	10/93	5/97	5/01	8/05	<sup>4/</sup>
Billing data <sup>5/</sup>	4/78 to 3/79	4/80 to 3/81	4/82 to 3/83	4/84 to 3/85	1/87 to 12/87	1/90 to 12/90	1/93 to 12/93	1/97 to 12/97	1/01 to 12/01	1/05 to 12/05	1/05 to 12/05
Income data <sup>6/</sup>	1979	1981	1983	1985	1987	1990	1993	1997	2001	2005	2010
Sample size	4,081	6,051	4,724	5,682	6,229	5,095	7,111	5,900	5,318	4,382	4,382

<sup>1/</sup>Represents the year that includes the last month for which billing data were collected from fuel suppliers.

<sup>2/</sup>Surveys include the National Interim Energy Consumption Survey (NIECS) and the RECS.

<sup>3/</sup>Month and year in which household interviews began.

<sup>4/</sup>Data projected from the 2005 RECS using changes in weather and prices. See Appendix A for the procedure used to calculate the projections.

<sup>5/</sup>Time period in which residential energy bills were collected from fuel suppliers.

<sup>6/</sup>Mean income computed using calendar year data from the CPS ASEC.

## **Trends in consumption, expenditures, and burden**

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

Figures 3-1 and 3-2, on the next page, furnish information on the fuel choices by low income households. Figure 3-1 shows that low income households have increased their use of electricity as a main heating fuel, from 10.4 percent in 1979 to 33.1 percent in 2005, while they have reduced their use of fuel oil as a main heating fuel, from 20.0 percent in 1979 to 8.1 percent in 2005.<sup>20</sup> In addition, the use of wood or coal as a main heating fuel (included under “Other”) peaked in 1985, declined substantially through 2001, then almost doubled by 2005.

Figure 3-2 shows that low income households increased their use of central air-conditioning systems from 8.5 percent in 1979 to 42.8 percent in 2005.<sup>21</sup> The proportion of low income households with no air-conditioning fell from 62.8 percent in 1979 to 20.1 percent in 2005. Other things being equal, increased use of air-conditioning equipment among low income households can be expected to increase home cooling expenditures.

<sup>20</sup>For all households, the share using electricity as their main heating fuel grew from 15.8 percent in 1979 to 30.1 percent in 2005, and the share using fuel oil as their main heat fell from 22.1 percent to 6.9 percent.

<sup>21</sup>For all households, the share using electric central air-conditioning grew from 23 percent in 1979 to 58 percent in 2005.

Figure 3-1. Main heating fuel for households with incomes at or below 150 percent of HHS' poverty guidelines, 1979 to 2005

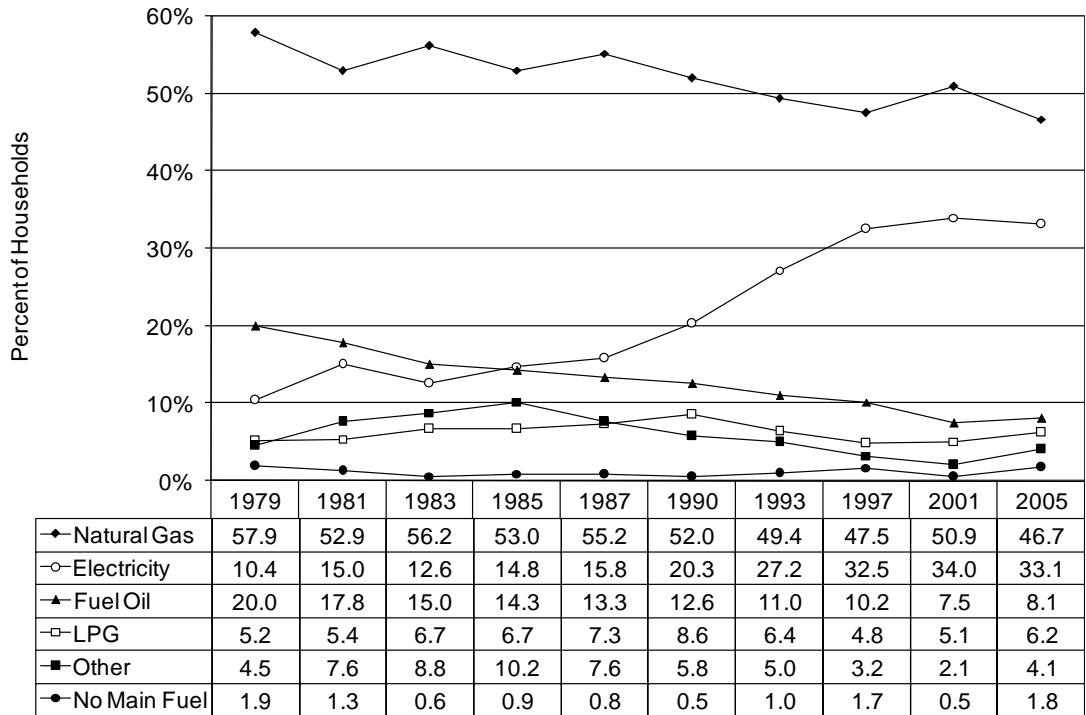
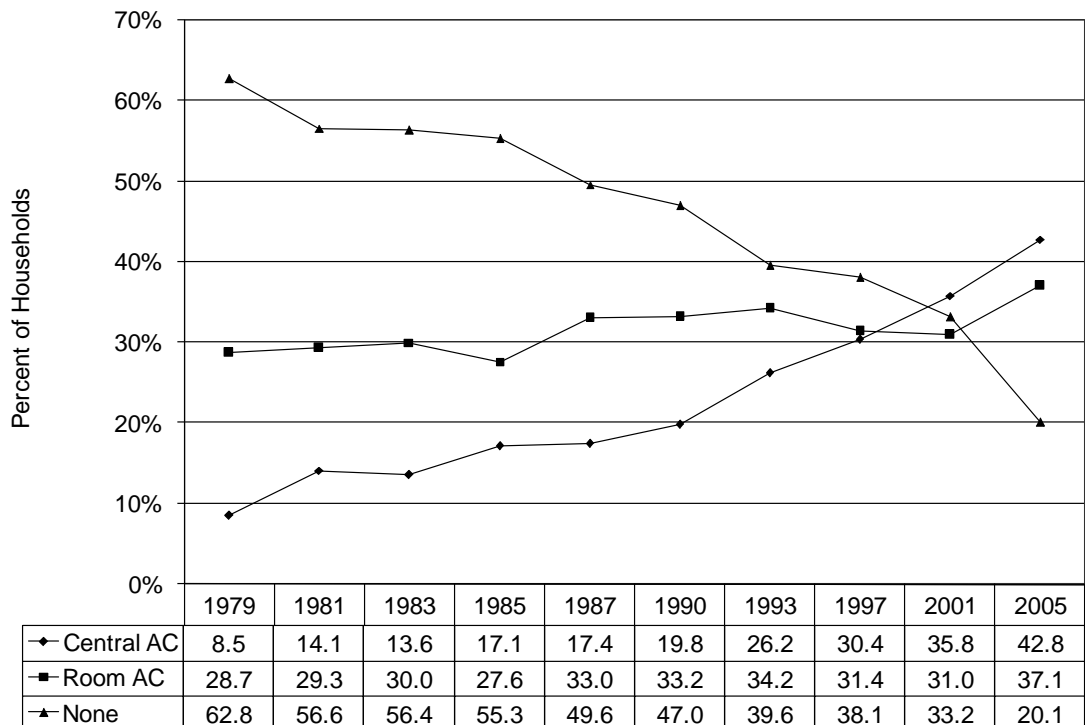


Figure 3-2. Air-conditioning type for households with incomes at or below 150 percent of HHS' poverty guidelines, 1979 to 2005



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 2010. Figure 3-3 shows that low income households substantially reduced their residential energy consumption between 1979 and 1983. This suggests a significant increase in efficiency resulting from conservation measures or actions. Examination of the components of residential energy consumption indicates that the reduction was the result of reductions in home heating consumption. From 1983 to 1990, mean residential energy consumption fluctuated from year to year, corresponding to expected changes in heating and cooling consumption that resulted from changes in heating and cooling degree days.<sup>22</sup> 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, the use of energy for purposes other than heating and cooling dropped but then increased by over 10 percent in 2005 through FY 2010.

**Figure 3-3. Mean residential energy consumption per household in MMBtus by end use for households with incomes at or below 150 percent of HHS' poverty guidelines, 1979 to FY 2010**

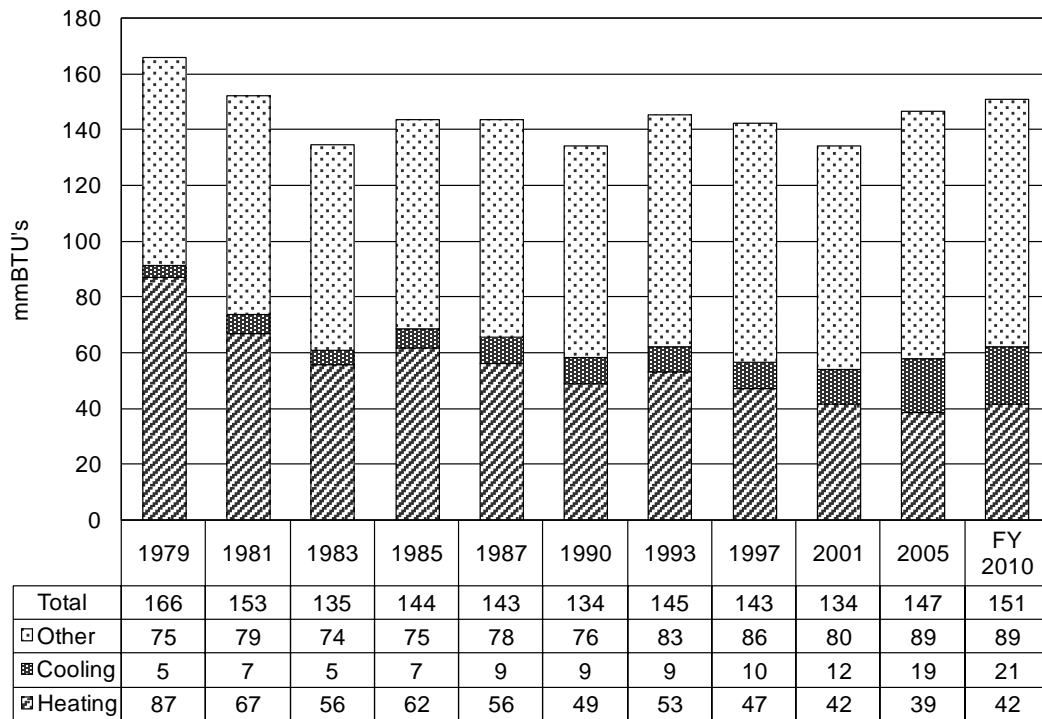
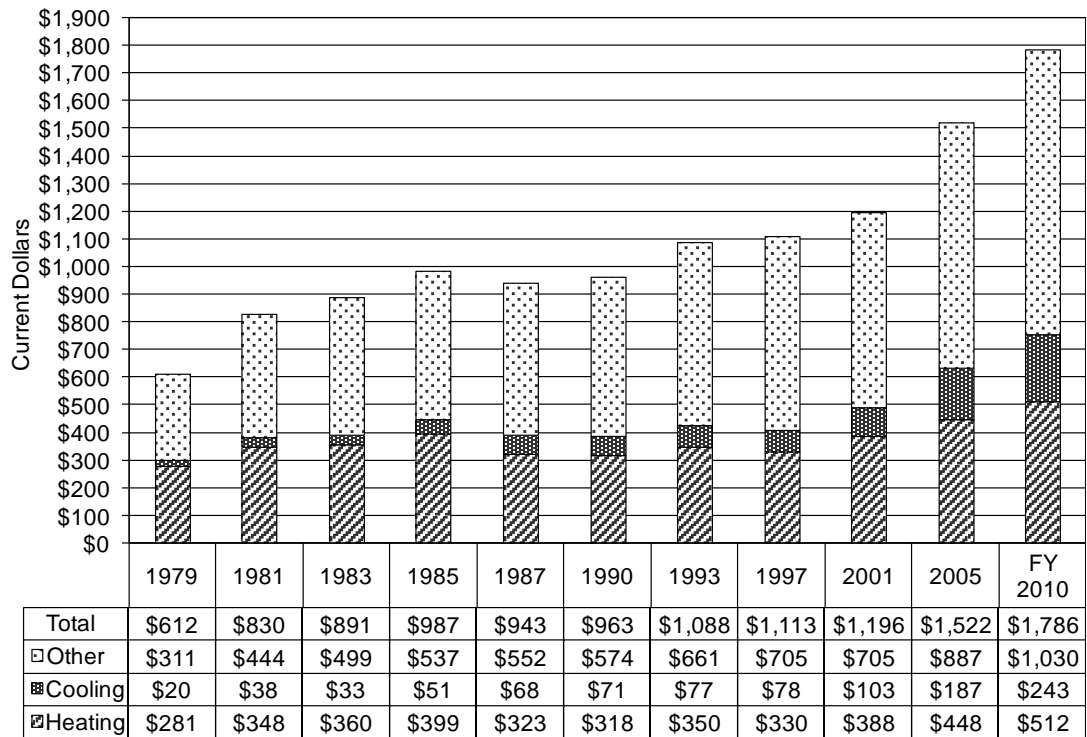


Figure 3-4, on the next page, shows that mean residential energy expenditures for low income households increased rapidly from 1979 to 1985; the increases were the result of fuel price increases. Examination of the components of energy expenditures indicates that the greatest increases were in home cooling and other residential expenditures, while increases in home heating expenditures were more moderate until 2005. Mean residential energy expenditures increased at a moderate rate from \$943 in 1987 to \$1,196 in 2001. From 2001 to 2005, mean residential energy expenditures increased by 27 percent to \$1,522. By FY 2010, mean residential energy expenditures rose by over 17 percent to \$1,786. Mean home heating expenditures fell from \$399 in 1985 to \$318 in 1990, then rose and fell moderately until 1997. Home heating expenditures saw an 18 percent increase in 2001 over

<sup>22</sup>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.

1997, a 15 percent increase in 2005 over 2001, and a 14 percent increase in FY 2010 over 2005. The increase in expenditures in 2005 and FY 2010 were the result of higher fuel prices. Mean home cooling expenditures rose continuously from \$51 in 1985 to \$187 in 2005. In FY 2010 mean home cooling expenditures were \$243.

**Figure 3-4. Mean residential energy expenditures by end use for households with incomes at or below 150 percent of HHS' poverty guidelines, 1979 to FY 2010**



The next series of Figures, 3-5 through 3-7, furnishes information on energy burden for low income households.<sup>23</sup> 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.<sup>24</sup> Each of the statistics offers somewhat different information and gives somewhat different results. All three are valid from a statistical perspective. The statistics are defined as follows.

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

<sup>23</sup>These figures present gross burden statistics; they do not present net burden statistics, which 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.

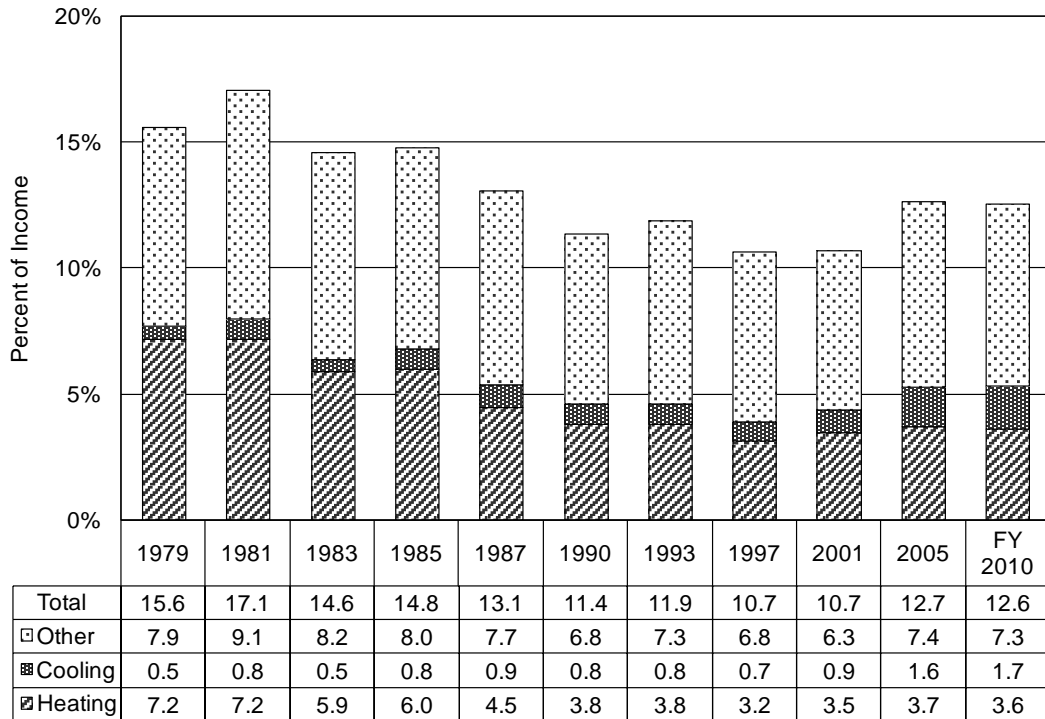
<sup>24</sup>The mean is the sum of all values divided by the number of values, or what is commonly called the average. The median is the value at the midpoint in the distribution of values.

median, or middle point, of the distribution of these household-level energy burdens in the set.

Mean group burden is the burden statistic that has been used in the series of *LIHEAP Annual Reports to Congress*. Recent technical research has furnished additional insights on the range of alternative burden summary statistics.<sup>25</sup>

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 burden declined because mean home energy expenditures for low income households fell, while mean incomes for low income households rose. Mean group home energy burden rose to 4.4 percent in 2001 and 5.3 percent in 2005 and in FY 2010 as a result of increases in fuel prices. Home energy burden for FY 2010 was 20 percent higher than in 2001, nearly 6 percent higher than in 2005, but was 34 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 HHS' poverty guidelines, 1979 to FY 2010**

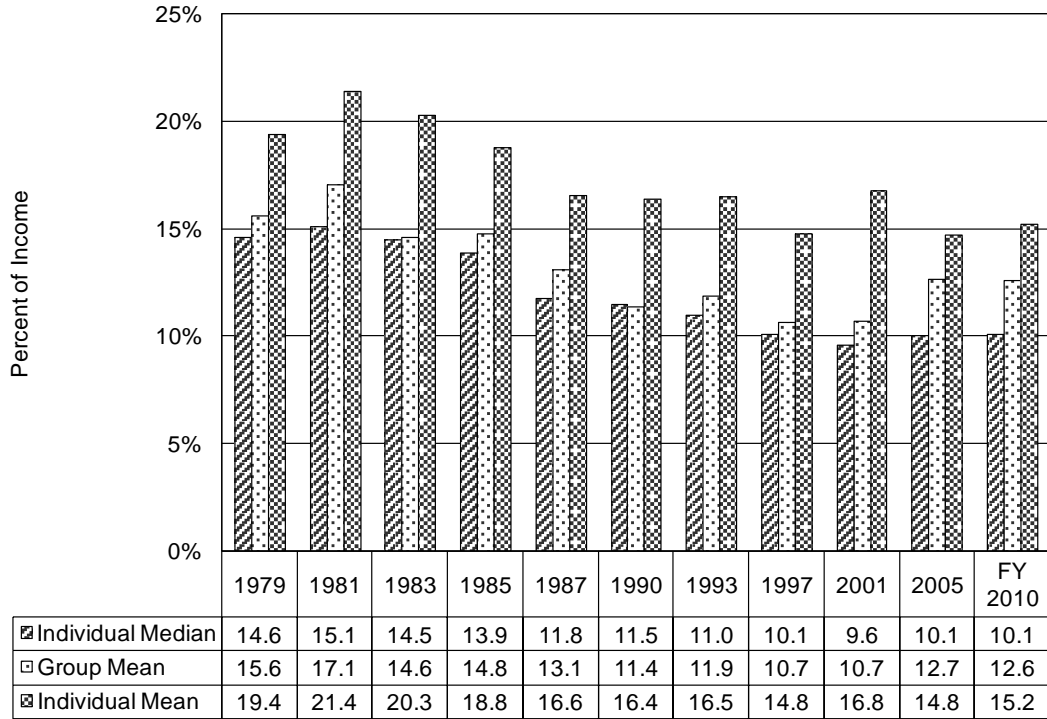


Figures 3-6 and 3-7 show how the mean individual and median individual energy burden statistics compare to the group energy burden statistics. Figure 3-6 shows the trends in residential energy burden for low income households, and Figure 3-7 shows the trends in home energy burden for low income households. In 2005, the mean individual residential energy burden was 14.8 percent, significantly higher than the median individual burden of 10.1 percent and the mean group burden of 12.7 percent. In 2005, the mean individual home energy burden was 6.8 percent, the median individual burden was 3.9 percent, and the mean group burden was 5.3 percent. For all three

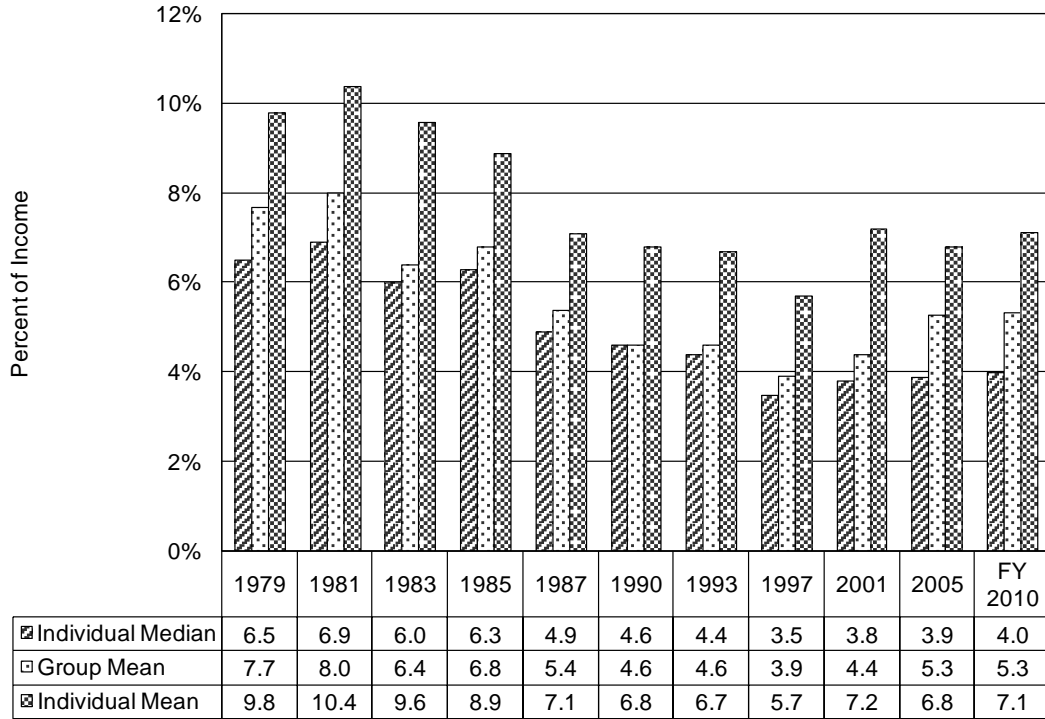
<sup>25</sup> See Appendix A for additional information on the interpretation of alternative burden statistics.

summary statistics, the highest home energy burden occurred in 1981 and the lowest home energy burden occurred in 1997. For FY 2010, median individual home energy burden was 42 percent lower, group mean burden was 34 percent lower, and individual mean burden was 32 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 HHS' poverty guidelines, 1979 to FY 2010**



**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 HHS' poverty guidelines, 1979 to FY 2010**



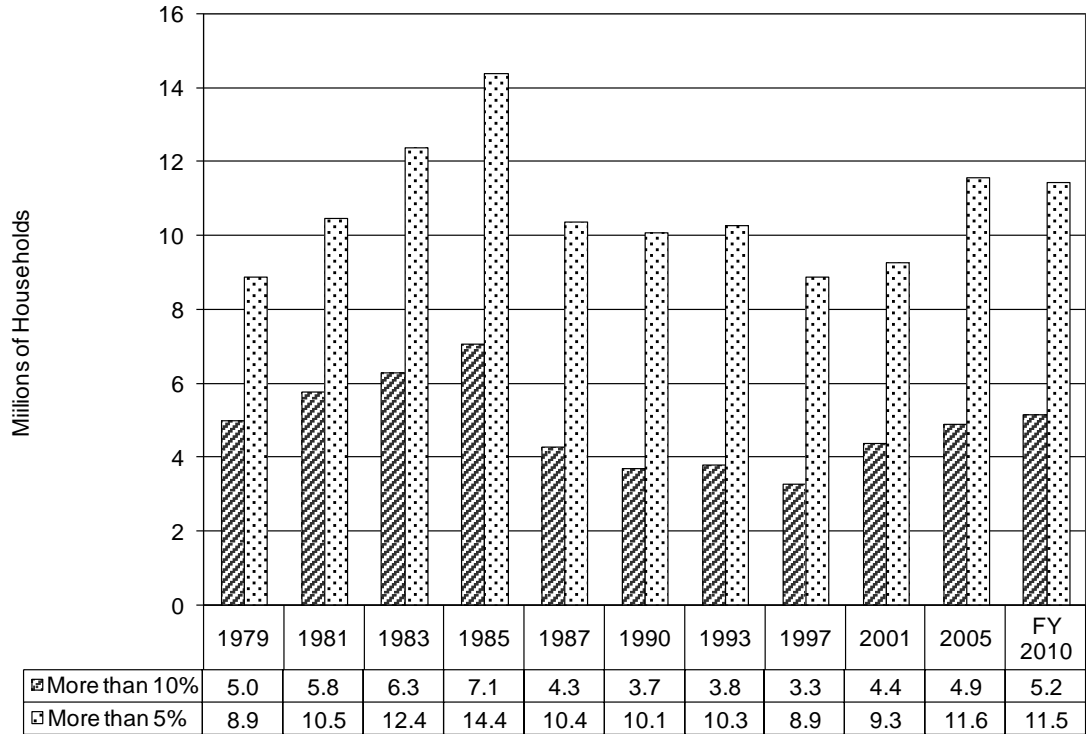
Figures 3-8 and 3-9 present information on the number and percent of low income households that had home energy burdens that exceeded specified levels. The levels are reference points and do not represent any judgment regarding an “affordable” level of energy burden.

