

# **LIHEAP Home Energy Notebook**

## **For Fiscal Year 2007**



**U.S. DEPARTMENT OF  
HEALTH AND HUMAN SERVICES  
Administration for Children and Families  
Office of Community Services  
Division of Energy Assistance  
June 2009**

# **LIHEAP Home Energy Notebook**

## **For Fiscal Year 2007**

This document has been prepared for the Office of Community Services' Division of Energy Assistance by APPRISE Incorporated under contract #DE-AM01-04EI41006. The statements, findings, conclusions, and recommendations are solely those of analysts from APPRISE and do not necessarily reflect the views of EIA or HHS.

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## Table of Contents

Figures and Tables.....	ii
List of Acronyms and Abbreviations .....	v
<b>Executive Summary.....</b>	<b>i</b>
Home energy data .....	i
Low income home energy trends .....	iv
Trends in LIHEAP.....	x
Federal LIHEAP targeting performance.....	xi
<b>I. Introduction.....</b>	<b>1</b>
Purpose of Notebook.....	1
Organization of Notebook .....	2
<b>II. Home Energy Data .....</b>	<b>3</b>
Residential energy data .....	3
Home heating data .....	5
Home cooling data.....	8
<b>III. Low Income Home Energy Trends.....</b>	<b>10</b>
Trends in consumption, expenditures, and burden .....	12
Analysis of energy price and energy efficiency trends .....	24
Trends in LIHEAP.....	29
Analysis of LIHEAP benefits .....	33
<b>IV. Federal LIHEAP Targeting Performance.....</b>	<b>36</b>
LIHEAP program goals and performance goals .....	36
Performance measures .....	37
Performance measurement research.....	39
Uses of LIHEAP performance data.....	44
Targeting performance measurement issues.....	45
<b>V. LIHEAP Vulnerable Household Targeting Study .....</b>	<b>46</b>
Background .....	46
Study Scope.....	48
Literature Review Findings and Recommendations .....	48
Research on State LIHEAP Targeting Procedures .....	54
Recommendations .....	57
Conclusion .....	60
<b>Appendix A: Home Energy Estimates .....</b>	<b>61</b>
Description of RECS.....	61
Strengths and limitations of RECS data.....	62
Average home energy consumption and expenditures .....	63
Energy burden.....	63
Projecting energy consumption and expenditures.....	66
<b>Appendix B: Income Eligible Household Estimates .....</b>	<b>78</b>

## Figures and Tables

Figure 1. Percent of U.S. residential energy expenditures by low income households, by end use, FY 2007.....	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 2007.....	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 2007.....	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 2007.....	vi
Figure 7. Mean residential energy expenditures for low income households, 1979 to FY 2007.....	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 2007.....	viii
Figure 9. Shifts in composite energy price index and Consumer Price Index (CPI), 1979 to FY 2007.....	ix
Figure 10. Index of heating degree days (HDD), heating consumption for low income households per HDD, cooling degree days (CDD), and cooling consumption for low income households per CDD, 1979 to FY 2007.....	x
Figure 11. Number of LIHEAP/LIHEAP income eligible and heating and/or winter crisis assistance recipient households, FY 1981 to FY 2007.....	xi
Table 1. Barriers to Enrollment.....	xiv
Table 2. Effective Outreach and Intake Strategies.....	xv
Table 3. State Outreach and Intake Targeting Elderly Households.....	xv
Table 4. State Outreach and Intake Targeting Young Child Households.....	xvi
Table 2-1. Residential energy: Average annual household consumption, expenditures, and burden by all, non low income, low income, and LIHEAP recipient households, by main heating fuel type, United States, FY 2007 (See also Tables A-3a – A-3c, Appendix A).....	4
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 2007.....	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).....	5
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).....	8
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 2007 (See also Table A-7, Appendix A).....	9
Table 3-1. Definition of special terms.....	11
Table 3-2. Data used for the study of low income home energy trends.....	12
Figure 3-1. Main heating fuel for households with incomes at or below 150 percent of HHS' poverty guidelines, 1979 to 2005.....	13
Figure 3-2. Air-conditioning type for households with incomes at or below 150 percent of HHS' poverty guidelines, 1979 to 2005.....	13
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 2007.....	14
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 2007.....	15
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 2007.....	16
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 2007.....	17
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 2007.....	18

**LIHEAP Home Energy Notebook for FY 2007: Table of Contents**

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Figure 3-8. Number of low income households spending over 5 percent and 10 percent of income on home energy, 1979 to FY 2007 .....	19
Figure 3-9. Percent of low income households spending over 5 percent and 10 percent of income on home energy, 1979 to FY 2007 .....	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 2007 .....	20
Figure 3-11. Number of low income households spending over 15 percent and 25 percent of income on residential energy, 1979 to FY 2007 .....	21
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 2007 .....	22
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 2007 .....	23
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.....	24
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 2007 .....	25
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 2007.....	26
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 2007.....	27
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 2007 .....	28
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 2007 .....	28
Figure 3-20. Percentage of LIHEAP/LIHEAP Federally eligible households receiving LIHEAP/LIHEAP heating and/or winter crisis assistance, FY 1981 to FY 2007 .....	29
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 2007 .....	30
Figure 3-22. Funds used for LIHEAP/LIHEAP fuel assistance, FY 1981 to FY 2007.....	31
Figure 3-23. Mean combined LIHEAP/LIHEAP heating and/or winter crisis benefits and mean cooling and/or summer crisis benefits, in nominal dollars, FY 1981 to FY 2007.....	32
Figure 3-24. Mean combined LIHEAP/LIHEAP heating and/or winter crisis benefits and mean cooling benefits, in real 1981 dollars, FY 1981 to FY 2007 .....	32
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 2007.....	34
Figure 3-26. Mean group home heating burden for all households and LIHEAP/LIHEAP heating and winter crisis recipient households, FY 1981 to FY 2007 .....	35
Table 4-1. LIHEAP reciprocity targeting performance measures reported for FY 2003 – FY 2007.....	42
Table 4-2. LIHEAP reciprocity targeting of 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 .....	43
Table 4-3. LIHEAP benefit targeting of 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 .....	43
Table 4-4. LIHEAP burden reduction targeting of 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.....	44
Table 5-1. Barriers to Enrollment .....	53
Table 5-2. Effective Outreach and Intake Strategies.....	53
Table 5-3. State Outreach Targeting Elderly Households.....	54
Table 5-3A. Outreach Through Agencies Serving Elderly Households .....	54
Table 5-4. State Intake Procedures Targeting Elderly Households.....	55
Table 5-4A. Higher Benefits for Elderly Households .....	55
Table 5-5. State Outreach Targeting Young Child Households.....	56
Table 5-6. State Intake Targeting Young Child Households .....	56
Figure A-1. Distribution of LIHEAP income eligible households by home energy burden, 2005 .....	65

## **LIHEAP Home Energy Notebook for FY 2007: Table of Contents**

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Table A-1. National price factors for FY 2007 .....	67
Table A-2. Residential energy: Average consumption per household, by all fuels and specified fuels, by all, non low income, low income and LIHEAP recipient households, by Census region, FY 2007 .....	68
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 2007.....	69
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 2007.....	70
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 2007.....	71
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 .....	72
Table A-5. Home heating: Average consumption per household, by all fuels and specified fuels, by all, non low income, low income and LIHEAP recipient households, by Census region, FY 2007 .....	73
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 2007.....	74
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 2007.....	75
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 2007 .....	76
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 2007 .....	77
Table B-1. Average of 2006, 2007, and 2008 State-level estimates of the number of LIHEAP income eligible households using the Federal maximum LIHEAP income standard by vulnerability .....	80
category.....	80
Table B-2. Average of 2006, 2007, and 2008 State-level estimates of the number of LIHEAP income eligible households using State LIHEAP income standards by vulnerability category.....	81
Table B-3. Average of 2006, 2007, and 2008 State-level estimates of the number of LIHEAP income eligible households using the Federal maximum LIHEAP income standard classified by HHS poverty guidelines .....	82
Table B-4. Average of 2006, 2007, and 2008 State-level estimates of the number of LIHEAP income eligible households using the State maximum LIHEAP income standards.....	83
Table B-5. Average of 2005, 2006, and 2007 State-level estimates of the number of LIHEAP income eligible households using the Federal maximum LIHEAP income standard by vulnerability category.....	84
Table B-6. Average of 2005, 2006, and 2007 State-level estimates of the number of LIHEAP income eligible households using State LIHEAP income standards by vulnerability category.....	85
Table B-7. Average of 2005, 2006, and 2007 State-level estimates of the number of LIHEAP income eligible households using the Federal maximum LIHEAP income standard classified by HHS poverty guidelines .....	86
Table B-8. Average of 2005, 2006, and 2007 State-level estimates of the number of LIHEAP income eligible households using the State maximum LIHEAP income standards.....	87

## **List of Acronyms and Abbreviations**

ACF	The U.S. Department of Health and Human Services' Administration for Children and Families
ACS	American Community Survey
ASEC	CPS Annual Social and Economic Supplement
CDD	Cooling Degree Day
CPI	Consumer Price Index
CPS	Current Population Survey
DEA	Office of Community Services' Division of Energy Assistance
EIA	Energy Information Administration
FY	Fiscal Year
GPRA	Government Performances and Results Act of 1993
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	Administration for Children and Families' Office of Community Services
RECS	Residential Energy Consumption Survey

# Executive Summary

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

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 Department of Energy, Information Administration’s (EIA’s) 2005 Residential Energy Consumption Survey (RECS).<sup>1</sup> 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. RECS residential energy consumption and expenditures data have been adjusted to reflect FY 2007 weather and fuel prices.

### Residential energy data

In FY 2007, average energy expenditures for all households were \$1,986, and the mean individual energy burden was 7 percent of income.<sup>2</sup> Low income households had average energy expenditures of \$1,715, about 13.6 percent lower than the average for all households.<sup>3</sup> The mean individual energy burden for low income households was 13.5 percent, almost twice the mean individual energy burden of all households. LIHEAP recipient households had average energy expenditures of \$1,900, about 11 percent higher than the average for all low income households. The mean individual energy burden for LIHEAP recipients was 16 percent, 9 percentage points higher than the mean individual energy burden for all households and 2.5 percentage points higher than the mean individual energy burden for low income households.

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<sup>1</sup> The FY 2007 *Notebook* is the first to use the 2005 RECS data. The FY 2006 *Notebook* used projections from the 2001 RECS, which had a different sample frame and different procedure than the 2005 RECS. The reader should exercise caution in comparing the results for FY 2007 to those for FY 2006, as some of the observed changes may be due to the changes in the base survey used.

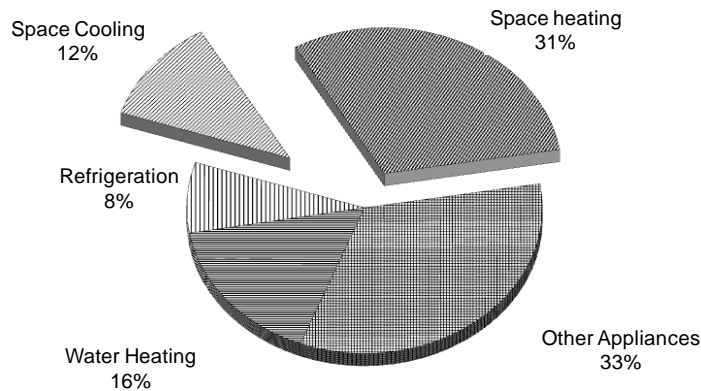
<sup>2</sup> The mean is the sum of all values divided by the number of values. The mean is also referred to as the average. See Appendix A for a discussion of the computation of energy burden statistics.

<sup>3</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’s poverty income guidelines and 60 percent of State median income). The terms “low income” and “LIHEAP income eligible” are equivalent in the Executive Summary. “Non low income” refers to those households with incomes above the Federal maximum LIHEAP eligibility standard.



LIHEAP assists households with only that portion of residential energy costs that goes for home energy, i.e., home heating and home cooling. As shown in Figure 1, home heating and home cooling represent about 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 33 percent of residential energy expenditures.

**Figure 1. Percent of U.S. residential energy expenditures by low income households, by end use, FY 2007**



### **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 differences in main heating fuel choice by income group.

In FY 2007, as shown in Figures 2 and 3, average home heating expenditures for all households were \$553, and the mean individual home heating burden was 2.2 percent. Low income households had average home heating expenditures of \$525; this average was about 5 percent lower than that for all households. The mean individual home heating burden for low income households was 4.4 percent, twice as much as the mean individual home heating burden for all households. The average home heating expenditures for LIHEAP households was \$717, 36.6 percent higher than the average for low income households and about 30 percent higher than the average for all households. Mean individual home heating burden for LIHEAP households was 6.5 percent, 4.3 percentage points higher than the mean individual home heating burden for all households and more than 2 percentage points higher than that for low income households.

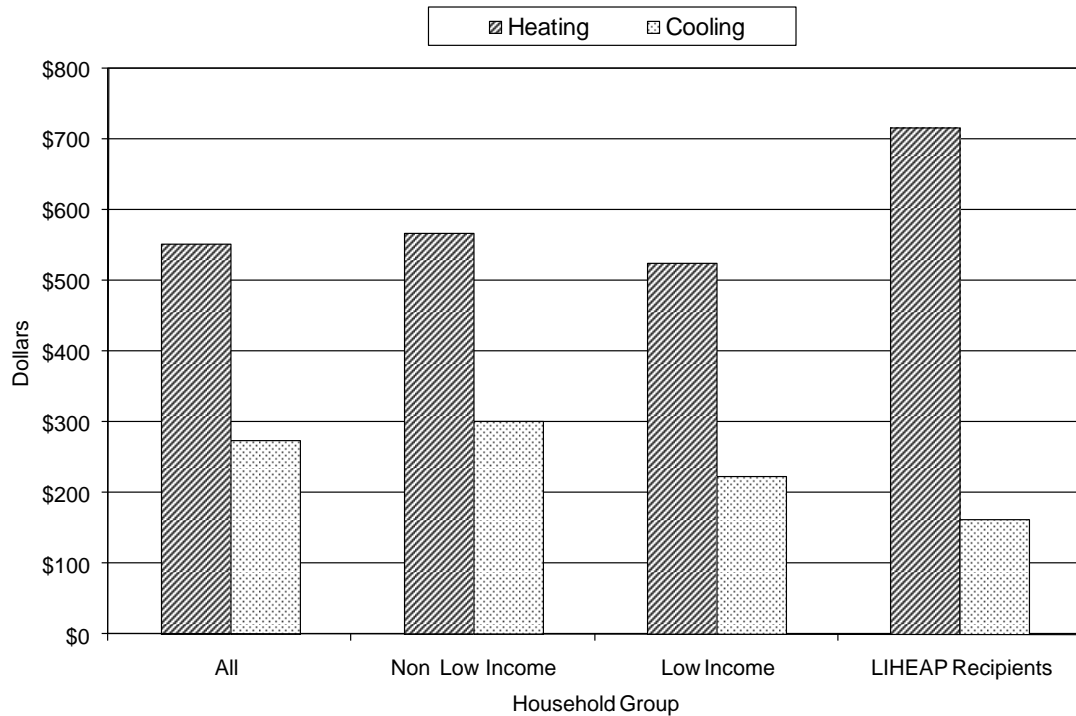
### **Home cooling data**

In 2005, about 92 percent of all households cooled their homes. Low income and LIHEAP recipient households were less likely to cool their homes than were non low income households; 89 percent of

low income households and 86 percent of LIHEAP recipient households cooled their homes using one of the methods recorded by the RECS.<sup>4</sup>

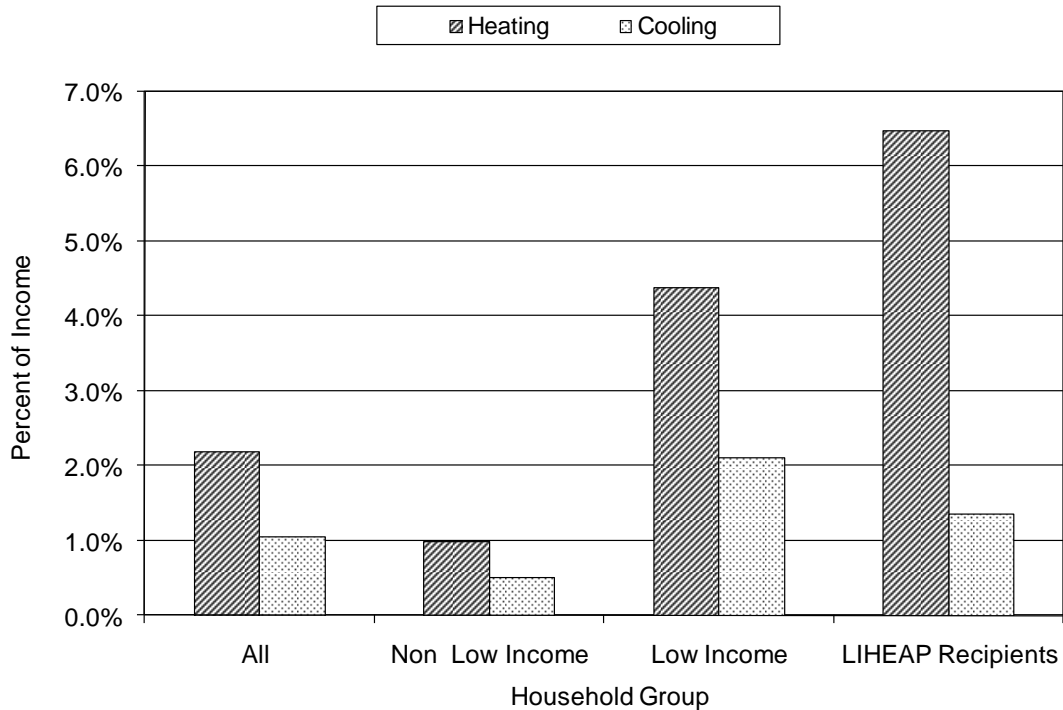
As Figures 2 and 3 show, in FY 2007, for households that cooled, average home cooling expenditures for all households were \$275, and the mean individual home cooling burden was 1.1 percent. Low income households had average home cooling expenditures of \$223; this average was about 19 percent lower than that for all households. The mean individual home cooling burden for low income households was 2.1 percent, almost twice as much as the mean individual home cooling burden for all households. Average home cooling expenditures for LIHEAP recipient households were \$162, 27 percent lower than the average for low income households and over 41 percent lower than the average for all households. The mean individual home cooling burden for LIHEAP recipient households was 1.4 percent, about 27 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 2007**



<sup>4</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 2007**



## Low income home energy trends

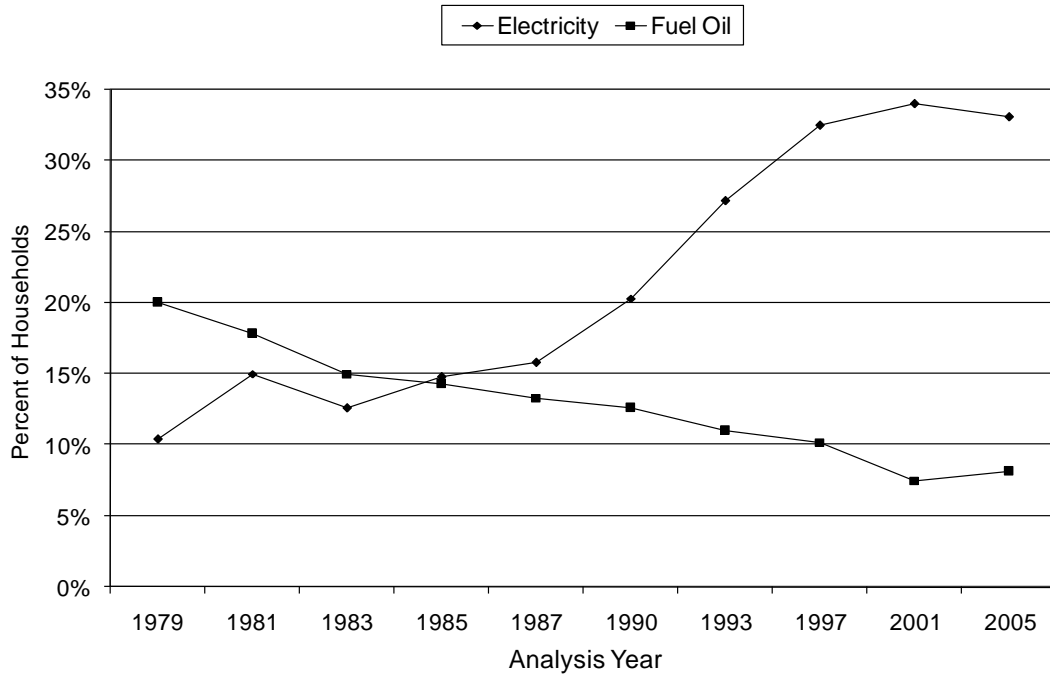
This section presents data on home energy trends for low income households from 1979 through 2005 or FY 2007, depending upon the latest year of availability.<sup>5</sup> Statistics are derived from a series of national residential energy consumption surveys (including the RECS) and from HHS’ administrative 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.

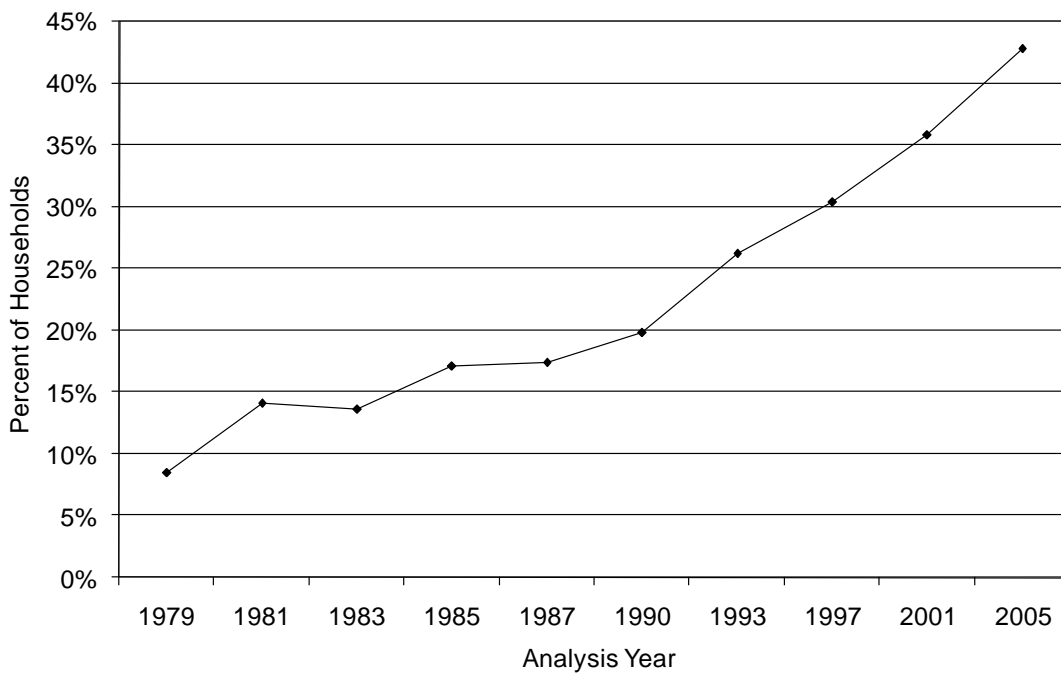
<sup>5</sup>In this section, low income households are defined as those households with incomes at or below 150 percent of poverty.

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



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

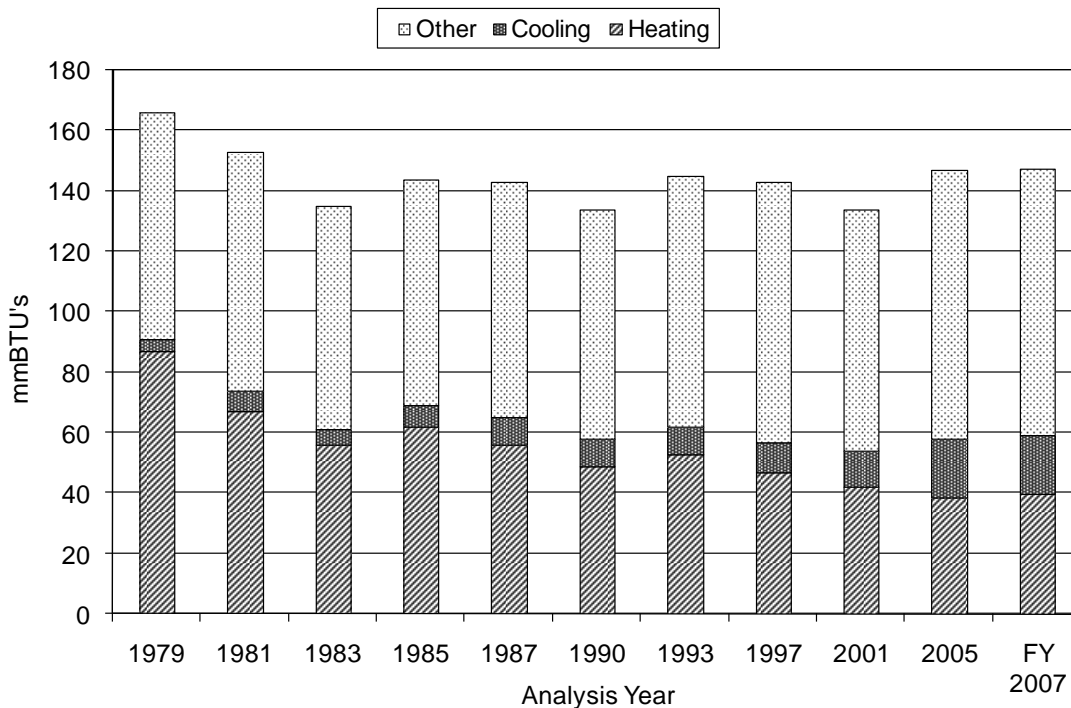
**Figure 5. Percent of low income households using central air-conditioning, 1979 to 2005**



## 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 2007, the use of energy for home heating, home cooling, and for other purposes, appears to have remained stable.

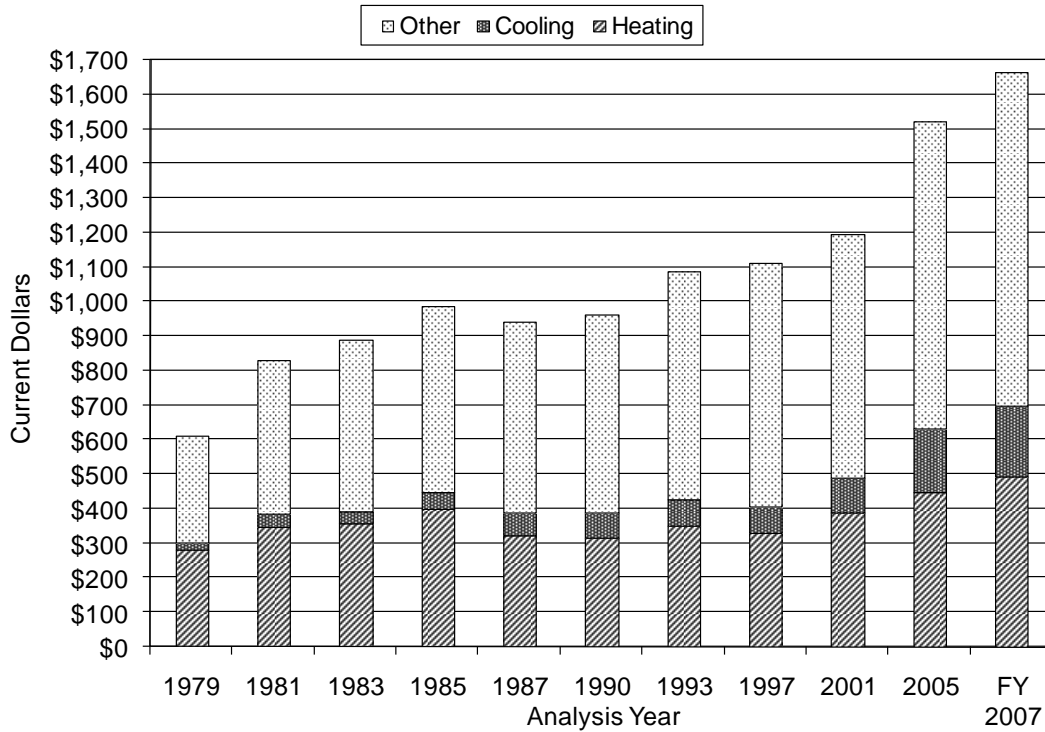
**Figure 6. Mean residential energy consumption (in mmBTUs) per low income household, 1979 to FY 2007<sup>11</sup>**



<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 or mmBTUs 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 2007, mean expenditures for home heating rose by almost 10 percent, again due to higher fuel prices. Mean expenditures on uses other than home heating or home cooling rose continuously from 1979 to FY 2007. Mean expenditures on cooling rose from 1979 to 2005, and rose again by almost 10 percent from 2005 to FY 2007.

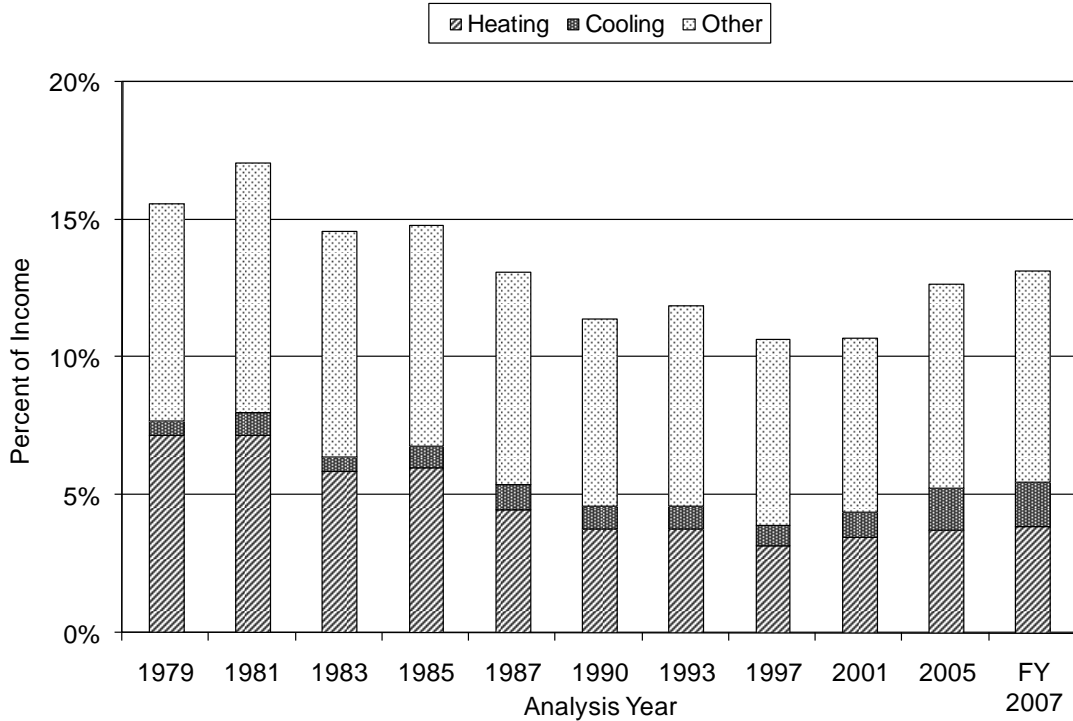
Figure 7. Mean residential energy expenditures for low income households, 1979 to FY 2007



As Figure 8 shows, the mean group home energy burden declined from 7.7 percent in 1979 to 5.5 percent in FY 2007; this represented a decline of 2.2 percentage points.<sup>6</sup> The decline in mean group residential energy burden from 1979 to FY 2007 was 2.5 percentage points (from 15.6 percent to 13.1 percent). Most of the decline in residential energy burden is associated with a decline in home energy burden (i.e., burden associated with home heating and home cooling) rather than a decline in the burden associated with energy use for other purposes (i.e., water heating, appliances, and refrigeration).

