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OAK RIDGE NATIONAL LABORATORY

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THE SCOPE OF THE WEATHERIZATION ASSISTANCE PROGRAM:

PROFILE OF THE POPULATION IN NEED

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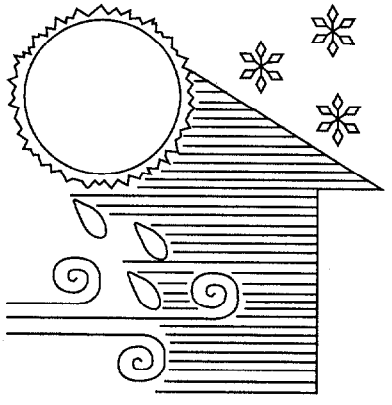

WEATHERIZATION ASSISTANCE PROGRAM

MANAGED BY
MARTIN MARIETTA ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

ORNL/SUB/92-SK904/V2

THE SCOPE OF THE WEATHERIZATIONASSISTANCE PROGRAM:

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EXECUTIVE SUMMARY

OVERVIEW

The U.S. Department of Energy (DOE) is conducting a national evaluation of its Weatherization Assistance Program, an energy efficiency program that provides financial assistance to qualifying low-income households for the "weatherization" of their housing units. The evaluation, being conducted for the Department by Oak Ridge National Laboratory (ORNL), is comprised of five studies. One of the five is a two-part analysis of the scope of the Weatherization Assistance Program and other resources devoted to low-income energy efficiency, including the number of dwellings weatherized to date and the population remaining to be served. This study is referred to here as the "Scope" study.

This report presents the results of the second part of the "Scope" study, which investigates the characteristics of the population eligible for and in need of the DOE Weatherization Assistance Program -- The Profile of the Population in Need. The "Profile" study is an attempt to use the Energy Information Administration's Residential Energy Consumption Survey (RECS) for 1990 to define the weatherization-related characteristics of the low-income population. The RECS, a national survey with a sample size of 5,095 households, is the most reliable source for information regarding residential energy-use and housing characteristics because data is collected from fuel vendors on actual household energy bills and consumption for a large and representative sample of households.

Research Objectives

The research objective of The Profile of the Population in Need is to describe the population of low-income households, their location, housing, energy-use and demographic characteristics in 1990. The study's intent is to highlight those attributes that shed some light on the need for low-income energy efficiency services among those households that may qualify under national income standards for the Weatherization Assistance Program and the Department of Health and Human Services' Low Income Home Energy Assistance Program (LIHEAP).[1] The study further seeks to examine the characteristics of several subsets of the low-income population for purposes of refining the understanding of how best to target and allocate limited weatherization resources. Among the subsets of the eligible population examined in the study and highlighted in this report are the following:

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[1] The income standard for LIHEAP is the greater of 60 percent of state median income or 150 percent of the poverty level. The income standard for the Weatherization Assistance Program is at or below 125 percent of the poverty level; however, a state may elect to use the LIHEAP income standard if its state LIHEAP income standard is at least 125 percent of the poverty level. For this study, the fiscal year 1990 state median income estimates and the calendar year 1989 poverty income guidelines were used with the 1990 RECS population and income data in classifying low income households.

1) "High-Expenditure" Households -- those with high space heating costs per heating degree day and square feet of living space relative to others in their climate zone and region;

2) "High-Burden" Households -- those with high total residential energy expenditures in proportion to income relative to others in their climate zone and region;

3) "High-Burden/High-Expenditure" Households -- those households that qualified in both categories described above.

High-expenditure households are of particular interest because their high consumption, weighted by price, may indicate that they have above-average energy savings potential. This potential is based on the fact that dwellings that consume more energy before weatherization save more energy after weatherization, a major finding of the *National Weatherization Evaluation's* single-family study.

It is a major purpose of the Weatherization Assistance Program, not only to increase energy efficiency, but also to reduce the burden of energy costs to those who can least afford it. It is therefore important to understand the relationship between high energy expenditures and income. One key question that this study tries to answer is the following: Is the high-expenditure set of households, which appears to have greater-than-average energy-efficiency potential, also likely to be in greater need of weatherization because high energy costs place a heavier-than-average burden on household budgets?

High-burden households are a subpopulation deserving particular attention because they can least afford the residential energy that they consume. While this may sometimes result from higher-than-average energy expenditures, it may also be produced by lower-than-average income or some combination of the two. These households stand to gain the greatest benefit from the expenditure reductions that weatherization can produce. A key question about this population that the study tries to answer is the following: Is this set of households likely to offer high energy-efficiency potential as well as being logical targets for weatherization on equity grounds?

The high-burden/high-expenditure subset is examined because, as the intersection of the high-burden and high-expenditure groups, it should highlight a population that offers both high energy-efficiency potential as well as an excellent opportunity to assist those households that are most in need of assistance.

RESIDENTIAL ENERGY-USE CHARACTERISTICS OF THE LOW-INCOME POPULATION

This report relies on RECS as it is the only national household survey that provides data on both income and energy expenditures. Based on the 1990 RECS, there were 27.9 million households with incomes at or below the higher of 60 percent of state median income or 150 percent of poverty, comprising approximately 30 percent of all U.S. households. However, not all of the 27.9 million

households would have income eligible for the Low Income Home Energy Assistance Program and DOE/Weatherization Assistance Program in 1990 due to limitations in RECS income data. Based on more accurate income data collected by the Bureau of the Census' March 1991 Current Population Survey, there were 25.9 million households that were income eligible for both programs. The reader should therefore bear in mind that the statistics for "eligible" households as defined by the RECS data may include some households with actual incomes that were slightly above the income eligibility guidelines.

RECS is the only national data source that allows for consistent identification and comparison among the subpopulations of interest as defined in this study. Of the 27.9 million low-income households, 7.2 million were high burden households and 5.0 million were high expenditure households. The intersecting group of high-burden/high-expenditure households comprised 2.1 million households. These subpopulations are shown in Figure E.1. Given the RECS overcount, these subpopulations also may be overcounted.

The population described in this report as eligible for weatherization in 1990 contained some households that had already received weatherization services from DOE or other sources, though this group is small relative to the eligible and potentially eligible pool of households. In light of the absence of data in RECS that permits identification of all the weatherized households within the low-

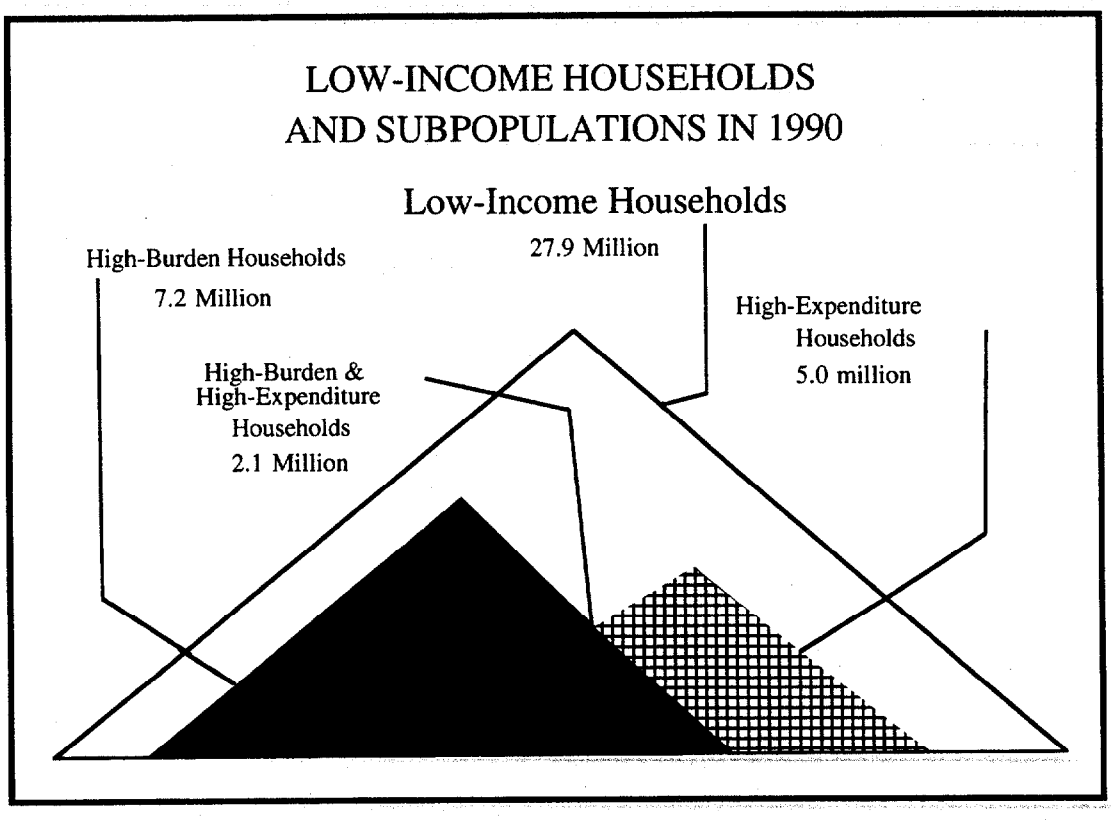

Figure E.1 Low-Income Households and Subpopulations in 1990
(Source: 1990 Residential Energy Consumption Survey)