As shown in Figure 3-8, the number of low income households with home energy burdens exceeding 10 percent of income grew from 5.0 million in 1979 to 7.1 million in 1985, an increase of 42 percent. The number of low income households with home energy burdens exceeding 5 percent of income grew by 62 percent from 1979 to 1985. These increases were primarily the result of growth in the total number of low income households. As Figure 3-9 shows, the percentage of low income households with home energy burdens exceeding 5 percent remained quite stable from 1979 through 1985. However, the percentage of low income households with home energy burdens exceeding 10 percent dropped by 17 percent over that same period.

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. From 2001 to FY 2010, while the percent of households exceeding the specified levels remained relatively stable, the number of households exceeding the specified levels increased by at least 18 percent. The number of low income households with home energy burdens exceeding 10 percent of income in FY 2010 was almost 27 percent less than the 1985 level and 4 percent more than the 1979 level.



**Figure 3-8. Number of low income households spending over 5 percent and 10 percent of income on home energy, 1979 to FY 2010**



**Figure 3-9. Percent of low income households spending over 5 percent and 10 percent of income on home energy, 1979 to FY 2010**

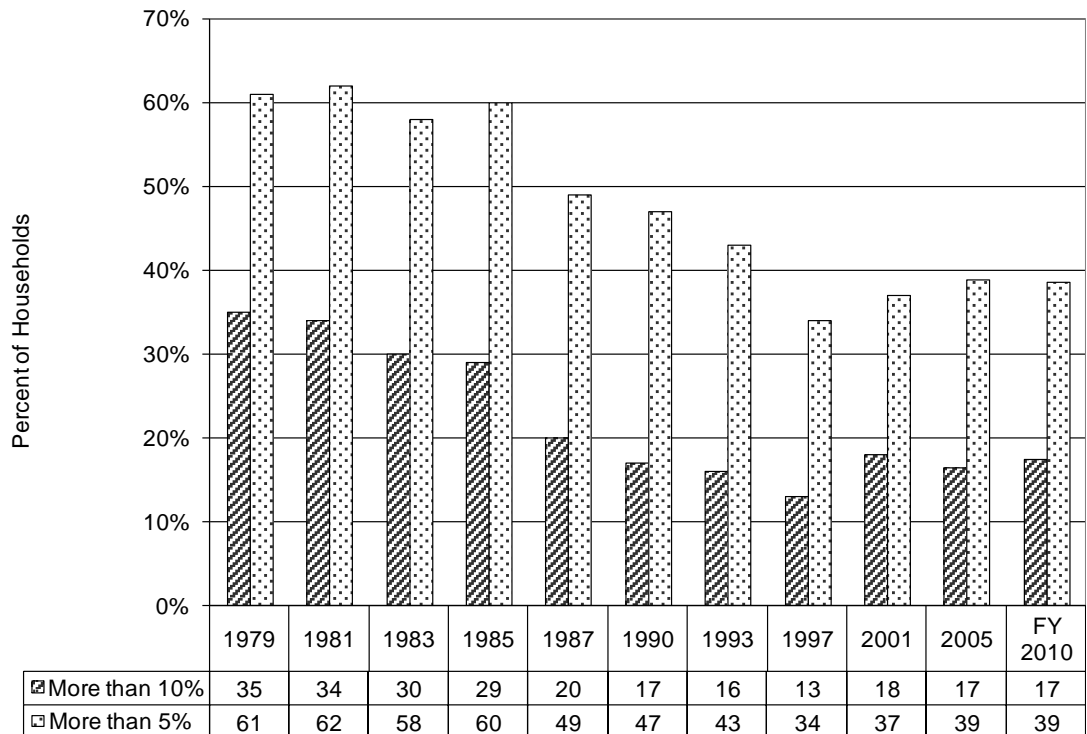


Figure 3-10 shows the total assistance funding that would be required to reduce the home energy burden for all low income households to 10 percent of income and 5 percent of income.<sup>26</sup> The amount required for a reduction in the home energy burden of low income households to 5 percent of income was \$2.2 billion in 1979, \$4.6 billion by 1985, \$3.3 billion in 2001, \$5.5 billion in 2005, and \$6.9 billion in FY 2010. The number of households with home energy burdens exceeding 5 percent of income fell between 1985 and 1997. The total dollars of assistance funding required to reduce the home energy burden of low income households to 5 percent also fell through 1997. From 1997 to 2005, increased expenditures caused the number of low income households exceeding the percent of income reference points to rise. Accordingly, the total dollars of assistance funding required to reduce the home energy burden to 5 percent also rose substantially. In FY 2010, both the number of low income households exceeding the percent of income reference points and their average expenditures increased. Therefore, total dollars of assistance funding required to reduce home energy burdens rose substantially.

**Figure 3-10. Total fuel assistance dollars needed to reduce low income household spending on home energy to 5 percent and 10 percent of income, 1979 to FY 2010**

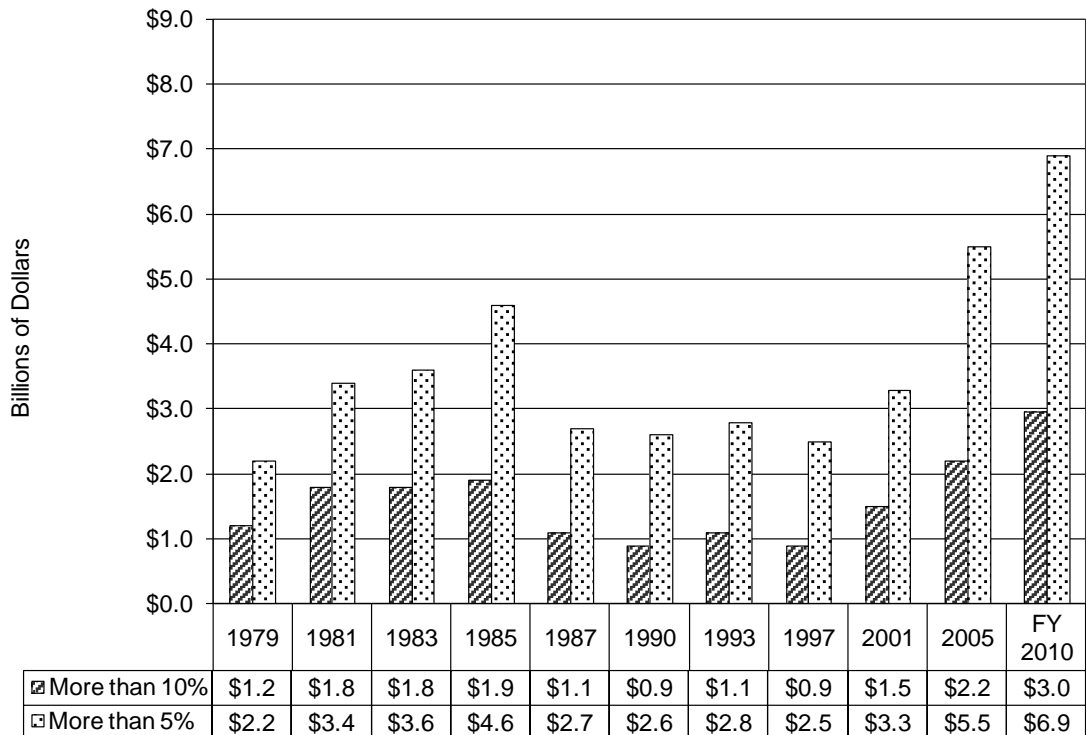
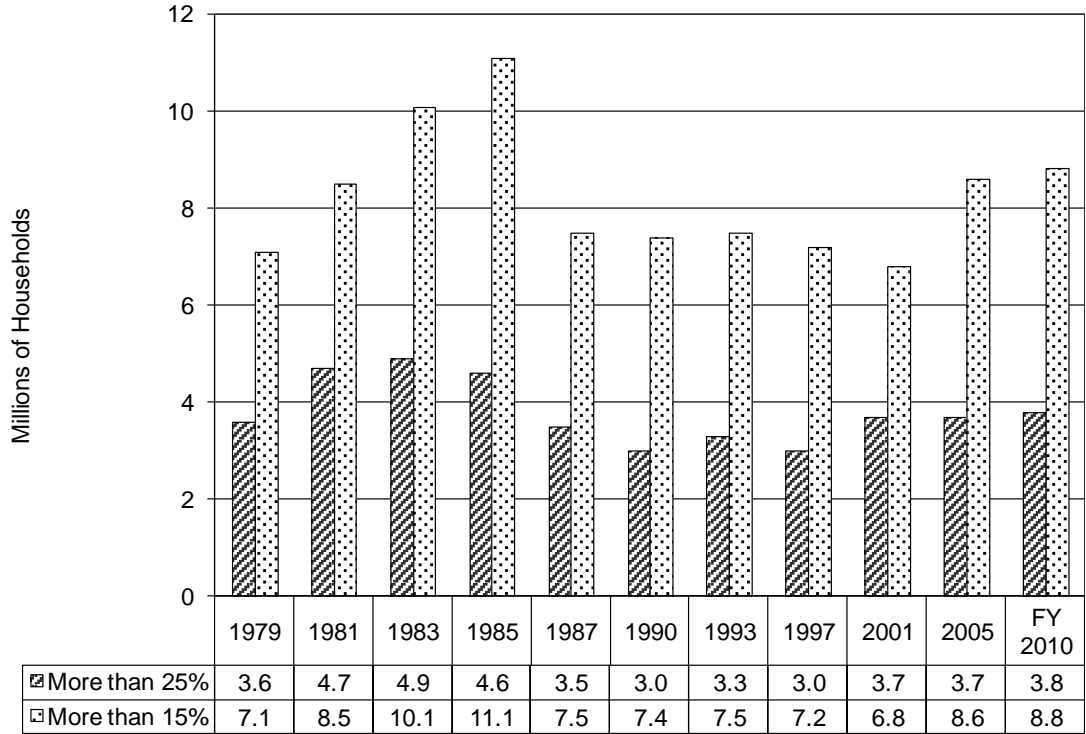


Figure 3-11 furnishes statistics on the number of low income households that had residential energy expenditures that exceeded specified levels. Figure 3-12 furnishes statistics on total fuel assistance dollars needed to reduce residential energy burden to specified levels. Figure 3-11 shows that the number of households spending over 15 and 25 percent of their income on residential energy followed a pattern similar to that observed in Figure 3-8. The largest number of households exceeded the specified percentages in 1983 and 1985. While the numbers exceeding 15 and 25 percent of

<sup>26</sup> This is calculated first by finding the amount of funds for each low income household that would be required to reduce its home energy burden to the specified percent of income. This amount is the difference between the household's actual home energy burden and the specified home energy burden (the dollar amount of the specified percent of household income). Then the household amounts are aggregated to produce the total assistance funding that is needed for all low income households.

income were lower in FY 2010 than during the peak years, they were higher in FY 2010 than at any time since the peak years. Figure 3-12 demonstrates that the funds required to reduce all low income households to the specified percentages reached their highest levels in FY 2010.

**Figure 3-11. Number of low income households spending over 15 percent and 25 percent of income on residential energy, 1979 to FY 2010**



**Figure 3-12. Total fuel assistance dollars needed to reduce low income household spending on residential energy to 15 percent and 25 percent of income, 1979 to FY 2010**

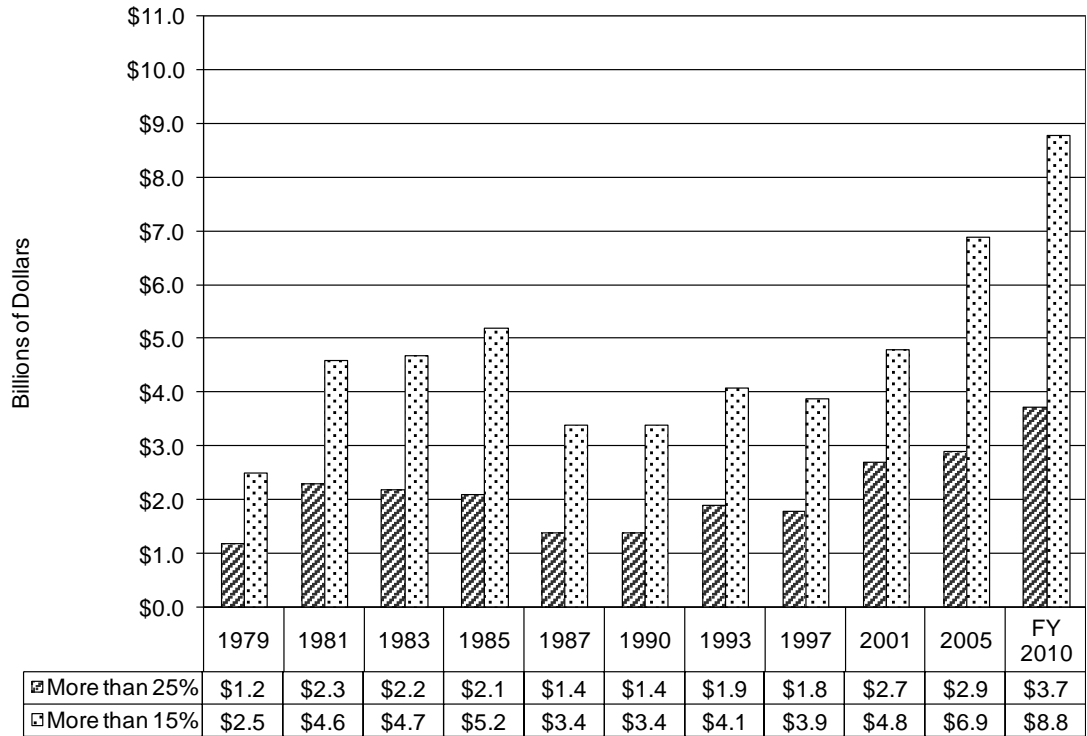


Figure 3-13 shows how the aggregated residential energy bill for all low income households has changed from 1979 to FY 2010. In 1979, the aggregated home energy bill (heating costs plus cooling costs) for low income households was \$4.5 billion. By FY 2010, the aggregated home energy bill had grown to \$19.6 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 costs accounted for about half of the total low income residential energy bill. In FY 2010, home energy costs accounted for 42.4 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 HHS' poverty guidelines, 1979 to FY 2010**

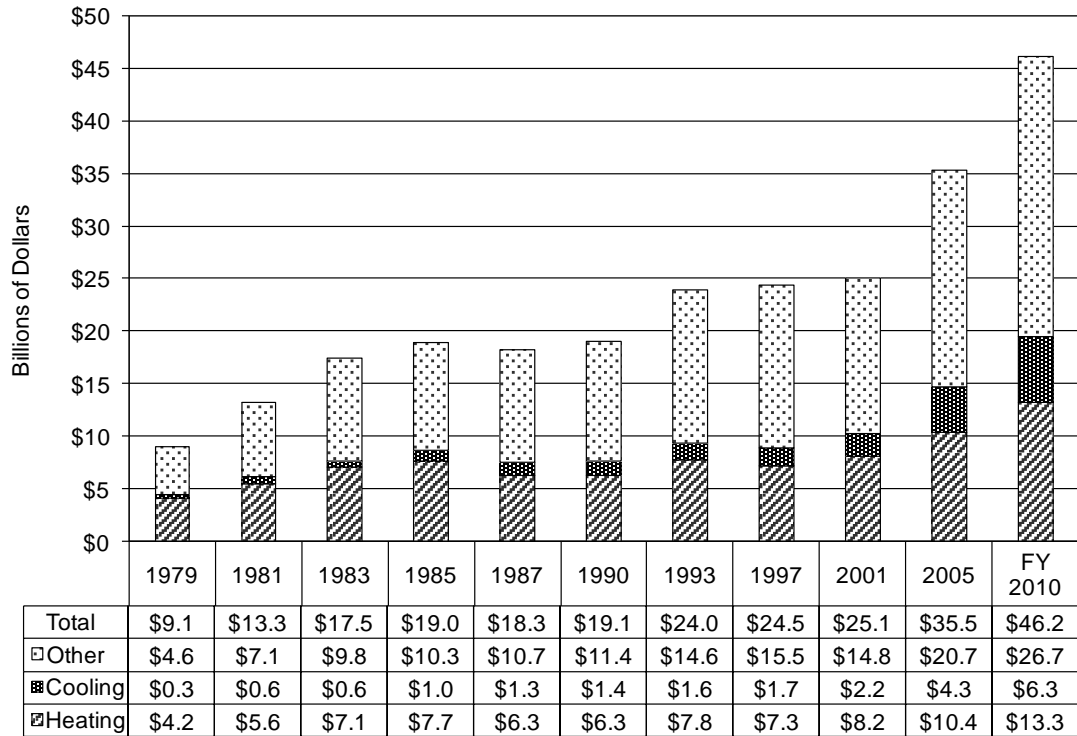
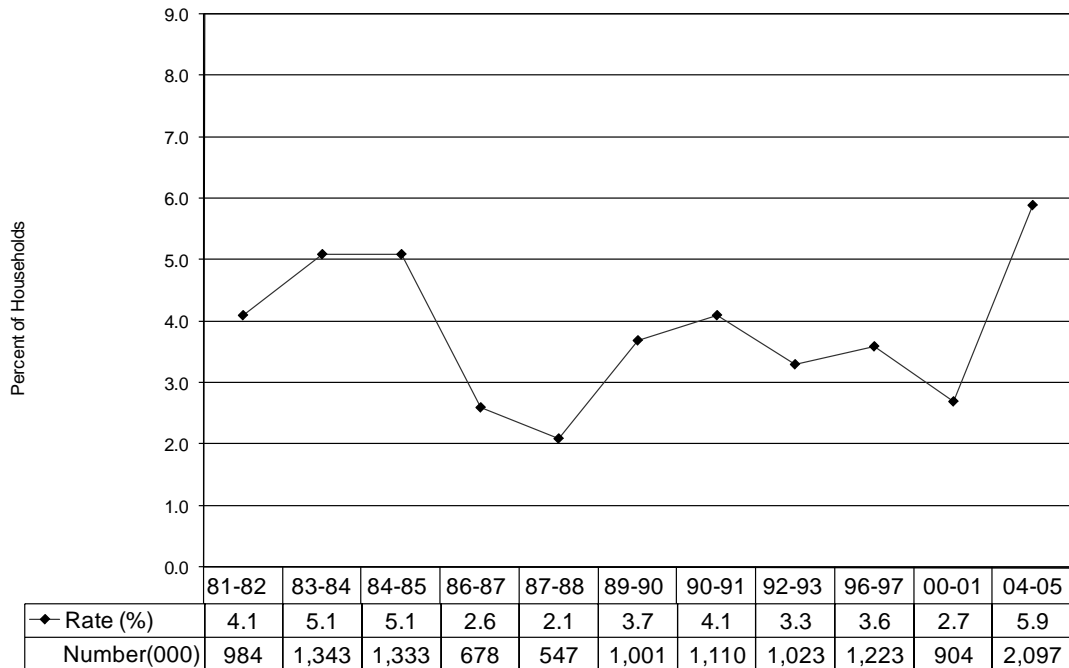


Figure 3-14, on the next page, demonstrates the impact of the inability to afford home energy on LIHEAP income eligible households. It shows the number of LIHEAP income eligible households that reported that they were unable to use their main source of heat for a period of two hours or more during the heating season because they were unable to pay for their main heating fuel. In 1981-82, 984 thousand LIHEAP income eligible households (4.1 percent of LIHEAP income eligible households) had heat interruptions during the heating season. The number and percentage grew to 1.34 million (5.1 percent) in 1983-84 and then fell consistently to 547 thousand (2.1 percent) in 1987-1988. In 1989-90 there was a sharp increase to 1.0 million (3.7 percent). This higher level of heat interruptions was sustained in 1990-91 when 1.1 million (4.1 percent) LIHEAP income eligible households had heat interruptions and in 1992-93 when 1.0 million (3.3 percent) LIHEAP income eligible households had heat interruptions. The number and percentage increased to 1.2 million (3.6 percent) in 1996-97. In 2000-01, the number and percentage of LIHEAP income eligible households with heat interruptions decreased to 904 thousand (2.7 percent). The number and percentage increased substantially to 2.1 million (5.9 percent) in 2004-2005.

**Figure 3-14. Percentage of LIHEAP income eligible households with heat interruptions of two hours or more caused by an inability to pay for energy to run the household's main heating system, 1981-82 heating season to 2004-05 heating season<sup>27</sup>**



## Analysis of energy price and energy efficiency trends

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

Figure 3-15, on the next page, furnishes an index of average fuel prices compared to an index of inflation that is based upon the Consumer Price Index (CPI). The fuel price index shows the percentage change from 1979 to FY 2009. For example, the CPI-based inflation index 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 37 percent during that period, while the composite average of fuel prices increased by 81 percent. From 1983 through 1997, the increase in the composite average of fuel prices moderated somewhat and generally grew more slowly than the CPI. However, from 1997 to 2005, the pattern was reversed; the composite average fuel price index grew by over 45 percent while the CPI grew by only 22 percent. 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 2005, fuel prices increased by 45 percent over 1997 prices. The increase in fuel prices explains why expenditures also

<sup>27</sup>Data for 2004-2005 heating season refer to heat interruptions of any length. 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 income eligible households last at least 2 hours but less than 24 hours. The procedures for analyzing heat interruption data have changed since the issuance of the *LIHEAP Report to Congress for FY 1993*. The heat interruption rates for 1983-84 through 1987-88 are slightly higher with this new analysis.

rose. In FY 2010, fuel prices increased by nearly 15 percent over 2005 prices and once more contributed to an increase in expenditures.