<sup>6</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 2007**



### 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 2007, fuel prices increased again. FY 2007 fuel prices were over 9 percent higher than 2005 fuel prices. The increases in fuel prices from 2005 through FY 2007 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 2007

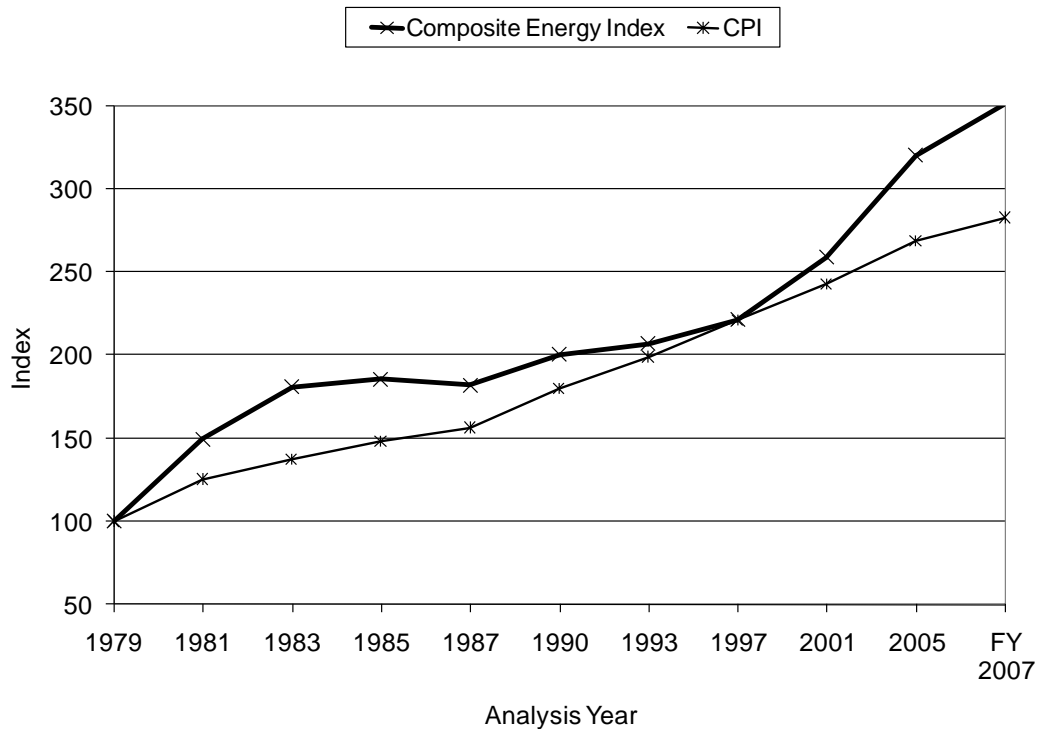
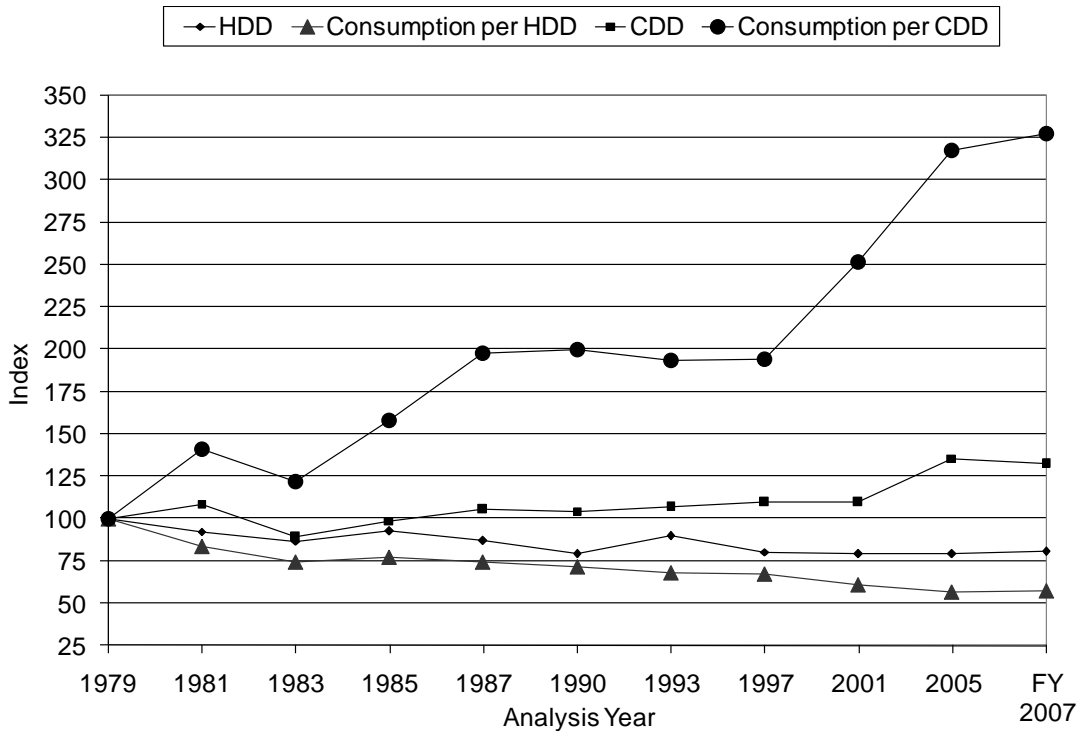


Figure 10 shows energy consumption for heating and cooling compared to heating and cooling degree days from 1979 to FY 2007 for low income households. As shown, heating consumption per heating degree day declined continuously from 1979 to 2005 as a result of energy conservation efforts, but rose slightly from 2005 to FY 2007. In contrast, cooling consumption per cooling degree day rose sharply through 2005 because of a large increase in the availability of air-conditioning to low income households,<sup>7</sup> and stayed stable from 2005 to FY 2007. Only 37 percent of low income households had air-conditioning equipment in 1979, but by 2005 the number had risen to 80 percent.

<sup>7</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), heating consumption for low income households per HDD, cooling degree days (CDD), and cooling consumption for low income households per CDD, 1979 to FY 2007**



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 2007, the mean group home energy burden for all households was 1.2 percent. That year, the mean group home energy burden for low income households was 5.5 percent, again over four times higher than that for all households.

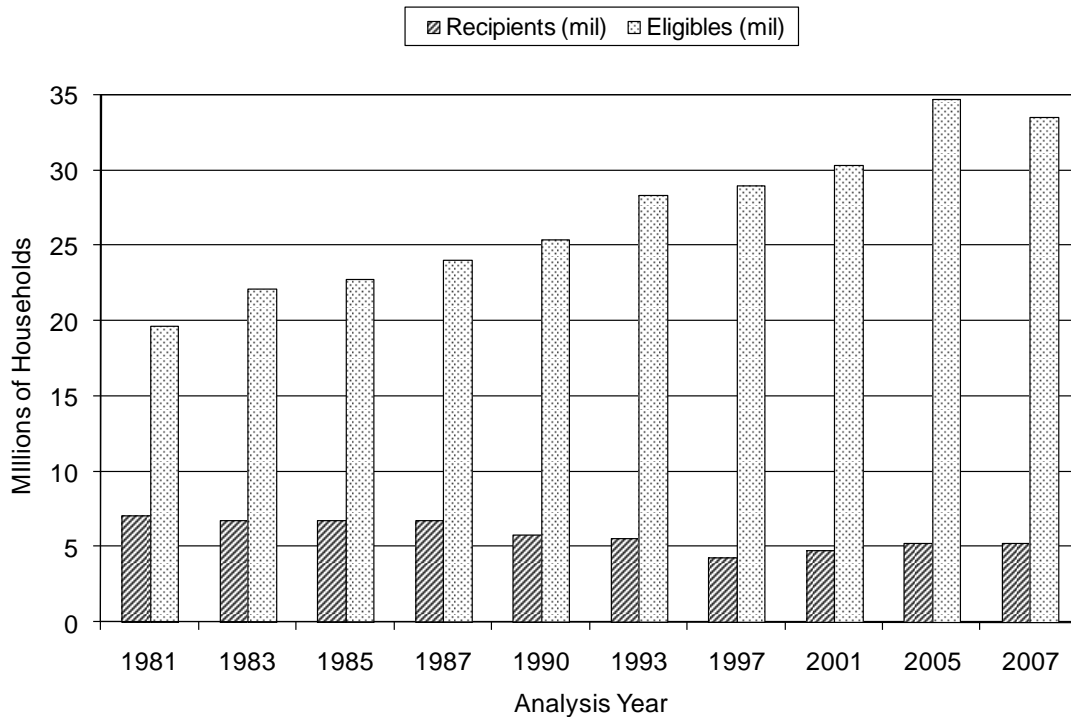
## Trends in LIHEAP

Between 1981 and FY 2007, as shown in Figure 11, the number of income eligible households has risen more than 70 percent, during which time Federal fuel assistance funds have increased by 17.3 percent.<sup>8</sup> Also during this period, the percentage of income eligible households receiving heating and/or winter crisis assistance has declined sharply from 36 percent in 1981 to 16 percent in FY 2007. 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 slightly by 5 percent in FY 2007. 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 over 13 percent in FY 2007. After adjusting for inflation, the mean value of combined Federal heating and winter crisis benefits fell from \$213 in 1981 to \$139 in FY 2007. Cooling benefits fell from \$129 in 1981 to \$74 in FY 2007.

<sup>8</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 2605((b)(2)(A)) of the LIHEAP statute.

The percentage of the total home heating bill for LIHEAP/LIHEAP income eligible households covered by LIHEAP/LIHEAP heating and winter crisis benefits decreased from 23 percent in 1981 to 10 percent in FY 2007. The decrease resulted from the combination of higher home heating bills and a smaller per-household amount of assistance benefits.

**Figure 11. Number of LIHEAP/LIHEAP income eligible and heating and/or winter crisis assistance recipient households, FY 1981 to FY 2007**



The mean group home heating burden for LIHEAP/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), Public Law 103-62 focuses on program results to provide Congress with objective information on the achievement of statutory objectives or program goals. The resulting performance data are to be used in making decisions on budget and appropriation levels.

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

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

In FY 2007, 16 percent of federally income eligible households received assistance with their heating costs.<sup>9</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 households with the lowest incomes and highest home energy costs.

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

## **Performance measures**

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

- The *reciprocity targeting index* quantifies 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

- 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.

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<sup>9</sup> States are not required to report an unduplicated count of assisted households that receive LIHEAP assistance regardless of the type(s) of assistance provided to recipient households. Therefore this percentage does not provide a complete picture to those household that may have received other types of LHEAP assistance. Additionally, income eligible household estimates do not include those households with incomes greater than the statutory income standards but who may still qualify for LIHEAP benefits because they are categorically eligible for LIHEAP under section 2605((b)(2)(A)) of the LIHEAP statute.

## **Performance measurement research**

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

- **Validation Study** – The performance measurement validation study examined the available data sources for estimating the targeting indexes required by the performance measurement plan for LIHEAP and identified the data sources that furnished the most reliable data.<sup>10</sup>
- **Energy Burden Study** – The energy burden evaluation study used the 2001 RECS LIHEAP Supplement to measure the baseline performance of the LIHEAP program in serving high burden households and to examine the competing demands associated with targeting vulnerable and high burden households.<sup>11</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**

ACF's *Final FY 2009 Annual Performance Plan and FY 2007 Annual Performance Report* furnished measurements of targeting performance. The performance report showed the LIHEAP targets and performance results for FY 2007.

## **LIHEAP Vulnerable Household Targeting Study**

Performance measurement statistics have shown that the LIHEAP program failed to meet Federal performance goals during the period from FY 2003 through FY 2006. To help address this issue, OCS commissioned a special study to identify strategies that State LIHEAP programs can use to increase the level of LIHEAP participation by vulnerable population groups.<sup>12</sup>

### **Study Scope**

The targeting performance study consisted of the following research activities:

- **Literature Search** – Researchers searched for studies and reports on targeting by Federal social service programs.
- **Literature Review** – Researchers reviewed the literature to understand program participation barriers and successful strategies for improving program participation for targeted households.
- **State LIHEAP Survey** – Researchers conducted a survey with State LIHEAP program managers to identify the outreach and intake strategies used by each State LIHEAP program.

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<sup>10</sup> *LIHEAP Targeting Performance Measurement Statistics: GPRA Validation of Estimation Procedures*, August 2004, Report prepared by APPRISE Incorporated under PSC Order No. 043Y00471301D.

<sup>11</sup> *LIHEAP Energy Burden Evaluation Study*, March 2005, Report prepared by APPRISE Incorporated under PSC Order No. 043Y00471301D.

<sup>12</sup> The complete report, *Reciprocity Targeting Analysis for Elderly and Young Child Households* is available on OCS' LIHEAP website at: [www.acs.hhs.gov/programs/ocs/liheap/targeting\\_report.html](http://www.acs.hhs.gov/programs/ocs/liheap/targeting_report.html). The study was funded through contract #HHSP23320070081P.

- **LIHEAP Targeting Analysis** – Researchers compared the implementation of targeting strategies to the targeting performance of the State LIHEAP program.

### **Summary of Findings from Literature Review**

The literature search identified published and unpublished research studies on targeting vulnerable households in other Federal social welfare program. The Food Stamps Program developed the most extensive body of research on targeting; however, other important sources of information included studies conducted for Medicaid, the Medicare Savings Program, SCHIP, and WIC. The literature review furnished detailed information on program barriers and the effectiveness of strategies for overcoming those barriers.

Table 1 presents information on the major program barriers and how they are manifested in practice for elderly and young child households. Some elderly households perceive that they are not eligible for the programs for a number of different reasons. When they do consider applying, they are sometimes overwhelmed by the logistics and procedures. As a growing number of young child households are working and/or are legal immigrants, many such households perceive that they are not eligible for programs. When they do consider applying, some have difficulty in getting to the intake sites during operating hours.

**Table 1. Barriers to Enrollment**

<b>Barrier</b>	<b>Elderly Households</b>	<b>Young Child Households</b>
Understanding of Eligibility Related to Household Status	Since many programs explicitly target children, elderly households perceive that are not eligible for programs.	Some young child households are legal immigrants who believe that their status affects eligibility.
Understanding of Eligibility Related to Income and Sources of Income	Some elderly households did not qualify for benefits when working but do now that they have lower income.	Some young child households believe that having wage income makes them ineligible for programs.
Understanding of Eligibility Related to Physical Assets	Both household types perceive that owning a home or a car makes them ineligible, despite the fact that most program have exemptions.	
Application Barriers	Many elderly households have difficulty accessing intake sites and are confused about forms and procedures.	Many young child households can't get time off from work and/or get childcare to apply for benefits.

Table 2, on the next page, presents information on effective outreach and intake strategies, and how they can be implemented for elderly households and young child households. It is important to note that some strategies can be jointly implemented for elderly and young child households, while others are particular to one of the targeted groups.

**Table 2. Effective Outreach and Intake Strategies**

<b>Strategy</b>	<b>Elderly Households</b>	<b>Young Child Households</b>
Make program rules clear and consistent.	Inform households that all types of households with all sources of income are eligible if they are income eligible. Inform households that some assets are allowable. Highlight rule changes in program literature.	
Reduce stigma by tailoring outreach to specific groups.	Tailor outreach materials to elderly households and distribute through familiar organizations and individuals.	Distribute outreach information through Head Start and community health programs.
Reduce application barriers by implementing special procedures for targeted households.	Reduce application requirements to elderly households on fixed incomes.	Make it easier for working young child households to apply for benefits by having evening hours and childcare services.
	Offer application assistance to elderly households.	
	Offer a special application period for targeted households.	
Increase the value of the program.	Offer higher benefits to elderly households and young child households.	

**Research on State LIHEAP Targeting Procedures**

The literature review identified specific targeting procedures that have been effective in increasing participation in other social welfare programs. In the next phase of the research, 17 State LIHEAP Directors were interviewed to determine whether they were currently using these procedures and to assess the effectiveness of these procedures for LIHEAP.

Table 3 furnishes information on some of the outreach and intake measures that the interviewed States reported using to target elderly households. Most interviewed States reported that they conduct outreach through agencies that serve elderly households and offered elderly households alternative intake sites. However, fewer than half of the interviewed States reported that they prepared outreach materials targeting elderly households, or had special application periods or special application procedures for elderly households. Further, the analysis of the targeting performance for the responding States did not show a correlation between implementation of a particular targeting strategy and higher targeting performance.

**Table 3. State Outreach and Intake Targeting Elderly Households**

<b>Outreach Method</b>	<b>States Using Method</b>	<b>States not Using Method</b>
Outreach through agencies serving elderly	11	6
Outreach materials targeting elderly	5	12
Special application period for elderly	6	11
Special application procedures for elderly	6	11
Alternate intake sites for elderly	14	3

Table 4, on the next page, furnishes information on some of the outreach and intake procedures the interviewed States reported using to target young child households. Some interviewed States reported that they conduct outreach through agencies that serve children and offer special intake locations for young child households. However, few interviewed States explicitly address working families in their program outreach literature or have a special intake period for young child households.

**Table 4. State Outreach and Intake Targeting Young Child Households**

<b>Outreach Method</b>	<b>States Using Method</b>	<b>States not Using Method</b>
Outreach through agencies serving children	6	11
Outreach materials targeting working families	4	13
Special application period	2	15
Special intake locations	7	10

In the interviews, some program managers identified other program design features that may account for the targeting outcomes observed for those States. Examples of these findings include:

- **Elderly Application Period with Outreach** – One State has a special application period for elderly households that is well-publicized by the State and local agencies. During the most recent program year, 55 percent of LIHEAP funds were used before the program was open for other types of households. That State has a high elderly reciprocity targeting index and a low young child reciprocity targeting; and
- **Focus on Applicants to Other Programs** – During the LIHEAP season, one State has a policy of reviewing all applications for other programs to determine whether the household is also eligible for LIHEAP. That State has a high young child reciprocity targeting index and a low elderly reciprocity targeting index.

These and other examples identified during the interviews suggest that certain overarching program design elements can have a more significant impact on State LIHEAP program targeting rates than any other particular outreach activity. More research needs to be conducted regarding the correlation between specific outreach activities and these larger program features in terms of the resulting targeting performance.

## **Recommendations**

Actions by individual State LIHEAP programs can improve the reciprocity targeting performance in that State and by extension, for the entire program. However, as identified by the research on existing State LIHEAP program practices, a State cannot simply adopt a set of outreach and intake strategies to increase targeting performance. If a State LIHEAP program chooses to take action, the following approach is recommended.

- **Baseline Assessment** – Program administrators need to measure current reciprocity targeting rates and examine the ways that program design, outreach, and intake strategies are linked to the targeting outcomes. If there are any design features that specifically detract from targeting to elderly and/or young child households, the program administrators should consider changing those before any additional improvements are made.
- **General Outreach** – Program administrators should review program’s general outreach to assess whether current efforts are adequate to establish a basic awareness and understanding of the program. If outreach is not sufficient, or if outreach messages discourage elderly or young child households from applying, State administrators should consider improving the general outreach before any additional improvements are made.

- Specific Outreach and Intake Strategies – Working with field staff and intake agency directors, program administrators should identify the changes that are perceived to be both feasible and likely to result in changes in program targeting.
- Measurement – Program administrators should consider testing the program changes with a subset of agencies or in one part of the State. Program administrators also should develop a benchmark for program reciprocity targeting indexes and measure the changes that result from the implementation of program enhancements.

Only systematic efforts on the part of State LIHEAP program managers are likely to have a significant impact on vulnerable household reciprocity targeting levels for the LIHEAP program. Such an impact is even greater when vulnerable households also have high home energy burdens.



# I. Introduction

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

In 1994, Congress amended the purpose of LIHEAP to clarify that LIHEAP is “to assist low income households, particularly those with the lowest income, that pay a high proportion of household income for home energy, primarily in meeting their immediate home energy needs” (The Human Services Amendments of 1994, Public Law 103-252, Sec. 2602(a) as amended). Congress further indicated that LIHEAP grantees need to reassess their LIHEAP benefit structures to ensure that they are actually targeting those low income households that have the highest energy costs or needs. The Energy Policy Act of 2005 (Public Law 109-58) reauthorized LIHEAP through FY 2007 without substantive changes.

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

## Purpose of Notebook

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

The *LIHEAP Home Energy Notebook* focuses on the home energy mission of LIHEAP by providing LIHEAP grantees with the latest national and regional data on home energy consumption, expenditures, and burden; low income home energy trends; and the LIHEAP performance measurement system.

The FY 2007 home energy data presented in this *Notebook* were derived from existing data sources and analytic procedures, including:

- Household-level data on home energy available from the Department of Energy, Energy Information Administration’s (EIA’s) national Residential Energy Consumption Surveys (RECS) and household-level data on income available from the Department of Commerce, Bureau of the Census’ (Census’) national Current Population Survey (CPS) Annual Social and Economic Supplement (ASEC) data files.
- National and State-level data on residential energy prices from the 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).

## 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 2007. 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 2007. 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.
- Section V – LIHEAP Vulnerable Household Targeting Study. This section presents the results of the special study commissioned by OCS to identify strategies that State LIHEAP programs can use to increase the level of LIHEAP participation by vulnerable population groups.
- Appendix A documents the procedures used to prepare the FY 2007 energy statistics. Procedures reviewed include: projecting changes in energy consumption and expenditures, disaggregating energy consumption and expenditures into end use components, and computing energy burden statistics. Appendix A also includes detailed tabulations on residential energy use, expenditures, and burden at the national and regional level by main heating fuel for all, low income, non low income, and LIHEAP recipient households.
- Appendix B furnishes averages of State-level estimates of the numbers of households that are eligible for LIHEAP at both the Federal and State income standards. These averages are presented by vulnerability and income group.

## II. Home Energy Data

Section II presents home energy consumption and expenditure data. The primary data source for this section is the 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 2007 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.<sup>13</sup>

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

### Residential energy data

Table 2-1, on the next page, presents data on average annual residential energy consumption, expenditures, and burden by fuel type for all, non low income, low income, and LIHEAP recipient households.<sup>14</sup> In FY 2007, average residential energy consumption for all households was 95.8 million British Thermal Units (mmBTUs) and average expenditures were \$1,986. The mean individual residential energy burden for all households was 7.0 percent of income.

Low income households had average residential energy consumption of 84.4 mmBTUs (11.9 percent less than all households) and average energy expenditures of \$1,715 (13.6 percent less than all households). Their mean individual residential energy burden was 13.5 percent, almost twice that for all households and almost four times that for non low income households.

Average residential energy expenditures for LIHEAP recipient households were \$1,900, about 11 percent higher than that for all low income households. The mean individual residential energy burden was 16.0 percent, 2.5 percentage points higher than that for low income households.

Households consume residential energy for a variety of uses that include space heating, water heating, space cooling (air-conditioning or circulation), refrigeration, and other appliances. Table 2-2 furnishes data on the percentage of the residential energy bill that is attributable to each of these five end uses. By statute, LIHEAP targets assistance to home energy expenditures, i.e., to home heating and home cooling expenditures. In FY 2007, home heating was 31 percent of the residential energy bill for low income households, and home cooling made up 12 percent.

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<sup>13</sup> The FY 2007 *Notebook* is the first to use the 2005 RECS data. The FY 2006 *Notebook* used projections from the 2001 RECS, which had a different sample frame and different procedure than the 2005 RECS. The reader should exercise caution in comparing the results for FY 2007 to those for FY 2006, as some of the observed changes may be due to the changes in the base survey used.

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

**LIHEAP Home Energy Notebook for FY 2007: II. Home Energy Data**

**Table 2-1. Residential energy: Average annual household consumption, expenditures, and burden by all, non low income, low income, and LIHEAP recipient households, by main heating fuel type, United States, FY 2007<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>
<i>All households</i>					
All fuels	95.8	\$1,986	7.0%	4.2%	3.0%
Natural gas	111.4	\$1,956	6.2%	3.9%	2.9%
Electricity	61.2	\$1,696	6.9%	3.9%	2.5%
Fuel oil	145.6	\$3,248	12.1%	7.2%	4.9%
Kerosene	53.8	\$1,392	9.6%	6.9%	2.1%
LPG <sup>6/</sup>	108.6	\$2,640	9.3%	6.3%	4.0%
<i>Non low income households</i>					
All fuels	101.9	\$2,132	3.6%	3.1%	2.5%
Natural gas	116.1	\$2,098	3.4%	2.9%	2.4%
Electricity	66.0	\$1,828	3.3%	2.9%	2.1%
Fuel oil	154.5	\$3,489	5.5%	4.9%	4.0%
Kerosene	60.8	\$1,419	4.3%	4.6%	1.6%
LPG <sup>6/</sup>	115.8	\$2,742	5.0%	4.5%	3.2%
<i>Low income households</i>					
All fuels	84.4	\$1,715	13.5%	9.3%	9.9%
Natural gas	101.4	\$1,653	12.2%	8.8%	9.5%
Electricity	53.1	\$1,471	13.1%	8.2%	8.5%
Fuel oil	131.9	\$2,879	22.3%	16.1%	16.6%
Kerosene	52.5	\$1,387	10.6%	8.6%	8.0%
LPG <sup>6/</sup>	94.9	\$2,449	17.4%	13.8%	14.1%
<i>LIHEAP recipient households</i>					
All fuels	103.2	\$1,900	16.0%	10.5%	13.3%
Natural gas	112.9	\$1,770	14.6%	10.3%	12.4%
Electricity	49.7	\$1,219	14.9%	9.1%	8.5%
Fuel oil	149.9	\$3,290	24.8%	23.8%	23.0%
Kerosene	76.8	\$1,612	18.7%	13.8%	11.3%
LPG <sup>6/</sup>	107.8	\$2,970	17.1%	11.3%	20.8%

<sup>1/</sup>Data are derived from the 2005 RECS, adjusted to reflect FY 2007 heating degree days, cooling degree days, and fuel prices. Data represent residential energy used from October 2006 through September 2007.

<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 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 2007 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 2007 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 2007; and (3) dividing the adjusted figures by the average income for each group of households from the 2007 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.

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 38 percent of their annual residential expenditures for space heating, 7 percentage points more than did the average low income household. LIHEAP recipient households spent 7 percent for space cooling, about 58 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 2007**

End Use	All households	Non low income households	Low income households	LIHEAP recipient households
Space heating	28%	27%	31%	38%
Space cooling	13%	13%	12%	7%
Water heating	15%	15%	16%	16%
Refrigeration	8%	8%	8%	7%
Appliances	36%	37%	33%	32%
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. Non low income households used natural gas at the highest rate, 55.0 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, 31.8 percent, and LIHEAP recipient households used electricity at the lowest rate, 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>15</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 Table 2-4. In FY 2007, average home heating consumption for all households was 38.9 mmBTUs, average expenditures were \$553, and mean individual home heating burden was 2.2 percent.

Low income households had average home heating consumption of 36.9 mmBTUs (5 percent less than the average for all households) and average home heating expenditures of \$525 (5.1 percent less than the average for all households). The mean individual home heating burden for low income households was 4.4 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.

Average home heating consumption for LIHEAP recipient households was 52.9 mmBTUs (36 percent higher than the average for all households), and average home heating expenditures were \$717 (almost 30 percent higher than the average for all households). Mean individual home heating burden for LIHEAP households was 6.5 percent, 2.1 percentage points higher than the average for low income households and close to three times the average for all households. Average home heating consumption for LIHEAP recipient households was 43 percent greater than that for all low income households, because LIHEAP heating assistance recipient households tend to live in colder climate regions.<sup>16</sup>

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<sup>15</sup>Findings from the 2005 RECS, Energy Information Administration, U.S. Department of Energy.

<sup>16</sup>LIHEAP Home Energy Notebook for FY 2006.

**LIHEAP Home Energy Notebook for FY 2007: II. Home Energy Data**

**Table 2-4. Home heating: Average annual household consumption, expenditures, and burden by all, non low income, low income, and LIHEAP recipient households, by fuel type, United States, FY 2007<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>
<i>All households</i>					
All fuels	38.9	\$553	2.2%	0.9%	0.8%
Natural gas	50.4	\$562	2.1%	1.0%	0.8%
Electricity	8.5	\$243	1.1%	0.5%	0.4%
Fuel oil	95.1	\$1,664	7.2%	3.6%	2.5%
Kerosene	20.2	\$346	2.2%	1.7%	0.5%
LPG <sup>6/</sup>	51.8	\$1,107	4.0%	2.4%	1.7%
<i>Non low income households</i>					
All fuels	40.0	\$568	1.0%	0.6%	0.7%
Natural gas	50.0	\$561	1.0%	0.7%	0.6%
Electricity	9.0	\$255	0.5%	0.4%	0.3%
Fuel oil	98.6	\$1,731	2.9%	2.4%	2.0%
Kerosene	25.2	\$416	1.4%	0.9%	0.5%
LPG <sup>6/</sup>	57.4	\$1,186	2.2%	1.8%	1.4%
<i>Low income households</i>					
All fuels	36.9	\$525	4.4%	2.2%	3.0%
Natural gas	51.4	\$564	4.5%	2.8%	3.3%
Electricity	7.7	\$221	2.0%	1.2%	1.3%
Fuel oil	89.8	\$1,563	13.9%	9.1%	9.0%
Kerosene	19.3	\$333	2.3%	1.7%	1.9%
LPG <sup>6/</sup>	41.4	\$958	7.3%	5.8%	5.5%
<i>LIHEAP recipient households</i>					
All fuels	52.9	\$717	6.5%	3.4%	5.0%
Natural gas	61.1	\$673	6.4%	3.5%	4.7%
Electricity	8.8	\$237	3.4%	1.8%	1.7%
Fuel oil	96.8	\$1,686	12.5%	10.0%	11.8%
Kerosene	24.4	\$386	4.1%	4.4%	2.7%
LPG <sup>6/</sup>	45.2	\$1,052	6.9%	4.2%	7.4%

<sup>1/</sup>Data are derived from the 2005 RECS, adjusted to reflect FY 2007 heating degree days and fuel prices. Data represent home energy used from October 2006 through September 2007.

<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 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 2007 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 2007 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 2007; and (3) dividing the adjusted figures by the average income for each group of households from the 2007 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.

## 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. 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 defined 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 2007, average home cooling consumption for households that cooled was 8.7 mmBTUs, average expenditures were \$275, and mean individual home cooling burden was 1.1 percent.

For households that cooled, low income households had average home cooling energy consumption of 7.0 mmBTUs (nearly 20 percent less than the average for all households) and average home cooling expenditures of \$223 (about 19 percent less than the average for all households). The mean individual home cooling burden for low income households was 2.1 percent, almost twice the average home cooling burden of all households and more than four times that of non low income households.

For households that cooled, average home cooling consumption for LIHEAP recipient households was 5.1 mmBTUs (about 41 percent less than all households), and average home cooling expenditures were \$162 (41 percent less than all households). Mean individual home cooling burden for LIHEAP recipient households was 1.4 percent, 1.27 times the average for all households. On average, LIHEAP recipient households consumed over 27 percent fewer BTUs for cooling than did all low income households.



**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 2007<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	8.7	\$275	1.1%	0.4%	0.4%
Non low income households	9.6	\$301	0.5%	0.3%	0.3%
Low income households	7.0	\$223	2.1%	0.9%	1.3%
LIHEAP recipient households	5.1	\$162	1.4%	0.6%	1.1%

<sup>1/</sup>Data are derived from the 2005 RECS, adjusted to reflect FY 2007 cooling degree days and fuel prices. Data represent residential energy used from October 2006 through September 2007.

<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 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 2007 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 2007 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 2007; and (3) dividing the adjusted figures by the average income for each group of households from the 2007 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 with incomes below the greater of 150 percent of poverty or 60 percent of State median income. Based on estimates from the 2007 CPS ASEC, the more restrictive definition excludes 11 million households of the 33.6 million households that meet the definition of LIHEAP income eligible households. Therefore, differences in FY 2007 home energy data reported in this section and that reported in other parts of this *Notebook* are the result of the difference in definition of “low income.”<sup>17</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.