income population, as well as the small proportion of such households in the population, this study focuses on the total eligible population in 1990 as the population in need, with the understanding that some of these households have already been weatherized.

Housing Characteristics

Low-income households, like the population at large, tend to reside in single-family homes. In fact, 58.7% lived in single-family units and an additional 8.2% lived in mobile homes. Of the remaining households, 19.1% lived in large multifamily dwellings and 14.1% occupied apartments in small multifamily buildings of two-through-four units. Fifty percent, of low-income households owned their own homes in 1990. Among these, the vast majority, 82.6%, lived in single-family units but a large number, 1.6 million or 11.4%, were in mobile homes. There were 13.9 million low-income renter households.

Of the four Census Regions, the South had the largest number of the poor, 37% of all eligible households. Approximately 23% lived in the Midwest. The West and Northeast each contained 20% of all low-income households.

Heating Fuel

The pattern of primary fuel use among the poor is generally the same as that for the population at large. Fifty-three percent of low-income households heated with natural gas in 1990 as compared to 55% of all U.S. households. Twenty percent of low-income households heated with electricity, and home heating oil was used by 11%. Those proportions are comparable to the respective percentages of 22.9% for electricity and 11.7% for fuel oil among all households. The percentage of households heating with propane was 7.6% for low-income households compared to 4.7% for all U.S. households.

Residential Energy Expenditures

In 1990 the average low-income household spent $994 for residential energy, with substantial variation by fuel type, housing type, and region. This compares to an average residential energy expenditure of $1,172 for all U.S. households. The average expenditure for all low-income households in the Northeast was $1,201, nearly 60% higher than the average of $756 in the West. Expenditures in the Midwest and South were closer to the over-all low-income average at $1,094 and $958 respectively.

Households heating with electricity, located more frequently in warmer regions, tended to have much lower average residential energy expenditures than the low-income population as a whole at $826. Those heating with fuel oil, on the other hand, had the highest expenditures, at an average of $1,246, because more of them were located in the colder parts of the country where heating loads

were greater. Those heating with natural gas and propane had expenditures close to the general average.

Residents of large multifamily units had average expenditures of $634, 36% below the low-income average. This reflects the relatively small housing units they occupy, even though they tend to be concentrated in the coldest region. By contract, households living in single-family homes had an average energy expenditure of $1,115. Residents of mobile homes and small multifamily buildings had average energy expenditures that were very close to the overall low-income population average.

Income

The average income of "households" elegible for LIHEAP and Weatherization Assistance based on RECS data was $10,048 in 1990.[2] This compared to an average income for all households in 1990 of $33,486. Average homeowner income for eligible households was $10,989 compared to $9,095 for renters.

Residential Energy Burden

"Energy burden" is calculated by dividing residential energy expenditures by income to express expenditures as a percentage of income. In many respects it is the key measure of the impact of energy costs on low-income households because it provides a measure, not only of energy costs, but of affordability as well.

The average individual burden for all low-income households averaged 14.4% in 1990. This is more than four times the burden for non-poor U.S. households which averaged 3.5%. When measured as the ratio of the average of all low-income energy expenditures to the average of all low-income incomes (group burden), the average energy burden for low-income households was 9.9%, more than three times the burden for non-poor U.S. households when calculated in this manner. Please see the sidebar on the following page for an explanation of alternative methods for calculating average energy burden as well as Table E.1, which provides a breakdown of energy burden, income, and expenditures by primary heating fuel type.

Demographics of the Eligible Population

Households with elderly residents and those with children are priority households for weatherization services under the law that authorizes the program.[3]

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[2] Household income in the RECS is actually family income and does not include income from unrelated members of the household. This contributes to lower income estimates in RECS than those in other surveys such as the CPS or Survey of Income and Program Participation.

[3] Households with persons with disabilities also are priority households, but RECS does not distinguish this subpopulation.

Elderly -- Among all low-income households, 12.2 million (43.7%) had at least one person classified as elderly (60 or older). The average energy expenditure for households with an elderly member was $984 in 1990, essentially the same as that of the low-income population as a whole. The average energy burden for these households also was similar to that of all low-income households at 14.0% of income.

Children -- Approximately 43% of the program-eligible households, or 12 million, were households with children. The average energy burden for these households, at 14.0%, was approximately the same as that for all low-income households.

Single-Parent -- These households comprise a unique subset of the low-income households with children and are 19.9% of the total eligible population. Their energy burden was 18.0% of income in 1990, which is higher than either of the priority groups.

Program Participation

An estimated 3.3 million households, 11.9% of all eligible households, participated in the Aid To Families With Dependent Children (AFDC) Program, 2.3 million were recipients of Supplemental Security Income (SSI) and 5.6 million, 20%, were Food Stamp recipients. An estimated 3.8 million reported receiving heating assistance, (LIHEAP). These estimates from RECS, as well as other surveys such as Current Population Survey and Census,

THE WHOLE PICTURE

There are two principal ways in which average energy burden can be calculated for a given group of households. One of these calculates energy burden for each household in a sample and then derives an average for these individual calculations - that is to say the average individual burden. The second method calculates average energy expenditures for all households in the group and divides this by the average of all income for the group; in other words, the average group burden.

These two methods provide remarkably different results, each of which says something important about the impact of energy expenditures on low-income budgets. By the first method, the average individual burden, the mean energy burden for low-income households in 1990 was 14.4% of income. By the second method, the average group burden, the mean energy burden for low-income households was 9.9% of income. Why was there so great a difference between the two?

In large measure the difference can be explained by the fact that a substantial minority of low-income households have energy expenditures that far exceed the low-income average and/or have incomes that are substantially below the average. The extreme burdens of these households are better represented by the burden when calculated as an average of individual household burdens, or 14.4%.

The second method, on the other hand, tends to better reflect the central tendency of the whole group that is being measured. That is to say, it comes closer to representing the energy burden for those households that are near the median of the group. However, it says nothing about the individual households; it is a group statistic.

In this report, which employs energy burden to identify and separate individual households into groups, the more frequently used statistic is the average individual burden. In most cases this will provide the reader with the sharpest contrast between the groups being described and compared. Wherever possible the report will also provide statistics in its tables on average group burden so that the reader can get a balanced picture of the central tendency and overall distribution of energy burden for the populations being discussed. These statistics will be designated as "group burden."

tend to understate participation in all assistance programs when compared to participation as reported by administering program offices. Actual program participation was therefore significantly higher than these numbers would suggest.

Table E.1 Income, Energy Expenditures and Energy Burden of Eligible Low-Income Households in 1990 (Source: 1990 RECS)

FUEL		HOUSEHOLD			
Main Heating Fuel	Percentage of All Types	Income	Expenditure	Individual Burden	Group Burden
Natural Gas	52.7%	$10,162	$984	13.9%	9.7%
Electricity	20.0%	9,368	826	13.1%	8.8%
Fuel Oil	11.2%	10,234	1,246	18.5%	12.2%
Propane	7.6%	9,275	1,184	18.1%	12.8%
Other	6.0%	11,449	874	9.6%	7.6%
All	100.0%*	$10,048	$994	14.4%	9.9%

* Does not add to 100% due to the exclusion of a separate line for kerosene which represents a small number of households. Kerosene was not included in the calculation of "other" but it was a component of the calculation of the overall average presented on the bottom line.