**Figure 3-15. Index of dollar prices for fuel oil, natural gas, electricity, and a composite compared to the Consumer Price Index (CPI), 1979 to FY 2010**

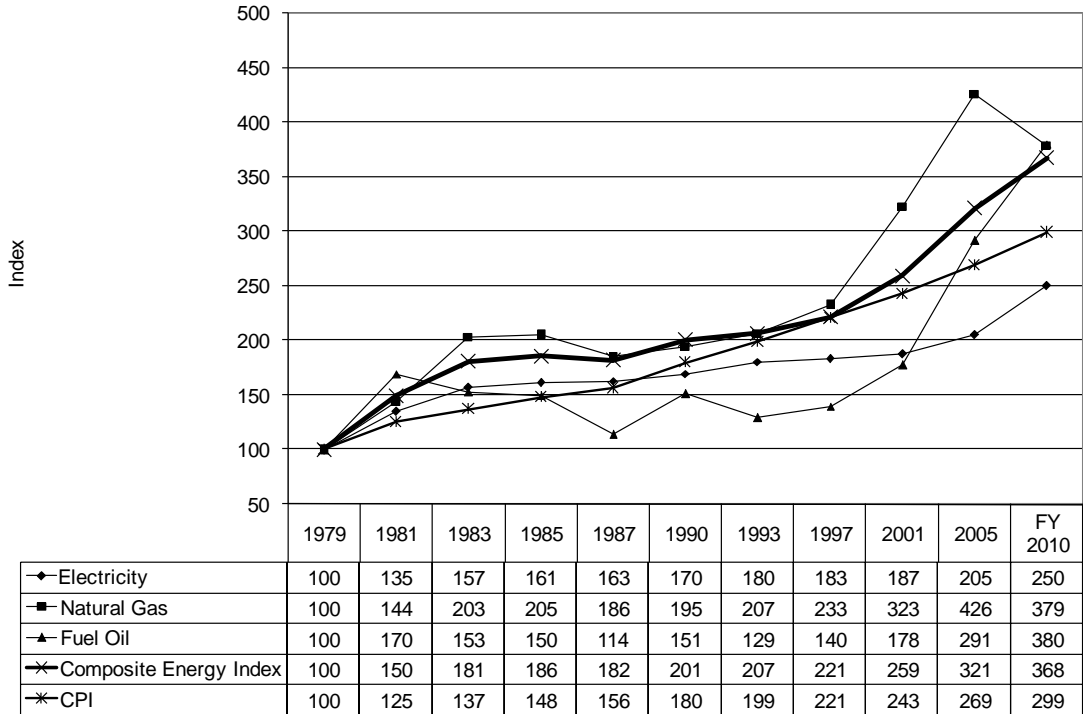


Figure 3-16 demonstrates how changes in heating energy consumption among low income households from 1979 to FY 2010 compared to changes in heating degree days for the same period. From 1979 to 1983, home heating consumption fell more rapidly than did heating degree days, suggesting a significant increase in efficiency as a result of conservation measures or actions. Consumption per heating degree day dropped rapidly for that period. From 1983 to 1997, there was only a moderate reduction in consumption per heating degree day. Thus, heating consumption fluctuations appear to be primarily a result of the changes in the weather for those years. From 1997 to 2005, home heating consumption again fell more rapidly than did heating degree days, suggesting a moderate increase in efficiency as a result of conservation measures or actions. This was perhaps driven by the high fuel prices experienced in 2001 and 2005. From 2005 to FY 2010, there was a slight reduction in consumption per heating degree day

**Figure 3-16. Index of heating consumption, heating degree days, and heating consumption per heating degree day for households with incomes at or below 150 percent of HHS' poverty guidelines, 1979 to FY 2010**

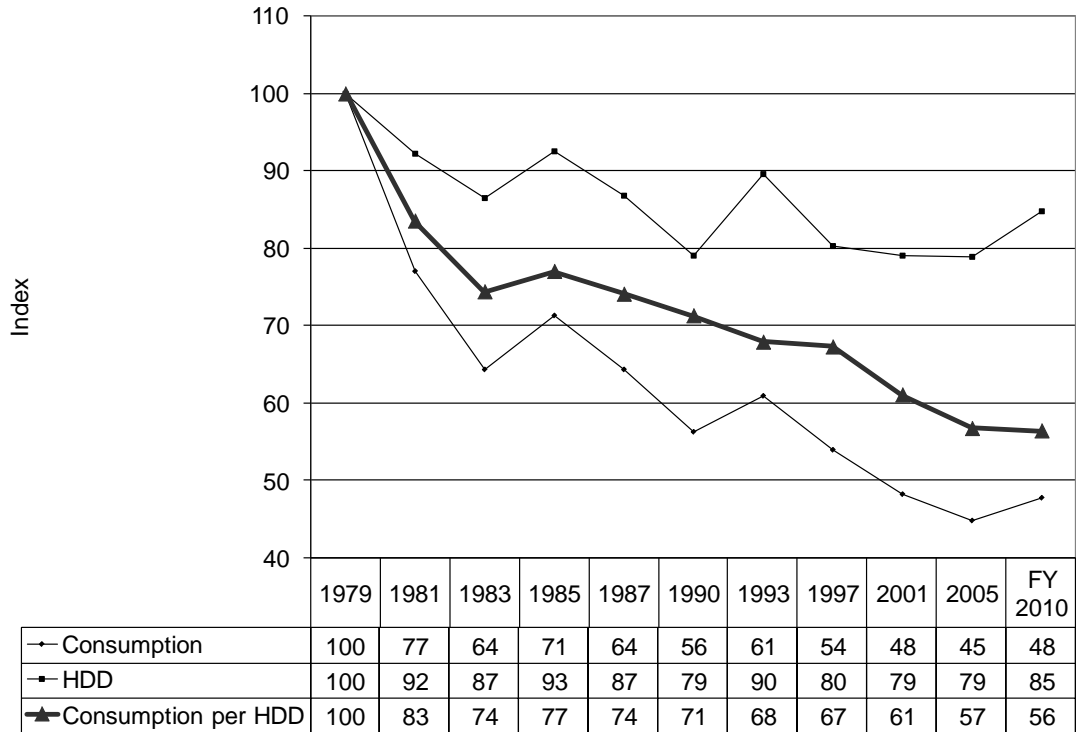
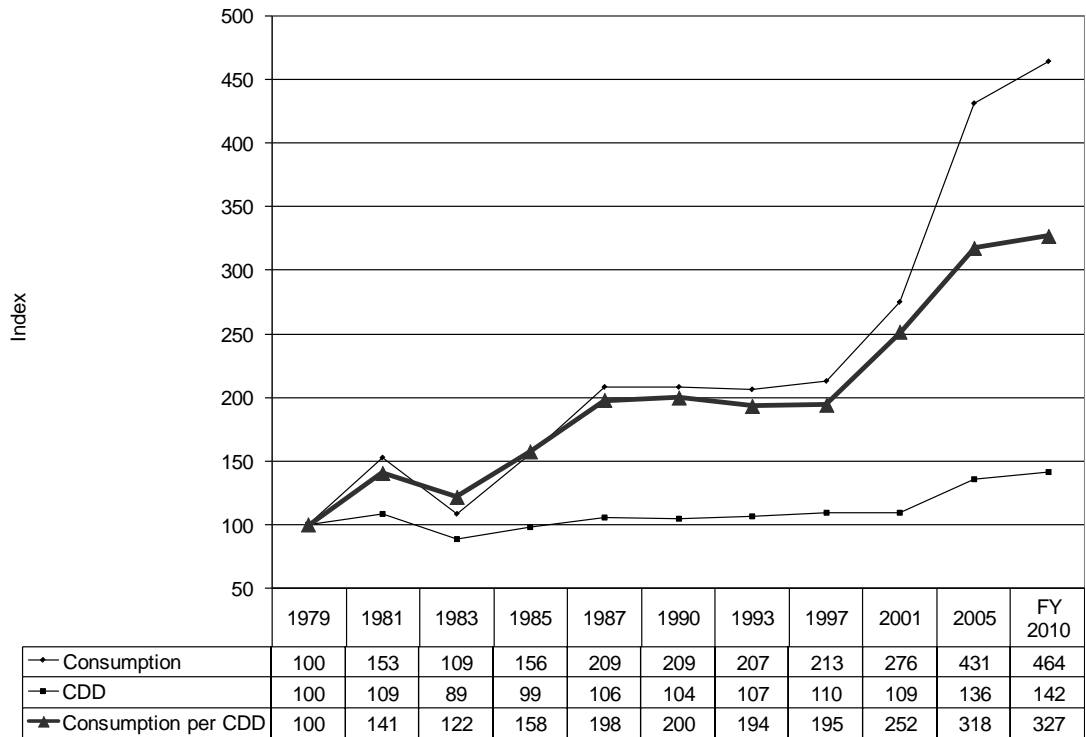


Figure 3-17 shows that home cooling consumption trends among low income households are somewhat more complex than are home heating consumption trends. In FY 2010, mean home cooling consumption was much higher than it was in 1979, even though households experienced only slightly more cooling degree days. Thus, mean consumption per cooling degree day increased substantially from 1979 to FY 2010, making it appear as though there was a reduction in efficiency. However, the primary cause of the increase in mean home cooling consumption was the large increase in the availability of air-conditioning among low income households.<sup>28</sup> As shown in Figure 3-2, only 37 percent of low income households had air-conditioning in 1979, while in 2005, 80 percent of low income households had air-conditioning. Because of this fundamental change in the number of households that use air-conditioning, it is very difficult to assess either changes in efficiency from 1979 to FY 2010 or year-to-year changes in consumption in response to changes in cooling degree days.

<sup>28</sup>Air-conditioning equipment includes central air conditioners and window or wall units, ceiling fans, and evaporative coolers. The availability of all household appliances increased for low income households over this period due to the overall increase in the wealth of the nation and the decrease in the cost of older technologies.

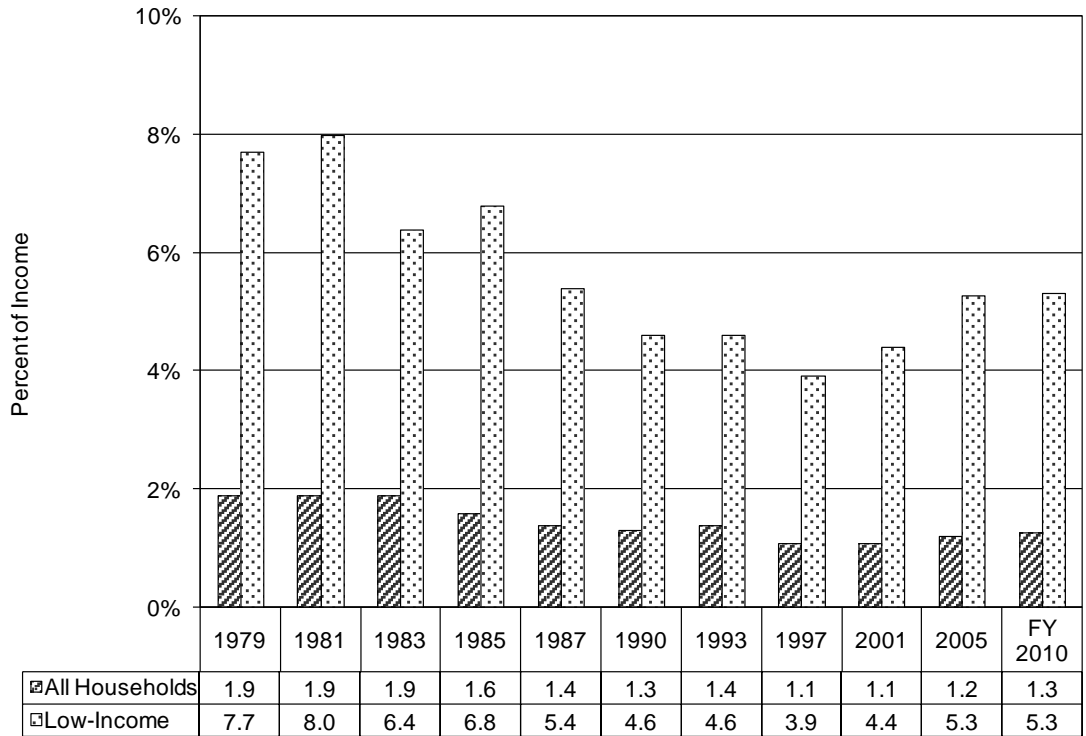


**Figure 3-17. Index of cooling consumption, cooling degree days, and cooling consumption per cooling degree day for households with incomes at or below 150 percent of HHS' poverty guidelines, 1979 to FY 2010**

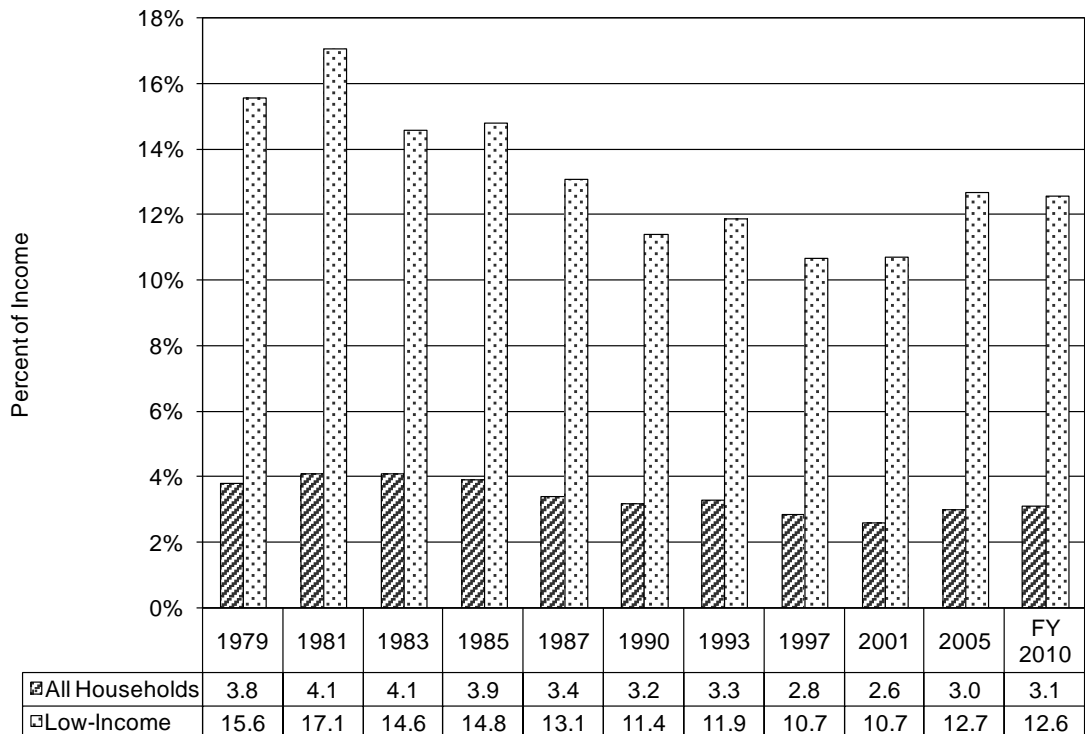


Figures 3-18 and 3-19, on the next page, show that the mean group energy burden for low income households is substantially higher than that for all households. In FY 2010, the mean group home energy burden for all households was 1.3 percent, and that for low income households was 5.3 percent. In FY 2010, the mean group residential burden was 3.1 percent for all households and 12.6 percent for low income households. Over time, the gap between the burden for low income and all households has fluctuated somewhat. Figure 3-18 shows that in 1979, the mean group home energy burden for low income households was just over 4 times that of all households, while in 1993, the mean group burden for low income households was close to 3.5 times that of all households. However in FY 2010, 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 HHS' poverty guidelines, 1979 to FY 2010**



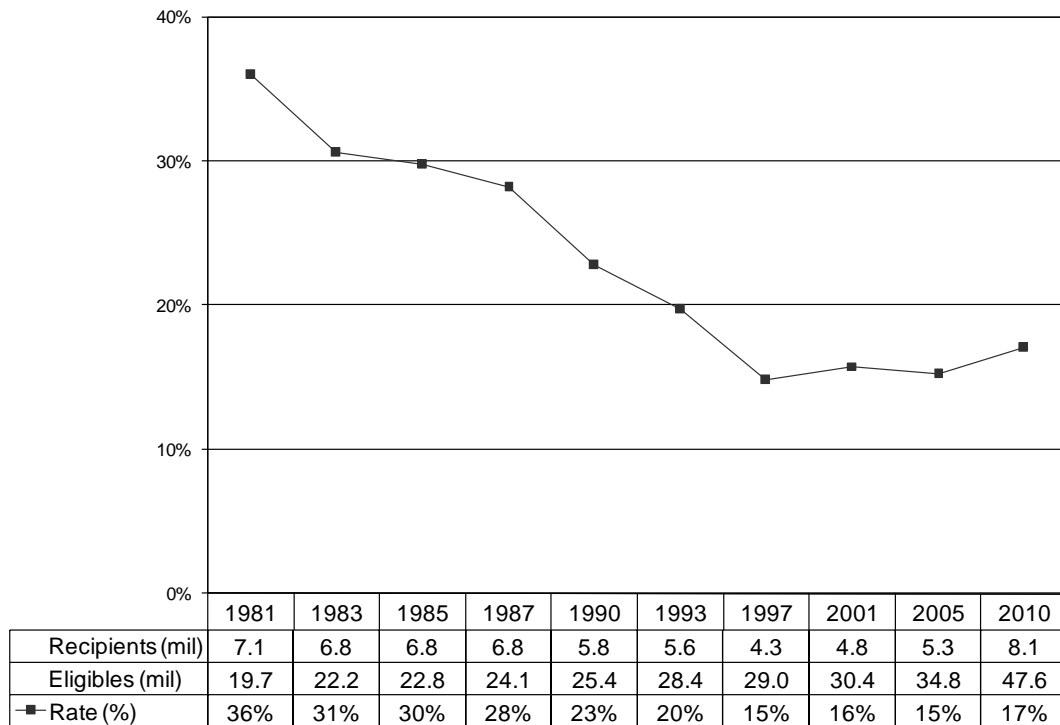
**Figure 3-19. Mean group residential energy burden for all households and for households with incomes at or below 150 percent of HHS' poverty guidelines, 1979 to FY 2010**



## Trends in LIHEAP

Figures 3-20 through 3-24 furnish information on trends for HHS' energy assistance programs from FY 1981 through FY 2010. Figure 3-20 shows that the percentage of LIHEAP income eligible households that have received heating and/or winter crisis assistance had fallen steadily until 1997 but has remained steady at about 16 percent since then. In FY 1981, 36 percent of eligible households received heating and/or winter crisis assistance benefits; this number fell to 15 percent in 1997. In FY 2010, 17 percent of LIHEAP income eligible households received those benefits.<sup>29</sup> Figure 3-21, on the next page, furnishes statistics on the count of recipients by benefit type.

**Figure 3-20. Percentage of LIHEAP/LIHEAP Federally eligible households receiving LIHEAP/LIHEAP heating and/or winter crisis assistance, FY 1981 to FY 2010**

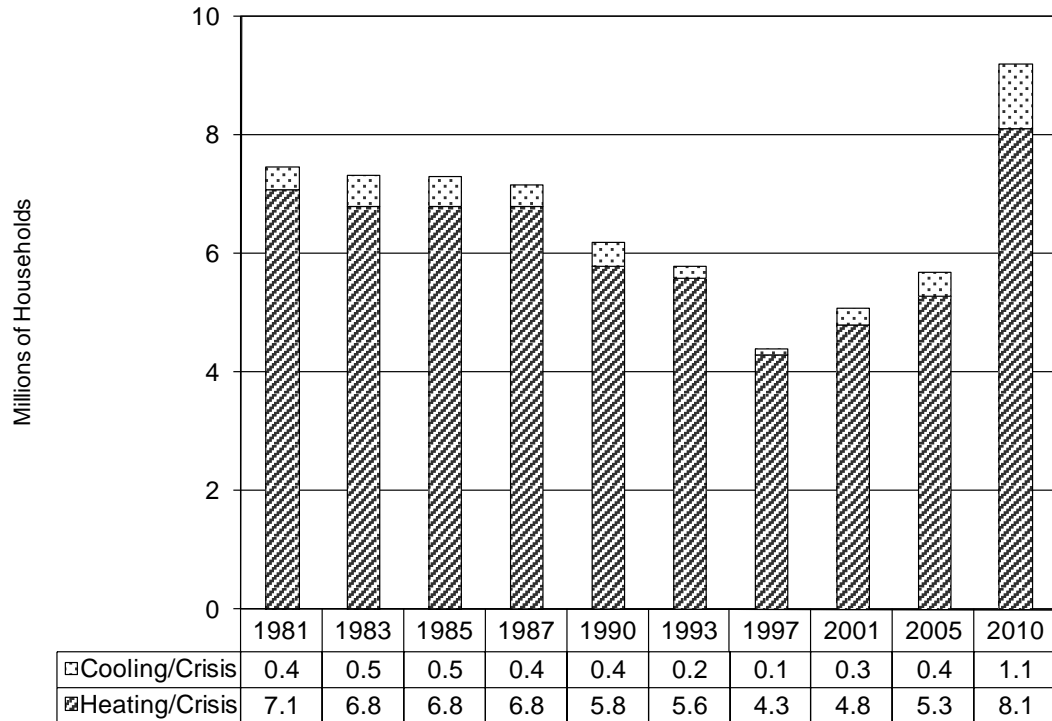


NOTE: The FY 1981 and FY 2010 estimate of income eligible households are not directly comparable to those of the other years because the income eligibility guidelines for the FY 1981 and FY 2010 programs differed from those of other years. If the previous Federal maximum LIHEAP income standard – the greater of 150 percent of HHS Poverty Guidelines or 60 percent of State median income – were used in the calculations, the number of income eligible households in FY 2010 would have been 37.1 million.

SOURCE: HHS Administrative Data — such data for FY 2010 are preliminary; thus the actual figures may differ.

<sup>29</sup>Note that the Federal income eligibility guidelines for the FY 1981 Low Income Energy Assistance Program (LIEAP) and the FY 2010 LIHEAP were different from the LIHEAP programs in other years included in the table.