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<sup>17</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 costs and consumption data furnished by the household's fuel supplier.
Composite price	The weighted average price of electricity, natural gas, and fuel oil used for residential purposes.
Real dollar expenditures	Costs adjusted for changes in the price of a market basket of consumer goods between two years (adjusted for inflation or deflation).
Cooling degree days	Daily cooling degree days are computed by subtracting a base temperature (65 degrees Fahrenheit) from a day's mean temperature when it exceeds 65 degrees Fahrenheit. If the mean temperature on a day is 70, the number of cooling degree days experienced on that day is 5 (70 minus 65). In this <i>Notebook</i> , we refer to annual cooling degree days, or the sum of all cooling degree days experienced during a year.
Dollar expenditures	Actual costs as reported in the year of the energy survey (unadjusted for inflation or deflation). Unless noted otherwise all dollar expenditures are unadjusted.
Energy burden	The share or percentage of annual household income that is used to pay annual energy bills. <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 2007	
Survey <sup>2/</sup>	NIECS	RECS	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	2007	
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>18</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>19</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>18</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>19</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

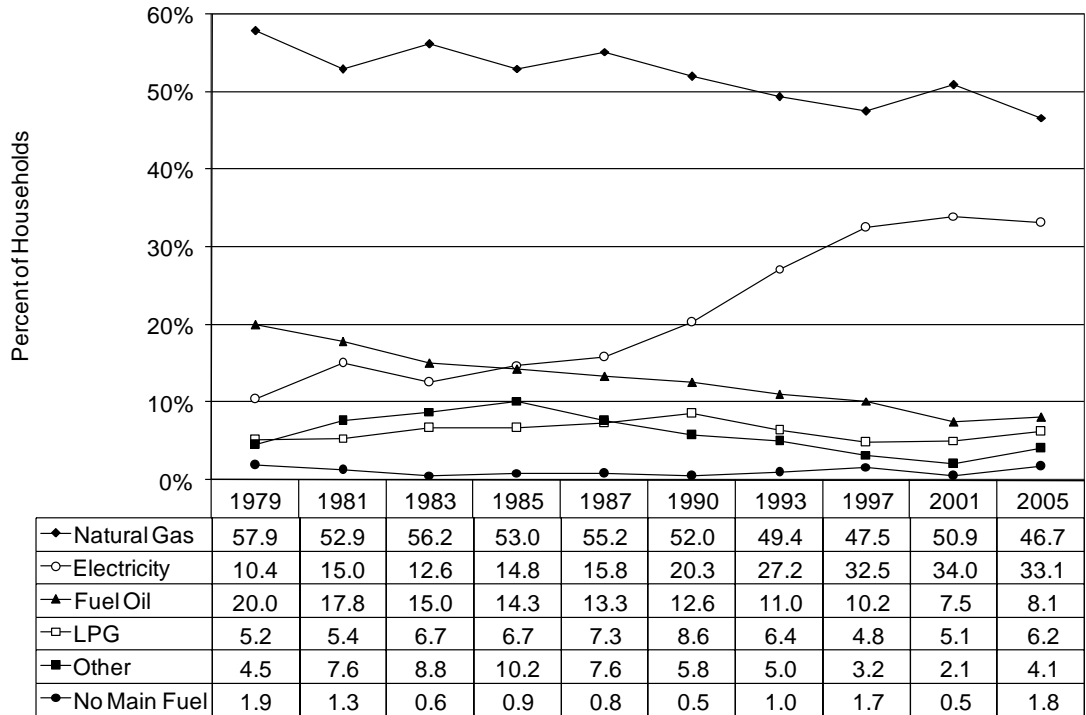
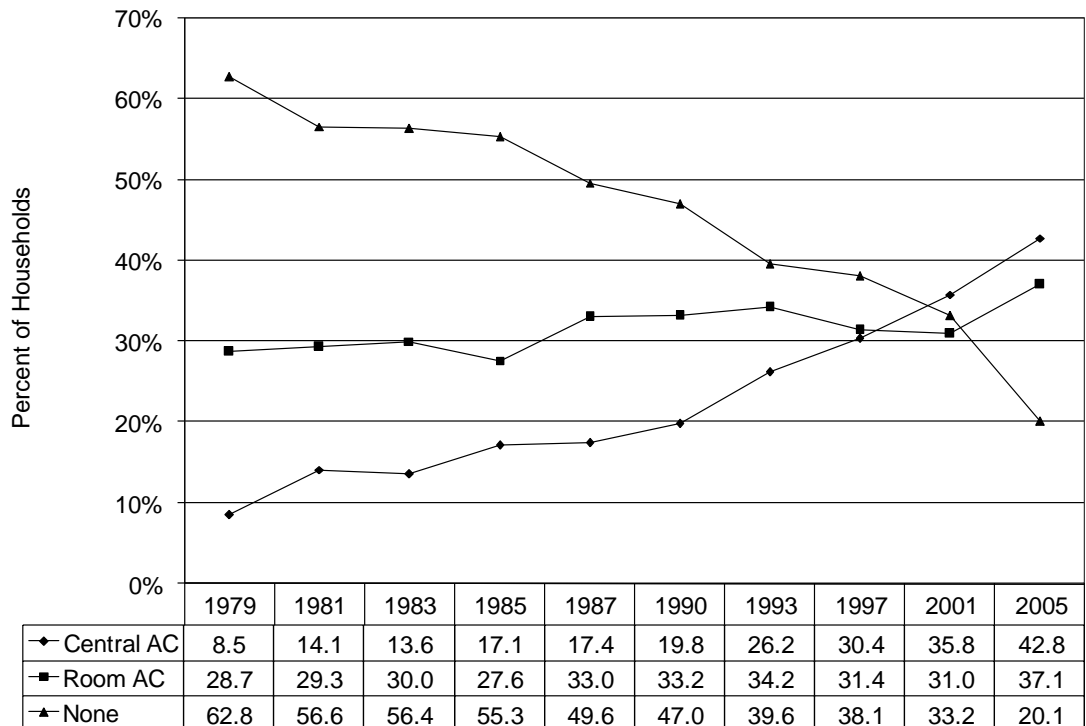


Figure 3-2. Air-conditioning type for households with incomes at or below 150 percent of HHS' poverty guidelines, 1979 to 2005



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 2007. 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>20</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 2007.

**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 2007**

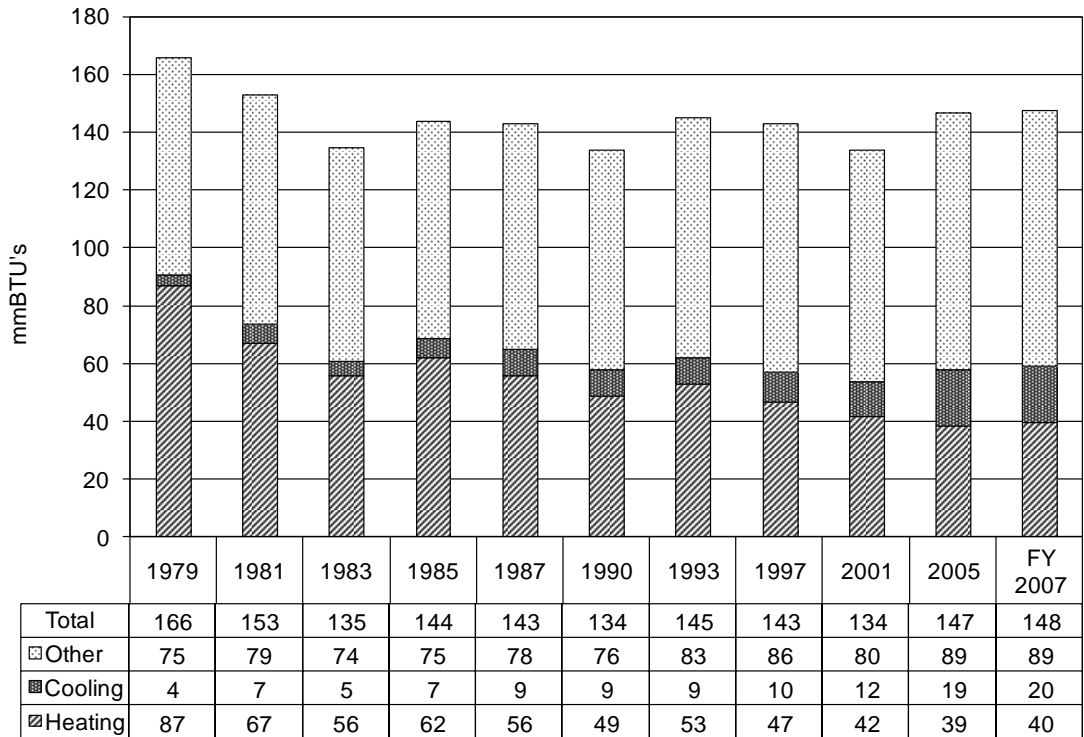
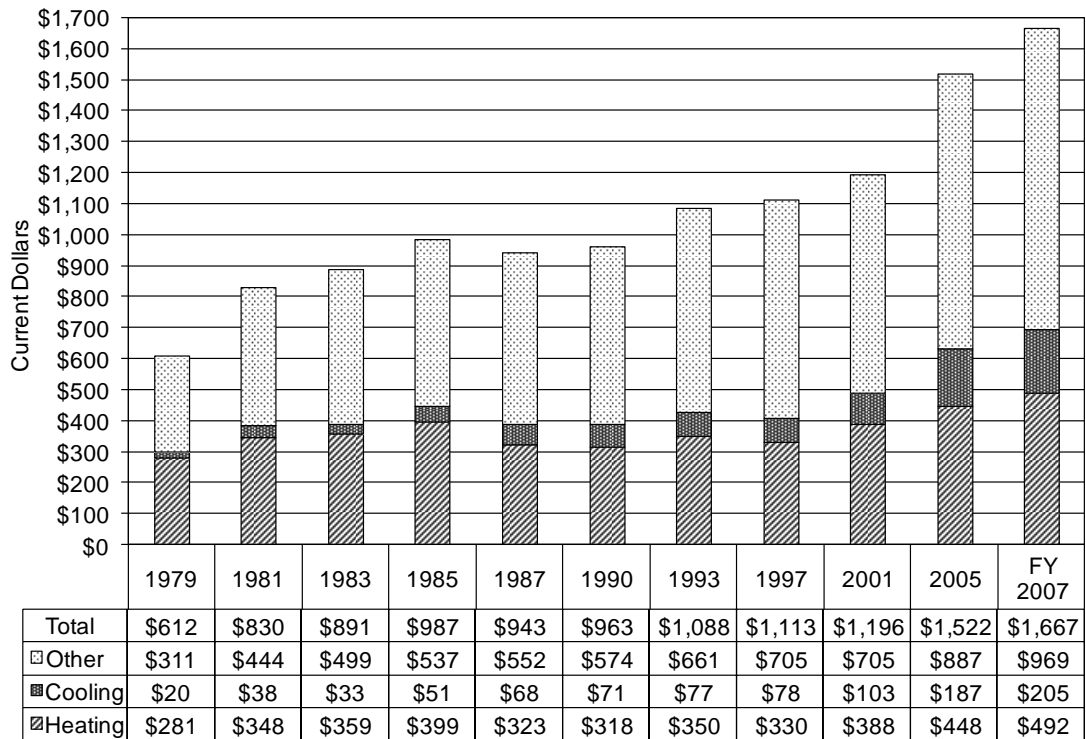


Figure 3-4, on the next page, shows that residential energy expenditures for low income households increased rapidly from 1979 to 1985; the increases were the result of fuel price increases. Examination of the components of energy expenditures indicates that the greatest increases were in home cooling and other residential expenditures, while increases in home heating expenditures were more moderate until 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 2007, mean residential energy expenditures rose by almost 10 percent to \$1,667. 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 1997

<sup>20</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.

and a 15 percent increase in 2005 over 2001. Mean home heating expenditures rose by almost 10 percent in FY 2007. The increase in expenditures in 2005 and FY 2007 were the result of higher fuel prices. Mean home cooling expenditures rose continuously from \$51 in 1985 to \$187 in 2005. In FY 2007 mean home cooling expenditures were \$205.

**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 2007**



The next series of Figures, 3-5 through 3-7, furnishes information on energy burden for low income households.<sup>21</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>22</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 RECS and CPS ASEC data, the energy burden for each individual household in a given set (such as low income households) and then taking the mean of these energy burdens for all households in that set.
- *Median Individual Burden:* Computed by finding, using RECS and CPS ASEC data, the energy burden for each individual household in a given set (such as low income households)

<sup>21</sup>These figures present gross burden statistics; they do not account for the reduction in burden attributable to the receipt of LIHEAP benefits. Figure 3-26 compares gross burden and net burden for LIHEAP recipient households.

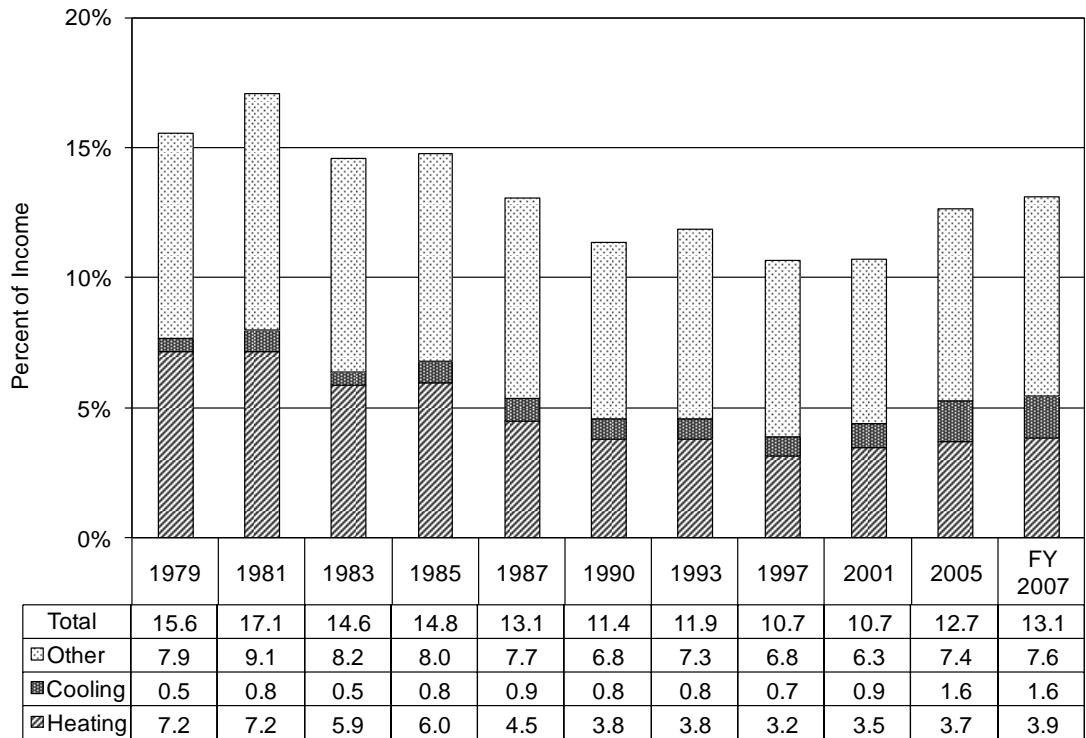
<sup>22</sup>The mean is the sum of all values divided by the number of values, or what is commonly called the average. The median is the value at the midpoint in the distribution of values.

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

Mean group burden is the burden statistic that has been used in the series of *LIHEAP Annual Reports to Congress*. Recent technical research has furnished additional insights on the range of alternative burden summary statistics.<sup>23</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. This increase in home energy burden was the result of the dramatic increase in expenditures for home energy due to higher prices. In FY 2007, burden rose slightly to 5.5 percent because expenditures rose. Home energy burden for FY 2007 was over 25 percent higher than in 2001, almost 4 percent higher than in 2005, but was 31 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 2007**



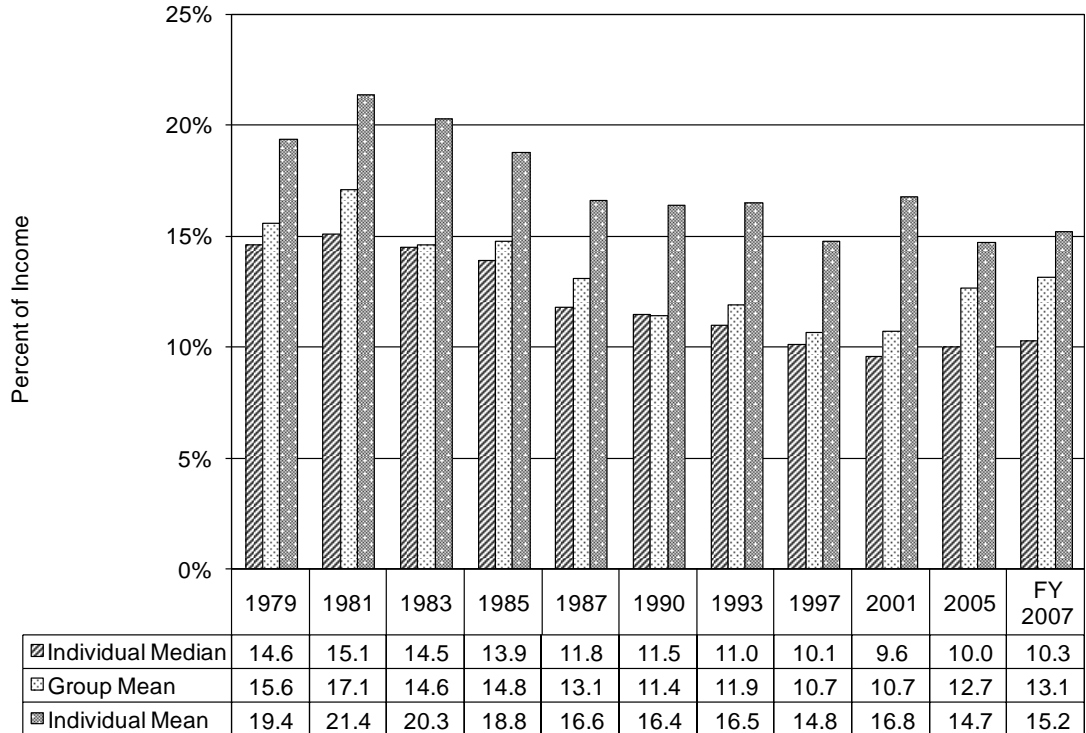
Figures 3-6 and 3-7 show how the mean individual and median individual energy burden statistics compare to the group energy burden statistics. Figure 3-6 shows the trends in residential energy burden for low income households, and Figure 3-7 shows the trends in home energy burden for low income households. In 2005, the mean individual residential energy burden was 14.7 percent, significantly higher than the median individual burden of 10.0 percent and the mean group burden of 12.7 percent. In 2005, the mean individual home energy burden was 6.8 percent, the median

<sup>23</sup> See Appendix A for additional information on the interpretation of alternative burden statistics.

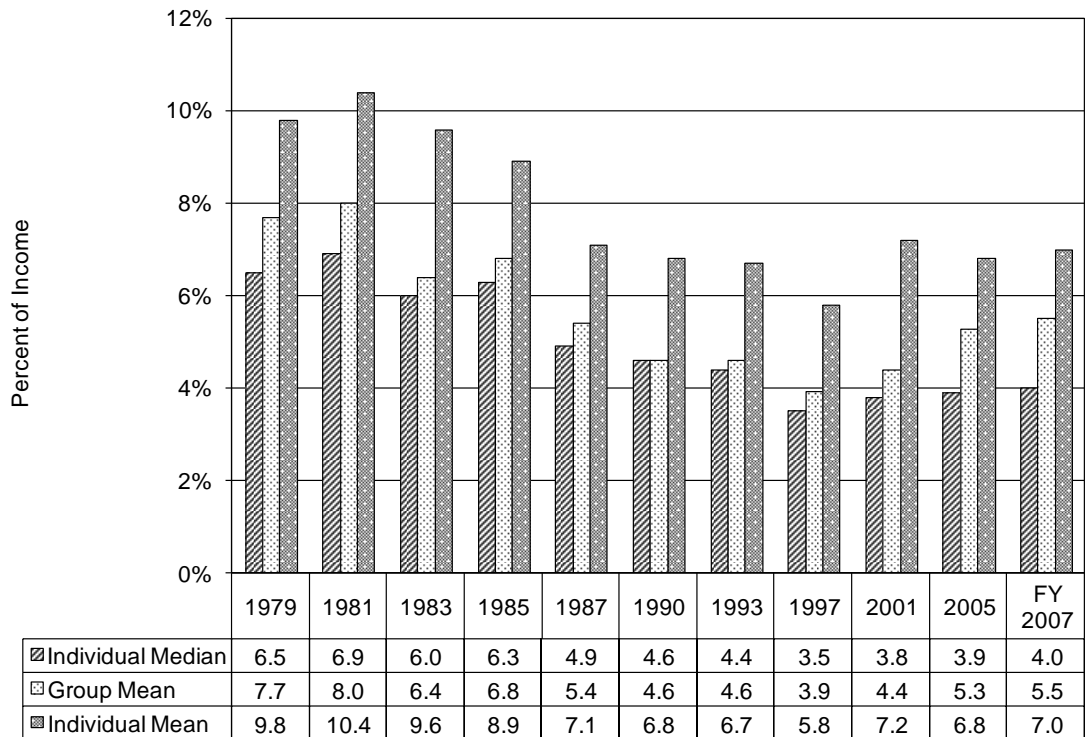


individual burden was 3.9 percent, and the mean group burden was 5.3 percent. For all three summary statistics, the highest home energy burden occurred in 1981 and the lowest home energy burden occurred in 1997. For FY 2007, median individual residential energy burden was nearly 32 percent lower, group mean burden was 23 percent lower, and individual mean burden was 29 percent lower than the 1981 peak.

**Figure 3-6. Comparison of mean group, mean individual, and median individual residential energy burden for households with incomes at or below 150 percent of HHS' poverty guidelines, 1979 to FY 2007**



**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 2007**



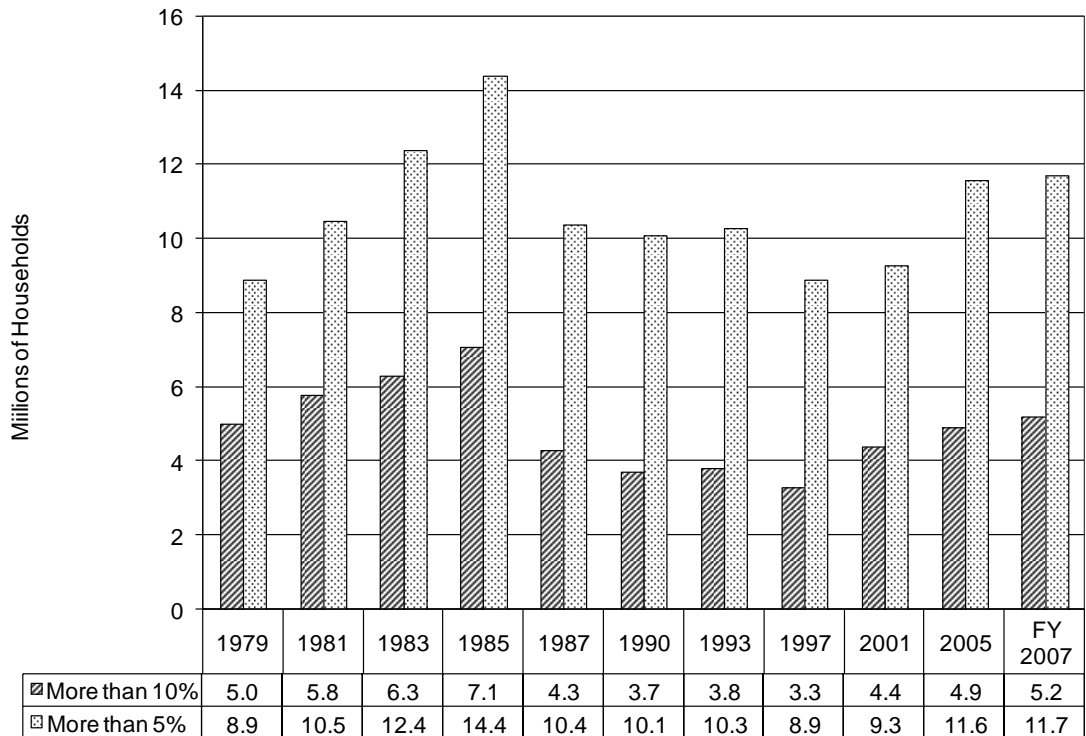
Figures 3-8 and 3-9 present information on the number and percent of low income households that had home energy burdens that exceeded specified levels. The levels are reference points and do not represent any judgment regarding an “affordable” level of energy burden.

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 2007, the percent of households exceeding the specified levels remained approximately the same, while 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 2007 was 27 percent less than the 1985 level and 4 percent more than the 1979 level.

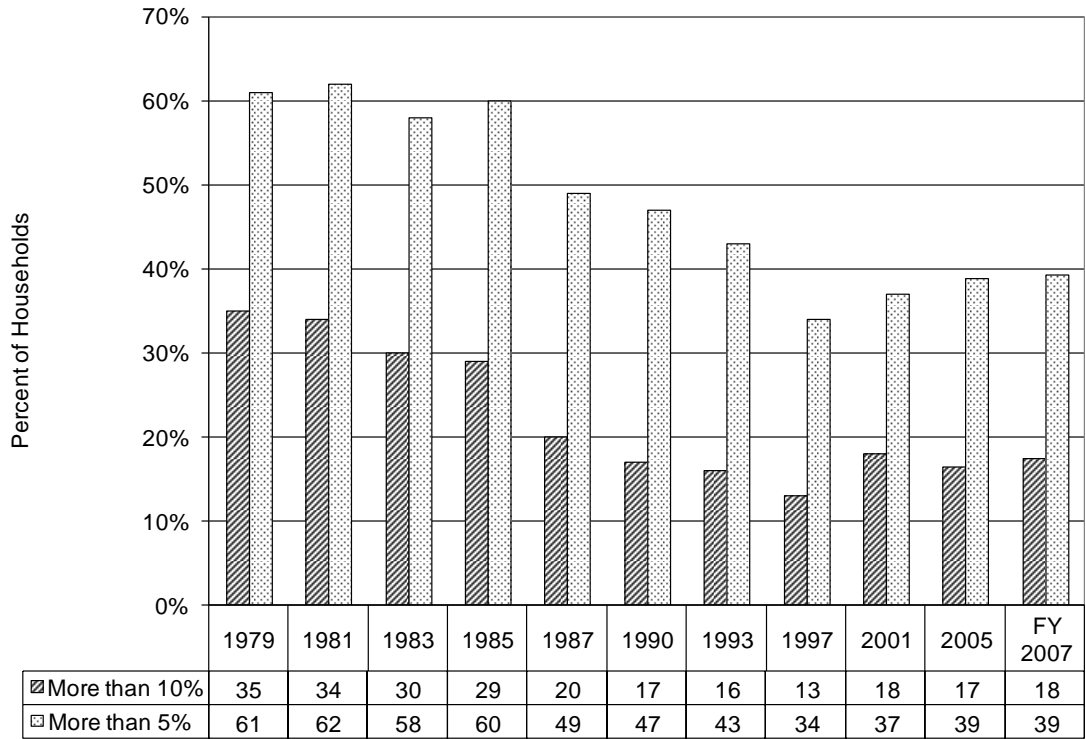
Figure 3-10 shows the total assistance funding that would be required to reduce the home energy burden for all low income households to 10 percent of income and 5 percent of income.<sup>24</sup> The amount required for a reduction in the home energy burden of low income households to 5 percent of income was \$2.2 billion in 1979, \$4.6 billion by 1985, \$3.3 billion in 2001, \$5.5 billion in 2005, and \$6.3 billion in FY 2007. 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 2007, while the number of low income households exceeding the percent of income reference points increased, their average expenditures increased. Therefore, total dollars of assistance funding required to reduce home energy burdens rose substantially.

**Figure 3-8. Number of low income households spending over 5 percent and 10 percent of income on home energy, 1979 to FY 2007**



<sup>24</sup> This is calculated first by finding the amount of funding for each low income household that would be required to reduce its home energy burden to the specified percent of income. This amount is the difference between the household's actual home energy burden and the specified home energy burden ( the dollar amount of the specified percent of household income). Then the household amounts are aggregated to produce the total assistance funding that is needed for all low income households.

**Figure 3-9. Percent of low income households spending over 5 percent and 10 percent of income on home energy, 1979 to FY 2007**



**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 2007**

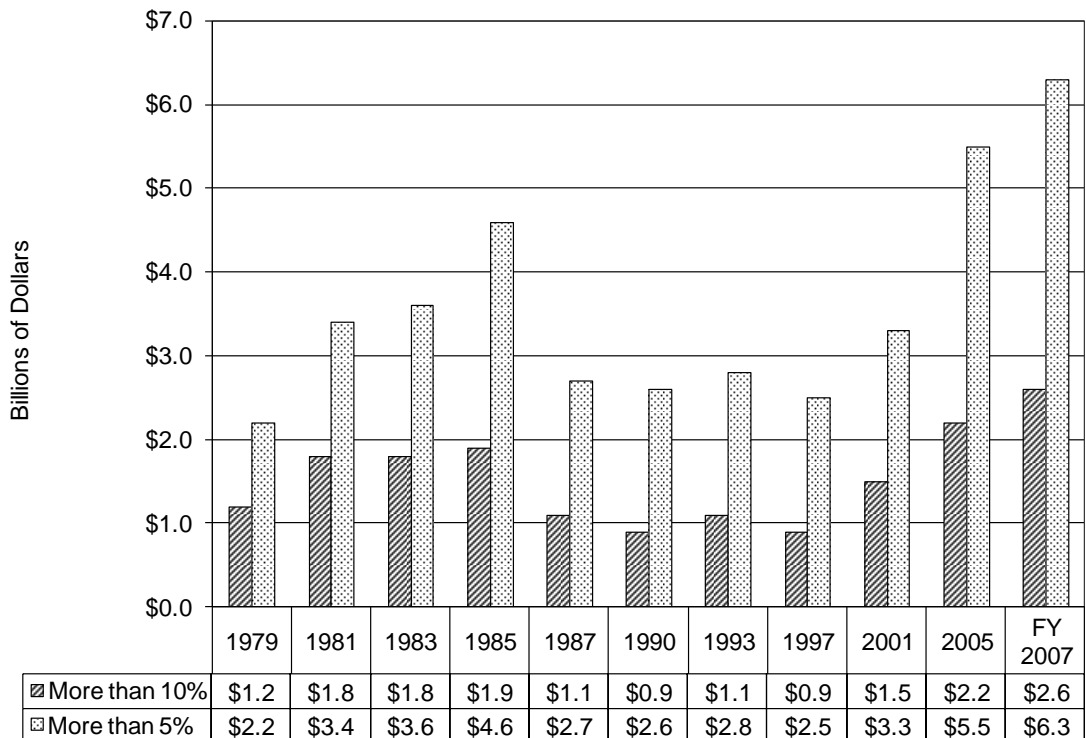
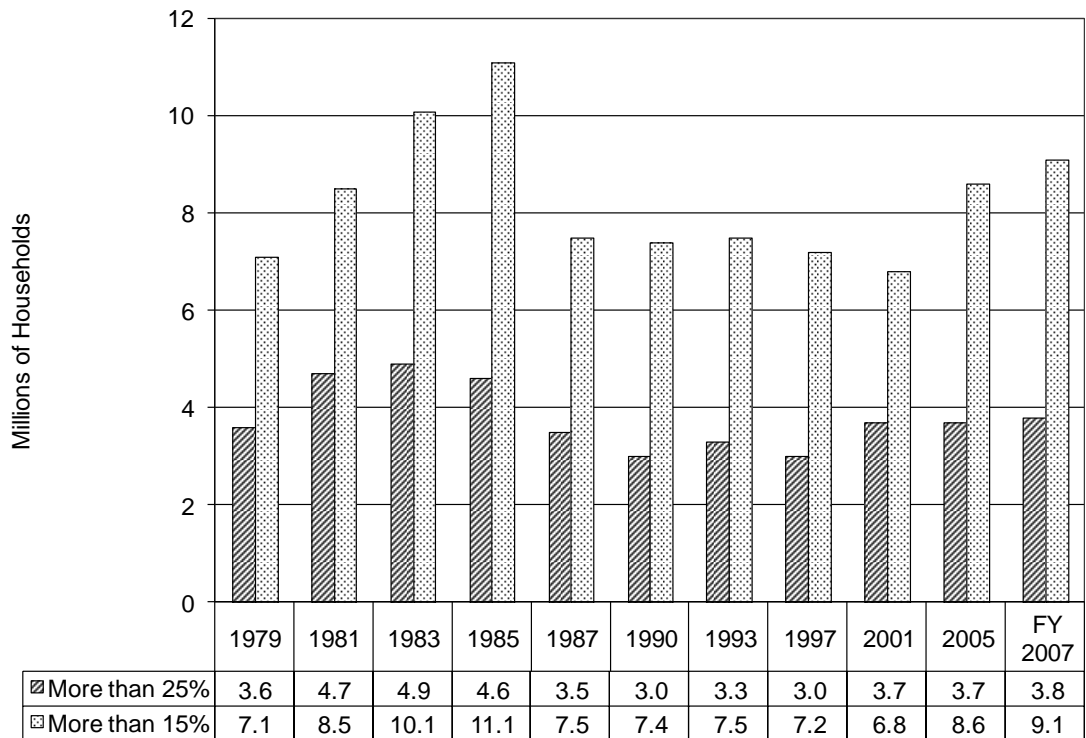


Figure 3-11 furnishes statistics on the number of low income households that had residential energy expenditures that exceeded specified levels. Figure 3-12 furnishes statistics on total fuel assistance dollars needed to reduce residential energy burden to specified levels. Figure 3-11 shows that the 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 income were lower in FY 2007 than during the peak years, they remained high. Figure 3-12 demonstrates that the funds required to reduce all low income households to the specified percentages reached their highest levels in FY 2007.