PROFILE OF THE HIGH-EXPENDITURE HOUSEHOLDS

High-expenditure households were defined as those with average residential energy expenditures per heating degree day and square foot of living space that were one standard deviation or more above the mean for their region and temperature zone. This definition assures that the estimated 5.0 million households that fall into this category were derived from all regions and climate zones in the country. For maps of the climate and Census regions please see Appendix B.

Expenditures, Income, and Burden of High-Expenditure Households

The mean energy expenditure for high-expenditure households was $1,233 in 1990, which was substantially higher than the average for all low-income households of $994. Higher-than-average expenditures were not accompanied by higher-than-average incomes. The average income of high-expenditure households was less than the average for all low-income households, $9,254 in 1990 compared to $10,048.

The interaction of higher energy expenditures and lower incomes produced a mean energy burden for high-expenditure households in 1990 of 19.2%, substantially higher than the 14.4% average for all low-income households. By the alternative standard, the group burden for these households was 13.3%, compared to 9.9% for all low-income households. These households would

therefore appear to offer both a solid energy-efficiency opportunity and a good target population for weatherization based on their need for lower energy burdens on household budgets.

Fuel oil users had by far the highest average burden among the major heating fuel types at 27.3% of income. This compares to 21.0% for electricity users and 17.0% for households heating with natural gas. Please see Table E.2 for details of energy expenditures and burden for the high-expenditure subgroup.

Table E.2 Income, Energy Expenditures and Energy Burden of High-Expenditure Households in 1990

FUEL		HOUSEHOLD			
Main Heating Fuel	Percentage of All Types	Income	Expenditure	Individual Burden	Group Burden
Natural Gas	47.2%	$9,301	$1,155	17.0%	12.4%
Electricity	18.7%	7,863	1,073	21.0%	13.6%
Fuel Oil	11.3%	10,235	1,567	27.3%	15.3%
Propane	17.4%	9,817	1,343	16.5%	13.7%
Other	5.4%	9,828	1,417	24.4%	22.5%
All	100.0%	$9,254	$1,233	19.2%	13.3%

High-expenditure renters in large multifamily buildings faced a high 22.3% burden in 1990. This is in sharp contrast with the general low-income population, where the average burden for renters in large multifamily buildings was somewhat lower than the average for all households. The average expenditure for this group was $856, well above the $633 average for low-income renters in large buildings. Their average income, by contrast, was only $6,167, compared to $7,978 for all low-income renters in such buildings.

Other Distinguishing Characteristics of High-Expenditure Households

The proportions of fuel use by type for high-expenditure households tends to be consistent with that of the general low-income population. Natural gas was the dominant primary heating fuel, used by 47.2% of high-expenditure households, followed by 18.7% for electricity and 11.3% for home heating oil. The most striking figure was the proportion of high-expenditure households using propane-- 17.4%, compared to 7.6% for all low-income households.

In terms of demographics and program participation the high-expenditure households are not readily distinguishable from all low-income households as a group. For example, the proportion of low-income households with at least one person over the age of 60 among low-income high-expenditure households was 44.5%, about the same as the proportion for the low-income population

as a whole. Among high-expenditure households the rate of participation in basic public assistance programs was roughly comparable to that for the low-income population as a group.

PROFILE OF THE HIGH-BURDEN HOUSEHOLDS

Expenditure, Income, and Burden Characteristics of High-Burden Households

High-burden households comprised 7.2 million of the 27.9 million households federally eligible for weatherization in 1990, 26% of the total. They were defined as those households in the low-income population with energy burdens, measured as household energy expenditures divided by household income, that were one standard deviation or more above the mean for all households in their Census Divisions and climate zones.

Though fuel-use patterns were similar to those of all low-income households, high burden households had higher-than-average residential energy expenditures. The mean residential energy expenditure for all high-burden households was $1,175, statistically comparable to that for high-expenditure households, which was $1,233 in 1990.

The single characteristic that most distinguishes high burden households from low-income households in general is income. The average income of these households was only $5,419 compared to $10,048 for all low-income households in 1990. As one might expect, the energy burden figures for this group are startling. The average burden nationwide was 30.1%, compared to 14.4% for all low-income households. When measured by the alternative method, the group burden, the burden for these households averaged 21.7% of income, more than twice the 9.9% average for all low-income households.

Indeed, the relationship between high burdens and low incomes is further demonstrated by an analysis of energy burden by income group. This reveals that the average burden for all households with incomes at or below $5,000 in 1990 was 33% of income, roughly comparable to the average burden calculated for the high-burden households and reflecting the significant overlap of the two groups. Please see Table E.3 for further details of income, expenditures, and burdens for high-burden households.

Distinguishing Characteristics of the High-Burden Population

There was little to distinguish the high-burden households from other low income households in terms of their demographics. The elderly compromise 41.3% of the high-burden population, and households with children were 39.9% of the total. These proportions are comparable to those for the low-income population as a whole. The proportion of single-parent households was higher in the high-burden population than among low-income households in general.

Table E.3 Income, Energy Expenditures and Energy Burden of High-Burden Households in 1990

FUEL		HOUSEHOLD			
Main Heating Fuel	Percentage of All	Income	Expenditure	Individual Burden	Group Burden
Natural Gas	49.4%	$5,598	$1,150	28.8%	20.5%
Electricity	17.3%	4,240	954	30.8%	22.5%
Fuel Oil	15.6%	5,865	1,422	34.0%	24.2%
Propane	10.9%	5,712	1,324	30.5%	23.2%
Other	5.9%	4,475	1,077	31.6%	19.0%
All	100.0%*	$5,419	$1,175	30.1%	21.7%

* Does not sum due to rounding.

Their rate of participation in public assistance programs was substantially above that of all low-income household for certain key programs. Approximately 22.6% of these households were AFDC recipients compared to 11.9% of all the poor who received those benefits. An estimated 22.7% received LIHEAP benefits compared to 13.8% of all the poor. The Food Stamp participation rate was 33.3% compared to 20% for all the poor.

PROFILE OF THE HIGH-BURDEN/HIGH-EXPENDITURE POPULATION

Households that are both high-expenditure households and high-burden households are of particular interest to those concerned with targeting weatherization for maximum energy efficiency and equity benefits. These are households that were at least one standard deviation above the means in their Census Division and climate zone in both energy burden and heating expenditure per heating degree day and square foot of living space. An estimated 2.1 million households fitted into this category in 1990. These were 42.6% of all high-expenditure households and 29.3% of all high-burden households.

Housing Characteristics of High-Burden/High-Expenditure Households

An estimated 51.4% of the high-burden/high-expenditure households lived in single-family homes, 19.3% lived in small multifamily dwellings and 17.5% in mobile homes. The percentage living in large multifamily buildings was 11.8%. These statistics indicate that the high-burden/high-expenditure population are more heavily concentrated in small multifamily dwellings and mobile homes and less likely to live in single-family units and large apartment buildings than the low-income population as a whole.

Primary Heating Fuels of High-Burden/High-Expenditure Households

Natural gas was the single most significant fuel for heating in this population, with 40% using it nationwide. This proportion is substantially below that for the low-income population as a whole. Electricity was used for heating by 25.3%, fuel oil by 13.1% and propane by 16.6% of the households. The proportion of households using propane was more than twice the proportion doing so among all low-income households.

Energy Expenditures and Income

The high-burden/high-expenditure households were distinguished by their very high energy expenditures and very low incomes relative to all low-income households. The average energy expenditure of the high-burden/high-expenditure households in 1990 was $1,339, well above the average for all low-income households of $994. Households in the high-burden/high-expenditure category had an average income of $6,114 in 1990 compared to $10,048 for all low-income households.

The energy burden for high-burden/high-expenditure households averaged 30.4%, a figure comparable to that for high-burden households and well above the average for high-expenditure households, which was 19.2% in 1990. The group burden for these households was 21.9%, more than twice the average for all low-income households.