**Figure 3-21. Number of households receiving LIHEAP/LIHEAP heating and/or winter crisis assistance or cooling and/or summer crisis assistance, FY 1981 to FY 2010<sup>1/</sup>**

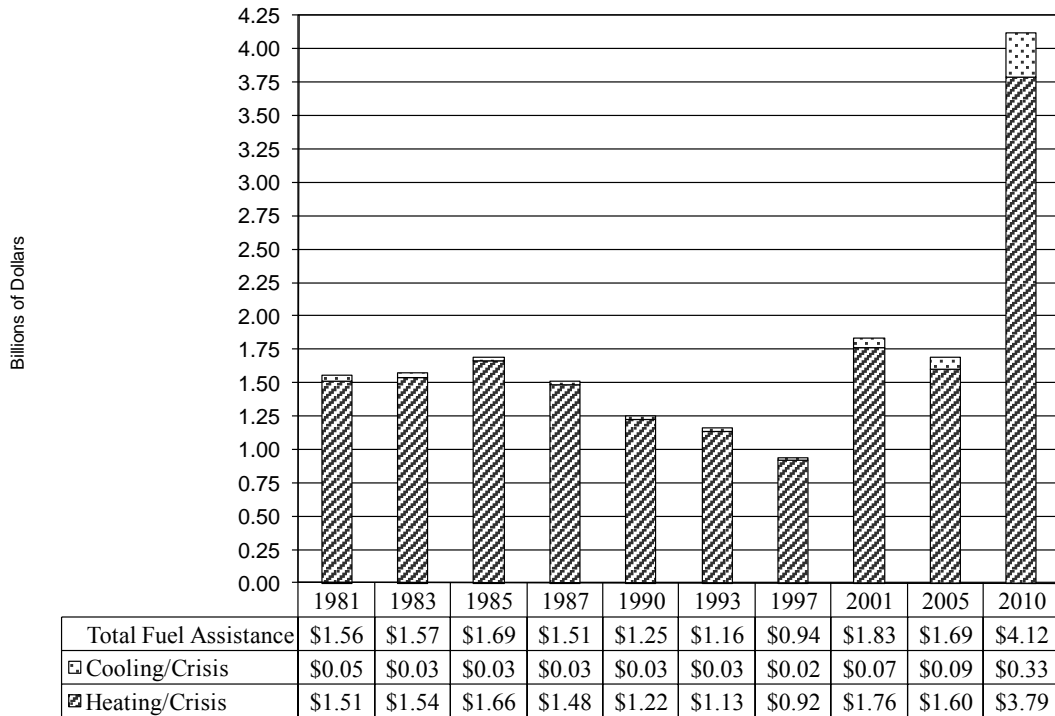


SOURCE: HHS Administrative Data — such data for FY 2010 are preliminary; thus the actual figures may differ.

<sup>1/</sup>Cooling assistance/summer crisis figures cannot be added to heating assistance/winter crisis figures to generate total assistance + crisis figures for each year because households can receive more than one type of assistance.

Figure 3-22, on the following page, shows that the total funds used for fuel assistance benefits have fluctuated over time. For the years shown, funding was highest in FY 2010, when \$4.12 billion dollars were used for heating and cooling assistance benefits, and lowest in FY 1997 when \$0.94 billion dollars were used for assistance benefits. In FY 2010, Congress provided LIHEAP with \$5.1 billion in funding which is the highest level of funding the program has received.

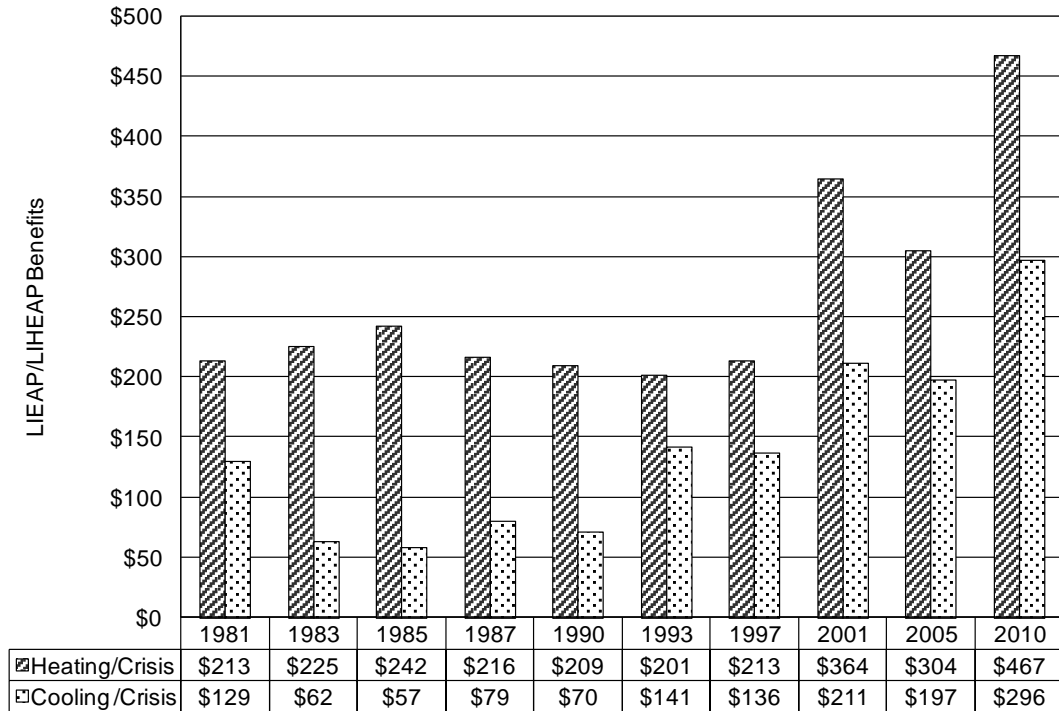
**Figure 3-22. Funds used for LIEAP/LIHEAP fuel assistance, FY 1981 to FY 2010**



SOURCE: HHS Administrative Data — such data for FY 2010 are preliminary; thus the actual figures may differ.

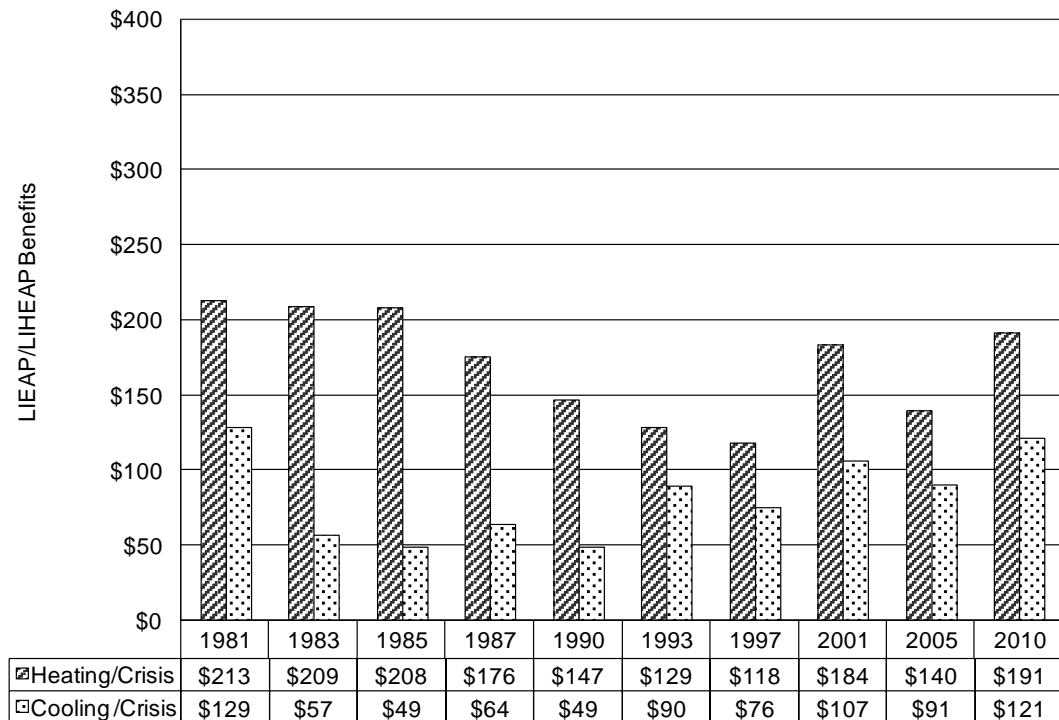
Figure 3-23 on the following page shows that, for the years shown, mean heating/winter crisis benefits were \$213 in FY 1981, grew to \$242 in FY 1985, fell back to \$213 in 1997, rose to \$364 in FY 2001, dropped to \$304 in FY 2005, and then rose substantially to \$467 in FY 2010. Figure 3-24 shows that, after adjusting for inflation, with the exception of FY 2010, the mean value of benefits has fallen substantially. The mean value of heating and/or winter crisis benefits, in 1981 dollars, fell from \$213 in FY 1981 to \$140 in FY 2005. In FY 2010, mean heating benefits increased considerably to \$191. With the exception of FY 1981, mean cooling benefits ranged, in 1981 dollars, from \$49 to \$90 through FY 1997, then rose to \$107 in FY 2001, then fell to \$91 in FY 2005. In FY 2010, mean cooling benefits increased substantially to \$121. In FY 1993, one State made program changes that significantly increased the mean benefit and decreased the total number of recipients.

**Figure 3-23. Mean combined LIEAP/LIHEAP heating and/or winter crisis benefits and mean cooling and/or summer crisis benefits, in nominal dollars, FY 1981 to FY 2010**



SOURCE: HHS Administrative Data — such data for FY 2010 are preliminary; thus the actual figures may differ.

**Figure 3-24. Mean combined LIEAP/LIHEAP heating and/or winter crisis benefits and mean cooling benefits, in real 1981 dollars, FY 1981 to FY 2010**



SOURCE: HHS Administrative Data — such data for FY 2010 are preliminary; thus the actual figures may differ.

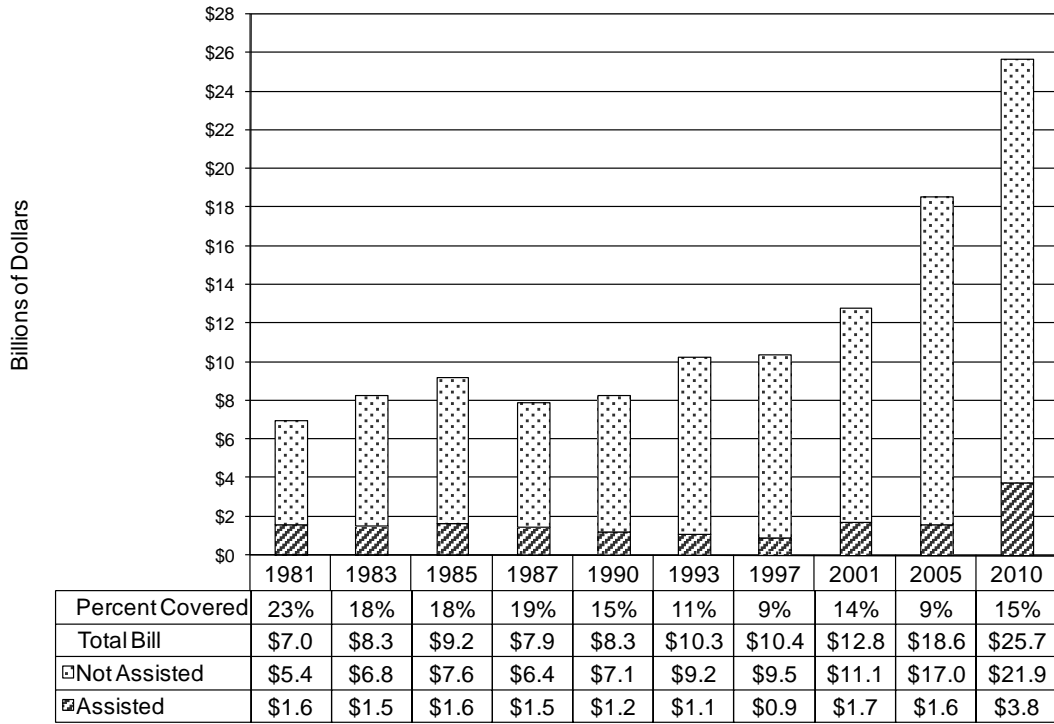
## **Analysis of LIHEAP benefits**

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

Figure 3-25 shows that the LIHEAP heating coverage rate fell from 23 percent in FY 1981 to 15 percent in FY 2010. An increase in the size of the total bill and a substantial increase in the number of households eligible for assistance benefits in FY 2010 caused this reduction.

Figure 3-26 shows that the net effect of LIHEAP has been to lower recipient group home heating burdens to levels that are much closer to the levels of the average household. In FY 1981, the gross mean group home heating burden for LIHEAP recipients was 8.5 percent, while the net mean group home heating burden (with home heating expenditures taken after deducting LIHEAP benefits) was 2.9 percent. In FY 2010, the gross mean group home heating burden for LIHEAP recipients was 3.1 percent, while the net mean group home heating burden was 1.1 percent. It is interesting to note that, while the gross mean group home heating burden for LIHEAP recipients fell from 8.5 percent in FY 1981 to 4.0 percent in FY 1997, decreases in mean LIHEAP benefits in relation to household income caused the net mean group home heating burden to range between 1.4 and 2.2 times as high as the gross mean group home heating burden for all households except for FY 2005 when that ratio was more than 3 to 1. In FY 2001, significant increases in the mean heating benefit caused the net mean group home heating burden for LIHEAP recipients to fall to 1.7 percent, however it remained twice as high as the mean group burden for all households. In FY 2005, the mean heating benefit decreased by 16 percent, and net mean group home heating burden almost doubled, increasing by 94 percent. The changes in net mean group heating burden resulted from the combination of mean heating benefit decrease and much higher fuel prices in FY 2005. In FY 2010, the net mean group home heating burden for LIHEAP recipients decreased substantially to 1.1 percent due to an increase in mean heating benefit and an increase in LIHEAP Federal income guidelines.

**Figure 3-25. Amount and percentage of total home heating billed amounts for LIHEAP/LIHEAP income eligible households covered by LIHEAP/LIHEAP heating and winter crisis benefits, FY 1981 to FY 2010**

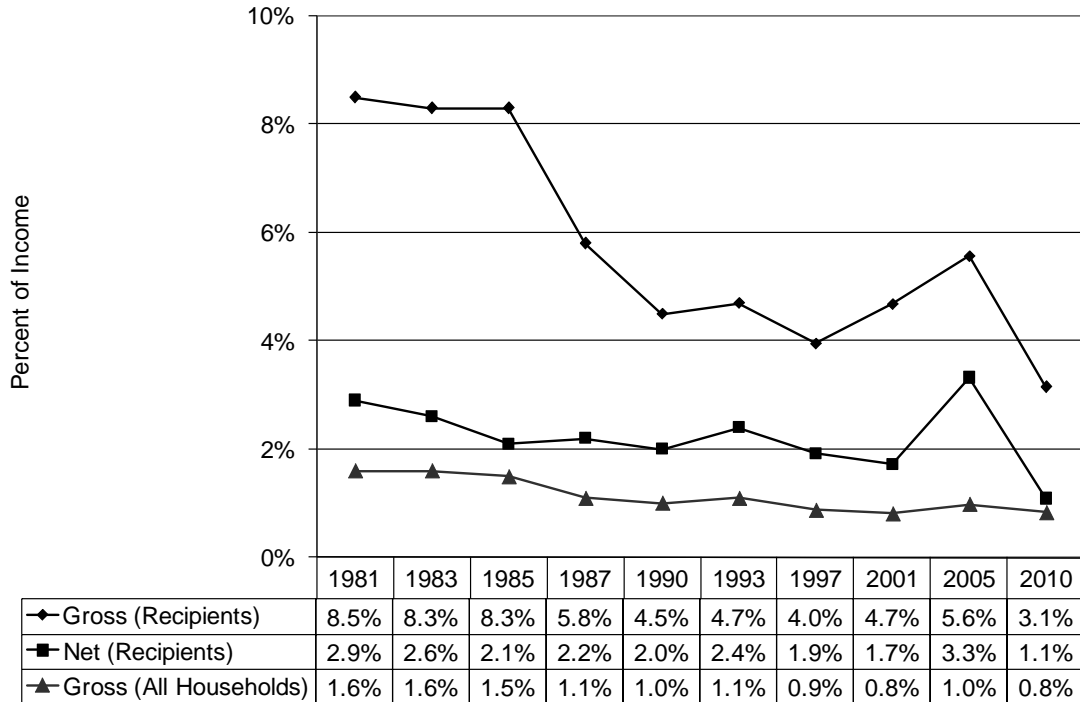


SOURCE: Assistance number from HHS data and heating bill estimates from RECS — HHS data for FY 2010 are preliminary; thus the actual figures may differ.

NOTE: The FY 1981 and FY 2010 estimate of income eligible households are not directly comparable to those of the other years because the income eligibility guidelines for the FY 1981 and FY 2010 programs differed from those of other years. If the previous Federal maximum LIHEAP income standard – the greater of 150 percent of HHS Poverty Guidelines or 60 percent of State median income – were used in the calculations, in FY 2010, percent covered would have been 20%, total bill would have been \$20.1 billion, and not assisted would have been \$16.3 billion.



**Figure 3-26. Mean group home heating burden for all households and LIHEAP/LIHEAP heating and winter crisis recipient households, FY 1981 to FY 2010**



SOURCE: Mean burden uses expenditures from RECS and income from CPS ASEC.

Net Burden = (Mean Expenditures - Mean Benefit) / Mean Income

NOTE: The FY 1981 and FY 2010 estimate of income eligible households are not directly comparable to those of the other years because the income eligibility guidelines for the FY 1981 and FY 2010 programs differed from those of other years. If the previous Federal maximum LIHEAP income standard – the greater of 150 percent of HHS Poverty Guidelines or 60 percent of State median income – were used in the mean group income calculations, in FY 2010, gross and net home heating burden for LIHEAP recipients would have been 3.8% and 1.3%, respectively.

## **IV. Federal LIHEAP Targeting Performance**

The Government Performance and Results Act of 1993 (GPRA) focuses on program results to provide Congress with objective information on the achievement of statutory objectives or program goals. The resulting performance data are to be used in making decisions on budget and appropriation levels.

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

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

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

### **LIHEAP program goals and performance goals**

LIHEAP is not an entitlement program. Therefore, the program's grantees are unable to serve all of the households that are income eligible under the Federal maximum income eligibility standard. In FY 2010, 16 percent of income eligible households<sup>30</sup> received heating and/or winter crisis assistance. 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

---

<sup>30</sup> Note that the Federal LIHEAP maximum income standard – the greater of 150 percent of HHS Poverty Guidelines or 75 percent of State median income – that was in effect in FY 2010 is used in the estimation of the number income eligible households.

hypothermia or hyperthermia, and increased susceptibility to other health conditions such as stroke and heart attacks.

- **High Burden Households:** High burden households are those 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 homes if they cannot pay their heating or cooling bills. Safety risks can include the use of makeshift heating sources or inoperative/faulty heating or cooling equipment that can lead to indoor fires, sickness, or asphyxiation.

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

Based on the authorizing legislation, LIHEAP's goal is to provide LIHEAP assistance to vulnerable households and high-energy burden households whose health and/or safety are endangered by living in homes without sufficient heating or cooling.

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

## **Targeting index performance measures**

Performance goals must be measurable in order to determine if the goals are being achieved. ACF has developed a set of performance measures (i.e., targeting indexes) that show the extent to which LIHEAP meets its performance goals. These measures, which are presented below, show LIHEAP's performance in targeting vulnerable and high-burden households:

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

An index greater than 100 indicates that the target group's incidence in the LIHEAP recipient population is higher than that group's incidence in the income eligible population. An index less than 100 indicates that the target group's incidence in the LIHEAP-recipient population is lower than that group's incidence in the income eligible population.

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

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

- The **burden reduction targeting index** quantifies burden reduction targeting performance. The index is computed by dividing the percent reduction in the median individual energy burden due to LIHEAP for a specified group of recipients by the percent reduction in the median individual energy burden due to LIHEAP for all recipients and then multiplying the result by 100.<sup>31</sup> For example, if high burden recipients have their median individual energy burden reduced by 25 percent (e.g., from 8 percent of income to 6 percent of income) and all recipient households have their median individual energy burden reduced by 20 percent (e.g., from 5 percent of income to 4 percent of income), the burden reduction targeting index is 125 (100 times 25 divided by 20).

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

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

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

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

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

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

ACF's annual LIHEAP performance measures are:

- Increase the reciprocity targeting index score of LIHEAP households having at least one member 60 years or older.

---

<sup>31</sup>In general, the mean (or average) is preferred to the median (or midpoint), as it is more informative. The mean, which is commonly called the average, is the sum of all values divided by the number of values. The median is the value at the midpoint in the distribution of values. LIHEAP benefit reciprocity variables are not highly skewed (or distorted); therefore, mean benefits are used to compute the benefit targeting index. Energy burden variables, however, are highly skewed; thus the median energy burden, which is less affected by extreme values, is used to calculate the burden reduction index.

- Maintain the reciprocity targeting index score of LIHEAP households having at least one member five years or younger.

There are no annual measures for the benefit targeting or burden reduction targeting indexes because the data that enter into these indexes are not available annually. The baseline value for the burden reduction targeting index was computed for 2001 using the Residential Energy Consumption Survey (RECS) LIHEAP Supplement. However, this index can be updated only as often as the RECS occurs, which is generally every four years. The last update to this index came from the 2005 RECS data.

## **Outcome performance measures**

ACF seeks to improve the way in which it measures LIHEAP's performance. LIHEAP supports Objective B of HHS' Goal 3: Promote economic and social well-being for individuals, families, and communities. However, the indicators that ACF uses to measure LIHEAP's performance, the young child and elderly reciprocity targeting indexes, serve only as proxies for LIHEAP's outcomes. ACF intended these proxies to be replaced by more outcome-focused measures.

In June 2008, ACF established the LIHEAP Performance Measures Planning Work Group, consisting of state LIHEAP Directors and ACF staff. The Work Group developed a logic model which identifies the long-term goal of LIHEAP as providing LIHEAP recipients with continuous, safe, and affordable home energy service. The Work Group completed its work in January 2010 when it drafted a set of over 36 potential LIHEAP performance measures that could be useful to both the states and ACF. These draft measures are grouped into one of four tiers by type of LIHEAP assistance. Performance measures in tiers 1-3 are to be state-reported based on each state's ability to collect increasingly complex data. Tier 4 data are to be collected at the federal level.

In April 2010, ACF established a follow-up group, the LIHEAP Performance Measures Implementation Work Group, consisting of state LIHEAP Directors and ACF staff. The Work Group will be active through at least 2014 in overseeing the selection and implementation of the first Work Group's proposed LIHEAP outcome measures. Thus far, the Work Group engaged in the following activities during FY 2010:

- In summer 2010, the Work Group administered to states a LIHEAP performance measures needs assessment.
- In fall 2010, the Work Group analyzed and reported on the results of the needs assessment, developed objectives for implementing the proposed performance measures, and began creating the tools and resources to allow state grantees to measure LIHEAP program performance.

## **Performance measurement research**

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

- Validation Study – The performance measurement validation study examined the available data sources for estimating the targeting indexes required by the performance measurement plan for LIHEAP and identified the data sources that furnished the most reliable data.<sup>32</sup>
- Energy Burden Study – The energy burden evaluation study used the 2001 RECS LIHEAP Supplement to measure the baseline performance of LIHEAP in serving high burden households and to examine the competing demands associated with targeting vulnerable and high burden households.<sup>33</sup>

These studies are available on the web, either electronically or by request, at [http://www.acf.hhs.gov/programs/ocs/liheap/publications/publications\\_reports.html#s](http://www.acf.hhs.gov/programs/ocs/liheap/publications/publications_reports.html#s).

### **Performance measurement data sources**

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

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

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

- The income eligible population – According to the Census Bureau, the CPS ASEC furnishes the most reliable national estimates of the number of income eligible households.<sup>34</sup>
- Income eligible vulnerable households – The CPS ASEC furnishes the most reliable estimates of the number of income eligible vulnerable households (i.e., elderly households and young child households).
- LIHEAP heating recipients – The annual State *LIHEAP Household Reports* furnished by State LIHEAP administrators to ACF furnish the most reliable estimates of the number of recipient households.

---

<sup>32</sup> *LIHEAP Targeting Performance Measurement Statistics: GPRA Validation of Estimation Procedures*, September 2004, prepared by APPRISE Incorporated under PSC Order No. 043Y00471301D.

<sup>33</sup> *LIHEAP Energy Burden Evaluation Study*, July 2005, prepared by APPRISE Incorporated under PSC Order No. 043Y00471301D.

<sup>34</sup> "Guidance about Income Sources." U.S. Census Bureau. Housing and Household Economics Statistics Division. November 1, 2011. <http://www.census.gov/hhes/www/income/method/guidance/index.html>.