**Figure 3-11. Number of low income households spending over 15 percent and 25 percent of income on residential energy, 1979 to FY 2007**



**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 2007**

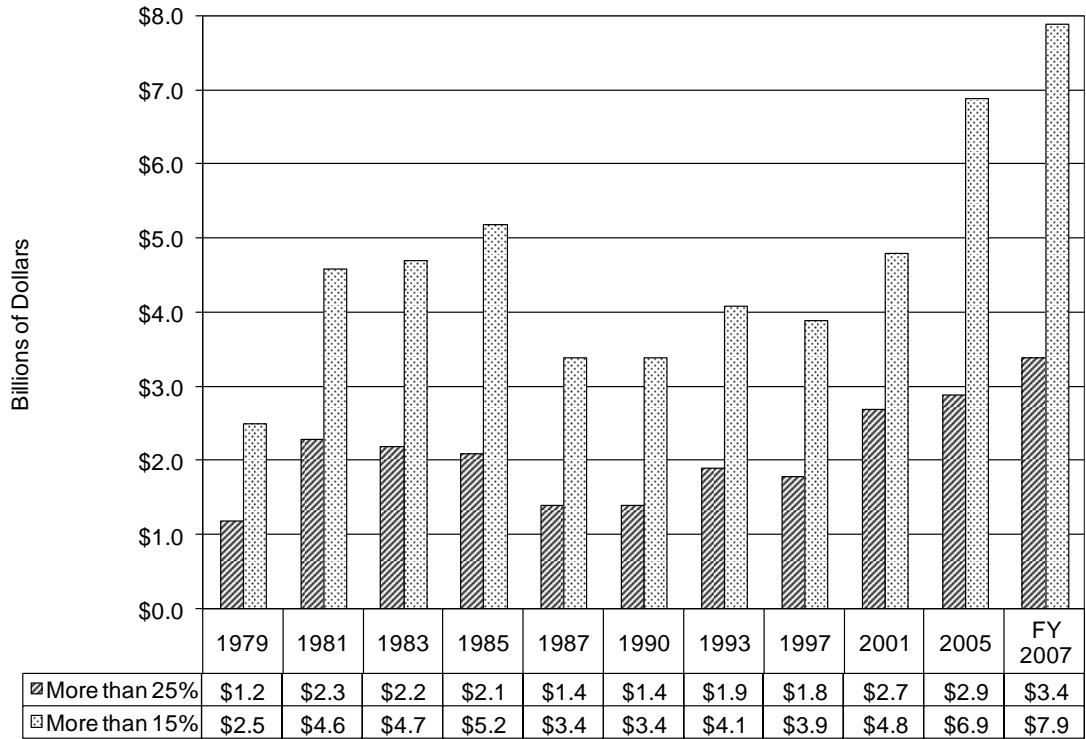


Figure 3-13 shows how the aggregated residential energy bill for all low income households has changed from 1979 to FY 2007. In 1979, the aggregated home energy bill for low income households was \$4.5 billion. By FY 2007, the aggregated home energy bill had grown to \$16.0 billion. This growth results from both the increase in average home energy bills and growth in the size of the low income population.

Figure 3-13 also shows that in 1979, home energy accounted for about half of the total low income residential energy bill. In FY 2007, home energy accounted for 41.8 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 2007**

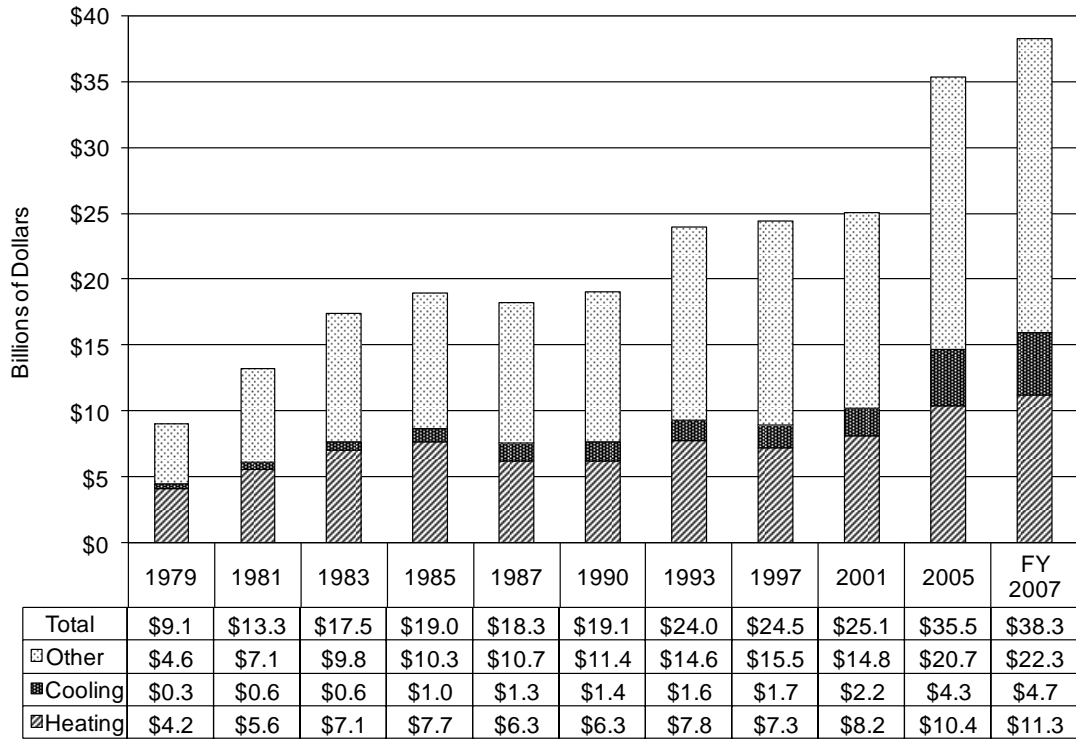
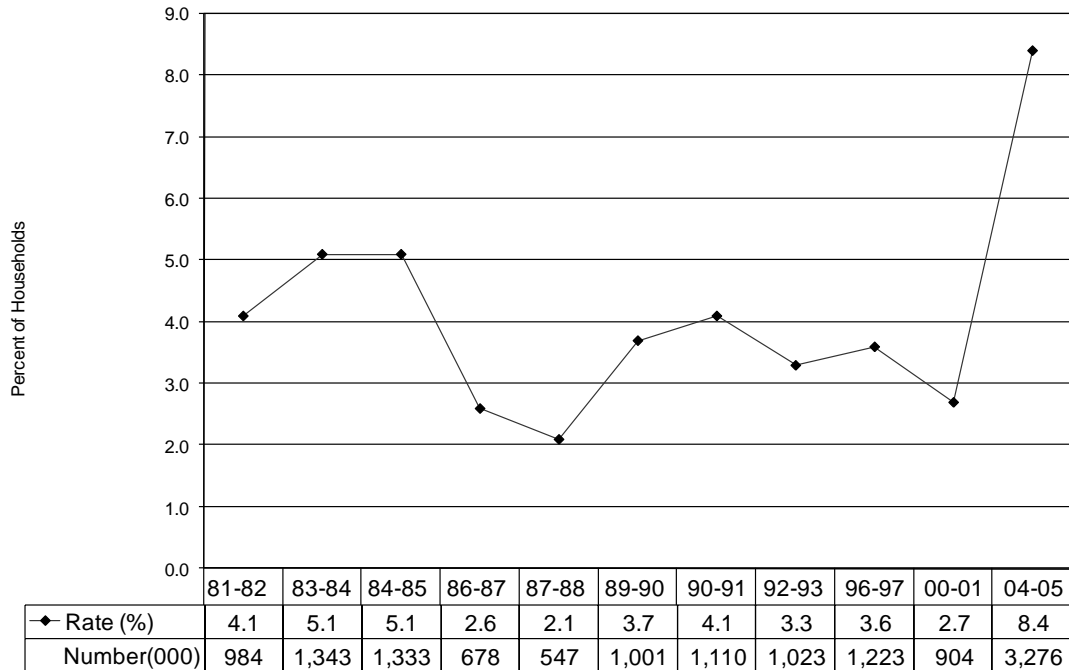


Figure 3-14, on the next page, demonstrates the impact of energy burden on LIHEAP income eligible households. It shows the number of LIHEAP income eligible households that reported that they were unable to use their main source of heat for a period of two hours or more during the heating season because they were unable to pay for their main heating fuel. During 1981-82, 984 thousand LIHEAP income eligible households (4.1 percent of LIHEAP income eligible households) had heat interruptions during the heating season. The number and percentage grew to 1.34 million (5.1 percent) in 1983-84 and then fell consistently to 547 thousand (2.1 percent) in 1987-1988. In 1989-90 there was a sharp increase to 1.0 million (3.7 percent). This higher level of heat interruptions was sustained in 1990-91 when 1.1 million (4.1 percent) LIHEAP income eligible households had heat interruptions and in 1992-93 when 1.0 million (3.3 percent) LIHEAP income eligible households had heat interruptions. The number and percentage increased to 1.2 million (3.6 percent) in 1996-97. In 2000-01, the number and percentage of LIHEAP income eligible households with heat interruptions decreased to 904 thousand (2.7 percent). The number and percentage increased substantially to 3.3 million (8.4 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>25</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 2007. 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

<sup>25</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.



increased 45 percent over 1997 prices. The increase in fuel prices explains why expenditures also rose. In FY 2007 prices increased again and once more contributed to an increase in expenditures.

**Figure 3-15. Index of dollar prices for fuel oil, natural gas, electricity, and a composite compared to the Consumer Price Index (CPI), 1979 to FY 2007**

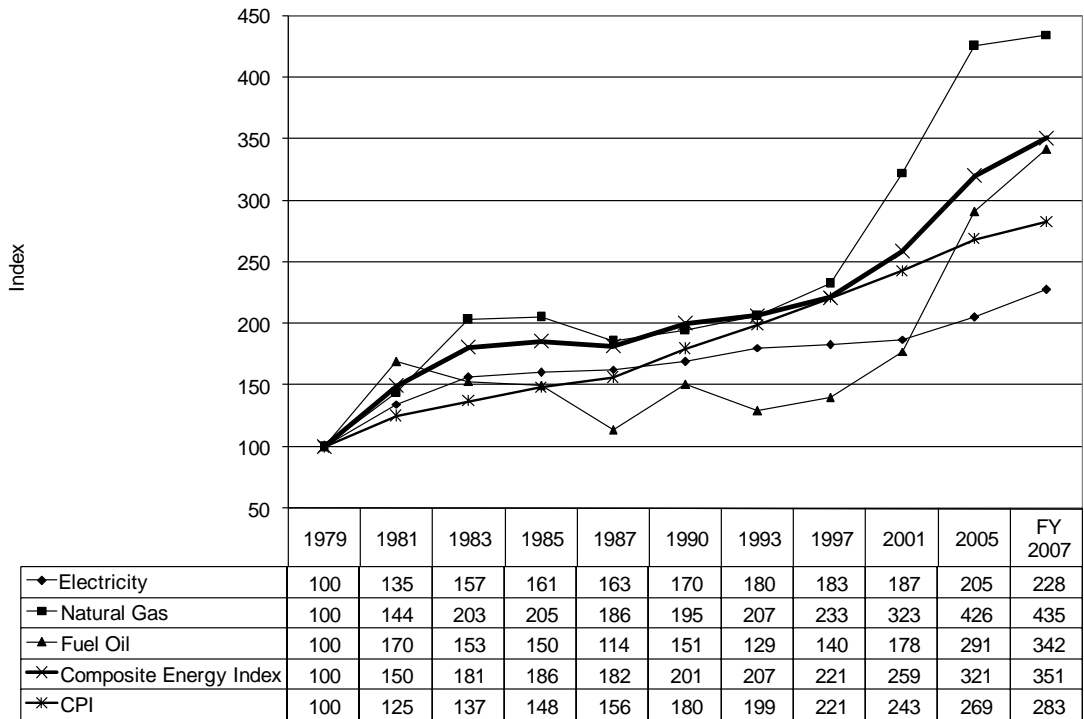


Figure 3-16 demonstrates how changes in heating energy consumption from 1979 to FY 2007 compared to changes in heating degree days for the same period. From 1979 to 1983, home heating consumption fell more rapidly than did heating degree days, suggesting a significant increase in efficiency as a result 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. In FY 2007, both consumption and heating days increased slightly, and consumption per heating degree day remained unchanged.

**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 2007**

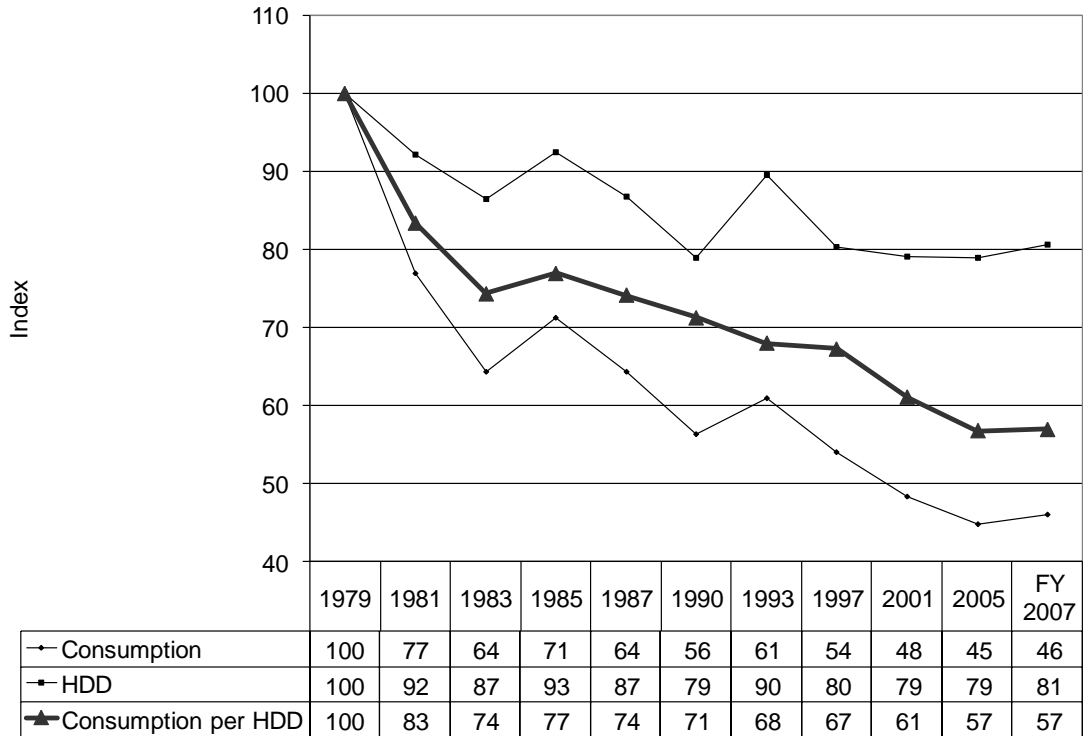
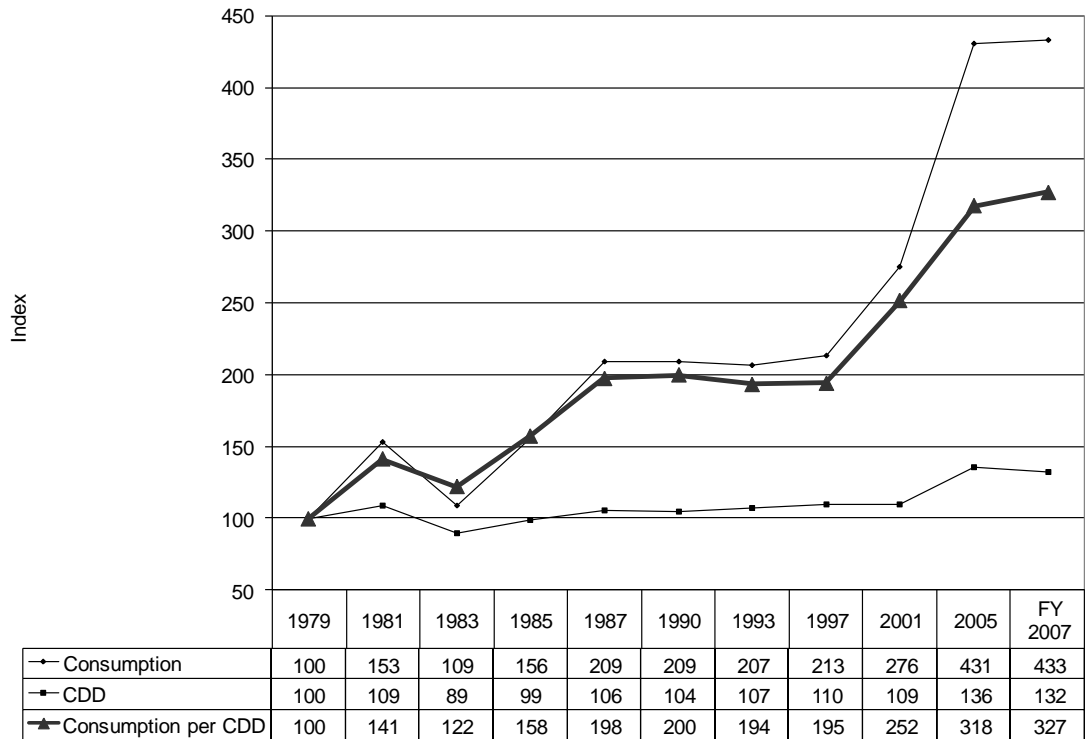


Figure 3-17 shows that home cooling consumption trends are somewhat more complex than are home heating consumption trends. In FY 2007, mean home cooling consumption was much higher than it was in 1979, even though households experienced only slightly more cooling degree days. Thus, mean consumption per cooling degree day increased substantially from 1979 to FY 2007, 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>26</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 2007 or year-to-year changes in consumption in response to changes in cooling degree days.

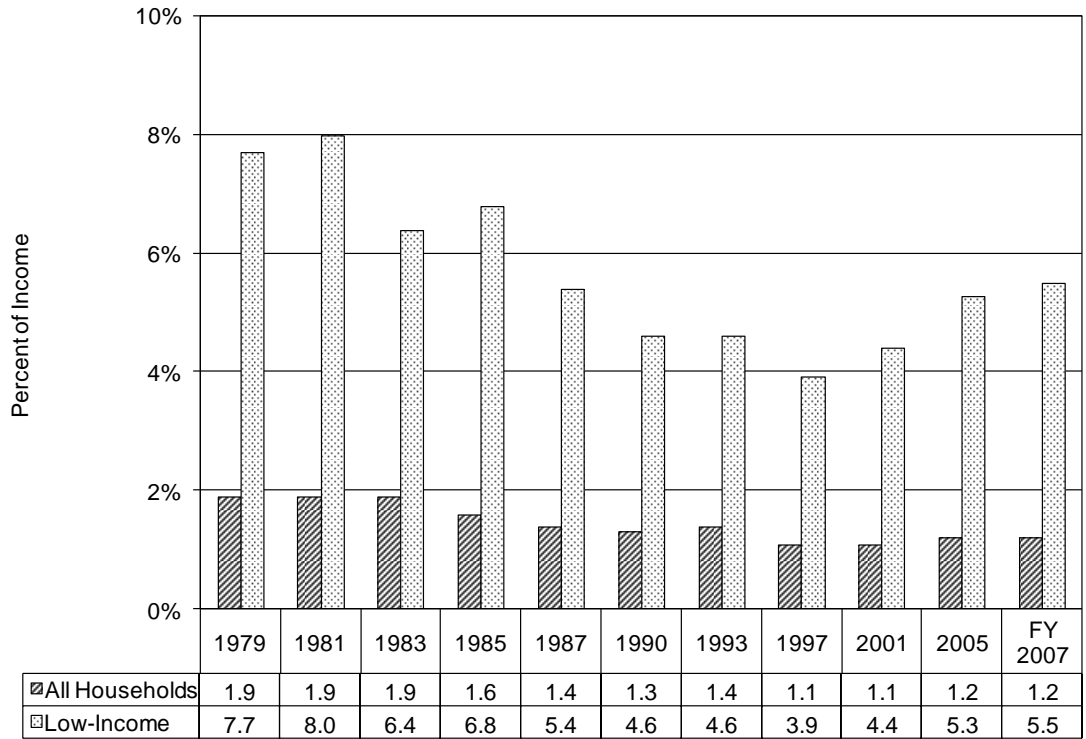
<sup>26</sup>Air-conditioning equipment includes central air conditioners and window or wall units, ceiling fans, and evaporative coolers. The availability of all household appliances increased for low income households over this period due to the overall increase in the wealth of the nation and the 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 2007**

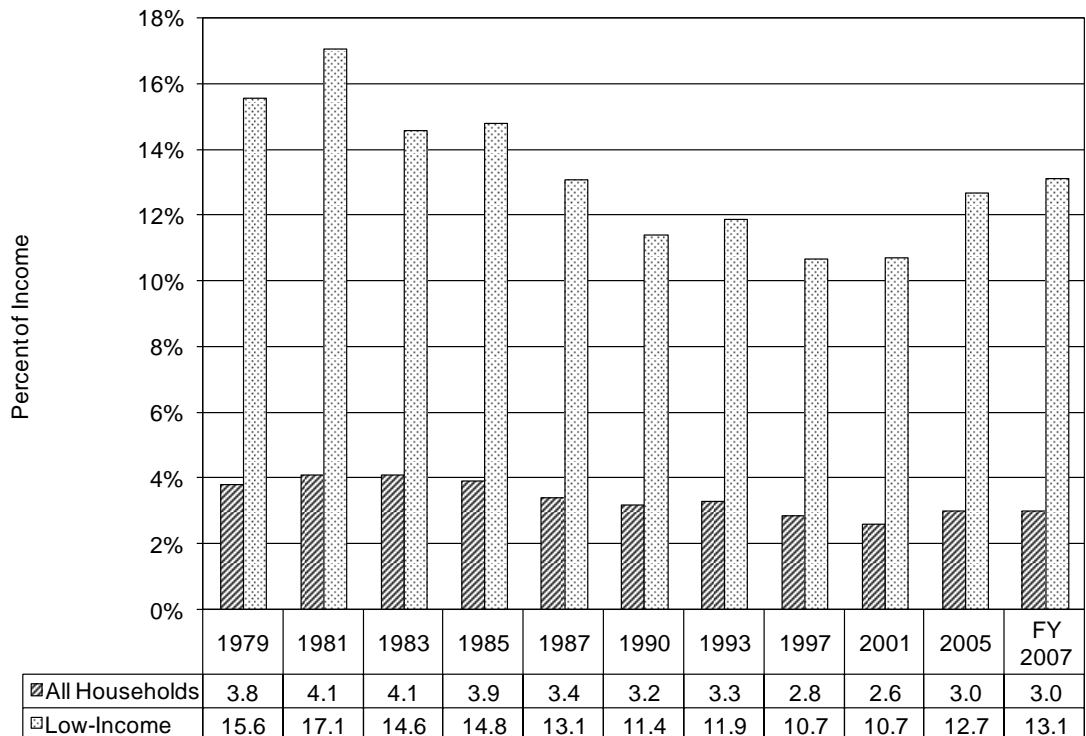


Figures 3-18 and 3-19, on the next page, show that the mean group energy burden for low income households is substantially higher than that for all households. In FY 2007, the mean group home energy burden for all households was 1.2 percent, and that for low income households was 5.5 percent. In FY 2007, the mean group residential burden was 3.0 percent for all households and 13.1 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 2007, 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 2007**



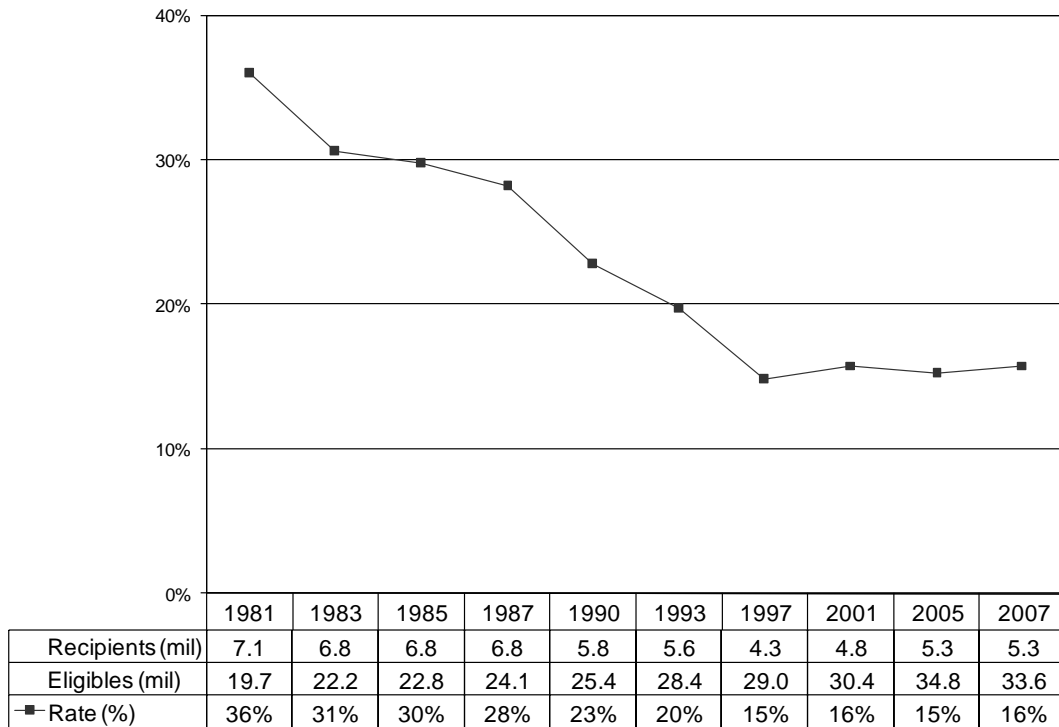
**Figure 3-19. Mean group residential energy burden for all households and for households with incomes at or below 150 percent of HHS' poverty guidelines, 1979 to FY 2007**



## Trends in LIHEAP

Figures 3-20 through 3-24 furnish information on trends for HHS' energy assistance programs from FY 1981 through FY 2007. Figure 3-20 shows that the percentage of LIHEAP income eligible households that has been assisted has fallen significantly over time but has been steady at about 16 percent in recent years. In FY 1981, 36 percent of eligible households received heating and/or winter crisis assistance benefits, but this number fell to 15 percent in 1997.<sup>27</sup> By FY 2007, 16 percent of LIHEAP income eligible households received those benefits. Figure 3-21, on the next page, furnishes statistics on the count of recipients by benefit type.

**Figure 3-20. Percentage of LIHEAP/LIHEAP Federally eligible households receiving LIHEAP/LIHEAP heating and/or winter crisis assistance, FY 1981 to FY 2007**

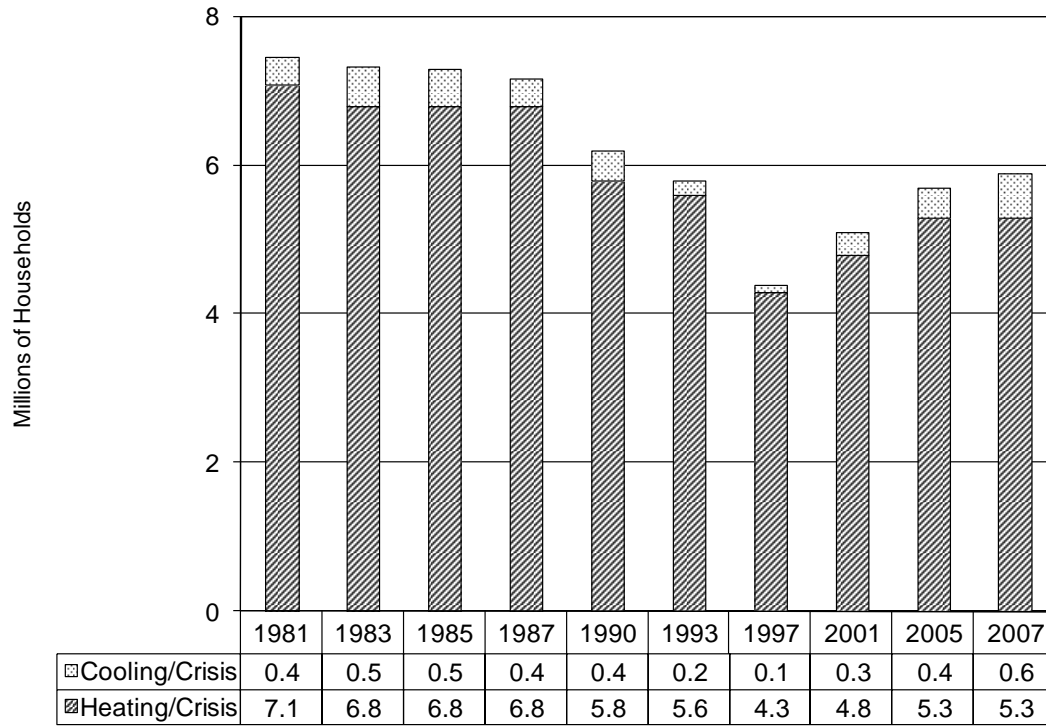


NOTE: The FY 1981 estimate of LIHEAP income eligible households is not directly comparable to those of the other years.

SOURCE: HHS Administrative Data — such data for FY 2007 are preliminary; thus the actual figures may differ.

<sup>27</sup>Note that the Federal income eligibility guidelines for the FY 1981 Low Income Energy Assistance Program (LIEAP) were different from those for subsequent LIHEAP programs included in the table.

**Figure 3-21. Number of households receiving LIHEAP/LIHEAP heating and/or winter crisis assistance or cooling and/or summer crisis assistance, FY 1981 to FY 2007<sup>1/</sup>**

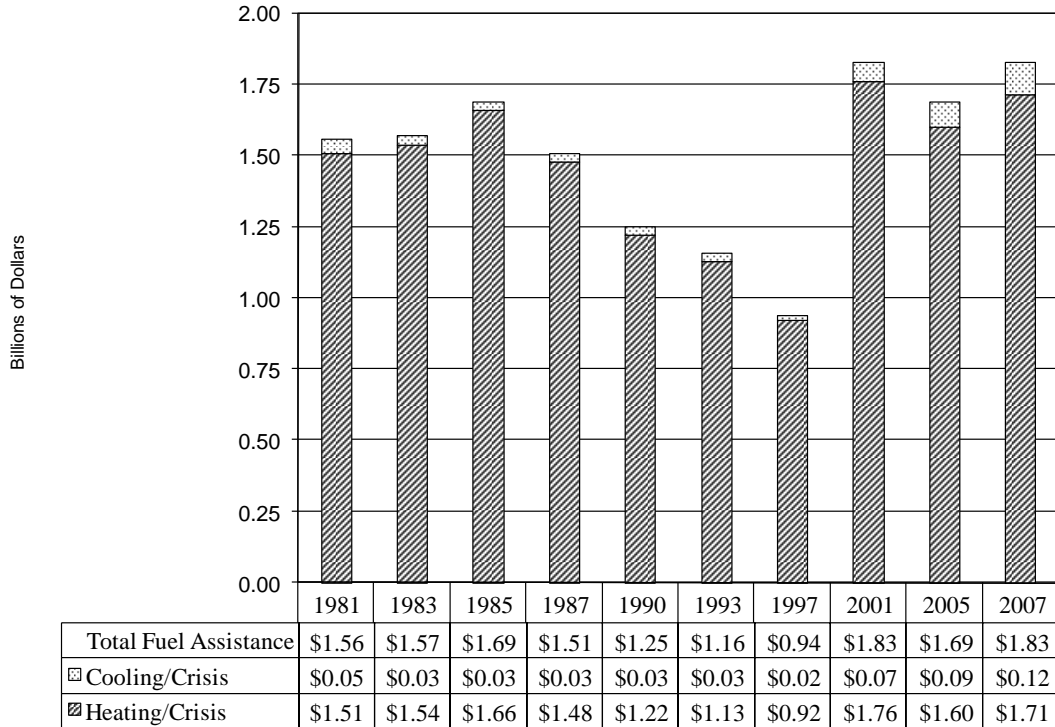


SOURCE: HHS Administrative Data — such data for FY 2007 are preliminary; thus the actual figures may differ.

<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 2001 & 2007, when \$1.83 billion dollars were used for heating and cooling assistance benefits, and lowest in FY 1997 when \$0.94 billion dollars were used for assistance benefits. The large funding increase for FY 2001 was due in part to the substantial increase in funds for cooling assistance benefits. In FY 2007, funding for cooling assistance reached its highest level to date. Funding for heating assistance benefits was \$1.71 billion dollars.

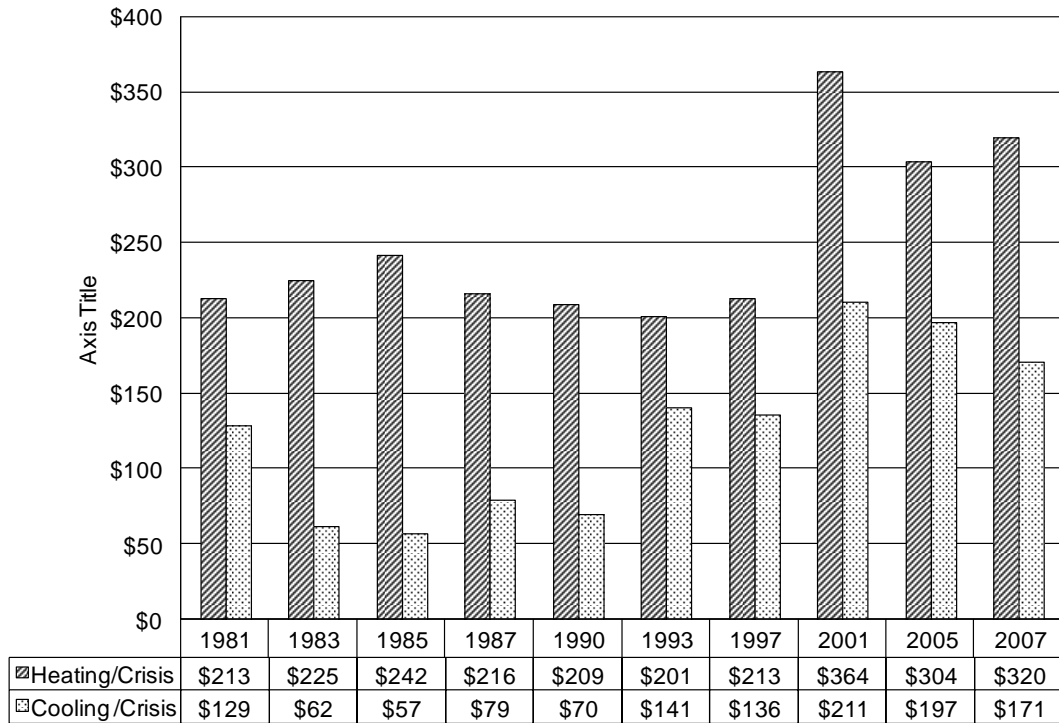
**Figure 3-22. Funds used for LIEAP/LIHEAP fuel assistance, FY 1981 to FY 2007**



SOURCE: HHS Administrative Data — such data for FY 2007 are preliminary; thus the actual figures may differ.