OTHER POPULATIONS OF INTEREST

The research team identified three other subpopulations of low-income households that could potentially provide additional insights into the best ways to target weatherization assistance. The first subset consists of households with housing characteristics that might indicate the need for weatherization, i.e. "low-efficiency" households. The second subset consists of those households that were qualified for assistance in both 1987 and in 1990 -- "persistent-eligible" households. The third subset consists of households weatherized in 1990.

Low-Efficiency Households

Low-efficiency households were defined as those households nationwide who reported little or no attic insulation as well as those in the Northeast and Midwest having storm windows on less than 25% of their windows. These comprised 4.6 million households across the country.

An estimated 73% of low-efficiency households lived in single-family units, well above the national average for all low-income households. The average residential energy expenditure for the subset was $1,084 and the average energy burden was 15.9% of income. Neither statistic distinguishes these households from the overall low-income population. This probably indicates that

these "efficiency" characteristics as surveyed in RECS are not adequate indicators of energy efficiency in the sample housing stock.

Persistent-Eligible Households

According to RECS data, there were 17.3 million households that qualified for weatherization in both 1987 and 1990. The persistence of their poverty over time makes them a natural target group for energy-efficiency programs.

These households were 20% more likely to have an elderly member and 33% more likely to have an African-American member then all low-income households. The average residential energy expenditure for the persistent-eligible households was $990, essentially the same as the "1990-only" households. The average burden was also comparable to that of all eligible households.

Though they are therefore not distinguished from other low-income households by these energy criteria, persistent-eligible households may deserve prioritization because their energy affordability problems seem less likely to be resolved by a positive change in their financial circumstances then other households.

Households Weatherized in 1990

Households weatherized during the year previous to the 1990 RECS comprised so small a sample within the survey that any effort to draw meaningful comparisons between these households and the low-income sample was extremely limited.

COMPARISON OF THE POPULATIONS OF INTEREST AND SUMMARY

A comparison of key statistics from the major subsets and for the eligible population as a whole indicate that in many respects there is remarkable consistency among the high-burden and high-expenditure subgroups relative to the overall low-income population. The outstanding characteristics that distinguish the subgroups are the characteristics that define them, namely energy expenditures for the high-expenditure group and income for the high burden group.

Housing Type and Tenure

The major distinctions in housing type concern high-expenditure households. Mobile homes are nearly 20% of the high-expenditure subgroup though they comprise only 8.2% of all eligible households and 8.5% of high-burden households. Large multifamily dwellings are a significantly smaller proportion of this group than of the overall low-income housing stock. Mobile home residents may therefore be a subpopulation of particular interest from an energy efficiency perspective. Please see Figure E.2 for details.

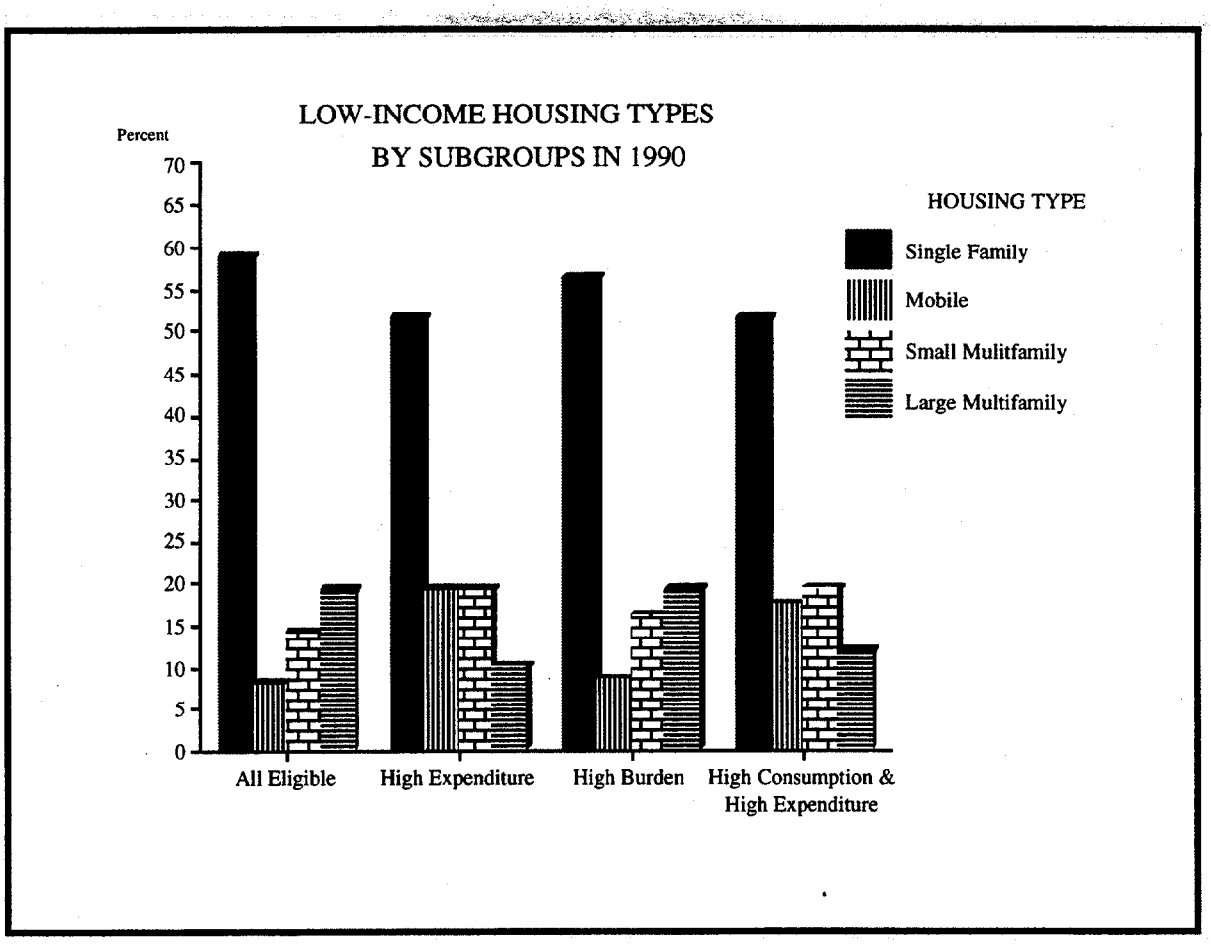

Figure E.2 Low-Income Housing Types by Subgroups in 1991

Demographics and Program Participation

High-burden households have a higher rate of participation in AFDC, LIHEAP, and Food Stamps than does the eligible population as a whole. LIHEAP participation rates in particular are much greater for high-burden households than for all low-income households, a result that is consistent with the legislative mandate of that program to serve households with the greatest energy burdens. African-American households are disproportionately represented in the high-expenditure and high-burden populations. Other demographic characteristics, such as the presence of elderly persons, children, or single-parent families do not vary among the subgroups and eligible population to any significant degree.

Statistical Summary of Income and Energy-Related Characteristics of Low-Income Households

1) The average income for eligible households was $10,048 in 1990, approximately 30% of the average income for all U.S. households.

2) Mean income for high-expenditure households was 8% below the average for all low-income households. This indicates that their higher expenditures were not a function of relatively higher income compared to other poor households.
3) High-burden households, with an average income of only $5,419, were clearly disadvantaged, even relative to other low-income households.
4) Low-income households had an average residential energy expenditure of $994 in 1990, 15% below the national household average.
5) The average residential energy expenditure by high-expenditure households, at $1,233, was 24% greater than the low-income average and also exceeded the national household average.
6) High-burden households, despite their lower incomes, had an average residential energy expenditure of $1,175, comparable to that of high-expenditure households.
7) The average individual energy burden of eligible households was 14.4% of income in 1990, well above the national average for non-poor households of 3.5%.
8) High-expenditure households, with an average burden of 19.2%, were more heavily burdened than the average low-income household and high-burden households were expending an onerous average of 30.1% of their income for residential energy. Please see Figure E.3.
9) Approximately 43% of the high-expenditure households, 2.1 million, are also in the high-burden category. These households are particularly worthy of greater attention in that they appear to offer a major energy efficiency and equity opportunity.
10) For high-burden/high-expenditure households the average residential energy expenditure was $1,339 and the average burden was 30.4% of income.
11) An emphasis of weatherization efforts on this 2.1 million would place greater focus on mobile homes and small multifamily dwellings. Households heated with propane and renters in single-family units would also receive more emphasis.