- Vulnerable household heating recipients – The annual State *LIHEAP Household Reports* furnished by State LIHEAP administrators to ACF furnish the most reliable estimates of the number of vulnerable recipient households.
- Income eligible high burden households – The RECS furnishes the most reliable estimates of the number of income eligible high burden households.
- High burden heating recipients – The RECS LIHEAP Supplement furnishes the most reliable estimates of the number of high burden recipient households.

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

- CPS ASEC – The CPS ASEC is a national household sample survey that is conducted monthly by the Bureau of the Census. The CPS ASEC includes data that allow one to characterize household demographic characteristics. The CPS ASEC is the best source of annual national data for estimating the number of income eligible households and the number of income eligible vulnerable households. The CPS ASEC data needed to prepare performance statistics for FY 2010 were available in October 2010.
- Federal LIHEAP Household Report – The preliminary LIHEAP Household Reports for FY 2010 were due from the States by September 1, 2010, when the States' LIHEAP block grant applications for FY 2011 were due. ACF set a goal for the States to submit their final LIHEAP Household Report for FY 2010 by December 2010. Each LIHEAP Household Report needs to be received, reviewed, processed, and compared against data from each State's Federal LIHEAP Grantee Survey for FY 2010 that was conducted in February 2011. The data on the number of LIHEAP households assisted in FY 2010 will be included in the *LIHEAP Report to Congress* for FY 2010.
- The RECS – The EIA's RECS is a national household sample survey that is conducted once every four years. The most recent survey for which the necessary data is available was conducted in 2005. The RECS data were used in 2001 for baseline measurement of targeting performance for high energy burden households and can track longer-term changes in performance over time (2001 to 2005). However, the RECS currently cannot furnish annual updates on LIHEAP targeting performance for high energy burden households.

### **Targeting performance for high burden households**

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

- Targeting – Measure the extent to which LIHEAP 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 LIHEAP with respect to the goal of increasing the percentage, among LIHEAP recipient

households, of those households with the lowest incomes and the highest energy costs (i.e. high energy burden households).

The study furnished the following information to ACF with respect to targeting of high energy burden households.<sup>35</sup>

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

In addition, the LIHEAP Energy Burden Evaluation Study examined two other performance indicators – the benefit targeting index and the burden reduction targeting index. The study furnished baseline measures for these indicators and discussed the value and challenges of including those benefit and burden reduction targeting indicators in the performance plan for LIHEAP. These indexes were updated for FY 2005 using the 2005 RECS.

### **Performance measurement statistics**

Tables 4-1a and 4-1b show the LIHEAP reciprocity targeting performance measures from FY 2003 through FY 2010. The first column in the table restates the performance goal. The second column shows performance targets (to be reached), and the third column shows the targeting index scores that were achieved. FY 2003 was the baseline year for both measures.

For measure 1A, the baseline targeting index score of 79 indicates that income eligible elderly households were not being effectively targeted within the income eligible population of elderly households in FY 2003. The FY 2004 through FY 2009 targeting index scores fluctuated between 76 and 79. In FY 2010, the targeting index for households with elderly decreased to 73. This indicates that there was no improvement over the baseline targeting index score in those years.

For measure 1B, the baseline targeting index score of 122 for households with a young child indicates that such households were being effectively targeted within the income eligible population of households with young children in FY 2003. The FY 2004 through FY 2008 targeting index scores showed a decrease in targeting households with young children. However, in FY 2009, the targeting

---

<sup>35</sup> The study developed a definition of “high burden,” though the statute offers no such definition. The study’s definition is used here.



index for households with a young child increased to 117, and in FY 2010, it increased further to 118.<sup>36</sup>

**Table 4-1a. LIHEAP reciprocity targeting performance measure 1A: Increase the reciprocity targeting index score of LIHEAP households having at least one member 60 years or older (reported for FY 2003 – FY 2010)**

Fiscal Year	Target	Result
FY 10	77	73
FY 09	96	76
FY 08	96	76
FY 07	94	78
FY 06	92	77
FY 05	84	79
FY 04	82	78
FY 03	Baseline	79

**Table 4-1b. LIHEAP reciprocity targeting performance measure 1B: Maintain the reciprocity targeting index score of LIHEAP households having at least one member five years or younger (reported for FY 2003 – FY 2010)**

Fiscal Year	Target	Result
FY 10	110	118
FY 09	122	117
FY 08	122	110
FY 07	122	110
FY 06	122	112
FY 05	122	113
FY 04	122	115
FY 03	Baseline	122

SOURCE: HHS Administrative Data — such data for FY 2010 are preliminary; thus the actual figures may differ.

As noted above, the *LIHEAP Energy Burden Evaluation Study* developed baseline statistics on high energy burden household targeting. That study recommended that measurement of targeting to high energy burden households is important since LIHEAP’s statutory mandate is to serve the households “with the lowest incomes, that pay a high proportion of household income for home energy, primarily in meeting their immediate home energy needs.”

Table 4-2 shows the national and regional reciprocity targeting indexes for high home energy burden households for FY 2001 and FY 2005. The 2001 RECS, the 2001 RECS LIHEAP Supplement, and the 2005 RECS were used to develop these statistics. These statistics demonstrate that, except for the

<sup>36</sup> If the new Federal LIHEAP maximum income standard – the greater of 150 percent of HHS Poverty Guidelines or 75 percent of State median income – were used in calculations, the targeting index would have been 74 for elderly households and 124 for young child households in FY 2010.

Northeast region in FY 2005, LIHEAP was targeting high burden households.<sup>37</sup> However, FY 2005 targeting index scores indicate a significant decrease in targeting high burden households compared to the FY 2001 baseline scores.

**Table 4-2. LIHEAP reciprocity targeting index for high burden households by region for FY 2001 from the 2001 RECS and the 2001 RECS LIHEAP Supplement, and for FY 2005 from the 2005 RECS**

Region	FY 2001	FY 2005
Northeast	163	99
Midwest	132	116
South	155	119
West	293	184
United States	170	122

The energy burden evaluation study also furnished estimates of the benefit and burden reduction targeting indexes for FY 2001. These indexes were updated for FY2005 using the 2005 RECS data. Benefit and burden reduction targeting are not part of the performance plan for LIHEAP. However, the study concluded that those indexes were consistent with the statutory mandate to furnish the highest benefits “to those households which have the lowest incomes and the highest energy costs or needs in relation to income.”

Table 4-3 shows national and regional benefit targeting indexes and Table 4-4 shows national and regional burden reduction targeting indexes. In FY 2001, at the national level and in all regions, high burden households received slightly higher average benefits than did households that did not have high burdens. The benefit targeting index scores were slightly lower at the national level and in most regions in FY 2005 compared to FY 2001. However, Table 4-4 shows that at the national level and in all regions, high burden households experienced lower burden reductions than did households that did not have a high burden. From FY2001 to FY2005, burden reduction index scores decreased for all regions.

---

<sup>37</sup> 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 FY 2001 targeting indexes in Table 4-2 are statistically different from 100 while the FY 2001 targeting indexes shown in Tables 4-3 and 4-4 are not statistically different from 100. Therefore, the null hypothesis that high burden households and households that are not high burden are served at the same rate can be rejected, while the null hypothesis that LIHEAP benefits and burden reduction are the same for high burden households and households that are not high burden cannot be rejected. The FY 2005 targeting indexes in Table 4-2 and 4-4 are statistically different from 100 at the national level but not at the regional level, while the targeting indexes shown in Tables 4-3 are not statistically different from 100 at either regional or national level.

**Table 4-3. LIHEAP benefit targeting index for high burden households by region for FY 2001 from the 2001 RECS and the 2001 RECS LIHEAP Supplement, and for FY 2005 from the 2005 RECS**

Region	FY 2001	FY 2005
Northeast	103	104
Midwest	108	104
South	110	81
West	124	119
United States	109	101

**Table 4-4. LIHEAP burden reduction targeting index for high burden households by region for FY 2001 from the 2001 RECS and the 2001 RECS LIHEAP Supplement, and for FY 2005 from the 2005 RECS**

Region	FY 2001	FY 2005
Northeast	96	74
Midwest	93	70
South	98	84
West	86	60
United States	94	71

## Uses of LIHEAP performance data

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

### LIHEAP grantee use of targeting indexes

Individual LIHEAP grantees can use the reciprocity targeting indexes to examine the effectiveness of their outreach to households with vulnerable members.<sup>38</sup>

- In absolute terms, if a given group has a reciprocity targeting index over 100, then that group's incidence in the LIHEAP-recipient population is higher than that group's incidence in the income eligible population.
- In relative terms, if a given group has a higher reciprocity targeting index than another group, then the given group has been targeted relative to the other group. For example, if the index for elderly households is 90 and the index for non-vulnerable households is 75, then elderly households are targeted at a higher rate than non-vulnerable households are.

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.<sup>39</sup>

<sup>38</sup> LIHEAP grantees have the ability to create these reciprocity targeting indexes using recipient counts from the State Household Reports and the estimated income eligibility counts provided in Appendix B of this report.

<sup>39</sup> LIHEAP grantees have the benefit data needed to create benefit targeting indexes. If they calculate household energy burdens for their recipients, LIHEAP grantees can also create burden reduction indexes.

- In absolute terms, if a given group has a benefit or burden reduction targeting index greater than 100, then that group has a higher average benefit (benefit targeting index) or experiences a greater median burden reduction (burden reduction index) than the recipient population has or experiences. If a group has a benefit or burden reduction targeting index less than 100, then that group has a lower average benefit (benefit targeting index) or experiences a smaller median burden reduction (burden reduction index) than the recipient population has or experiences.
- In relative terms, if a given group has a higher benefit or burden reduction targeting index than another group, then the given group has been targeted relative to the other group. For example, if the benefit targeting index for elderly households is 90 and the benefit targeting index for non-vulnerable households is 75, then elderly households have higher average benefits than non-vulnerable households. Likewise, if the burden reduction targeting index for elderly households is 90 and the burden reduction targeting index for non-vulnerable households is 75, then elderly households have greater percentage reduction in median energy burden.

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

### **ACF's use of targeting indexes**

ACF is using national targeting indexes to examine the targeting performance of LIHEAP and to measure changes in performance over time. In so doing, ACF found that the national reciprocity targeting indexes indicate that elderly households face difficulty in enrolling in LIHEAP as compared to young child households. A review of the literature indicates that other federal social programs also have limited success in serving eligible elderly households, especially in comparison to households with young children. Program participation barriers appear to be most significant when elderly households have not made previous use of public assistance programs. For this reason, ACF is an active federal partner with the National Center for Outreach and Benefit Enrollment that is funded by the Administration on Aging. LIHEAP is one of five federal benefit programs for which the Center is seeking to develop innovative ways to increase enrollment of the elderly.

ACF is continuing to examine the reliability and validity of targeting indexes in making the following comparisons:

- ACF can compare reciprocity targeting measures among groups of households and identify which groups are not effectively targeted by LIHEAP. For example, if the national LIHEAP reciprocity targeting index for elderly households is 85 and the national LIHEAP reciprocity targeting index for households with young children is 110, then households with young children are targeted at a higher level than are elderly households. ACF might conclude from these statistics that a greater share of the technical assistance efforts should be allocated to increasing targeting to elderly households.
- ACF can compare reciprocity targeting measures among areas of the country to assess which areas are in greatest need of technical assistance and to determine the type of technical assistance that is required. For example, if the reciprocity targeting index for elderly households in the New England Census Division is 75, while the reciprocity indexes for elderly households in all other divisions are over 100, then elderly households are targeted at

a lower level in New England than in other parts of the country. ACF might conclude from these statistics that a greater share of the technical assistance efforts should be allocated to increasing targeting to elderly households among one or more grantees in New England.

- ACF can compare national targeting measures over time to measure changes in targeting performance. For example, if the targeting indicator for elderly households was 75 in one fiscal year and was 85 in a later fiscal year, then it would demonstrate that LIHEAP targeted elderly households at a higher level over time.

## **Targeting performance measurement issues**

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

A major challenge in executing the LIHEAP performance plan is in finding an effective way to gather the data that enter into vulnerable and high burden targeting indexes in a timely way. ACF has found the timeliness of such collection to be challenging, due to the collection instrument's (i.e. the Household Report's) early deadlines and due States' reporting challenges. In addition, the RECS' relative infrequency presents a challenge.

Starting with FY 2011, the LIHEAP Household Report will furnish an unduplicated count of households receiving all types of LIHEAP benefits. This will allow ACF to show the targeting of all types of LIHEAP benefits, rather than just the targeting of heating benefits.

## Appendix A: Home Energy Estimates

Appendix A provides information on how estimates of home energy data were derived from the 2005 Residential Energy Consumption Survey (RECS) and updated for FY 2010. The following topics are covered in this Appendix.

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

### Description of RECS

The RECS is a national household sample survey that provides information on residential energy use. It has been conducted by the Energy Information Administration (EIA) of the U.S. Department of Energy (DOE) since 1978. It is designed to provide reliable data at the national and Census regional levels. The RECS includes information on energy consumption and expenditures, household demographics, housing characteristics, weatherization/conservation practices, home appliances, and type of heating and cooling equipment. Currently, this survey is conducted every four years.

The survey consists of three parts:

- EIA interviews households for information about which fuels are used, how fuels are used, energy-using appliances, structural features, energy-efficiency measures taken, demographic characteristics of the household, heating interruptions, and receipt of energy assistance.
- EIA interviews rental agents for households whose rent includes some portion of their energy bill. This information augments information from those households that may not be knowledgeable about the fuels used for space heating or water heating.
- After obtaining permission from respondents, EIA mails questionnaires to their energy suppliers to collect the actual billing data on energy consumption and expenditures. This fuel supplier survey eliminates the inaccuracy of self-reported data. When a household does not consent or when fuel consumption records are unusable or nonexistent, regression analysis is used to impute missing data.<sup>40</sup>

The 2005 RECS is the twelfth survey in the series of surveys.<sup>41</sup> For the 2005 RECS, 4,382 households were interviewed, including 434 verified LIHEAP recipient households. For the tabulations in this *Notebook*, 2005 RECS consumption and expenditure data were updated using price and weather data to represent consumption and expenditures for FY 2010.

---

<sup>40</sup>Regression analysis is a statistical tool for evaluating the relationship of one or more independent variables to a single continuous dependent variable. Formulas developed from regression analysis are used to predict the value of the dependent variable under varying conditions of the independent variable(s).

<sup>41</sup>More information about the RECS sample design, see Energy Information Administration, *Sample Design for the Residential Energy Consumption Survey*, DOE/EIA-0555 (94)/1, Washington, DC, August 1994. The data collected from the 2005 RECS are available from the EIA website: [RECS Survey Data](http://www.eia.gov/consumption/residential/data/2005/), Energy Information Administration, <http://www.eia.gov/consumption/residential/data/2005/>

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

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

- RECS uses a representative national household sample, providing statistically reliable estimates for all, non low income, and low income households.
- The 2005 RECS included an oversample of LIHEAP recipient households that is representative of the population of LIHEAP heating and cooling assistance recipients.
- The RECS includes usage data for all residential fuels.
- Energy suppliers provide information on actual residential energy consumption and expenditures of RECS sample households in order to eliminate the inaccuracy of self-reported data.
- Regression analyses of RECS data provide estimates of the amounts of fuels going to various end uses, including home heating and cooling.

While the updated 2005 RECS data provide the most current and comprehensive data on residential energy use by low income households, several significant limitations must be addressed:<sup>42</sup>

- The 2005 RECS data for calendar year 2005 were updated to FY 2010 (October 1, 2009 to September 30, 2010), using procedures that adjust the 2005 data to reflect the weather and fuel prices for FY 2010. These procedures are comparable to those used for the FY 1986 - FY 2009 annual LIHEAP Reports to Congress. However, the reader should exercise caution in comparing the data in this *Notebook* with data in annual LIHEAP Reports to Congress prior to FY 1986, in which consumption and expenditure data were predicted on the RECS year (April 1 to March 31).
- For some variables, disaggregation of data into subgroups at the regional level results in estimates made from a small number of sample cases. This is particularly true of the LIHEAP recipient households and the liquefied petroleum gas and kerosene heating subgroups. This affects the reliability of the estimates.
- The household is a basic reporting unit for RECS and LIHEAP. RECS defines a household as all individuals living in a housing unit, whether related or not, who (1) share a common direct access entry to the unit from outside the building or from a hallway, and (2) do not normally eat their meals with members of other units in the building. A household does not include temporary visitors or household members away at college or in the military. LIHEAP defines a household as one or more individuals living together as an economic unit who purchase energy in common or make undesignated payments for energy in their rent. Some variation in the count of households, particularly those containing renters or boarders, may result from the difference in definitions.
- The Current Population Survey Annual Social and Economic Supplement (CPS ASEC), conducted by the Bureau of the Census, provides, at national and regional levels, data on total household income as a specific dollar amount. CPS's larger sample size and method of

---

<sup>42</sup>Information about the quality of RECS data is available from the EIA website: *RECS Methodology*, Energy Information Administration, <http://www.eia.gov/consumption/residential/methodology/index.cfm>.

collecting income data result in more accurate income data than RECS income data. Therefore, the 2010 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*.<sup>43</sup>

- Households were classified in the 2005 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 HHS' poverty guidelines or 60 percent of State median income). These estimates do not include households whose incomes may have exceeded the statutory income standards but who received LIHEAP benefits because they (1) were categorically eligible for LIHEAP under section 8624 (b)(2)(A) of the LIHEAP statute; (2) became income-ineligible for LIHEAP at the time of the survey; or (3) were deemed eligible for LIHEAP based on incorrectly-reported income. However, the tabulations of LIHEAP households 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 2010 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 2005 RECS sample case using FY 2010 heating degree days, cooling degree days, and price inflators applied to the original expenditure data, as well as the regression formula developed from the 2005 RECS. Home energy consumption and expenditure data were developed by aggregating and averaging home heating and cooling estimates for the sample cases that represented all, non low income, low income, and LIHEAP recipient households.

Tables A-2 through A-3c display national and regional consumption and expenditure data for residential energy (including energy used for space heating, water heating, space cooling, and appliances). Tables A-4 through A-6c display national and regional usage, consumption, and expenditure data for home heating. Table A-7 displays national and regional usage, consumption, and expenditure data for home cooling. Analysis and discussion of home energy consumption and expenditures appear in Section II 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 residential energy. However, there are different ways to compute energy burden and different interpretations of the energy burden statistics. The purpose of this section is to examine alternative energy burden statistics and discuss the interpretation of each.<sup>44</sup>

---

<sup>43</sup> Note that household-level energy and income data from RECS are used to calculate mean and median individual energy burden.

<sup>44</sup> More detailed information is available in the Division of Energy Assistance's (DEA's) technical report, *Characterizing the Impact of Energy Expenditures on Low Income Households: An Analysis of Alternative Energy Burden Statistics*, (November, 1994).



## **Computational procedures**

There are two ways to compute mean energy burden for households.<sup>45</sup> The first is the “mean individual” approach, and the second is the “mean group” approach. While these approaches appear to be similar, they give quite different values.

Using the “mean individual burden” approach, energy burden is computed as follows. 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.<sup>46</sup> 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.

According to the 2005 RECS, the mean residential energy burden for all LIHEAP Federally eligible households, in 2005, using the first approach was 12.9 percent and using the second approach was 9.6 percent. The disparity between the two statistics is because the lowest income households spend a greater share of their income on residential energy than do higher income households.<sup>47</sup> If the relationship between income and residential energy expenditures is linear (i.e., a 10 percent increase in income is associated with a 10 percent increase in residential energy expenditures), the two statistics would be equal. However, since a number of low income households spend a large share of their income on energy, the relationship between income and residential energy expenditures is not linear (i.e., a 10 percent increase in income is associated with a considerably smaller increase in energy expenditures). Therefore, there is a substantial difference between the two statistics.

## **Statistical measures**

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

In the discussion of computational procedures, the “mean individual burden” was examined. It is also possible to look at the “median individual burden.” As noted above for LIHEAP income eligible households, the mean residential energy burden computed as the “mean individual burden” was 12.9 percent. The median of the distribution of residential energy burdens from the 2005 RECS survey was 8.8 percent. The disparity between these two statistics is the result of the skewed distribution of

---

<sup>45</sup>The mean is the sum of all values divided by the number of values. The mean is also referred to as the average.

<sup>46</sup>For some households, residential energy expenditures appear to exceed income. Elderly households living on their savings are an example of such households. In calculating mean individual burden, the energy burden figures for such households have been limited to 100 percent.

<sup>47</sup>For example, 2005 RECS households with incomes of \$10,000 or less had average residential energy expenditures of \$1,357, while those with incomes between \$20,000 - \$35,000 had average residential energy expenditures of \$1,601. Thus, households which had more than twice as much income spent only 18 percent more on energy.

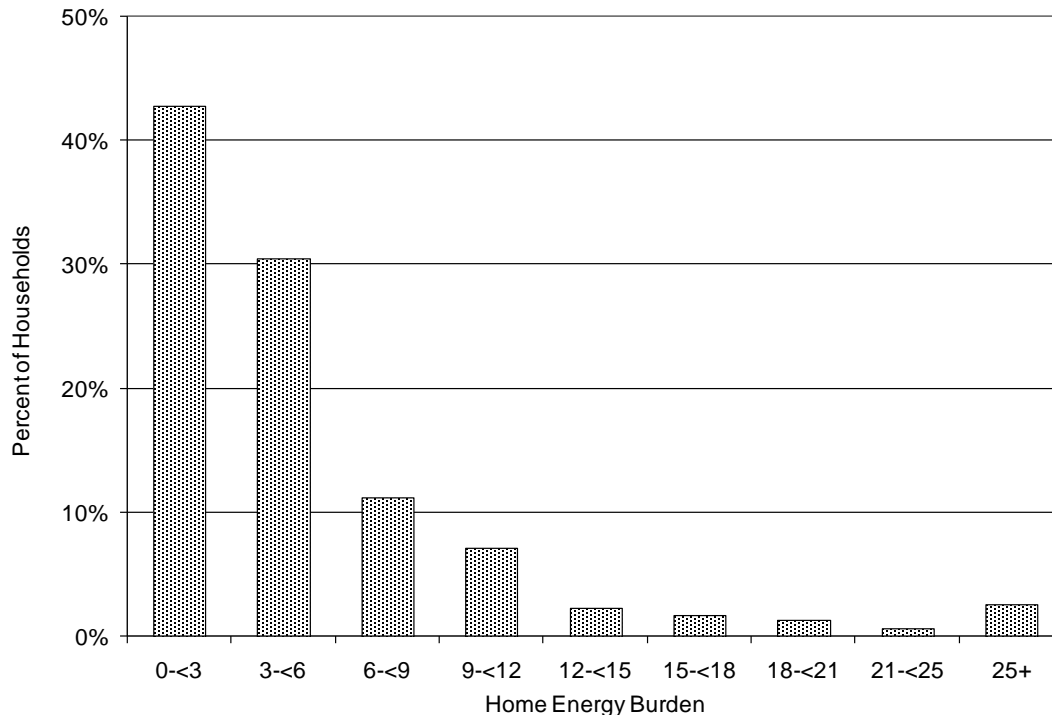
energy burden ratios. Figure A-1 demonstrates a skewed distribution of LIHEAP income eligible households by home energy burden.

**Data files**

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

The RECS, which categorizes more households as income eligible for LIHEAP than the CPS ASEC, thus categorizes too many households as income eligible for LIHEAP. Based on the 2005 RECS, in calendar year 2005, 38.6 million households were estimated to be LIHEAP income eligible households. Based on the 2005 CPS ASEC, the estimate of LIHEAP income eligible households for calendar year 2005 was 34.8 million households. Since some households that were not LIHEAP income eligible were categorized by RECS as LIHEAP income eligible, the RECS overestimated the average energy expenditures for LIHEAP income eligible households.<sup>48</sup>

**Figure A-1. Distribution of LIHEAP income eligible households by home energy burden, 2005**



**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.

<sup>48</sup>The estimates of average energy burden may be overstated since RECS, like other surveys, understates income. Comparisons between the estimates of the number of LIHEAP income eligible households from the 1990 RECS and the March 1991 CPS suggest that the probable range of the overestimate in mean group energy burden is from 5-10 percent.