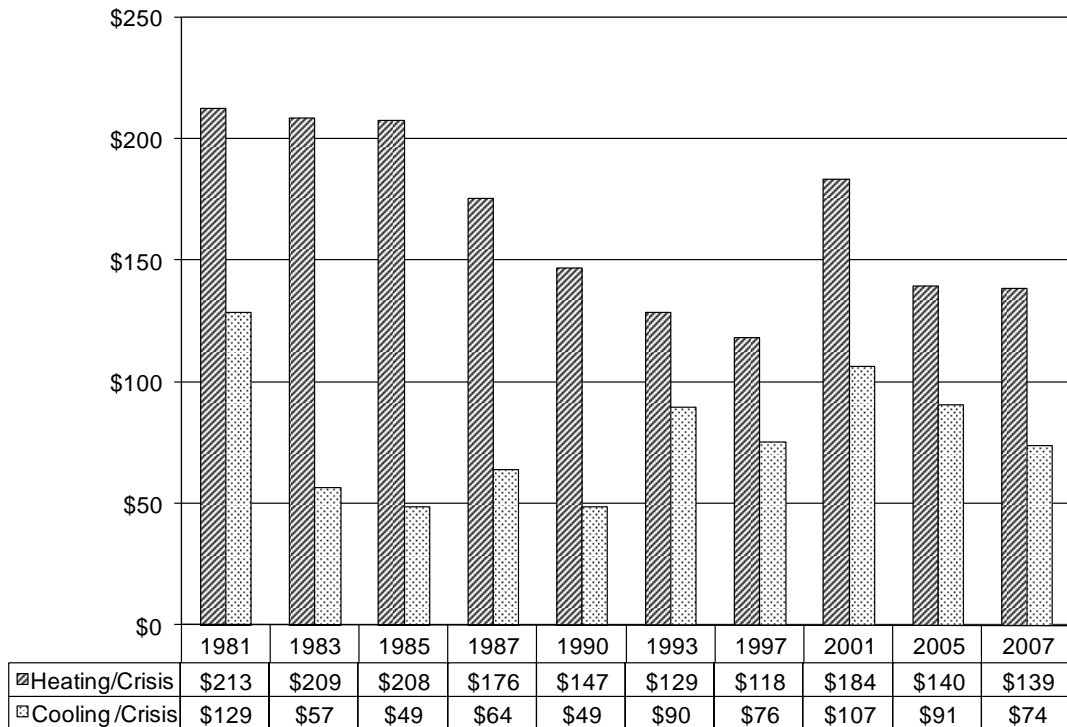
Figure 3-23 on the following page shows that the mean heating/winter crisis benefits received by LIHEAP recipients were highest in FY 2001. For the years shown, mean heating/winter crisis benefits were \$213 in FY 1981, grew to \$242 in FY 1985, fell back to \$213 in 1997 then rose to \$320 in FY 2007. Figure 3-24 shows that, after adjusting for inflation, the mean value of benefits has fallen substantially. The mean value of heating and/or winter crisis benefits, in 1981 dollars, fell from \$213 in FY 1981 to \$139 in FY 2007. With the exception of FY 1981, mean cooling benefits ranged, in 1981 dollars, from \$49 to \$90 through FY 1997, and rose to \$107 in FY 2001, and then fell to \$91 in FY 2005. In FY 2007, mean cooling benefits decreased to \$74. 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 2007**



SOURCE: HHS Administrative Data — such data for FY 2007 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 2007**



SOURCE: HHS Administrative Data — such data for FY 2007 are preliminary; thus the actual figures may differ.



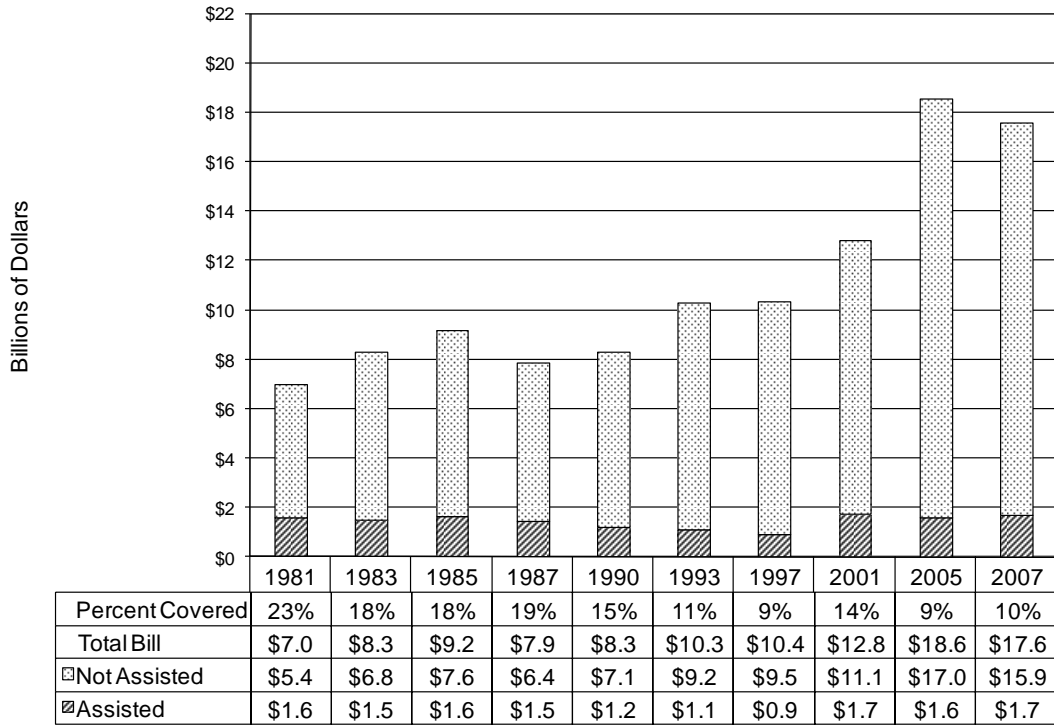
## **Analysis of LIHEAP benefits**

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 10 percent in FY 2007. An increase in the size of the total bill and an increase in the number of households eligible for assistance benefits caused this reduction.

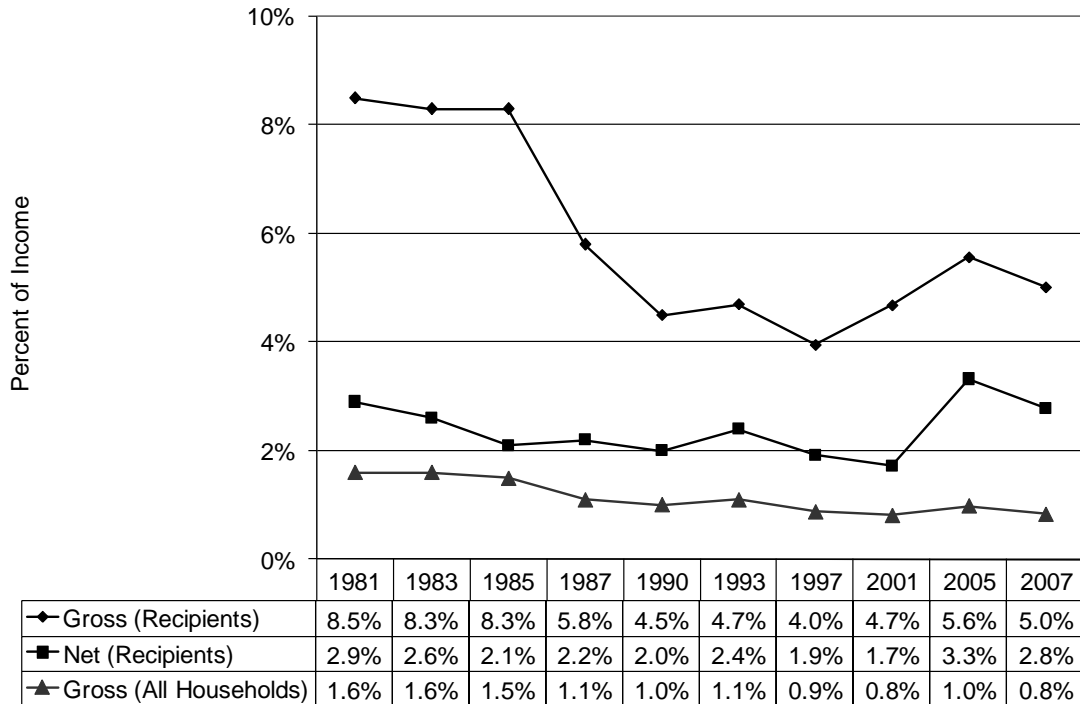
Figure 3-26 shows that the net effect of LIHEAP has been to lower recipient group home heating burdens to levels that are much closer to the levels of the average household. In FY 1981, the gross mean group home heating burden for LIHEAP recipients was 8.5 percent, while the net mean group home heating burden (home heating expenditures minus LIHEAP benefits) was 2.9 percent. In FY 2007, the gross mean group home heating burden for LIHEAP recipients was 5.0 percent, while the net mean group home heating burden was 2.8 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 and FY 2007 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 2007, the net mean group home heating burden for LIHEAP recipients decreased slightly to 2.8 percent.

**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 2007**



SOURCE: Assistance number from HHS data and heating bill estimates from RECS — HHS data for FY 2007 are preliminary; thus the actual figures may differ.

**Figure 3-26. Mean group home heating burden for all households and LIHEAP/LIHEAP heating and winter crisis recipient households, FY 1981 to FY 2007**



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

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

The Government Performance and Results Act of 1993 (GPRA), Public Law 103-62, focuses on program results to provide Congress with objective information on the achievement of statutory objectives or program goals. The resulting performance data are to be used in making decisions on budget and appropriation levels.

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

This Section of the *Notebook* describes ACF's approach to LIHEAP performance measurement and discusses the findings from ACF-funded research on performance measurement for 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, LIHEAP is unable to serve all of the households that are income eligible under the Federal maximum income eligibility standard. In FY 2007, 16 percent of income eligible households received assistance with their heating costs. Given that limitation, the LIHEAP statute requires LIHEAP grantees to provide, in a timely manner, that the highest level of assistance will be furnished to those households that have the lowest incomes and the highest energy costs or needs in relation to income, taking into account family size. The LIHEAP statute identifies two groups of low income households as having the highest home energy needs:

- *Vulnerable Households*: Vulnerable households are those with at least one member that is a young child, an individual with disabilities, or a frail older individual. The statute does not define the terms "young children," "individuals with disabilities," and "frail older individuals." The primary concern is that such households face serious health risks if they do not have adequate heating or cooling in their homes. Health risks can include death from hypothermia or hyperthermia, and increased susceptibility to other health conditions such as stroke and heart attacks.
- *High Burden Households*: High burden households are those households with the lowest incomes and highest home energy costs. The primary concern is that such households will face safety risks in trying to heat or cool their 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, the LIHEAP program goal is to provide LIHEAP assistance to vulnerable households (with at least one member that is a young child, an individual with disabilities, or a frail older individual) and high-energy burden households (with the lowest incomes and highest home energy costs) whose health and/or safety are endangered by living in homes without sufficient heating or cooling.

Based on the national LIHEAP program goals, ACF has focused its annual performance goals on targeting the availability of LIHEAP heating assistance to vulnerable low income households. In addition, ACF has set an annual efficiency goal for 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.

## **Performance measures**

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

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

An index greater than 100 indicates that the target group'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>28</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 the different aspects of benefit targeting.

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

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

ACF's annual LIHEAP performance measures are:

- Increase the 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.

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<sup>28</sup>In general, the mean (or average) is preferred to the median (or midpoint), as it is more informative. The mean is the sum of all values divided by the number of values, or what is commonly called the average. The median is the value at the midpoint in the distribution of values. LIHEAP benefits are not highly skewed (or distorted) variables; therefore, mean benefits are used to compute the benefit targeting index. Because energy burden is a highly skewed statistic, the median energy burden, which is less affected by extreme values, is used to calculate the burden reduction index.

There is no annual measure for the burden reduction targeting index. The baseline value for the burden reduction targeting index was computed for 2001 using the Residential Energy Consumption Survey (RECS) LIHEAP Supplement. The burden reduction targeting index is updated using the 2005 RECS data.

## **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>29</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>30</sup>

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

## **Performance measurement data sources**

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

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

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

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<sup>29</sup> *LIHEAP Targeting Performance Measurement Statistics: GPRA Validation of Estimation Procedures*, August 2004, prepared by APPRISE Incorporated under PSC Order No. 043Y00471301D.

<sup>30</sup> *LIHEAP Energy Burden Evaluation Study*, March 2005, prepared by APPRISE Incorporated under PSC Order No. 043Y00471301D.

- The income eligible population – According to the Census Bureau, the CPS ASEC furnishes the most reliable national and regional estimates of the number of income eligible households.<sup>31</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.
- 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 2007 were available in October 2007.
- Federal LIHEAP Household Report – The preliminary LIHEAP Household Reports for FY 2007 were due from the States by September 1, 2007, when the States' LIHEAP block grant applications for FY 2008 were due. ACF set a goal for the States to submit their final LIHEAP Household Report for FY 2007 by December 2007. Each LIHEAP Household Report needs to be received, reviewed, processed, and compared against data from each State's Federal LIHEAP Grantee Survey for FY 2007 that was conducted in February 2008. The data on the number of LIHEAP households assisted in FY 2007 will be included in the *LIHEAP Report to Congress* for FY 2007.
- The RECS – The EIA's RECS is a national household sample survey that is conducted once every four years. The most recent survey was conducted in 2005. The RECS data were used for baseline measurement (2001) of targeting performance for high energy burden households and can track longer-term changes in performance over time (2001 to 2005). However, the RECS currently cannot furnish annual updates on LIHEAP targeting performance for high energy burden households.

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<sup>31</sup> "Guidance on Income and Poverty Estimates From Different Sources." U.S. Census Bureau. Housing and Household Economic Statistics Division. 6 Nov. 2006 <<http://www.census.gov/hhes/www/income/newguidance.html#summary>>.



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

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

- Targeting – Measure the extent to which 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 percent of LIHEAP recipient households having the lowest incomes and the highest energy costs.

The study furnished the following information to ACF with respect to targeting of high energy burden households.<sup>32</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 energy burden households that do not have a vulnerable household member.
- Measurement – The study identified options for collecting annual data on high energy burden recipient households.

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

## **Performance measurement statistics**

Table 4-1 shows the LIHEAP reciprocity targeting performance measures from FY 2003 through FY 2007. The first column in the table restates the performance goal. The second column shows

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<sup>32</sup> The study developed a definition of “high burden,” though the statute offers no such definition.

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

For measure 1A, the baseline targeting index score of 79 indicates that income eligible elderly households were not being effectively targeted within the income eligible population of elderly households in FY 2003. The FY 2004 and FY 2005 targeting index scores indicate that there was basically no improvement in targeting the elderly in those years, and the FY 2006 drop in the targeting index score indicates a worsening in targeting households with elderly members. The FY 2007 targeting index score shows no improvement over the baseline targeting index score. ACF is attempting to increase the targeting of eligible elderly households through a national LIHEAP outreach campaign.

For measure 1B, the baseline targeting index score of 122 for households with a young child indicates that such households were being effectively targeted within the income eligible population of households with young children in FY 2003. The FY 2004, FY 2005, FY 2006, and FY2007 targeting index scores indicate a decrease in targeting households with young children. However, the scores indicate that LIHEAP grantees still are effectively targeting households with younger children although to a lesser degree for unknown reasons.

**Table 4-1. LIHEAP reciprocity targeting performance measures reported for FY 2003 – FY 2007**

Performance Measures	Fiscal Year	Target	Result
1A. Increase the reciprocity targeting index score of LIHEAP recipient households having at least one member 60 years or older	FY 07	94	78
	FY 06	92	74
	FY 05	84	79
	FY 04	82	78
	FY 03	Baseline	79
1B. Maintain the reciprocity targeting index score of LIHEAP recipient households having at least one member five years or younger	FY 07	122	110
	FY 06	122	115
	FY 05	122	113
	FY 04	122	115
	FY 03	Baseline	122

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

Table 4-2 shows the national and regional targeting indexes for high 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 the LIHEAP program was targeting high burden households.<sup>33</sup> However, FY 2005 targeting index scores indicate a significant decrease in targeting high burden households compared to the FY 2001 baseline scores.

<sup>33</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 significant while the targeting indexes shown in Tables 4-3 and 4-4 are not statistically significant. Therefore, the null hypothesis that high burden households and households that are not high burden are served at the same rate can be rejected, while the null hypothesis that LIHEAP benefits and burden reduction are the same for high burden households and households that are not high burden cannot be rejected. The FY 2005 targeting indexes in Table 4-2

**Table 4-2. LIHEAP reciprocity targeting of 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	Reciprocity targeting index for high burden households – home energy	
	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 FY 2001 to FY 2005, burden reduction index scores decreased for all regions.

**Table 4-3. LIHEAP benefit targeting of 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	Benefit targeting index for high burden households – home energy	
	FY 2001	FY 2005
Northeast	103	104
Midwest	108	104
South	110	81
West	124	119
United States	109	101

and 4-4 are statistically significant at the national level but not statistically significant at the regional level while the targeting indexes shown in Tables 4-3 are not statistically significant at either regional or national level.

**Table 4-4. LIHEAP burden reduction targeting of 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	Burden reduction targeting index for high burden households – home energy	
	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>34</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>35</sup>

- 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

<sup>34</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>35</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.

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

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

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

## **V. LIHEAP Vulnerable Household Targeting Study**

The Low Income Home Energy Assistance Program (LIHEAP) Statute requires that grantees “provide, in a timely manner, that the highest level of assistance will be furnished to those households which have the lowest incomes and the highest energy costs or needs in relation to income, taking into account family size” (LIHEAP Statute, Section 2605(b)(5)). The Statute identifies “vulnerable households” (i.e., households with at least one member that is a young child, an individual with disabilities, or a frail older individual) as one of two groups of households having the highest home energy needs. To address that mandate, the Office of Community Services (OCS), which administers LIHEAP, has focused its initial performance goals and measurement on targeting income eligible vulnerable households, particularly households with at least one member 60 years or older and households having at least one member five years or younger. This Section of the Notebook presents information on a study commissioned by OCS to help State LIHEAP programs enhance their targeting of these two vulnerable households groups.<sup>36</sup>

### **Background**

Performance measurement statistics have shown that the LIHEAP program has failed to meet Federal performance goals during the period from FY 2003 through FY 2006. In fact, the targeting performance measures for both elderly households and young child households declined during that time period. During 2007 and 2008, OCS commissioned LIHEAP performance measurement research studies that consider the appropriateness and attainability of these performance goals. One study identified literature that supports the Congressional concern that elderly, disabled, and young child households are more vulnerable to the adverse health impacts from extreme cold and extreme heat than other types of households. Further, research on reciprocity targeting indexes for vulnerable households found some differences in State-level reciprocity targeting indexes are statistically significant. Based on these findings, OCS decided to commission a special study to identify strategies that State LIHEAP programs can use to increase the level of LIHEAP participation by vulnerable population groups.

### **Importance of Targeting Elderly, Disabled and Young Child Households**

The Centers for Disease Control (CDC) reports that “older persons with preexisting medical conditions such as congestive heart failure, diabetes, or gait disturbance also are at increased risk for hypothermia because their bodies have a reduced ability to generate heat and because they are less likely to recognize symptoms of hypothermia and seek shelter from the cold.”<sup>37</sup> In that same report, the CDC found that 49 percent of the hypothermia-related deaths in the U.S. during the period from 1999 to 2002 were individuals who were 65 or older. Moreover, a detailed study conducted in Alabama showed that the majority of deaths of elderly individuals were indoor deaths, compared to outdoor deaths associated more with individuals less than age 65.<sup>38</sup>

The CDC also reports that:

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<sup>36</sup> The complete report, *Reciprocity Targeting Analysis for Elderly and Young Child Households* is available on OCS's LIHEAP website at: [www.acs.hhs.gov/programs/ocs/liheap/targeting\\_report.html](http://www.acs.hhs.gov/programs/ocs/liheap/targeting_report.html). The study was funded through contract #HHSP23320070081P.

<sup>37</sup> “Hypothermia-Related Deaths – United States, 2003”, *Morbidity and Mortality Weekly Report*, 55(10):282-84, 2006

<sup>38</sup> Taylor, AJ, McGwin Jr, G, Davis GG, Brissie RM, Holley TD, Rue III RL, “Hypothermia Deaths in Jefferson County, Alabama” *Injury Prevention*, 2001;7:141-5.

infants, elderly persons, socially isolated persons, bedridden persons, and persons with certain mental and chronic illnesses are at highest risk for heat stroke. The elderly, especially those aged  $\geq 80$  years, are susceptible to heat-related illness because they are less able to adjust to physiologic changes (e.g., vasodilatation) that occur with exposure to excessive heat and are more likely to be taking medication for chronic illness (e.g., tranquilizers and anticholinergics) that increase the risk for heat-related illness. Infants also are sensitive to heat. Conditions such as mild fever can progress quickly to heatstroke if heat stress occurs.<sup>39</sup>

Studies of heat waves in Chicago<sup>40</sup> and Milwaukee<sup>41</sup> report that elderly and disabled individuals accounted for the most deaths due to the heat wave of 1995.

The Children's Sentinel Nutrition Assessment Project (C-SNAP) study established an association between energy costs and nutrition for young children. The study<sup>42</sup> concluded that:

after adjustment for differences in background risk, living in a household receiving the Low Income Home Energy Assistance Program is associated with less anthropometric evidence of undernutrition, no evidence of increased overweight, and lower odds of acute hospitalization from an emergency department visit among young children in low-income renter households compared with children in comparable households not receiving the Low Income Home Energy Assistance Program.

These statistics suggest that targeting households with a members who is elderly, disabled, or a young child is appropriate because these individuals are more susceptible to the health problems—and even mortality—caused by a home temperature that is too hot or cold. The household's susceptibility is increased if these households also have high home energy burdens.

## **LIHEAP Targeting Performance**

As elderly, disabled, and young child households represent about 72 percent of the income-eligible population (see Table B-1 in Appendix B), it is challenging for States to target these groups. However, LIHEAP performance measurement statistics suggest that improvement is both feasible and appropriate. First, the national elderly reciprocity targeting index and the national young child reciprocity targeting index declined from FY 2003 to FY 2006. Second, recently developed State reciprocity targeting indexes have shown that State-level targeting performance varies considerably. In FY 2006, six States successfully targeted both elderly households and young child households (i.e., have a reciprocity targeting index greater than 100) while seven States did not target either elderly or young child households (i.e., have a reciprocity targeting index less than 100). Based on those statistics, it may be possible for some States to improve their targeting performance by either adopting targeting procedures used in other States or by adopting other targeting strategies that are identified in this research.

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<sup>39</sup> "Heat-Related Deaths – Four States, July August 2001, and United States, 1979-1999", *Morbidity and Mortality Weekly Report*, 51(26):567-570, 2002

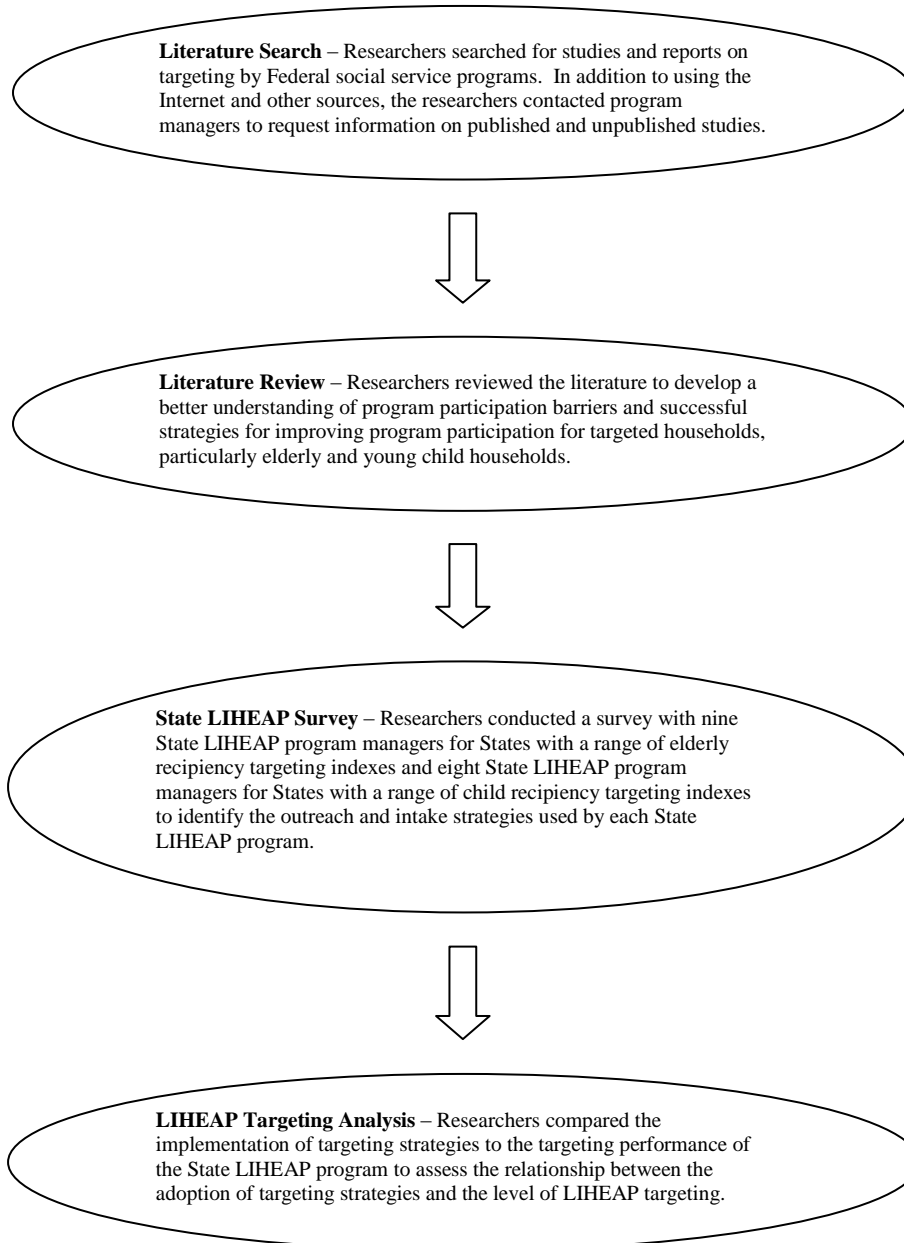
<sup>40</sup> "Heat-Related Mortality – Chicago, July 1995", *Morbidity and Mortality Weekly Report*, 45(24):577-79, 1996

<sup>41</sup> "Heat-Wave-Related-Mortality – Milwaukee, Wisconsin, July 1995," *Morbidity and Mortality Weekly Report*, 45(24):505-507

<sup>42</sup> Frank, Deborah A. *et al.* "Heat or Eat: The Low Income Home Energy Assistance Program and Health Risks Among Children Less Than 3 Years of Age," *Pediatrics*, 118:1293-1302, 2006

## **Study Scope**

The targeting performance study consisted of the following research activities:



## **Literature Review Findings and Recommendations**

This part of the study reviewed research on general vs. specific major Federal programs serving elderly households and households with young children. The general population programs included: Food Stamp Program (FSP),<sup>43</sup> Medicaid, Housing Vouchers, and the Weatherization Assistance Program (WAP). The

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<sup>43</sup> As of October 1, 2008, the program's name was changed to the Supplemental Nutrition Assistance Program (SNAP). For purposes of this document, the program is referred to FSP.



programs specifically serving elderly households included: the Medicare Savings Programs, SSI, and the Nutrition Programs for the Elderly (NPE). The programs specifically serving households with children included: Earned Income Tax Credit (EITC), Women, Infants, and Children Nutrition Program (WIC), Head Start, and the State Children's Health Insurance Program (SCHIP). For some of these programs, there was an extensive literature on program targeting, while for others, there was little or no information.

One important resource for the study was the 2005 Report by the Government Accountability Office (GAO), *Means Tested Programs – Information on Program Access can be an Important Management Tool*. In that study, GAO developed information on: “(1) the proportion of those eligible who are participating in 12 selected low income programs; (2) the factors that influence participation in those programs; and (3) strategies used by Federal, State, and local administrators to improve both access and integrity, and whether agencies monitor access by measuring participation rates.”

A comprehensive study, it looks at both overall participation and the participation of targeted population groups within programs. The study helped in the literature search and furnished some useful insights on relative participation rates for programs. However, a key finding included that only five of the twelve programs estimate a participation rate and that only three of the programs (FSP, WIC, and Child Care and Development Fund) include such information in a performance or program report. This finding may suggest why the targeting performance study literature review found a comprehensive body of literature on program targeting only for the FSP (which explicitly includes participation in its performance report) and SCHIP (which has recently had funding increases that called for additional program outreach).

## **General Population Programs**

Among the general population programs reviewed, the FSP and Medicaid had program participation literature. There was no identifiable information for the Housing Vouchers Program or the WAP program.

### **FSP**

The FSP is a Federally-funded entitlement program providing low income households with the means to buy food at retail stores through the use of electronic benefit cards. FSP participation rates vary by group. Rates are highest for households on public assistance and for households with incomes below poverty. The participation rates are estimated to be between 27 and 28 percent for households with elderly members and between 55 and 57 percent for households with children.

The literature on FSP participation is extensive. FSP participation rates declined significantly with the implementation of welfare reform in the late 1990s. The U.S. Department of Agriculture's Food and Nutrition Service (FNS) funded a number of different kinds of research to address this problem, including: studies of program participation rates, surveys with FSP recipients and income eligible nonrecipients, research on local intake agency practices and their impacts on clients, and demonstration projects with local agencies. Because of this extensive research, Food Stamp Program researchers are able to clearly describe the barriers to program participation and to directly measure whether outreach strategies are effective in increasing program participation.

The following findings from the review of FSP literature were most relevant to the study:

- **General Outreach** – In general, studies found that the more FSP outreach and the more different modes of FSP specific outreach conducted by an office, the higher the level of program awareness and correct understanding of the Food Stamp Program. However, there are limits to these findings. Some studies found that linking FSP outreach with the outreach for programs that are focused on families (e.g. WIC) can sometimes cause an elderly person to conclude that the program is not relevant for them. For that reason, researchers concluded that materials sent to

special populations should be specifically targeted to that population (e.g., FSP outreach materials sent out through AARP should be focused on alerting elderly households about the specific conditions under which they are eligible for FSP).

- **Reducing Barriers for Elderly Households** – Surveys and focus groups found that elderly individuals find FSP offices inaccessible for a number of reasons. Elderly individuals who are medically homebound or who are no longer able to drive may find it difficult to get to an office. Other office access problems mentioned include inadequate waiting areas and unfamiliar neighborhoods. For these reasons, research suggested that home visits and intake by senior service providers can substantially increase participation by elderly individuals. However, at the same time, those studies showed that seniors want to enroll for FSP at senior service agencies, not at locations where seniors congregate (e.g., churches, senior social centers).
- **Reducing Barriers for Young Child Households** – Surveys showed that households with children are sometimes discouraged from applying for the program if the local office is not “child friendly.” In addition, since many young child households are employed and/or legal immigrants, it is more challenging to communicate about the FSP and to furnish convenient program enrollment sites for these households. Allowing for intake at Head Start program offices and/or community health centers can make completing the necessary forms more convenient for these households. However, the literature suggested that public schools are not a good place to conduct outreach, since working low income households are not as likely to participate in school activities and households do not want to be identified as being low income.

One important issue in applying the results of the FSP research is that the FSP is an entitlement program, while LIHEAP is a non-entitlement program.<sup>44</sup> For entitlement programs, the goal is to maximize participation among eligible households. Though the program can make special efforts to increase participation for any groups of targeted households, it does not have to be done by reducing the participation of non-targeted households. In contrast, if a non-entitlement program is using all of its funding, it can only increase targeting to vulnerable households by giving those households improved access compared to nonvulnerable households. So, the LIHEAP program must not just do a better job of reaching all households, but must specifically do a better job of reaching elderly, disabled, and young child households.