A logical target for future research is a more in-depth evaluation of the demographics, location, housing, and energy profile of the high-burden/high-expenditure group. This may prove useful to state, community, and utility weatherization specialists who are trying to maximize both the equity and efficiency returns to scarce weatherization dollars.

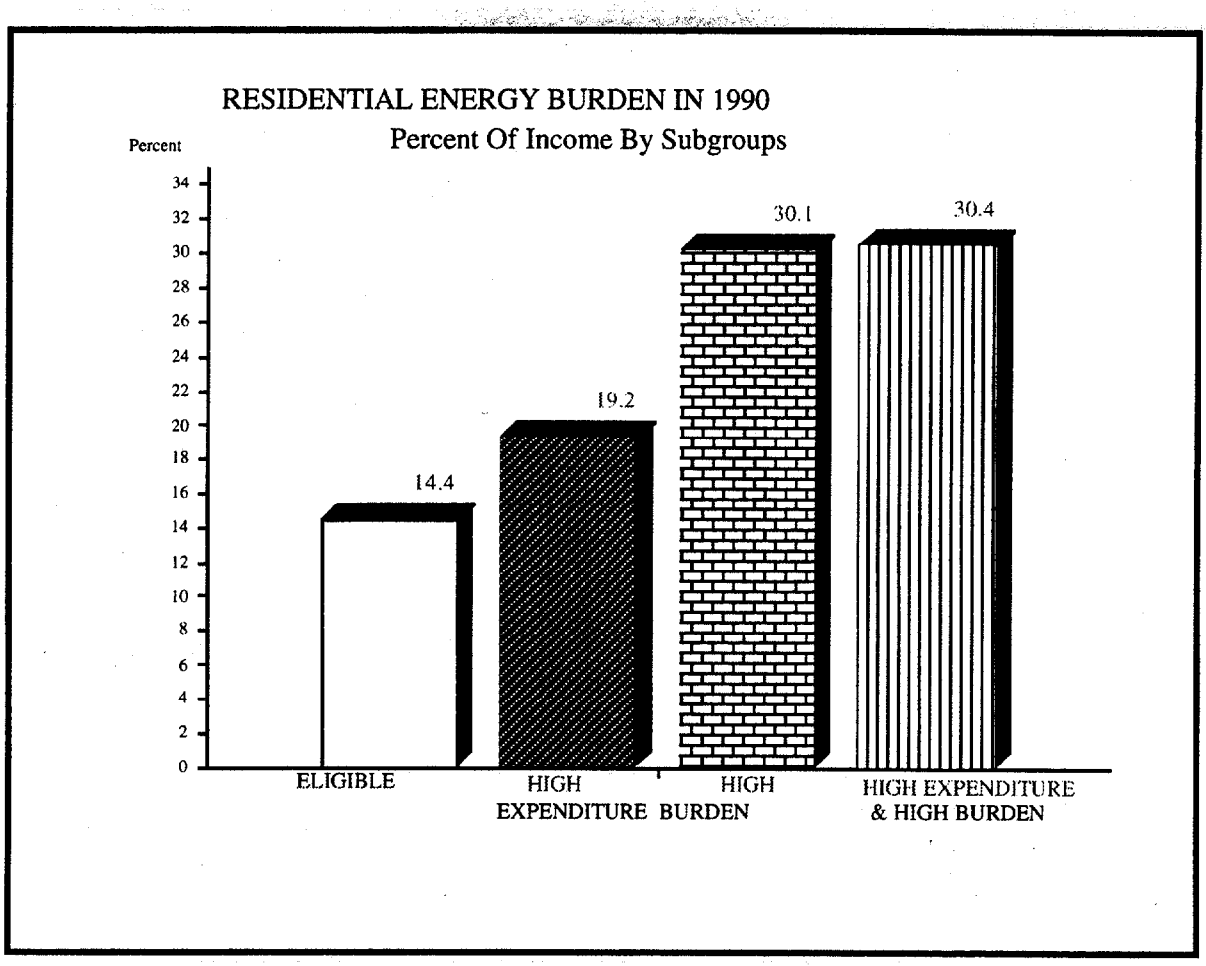

Figure E.3 Residential Energy Burden by Subgroups in 1990

1. INTRODUCTION

The U.S. Department of Energy (DOE) is conducting a national evaluation of its Weatherization Assistance Program (DOE/WAP), an energy-efficiency program that provides financial assistance to qualifying low-income households for the "weatherization" of their housing units. The evaluation, being conducted for the Department by Oak Ridge National Laboratory (ORNL), is comprised of five studies. Three of these studies focus on principal Weatherization Assistance Program submarkets:

- single-family fuel-oil homes (the Fuel-Oil Study -- Ternes and Levins, 1993);
- single-family and small multifamily homes using gas and electricity (the Single-Family Study -- Brown et al., 1993); and
- high-density multifamily buildings-- (the Multifamily Study -- MacDonald, 1993).

The remaining two studies investigate issues that are important for planning and assessing opportunities for innovation, new initiatives, and resource leveraging.

- a description of the Weatherization Assistance Program network's characteristics and innovations; and
- an analysis of the scope of the Weatherization Assistance Program, dwellings weatherized to date, and the population remaining to be served, referred to below as the "Scope" study.

The first part of the "Scope" study, entitled The Scope of Weatherization Assistance Program: The Weatherized Population and the Resource Base (Power, et.al., 1992) has been completed. It describes the size and sources of the investment made in low-income weatherization from Program Year 1978 through 1989, the number and types of homes weatherized, and the extent to which non-DOE Weatherization Assistance Program funding has been mobilized.

This is the second part of the "Scope" study which investigates the characteristics of the population eligible for and in need of the DOE Weatherization Assistance Program - The Profile of the Population in Need. The "Profile" study is an attempt to use major national survey results from the Residential Energy Consumption Survey (RECS) for 1990 and other sources to define the weatherization-related characteristics of the low-income population.

1.1 RESEARCH OBJECTIVES

The Profile of the Population in Need describes the population of low-income households, their location, housing attributes, energy-use and demographic characteristics. The study's intent is to highlight those attributes that shed some light on the need for low-income energy efficiency services among those households that may qualify under national income standards for the

Weatherization Assistance Program and the Department of Health and Human Services' Low Income Home Energy Assistance Program (LIHEAP). The income standard for LIHEAP is the greater of 60 percent of state median income or 150 percent of the poverty level. The income standard for the Weatherization Assistance Program is at or below 125 percent of the poverty level; however, a state may elect to use the LIHEAP income standard if its states LIHEAP income standard is at least 125 percent of the poverty level.[1]

The study further seeks to examine the characteristics of several subsets of the eligible low-income population for purposes of refining the understanding of how best to target and allocate limited weatherization resources.

Among the subsets of the eligible population examined in this report are the following:

1) "High-Expenditure" Households -- These were eligible households with space heating expenditures per square foot of living space that were at least one standard deviation above the average relative to other households located in the same Census Division and heating-degree-day zone.[2]
2) "High-Burden" Household -- These were household with residential energy expenditures in proportion to income that were at least one standard deviation above the average relative to other low-income households located in the same Census Division and heating-degree-day zone.
3) "High-burden/High-expenditure" Households -- These were households that belonged to both the high-burden and high-expenditure sets defined above.
4) "Persistent-Eligible" Households -- These were households that were federally eligible for participation in the Weatherization Assistance Program in both 1987 and 1990. Federal eligibility is defined as the higher of 150% of the federal Poverty Level or 60% of State median income. The most recent previous Residential Energy Consumption Survey was conducted in 1987.
5) "Weatherized" Households -- These were households that responded "yes" when asked if they had received government weatherization assistance during the previous year in the 1990 RECS. No particular government agency or program was specified in the RECS question.

In the previously completed section of the scope study, "The Weatherized Population and The Resource Base," it was estimated that 3.9 million housing units had been weatherized through Program Year 1989. In an ideal world it would be possible to examine these households that had

[1] For this study, the fiscal year 1990 state median income estimates and the calendar year 1989 poverty income guidelines were used with the 1990 RECS population and income data in classifying low income households.
[2] A standard deviation is a measure of the degree to which a set of numbers varies from the average for the set.

received weatherization assistance and those that have not received it as separate subsets of the same data base. This would permit profiles to be created of both the "served" and "not-served" populations that are eligible for Weatherization Assistance Program.