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

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

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

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

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

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

## **Projecting energy consumption and expenditures**

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

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

Consumption projections utilized end use consumption estimates that were developed with the 2005 RECS data. These estimates were based on models for each fuel, using households that had actual (not imputed) consumption records for the fuel. The models used nonlinear estimation techniques to estimate parameters that described the relationship of consumption to end uses, housing characteristics, weather, and demographics.

To develop consumption projections, heating and cooling end use estimates for Calendar Year 2005 were adjusted for weather differences between 2005 and Fiscal Year 2010. The following equation was applied to each household in the microsimulation data file.

$$\text{FY 2010 Projected Btus} = (2005 \text{ estimated heat use} * \text{HDD change}) + (2005 \text{ estimated cooling use} * \text{CDD change}) + (2005 \text{ estimated water use} + 2005 \text{ estimated appliance use})$$

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

$$\text{Preliminary Expenditures} = 2005 \text{ Expenditures} * (\text{FY 2010 Projected Usage} / 2005 \text{ Actual Usage})$$

$$\text{Final Expenditures} = \text{Preliminary Expenditures} * \text{Price Change}^{49}$$

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 2005 to FY 2010. For example, electricity prices increased by almost 22 percent from 2005 to FY 2010.

**Table A-1. National price factors for FY 2010**

Fuel	Price Factors for FY 2010 Projections
Electricity	1.2162
Natural gas	0.8801
Fuel oil / kerosene	1.3088
Liquefied petroleum gas (LPG)	1.2943

Expenditure data were adjusted using national price factors for FY 2010. 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

<sup>49</sup>Price factors were developed using price data obtained from the Energy Information Administration's Monthly Energy Review, September 2011, for all fuels. Electricity and natural gas consumption data used for calculating price factors are from the Energy Information Administration website (<http://www.eia.doe.gov>). Fuel Oil and LPG consumption data used for calculating price factors are from the Monthly Energy Review, September 2011.

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.

**Table A-2. Residential energy: Average consumption in MMBtus per household, by all fuels and specified fuels, by all, non low income, low income and LIHEAP recipient households, by Census region, FY 2010<sup>1/</sup>**

Census Region	All Fuels <sup>2/</sup> (MMBtus) <sup>3/</sup>	Natural Gas (MMBtus)	Electricity (MMBtus)	Fuel Oil (MMBtus)	Kerosene (MMBtus)	LPG (MMBtus)
US - All households	97.8	113.8	63.2	143.9	55.3	112.9
US - Non low income households	104.1	118.7	68.1	152.8	61.3*	119.8
US - Low income households <sup>4/</sup>	86.1	103.5	54.7	130.1	54.2	99.8
US - LIHEAP recipient households <sup>5/</sup>	104.6	114.7	50.7	147.4	77.9*	113.7
Northeast - All households	119.8	120.0	48.4	146.6	37.3	121.3
Northeast - Non low income households	130.7	129.1	54.2	157.6	62.0*	130.8
Northeast - Low income households	103.3	104.8	41.9	130.5	33.2*	96.5*
Northeast - LIHEAP recipient households	114.9	108.6	48.6	147.1	74.9*	80.2*
Midwest - All households	117.0	128.7	61.2	125.7	89.8*	127.8
Midwest - Non low income households	122.8	133.3	67.3	133.8	NC	129.0
Midwest - Low income households	107.2	120.8	53.5	115.4	89.8*	123.4
Midwest - LIHEAP recipient households	120.0	132.0	50.4	145.5*	89.7*	104.8*
South - All households	85.9	115.8	66.3	132.8	55.4	105.2
South - Non low income households	93.0	122.8	71.4	129.7	61.1*	111.9
South - Low income households	72.2	98.6	56.6	139.6*	53.8	96.8
South - LIHEAP recipient households	91.3	109.8	52.6	148.0*	77.3*	124.9*
West - All households	78.9	88.3	57.4	150.0	59.8*	102.1
West - Non low income households	84.4	92.9	59.8	145.0*	NC	111.8
West - Low income households	66.0	74.7	53.5	177.0*	59.8*	85.7
West - LIHEAP recipient households	70.6	79.9	49.1	167.4*	NC	113.7*

<sup>1/</sup>Developed from the 2005 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy, and adjusted for FY 2010 for heating and cooling degree days.

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

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

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

<sup>5/</sup> Includes verified LIHEAP recipient households from the 2005 RECS.

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

NC = No cases in the 2005 RECS household sample.

**Table A-3a. Residential energy: Average annual expenditures, by amount (dollars) and mean group burden (percent of income), for all, non low income, low income, and LIHEAP recipient households, by Census region and main heating fuel, FY 2010**

Census Region	All fuels <sup>1/</sup>	All fuels <sup>2/</sup>	Natural gas	Natural gas	Electricity	Electricity	Fuel oil	Fuel oil	Kerosene	Kerosene	LPG	LPG
US - All households	\$2,120	3.1%	\$1,993	2.9%	\$1,908	2.8%	\$3,570	5.3%	\$1,553	2.3%	\$3,029	4.5%
US - Non low income households	\$2,277	2.5%	\$2,149	2.4%	\$2,059	2.3%	\$3,841	4.2%	\$1,575*	1.7%	\$3,133	3.5%
US - Low income households <sup>3/</sup>	\$1,830	9.7%	\$1,663	8.8%	\$1,653	8.8%	\$3,155	16.7%	\$1,549	8.2%	\$2,832	15.0%
US - LIHEAP recipient households <sup>4/</sup>	\$1,986	12.4%	\$1,762	11.0%	\$1,346	8.4%	\$3,596	22.5%	\$1,764*	11.0%	\$3,451	21.6%
Northeast - All households	\$2,634	3.5%	\$2,200	2.9%	\$1,787	2.4%	\$3,700	4.9%	\$1,189	1.6%	\$3,578	4.7%
Northeast - Non low income households	\$2,893	2.8%	\$2,431	2.3%	\$1,880	1.8%	\$4,043	3.9%	\$2,307*	2.2%	\$3,615	3.5%
Northeast - Low income households	\$2,243	10.7%	\$1,813	8.7%	\$1,682	8.0%	\$3,199	15.3%	\$1,003*	4.8%	\$3,483*	16.6%
Northeast - LIHEAP recipient households	\$2,472	14.4%	\$1,915	11.1%	\$1,559	9.1%	\$3,639	21.1%	\$1,957*	11.4%	\$2,329*	13.5%
Midwest - All households	\$1,994	3.1%	\$1,946	3.0%	\$1,478	2.3%	\$2,984	4.6%	\$1,947*	3.0%	\$3,157	4.9%
Midwest - Non low income households	\$2,131	2.5%	\$2,063	2.4%	\$1,620	1.9%	\$3,261	3.8%	NC	NC	\$3,140	3.7%
Midwest - Low income households	\$1,762	9.3%	\$1,746	9.2%	\$1,300	6.8%	\$2,633	13.8%	\$1,947*	10.2%	\$3,219	16.9%
Midwest - LIHEAP recipient households	\$1,805	11.5%	\$1,821	11.6%	\$1,281	8.2%	\$3,156*	20.2%	\$1,487*	9.5%	\$2,822*	18.0%
South - All households	\$2,193	3.5%	\$2,281	3.6%	\$2,074	3.3%	\$2,968	4.7%	\$1,659	2.6%	\$2,927	4.6%
South - Non low income households	\$2,347	2.8%	\$2,469	2.9%	\$2,208	2.6%	\$2,771	3.3%	\$1,334*	1.6%	\$3,034	3.6%
South - Low income households	\$1,899	11.1%	\$1,817	10.6%	\$1,821	10.6%	\$3,396*	19.8%	\$1,750	10.2%	\$2,792	16.3%
South - LIHEAP recipient households	\$2,035	14.4%	\$1,851	13.1%	\$1,495	10.6%	\$3,485*	24.7%	\$1,753*	12.4%	\$4,020*	28.5%
West - All households	\$1,694	2.3%	\$1,622	2.2%	\$1,601	2.2%	\$3,304	4.5%	\$1,426*	1.9%	\$2,827	3.8%
West - Non low income households	\$1,854	1.9%	\$1,774	1.8%	\$1,764	1.8%	\$3,294*	3.4%	NC	NC	\$3,109	3.2%
West - Low income households	\$1,324	6.6%	\$1,165	5.8%	\$1,343	6.7%	\$3,361*	16.9%	\$1,426*	7.2%	\$2,350	11.8%
West - LIHEAP recipient households	\$1,246	7.3%	\$1,131	6.6%	\$1,061	6.2%	\$3,349*	19.5%	NC	NC	\$3,002*	17.5%

<sup>1/</sup>Estimates are derived from the 2005 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy. The 2005 RECS data have been adjusted for heating degree days, cooling degree days, and fuel price estimates for FY 2010. Expenditures represent the costs for fuel oil, kerosene, and LPG delivered and billed costs for natural gas and electricity. Expenditure data are not collected for other fuels.

<sup>2/</sup>Represents the percent of household's income used for residential energy expenditures. National and regional mean incomes are calculated from the 2010 CPS ASEC, which reports income for calendar year 2009. Mean group residential burden is computed as mean group energy expenditures (from RECS) divided by mean group income (from CPS ASEC). See text in Appendix A for a discussion of energy burden.

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

<sup>4/</sup>Includes verified LIHEAP recipient households from the 2005 RECS.

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

NC = No cases in the 2005 RECS household sample.

**Table A-3b. Residential energy: Average annual expenditures, by amount (dollars) and mean individual burden (percent of income), for all, non low income, low income, and LIHEAP recipient households, by Census region and main heating fuel, FY 2010**

Census Region	All fuels <sup>1/</sup>	All fuels <sup>2/</sup>	Natural gas	Natural gas	Electricity	Electricity	Fuel oil	Fuel oil	Kerosene	Kerosene	LPG	LPG
US - All households	\$2,120	6.9%	\$1,993	5.7%	\$1,908	7.1%	\$3,570	12.1%	\$1,553	9.8%	\$3,029	9.8%
US - Non low income households	\$2,277	3.5%	\$2,149	3.1%	\$2,059	3.4%	\$3,841	5.5%	\$1,575*	4.3%	\$3,133	5.3%
US - Low income households <sup>3/</sup>	\$1,830	13.2%	\$1,663	11.2%	\$1,653	13.4%	\$3,155	22.3%	\$1,549	10.8%	\$2,832	18.5%
US - LIHEAP recipient households <sup>4/</sup>	\$1,986	15.4%	\$1,762	13.4%	\$1,346	15.1%	\$3,596	24.9%	\$1,764*	18.6%	\$3,451	18.1%
Northeast - All households	\$2,634	8.4%	\$2,200	6.3%	\$1,787	7.4%	\$3,700	12.5%	\$1,189	9.4%	\$3,578	9.8%
Northeast - Non low income households	\$2,893	4.1%	\$2,431	3.5%	\$1,880	2.9%	\$4,043	5.5%	\$2,307*	4.2%	\$3,615	5.0%
Northeast - Low income households	\$2,243	15.0%	\$1,813	11.1%	\$1,682	12.4%	\$3,199	22.7%	\$1,003*	10.2%	\$3,483*	22.1%
Northeast - LIHEAP recipient households	\$2,472	16.9%	\$1,915	12.5%	\$1,559	16.5%	\$3,639	24.3%	\$1,957*	23.2%	\$2,329*	11.2%
Midwest - All households	\$1,994	6.5%	\$1,946	6.5%	\$1,478	5.7%	\$2,984	10.8%	\$1,947*	8.4%	\$3,157	6.9%
Midwest - Non low income households	\$2,131	3.2%	\$2,063	3.1%	\$1,620	2.9%	\$3,261	5.3%	NC	NC	\$3,140	4.5%
Midwest - Low income households	\$1,762	12.0%	\$1,746	12.4%	\$1,300	9.2%	\$2,633	17.7%	\$1,947*	8.4%	\$3,219	15.9%
Midwest - LIHEAP recipient households	\$1,805	16.3%	\$1,821	15.5%	\$1,281	20.2%	\$3,156*	27.8%	\$1,487*	5.8%	\$2,822*	14.1%
South - All households	\$2,193	7.7%	\$2,281	6.4%	\$2,074	7.7%	\$2,968	12.2%	\$1,659	10.7%	\$2,927	12.3%
South - Non low income households	\$2,347	3.9%	\$2,469	3.8%	\$2,208	3.7%	\$2,771	5.9%	\$1,334*	4.4%	\$3,034	6.3%
South - Low income households	\$1,899	15.0%	\$1,817	12.7%	\$1,821	15.4%	\$3,396*	25.9%	\$1,750	12.5%	\$2,792	19.7%
South - LIHEAP recipient households	\$2,035	16.6%	\$1,851	13.6%	\$1,495	16.5%	\$3,485*	39.5%	\$1,753*	19.0%	\$4,020*	23.0%
West - All households	\$1,694	4.6%	\$1,622	3.7%	\$1,601	5.5%	\$3,304	7.7%	\$1,426*	7.2%	\$2,827	8.8%
West - Non low income households	\$1,854	2.6%	\$1,774	2.4%	\$1,764	2.5%	\$3,294*	5.3%	NC	NC	\$3,109	4.6%
West - Low income households	\$1,324	9.2%	\$1,165	7.5%	\$1,343	10.2%	\$3,361*	20.9%	\$1,426*	7.2%	\$2,350	16.0%
West - LIHEAP recipient households	\$1,246	8.2%	\$1,131	8.5%	\$1,061	7.6%	\$3,349*	3.4%	NC	NC	\$3,002*	9.4%

<sup>1/</sup>Estimates are derived from the 2005 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy. The 2005 RECS data have been adjusted for heating degree days, cooling degree days, and fuel price estimates for FY 2010. Expenditures represent the costs for fuel oil, kerosene, and LPG delivered and billed costs for natural gas and electricity. Expenditure data are not collected for other fuels.

<sup>2/</sup>Represents the percent of household income used for residential energy expenditures. For individual households, FY 2010 income is estimated by inflating income reported in the 2005 RECS by the consumer price index (CPI) and FY 2010 energy expenditures are estimated by adjusting energy expenditures reported in the 2005 RECS for changes in weather and energy prices. FY 2010 residential energy burden for each household is computed as estimated FY 2010 residential energy expenditures divided by estimated FY 2010 annual income. Mean individual residential burden is computed by computing the mean of the individual values. See text in Appendix A for a discussion of energy burden.

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

<sup>4/</sup> Includes verified LIHEAP recipient households from the 2005 RECS.

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

NC = No cases in 2005 RECS household sample.



**Table A-3c. Residential energy: Average annual expenditures, by amount (dollars) and median individual burden (percent of income), for all, non low income, low income, and LIHEAP recipient households, by Census region and main heating fuel, FY 2010**

Census Region	All fuels <sup>1/</sup>	All fuels <sup>2/</sup>	Natural gas	Natural gas	Electricity	Electricity	Fuel oil	Fuel oil	Kerosene	Kerosene	LPG	LPG
US - All households	\$2,120	4.1%	\$1,993	3.6%	\$1,908	4.0%	\$3,570	7.3%	\$1,553	7.0%	\$3,029	6.7%
US - Non low income households	\$2,277	3.0%	\$2,149	2.7%	\$2,059	3.0%	\$3,841	4.9%	\$1,575*	4.6%	\$3,133	4.6%
US - Low income households <sup>3/</sup>	\$1,830	9.0%	\$1,663	8.0%	\$1,653	8.5%	\$3,155	16.1%	\$1,549	8.6%	\$2,832	15.0%
US - LIHEAP recipient households <sup>4/</sup>	\$1,986	9.9%	\$1,762	9.3%	\$1,346	8.9%	\$3,596	22.6%	\$1,764*	14.1%	\$3,451	11.8%
Northeast - All households	\$2,634	5.1%	\$2,200	4.0%	\$1,787	4.6%	\$3,700	7.3%	\$1,189	8.6%	\$3,578	5.7%
Northeast - Non low income households	\$2,893	3.6%	\$2,431	2.9%	\$1,880	2.7%	\$4,043	4.9%	\$2,307*	4.0%	\$3,615	5.2%
Northeast - Low income households	\$2,243	9.8%	\$1,813	8.0%	\$1,682	8.1%	\$3,199	16.0%	\$1,003*	8.6%	\$3,483*	21.8%
Northeast - LIHEAP recipient households	\$2,472	10.6%	\$1,915	7.1%	\$1,559	11.9%	\$3,639	22.6%	\$1,957*	14.7%	\$2,329*	9.4%
Midwest - All households	\$1,994	4.1%	\$1,946	3.9%	\$1,478	3.9%	\$2,984	7.1%	\$1,947*	6.4%	\$3,157	4.6%
Midwest - Non low income households	\$2,131	2.8%	\$2,063	2.7%	\$1,620	2.4%	\$3,261	4.5%	NC	NC	\$3,140	4.3%
Midwest - Low income households	\$1,762	9.1%	\$1,746	9.0%	\$1,300	7.0%	\$2,633	16.7%	\$1,947*	6.4%	\$3,219	16.1%
Midwest - LIHEAP recipient households	\$1,805	10.2%	\$1,821	9.9%	\$1,281	10.8%	\$3,156*	29.0%	\$1,487*	5.8%	\$2,822*	18.5%
South - All households	\$2,193	4.7%	\$2,281	4.3%	\$2,074	4.5%	\$2,968	8.0%	\$1,659	7.0%	\$2,927	8.6%
South - Non low income households	\$2,347	3.4%	\$2,469	3.3%	\$2,208	3.3%	\$2,771	6.2%	\$1,334*	5.3%	\$3,034	5.7%
South - Low income households	\$1,899	10.1%	\$1,817	9.9%	\$1,821	9.7%	\$3,396*	17.6%	\$1,750	9.7%	\$2,792	14.9%
South - LIHEAP recipient households	\$2,035	14.1%	\$1,851	15.2%	\$1,495	9.9%	\$3,485*	46.9%	\$1,753*	14.1%	\$4,020*	20.7%
West - All households	\$1,694	2.8%	\$1,622	2.5%	\$1,601	3.0%	\$3,304	5.3%	\$1,426*	7.6%	\$2,827	5.5%
West - Non low income households	\$1,854	2.2%	\$1,774	2.1%	\$1,764	2.2%	\$3,294*	5.3%	NC	NC	\$3,109	4.1%
West - Low income households	\$1,324	5.7%	\$1,165	5.4%	\$1,343	5.6%	\$3,361*	23.7%	\$1,426*	7.6%	\$2,350	9.7%
West - LIHEAP recipient households	\$1,246	7.3%	\$1,131	7.1%	\$1,061	7.3%	\$3,349*	3.4%	NC	NC	\$3,002*	4.9%

<sup>1/</sup>Estimates are derived from the 2005 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy. The 2005 RECS data have been adjusted for heating degree days, cooling degree days, and fuel price estimates for FY 2010. Expenditures represent the costs for fuel oil, kerosene, and LPG delivered and billed costs for natural gas and electricity. Expenditure data are not collected for other fuels.

<sup>2/</sup>Represents the percent of household income used for residential energy expenditures. For individual households, FY 2010 income is estimated by inflating income reported in the 2005 RECS by the consumer price index (CPI) and FY 2010 energy expenditures are estimated by adjusting energy expenditures reported in the 2005 RECS for changes in weather and energy prices. FY 2010 residential energy burden for each household is computed as estimated FY 2010 residential energy expenditures divided by estimated FY 2010 annual income. Median individual residential burden is computed by computing the median of the individual values.

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

<sup>4/</sup>Includes verified LIHEAP recipient households from the 2005 RECS.

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

NC = No cases in the 2005 RECS household sample.

**Table A-4. Home heating: Percent of households using major types of heating fuels, by all, non low income, low income, and LIHEAP recipient households, by Census region and main heating fuel type, April 2005<sup>1/</sup>**

Census Region	Natural Gas <sup>2/</sup>	Electricity	Fuel Oil	Kerosene	LPG	Other <sup>3/</sup>
US - All households	52.6%	30.1%	6.9%	0.6%	5.5%	3.2%
US - Non low income households	55.0%	29.2%	6.5%	0.1%	5.5%	2.9%
US - Low income households <sup>4/</sup>	48.1%	31.8%	7.8%	1.5%	5.4%	3.7%
US - LIHEAP recipient households <sup>5/</sup>	60.0%	19.0%	12.0%	2.4%	5.2%	1.2%
Northeast - All households	55.5%	7.9%	30.1%	0.9%	2.1%	3.1%
Northeast - Non low income households	57.7%	6.9%	29.7%	0.2%	2.6%	2.9%
Northeast - Low income households	52.3%	9.3%	30.8%	1.9%	1.5%	3.2%
Northeast - LIHEAP recipient households	53.8%	8.4%	33.6%	1.3%	2.4%	0.5%
Midwest - All households	72.6%	13.2%	2.7%	0.3%	7.4%	3.5%
Midwest - Non low income households	73.0%	11.6%	2.4%	NC	9.3%	3.5%
Midwest - Low income households	72.0%	15.8%	3.2%	0.9%	4.2%	3.6%
Midwest - LIHEAP recipient households	80.2%	13.4%	2.5%	0.7%	2.8%	0.5%
South - All households	33.7%	53.9%	1.3%	0.9%	6.6%	2.6%
South - Non low income households	36.6%	53.7%	1.4%	0.3%	5.6%	1.8%
South - Low income households	28.2%	54.5%	1.2%	2.0%	8.5%	4.0%
South - LIHEAP recipient households	44.9%	31.1%	2.4%	7.7%	12.4%	1.5%
West - All households	60.7%	26.7%	1.1%	0.2%	4.3%	3.9%
West - Non low income households	65.3%	23.4%	1.3%	NC	3.9%	3.8%
West - Low income households	50.2%	34.2%	0.6%	0.7%	5.3%	4.1%
West - LIHEAP recipient households	54.6%	34.0%	1.4%	NC	4.6%	3.6%

<sup>1/</sup>Data derived from the 2005 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy. Represents main heating fuel used in April 2005.

<sup>2/</sup>The sum of percentages across fuel types may not equal 100%, due to rounding.

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

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

<sup>5/</sup> Includes verified LIHEAP recipient households from the 2005 RECS.

NC = No cases in the 2005 RECS household sample.

**Table A-5. Home heating: Average consumption in MMBtus per household, by all fuels and specified fuels, by all, non low income, low income and LIHEAP recipient households, by Census region, FY 2010<sup>1/</sup>**

Census Region	All Fuels <sup>2/</sup> (MMBtus) <sup>3/</sup>	Natural Gas (MMBtus)	Electricity (MMBtus)	Fuel Oil (MMBtus)	Kerosene (MMBtus)	LPG (MMBtus)
US - All households	40.4	52.4	9.7	92.7	21.5	55.6
US - Non low income households	41.6	52.1	10.3	96.1	25.5*	60.9
US - Low income households <sup>4/</sup>	38.1	53.1	8.7	87.4	20.7	45.6
US - LIHEAP recipient households <sup>5/</sup>	53.8	62.5	9.4	93.6	25.5*	50.2
Northeast - All households	67.4	64.9	12.1	93.2	15.0	71.7
Northeast - Non low income households	71.7	67.4	13.2	98.2	20.6*	77.8
Northeast - Low income households	60.8	60.8	11.0	85.9	14.1*	55.8*
Northeast - LIHEAP recipient	65.9	61.8	11.1	90.5	14.5*	44.6*
Midwest - All households	59.3	68.4	14.6	81.3	46.9*	66.9
Midwest - Non low income households	60.6	68.7	16.4	73.5	NC	69.3
Midwest - Low income households	56.9	67.8	12.3	91.1	46.9*	57.5
Midwest - LIHEAP recipient households	65.9	74.5	11.5	120.9*	5.0*	55.1*
South - All households	24.0	42.2	9.2	97.0	18.9	48.7
South - Non low income households	25.5	43.1	9.9	99.1	27.1*	49.7
South - Low income households	21.3	39.9	8.0	92.5*	16.6	47.5
South - LIHEAP recipient households	36.8	51.8	8.2	95.8*	30.2*	51.6*
West - All households	25.0	31.9	8.3	102.7	18.9*	46.1
West - Non low income households	26.9	32.4	8.4	96.4*	NC	58.8
West - Low income households	20.5	30.7	8.1	136.7*	18.9*	24.6
West - LIHEAP recipient households	29.4	40.2	8.4	148.9*	NC	43.8*

<sup>1/</sup>Developed from the 2005 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy, and adjusted for FY 2010 for heating degree days.