### **Medicaid**

Medicaid is a Federally- and State-funded entitlement program providing health insurance coverage for low income households. The overall participation rate for Medicaid in 2000 was between 66 and 70 percent. While there is some literature on program barriers, the literature did not specifically look at how those barriers affected vulnerable households.

The research on enrollment found two barriers to program enrollment that are particularly important for Medicaid. First, the long and complicated application procedures for Medicaid are both a significant enrollment barrier and can lead to confusion about program eligibility. Second, since some clients perceive that they would not get the same level of care through Medicaid, they are unwilling to participate in Medicaid. As much of the research focused on overcoming those barriers, the Medicaid literature is less useful to LIHEAP than the FSP literature because the barriers are relevant only to Medicaid.

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<sup>44</sup> In an entitlement program, every applicant household that meets the program eligibility requirements must be served by the program, no matter what the total cost. SSI is an example of an entitlement program. In a non-entitlement program, there is a limit to program funding. So, households that meet the eligibility requirements can receive benefits only as long as funding is available.

## **Programs Targeting the Elderly**

Among the programs targeting elderly households, the Medicare Savings Programs had the most information about program participation. There was no identifiable information on increasing program participation for SSI or the Nutrition Programs for the Elderly (NPE).

### **Medicare Savings Program**

The Medicare Savings Programs (MSP) are a set of programs providing low income aged and disabled populations relief from expenses and services left uncovered by Medicare. About one-half to two-thirds of all eligible Medicare beneficiaries are covered by these programs.

Potential enrollees in the MSP face some of the same barriers to enrollment that they face in the FSP. Individuals are often not aware of the program, confused about eligibility and program rules, are dissuaded by difficult application and office procedures, and hold strong feelings about what it means to participate in the programs. A survey found that the most effective method of distributing information to seniors is through one-on-one communication. Survey respondents suggested the following steps to reduce barriers:

- using bigger print and shortening the application;
- creating a separate form for seniors that eliminates irrelevant questions;
- making sure verification requirements are clearly explained; and
- moving the application site to some place other than the social services office in order to diminish the stigma of program assistance as a “handout”.

## **Programs Targeting Children**

Among the programs targeting young child households, the SCHIP and WIC programs had the most information about program participation. There was no identifiable information on increasing program participation for EITC or Head Start.

### **SCHIP**

SCHIP is a Federally- and State-funded non-entitlement program that is similar to Medicaid but expands health insurance coverage to children whose families have income above the limits set for Medicaid. The overall coverage rate for SCHIP in 2000 was between 44 and 51 percent.

The barriers to SCHIP enrollment are difficult application procedures, confusion about eligibility, office procedures, and treatment stigma. As with LIHEAP program funding, SCHIP funding changes annually. For both programs, a significant increase or decrease in funding is often addressed by changing eligibility guidelines; some households are eligible one year, but not the next. This adds to confusion about eligibility. Another challenge that SCHIP faces is that it targets households that do not participate in other programs and therefore cannot be easily reached through existing social service program networks. For example, many households who participate in social welfare programs are eligible for Medicaid.

Studies suggested the following to reduce barriers:

- creating continuous enrollment schedules;
- simplifying the enrollment process by requiring less documentation;

- allowing online or mail-in applications;
- extending hours on weekdays or open on weekends to accommodate working parents' time constraints; and
- providing hotlines in several languages.

In order to increase enrollment, SCHIP programs also engage in a variety of creative coordination and outreach efforts. These programs work with schools, community-based, and faith-based organizations. Other SCHIP outreach solutions to increase enrollment include: traditional pamphlets and posters, television and radio advertising, toll-free numbers, and websites.

Like SCHIP, the LIHEAP income eligible population includes households that do not participate in other social welfare programs. Because of that similarity, some of the findings from the SCHIP literature about reaching such households are particularly relevant to LIHEAP.

### **Women, Infants, and Children Nutrition Program**

WIC is a Federally-funded, non-entitlement program providing supplemental foods, nutrition education, health screening and service referrals to low income and nutritionally at-risk households. WIC participants must be pregnant, breastfeeding, or non-breastfeeding postpartum women; infants up to age one; or children up to age five. WIC's had an estimated coverage rate in 1998 of 51 percent.

Many of the barriers that are discussed in reference to the WIC program were similar to the other programs. The main finding shown to increase participation in the WIC program is one-on-one contacts with trusted information sources. One such trusted information source is the community health centers that clients use for health services.

## **Summary of Findings from Review of Federal Social Welfare Programs**

The experience of other Federal social welfare programs in targeting households with elderly members and/or young children furnishes information on the barriers to program enrollment and the strategies that most effectively address those barriers.

### **Findings on Barriers to Enrollment**

Table 5-1, on the next page, presents information on the major program barriers and how they are manifested in practice for elderly and young child households. Some elderly households perceive that they are not eligible for the programs for a number of different reasons. When they do consider applying, they are sometimes overwhelmed by the logistics and procedures. As a growing number of young child households are working and/or are legal immigrants, many such households perceive that they are not eligible for programs. When they do consider applying, some have difficulty in getting to the intake sites during operating hours.

### **Findings on Effective Outreach and Intake Strategies**

Table 5-2, on the next page, presents information on effective outreach and intake strategies, and how they can be implemented for elderly households and young child households. It is important to note that some strategies can be jointly implemented for elderly and young child households, while others are particular to one of the targeted groups.

**Table 5-1. Barriers to Enrollment**

<b>Barrier</b>	<b>Elderly Households</b>	<b>Young Child Households</b>
Understanding of Eligibility Related to Household Status	Many programs explicitly target households with children. Sometimes elderly households perceive that households without children are not eligible.	Some young child households are legal immigrants. Sometimes these households believe that their immigration status affects eligibility.
Understanding of Eligibility Related to Income and Sources of Income	Some elderly households did not qualify for benefits when working but do now that they are retired and have lower income.	Most young child households have wage income. Some of these households believe that having wage income makes them ineligible for programs.
Understanding of Eligibility Related to Physical Assets	Both household types perceive that owning a home or a car makes them ineligible, despite the fact that most program have exemptions.	
Application Barriers	Many elderly households have difficulty accessing intake sites and are confused about forms and procedures.	Many young child households have difficulty getting time off from work and/or getting childcare if such facilities are not offered at the intake site.

**Table 5-2. Effective Outreach and Intake Strategies**

<b>Strategy</b>	<b>Elderly Households</b>	<b>Young Child Households</b>
Make program rules clear and consistent.	<p>Make sure that households are aware that all types of households with all sources of income are eligible if they are income eligible.</p> <p>Make sure that program literature indicates that households can have certain assets and still be eligible for benefits.</p> <p>When rules change, explicitly make sure that program literature highlights that formerly ineligible households may now be eligible.</p>	
Reduce stigma and increase awareness by tailoring outreach to specific groups.	Elderly households are more likely to participate in programs when the outreach literature is directed to them by organizations and individuals that they trust.	Eligible young child households that do not participate in other social welfare programs can be reached through organizations that they use and trust, such as Head Start programs and community health centers.
Reduce application barriers by implementing special procedures for targeted households.	Consider reducing application requirements to elderly households on fixed incomes.	Make it easier for working young child households to apply for benefits by having evening hours and/or times when childcare is available.
	Offer application assistance to elderly households, either directly or by engaging elderly service organizations.	
	Offer a special application period that allows targeted households a greater opportunity to apply for and receive benefits.	
Increase the value of the program to targeted households.	Offer higher benefits to elderly households and young child households.	

## Research on State LIHEAP Targeting Procedures

The literature review identified specific targeting procedures that have been effective in increasing participation in other social welfare programs. In the next phase of the research, 17 State LIHEAP Directors were interviewed to determine whether they were currently using these procedures and to assess the effectiveness of these procedures for LIHEAP. The sample of States included those with high, moderate, and low elderly reciprocity targeting indexes and those with high, moderate, and low young child reciprocity targeting indexes.<sup>45</sup>

### Findings for Targeting Elderly Households

Table 5-3 furnishes information on the outreach measures that the interviewed States reported using to target elderly households. While most interviewed States reported that they conduct outreach through agencies that serve elderly households, relatively few applied other outreach techniques that more explicitly targeted elderly households by directly discussing issues that are relevant to such households or by mailing information to income eligible elderly households.

**Table 5-3. State Outreach Targeting Elderly Households<sup>46</sup>**

Outreach Method	States Using Method	States not Using Method
Outreach through agencies serving elderly	11	6
Outreach materials targeting elderly	5	12
Outreach materials with benefit amount	2	15
Direct mail to elderly program participants	2	15

The majority of the interviewed States do conduct outreach through agencies serving the elderly. However, Table 5-3A shows that there is no difference among the interviewed States with high, moderate, and low recipient targeting indexes for elderly households in terms of those that use this procedure and those that do not.

**Table 5-3A. Outreach Through Agencies Serving Elderly Households**

Targeting Method	States Using Method	States not Using Method
High Elderly Targeting	4	3
Moderate Elderly Targeting	3	2
Low Elderly Targeting	4	1
All Interviewed States	11	6

Table 5-4 furnishes information on the intake procedures the interviewed States reported using to target elderly households. Many interviewed States reported that they offer some intake procedures that should increase targeting of elderly households. Almost all interviewed States offer alternate intake sites and

<sup>45</sup> See Section IV for a discussion of reciprocity targeting indexes.

<sup>46</sup> Tables that segment the States by reciprocity targeting performance are available in the full study.

about half of interviewed States reported that elderly households receive higher benefits. However, the research did not show that there was a correlation between these procedures and higher targeting rates. As relatively few interviewed States conduct outreach targeted at elderly households, it is possible that low awareness levels by income eligible elderly households reduce the impact of intake procedures targeted at elderly households.

**Table 5-4. State Intake Procedures Targeting Elderly Households**

<b>Intake Method</b>	<b>States Using Method</b>	<b>States not Using Method</b>
Screening participants of elderly programs	4	13
Special application period for elderly	6	11
Special application procedures for elderly	6	11
Alternate intake sites for elderly	14	3
Application assistance for elderly	6	11
Higher benefits for elderly	8	9

Almost half of the interviewed States do offer higher benefits for elderly households. However, Table 5-4A shows that there is no difference among the interviewed States with high, moderate, and low reciprocity targeting indexes for elderly households in terms of those that offer higher benefits and those that do not.

**Table 5-4A. Higher Benefits for Elderly Households**

<b>Targeting Method</b>	<b>States Using Method</b>	<b>States not Using Method</b>
High Elderly Targeting	2	5
Moderate Elderly Targeting	4	1
Low Elderly Targeting	2	3
All Interviewed States	8	9

### **Findings for Targeting Young Child Households**

Table 5-5 furnishes information on the outreach procedures the interviewed States reported using to target young child households. Some interviewed States report that they offer outreach procedures that should increase targeting of young child households. About one-third of interviewed States conduct outreach through agencies serving children. About one-third of interviewed State reported that they conduct outreach to young child households who participate in programs that serve young children. However, very few interviewed States explicitly address working families or immigrant families in their program outreach.

**Table 5-5. State Outreach Targeting Young Child Households**

<b>Outreach Method</b>	<b>States Using Method</b>	<b>States not Using Method</b>
Outreach through agencies serving children	6	11
Outreach materials targeting working families	4	13
Outreach materials targeting immigrant families	1	16
Outreach to participants of other programs	5	12

Table 5-6 furnishes information on the intake procedures the interviewed States reported using to target young child households. Some interviewed States report that they offer intake procedures that should increase targeting of young child households. Almost half have special intake locations for young child households. However, relatively few interviewed States implement the other procedures that would target young child households.

**Table 5-6. State Intake Targeting Young Child Households**

<b>Intake Method</b>	<b>States Using Method</b>	<b>States not Using Method</b>
Screen clients of programs serving young child households	0	17
Special application period for young child households	2	15
Special intake locations for young child households	7	10
Higher benefit for young child households	4	13

This research on State LIHEAP outreach and intake practices documented two important facts about State practices. First, while every interviewed State LIHEAP program has implemented an outreach plan, relatively few have implemented procedures that the research suggests are effective in reducing program application barriers for elderly and young child households. Second, there was no correlation between the States that implemented such outreach and intake procedures and a high, overall reciprocity targeting index for elderly or young child households. So, while implementing these procedures should result in incremental increases in reciprocity targeting indexes, other program changes might also be needed to effectively target elderly or young child households.

### **Linkages between Program Design and Targeting Outcomes**

During the interviews, some State program managers furnished information on special program design features that appear to account for the targeting outcomes observed for those States. Examples of these findings include:

- **Elderly Application Period with Outreach** – One State has a special application period for elderly households that is well-publicized by the State and local agencies. During the most recent program year, 55 percent of LIHEAP funds were used before the program was open for other types of households. That State has a high elderly reciprocity targeting index and a low young child reciprocity targeting;
- **Focus on Applicants to Other Programs** – During the LIHEAP season, one State program manager reports that the State has a policy of reviewing all applications for other programs to



determine whether the household is also eligible for LIHEAP. That State has a high young child reciprocity targeting index and a low elderly reciprocity targeting index;

- State Office Application Processing – One State program manager reports that all LIHEAP applications are completed at the local level, but processed by the State LIHEAP office. Many different types of agencies, including local community-based organizations, Head Start programs, and AOA offices are given the opportunity to submit applications for their clients. That State has a high elderly reciprocity targeting index and a high young child reciprocity targeting index;
- Intensive Outreach – One State not interviewed for the research has had a significant increase in its elderly reciprocity targeting index over the last three years. That State recently implemented a ratepayer funded low income energy assistance program directly linked to the LIHEAP program. When the State determined that participation of elderly households in the ratepayer program was very low, there were intensive outreach efforts conducted by the ratepayer program to low income elderly households. That outreach appears to be associated with the increase in the targeting of elderly household by the State LIHEAP program<sup>47</sup>; and
- State Income Tax System – One State reported that their LIHEAP benefits are distributed through the State income tax system. That State has a moderate elderly reciprocity targeting index and a high young child reciprocity targeting index. Significant outreach for the Earned Income Tax Credit has raised participation of working households with children to very high rates across the country. Such households also would benefit by receiving LIHEAP by completing their tax returns in this State. Low income elderly households, on the other hand, might not even need to file taxes. So, they would not be as likely to receive LIHEAP benefits in this State.

These examples suggest that certain program design elements can have a significant impact on State LIHEAP program targeting rates.

## **Recommendations**

Based on findings from this research, this study recommends that State LIHEAP Directors who wish to increase targeting to either or both of these groups adopt the strategies, as described below.

### **Step One: Assess Reciprocity Targeting Performance**

Beginning with the data for FY 2006, OCS has furnished State LIHEAP Directors information on the reciprocity targeting performance of each State for elderly households and young child households. A State LIHEAP Director can review those data to understand whether their program is currently targeting vulnerable households and to compare their performance to that of comparable States. The State's targeting performance is likely to be a function of the following three different aspects of the program activities:

- Design – As discussed above, the basic program design will have a major impact on the reciprocity targeting rates for some States. Any review of the State's reciprocity targeting performance will need to carefully examine whether there are design features that have a significant impact on reciprocity targeting rates;
- General Outreach Procedure – Each State develops an outreach plan that is included in the State LIHEAP Plan that is submitted to OCS. The research shows that in some States general outreach

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<sup>47</sup>The researchers learned about these outreach efforts through another, independent study of the State's LIHEAP program.

is conducted by State agencies and in others general outreach is delegated to the local agencies. Any review of the State's reciprocity targeting performance will need to include a review of the messages and distribution of general program outreach; and

- **Specific Outreach and Intake Procedures** – Based on the findings from this research study, State LIHEAP Directors should consider which of the recommended procedures are currently being implemented by their program. By developing an inventory of the specific outreach and intake procedures that they are implementing, they may be able to get a better understanding of why their program is performing at its current level.

For any State, an assessment of reciprocity targeting performance should help to focus efforts to improve targeting by making changes in the program design, attempting to improve the general program outreach, and making incremental changes in outreach and intake procedures.

## **Step Two: Establish Specific Strategies for Increasing Targeting**

Once grantees are confident that no program design changes are needed and that the program outreach is sufficient to establish a basic level of awareness of the LIHEAP program, grantees can work to establish additional specific outreach strategies to increase awareness, understanding, and action among targeted groups.

Specific outreach strategies include:

- **Agencies Serving Targeted Households** – By conducting outreach through agencies that serve targeted households, a State LIHEAP program may be able to reach more of the targeted households and receive more attention because individuals trust those agencies;
- **Materials** – By tailoring outreach materials to explicitly focus on the targeted households, targeted clients may be more likely to pay attention to the information furnished by the materials;
- **Benefit Amount** – By including the benefit amount in the outreach materials, clients may be more motivated to apply for benefits; and
- **Targeted Program Participants** – Sending outreach materials to targeted households that participate in other programs may better focus outreach efforts on households that are likely to participate in assistance programs.

Specific intake strategies include:

- **Screening** – Some programs screen the recipients of other programs to assess eligibility for LIHEAP and automatically enroll clients in the program;
- **Priority** – Some programs give priority to the targeted households by establishing a special application period;
- **Reducing Barriers** – Some programs establish special application procedures for the targeted, while others conduct intake at special sites or offer special assistance to targeted households; and
- **Increasing Benefits** – Some programs offer additional benefits to targeted households in recognition of their special needs. This has the added advantage of increasing the motivation of targeted households to participate.

Based on the individual experiences of the interviewed State LIHEAP programs, some more specific actions that might be effective include:

- **Centralized Application Systems** – While local intake agencies do an important job of working with individual clients on applications, it also may be appropriate to establish a centralized State-level system to process certain kinds of applications. Two of the interviewed States had success with processing applications at the State LIHEAP office to enable certain groups to better access program enrollment;
- **Special Application Periods** – While some States have special application periods for elderly households, few have such periods for young child households. Special application periods help to target specific groups, but also can reduce office waiting times for elderly and young child households, both of which have difficulty with crowded offices; and
- **Year-Round Application Periods** – In general, special application periods are one or two months prior to the opening of the general LIHEAP program. However, if a State had a centralized processing option, it could take LIHEAP applications throughout the year for elderly and young child households. In particular, as most elderly households consistently pay their energy bills, a year-round application period with a once a year payment might give elderly households the benefit they need while also ensuring that they are able to apply for benefits whenever a caseworker identifies the need for the program.

Each grantee is likely to find that some of the identified strategies are already in place. What is most important is to assess what is and is not being done to target vulnerable households, and then implement procedures that address the missing targeting elements.

### **Step Three: Design and Test Program Changes**

Research conducted by other social programs, particularly the FSP, has demonstrated that the proposed enhancements to outreach and intake procedures are effective in improving participation by targeted households. However, one important finding from the research with State LIHEAP programs is that is that some States that have implemented the recommended measures have low reciprocity targeting indexes for elderly or young child households. With that in mind, it is appropriate for State program administrators to carefully research any proposed change prior to implementation, to monitor the implementation to make sure that the change is being implemented in the way it was designed, and to then track the impact of the change after it has been implemented.

To select among the possible program enhancements, State program administrators might consult with their field managers and intake agency directors to get feedback on the potential benefits and/or drawbacks of the possible program changes. The staff should be able to alert the program administrators of any major benefits to or problems with proposed changes.

Once the program enhancements have been selected, it is important for State program administrators to test and/or track the impacts of those changes. The program administrator can adopt a testing model in which the change is tested at a subset of agencies or in a certain part of the State. Alternatively, if all parties agree that a change is appropriate, the administrator can establish a benchmark for the program in the year prior to implementation and then track changes that result during the implementation year. To supplement that information, the administrator might solicit feedback from LIHEAP field staff and agency directors to get additional information on the effectiveness of the program change.

## **Conclusion**

Targeting elderly and young child households is appropriate because of the health impacts for these individuals from living in homes that are too hot or too cold. OCS research has shown that national reciprocity targeting for elderly and young child households has declined and has further determined that there are some statistically significant differences in State reciprocity targeting indexes. Finally, the targeting study has identified outreach and intake procedures that have been effective in other low income programs and has found that not many of the interviewed State LIHEAP programs have implemented a comprehensive targeting strategy that uses those procedures.

Actions by individual State LIHEAP programs can improve the reciprocity targeting performance in that State and by extension, for the entire program. If a State LIHEAP program chooses to take action, the following approach is recommended.

- **Baseline Assessment** – Program administrators need to measure current reciprocity targeting rates and examine the ways that program design, outreach, and intake strategies are linked to the targeting outcomes. If there are any design features that specifically detract from targeting to elderly and/or young child households, the program administrators should consider changing those before any additional improvements are made.
- **General Outreach** – Program administrators should review program’s general outreach to assess whether current efforts are adequate to establish a basic awareness and understanding of the program. If outreach is not sufficient, or if outreach messages discourage elderly or young child households from applying, State administrators should consider improving the general outreach before any additional improvements are made.
- **Specific Outreach and Intake Strategies** – Working with field staff and intake agency directors, program administrators should identify the changes that are perceived to be both feasible and likely to result in changes in program targeting.
- **Measurement** – Program administrators should consider testing the program changes with a subset of agencies or in one part of the State. In addition, program administrators should develop a benchmark for program reciprocity targeting indexes and measure the changes in reciprocity targeting indexes that result from the implementation of program enhancements.

Only systematic efforts on the part of State LIHEAP program managers are likely to have a significant impact on vulnerable household reciprocity targeting levels for the LIHEAP program. Such an impact is even greater when vulnerable households also have high home energy burdens.

## 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 2007. 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>48</sup>

The 2005 RECS is the twelfth survey in the series of surveys.<sup>49</sup> For the 2005 RECS, 4,382 households were interviewed, including 443 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 2007.

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<sup>48</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>49</sup>For information about the RECS sample design, see Energy Information Administration, *Sample Design for the Residential Energy Consumption Survey*, DOE/EIA-0555 (94)/1, Washington, DC, August 1994. The data collected from the 2005 RECS are available from the EIA website: *Residential Energy Consumption Survey – home energy uses and costs*, Energy Information Administration, <[www.eia.doe.gov/emeu/recs/contents.html](http://www.eia.doe.gov/emeu/recs/contents.html)>.

## **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>50</sup>

- The 2005 RECS data for calendar year 2005 were updated to FY 2007 (October 1, 2006 to September 30, 2007), using procedures that adjust the 2005 data to reflect the weather and fuel prices for FY 2007. These procedures are comparable to those used for the FY 1986 - FY 2006 annual LIHEAP Reports to Congress. However, the reader should exercise caution in comparing the data in this *Notebook* with data in annual LIHEAP Reports to Congress prior to FY 1986, in which consumption and expenditure data were predicted on the RECS year (April 1 to March 31).
- For some variables, disaggregation of data into subgroups at the regional level results in estimates made from a small number of sample cases. This is particularly true of the LIHEAP recipient households and the liquefied petroleum gas and kerosene heating subgroups. This affects the reliability of the estimates.
- The household is a basic reporting unit for RECS and LIHEAP. RECS employs the Bureau of the Census' definition of household, i.e., a household includes all individuals living in a housing unit, whether related or not, who (1) share a common direct access entry to the unit from outside the building or from a hallway, and (2) do not normally eat their meals with members of other units in the building. A household does not include temporary visitors or household members away at college or in the military. LIHEAP defines a household as one or more individuals living together as an economic unit who purchase energy in common or make undesigned 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

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<sup>50</sup>Information about the quality of RECS data is available from the EIA website: *Residential Energy Consumption Survey – home energy uses and costs*, Energy Information Administration, <[www.eia.doe.gov/emu/recs/contents.html](http://www.eia.doe.gov/emu/recs/contents.html)>.

household income as a specific dollar amount. CPS's larger sample size and method of collecting income data result in more accurate income data than RECS income data. Therefore, the 2007 CPS ASEC is used to develop estimates of the number of low income households. In addition, mean income statistics from the CPS ASEC are used in the calculation of group energy burden for this *Notebook*.

- Households were classified in the 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 2605(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 2007 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 2007 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 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>51</sup>

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<sup>51</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>52</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>53</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.

Using the 2005 RECS, the mean residential energy burden for all LIHEAP Federally eligible households using the first approach is 12.9 percent and using the second approach is 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>54</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

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<sup>52</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>53</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>54</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.



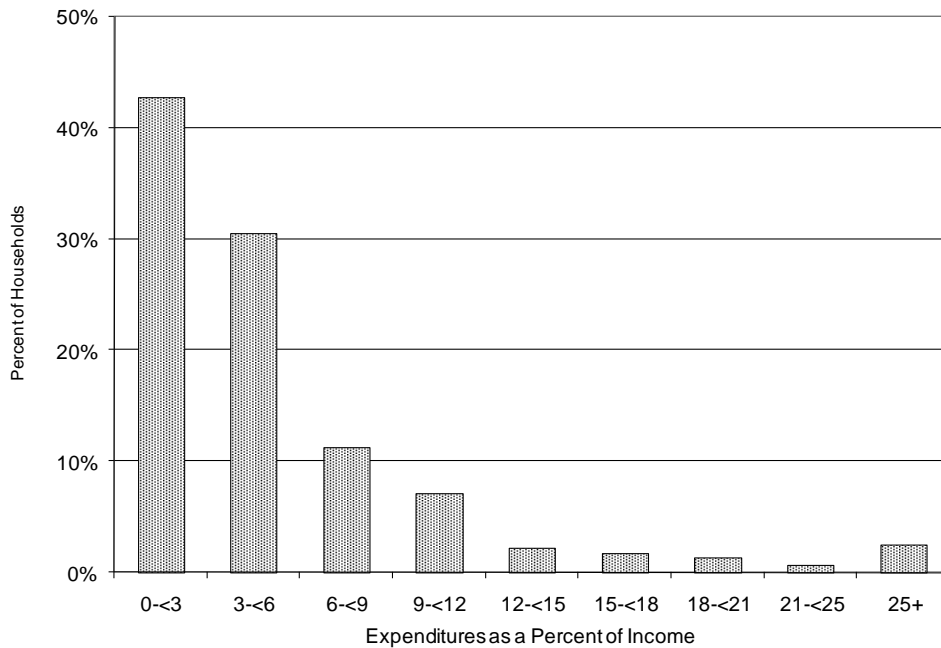
energy burden ratios. Figure A-1 demonstrates a skewed distribution of LIHEAP income eligible households by home energy burden.

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

As a result, the RECS categorizes too many households as income eligible for LIHEAP. Based on the 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>55</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>55</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*, both mean individual energy burden and mean group burden statistics are now furnished in the reports. Previous reports to Congress presented only the mean group burden. The text of this *Notebook* references mean group burden to maintain consistency with the previous reports to Congress.

## **Projecting energy consumption and expenditures**

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

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

Consumption projections utilized end use consumption estimates that were developed with the 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 2007. The following equation was applied to each household in the microsimulation data file.

$$\text{FY 2007 Projected BTUs} = (2005 \text{ estimated heat use} * \text{HDD change}) + (2005 \text{ estimated cooling use} * \text{CDD change}) + (2005 \text{ estimated water use} + 2005 \text{ estimated appliance use})$$

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

$$\text{Preliminary Expenditures} = 2005 \text{ Expenditures} * (\text{FY 2007 Projected Usage} / 2005 \text{ Actual Usage})$$

$$\text{Final Expenditures} = \text{Preliminary Expenditures} * \text{Price Change}^{56}$$

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 2007. For example, electricity prices increased by 11 percent from 2005 to FY 2007.

**Table A-1. National price factors for FY 2007**

Fuel	Price Factors for FY 2007 Projections
Electricity	1.1081
Natural gas	1.0097
Fuel oil / kerosene	1.1769
Liquefied petroleum gas (LPG)	1.1630

Expenditure data were adjusted using national price factors for FY 2007. Earlier *Notebooks* used State-level price factor data. For FY 1993/1994, State-level data did not vary much from the national average for electricity and natural gas. For electricity, price changes varied between 0.3 percent and 1.2 percent; the national average was 0.8 percent. For natural gas, price changes varied between 1.7 percent and 2.8 percent; the national average was 2 percent. Expenditure projections using national price data do not appear to be significantly different from those obtained using State price data.

<sup>56</sup>Price factors were developed using price data obtained from the Energy Information Administration's Monthly Energy Review, September 2008, for all fuels. Electricity and natural gas consumption data used for calculating price factors are from the Energy Information Administration website ([www.eia.doe.gov](http://www.eia.doe.gov)). Fuel Oil and LPG consumption data used for calculating price factors are from the Monthly Energy Review, September 2008.

**Table A-2. Residential energy: Average consumption per household, by all fuels and specified fuels, by all, non low income, low income and LIHEAP recipient households, by Census region, FY 2007<sup>1/</sup>**

	All Fuels <sup>2/</sup>	Natural Gas	Electricity	Fuel Oil	Kerosene	LPG
(In MmBTUs) <sup>3/</sup>						
<b>United States</b>						
All households	95.8	111.4	61.2	145.6	53.8	108.6
Non low income households	101.9	116.1	66.0	154.5	60.8*	115.8
Low income households <sup>4/</sup>	84.4	101.4	53.1	131.9	52.5	94.9
LIHEAP recipient households <sup>5/</sup>	103.2	112.9	49.7	149.9	76.8*	107.8
<b>Northeast</b>						
All households	121.1	120.8	47.9	149.6	37.8	123.5
Non low income households	132.1	129.8	53.5	160.7	63.9*	133.6
Low income households	104.6	105.7	41.5	133.4	33.5*	97.1*
LIHEAP recipient households	116.5	109.2	48.3	150.6	75.9*	81.6*
<b>Midwest</b>						
All households	115.1	126.6	60.2	124.5	88.7*	125.1
Non low income households	120.8	131.1	66.2	132.6	NC	126.3
Low income households	105.5	118.8	52.7	114.3	88.7*	120.7
LIHEAP recipient households	118.2	130.1	49.6	143.6*	89.6*	102.9*
<b>South</b>						
All households	81.4	109.0	63.4	125.9	52.7	97.8
Non low income households	88.2	115.6	68.3	123.5	59.8*	104.4
Low income households	68.3	92.8	54.1	131.1*	50.7	89.4
LIHEAP recipient households	86.8	104.6	50.6	141.3*	75.5*	114.8*
<b>West</b>						
All households	78.1	87.0	57.9	147.9	59.5*	100.2
Non low income households	83.6	91.6	60.4	142.4*	NC	109.4
Low income households	65.3	73.1	53.8	177.5*	59.5*	84.8
LIHEAP recipient households	69.0	77.2	49.1	164.5*	NC	112.9*

<sup>1/</sup>Developed from the 2005 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy, and adjusted for FY 2007.

<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 2007**

Census Region	Main heating fuel											
	All fuels		Natural gas		Electricity		Fuel oil		Kerosene		LPG	
	Dollars <sup>1/</sup>	Percent <sup>2/</sup>	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent
<b>United States</b>												
All households	\$1,986	3.0%	\$1,956	2.9%	\$1,696	2.5%	\$3,248	4.9%	\$1,392	2.1%	\$2,640	4.0%
Non low income households	\$2,132	2.5%	\$2,098	2.4%	\$1,828	2.1%	\$3,489	4.0%	\$1,419*	1.6%	\$2,742	3.2%
Low income households <sup>3/</sup>	\$1,715	9.9%	\$1,653	9.5%	\$1,471	8.5%	\$2,879	16.6%	\$1,387	8.0%	\$2,449	14.1%
LIHEAP recipient households <sup>4/</sup>	\$1,900	13.3%	\$1,770	12.4%	\$1,219	8.5%	\$3,290	23.0%	\$1,612*	11.3%	\$2,970	20.8%
<b>Northeast</b>												
All households	\$2,519	3.4%	\$2,212	3.0%	\$1,616	2.2%	\$3,385	4.6%	\$1,091	1.5%	\$3,261	4.4%
Non low income households	\$2,765	2.8%	\$2,435	2.5%	\$1,693	1.7%	\$3,692	3.7%	\$2,120*	2.2%	\$3,304	3.4%
Low income households	\$2,148	11.4%	\$1,841	9.8%	\$1,530	8.1%	\$2,936	15.6%	\$919*	4.9%	\$3,147*	16.7%
LIHEAP recipient households	\$2,364	15.3%	\$1,926	12.5%	\$1,455	9.4%	\$3,345	21.7%	\$1,890*	12.3%	\$2,140*	13.9%
<b>Midwest</b>												
All households	\$1,933	3.0%	\$1,943	3.1%	\$1,344	2.1%	\$2,679	4.2%	\$1,786*	2.8%	\$2,802	4.4%
Non low income households	\$2,059	2.5%	\$2,050	2.5%	\$1,476	1.8%	\$2,929	3.5%	NC	NC	\$2,788	3.4%
Low income households	\$1,721	9.9%	\$1,760	10.1%	\$1,180	6.8%	\$2,364	13.6%	\$1,786*	10.2%	\$2,856	16.4%
LIHEAP recipient households	\$1,803	12.2%	\$1,861	12.5%	\$1,156	7.8%	\$2,810*	18.9%	\$1,510*	10.2%	\$2,522*	17.0%
<b>South</b>												
All households	\$1,956	3.2%	\$2,129	3.5%	\$1,811	2.9%	\$2,553	4.1%	\$1,463	2.4%	\$2,467	4.0%
Non low income households	\$2,098	2.6%	\$2,297	2.9%	\$1,930	2.4%	\$2,384	3.0%	\$1,189*	1.5%	\$2,566	3.2%
Low income households	\$1,686	10.8%	\$1,714	10.9%	\$1,588	10.1%	\$2,921*	18.7%	\$1,540	9.8%	\$2,343	15.0%
LIHEAP recipient households	\$1,842	15.6%	\$1,785	15.1%	\$1,319	11.2%	\$3,022*	25.6%	\$1,562*	13.2%	\$3,372*	28.6%
<b>West</b>												
All households	\$1,637	2.3%	\$1,609	2.2%	\$1,508	2.1%	\$2,965	4.1%	\$1,288*	1.8%	\$2,530	3.5%
Non low income households	\$1,792	1.9%	\$1,756	1.9%	\$1,656	1.8%	\$2,952*	3.2%	NC	NC	\$2,765	3.0%
Low income households	\$1,278	6.9%	\$1,168	6.3%	\$1,272	6.8%	\$3,040*	16.3%	\$1,288*	6.9%	\$2,133	11.4%
LIHEAP recipient households	\$1,195	8.1%	\$1,129	7.7%	\$993	6.7%	\$2,968*	20.1%	NC	NC	\$2,706*	18.4%

<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 2007. 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 2007 CPS ASEC, which reports income for calendar year 2006. Mean group residential burden is computed as mean group energy expenditures (from RECS) by mean group income (from CPS ASEC). See text in Appendix A for a discussion of energy burden.