Unfortunately there is no data base that identifies energy and housing characteristics for all weatherized households. The RECS does ask questions regarding weatherization assistance over the year previous to the survey, but no data is provided on households weatherized in previous years.

Furthermore, the dynamics of income and poverty are such that a substantial number of households that are eligible for the program in one year are not eligible in later years. Conversely new households that were not poor enough to qualify for program services in one year find their income drops below the qualification level in later years. Consequently an estimated 38.7 million households were federally qualified to receive Weatherization Assistance Program services in either 1987 or 1990 or in both years, though the count of eligible households in 1990 was 27.9 million. Simply put, the number of households that has received Weatherization Assistance Program services is small relative to the eligible and potentially eligible pool of households.

In light of these realities this study describes the total eligible population in 1990 as well as subsets of interest with the understanding that some of these households have already been weatherized. The expectation is that these households are few enough in number so as not to distort conclusions drawn regarding segments of the eligible population that appear in need of weatherization. Some statistics are provided concerning weatherized households from the 1990 RECS so that the reader may compare and contrast the data.

1.2 OUTLINE OF THE STUDY

The second chapter of the profile study provides an in-depth description of the eligible households based on the 1990 RECS. The description includes a breakdown of these households by primary heating fuel type, housing type and tenure, by region, and by key demographic and program participation characteristics. Energy expenditures, household income, and energy burden statistics for the group and major subclassifications are then provided.

The third chapter provides a detailed description of those households defined as "high-expenditure". These households are logical targets for weatherization services and energy efficiency opportunities given their relatively high energy expenditures, adjusted by living space and temperature, compared to others in the eligible population. This chapter describes energy expenditure, household income, and energy burden characteristics for these households. An overview of key housing, fuel type, demographic, and program participation characteristics, is also provided.

The fourth chapter describes key characteristics for two subpopulations: "high-burden" households and "high-burden/high-expenditure" households. The high-burden population is

generally considered to be a priority population for energy assistance and weatherization based on equity grounds. The high-burden/high-consumption household subset provides an opportunity to determine the degree to which a set of high priority households emerge from the data that are exceptional weatherization candidates based on both their energy efficiency potential and the heavy burden they face because of their higher energy costs relative to income.

Chapter five describes key characteristics and conclusions that emerged from an examination of other subpopulations. These include:

- the "persistent-eligible" households for both 1987 and 1990,
- the weatherized households from the 1990 RECS, and
- those households with "low efficiency" characteristics in their housing, based on the limited data available in RECS regarding insulation and storm windows.

Chapter six provides a comparison of key statistics from the major subsets and for the eligible population as a whole. In this chapter conclusions based on the statistics and comparisons are offered. Suggestions are also made regarding areas in which further research may be productive.

The study concludes with appendices that provide detailed tables for the key subpopulations as well as an in-depth description of the RECS.

1.3 METHODOLOGY AND LIMITATIONS

The core of the study rests on a series of cross tabulations and statistics derived from the 1990 Residential Energy Consumption Survey. The RECS is the best available resource offering household data on residential energy use in combination with information on family income, housing type, tenure, fuel type, and over 400 other variables. The reliability of RECS lies in its collection of actual energy consumption and expenditure data from fuel vendors rather than estimates or recollections from members of the survey households.

However there are limitations to the RECS data that need to be recognized. First, the survey is relatively small. In 1990 there were 5,095 households that contributed data to the survey. The low-income eligible households comprised approximately 1,500 households of this total. Though the statistics in the tables are presented in terms of millions and hundreds of thousands of households, the underlying statistical base is small. The finer the statistic in terms of the precision of location, fuel type, and other characteristics, the more likely it is to rest on a relatively small survey base. Statistics were screened to limit the possibility that interesting but statistically insignificant comparisons and conclusions would be drawn. The reader is nonetheless warned to exercise care in using and comparing data from small populations presented in the Appendices, particularly for regional breakdowns of the population subsets.

Second, income data from RECS tends to be less reliable than the data that can be derived from the Current Population Survey (CPS) or the Survey of Income and Program Participation conducted by the Census Bureau. Indeed, when statistics are derived by the Department of Health and Human Services for energy burden for low-income households and Low-Income Home Energy Assistance recipients for the annual report on the Low Income Home Energy Assistance Program, the income data from the CPS is used because of its greater accuracy and its collection of household income data.

In this study the research team decided to use the less precise data in the RECS itself rather than the CPS in order to define the subpopulations of interest, particularly the high-burden and high-burden/high-expenditure sets. This could not have been done using the broad population averages derived from the CPS.

The reader should keep in mind the tendency of RECS income data to under-report household income to some degree. This under-reporting is most evident in high income categories. There is a tendency to over-report the lowest income categories as well. This would result in an overestimation of households eligible for the program when compared to the estimates from CPS. The total of households eligible for the program based on RECS is 27.9 million, 2.5 million higher than the CPS equivalent.

2. RESIDENTIAL ENERGY USE CHARACTERISTICS OF THE LOW-INCOME POPULATION

In 1990 there were an estimated 27.9 million households that were federally qualified for the LIHEAP and DOE/Weatherization Assistance Program programs. These were households with incomes at or below the higher of 150% of the federal government's Poverty Level for that year or 60% of their state's median income. The federally eligible households comprised 29.7% of all U.S. households, which totalled 94.0 million in 1990. In the balance of the report these households will be referred to as the "eligible" or "low-income" population.

2.1 HOUSING CHARACTERISTICS

Low-income households, like the population at large, tend to reside in single-family homes. In fact, 58.7% lived in single-family houses and an additional 8.2% lived in mobile homes. Of the remaining households, 19.1% lived in large multifamily dwellings and 14.1% occupied apartments in small multifamily buildings of two-through-four units. The proportion of low-income. households living in single-family homes is somewhat lower than the proportion for all U.S. households and that living in multifamily or mobile homes somewhat higher. For details, please see Tables 2.1 and 2.2.

Table 2.1 Housing Types for Low-Income Households
Thousands of Households in 1990

	Single Family	Mobile	Small Multifamily	Large Multifamily	Total
NORTHEAST	2,193	194	1,477	1,409	5,273
MIDWEST	4,065	537	985	832	6,454
SOUTH	7,065	907	835	1562	10,368
WEST	3,032	602	643	1,510	5,788
U.S.	16,335	2,277	3,938	5,313	27,883

There is substantial variation among the Census regions in the housing types occupied by low-income households. Of the 10.4 million low-income households in the South, 68.1% lived in single-family housing and 15% lived in large multifamily buildings in 1990. In the Northeast on the other hand, only 41.6% of the 5.3 million low-income households lived in single-family homes while 28% lived in small multifamily buildings and 26.7% lived in large multifamily buildings.

Table 2.2 Housing Types for Low-Income Households
Percent of Households in 1990

	Single Family	Mobile	Small Multifamily	Large Multifamily	Total
NORTHEAST	41.6%	3.7%	28.0%	26.7%	100%
MIDWEST	63.0%	8.9%	15.2%	12.9%	100%
SOUTH	68.1%	8.8%	8.1%	15.1%	100%
WEST	52.4%	10.4%	11.1%	26.1%	100%
U.S.	58.7%	8.2%	14.1%	19.1%	100%

In the Midwest, single-family occupancy was the housing type for 63% of the 6.5 million households, where as in the West, the proportion in single-family dwellings was only 52.4%. Households in the West occupied units in large multifamily buildings in 26% of the cases whereas in the Midwest the proportion was only 12.9%. In the West over 10% of low-income households lived in mobile homes.

2.1.1 Tenure

Approximately 50.3% of low-income households owned their own homes in 1990. The vast majority of homeowners, 82.6%, lived in single-family units but a large number, 11.4%, were in mobile homes. There were 13.9 million low-income renter households in 1990 and 34.4% of these lived in single-family houses. An additional 37.3% lived in large multifamily buildings and 23.4% rented in small multifamily buildings. Please see Appendix A, Table A-1 for details.