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

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

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

<sup>5/</sup> Includes verified LIHEAP recipient households from the 2005 RECS.

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

NC = No cases in the 2005 RECS household sample.

**Table A-6a. Home heating: Average annual expenditures by amount and mean group burden, by all, non low income, low income, and LIHEAP recipient households, by Census region and main heating fuel type, FY 2010**

Census Region	All fuels <sup>1/</sup>	All fuels <sup>2/</sup>	Natural gas	Natural gas	Electricity	Electricity	Fuel oil	Fuel oil	Kerosene	Kerosene	LPG	LPG
US - All households	\$569	0.8%	\$514	0.8%	\$306	0.4%	\$1,803	2.7%	\$400	0.6%	\$1,326	2.0%
US - Non low income households	\$585	0.6%	\$515	0.6%	\$323	0.4%	\$1,875	2.1%	\$468*	0.5%	\$1,405	1.5%
US - Low income households <sup>3/</sup>	\$541	2.9%	\$510	2.7%	\$276	1.5%	\$1,692	9.0%	\$387	2.1%	\$1,177	6.2%
US - LIHEAP recipient households <sup>4/</sup>	\$714	4.5%	\$604	3.8%	\$277	1.7%	\$1,814	11.3%	\$448*	2.8%	\$1,309	8.2%
Northeast - All households	\$1,013	1.3%	\$687	0.9%	\$480	0.6%	\$1,807	2.4%	\$283	0.4%	\$1,630	2.2%
Northeast - Non low income households	\$1,075	1.0%	\$724	0.7%	\$459	0.4%	\$1,911	1.8%	\$403*	0.4%	\$1,679	1.6%
Northeast - Low income households	\$919	4.4%	\$625	3.0%	\$504	2.4%	\$1,655	7.9%	\$263*	1.3%	\$1,504*	7.2%
Northeast - LIHEAP recipient households	\$990	5.8%	\$622	3.6%	\$418	2.4%	\$1,750	10.2%	\$238*	1.4%	\$1,177*	6.8%
Midwest - All households	\$674	1.0%	\$636	1.0%	\$369	0.6%	\$1,587	2.5%	\$908*	1.4%	\$1,454	2.3%
Midwest - Non low income households	\$698	0.8%	\$643	0.8%	\$409	0.5%	\$1,440	1.7%	NC	NC	\$1,477	1.7%
Midwest - Low income households	\$632	3.3%	\$625	3.3%	\$319	1.7%	\$1,773	9.3%	\$908*	4.8%	\$1,367	7.2%
Midwest - LIHEAP recipient households	\$688	4.4%	\$690	4.4%	\$309	2.0%	\$2,384*	15.2%	\$67*	0.4%	\$1,228*	7.8%
South - All households	\$426	0.7%	\$439	0.7%	\$299	0.5%	\$1,931	3.1%	\$342	0.5%	\$1,260	2.0%
South - Non low income households	\$439	0.5%	\$451	0.5%	\$318	0.4%	\$1,958	2.3%	\$489*	0.6%	\$1,264	1.5%
South - Low income households	\$400	2.3%	\$407	2.4%	\$263	1.5%	\$1,873*	10.9%	\$301	1.8%	\$1,256	7.3%
South - LIHEAP recipient households	\$592	4.2%	\$564	4.0%	\$236	1.7%	\$1,851*	13.1%	\$537*	3.8%	\$1,446*	10.2%
West - All households	\$322	0.4%	\$294	0.4%	\$251	0.3%	\$2,013	2.7%	\$361*	0.5%	\$1,137	1.5%
West - Non low income households	\$346	0.4%	\$300	0.3%	\$272	0.3%	\$1,900*	2.0%	NC	NC	\$1,431	1.5%
West - Low income households	\$267	1.3%	\$274	1.4%	\$218	1.1%	\$2,619*	13.1%	\$361*	1.8%	\$640	3.2%
West - LIHEAP recipient households	\$371	2.2%	\$346	2.0%	\$238	1.4%	\$2,869*	16.7%	NC	NC	\$955*	5.6%

<sup>1/</sup>Expenditures shown in this table are derived from the 2005 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy. The 2005 RECS data have been adjusted for heating degree days and fuel price estimates for FY 2010. Expenditures represent the costs for fuel oil, kerosene, and LPG delivered, and billed costs for natural gas and electricity used. Expenditure data are not collected for other fuels.

<sup>2/</sup>Represents the percent of household income used for home heating energy expenditures. National and regional mean incomes are calculated from the 2010 CPS ASEC, which reports income for calendar year 2009. 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.

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

<sup>4/</sup> Includes verified LIHEAP recipient households from the 2005 RECS.

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

NC = No cases in the 2005 RECS household sample.

**Table A-6b. Home heating: Average annual expenditures by amount and mean individual burden, by all, non low income, low income, and LIHEAP recipient households, by Census region and main heating fuel type, FY 2010**

Census Region	All fuels <sup>1/</sup>	All fuels <sup>2/</sup>	Natural gas	Natural gas	Electricity	Electricity	Fuel oil	Fuel oil	Kerosene	Kerosene	LPG	LPG
US - All households	\$569	2.1%	\$514	1.8%	\$306	1.2%	\$1,803	7.2%	\$400	2.3%	\$1,326	4.4%
US - Non low income households	\$585	0.9%	\$515	0.8%	\$323	0.6%	\$1,875	2.8%	\$468*	1.5%	\$1,405	2.4%
US - Low income households <sup>3/</sup>	\$541	4.2%	\$510	3.7%	\$276	2.4%	\$1,692	13.8%	\$387	2.5%	\$1,177	8.3%
US - LIHEAP recipient households <sup>4/</sup>	\$714	5.9%	\$604	5.4%	\$277	3.6%	\$1,814	12.4%	\$448*	4.4%	\$1,309	7.7%
Northeast - All households	\$1,013	3.8%	\$687	2.2%	\$480	2.5%	\$1,807	7.3%	\$283	2.0%	\$1,630	4.7%
Northeast - Non low income households	\$1,075	1.6%	\$724	1.1%	\$459	0.8%	\$1,911	2.7%	\$403*	0.7%	\$1,679	2.4%
Northeast - Low income households	\$919	7.1%	\$625	4.1%	\$504	4.5%	\$1,655	14.0%	\$263*	2.3%	\$1,504*	10.5%
Northeast - LIHEAP recipient	\$990	6.9%	\$622	4.5%	\$418	5.2%	\$1,750	11.4%	\$238*	2.9%	\$1,177*	6.0%
Midwest - All households	\$674	2.5%	\$636	2.5%	\$369	1.5%	\$1,587	6.7%	\$908*	3.8%	\$1,454	3.3%
Midwest - Non low income households	\$698	1.1%	\$643	1.0%	\$409	0.7%	\$1,440	2.6%	NC	NC	\$1,477	2.1%
Midwest - Low income households	\$632	4.8%	\$625	5.0%	\$319	2.4%	\$1,773	12.0%	\$908*	3.8%	\$1,367	7.4%
Midwest - LIHEAP recipient households	\$688	7.3%	\$690	7.3%	\$309	5.4%	\$2,384*	21.2%	\$67*	0.3%	\$1,228*	6.8%
South - All households	\$426	1.6%	\$439	1.4%	\$299	1.2%	\$1,931	7.5%	\$342	2.2%	\$1,260	5.7%
South - Non low income households	\$439	0.8%	\$451	0.7%	\$318	0.6%	\$1,958	4.3%	\$489*	1.7%	\$1,264	2.8%
South - Low income households	\$400	3.2%	\$407	3.1%	\$263	2.3%	\$1,873*	14.7%	\$301	2.3%	\$1,256	9.4%
South - LIHEAP recipient households	\$592	5.1%	\$564	4.4%	\$236	3.3%	\$1,851*	21.3%	\$537*	5.2%	\$1,446*	9.4%
West - All households	\$322	0.9%	\$294	0.7%	\$251	1.0%	\$2,013	5.2%	\$361*	1.8%	\$1,137	3.2%
West - Non low income households	\$346	0.5%	\$300	0.4%	\$272	0.4%	\$1,900*	3.2%	NC	NC	\$1,431	2.0%
West - Low income households	\$267	1.9%	\$274	1.7%	\$218	1.9%	\$2,619*	16.1%	\$361*	1.8%	\$640	5.2%
West - LIHEAP recipient households	\$371	2.4%	\$346	2.7%	\$238	1.8%	\$2,869*	2.9%	NC	NC	\$955*	3.2%

<sup>1/</sup>Expenditures shown in this table are derived from the 2005 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy. The 2005 RECS data have been adjusted for heating degree days and fuel price estimates for FY 2010. Expenditures represent the costs for fuel oil, kerosene, and LPG delivered, and billed costs for natural gas and electricity used. Expenditure data are not collected for other fuels.

<sup>2/</sup>Represents the percent of household income used for home heating energy expenditures. For individual households, FY 2010 income is estimated by inflating income reported in the 2005 RECS by the consumer price index (CPI) and FY 2010 energy expenditures are estimated by adjusting energy expenditures reported in the 2005 RECS for changes in weather and energy prices. FY 2010 home heating energy burden for each household is computed by computing the mean of the individual values. See text in Appendix A for a discussion of energy burden.

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

<sup>4/</sup>Includes verified LIHEAP recipient households from the 2005 RECS.

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

NC = No cases in the 2005 RECS household sample.

**Table A-6c. Home heating: Average annual expenditures by amount and median individual burden, by all, non low income, low income, and LIHEAP recipient households, by Census region and main heating fuel type, FY 2010**

Census Region	All fuels <sup>1/</sup>	All fuels <sup>2/</sup>	Natural gas	Natural gas	Electricity	Electricity	Fuel oil	Fuel oil	Kerosene	Kerosene	LPG	LPG
US - All households	\$569	0.9%	\$514	0.9%	\$306	0.6%	\$1,803	3.6%	\$400	1.8%	\$1,326	2.5%
US - Non low income households	\$585	0.6%	\$515	0.6%	\$323	0.4%	\$1,875	2.4%	\$468*	0.8%	\$1,405	2.0%
US - Low income households <sup>3/</sup>	\$541	2.1%	\$510	2.3%	\$276	1.3%	\$1,692	9.4%	\$387	1.8%	\$1,177	6.9%
US - LIHEAP recipient households <sup>4/</sup>	\$714	3.0%	\$604	2.9%	\$277	1.9%	\$1,814	9.9%	\$448*	4.6%	\$1,309	4.6%
Northeast - All households	\$1,013	1.8%	\$687	1.2%	\$480	1.1%	\$1,807	3.5%	\$283	1.4%	\$1,630	3.1%
Northeast - Non low income households	\$1,075	1.1%	\$724	0.9%	\$459	0.8%	\$1,911	2.3%	\$403*	0.8%	\$1,679	2.4%
Northeast - Low income households	\$919	3.7%	\$625	2.8%	\$504	2.4%	\$1,655	8.2%	\$263*	1.4%	\$1,504*	8.3%
Northeast - LIHEAP recipient households	\$990	3.8%	\$622	2.2%	\$418	3.0%	\$1,750	9.9%	\$238*	1.8%	\$1,177*	5.2%
Midwest - All households	\$674	1.2%	\$636	1.2%	\$369	0.9%	\$1,587	3.8%	\$908*	2.1%	\$1,454	2.3%
Midwest - Non low income households	\$698	0.8%	\$643	0.8%	\$409	0.6%	\$1,440	2.3%	NC	NC	\$1,477	1.9%
Midwest - Low income households	\$632	2.9%	\$625	3.0%	\$319	1.7%	\$1,773	11.6%	\$908*	2.1%	\$1,367	8.5%
Midwest - LIHEAP recipient households	\$688	3.6%	\$690	3.6%	\$309	2.0%		20.6%	\$67*	0.3%	\$1,228*	9.6%
South - All households	\$426	0.7%	\$439	0.7%	\$299	0.6%	\$1,931	5.4%	\$342	1.7%	\$1,260	3.7%
South - Non low income households	\$439	0.5%	\$451	0.5%	\$318	0.4%	\$1,958	5.2%	\$489*	2.5%	\$1,264	2.1%
South - Low income households	\$400	1.6%	\$407	2.2%	\$263	1.3%	\$1,873*	10.3%	\$301	1.7%	\$1,256	7.0%
South - LIHEAP recipient households	\$592	2.9%	\$564	3.0%	\$236	2.0%	\$1,851*	22.0%	\$537*	4.6%	\$1,446*	3.2%
West - All households	\$322	0.4%	\$294	0.4%	\$251	0.4%	\$2,013	2.8%	\$361*	1.8%	\$1,137	1.9%
West - Non low income households	\$346	0.3%	\$300	0.3%	\$272	0.3%	\$1,900*	2.8%	NC	NC	\$1,431	1.6%
West - Low income households	\$267	1.0%	\$274	1.1%	\$218	0.9%	\$2,619*	18.2%	\$361*	1.8%	\$640	3.2%
West - LIHEAP recipient households	\$371	1.5%	\$346	2.1%	\$238	1.3%	\$2,869*	2.9%	NC	NC	\$955*	0.9%

<sup>1/</sup> Expenditures shown in this table are derived from the 2005 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy. The 2005 RECS data have been adjusted for heating degree days and fuel price estimates for FY 2010. Expenditures represent the costs for fuel oil, kerosene, and LPG delivered, and billed costs for natural gas and electricity used. Expenditure data are not collected for other fuels.

<sup>2/</sup> Represents the percent of household income used for home heating energy expenditures. For individual households, FY 2010 income is estimated by inflating income reported in the 2005 RECS by the consumer price index (CPI) and FY 2010 energy expenditures are estimated by adjusting energy expenditures reported in the 2005 RECS for changes in weather and energy prices. FY 2010 home heating energy burden for each household is computed by computing the median of the individual values. See text in Appendix A for a discussion of energy burden.

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

<sup>4/</sup> Includes verified LIHEAP recipient households from the 2005 RECS.

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

NC = No cases in the 2005 RECS household sample.

**Table A-7. Home cooling: Percent of households that cool, average annual consumption per household, average annual expenditures per household, mean group burden, mean individual burden, and median individual burden for households that cooled, by all, non low income, low income, and LIHEAP recipient households, by Census region, FY 2010**

Census Region	Percent that cool <sup>1/</sup>	Consumption <sup>2/</sup> (in MMBtus)	Expenditures <sup>2/</sup>	Mean group burden <sup>3/</sup>	Mean individual burden <sup>3/</sup>	Median individual burden <sup>3/</sup>
US - All households	92.1%	9.3	\$324	0.5%	1.1%	0.5%
US - Non low income households	93.8%	10.2	\$354	0.4%	0.6%	0.3%
US - Low income households <sup>4/</sup>	89.1%	7.6	\$266	1.4%	2.3%	1.0%
US - LIHEAP recipient households <sup>5/</sup>	85.5%	5.7	\$202	1.3%	1.5%	0.6%
Northeast - All households	88.6%	4.2	\$199	0.3%	0.7%	0.3%
Northeast - Non low income households	93.6%	4.7	\$218	0.2%	0.3%	0.2%
Northeast - Low income households	81.2%	3.4	\$165	0.8%	1.4%	0.6%
Northeast - LIHEAP recipient households	84.1%	3.6	\$178	1.0%	1.1%	0.6%
Midwest - All households	96.7%	6.1	\$185	0.3%	0.6%	0.3%
Midwest - Non low income households	97.3%	6.6	\$200	0.2%	0.3%	0.2%
Midwest - Low income households	95.7%	5.2	\$159	0.8%	1.0%	0.7%
Midwest - LIHEAP recipient households	88.8%	4.3	\$134	0.9%	1.3%	0.6%
South - All households	98.1%	15.7	\$531	0.8%	2.0%	1.0%
South - Non low income households	99.4%	17.2	\$576	0.7%	0.9%	0.8%
South - Low income households	95.5%	12.8	\$441	2.6%	4.2%	2.2%
South - LIHEAP recipient households	92.1%	11.5	\$379	2.7%	2.8%	1.5%
West - All households	80.3%	5.2	\$193	0.3%	0.5%	0.2%
West - Non low income households	81.7%	5.7	\$215	0.2%	0.3%	0.1%
West - Low income households	77.1%	3.9	\$141	0.7%	1.0%	0.3%
West - LIHEAP recipient households	70.5%	2.1	\$67	0.4%	0.4%	0.2%

<sup>1/</sup>Cooling includes central and room air-conditioning, as well as non-air-conditioning cooling devices (e.g., ceiling fans, evaporative coolers). Excludes households that do not cool or cool in ways other than those recorded by the 2005 RECS (e.g., table and window fans.)

<sup>2/</sup>Consumption and expenditures are derived from the 2005 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy. The 2005 RECS data have been adjusted for cooling degree days and electricity price estimates for FY 2010. Expenditures represent billed costs for electricity used.

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

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

<sup>5/</sup>Includes verified LIHEAP recipient households from the 2005 RECS.

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

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

State-level estimates of the number of income eligible households for FY 2010 were developed using the American Community Survey (ACS). The Census Bureau recommends the use of the ACS for the state-level income and poverty analysis.<sup>50</sup> ACF also uses the estimates from the ACS and household recipient data from the States' *LIHEAP Household Report* to develop state-level targeting indexes.

The 2008-2010 ACS three-year Public Use Microdata Sample (PUMS) data are used to develop more precise estimates of the number of income eligible households than those that would have been obtained using the 2010 single-year ACS PUMS data.<sup>51</sup>

For fiscal years 2009 and 2010, the Congress raised the Federal maximum LIHEAP income standard to the greater of 75 percent of State median income or 150 percent of HHS Poverty Guidelines from the greater of 60 percent of State median income or 150 percent of HHS Poverty Guidelines.<sup>52</sup> For comparison purposes, state-level estimates of the number of LIHEAP income eligible households using both the new and previous Federal maximum LIHEAP income standard are presented.

Tables B-1 through B-3 show estimates of the number of LIHEAP income eligible households by vulnerability group,<sup>53</sup> derived from the 2008-2010 ACS, using the using the new Federal Maximum Income Standard, the previous Federal Maximum Income Standard, and the State Income Standards, respectively. The State Income Standards are the income levels that the States set to define LIHEAP income eligibility. These Standards may vary by LIHEAP component; however, they must fall between 110 percent of HHS Poverty Guidelines and the Federal Maximum Income Standard.

Similarly, Tables B-4 through B-6 show estimates of the number of LIHEAP income eligible households by poverty group, derived from the 2008-2010 ACS, using the using the new Federal Maximum Income Standard, the previous Federal Maximum Income Standard, and the State Income Standards, respectively.

---

<sup>50</sup> For an explanation, and to better understand the differences between the ACS and CPS ASEC, please visit "Guidance about Income Sources" at [www.census.gov/hhes/www/income/method/guidance/index.html](http://www.census.gov/hhes/www/income/method/guidance/index.html).

<sup>51</sup> The Census Bureau recommends data estimates from the three-year ACS instead of the one-year ACS when precision of the estimates are of primary importance. See [http://www.census.gov/acs/www/guidance\\_for\\_data\\_users/estimates/](http://www.census.gov/acs/www/guidance_for_data_users/estimates/).

<sup>52</sup> The State Median Income estimates for FY 2010 LIHEAP were published in *Federal Register* on March 13, 2009 (74 FR 10922-10924). The HHS Poverty Income Guidelines for FY 2010 LIHEAP were published in the *Federal Register* on January 23, 2009 (74 FR 4199-4201). These standards became optional on their dates of publication in the *Federal Register* and became mandatory on first day of the Federal Fiscal Year, October 1, 2009 for grantees whose fiscal years started on or before this date.

<sup>53</sup> The Census Bureau changed the questions on disability in ACS in 2008. Since the new questions were not comparable to those in previous years, the reader should exercise caution in comparing the estimates of households with disabled individuals with those in previous *Notebooks*.



**LIHEAP Home Energy Notebook for FY 2010: Appendix B: Income Eligible Household Estimates**

**Table B-1. State-level estimates of the number of LIHEAP income eligible households using the new (75% of SMI) Federal maximum LIHEAP income standard by vulnerability category<sup>1/ 2/ 4/</sup>**

(Three-Year ACS 2008-2010)

State	Total number of LIHEAP eligible households <sup>3/</sup>	LIHEAP eligible households with at least one person 60+ years	LIHEAP eligible households with at least one child less than 6 years old	LIHEAP eligible households with at least one person with a disability <sup>5/</sup>	LIHEAP eligible households with no vulnerable members
Alabama	721,743	267,612	123,271	320,654	208,038
Alaska	77,415	20,355	19,491	26,526	26,943
Arizona	865,070	304,227	189,738	269,006	284,186
Arkansas	429,119	159,806	83,139	190,400	115,809
California	4,694,568	1,618,281	1,061,574	1,440,655	1,621,320
Colorado	701,497	218,944	136,156	201,021	273,344
Connecticut	543,436	222,965	87,184	177,696	177,717
Delaware	123,787	49,668	23,185	43,872	37,121
District of Columbia	75,283	25,316	11,329	26,107	28,789
Florida	2,743,110	1,165,132	433,513	901,797	894,444
Georgia	1,402,370	453,335	300,117	473,335	487,656
Hawaii	158,928	62,988	29,700	47,951	55,368
Idaho	209,188	67,151	52,947	67,159	66,020
Illinois	1,868,503	690,226	349,667	579,613	655,588
Indiana	968,119	343,894	188,999	347,026	308,362
Iowa	456,944	178,246	80,849	150,172	147,647
Kansas	416,966	144,727	82,851	145,132	137,933
Kentucky	685,895	253,217	121,064	317,252	183,637
Louisiana	659,467	240,642	124,058	268,375	203,103
Maine	212,905	88,716	30,072	93,897	57,684
Maryland	795,249	300,751	145,962	247,014	273,671
Massachusetts	1,010,025	421,594	148,443	362,431	313,069
Michigan	1,646,009	609,249	279,172	602,594	535,104
Minnesota	824,740	303,869	144,216	246,999	291,750
Mississippi	428,126	157,590	84,264	194,299	117,797
Missouri	910,835	336,569	164,937	352,004	278,147
Montana	145,814	54,989	24,724	54,449	47,859
Nebraska	267,873	96,695	50,278	85,326	92,066
Nevada	334,340	115,036	72,749	96,559	116,231
New Hampshire	196,471	79,164	28,089	67,298	65,275
New Jersey	1,247,121	522,300	213,756	388,133	404,195
New Mexico	255,095	89,540	52,529	93,499	81,202
New York	2,853,292	1,129,489	487,451	955,651	939,176
North Carolina	1,417,775	502,174	276,437	520,953	456,390
North Dakota	97,079	37,208	14,999	29,903	36,095
Ohio	1,855,237	701,599	318,067	689,143	582,110
Oklahoma	507,923	177,107	106,552	214,957	147,218
Oregon	567,109	203,877	101,732	204,261	185,309
Pennsylvania	1,990,554	868,237	293,564	761,635	576,692
Rhode Island	170,827	69,179	26,090	66,402	51,661
South Carolina	679,535	250,269	126,277	261,175	212,133
South Dakota	117,102	45,541	21,919	38,145	38,359
Tennessee	952,629	352,653	177,331	393,641	281,138
Texas	3,141,491	964,618	793,657	1,038,658	1,057,427
Utah	289,483	77,931	86,839	79,089	97,450
Vermont	95,230	36,376	12,485	37,682	31,437
Virginia	1,090,609	403,044	195,218	364,086	375,025
Washington	936,922	316,156	180,597	316,051	321,621
West Virginia	289,929	124,132	39,771	144,621	71,111
Wisconsin	888,806	330,879	150,933	278,407	308,482
Wyoming	75,981	26,090	15,500	27,355	23,735
All States	44,093,524	16,279,353	8,363,442	15,300,066	14,379,644

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

<sup>2/</sup>The greater of 75 percent of State median income estimates or 150 percent of the HHS Poverty Guidelines.