<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 2007**

Census Region	Main heating fuel											
	All fuels		Natural gas		Electricity		Fuel oil		Kerosene		LPG	
	Dollars <sup>1/</sup>	Percent <sup>2/</sup>	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent
<b>United States</b>												
All households	\$1,986	7.0%	\$1,956	6.2%	\$1,696	6.9%	\$3,248	12.1%	\$1,392	9.6%	\$2,640	9.3%
Non low income households	\$2,132	3.6%	\$2,098	3.4%	\$1,828	3.3%	\$3,489	5.5%	\$1,419*	4.3%	\$2,742	5.0%
Low income households <sup>3/</sup>	\$1,715	13.5%	\$1,653	12.2%	\$1,471	13.1%	\$2,879	22.3%	\$1,387	10.6%	\$2,449	17.4%
LIHEAP recipient households <sup>4/</sup>	\$1,900	16.0%	\$1,770	14.6%	\$1,219	14.9%	\$3,290	24.8%	\$1,612*	18.7%	\$2,970	17.1%
<b>Northeast</b>												
All households	\$2,519	8.8%	\$2,212	7.0%	\$1,616	7.4%	\$3,385	12.5%	\$1,091	9.5%	\$3,261	9.8%
Non low income households	\$2,765	4.3%	\$2,435	3.9%	\$1,693	2.9%	\$3,692	5.5%	\$2,120*	4.3%	\$3,304	5.0%
Low income households	\$2,148	15.7%	\$1,841	12.3%	\$1,530	12.4%	\$2,936	22.8%	\$919*	10.4%	\$3,147*	22.0%
LIHEAP recipient households	\$2,364	17.7%	\$1,926	13.7%	\$1,455	16.8%	\$3,345	24.4%	\$1,890*	25.8%	\$2,140*	11.4%
<b>Midwest</b>												
All households	\$1,933	7.0%	\$1,943	7.2%	\$1,344	5.7%	\$2,679	10.6%	\$1,786*	8.4%	\$2,802	6.8%
Non low income households	\$2,059	3.4%	\$2,050	3.4%	\$1,476	2.9%	\$2,929	5.2%	NC	NC	\$2,788	4.4%
Low income households	\$1,721	12.9%	\$1,760	13.6%	\$1,180	9.1%	\$2,364	17.4%	\$1,786*	8.4%	\$2,856	15.5%
LIHEAP recipient households	\$1,803	17.4%	\$1,861	17.0%	\$1,156	20.0%	\$2,810*	27.1%	\$1,510*	6.5%	\$2,522*	13.8%
<b>South</b>												
All households	\$1,956	7.5%	\$2,129	6.6%	\$1,811	7.4%	\$2,553	11.4%	\$1,463	10.4%	\$2,467	11.3%
Non low income households	\$2,098	3.8%	\$2,297	3.9%	\$1,930	3.5%	\$2,384	5.5%	\$1,189*	4.3%	\$2,566	5.9%
Low income households	\$1,686	14.7%	\$1,714	13.2%	\$1,588	14.8%	\$2,921*	24.2%	\$1,540	12.1%	\$2,343	18.1%
LIHEAP recipient households	\$1,842	16.5%	\$1,785	14.4%	\$1,319	16.1%	\$3,022*	37.4%	\$1,562*	18.5%	\$3,372*	21.3%
<b>West</b>												
All households	\$1,637	4.8%	\$1,609	4.0%	\$1,508	5.6%	\$2,965	7.6%	\$1,288*	7.1%	\$2,530	8.6%
Non low income households	\$1,792	2.7%	\$1,756	2.6%	\$1,656	2.5%	\$2,952*	5.1%	NC	NC	\$2,765	4.5%
Low income households	\$1,278	9.6%	\$1,168	8.2%	\$1,272	10.5%	\$3,040*	20.8%	\$1,288*	7.1%	\$2,133	15.7%
LIHEAP recipient households	\$1,195	8.7%	\$1,129	9.3%	\$993	7.9%	\$2,968*	3.3%	NC	NC	\$2,706*	9.2%

<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 2007. 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 2007 income is estimated by inflating income reported in the 2005 RECS by the consumer price index (CPI) and FY 2007 energy expenditures are estimated by adjusting energy expenditures reported in the 2005 RECS for changes in weather and energy prices. FY 2007 residential energy burden for each household is computed as estimated FY 2007 residential energy expenditures divided by estimated FY 2007 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 2007**

Census Region	Main heating fuel											
	All fuels		Natural gas		Electricity		Fuel oil		Kerosene		LPG	
	Dollars <sup>1/</sup>	Percent <sup>2/</sup>	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent
United States												
All households	\$1,986	4.2%	\$1,956	3.9%	\$1,696	3.9%	\$3,248	7.2%	\$1,392	6.9%	\$2,640	6.3%
Non low income households	\$2,132	3.1%	\$2,098	2.9%	\$1,828	2.9%	\$3,489	4.9%	\$1,419*	4.6%	\$2,742	4.5%
Low income households <sup>3/</sup>	\$1,715	9.3%	\$1,653	8.8%	\$1,471	8.2%	\$2,879	16.1%	\$1,387	8.6%	\$2,449	13.8%
LIHEAP recipient households <sup>4/</sup>	\$1,900	10.5%	\$1,770	10.3%	\$1,219	9.1%	\$3,290	23.8%	\$1,612*	13.8%	\$2,970	11.3%
Northeast												
All households	\$2,519	5.3%	\$2,212	4.5%	\$1,616	4.5%	\$3,385	7.2%	\$1,091	8.6%	\$3,261	6.0%
Non low income households	\$2,765	3.8%	\$2,435	3.3%	\$1,693	2.6%	\$3,692	4.9%	\$2,120*	4.0%	\$3,304	5.4%
Low income households	\$2,148	10.5%	\$1,841	9.0%	\$1,530	8.0%	\$2,936	15.9%	\$919*	8.6%	\$3,147*	21.4%
LIHEAP recipient households	\$2,364	11.5%	\$1,926	7.6%	\$1,455	11.7%	\$3,345	23.8%	\$1,890*	14.8%	\$2,140*	9.4%
Midwest												
All households	\$1,933	4.3%	\$1,943	4.2%	\$1,344	3.9%	\$2,679	7.0%	\$1,786*	6.4%	\$2,802	4.5%
Non low income households	\$2,059	3.0%	\$2,050	2.9%	\$1,476	2.3%	\$2,929	4.4%	NC	NC	\$2,788	4.1%
Low income households	\$1,721	9.8%	\$1,760	9.9%	\$1,180	6.8%	\$2,364	16.3%	\$1,786*	6.4%	\$2,856	15.7%
LIHEAP recipient households	\$1,803	11.2%	\$1,861	11.2%	\$1,156	10.4%	\$2,810*	28.3%	\$1,510*	6.5%	\$2,522*	18.2%
South												
All households	\$1,956	4.6%	\$2,129	4.4%	\$1,811	4.3%	\$2,553	7.3%	\$1,463	6.9%	\$2,467	8.0%
Non low income households	\$2,098	3.3%	\$2,297	3.4%	\$1,930	3.1%	\$2,384	5.9%	\$1,189*	5.2%	\$2,566	5.5%
Low income households	\$1,686	9.9%	\$1,714	10.1%	\$1,588	9.2%	\$2,921*	17.1%	\$1,540	9.5%	\$2,343	13.8%
LIHEAP recipient households	\$1,842	13.8%	\$1,785	15.5%	\$1,319	9.4%	\$3,022*	44.6%	\$1,562*	13.8%	\$3,372*	19.2%
West												
All households	\$1,637	3.0%	\$1,609	2.8%	\$1,508	3.1%	\$2,965	5.2%	\$1,288*	7.5%	\$2,530	5.5%
Non low income households	\$1,792	2.3%	\$1,756	2.2%	\$1,656	2.3%	\$2,952*	5.2%	NC	NC	\$2,765	4.0%
Low income households	\$1,278	6.1%	\$1,168	5.9%	\$1,272	5.8%	\$3,040*	23.6%	\$1,288*	7.5%	\$2,133	10.0%
LIHEAP recipient households	\$1,195	7.8%	\$1,129	8.0%	\$993	7.6%	\$2,968*	3.3%	NC	NC	\$2,706*	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 2007. 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 2007 income is estimated by inflating income reported in the 2005 RECS by the consumer price index (CPI) and FY 2007 energy expenditures are estimated by adjusting energy expenditures reported in the 2005 RECS for changes in weather and energy prices. FY 2007 residential energy burden for each household is computed as estimated FY 2007 residential energy expenditures divided by estimated FY 2007 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>**

	Natural Gas <sup>2/</sup>	Electricity	Fuel Oil	Kerosene	LPG	Other <sup>3/</sup>
<b>United States</b>						
All households	52.6%	30.1%	6.9%	0.6%	5.5%	3.2%
Non low income households	55.0%	29.2%	6.5%	0.1%	5.5%	2.9%
Low income households <sup>4/</sup>	48.1%	31.8%	7.8%	1.5%	5.4%	3.7%
LIHEAP recipient households <sup>5/</sup>	60.0%	19.0%	12.0%	2.4%	5.2%	1.2%
<b>Northeast</b>						
All households	55.5%	7.9%	30.1%	0.9%	2.1%	3.1%
Non low income households	57.7%	6.9%	29.7%	0.2%	2.6%	2.9%
Low income households	52.3%	9.3%	30.8%	1.9%	1.5%	3.2%
LIHEAP recipient households	53.8%	8.4%	33.6%	1.3%	2.4%	0.5%
<b>Midwest</b>						
All households	72.6%	13.2%	2.7%	0.3%	7.4%	3.5%
Non low income households	73.0%	11.6%	2.4%	NC	9.3%	3.5%
Low income households	72.0%	15.8%	3.2%	0.9%	4.2%	3.6%
LIHEAP recipient households	80.2%	13.4%	2.5%	0.7%	2.8%	0.5%
<b>South</b>						
All households	33.7%	53.9%	1.3%	0.9%	6.6%	2.6%
Non low income households	36.6%	53.7%	1.4%	0.3%	5.6%	1.8%
Low income households	28.2%	54.5%	1.2%	2.0%	8.5%	4.0%
LIHEAP recipient households	44.9%	31.1%	2.4%	7.7%	12.4%	1.5%
<b>West</b>						
All households	60.7%	26.7%	1.1%	0.2%	4.3%	3.9%
Non low income households	65.3%	23.4%	1.3%	NC	3.9%	3.8%
Low income households	50.2%	34.2%	0.6%	0.7%	5.3%	4.1%
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 per household, by all fuels and specified fuels, by all, non low income, low income and LIHEAP recipient households, by Census region, FY 2007<sup>1/</sup>**

	All Fuels <sup>2/</sup>	Natural Gas	Electricity	Fuel Oil	Kerosene	LPG
(In MmBTUs) <sup>3/</sup>						
United States						
All households	38.9	50.4	8.5	95.1	20.2	51.8
Non low income households	40.0	50.0	9.0	98.6	25.2*	57.4
Low income households <sup>4/</sup>	36.9	51.4	7.7	89.8	19.3	41.4
LIHEAP recipient households <sup>5/</sup>	52.9	61.1	8.8	96.8	24.4*	45.2
Northeast						
All households	69.6	66.7	12.4	96.9	15.7	74.6
Non low income households	74.1	69.3	13.4	102.2	22.9*	81.3
Low income households	62.8	62.5	11.3	89.3	14.5*	57.3*
LIHEAP recipient households	68.2	63.6	11.4	94.6	15.7*	46.5*
Midwest						
All households	57.7	66.6	13.9	80.4	46.2*	64.4
Non low income households	59.0	66.9	15.7	72.8	NC	66.9
Low income households	55.5	66.1	11.8	90.1	46.2*	55.4
LIHEAP recipient households	64.3	72.8	10.8	119.2*	4.9*	53.4*
South						
All households	20.8	37.0	7.6	90.8	16.5	42.5
Non low income households	22.1	37.7	8.2	93.5	25.9*	43.6
Low income households	18.4	35.2	6.5	84.9*	13.9	41.1
LIHEAP recipient households	33.4	47.8	7.1	90.0*	28.5*	43.4*
West						
All households	23.5	29.9	7.8	100.4	18.5*	43.6
Non low income households	25.3	30.3	7.9	93.5*	NC	55.7
Low income households	19.2	28.6	7.7	137.0*	18.5*	23.0
LIHEAP recipient households	27.5	37.2	8.1	145.8*	NC	41.7*

<sup>1/</sup>Developed from the 2005 Residential Energy Consumption Survey (RECS), Energy Information Administration, U.S. Department of Energy, and adjusted for FY 2007.

<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 2007**

Census Region	Main heating fuel											
	All fuels		Natural gas		Electricity		Fuel oil		Kerosene		LPG	
	Dollars <sup>1/</sup>	Percent <sup>2/</sup>	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent
United States												
All households	\$553	0.8%	\$562	0.8%	\$243	0.4%	\$1,664	2.5%	\$346	0.5%	\$1,107	1.7%
Non low income households	\$568	0.7%	\$561	0.6%	\$255	0.3%	\$1,731	2.0%	\$416*	0.5%	\$1,186	1.4%
Low income households <sup>3/</sup>	\$525	3.0%	\$564	3.3%	\$221	1.3%	\$1,563	9.0%	\$333	1.9%	\$958	5.5%
LIHEAP recipient households <sup>4/</sup>	\$717	5.0%	\$673	4.7%	\$237	1.7%	\$1,686	11.8%	\$386*	2.7%	\$1,052	7.4%
Northeast												
All households	\$1,038	1.4%	\$806	1.1%	\$448	0.6%	\$1,691	2.3%	\$266	0.4%	\$1,523	2.1%
Non low income households	\$1,106	1.1%	\$850	0.9%	\$427	0.4%	\$1,788	1.8%	\$403*	0.4%	\$1,575	1.6%
Low income households	\$937	5.0%	\$732	3.9%	\$472	2.5%	\$1,549	8.2%	\$243*	1.3%	\$1,387*	7.3%
LIHEAP recipient households	\$1,009	6.5%	\$729	4.7%	\$391	2.5%	\$1,645	10.7%	\$233*	1.5%	\$1,106*	7.2%
Midwest												
All households	\$696	1.1%	\$703	1.1%	\$328	0.5%	\$1,413	2.2%	\$823*	1.3%	\$1,259	2.0%
Non low income households	\$718	0.9%	\$709	0.9%	\$365	0.4%	\$1,283	1.5%	NC	NC	\$1,279	1.5%
Low income households	\$659	3.8%	\$693	4.0%	\$281	1.6%	\$1,576	9.0%	\$823*	4.7%	\$1,184	6.8%
LIHEAP recipient households	\$733	4.9%	\$767	5.2%	\$265	1.8%	\$2,113*	14.2%	\$60*	0.4%	\$1,072*	7.2%
South												
All households	\$360	0.6%	\$437	0.7%	\$222	0.4%	\$1,625	2.6%	\$276	0.4%	\$986	1.6%
Non low income households	\$374	0.5%	\$447	0.6%	\$237	0.3%	\$1,658	2.1%	\$421*	0.5%	\$995	1.2%
Low income households	\$333	2.1%	\$410	2.6%	\$194	1.2%	\$1,551*	9.9%	\$236	1.5%	\$974	6.2%
LIHEAP recipient households	\$531	4.5%	\$591	5.0%	\$185	1.6%	\$1,565*	13.3%	\$457*	3.9%	\$1,086*	9.2%
West												
All households	\$313	0.4%	\$310	0.4%	\$217	0.3%	\$1,779	2.5%	\$319*	0.4%	\$968	1.3%
Non low income households	\$337	0.4%	\$317	0.3%	\$233	0.3%	\$1,671*	1.8%	NC	NC	\$1,220	1.3%
Low income households	\$259	1.4%	\$290	1.6%	\$192	1.0%	\$2,362*	12.7%	\$319*	1.7%	\$542	2.9%
LIHEAP recipient households	\$358	2.4%	\$365	2.5%	\$207	1.4%	\$2,528*	17.1%	NC	NC	\$815*	5.5%

<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 2007. 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 2007 CPS ASEC, which reports income for calendar year 2006. 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 2007**

Census Region	Main heating fuel											
	All fuels		Natural gas		Electricity		Fuel oil		Kerosene		LPG	
	Dollars <sup>1/</sup>	Percent <sup>2/</sup>	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent
United States												
All households	\$553	2.2%	\$562	2.1%	\$243	1.1%	\$1,664	7.2%	\$346	2.2%	\$1,107	4.0%
Non low income households	\$568	1.0%	\$561	1.0%	\$255	0.5%	\$1,731	2.9%	\$416*	1.4%	\$1,186	2.2%
Low income households <sup>3/</sup>	\$525	4.4%	\$564	4.5%	\$221	2.0%	\$1,563	13.9%	\$333	2.3%	\$958	7.3%
LIHEAP recipient households <sup>4/</sup>	\$717	6.5%	\$673	6.4%	\$237	3.4%	\$1,686	12.5%	\$386*	4.1%	\$1,052	6.9%
Northeast												
All households	\$1,038	4.2%	\$806	2.8%	\$448	2.6%	\$1,691	7.4%	\$266	2.1%	\$1,523	4.8%
Non low income households	\$1,106	1.8%	\$850	1.4%	\$427	0.8%	\$1,788	2.8%	\$403*	0.8%	\$1,575	2.5%
Low income households	\$937	7.8%	\$732	5.2%	\$472	4.7%	\$1,549	14.2%	\$243*	2.3%	\$1,387*	10.6%
LIHEAP recipient households	\$1,009	7.7%	\$729	5.8%	\$391	5.3%	\$1,645	11.7%	\$233*	3.0%	\$1,106*	6.3%
Midwest												
All households	\$696	2.8%	\$703	3.0%	\$328	1.4%	\$1,413	6.5%	\$823*	3.8%	\$1,259	3.1%
Non low income households	\$718	1.3%	\$709	1.2%	\$365	0.7%	\$1,283	2.5%	NC	NC	\$1,279	2.0%
Low income households	\$659	5.5%	\$693	6.1%	\$281	2.3%	\$1,576	11.6%	\$823*	3.8%	\$1,184	7.0%
LIHEAP recipient households	\$733	8.3%	\$767	8.6%	\$265	5.2%	\$2,113*	20.6%	\$60*	0.3%	\$1,072*	6.5%
South												
All households	\$360	1.5%	\$437	1.6%	\$222	0.9%	\$1,625	6.8%	\$276	1.9%	\$986	4.8%
Non low income households	\$374	0.7%	\$447	0.8%	\$237	0.5%	\$1,658	3.9%	\$421*	1.6%	\$995	2.4%
Low income households	\$333	2.9%	\$410	3.4%	\$194	1.8%	\$1,551*	13.2%	\$236	2.0%	\$974	8.0%
LIHEAP recipient households	\$531	4.9%	\$591	5.0%	\$185	2.9%	\$1,565*	19.6%	\$457*	4.8%	\$1,086*	8.0%
West												
All households	\$313	1.0%	\$310	0.9%	\$217	0.9%	\$1,779	5.1%	\$319*	1.8%	\$968	3.0%
Non low income households	\$337	0.5%	\$317	0.5%	\$233	0.4%	\$1,671*	3.1%	NC	NC	\$1,220	1.9%
Low income households	\$259	1.9%	\$290	1.9%	\$192	1.8%	\$2,362*	15.9%	\$319*	1.8%	\$542	4.7%
LIHEAP recipient households	\$358	2.5%	\$365	3.1%	\$207	1.7%	\$2,528*	2.8%	NC	NC	\$815*	3.0%

<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 2007. 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 2007 income is estimated by inflating income reported in the 2005 RECS by the consumer price index (CPI) and FY 2007 energy expenditures are estimated by adjusting energy expenditures reported in the 2005 RECS for changes in weather and energy prices. FY 2007 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 2007**

Census Region	Main heating fuel											
	All fuels		Natural gas		Electricity		Fuel oil		Kerosene		LPG	
	Dollars <sup>1/</sup>	Percent <sup>2/</sup>	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent
<b>United States</b>												
All households	\$553	0.9%	\$562	1.0%	\$243	0.5%	\$1,664	3.6%	\$346	1.7%	\$1,107	2.4%
Non low income households	\$568	0.6%	\$561	0.7%	\$255	0.4%	\$1,731	2.4%	\$416*	0.9%	\$1,186	1.8%
Low income households <sup>3/</sup>	\$525	2.2%	\$564	2.8%	\$221	1.2%	\$1,563	9.1%	\$333	1.7%	\$958	5.8%
LIHEAP recipient households <sup>4/</sup>	\$717	3.4%	\$673	3.5%	\$237	1.8%	\$1,686	10.0%	\$386*	4.4%	\$1,052	4.2%
<b>Northeast</b>												
All households	\$1,038	2.0%	\$806	1.5%	\$448	1.1%	\$1,691	3.6%	\$266	1.4%	\$1,523	3.2%
Non low income households	\$1,106	1.4%	\$850	1.1%	\$427	0.8%	\$1,788	2.4%	\$403*	0.9%	\$1,575	2.4%
Low income households	\$937	4.3%	\$732	3.5%	\$472	2.4%	\$1,549	8.4%	\$243*	1.4%	\$1,387*	8.3%
LIHEAP recipient households	\$1,009	4.6%	\$729	2.9%	\$391	3.1%	\$1,645	10.0%	\$233*	2.0%	\$1,106*	5.3%
<b>Midwest</b>												
All households	\$696	1.4%	\$703	1.5%	\$328	0.9%	\$1,413	3.6%	\$823*	2.0%	\$1,259	2.2%
Non low income households	\$718	1.0%	\$709	1.0%	\$365	0.6%	\$1,283	2.3%	NC	NC	\$1,279	1.8%
Low income households	\$659	3.3%	\$693	3.7%	\$281	1.7%	\$1,576	11.2%	\$823*	2.0%	\$1,184	7.5%
LIHEAP recipient households	\$733	4.2%	\$767	4.5%	\$265	2.0%	\$2,113*	20.0%	\$60*	0.3%	\$1,072*	9.5%
<b>South</b>												
All households	\$360	0.6%	\$437	0.8%	\$222	0.5%	\$1,625	5.1%	\$276	1.4%	\$986	3.0%
Non low income households	\$374	0.4%	\$447	0.6%	\$237	0.3%	\$1,658	4.6%	\$421*	2.4%	\$995	1.8%
Low income households	\$333	1.5%	\$410	2.3%	\$194	1.1%	\$1,551*	9.7%	\$236	1.4%	\$974	5.8%
LIHEAP recipient households	\$531	2.6%	\$591	3.6%	\$185	1.6%	\$1,565*	20.5%	\$457*	4.4%	\$1,086*	1.8%
<b>West</b>												
All households	\$313	0.4%	\$310	0.5%	\$217	0.4%	\$1,779	2.7%	\$319*	1.8%	\$968	1.7%
Non low income households	\$337	0.3%	\$317	0.3%	\$233	0.3%	\$1,671*	2.7%	NC	NC	\$1,220	1.6%
Low income households	\$259	1.0%	\$290	1.2%	\$192	0.8%	\$2,362*	18.0%	\$319*	1.8%	\$542	2.9%
LIHEAP recipient households	\$358	1.7%	\$365	2.5%	\$207	1.2%	\$2,528*	2.8%	NC	NC	\$815*	0.8%

<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 2007. 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 2007 income is estimated by inflating income reported in the 2005 RECS by the consumer price index (CPI) and FY 2007 energy expenditures are estimated by adjusting energy expenditures reported in the 2005 RECS for changes in weather and energy prices. FY 2007 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 2007**

	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>
<b>United States</b>						
All households	92.1%	8.7	\$275	0.4%	1.1%	0.4%
Non low income households	93.8%	9.6	\$301	0.3%	0.5%	0.3%
Low income households <sup>4/</sup>	89.1%	7.0	\$223	1.3%	2.1%	0.9%
LIHEAP recipient households <sup>5/</sup>	85.5%	5.1	\$162	1.1%	1.4%	0.6%
<b>Northeast</b>						
All households	88.6%	3.2	\$137	0.2%	0.5%	0.2%
Non low income households	93.6%	3.6	\$151	0.2%	0.2%	0.2%
Low income households	81.2%	2.6	\$114	0.6%	1.0%	0.5%
LIHEAP recipient households	84.1%	2.8	\$122	0.8%	0.8%	0.4%
<b>Midwest</b>						
All households	96.7%	5.7	\$159	0.2%	0.5%	0.3%
Non low income households	97.3%	6.2	\$172	0.2%	0.3%	0.2%
Low income households	95.7%	4.9	\$136	0.8%	1.0%	0.6%
LIHEAP recipient households	88.8%	4.1	\$116	0.8%	1.3%	0.6%
<b>South</b>						
All households	98.1%	14.4	\$443	0.7%	1.9%	0.9%
Non low income households	99.4%	15.7	\$481	0.6%	0.9%	0.7%
Low income households	95.5%	11.7	\$368	2.4%	3.9%	2.0%
LIHEAP recipient households	92.1%	10.3	\$310	2.6%	2.5%	1.3%
<b>West</b>						
All households	80.3%	6.1	\$207	0.3%	0.6%	0.2%
Non low income households	81.7%	6.6	\$229	0.2%	0.4%	0.2%
Low income households	77.1%	4.7	\$151	0.8%	1.1%	0.4%
LIHEAP recipient households	70.5%	2.6	\$74	0.5%	0.5%	0.3%

<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 defined 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 2007. 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. With extensive input from LIHEAP grantees, local administering agencies, and other interested parties, ACF developed model LIHEAP performance goals and measures in 1995. ACF has further developed targeting performance indicators to support measurement of LIHEAP targeting at the grantee level. For the last six years, ACF has furnished State grantees with State level estimates of the number of LIHEAP income eligible households, including the number of vulnerable households and the number of households by poverty level. State grantees can use these estimates with their own data on LIHEAP recipient characteristics to compute target performance measurement statistics.

State-level estimates of the number of income eligible households for FY 2007 were developed using both the CPS ASEC and the ACS. While the CPS ASEC file can be used to make State-level estimates, the statistical variances for many States are too large for the data to be useful for analysis. The U.S. Bureau of the Census uses averages derived from three consecutive years of CPS ASEC data to develop State-level estimates of poverty for the school lunch program. This method reduces the variances of the estimates and improves confidence in the data. To estimate the FY 2007 numbers of LIHEAP income eligible households in the population and in various vulnerability and poverty groups, averages derived from the 2006, 2007, and 2008 CPS ASEC were used. Averages derived from the 2005, 2006, and 2007 ACS were used as well, for similar statistical reasons.

The ACS and CPS ASEC differ in their measurement of income and disability, and despite the fact that both use the same Census definition of a household, the ACS data yield a lower estimate of the total number of households in the United States than do the CPS ASEC data.<sup>57</sup> Estimates from both ACS and CPS ASEC data are presented to show the differences between the two data sources so that readers can assess which changes have resulted from a change in methodology and which changes are actual increases or decreases in the numbers of income eligible households.

The U.S. Census Bureau recommends the use of the CPS ASEC data for the national-level income and poverty estimates and an analysis of historical trends by State and the ACS data for the State-level income and poverty estimates.<sup>58</sup>

Two sets of tables follow. Tables B-1 through B-4 show estimates produced using the averages derived from the 2006, 2007, and 2008 CPS ASEC. Tables B-5 through B-8 show estimates produced using the averages derived from the 2005, 2006, and 2007 ACS.

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<sup>57</sup> Though the ACS and CPS ASEC use a common definition of a household, the two differ in terms of who is considered to be a member of the household. It should also be noted that the definition of a household in the ACS and CPS ASEC data differs subtly from that defined in Section 2603(5) of the LIHEAP statute: "The term 'household' means any individual or group of individuals who are living together as one economic unit or for whom residential energy is customarily purchased in common or who make undesignated payments for energy in the form of rent." The ACS and CPS ASEC use the Census definition of a household, which is, "A household includes all the persons who occupy a housing unit. A housing unit is a house, an apartment, a mobile home, a group of rooms, or a single room that is occupied (or if vacant, is intended for occupancy) as separate living quarters. Separate living quarters are those in which the occupants live and eat separately from any other persons in the building and which have direct access from the outside of the building or through a common hall."

<sup>58</sup> For an explanation, and to better understand the differences between the two surveys, please visit "Guidance on Income and Poverty Estimates from Different Sources" at <<http://www.census.gov/hhes/www/income/newguidance.html>>.

Odd-numbered tables show the number of LIHEAP income eligible households, calculated using the Federal Maximum Income Standard, by vulnerability or poverty group for each State. Even-numbered tables show the number of LIHEAP income eligible households, calculated using the State Income Standards,<sup>59</sup> by vulnerability or poverty group for each State.

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<sup>59</sup> State Income Standards for FY 2007 were obtained from the LIHEAP Clearinghouse at <<http://www.liheap.ncat.org/tables/FY2007/POP07.htm>>

**LIHEAP Home Energy Notebook for FY 2007: Appendix B: Income Eligible Household Estimates**

**Table B-1. Average of 2006, 2007, and 2008 State-level estimates of the number of LIHEAP income eligible households using the Federal maximum LIHEAP income standard by vulnerability category<sup>1/ 2/</sup>**

(Three-Year Average of the CPS ASEC 2006-2008)

State	Total number of LIHEAP eligible households <sup>2/</sup>	LIHEAP eligible households by vulnerability category <sup>4/</sup>			LIHEAP eligible households with no vulnerable members
		At least one person 60+ years	At least one child less than 6 yrs. old	At least one person with a disability <sup>3/</sup>	
Alabama	550,398	218,676	96,644	222,511	143,552
Alaska	69,686	15,992	16,659	18,906	25,666
Arizona	630,341	199,741	169,791	155,997	195,265
Arkansas	301,160	125,570	53,300	107,443	81,393
California	3,840,876	1,433,466	867,982	900,832	1,199,091
Colorado	514,153	161,905	111,999	93,421	189,341
Connecticut	457,617	199,635	72,000	107,500	136,185
Delaware	95,394	39,358	20,648	23,561	23,949
District of Columbia	69,861	25,633	9,455	23,024	22,837
Florida	2,013,483	957,840	303,252	463,496	562,674
Georgia	999,434	327,173	249,240	302,206	295,120
Hawaii	109,532	48,210	19,674	24,980	31,269
Idaho	123,765	47,450	32,428	31,898	27,720
Illinois	1,506,838	613,244	284,964	316,661	454,387
Indiana	729,137	270,804	144,019	188,696	209,882
Iowa	324,110	130,322	60,389	71,272	92,805
Kansas	313,277	115,880	66,491	69,736	97,187
Kentucky	508,792	196,556	88,785	209,475	117,850
Louisiana	476,654	184,030	96,382	153,596	123,640
Maine	154,662	71,003	19,210	52,029	35,879
Maryland	607,980	256,067	106,887	135,817	190,970
Massachusetts	872,740	395,627	118,230	247,032	237,343
Michigan	1,218,551	479,263	219,668	350,573	350,804
Minnesota	587,936	245,140	93,812	121,059	183,310
Mississippi	339,311	137,799	71,637	139,376	80,596
Missouri	683,461	286,129	132,454	223,354	161,388
Montana	96,489	35,230	16,431	27,655	26,373
Nebraska	191,140	72,116	33,847	40,134	63,160
Nevada	224,501	87,816	47,662	51,596	66,181
New Hampshire	134,222	65,602	17,033	30,396	36,733
New Jersey	1,037,955	493,587	159,256	219,997	289,623
New Mexico	208,290	72,618	36,985	55,287	72,158
New York	2,478,716	1,040,835	399,422	657,721	728,136
North Carolina	1,061,471	442,533	194,854	334,707	287,670
North Dakota	75,800	30,677	12,680	12,115	26,390
Ohio	1,363,060	516,151	279,063	371,095	386,233
Oklahoma	404,643	148,694	88,461	118,330	121,501
Oregon	401,851	173,212	72,931	97,909	108,539
Pennsylvania	1,489,149	720,161	234,379	374,805	360,147
Rhode Island	129,094	53,505	20,376	38,905	33,275
South Carolina	480,334	202,161	82,900	163,337	121,011
South Dakota	83,527	36,233	15,654	17,028	24,325
Tennessee	715,897	301,523	118,391	252,128	173,817
Texas	2,456,387	876,525	638,276	673,275	692,509
Utah	198,661	62,368	61,134	39,152	56,312
Vermont	75,913	33,381	9,247	19,558	21,638
Virginia	816,492	345,656	174,391	210,301	221,897
Washington	674,016	272,743	122,457	180,655	191,108
West Virginia	204,218	88,366	34,461	85,241	41,450
Wisconsin	661,315	292,628	94,333	156,614	190,740
Wyoming	56,989	24,040	10,967	12,843	16,165
All States	33,819,278	13,670,869	6,501,592	8,995,236	9,627,194

<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 CPS ASEC average estimate of the total number of all U.S. households is 115,726,411.