There was substantial contrast among regions when housing tenure was considered. In the Northeast, only 44.7% of low-income households owned their own homes in 1990 whereas in the Midwest the proportion of owners was 58.3%. In the South 56.5% of low-income households owned their own homes, but in the West only 35.4% were owners.

2.1.3 Heating Fuel

The pattern of primary fuel use among the poor generally followed that for the population at large with 14.7 million, 52.7% of low-income households, heating with natural gas as compared to 55% of all U.S. households that used gas heating. Twenty percent of low-income households heated with electricity as compared to 23% of the general population. Fuel oil was used by 11.2% of the poor for heating and 1.2% used kerosene, percentages that are comparable to the proportions of all households using those fuels. The use of liquified petroleum gas (propane) was more common among low-income households than in the population at large. The percentage of households

heating with propane among all U.S. households was only 4.7% compared to 7.6% for low-income households.

The pattern of heating fuel use among low-income consumers varies significantly by region. In the Northeast, 38.7% of households heated with fuel oil and electricity was a much less significant primary heat source then it was in other parts of the country. Only 8.8% of the region's poor households heated with electricity and less than 1% heated with propane. In the Midwest, on the other hand, 67.1% of all low-income households heat with natural gas and 10.8% use propane for heat. Only 7.9% of low-income households in the region heated with electricity and just 6% heated with fuel oil. Please see Figure 2.1 for details.

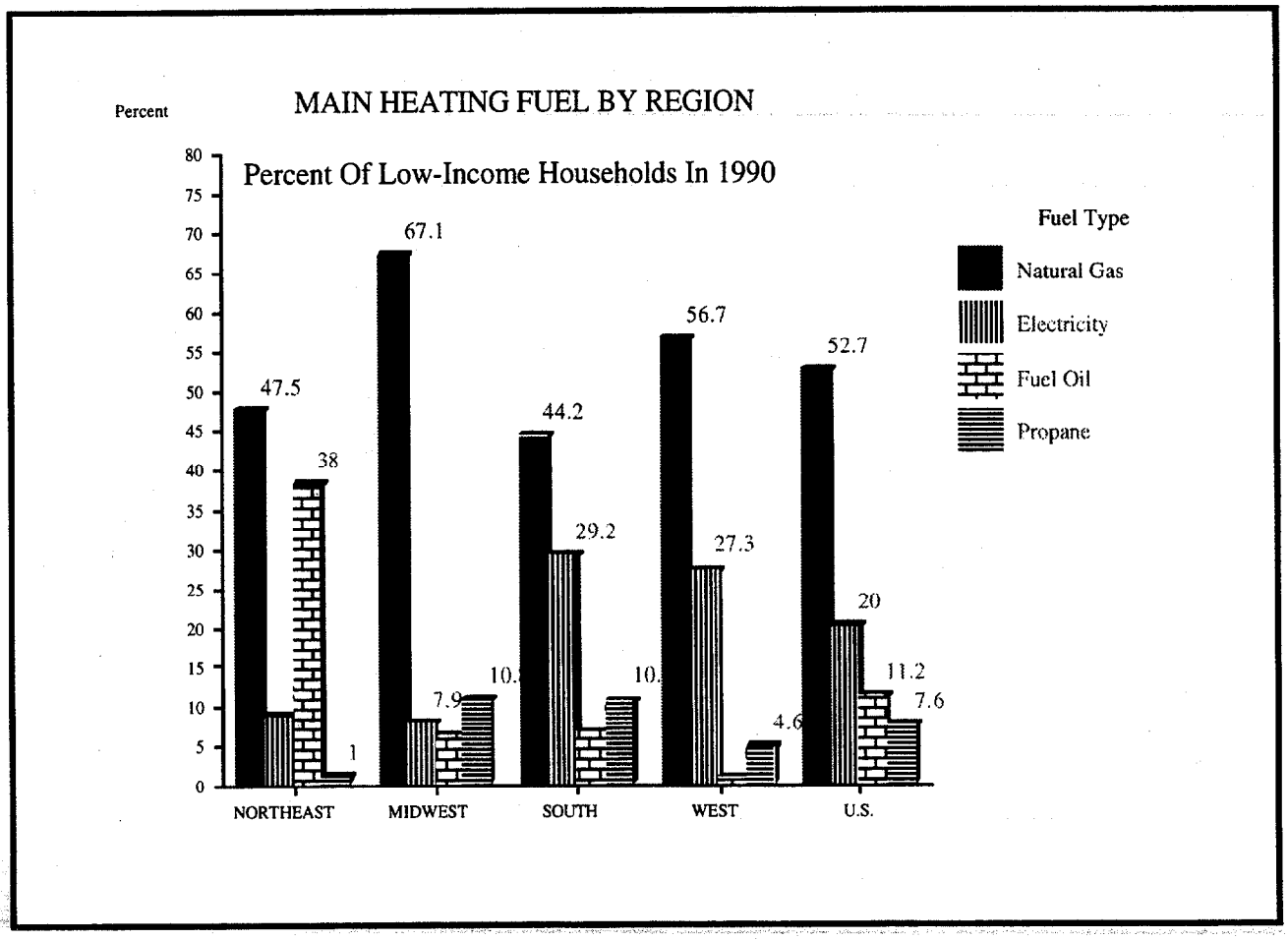

Figure 2.1 Main heating Fuel by Region

These patterns reflect the historical development of energy markets in which natural gas pipelines were quick to expand to the Midwest but not to the Northeast, which was further from the natural gas fields. In both regions electricity has been an expensive commodity relative to alternative energy sources.

In the South and West, on the other hand, electricity is far more common as a heating fuel. Twenty-nine percent of low-income households in the former and 27% in the latter used electricity for heat. Propane was used by 10.6% of the Southern poor but only 4.6% of those in the West. A significant number of Southern households, 6.6%, use fuel oil for heat, whereas in the West less than 1% did so. Natural gas, which heated 56.7% of the households in the region, was the dominant heating fuel in the West.

2.2 ENERGY EXPENDITURES

In 1990 the average low-income household spent $994 for residential energy, but there was substantial variation by fuel type, housing type and region. In fact, the standard deviation for energy expenditures by low-income households was $495. Thus, while approximately two thirds of all low-income households in the sample had expenditures ranging from $499 to $1,489, a significant number of the households actually had expenditures that were lower or higher than these figures.

The average residential energy expenditure for low-income households was lower than that of all U.S. households. The mean expenditure in 1990 for all households in the country was $1,172, 18% higher than the low-income average. Similar differences exist between the low-income and general populations for each primary heating fuel type as well. Low-income housing, is generally smaller than that of the general population. This, combined with lower disposable income, helps explain the difference in absolute expenditure levels. However, it should be kept in mind that the 18% gap between all household expenditures and low-income household expenditures is not proportional to the gap between average household income and that of the poor. Average household income was three times greater than the low-income average in 1990.

The broad range of expenditures and the significant number of households with residential energy costs well above the average, as shown in the next chapter, reflects the degree to which temperature, housing quality and type, fuel type, fuel cost, and household characteristics combine in countless variations to determine the cost of residential energy.

Some patterns regarding energy expenditures do emerge from the data. Households heating with electricity tended to have much lower average residential energy expenditures than the low-income population as a whole at $826, whereas those heating with fuel oil had the highest expenditures, at an average of $1,246. Those using kerosene or propane as their primary heating fuel also averaged in excess of $1,150 in expenditures. Households heating with natural gas had average expenditures of $984.

Not only did residential energy expenditures vary by fuel type but by housing type as well. Residents of large multifamily units had average expenditures of $634 whereas those in single-family homes averaged $1,115. Mobile home dwellers and those in small multifamily units averaged $978

and $938, respectively. For further details concerning average expenditures by fuel and housing type, please see Table 2.3 and Appendix A, Table A-11.