<sup>3/</sup>The three-year ACS estimate of the total number of all U.S. households is 114,596,908.

<sup>4/</sup>A household can be counted under more than one vulnerability category.

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

**LIHEAP Home Energy Notebook for FY 2010: Appendix B: Income Eligible Household Estimates**

**Table B-2. State-level estimates of the number of LIHEAP income eligible households using the previous (60% of SMI) Federal maximum LIHEAP income standard by vulnerability category<sup>1/ 2/ 4/</sup>**

(Three-Year ACS 2008-2010)

State	Total number of LIHEAP eligible households <sup>3/</sup>	LIHEAP eligible households with at least one person 60+ years	LIHEAP eligible household with at least one child less than 6 years old	LIHEAP eligible households with at least one person with a disability <sup>5/</sup>	LIHEAP eligible households with no vulnerable members
Alabama	570,228	207,456	101,251	264,622	155,198
Alaska	57,749	15,937	15,294	21,521	17,906
Arizona	668,996	229,894	153,694	215,375	213,461
Arkansas	332,502	122,017	68,440	152,409	84,035
California	3,731,650	1,279,001	869,464	1,186,767	1,242,796
Colorado	544,370	169,071	109,901	162,732	203,885
Connecticut	427,180	178,872	70,207	149,554	129,984
Delaware	95,790	38,647	19,280	35,977	26,482
District of Columbia	62,347	21,164	9,373	23,229	22,630
Florida	2,115,225	893,250	344,246	723,355	669,287
Georgia	1,107,784	359,699	244,951	391,010	365,908
Hawaii	120,767	47,748	22,183	38,539	40,915
Idaho	157,633	50,083	40,712	51,944	48,535
Illinois	1,456,346	534,293	284,569	474,655	489,346
Indiana	735,312	253,077	149,890	277,709	225,457
Iowa	341,388	134,120	60,834	119,560	105,267
Kansas	315,143	108,997	62,787	117,270	100,003
Kentucky	541,910	197,583	99,237	262,809	136,311
Louisiana	522,757	188,813	101,775	221,057	154,920
Maine	163,055	68,316	23,357	76,967	41,315
Maryland	611,791	236,693	114,091	203,627	197,811
Massachusetts	801,021	343,149	119,362	310,089	227,459
Michigan	1,279,202	456,030	228,498	488,480	402,460
Minnesota	627,733	238,280	111,342	203,305	206,661
Mississippi	350,528	124,524	73,229	164,164	93,108
Missouri	703,763	255,751	132,408	286,146	204,647
Montana	110,594	39,883	19,634	42,967	35,176
Nebraska	202,576	74,293	38,568	69,772	65,279
Nevada	254,464	87,891	57,757	75,686	84,580
New Hampshire	145,910	60,550	20,663	54,073	44,983
New Jersey	973,131	415,667	169,885	320,083	296,449
New Mexico	203,282	69,255	45,120	76,414	61,970
New York	2,279,362	904,303	402,989	805,347	713,594
North Carolina	1,111,955	389,407	228,792	427,648	339,256
North Dakota	72,915	28,358	11,884	24,206	25,218
Ohio	1,429,091	528,316	256,568	560,243	427,430
Oklahoma	389,908	132,204	85,579	169,154	108,954
Oregon	438,961	153,416	82,398	165,367	140,102
Pennsylvania	1,535,302	668,430	231,691	623,853	419,490
Rhode Island	138,390	57,238	21,366	57,146	38,737
South Carolina	531,238	195,393	102,211	213,549	156,743
South Dakota	89,140	35,576	17,581	31,595	26,576
Tennessee	750,175	272,839	143,827	324,332	211,586
Texas	2,480,073	752,985	651,592	849,043	802,164
Utah	212,116	56,563	61,453	60,754	71,876
Vermont	71,527	27,976	9,260	31,540	21,071
Virginia	836,416	316,996	154,465	299,467	265,849
Washington	716,861	237,506	142,508	254,360	236,686
West Virginia	226,818	92,754	33,062	116,383	53,938
Wisconsin	672,950	247,893	119,811	223,250	222,542
Wyoming	57,254	20,439	11,222	22,514	16,894
All States	34,372,579	12,618,596	6,750,261	12,521,618	10,692,930

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

<sup>2/</sup>The greater of 60 percent of State median income estimates or 150 percent of the HHS Poverty Guidelines.

<sup>3/</sup>The three-year ACS estimate of the total number of all U.S. households is 114,596,908.

<sup>4/</sup>A household can be counted under more than one vulnerability category.

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

## LIHEAP Home Energy Notebook for FY 2010: Appendix B: Income Eligible Household Estimates

**Table B-3. State-level estimates of the number of LIHEAP income eligible households using State LIHEAP income standards by vulnerability category<sup>1/2/4/</sup>**

(Three-Year ACS 2008-2010)

State	State Income Guidelines for 4-Person Household as % of HHS Poverty Guidelines	Total number of LIHEAP eligible households <sup>2/</sup>	LIHEAP eligible households with at least one person 60+ years	LIHEAP eligible households with at least one child less than 6 years old	LIHEAP eligible households with at least one person with a disability <sup>3/</sup>	LIHEAP eligible households with no vulnerable members
Alabama	175%	593,051	214,868	107,149	273,414	162,755
Alaska	150%	45,608	11,565	13,116	16,843	13,576
Arizona	200%	728,337	248,333	171,694	230,790	232,260
Arkansas	150%	322,920	116,503	68,398	148,536	81,080
California	§260%	4,694,568	1,618,281	1,061,574	1,440,655	1,621,320
Colorado	185%	459,752	139,339	99,409	141,291	166,893
Connecticut	§266%	427,180	178,872	70,207	149,554	129,984
Delaware	200%	83,875	32,946	17,850	31,654	22,667
District of Columbia	§176%	62,347	21,164	9,373	23,229	22,630
Florida	150%	1,597,121	648,749	281,861	559,968	494,297
Georgia	§187%	1,107,784	359,699	244,951	391,010	365,908
Hawaii	150%	80,604	32,003	16,132	27,310	25,236
Idaho	§165%	157,633	50,083	40,712	51,944	48,535
Illinois	150%	926,470	307,724	199,807	314,737	309,023
Indiana	150%	534,455	167,884	121,060	209,396	159,298
Iowa	150%	236,193	86,444	45,243	85,547	71,480
Kansas	130%	179,090	54,794	40,339	70,255	54,396
Kentucky	130%	397,836	132,811	78,562	198,868	98,175
Louisiana	§167%	522,757	188,813	101,775	221,057	154,920
Maine	200%	176,284	72,597	26,266	81,304	45,430
Maryland	175%	351,431	135,125	69,361	128,991	103,264
Massachusetts	§254%	801,021	343,149	119,362	310,089	227,459
Michigan	110%	568,604	149,455	123,353	229,940	180,455
Minnesota	189%	488,881	183,474	92,118	168,202	152,454
Mississippi	150%	349,376	123,911	73,229	163,880	92,678
Missouri	135%	461,327	154,576	93,638	197,814	129,138
Montana	200%	132,165	47,752	23,559	49,106	43,588
Nebraska	125%	108,867	36,551	22,221	40,398	34,429
Nevada	150%	182,898	58,284	45,736	55,123	59,543
New Hampshire	§241%	145,910	60,550	20,663	54,073	44,983
New Jersey	225%	788,124	332,839	145,965	268,095	229,303
New Mexico	150%	201,953	68,797	45,120	76,148	61,204
New York	§212%	2,279,362	904,303	402,989	805,347	713,594
North Carolina	110%	584,282	176,939	136,694	230,686	175,264
North Dakota	§183%	72,915	28,358	11,884	24,206	25,218
Ohio	200%	1,443,848	525,864	268,102	562,409	432,822
Oklahoma	130%	296,351	93,268	69,404	129,707	82,178
Oregon	§184%	438,961	153,416	82,398	165,367	140,102
Pennsylvania	150%	999,167	399,631	166,083	428,671	267,152
Rhode Island	§227%	138,390	57,238	21,366	57,146	38,737
South Carolina	150%	455,884	162,105	92,273	185,293	132,871
South Dakota	200%	100,491	38,912	19,703	33,933	31,698
Tennessee	200%	885,978	322,318	170,354	370,376	258,289
Texas	200%	2,901,317	876,367	760,031	971,328	957,853
Utah	150%	159,660	39,875	47,030	47,145	54,397
Vermont	125%	35,208	11,503	4,902	17,351	10,272
Virginia	130%	404,323	143,765	81,919	159,205	118,895
Washington	125%	353,498	99,990	75,311	136,878	112,985
West Virginia	130%	175,883	65,672	28,715	90,647	42,323
Wisconsin	§204%	672,950	247,893	119,811	223,250	222,542
Wyoming	§198%	57,254	20,439	11,222	22,514	16,894
All States	Not applicable	30,370,144	10,745,791	6,259,994	11,070,680	9,472,447

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

<sup>2/</sup>State income guidelines can vary from 110 percent of the HHS Poverty Guidelines up to the Federal maximum LIHEAP income standard and can be different for different components of LIHEAP assistance. The table shows the estimates of LIHEAP income eligible households for heating assistance. The State maximum LIHEAP income standards for a family of four were obtained from ACF's LIHEAP grantee survey.

<sup>3/</sup>The three-year ACS average estimate of the total number of all U.S. households is 114,596,908.

<sup>4/</sup>A household can be counted under more than one vulnerability category.

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

<sup>6/</sup>These States use a percent of State median income. The figures reported are the conversion to a percent of the HHS Poverty Guidelines.

**LIHEAP Home Energy Notebook for FY 2010: Appendix B: Income Eligible Household Estimates**

**Table B-4. State-level estimates of the number of LIHEAP income eligible households using the new (75% of SMI) Federal maximum LIHEAP income standard categorized by income as a percentage of HHS poverty guidelines<sup>1/ 2/</sup>**

(Three-Year ACS 2008-2010)

State	Total number of LIHEAP eligible households <sup>3/</sup>	LIHEAP eligible households or below HHS poverty guidelines	LIHEAP eligible households >100% - 125% HHS poverty guidelines	LIHEAP eligible households >125% - 150% HHS poverty guidelines	LIHEAP eligible households over 150% HHS poverty guidelines
Alabama	721,743	294,453	102,586	103,900	220,804
Alaska	77,415	23,330	11,083	11,195	31,807
Arizona	865,070	293,077	110,961	111,992	349,040
Arkansas	429,119	183,462	72,590	66,868	106,199
California	4,694,568	1,402,150	562,671	540,356	2,189,391
Colorado	701,497	204,224	75,691	77,307	344,275
Connecticut	543,436	118,630	40,885	45,386	338,535
Delaware	123,787	31,293	11,980	12,601	67,913
District of Columbia	75,283	37,236	8,202	7,795	22,050
Florida	2,743,110	891,737	348,738	356,646	1,145,989
Georgia	1,402,370	495,686	175,568	166,480	564,636
Hawaii	158,928	49,400	16,117	15,087	78,324
Idaho	209,188	70,209	31,214	33,037	74,728
Illinois	1,868,503	534,867	192,569	199,034	942,033
Indiana	968,119	297,355	114,939	122,161	433,664
Iowa	456,944	123,652	56,720	55,821	220,751
Kansas	416,966	119,323	51,913	49,062	196,668
Kentucky	685,895	285,654	95,528	89,616	215,097
Louisiana	659,467	265,179	94,767	90,177	209,344
Maine	212,905	63,280	29,701	29,380	90,544
Maryland	795,249	169,187	58,442	59,210	508,410
Massachusetts	1,010,025	258,687	93,815	85,475	572,048
Michigan	1,646,009	503,587	175,741	179,651	787,030
Minnesota	824,740	197,429	80,857	81,016	465,438
Mississippi	428,126	210,650	73,407	65,319	78,750
Missouri	910,835	302,292	115,196	115,575	377,772
Montana	145,814	48,622	20,209	20,365	56,618
Nebraska	267,873	75,414	33,453	32,645	126,361
Nevada	334,340	101,145	39,678	42,075	151,442
New Hampshire	196,471	36,676	15,764	18,820	125,211
New Jersey	1,247,121	267,273	102,223	106,927	770,698
New Mexico	255,095	117,356	44,208	40,389	53,142
New York	2,853,292	918,270	300,754	302,624	1,331,644
North Carolina	1,417,775	512,901	196,013	186,129	522,732
North Dakota	97,079	30,210	13,225	10,362	43,282
Ohio	1,855,237	597,049	202,841	213,085	842,262
Oklahoma	507,923	204,363	78,557	81,340	143,663
Oregon	567,109	179,184	71,292	73,373	243,260
Pennsylvania	1,990,554	558,836	218,705	221,626	991,387
Rhode Island	170,827	49,774	16,827	17,119	87,107
South Carolina	679,535	268,318	95,352	92,214	223,651
South Dakota	117,102	38,419	17,732	13,946	47,005
Tennessee	952,629	369,244	136,875	133,557	312,953
Texas	3,141,491	1,228,519	444,513	432,656	1,035,803
Utah	289,483	84,245	36,031	39,384	129,823
Vermont	95,230	24,382	10,826	11,240	48,782
Virginia	1,090,609	282,590	103,421	106,269	598,329
Washington	936,922	258,520	94,978	96,931	486,493
West Virginia	289,929	119,741	47,191	45,897	77,100
Wisconsin	888,806	232,668	95,267	100,220	460,651
Wyoming	75,981	20,155	8,645	8,664	38,517
All States	44,093,524	14,049,903	5,246,461	5,218,004	19,579,156

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

<sup>2/</sup>The greater of 75 percent of State median income estimates or 150 percent of the HHS Poverty Guidelines.

<sup>3/</sup>The three-year ACS estimate of the total number of all U.S. households is 114,596,908.

**LIHEAP Home Energy Notebook for FY 2010: Appendix B: Income Eligible Household Estimates**

**Table B-5. State-level estimates of the number of LIHEAP income eligible households using the previous (60% of SMI) Federal maximum LIHEAP income standard categorized by income as a percentage of HHS poverty guidelines<sup>1/2/</sup>**

(Three-Year ACS 2008-2010)

State	Total number of LIHEAP eligible households <sup>3/</sup>	LIHEAP eligible households at or below HHS poverty guidelines	LIHEAP eligible households >100% - 125% HHS poverty guidelines	LIHEAP eligible households >125% - 150% HHS poverty guidelines	LIHEAP eligible households over 150% HHS poverty guidelines
Alabama	570,228	294,453	102,586	103,900	69,289
Alaska	57,749	23,330	11,083	11,195	12,141
Arizona	668,996	293,077	110,961	111,992	152,966
Arkansas	332,502	183,462	72,590	66,868	9,582
California	3,731,650	1,402,150	562,671	540,356	1,226,473
Colorado	544,370	204,224	75,691	77,307	187,148
Connecticut	427,180	118,630	40,885	45,386	222,279
Delaware	95,790	31,293	11,980	12,601	39,916
District of Columbia	62,347	37,236	8,202	7,795	9,114
Florida	2,115,225	891,737	348,738	356,646	518,104
Georgia	1,107,784	495,686	175,568	166,480	270,050
Hawaii	120,767	49,400	16,117	15,087	40,163
Idaho	157,633	70,209	31,214	33,037	23,173
Illinois	1,456,346	534,867	192,569	199,034	529,876
Indiana	735,312	297,355	114,939	122,161	200,857
Iowa	341,388	123,652	56,720	55,821	105,195
Kansas	315,143	119,323	51,913	49,062	94,845
Kentucky	541,910	285,654	95,528	89,616	71,112
Louisiana	522,757	265,179	94,767	90,177	72,634
Maine	163,055	63,280	29,701	29,380	40,694
Maryland	611,791	169,187	58,442	59,210	324,952
Massachusetts	801,021	258,687	93,815	85,475	363,044
Michigan	1,279,202	503,587	175,741	179,651	420,223
Minnesota	627,733	197,429	80,857	81,016	268,431
Mississippi	350,528	210,650	73,407	65,319	1,152
Missouri	703,763	302,292	115,196	115,575	170,700
Montana	110,594	48,622	20,209	20,365	21,398
Nebraska	202,576	75,414	33,453	32,645	61,064
Nevada	254,464	101,145	39,678	42,075	71,566
New Hampshire	145,910	36,676	15,764	18,820	74,650
New Jersey	973,131	267,273	102,223	106,927	496,708
New Mexico	203,282	117,356	44,208	40,389	1,329
New York	2,279,362	918,270	300,754	302,624	757,714
North Carolina	1,111,955	512,901	196,013	186,129	216,912
North Dakota	72,915	30,210	13,225	10,362	19,118
Ohio	1,429,091	597,049	202,841	213,085	416,116
Oklahoma	389,908	204,363	78,557	81,340	25,648
Oregon	438,961	179,184	71,292	73,373	115,112
Pennsylvania	1,535,302	558,836	218,705	221,626	536,135
Rhode Island	138,390	49,774	16,827	17,119	54,670
South Carolina	531,238	268,318	95,352	92,214	75,354
South Dakota	89,140	38,419	17,732	13,946	19,043
Tennessee	750,175	369,244	136,875	133,557	110,499
Texas	2,480,073	1,228,519	444,513	432,656	374,385
Utah	212,116	84,245	36,031	39,384	52,456
Vermont	71,527	24,382	10,826	11,240	25,079
Virginia	836,416	282,590	103,421	106,269	344,136
Washington	716,861	258,520	94,978	96,931	266,432
West Virginia	226,818	119,741	47,191	45,897	13,989
Wisconsin	672,950	232,668	95,267	100,220	244,795
Wyoming	57,254	20,155	8,645	8,664	19,790
All States	34,372,579	14,049,903	5,246,461	5,218,004	9,858,211

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

<sup>2/</sup>The greater of 60 percent of State median income estimates or 150 percent of the HHS Poverty Guidelines.

<sup>3/</sup>The three-year ACS estimate of the total number of all U.S. households is 114,596,908.

**LIHEAP Home Energy Notebook for FY 2010: Appendix B: Income Eligible Household Estimates**

**Table B-6. State-level estimates of the number of LIHEAP income eligible households using the State maximum LIHEAP income standards categorized by income as a percentage of HHS poverty guidelines<sup>1/ 2/</sup>**

(Three-Year ACS 2008-2010)

State	State Income Guidelines for 4-Person Household as % of HHS Poverty Guidelines	Total number of LIHEAP eligible Households <sup>2/</sup>	LIHEAP eligible households at or below HHS poverty guidelines	LIHEAP eligible households >100%-125% HHS poverty guidelines	LIHEAP eligible households >125%-150% HHS poverty guidelines	LIHEAP eligible households over 150% HHS poverty guidelines
Alabama	175%	593,051	294,453	102,586	103,900	92,112
Alaska	150%	45,608	23,330	11,083	11,195	-
Arizona	200%	728,337	293,077	110,961	111,992	212,307
Arkansas	150%	322,920	183,462	72,590	66,868	-
California	<sup>4/</sup> 260%	4,694,568	1,402,150	562,671	540,356	2,189,391
Colorado	185%	459,752	204,224	75,691	77,307	102,530
Connecticut	<sup>4/</sup> 266%	427,180	118,630	40,885	45,386	222,279
Delaware	200%	83,875	31,293	11,980	12,601	28,001
District of Columbia	<sup>4/</sup> 176%	62,347	37,236	8,202	7,795	9,114
Florida	150%	1,597,121	891,737	348,738	356,646	-
Georgia	<sup>4/</sup> 187%	1,107,784	495,686	175,568	166,480	270,050
Hawaii	150%	80,604	49,400	16,117	15,087	-
Idaho	<sup>4/</sup> 165%	157,633	70,209	31,214	33,037	23,173
Illinois	150%	926,470	534,867	192,569	199,034	-
Indiana	150%	534,455	297,355	114,939	122,161	-
Iowa	150%	236,193	123,652	56,720	55,821	-
Kansas	130%	179,090	119,323	51,913	7,854	-
Kentucky	130%	397,836	285,654	95,528	16,654	-
Louisiana	<sup>4/</sup> 167%	522,757	265,179	94,767	90,177	72,634
Maine	200%	176,284	63,280	29,701	29,380	53,923
Maryland	175%	351,431	169,187	58,442	59,210	64,592
Massachusetts	<sup>4/</sup> 254%	801,021	258,687	93,815	85,475	363,044
Michigan	110%	568,604	503,587	65,017	-	-
Minnesota	189%	488,881	197,429	80,857	81,016	129,579
Mississippi	150%	349,376	210,650	73,407	65,319	-
Missouri	135%	461,327	302,292	115,196	43,839	-
Montana	200%	132,165	48,622	20,209	20,365	42,969
Nebraska	125%	108,867	75,414	33,453	-	-
Nevada	150%	182,898	101,145	39,678	42,075	-
New Hampshire	<sup>4/</sup> 241%	145,910	36,676	15,764	18,820	74,650
New Jersey	225%	788,124	267,273	102,223	106,927	311,701
New Mexico	150%	201,953	117,356	44,208	40,389	-
New York	<sup>4/</sup> 212%	2,279,362	918,270	300,754	302,624	757,714
North Carolina	110%	584,282	512,901	71,381	-	-
North Dakota	<sup>4/</sup> 183%	72,915	30,210	13,225	10,362	19,118
Ohio	200%	1,443,848	597,049	202,841	213,085	430,873
Oklahoma	130%	296,351	204,363	78,557	13,431	-
Oregon	<sup>4/</sup> 184%	438,961	179,184	71,292	73,373	115,112
Pennsylvania	150%	999,167	558,836	218,705	221,626	-
Rhode Island	<sup>4/</sup> 227%	138,390	49,774	16,827	17,119	54,670
South Carolina	150%	455,884	268,318	95,352	92,214	-
South Dakota	200%	100,491	38,419	17,732	13,946	30,394
Tennessee	200%	885,978	369,244	136,875	133,557	246,302
Texas	200%	2,901,317	1,228,519	444,513	432,656	795,629
Utah	150%	159,660	84,245	36,031	39,384	-
Vermont	125%	35,208	24,382	10,826	-	-
Virginia	130%	404,323	282,590	103,421	18,312	-
Washington	125%	353,498	258,520	94,978	-	-
West Virginia	130%	175,883	119,741	47,191	8,951	-
Wisconsin	<sup>4/</sup> 204%	672,950	232,668	95,267	100,220	244,795
Wyoming	<sup>4/</sup> 198%	57,254	20,155	8,645	8,664	19,790
All States	Not applicable	30,370,144	14,049,903	5,011,105	4,332,690	6,976,446

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

<sup>2/</sup>State income guidelines can vary from 110 percent of the HHS Poverty Guidelines up to the Federal maximum LIHEAP income standard and can be different for different components of LIHEAP assistance. The table shows the estimates of LIHEAP income eligible households for heating assistance. The State maximum LIHEAP income standards for a family of four were obtained from ACF's LIHEAP grantee survey.

<sup>3/</sup>The three-year ACS estimate of the total number of all U.S. households is 114,596,908.

<sup>4/</sup>These States use a percent of State median income. The figures reported are the conversion to a percent of the HHS Poverty Guidelines.