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

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



**LIHEAP Home Energy Notebook for FY 2007: Appendix B: Income Eligible Household Estimates**

**Table B-2. Average of 2006, 2007, and 2008 State-level estimates of the number of LIHEAP income eligible households using State LIHEAP income standards by vulnerability category<sup>1/ 2/</sup>**

(Three-Year Average of CPS ASEC 2006-2008)

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 by vulnerability category <sup>4/</sup>			LIHEAP eligible households with no vulnerable members
			At least one person 60+	At least one child less than 6 yrs. old	At least one person with a disability <sup>3/</sup>	
Alabama	150	447,785	173,003	82,033	187,964	112,228
Alaska	150	52,832	11,072	13,232	15,754	18,942
Arizona	150	484,240	140,000	138,993	123,689	151,226
Arkansas	125	215,776	84,580	43,566	81,476	55,121
California	<sup>6/</sup> 208	3,838,847	1,432,992	866,428	900,832	1,199,091
Colorado	185	411,897	126,828	93,516	82,197	146,897
Connecticut	150	215,215	86,230	38,538	67,391	56,966
Delaware	200	78,174	31,406	17,969	20,428	18,305
District of Columbia	<sup>6/</sup> 195	69,561	25,633	9,155	23,024	22,837
Florida	150	1,481,139	684,472	239,954	358,409	406,850
Georgia	150	723,614	226,905	201,263	238,521	190,904
Hawaii	150	78,555	33,196	14,268	19,453	22,137
Idaho	150	106,481	39,776	29,808	27,621	22,803
Illinois	150	863,177	326,436	185,514	216,816	240,407
Indiana	150	493,534	175,284	107,443	147,288	131,524
Iowa	150	209,055	74,783	43,587	53,537	59,882
Kansas	130	166,305	54,600	41,462	51,733	43,246
Kentucky	110	283,037	97,828	59,868	126,823	61,214
Louisiana	<sup>6/</sup> 163	475,551	184,030	95,280	153,596	123,640
Maine	<sup>7/</sup> 150	117,492	56,394	15,281	42,461	22,667
Maryland	200	424,097	182,345	82,684	114,353	111,835
Massachusetts	<sup>8/</sup> 200	664,852	291,430	88,936	203,445	175,086
Michigan	110	502,844	156,841	105,689	200,884	131,628
Minnesota	<sup>6/</sup> 197	456,663	191,548	69,870	101,836	136,637
Mississippi	150	330,764	135,369	71,637	139,376	74,478
Missouri	125	352,673	121,927	85,496	128,193	83,133
Montana	150	86,124	30,424	14,364	24,228	24,537
Nebraska	116	79,129	24,461	14,013	20,506	27,134
Nevada	150	154,526	57,323	35,051	38,759	43,546
New Hampshire	185	85,689	43,929	10,878	22,982	18,364
New Jersey	175	583,060	281,044	95,677	142,052	142,613
New Mexico	150	199,723	70,730	36,385	54,888	66,080
New York	<sup>6/ 9/</sup> 204	2,478,716	1,040,835	399,422	657,721	728,136
North Carolina	110	533,117	195,550	111,798	189,809	137,501
North Dakota	<sup>6/</sup> 205	75,800	30,677	12,680	12,115	26,390
Ohio	175	1,118,437	412,391	247,328	318,712	299,759
Oklahoma	110	224,362	76,588	54,589	72,559	65,430
Oregon	<sup>6/</sup> 184	401,851	173,212	72,931	97,909	108,539
Pennsylvania	150	940,146	418,693	156,181	283,316	213,613
Rhode Island	<sup>6/</sup> 218	129,094	53,505	20,376	38,905	33,275
South Carolina	150	388,791	156,444	74,894	136,888	93,204
South Dakota	160	67,517	29,090	13,342	14,687	19,048
Tennessee	125	462,832	175,994	78,906	180,070	111,002
Texas	125	1,655,748	551,491	456,173	504,881	446,051
Utah	125	99,886	31,201	31,276	22,811	26,547
Vermont	125	33,365	13,773	3,437	10,949	8,501
Virginia	130	340,292	143,264	79,086	103,181	82,288
Washington	125	309,473	107,776	59,192	101,667	80,596
West Virginia	130	156,015	63,041	27,408	68,237	32,330
Wisconsin	150	406,435	169,862	65,029	103,364	113,960
Wyoming	<sup>6/</sup> 199	56,933	24,040	10,910	12,843	16,165
All States	Not applicable	24,611,216	9,520,246	5,022,797	7,061,137	6,784,293

<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. 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 CPS ASEC average estimate of the total number of all U.S. households is 115,726,411.

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

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

<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.

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

<sup>8/</sup>150 percent of the HHS Poverty Guidelines whenever 200 percent of the HHS Poverty Guidelines exceeds 60 percent of the State median income.

<sup>9/</sup>150 percent of the HHS Poverty Guidelines for a family size of 11 or more.

**LIHEAP Home Energy Notebook for FY 2007: Appendix B: Income Eligible Household Estimates**

**Table B-3. Average of 2006, 2007, and 2008 State-level estimates of the number of LIHEAP income eligible households using the Federal maximum LIHEAP income standard classified by HHS poverty guidelines<sup>1/2/</sup>**

(Three-Year Average of CPS ASEC 2006-2008)

State	Total number of LIHEAP eligible households <sup>3/</sup>	Number of LIHEAP eligible households by intervals of HHS Poverty Guidelines			
		At or below poverty guidelines	>100% - 125% poverty guidelines	>125% - 150% poverty guidelines	Over 150% poverty guidelines
Alabama	550,398	268,655	90,285	88,845	102,613
Alaska	69,686	28,735	11,785	12,312	16,854
Arizona	630,341	276,456	107,222	100,562	146,101
Arkansas	301,160	152,005	63,771	71,469	13,916
California	3,840,876	1,250,875	683,775	606,271	1,299,956
Colorado	514,153	174,858	72,016	73,174	194,105
Connecticut	457,617	112,788	49,257	53,170	242,402
Delaware	95,394	25,826	10,955	13,127	45,486
District of Columbia	69,861	40,304	10,410	8,712	10,435
Florida	2,013,483	801,536	322,202	357,400	532,345
Georgia	999,434	421,874	147,171	154,568	275,820
Hawaii	109,532	44,781	18,589	15,185	30,977
Idaho	123,765	48,832	27,618	30,030	17,284
Illinois	1,506,838	478,932	185,933	198,312	643,661
Indiana	729,137	274,514	94,248	124,771	235,603
Iowa	324,110	108,296	44,717	56,041	115,056
Kansas	313,277	113,219	41,872	50,365	107,822
Kentucky	508,792	242,598	96,132	97,183	72,879
Louisiana	476,654	246,416	91,088	90,345	48,804
Maine	154,662	56,366	21,945	28,121	48,230
Maryland	607,980	167,952	59,356	71,641	309,032
Massachusetts	872,740	284,158	103,708	92,455	392,420
Michigan	1,218,551	439,448	169,263	151,054	458,785
Minnesota	587,936	144,422	75,157	73,019	295,338
Mississippi	339,311	203,166	66,008	61,590	8,547
Missouri	683,461	242,575	110,098	120,449	210,340
Montana	96,489	47,064	23,967	15,093	10,365
Nebraska	191,140	60,197	33,254	32,164	65,525
Nevada	224,501	80,640	31,926	41,960	69,975
New Hampshire	134,222	28,881	17,649	16,139	71,552
New Jersey	1,037,955	258,259	109,985	111,478	558,233
New Mexico	208,290	111,815	42,373	45,535	8,567
New York	2,478,716	1,006,275	341,851	328,618	801,972
North Carolina	1,061,471	455,833	206,970	189,548	209,120
North Dakota	75,800	28,316	13,048	13,395	21,040
Ohio	1,363,060	532,399	183,472	190,520	456,669
Oklahoma	404,643	188,658	92,233	79,880	43,871
Oregon	401,851	148,920	77,975	66,546	108,410
Pennsylvania	1,489,149	507,619	196,275	236,252	549,003
Rhode Island	129,094	41,592	15,889	15,456	56,157
South Carolina	480,334	207,446	94,434	86,911	91,542
South Dakota	83,527	29,856	16,673	14,796	22,202
Tennessee	715,897	332,467	130,366	134,091	118,974
Texas	2,456,387	1,176,802	478,946	426,228	374,411
Utah	198,661	66,063	33,823	39,940	58,835
Vermont	75,913	22,377	10,988	13,123	29,425
Virginia	816,492	217,216	98,088	119,324	381,864
Washington	674,016	208,311	101,162	96,251	268,292
West Virginia	204,218	106,442	40,062	48,424	9,290
Wisconsin	661,315	207,459	103,466	95,510	254,880
Wyoming	56,989	19,632	9,182	9,543	18,632
All States	33,819,278	12,740,124	5,278,640	5,266,896	10,533,618

<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 CPS ASEC average estimate of the total number of all U.S. households is 115,726,411.

**LIHEAP Home Energy Notebook for FY 2007: Appendix B: Income Eligible Household Estimates**

**Table B-4. Average of 2006, 2007, and 2008 State-level estimates of the number of LIHEAP income eligible households using the State maximum LIHEAP income standards<sup>1/ 2/</sup>**

(Three-Year Average of CPS ASEC 2006-2008)

State	State Income Guidelines for 4-Person Household as % of HHS Poverty Guidelines	Total number of LIHEAP eligible Households <sup>3/</sup>	Number of LIHEAP eligible households by HHS poverty intervals			
			At or below poverty guidelines	>100%-125% poverty guidelines	>125%-150% poverty guidelines	Over 150% poverty guidelines
Alabama	150	447,785	268,655	90,285	88,845	0
Alaska	150	52,832	28,735	11,785	12,312	0
Arizona	150	484,240	276,456	107,222	100,562	0
Arkansas	125	215,776	152,005	63,771	0	0
California	<sup>4/</sup> 208	3,838,847	1,250,875	683,775	604,242	1,299,956
Colorado	185	411,897	174,858	72,016	73,174	91,850
Connecticut	150	215,215	112,788	49,257	53,170	0
Delaware	200	78,174	25,826	10,955	13,127	28,266
District of Columbia	<sup>4/</sup> 195	69,561	40,304	10,232	8,590	10,435
Florida	150	1,481,139	801,536	322,202	357,400	0
Georgia	150	723,614	421,874	147,171	154,568	0
Hawaii	150	78,555	44,781	18,589	15,185	0
Idaho	150	106,481	48,832	27,618	30,030	0
Illinois	150	863,177	478,932	185,933	198,312	0
Indiana	150	493,534	274,514	94,248	124,771	0
Iowa	150	209,055	108,296	44,717	56,041	0
Kansas	130	166,305	113,219	41,872	11,214	0
Kentucky	110	283,037	242,598	40,439	0	0
Louisiana	<sup>4/</sup> 163	475,551	246,416	91,088	89,243	48,804
Maine	<sup>5/</sup> 150	117,492	56,366	21,945	28,121	11,060
Maryland	200	424,097	167,952	59,356	71,641	125,149
Massachusetts	<sup>6/</sup> 200	664,852	284,158	103,708	92,455	184,531
Michigan	110	502,844	439,448	63,396	0	0
Minnesota	<sup>4/</sup> 197	456,663	144,422	75,157	72,476	164,608
Mississippi	150	330,764	203,166	66,008	61,590	0
Missouri	125	352,673	242,575	110,098	0	0
Montana	150	86,124	47,064	23,967	15,093	0
Nebraska	116	79,129	60,197	18,932	0	0
Nevada	150	154,526	80,640	31,926	41,960	0
New Hampshire	185	85,689	28,881	17,649	16,139	23,019
New Jersey	175	583,060	258,259	109,985	111,478	103,338
New Mexico	150	199,723	111,815	42,373	45,535	0
New York	<sup>4/ 7/</sup> 204	2,478,716	1,006,275	341,851	328,618	801,972
North Carolina	110	533,117	455,833	77,283	0	0
North Dakota	<sup>4/</sup> 205	75,800	28,316	13,048	13,395	21,040
Ohio	175	1,118,437	532,399	183,472	190,520	212,046
Oklahoma	110	224,362	188,658	35,703	0	0
Oregon	<sup>4/</sup> 184	401,851	148,920	77,975	66,546	108,410
Pennsylvania	150	940,146	507,619	196,275	236,252	0
Rhode Island	<sup>4/</sup> 218	129,094	41,592	15,889	15,456	56,157
South Carolina	150	388,791	207,446	94,434	86,911	0
South Dakota	160	67,517	29,856	16,673	14,796	6,193
Tennessee	125	462,832	332,467	130,366	0	0
Texas	125	1,655,748	1,176,802	478,946	0	0
Utah	125	99,886	66,063	33,823	0	0
Vermont	125	33,365	22,377	10,988	0	0
Virginia	130	340,292	217,216	98,088	24,988	0
Washington	125	309,473	208,311	101,162	0	0
West Virginia	130	156,015	106,442	40,062	9,511	0
Wisconsin	150	406,435	207,459	103,466	95,510	0
Wyoming	<sup>4/</sup> 199	56,933	19,632	9,182	9,486	18,632
All States	Not applicable	24,611,216	12,740,124	4,916,362	3,639,264	3,315,466

<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. 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 CPS ASEC average estimate of the total number of all U.S. households is 115,726,411.

<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.

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

<sup>6/</sup>150 percent of the HHS Poverty Guidelines whenever 200 percent of the HHS Poverty Guidelines exceeds 60 percent of the State median income.

<sup>7/</sup>150 percent of the HHS Poverty Guidelines for a family size of 11 or more.

**LIHEAP Home Energy Notebook for FY 2007: Appendix B: Income Eligible Household Estimates**

**Table B-5. Average of 2005, 2006, and 2007 State-level estimates of the number of LIHEAP income eligible households using the Federal maximum LIHEAP income standard by vulnerability category<sup>1/</sup>**  
<sup>2/</sup>

(Three-Year Average of the ACS 2005-2007)

State	Total number of LIHEAP eligible households <sup>2/</sup>	LIHEAP eligible households by vulnerability category <sup>3/</sup>			LIHEAP eligible households with no vulnerable members
		At least one person 60+ years	At least one child less than 6 yrs. old	At least one person with a disability <sup>4/</sup>	
Alabama	581,226	213,696	106,262	235,233	172,824
Alaska	60,314	14,853	16,208	15,841	23,121
Arizona	552,379	186,179	131,226	148,975	183,091
Arkansas	321,981	116,269	64,025	135,239	88,407
California	3,403,230	1,142,126	807,155	933,459	1,170,996
Colorado	510,809	151,531	108,911	118,618	203,055
Connecticut	375,961	161,487	59,048	109,181	116,596
Delaware	87,917	35,858	17,988	24,892	25,407
District of Columbia	64,136	21,817	9,967	20,144	24,600
Florida	1,842,493	805,418	315,724	557,130	556,355
Georgia	952,578	307,271	212,069	312,138	323,156
Hawaii	103,726	41,033	19,555	27,762	34,998
Idaho	140,280	43,620	35,233	40,083	44,898
Illinois	1,393,107	513,525	279,255	389,092	477,882
Indiana	702,210	247,974	139,518	223,336	228,718
Iowa	340,260	131,369	59,989	100,061	112,453
Kansas	313,971	105,877	65,532	88,858	109,864
Kentucky	512,456	184,641	90,976	232,369	135,574
Louisiana	499,502	177,602	99,902	179,460	158,887
Maine	153,761	65,698	21,889	59,842	40,472
Maryland	541,862	210,217	101,312	149,693	183,849
Massachusetts	739,325	322,406	107,755	246,135	219,241
Michigan	1,204,341	439,767	217,246	393,925	396,372
Minnesota	565,469	218,462	104,044	146,680	189,007
Mississippi	354,579	127,523	71,527	156,426	98,248
Missouri	694,085	255,391	133,276	244,449	213,697
Montana	93,209	31,479	14,730	28,509	34,755
Nebraska	194,330	69,324	40,086	53,324	65,167
Nevada	206,512	70,817	47,390	50,101	70,924
New Hampshire	125,092	52,444	17,030	38,489	39,189
New Jersey	928,779	404,300	161,113	253,989	294,639
New Mexico	200,645	63,953	44,592	59,834	68,800
New York	2,114,453	848,341	370,362	668,709	669,932
North Carolina	1,016,380	358,764	203,792	353,580	326,782
North Dakota	76,204	30,746	10,919	20,824	27,961
Ohio	1,376,968	507,964	254,835	462,517	428,839
Oklahoma	398,250	133,316	87,367	143,762	121,596
Oregon	399,112	133,990	72,802	118,924	143,414
Pennsylvania	1,484,126	652,951	219,877	507,784	426,837
Rhode Island	118,664	50,063	18,123	41,022	34,282
South Carolina	488,039	181,277	91,813	175,527	151,164
South Dakota	89,500	34,612	16,062	25,253	30,058
Tennessee	708,071	258,899	134,993	280,706	208,362
Texas	2,314,860	693,630	616,742	644,491	803,786
Utah	201,079	51,161	67,375	46,892	65,205
Vermont	69,073	25,519	10,272	23,087	22,930
Virginia	750,906	284,357	135,276	239,113	249,422
Washington	667,243	217,152	133,103	209,244	227,103
West Virginia	223,402	84,148	35,299	107,182	55,235
Wisconsin	634,579	242,150	108,645	181,475	212,046
Wyoming	47,408	17,329	8,631	13,656	16,489
<b>All States</b>	<b>31,938,842</b>	<b>11,740,298</b>	<b>6,316,824</b>	<b>10,037,013</b>	<b>10,326,687</b>

<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 average estimate of the total number of all U.S. households is 111,688,170.

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

<sup>5/</sup>A person with a disability is defined as anyone 16 years or older who reported having difficulty working due to a "physical, mental, or emotional condition lasting 6 months or more," as reported on the ACS. The definition also includes individuals ages 15 through 64 who received Supplemental Security Income in the past year and non-widowed individuals ages 19 through 61 who received Social Security income in the past year.

**LIHEAP Home Energy Notebook for FY 2007: Appendix B: Income Eligible Household Estimates**

**Table B-6. Average of 2005, 2006, and 2007 State-level estimates of the number of LIHEAP income eligible households using State LIHEAP income standards by vulnerability category<sup>1/ 2/</sup>**

(Three-Year Average of the ACS 2005-2007)

State	State Income Guidelines for 4-Person Household as % of HHS Poverty Guidelines	Total number of LIHEAP eligible households <sup>3/</sup>	LIHEAP eligible households by vulnerability category <sup>4/</sup>			LIHEAP eligible households with no vulnerable members
			At least one person 60+	At least one child less than 6 yrs. old	At least one person with a disability <sup>5/</sup>	
Alabama	150	499,498	180,601	94,627	207,039	145,467
Alaska	150	34,942	8,594	8,994	11,018	12,630
Arizona	150	449,206	143,851	112,833	123,556	147,804
Arkansas	125	247,880	85,809	52,180	107,248	65,790
California	<sup>6/</sup> 208	3,400,610	1,141,376	804,716	932,656	1,170,901
Colorado	185	416,003	122,285	93,921	101,650	158,198
Connecticut	150	181,993	74,025	29,892	63,880	50,621
Delaware	200	77,616	30,727	16,680	22,762	22,034
District of Columbia	<sup>6/</sup> 195	64,136	21,817	9,967	20,144	24,600
Florida	150	1,437,577	611,574	259,916	449,829	423,684
Georgia	150	740,465	237,696	170,064	255,498	239,088
Hawaii	150	62,510	24,037	11,805	18,403	20,210
Idaho	150	118,068	36,366	30,797	34,974	36,053
Illinois	150	881,572	299,358	191,667	265,335	294,661
Indiana	150	478,193	156,635	101,589	163,846	150,763
Iowa	150	235,363	87,359	44,570	75,427	74,359
Kansas	130	174,236	53,774	38,989	54,943	58,434
Kentucky	110	306,104	95,166	59,888	147,873	77,811
Louisiana	<sup>6/</sup> 163	498,717	177,354	99,243	179,292	158,803
Maine	<sup>7/</sup> 150	124,757	56,986	18,435	51,466	28,668
Maryland	200	395,257	156,048	74,186	120,570	125,392
Massachusetts	<sup>8/</sup> 200	564,121	246,781	81,546	203,546	156,423
Michigan	110	526,177	146,697	112,191	188,433	175,047
Minnesota	<sup>6/</sup> 197	445,184	174,107	80,664	125,679	141,723
Mississippi	150	351,425	125,486	71,527	155,055	97,513
Missouri	125	399,065	131,189	84,278	153,135	118,169
Montana	150	84,341	28,055	13,712	26,025	31,266
Nebraska	116	92,249	29,960	21,684	29,382	28,065
Nevada	150	150,628	49,209	36,713	38,676	49,842
New Hampshire	185	86,398	36,104	11,936	30,615	23,852
New Jersey	175	556,858	242,859	102,520	173,182	159,720
New Mexico	150	197,098	62,039	44,515	58,819	67,517
New York	<sup>6/</sup> 204	2,114,096	848,256	370,006	668,686	669,932
North Carolina	110	542,445	168,461	117,920	200,540	172,686
North Dakota	<sup>6/</sup> 205	76,160	30,746	10,875	20,824	27,961
Ohio	175	1,145,633	402,558	225,524	400,419	349,399
Oklahoma	110	239,793	69,255	55,996	91,255	72,916
Oregon	<sup>6/</sup> 184	398,917	133,990	72,633	118,790	143,388
Pennsylvania	150	973,690	402,758	156,245	362,999	267,302
Rhode Island	<sup>6/</sup> 218	118,664	50,063	18,123	41,022	34,282
South Carolina	150	411,502	150,079	80,286	153,131	123,527
South Dakota	160	75,352	29,122	14,184	22,006	24,194
Tennessee	125	478,230	164,209	97,178	202,253	132,950
Texas	125	1,597,621	451,545	457,085	464,525	533,301
Utah	125	104,443	23,412	34,426	27,450	33,958
Vermont	125	33,787	11,705	5,287	13,125	10,026
Virginia	130	385,772	145,787	68,966	140,645	118,409
Washington	125	336,955	95,189	70,857	121,882	109,362
West Virginia	130	184,104	63,854	31,537	89,062	45,935
Wisconsin	150	392,895	141,877	70,348	127,497	125,279
Wyoming	<sup>6/</sup> 199	47,408	17,329	8,631	13,656	16,489
All States	Not applicable	23,935,716	8,474,121	4,952,352	7,869,726	7,546,401

<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. 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 111,688,170.

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

<sup>5/</sup>A person with a disability is defined as anyone 16 years or older who reported having difficulty working due to a "physical, mental, or emotional condition lasting 6 months or more," as reported on the ACS. The definition also includes individuals ages 15 through 64 who received Supplemental Security Income in the past year and non-widowed individuals ages 19 through 61 who received Social Security income in the past year.

<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.

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

<sup>8/</sup>150 percent of the HHS Poverty Guidelines whenever 200 percent of the HHS Poverty Guidelines exceeds 60 percent of the State median income.

<sup>9/</sup>150 percent of the HHS Poverty Guidelines for a family size of 11 or more.

**LIHEAP Home Energy Notebook for FY 2007: Appendix B: Income Eligible Household Estimates**

**Table B-7. Average of 2005, 2006, and 2007 State-level estimates of the number of LIHEAP income eligible households using the Federal maximum LIHEAP income standard classified by HHS poverty guidelines<sup>1/ 2/</sup>**

(Three-Year Average of the ACS 2005-2007)

State	Total number of LIHEAP eligible households <sup>3/</sup>	Number of LIHEAP eligible households by intervals of HHS Poverty Guidelines			
		At or below poverty guidelines	>100% - 125% poverty guidelines	>125% - 150% poverty guidelines	Over 150% poverty guidelines
Alabama	581,226	292,272	107,109	100,117	81,728
Alaska	60,314	18,113	8,036	8,793	25,372
Arizona	552,379	248,717	97,521	102,968	103,173
Arkansas	321,981	178,925	68,955	64,668	9,433
California	3,403,230	1,233,697	565,639	524,813	1,079,080
Colorado	510,809	185,017	68,609	66,213	190,970
Connecticut	375,961	103,313	39,198	39,482	193,968
Delaware	87,917	27,997	11,668	11,982	36,270
District of Columbia	64,136	37,358	8,192	8,080	10,506
Florida	1,842,493	777,102	324,344	336,131	404,916
Georgia	952,578	435,508	155,478	149,479	212,113
Hawaii	103,726	37,833	12,456	12,221	41,216
Idaho	140,280	61,848	28,239	27,980	22,212
Illinois	1,393,107	511,493	184,968	185,110	511,535
Indiana	702,210	265,517	105,820	106,856	224,017
Iowa	340,260	123,511	54,165	57,687	104,897
Kansas	313,971	113,594	49,768	52,720	97,890
Kentucky	512,456	270,465	91,580	86,756	63,655
Louisiana	499,502	284,501	94,146	85,153	35,702
Maine	153,761	60,232	26,579	26,618	40,332
Maryland	541,862	149,492	58,403	61,126	272,842
Massachusetts	739,325	245,600	82,045	81,877	329,803
Michigan	1,204,341	461,110	163,748	164,239	415,244
Minnesota	565,469	168,787	70,052	72,578	254,051
Mississippi	354,579	210,967	76,409	64,049	3,154
Missouri	694,085	288,467	110,598	107,958	187,061
Montana	93,209	45,828	19,566	18,947	8,868
Nebraska	194,330	72,780	32,218	31,062	58,270
Nevada	206,512	82,172	32,790	35,666	55,884
New Hampshire	125,092	34,635	14,434	13,854	62,169
New Jersey	928,779	255,655	98,565	100,222	474,337
New Mexico	200,645	115,896	42,116	39,086	3,547
New York	2,114,453	901,951	290,497	288,610	633,394
North Carolina	1,016,380	471,067	179,963	172,283	193,067
North Dakota	76,204	30,898	12,839	13,849	18,618
Ohio	1,376,968	542,007	199,597	203,000	432,365
Oklahoma	398,250	209,461	78,811	76,613	33,365
Oregon	399,112	164,340	66,763	67,393	100,615
Pennsylvania	1,484,126	536,308	218,027	219,356	510,436
Rhode Island	118,664	43,272	18,089	17,302	40,000
South Carolina	488,039	237,000	89,944	84,558	76,537
South Dakota	89,500	38,394	13,478	15,743	21,885
Tennessee	708,071	352,199	126,031	124,320	105,521
Texas	2,314,860	1,178,142	419,479	409,298	307,941
Utah	201,079	71,196	33,247	37,862	58,774
Vermont	69,073	23,626	10,161	10,392	24,894
Virginia	750,906	264,173	100,831	97,913	287,989
Washington	667,243	245,703	91,252	93,088	237,201
West Virginia	223,402	125,905	48,743	44,268	4,485
Wisconsin	634,579	204,847	94,173	93,875	241,684
Wyoming	47,408	16,629	7,429	10,043	13,307
All States	31,938,842	13,055,520	5,002,770	4,924,259	8,956,293

<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 average estimate of the total number of all U.S. households is 111,688,170.

**LIHEAP Home Energy Notebook for FY 2007: Appendix B: Income Eligible Household Estimates**

**Table B-8. Average of 2005, 2006, and 2007 State-level estimates of the number of LIHEAP income eligible households using the State maximum LIHEAP income standards<sup>1/ 2/</sup>**

(Three-Year Average of the ACS 2005-2007)

State	State Income Guidelines for 4-Person Household as % of HHS Poverty Guidelines	Total number of LIHEAP eligible Households <sup>3/</sup>	Number of LIHEAP eligible households by HHS poverty intervals			
			At or below poverty guidelines	>100%-125% poverty guidelines	>125%-150% poverty guidelines	Over 150% poverty guidelines
Alabama	150	499,498	292,272	107,109	100,117	0
Alaska	150	34,942	18,113	8,036	8,793	0
Arizona	150	449,206	248,717	97,521	102,968	0
Arkansas	125	247,880	178,925	68,955	0	0
California	<sup>4/</sup> 208	3,400,610	1,233,697	565,403	522,429	1,079,080
Colorado	185	416,003	185,017	68,609	66,213	96,164
Connecticut	150	181,993	103,313	39,198	39,482	0
Delaware	200	77,616	27,997	11,668	11,982	25,969
District of Columbia	<sup>4/</sup> 195	64,136	37,358	8,192	8,080	10,506
Florida	150	1,437,577	777,102	324,344	336,131	0
Georgia	150	740,465	435,508	155,478	149,479	0
Hawaii	150	62,510	37,833	12,456	12,221	0
Idaho	150	118,068	61,848	28,239	27,980	0
Illinois	150	881,572	511,493	184,968	185,110	0
Indiana	150	478,193	265,517	105,820	106,856	0
Iowa	150	235,363	123,511	54,165	57,687	0
Kansas	130	174,236	113,594	49,768	10,874	0
Kentucky	110	306,104	270,465	35,638	0	0
Louisiana	<sup>4/</sup> 163	498,717	284,501	94,102	84,412	35,702
Maine	<sup>5/</sup> 150	124,757	60,232	26,579	26,618	11,328
Maryland	200	395,257	149,492	58,403	61,126	126,237
Massachusetts	<sup>6/</sup> 200	564,121	245,600	82,045	81,877	154,599
Michigan	110	526,177	461,110	65,067	0	0
Minnesota	<sup>4/</sup> 197	445,184	168,787	70,043	72,480	133,874
Mississippi	150	351,425	210,967	76,409	64,049	0
Missouri	125	399,065	288,467	110,598	0	0
Montana	150	84,341	45,828	19,566	18,947	0
Nebraska	116	92,249	72,780	19,470	0	0
Nevada	150	150,628	82,172	32,790	35,666	0
New Hampshire	185	86,398	34,635	14,434	13,854	23,475
New Jersey	175	556,858	255,655	98,565	100,222	102,416
New Mexico	150	197,098	115,896	42,116	39,086	0
New York	<sup>4/ 7/</sup> 204	2,114,096	901,951	290,497	288,254	633,394
North Carolina	110	542,445	471,067	71,378	0	0
North Dakota	<sup>4/</sup> 205	76,160	30,898	12,795	13,849	18,618
Ohio	175	1,145,633	542,007	199,597	203,000	201,030
Oklahoma	110	239,793	209,461	30,332	0	0
Oregon	<sup>4/</sup> 184	398,917	164,340	66,661	67,300	100,615
Pennsylvania	150	973,690	536,308	218,027	219,356	0
Rhode Island	<sup>4/</sup> 218	118,664	43,272	18,089	17,302	40,000
South Carolina	150	411,502	237,000	89,944	84,558	0
South Dakota	160	75,352	38,394	13,478	15,743	7,737
Tennessee	125	478,230	352,199	126,031	0	0
Texas	125	1,597,621	1,178,142	419,479	0	0
Utah	125	104,443	71,196	33,247	0	0
Vermont	125	33,787	23,626	10,161	0	0
Virginia	130	385,772	264,173	100,831	20,768	0
Washington	125	336,955	245,703	91,252	0	0
West Virginia	130	184,104	125,905	48,743	9,456	0
Wisconsin	150	392,895	204,847	94,173	93,875	0
Wyoming	<sup>4/</sup> 199	47,408	16,629	7,429	10,043	13,307
All States	Not applicable	23,935,716	13,055,520	4,677,902	3,388,245	2,814,050

<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. 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 111,688,170.

<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.

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

<sup>6/</sup>150 percent of the HHS Poverty Guidelines whenever 200 percent of the HHS Poverty Guidelines exceeds 60 percent of the State median income.

<sup>7/</sup>150 percent of the HHS Poverty Guidelines for a family size of 11 or more.