Table 2.3 Average Residential Energy Expenditures Low-Income Households in 1990

FUEL	HOUSING TYPE				
Main Heating Fuel	Single-family	Mobile	Small Multifamily	Large Multifamily	All
Natural Gas	$1,110	$ 801	$ 968	$ 646	$ 984
Electricity	1,034	860	764	574	826
Fuel Oil	1,370	n.a.	1,318	774	1,246
Propane	1,156	1,210	n.a.	n.a.	1,184
All	$1,115	$ 978	$ 983	$ 634	$ 994

Expenditures by region for low-income households varied in a pattern that was roughly consistent with temperature-driven energy consumption. Expenditures in the Northeast averaged $1,201 and in the Midwest they averaged $1,094. The higher costs in the Northeast, despite lower average fuel consumption, reflects the relatively higher use of somewhat less expensive natural gas in the Midwest and higher reliance on more expensive fuel oil in the Northeast. Expenditures in the South averaged $958 and in the West they averaged on $756. This difference reflects not only lower average consumption in the West but lower energy prices as well.

2.3 INCOME

The average income of households eligible for LIHEAP based on RECS data was $10,048 in 1990. This compared to an average income for all households in 1990 of $33,486. Incomes for households heating with natural gas and fuel oil, which together comprised 63.9% of all eligible households, were close to this average at $10,162 per year and $10,234, respectively. Households using electricity, kerosene and propane had average incomes $700 to $850 below the mean.

As one might expect, households that owned their own homes had average incomes substantially higher than those that rented their homes. Average owner income for eligible households was $10,989 compared to $9,095 for renters. There was relatively little disparity between households that rented single-family homes and those that owned them. The major gap among incomes of the poor relative to housing type and tenure can be seen between owners and those who rented mobile homes or units in large multifamily buildings. Renters in large buildings had incomes

that averaged only $7,978 and those that rented mobile homes had incomes that averaged $7,199, nearly $3,000 less than the average for all low-income households.

It is interesting to note that 70% of the 2.3 million residents in mobile homes owned their own homes and had incomes slightly above the average for all the poor. The large income gap pertains to the 675 thousand mobile home renters. For details of income by housing type and tenure please see Appendix A, Table A-21.

There was some difference in average income apparent when these data were calculated based on regional location. Low-income households in the West had the highest average incomes at $11,324 and those in the South had the lowest at $9,209. Low-income households in the Northeast had an average income of $10,622 and those in the Midwest averaged $9,781. These patterns generally were consistent with regional variations in living costs.

2.4 RESIDENTIAL ENERGY BURDEN

"Energy Burden" is a statistic intended to reflect the actual impact of residential energy costs on household budgets. It is calculated by dividing average residential energy expenditures by average income to express expenditures as a percentage of income. In many respects it is the key measure of the impact of energy costs on low-income households because it provides a measure, not only of energy costs, but of affordability as well.

There are two principal ways in which energy burden can be calculated for a given group of households. One of these calculates energy burden for each household in a sample and then derives an average for these individual calculations_ that is to say the average of the individual burdens. The second method calculates average energy expenditures for all households in the group and divides this by the average of all income for the group; in other words, the group burden.

These two methods yield remarkably different results, each of which says something important about the impact of energy expenditures on low-income budgets. By the first method, the average of the individual burdens, the mean energy burden for low-income households in 1990 was 14.4% of income and for all U.S. households it was 6.8%. The median low-income household burden was 10%. By the second method, the group burden, the mean energy burden for low-income households was 10.1% of income and for all U.S. households it was 3.5%.

In large measure the difference can be explained by the fact that a substantial minority of low-income households has energy expenditures that far exceed the low-income average and/or have incomes that are substantially below the average. These households are better represented by the burden when calculated as an average of individual household burdens, or 14.4% of income, because this method weights each individual household equally. Another advantage to this way of measuring energy burden is that it treats burden as an individual household statistic and permits one to distinguish among subgroups of households based on their individual energy burdens.

The second method, the group burden, tends to better reflect the central tendency of the whole group that is being measured. That is to say, it comes closer to representing the energy burden for those households that are in the middle of the group as defined by a numerically balanced distribution of the households around the median of 10%. This measure has the added advantage of allowing one to more easily measure the amount of money needed to redress imbalances between energy burdens among different classes of consumers.

In this report, which places greater emphasis on the comparison of energy burden among households, the more frequently used statistic is the average of the burdens, that is to say, the first method. In most cases this will provide the reader with the sharpest contrast between the groups being described and compared. In many cases the report will also provide statistics in its tables on burden as measured by the ratio of the averages, the second method, so that the reader can get a balanced picture of the central tendency and overall distribution of energy burden for the populations being discussed. These statistics will be designated as group burden so as to allow them to be distinguished from the individual burden measures derived by the first method.

As previously noted there are significant differences in energy expenditures by housing type and tenure, fuel type, and region. There are also differences in incomes by those characteristics though they tend to be less dramatic. When these characteristics are combined to produce the burden statistics they generate a broad range of results reflecting the diversity of residential energy impacts on low-income budgets.

2.4.1 Low-Income Burdens by Fuel Type

Households heating with regulated fuels, both natural gas and electricity, had lower average energy burdens than those heating with "bulk" fuels like fuel oil, kerosene, and propane. Low-income households heating with natural gas had an average burden of 13.9% in 1990 and those heating with electricity had an average burden of 13.1%. By contrast, the households heating with fuel oil had a burden of 18.5% while those heating with propane had an average burden of 18.1%.

There are a number of possible explanations for this disparity, not the least of which is the relatively high concentration of fuel oil households in the colder regions of the country, which tends to boost average expenditures. A second explanation is the concentration of propane fuel use in rural populations where the incomes are lower than average for all low-income households. Both lower-than-average incomes and higher-than-average expenditures are therefore contributing factors. Please see Table 2.4 for details.

Table 2.4 Income, Energy Expenditures and Energy Burden of Eligible Low-Income Households in 1990

FUEL		HOUSEHOLD			
Main Heating Fuel	Percentage of All Types	Income	Expenditure	Burden	Group Burden
Natural Gas	52.7%	$10,162	$ 984	13.9%	9.7%
Electricity	20.0%	9,368	826	13.1%	8.8%
Fuel Oil	11.2%	10,234	1,246	18.5%	12.2%
Propane	7.6%	9,275	1,184	18.1%	12.8%
Other	6.0%	11,449	874	9.6%	7.6%
All	100.0%*	$10,048	$ 994	14.4%	9.9%

* Does not add to 100% due to the exclusion of a separate line for kerosene which represents a small number of households. Kerosene was not included in the calculation of "other" but it was a component of the calculation of the overall average presented on the bottom line.

2.4.2 Low-Income Burdens by Housing Type and Tenure

Residents in large multifamily buildings had energy burdens similar to those in the other housing types, 13.3% compared to 14.2% for residents of single-family dwellings and 13.7% for residents of mobile homes. By contrast, the 14% of all low-income households living in small multifamily buildings had an average energy burden of 17%.

The burden for low-income residents of larger buildings tends to be nearly the same as that of all low-income households because both incomes and expenditures were lower than those for the low-income population as a whole. In the case of residents of small multifamily buildings, the relatively high energy burdens result from a larger proportion having incomes well below the mean and energy expenditures that were near the average.

For each housing type the households that rented tend to have higher energy burdens than those that owned their own homes. Owners had an average burden of 13.7% and renters had an average burden of 15.2%. Among low-income residents of single-family homes the burden on renters was 1.1% higher than the average for owners and among occupants of small multifamily dwellings the burden was 1.6% higher for renters. For residents of mobile homes the average burden was 17.9% for renters and 12% for owners.

As a general matter the higher energy burdens of renter households resulted from of lower incomes rather than higher energy expenditures. Residential energy expenditures for renter households averaged $854 in 1990 as compared to $1,131, for owners even though the average burden for the former was higher. This was because renter incomes were disproportionately low,

averaging $9,095 compared to $10,989 for owner households. This pattern held true regardless of housing type and was particularly acute in the mobile home population in which renters had an average income of $7,199 whereas owners had an average income of $10,339. Please see Appendix A, Table A-22 for further details.

2.4.3 Low-Income Burdens by Regions

Low-income residents of the Northeast had the highest energy burdens at 17% of income and those in the West the lowest, at 9.8%. The low-income residents of the South and Midwest had average energy burdens of approximately 15%.

The relatively low energy burdens in the West reflects both higher incomes in that region as well as substantially lower energy expenditures. Households heating with natural gas in the West had an average burden of 8.2%, less than half that of fuel oil users in the Northeast, who faced an average burden of 20.2%, and propane users in the Midwest, who had an average burden of 18.1%. For details please see Figure 2.2.

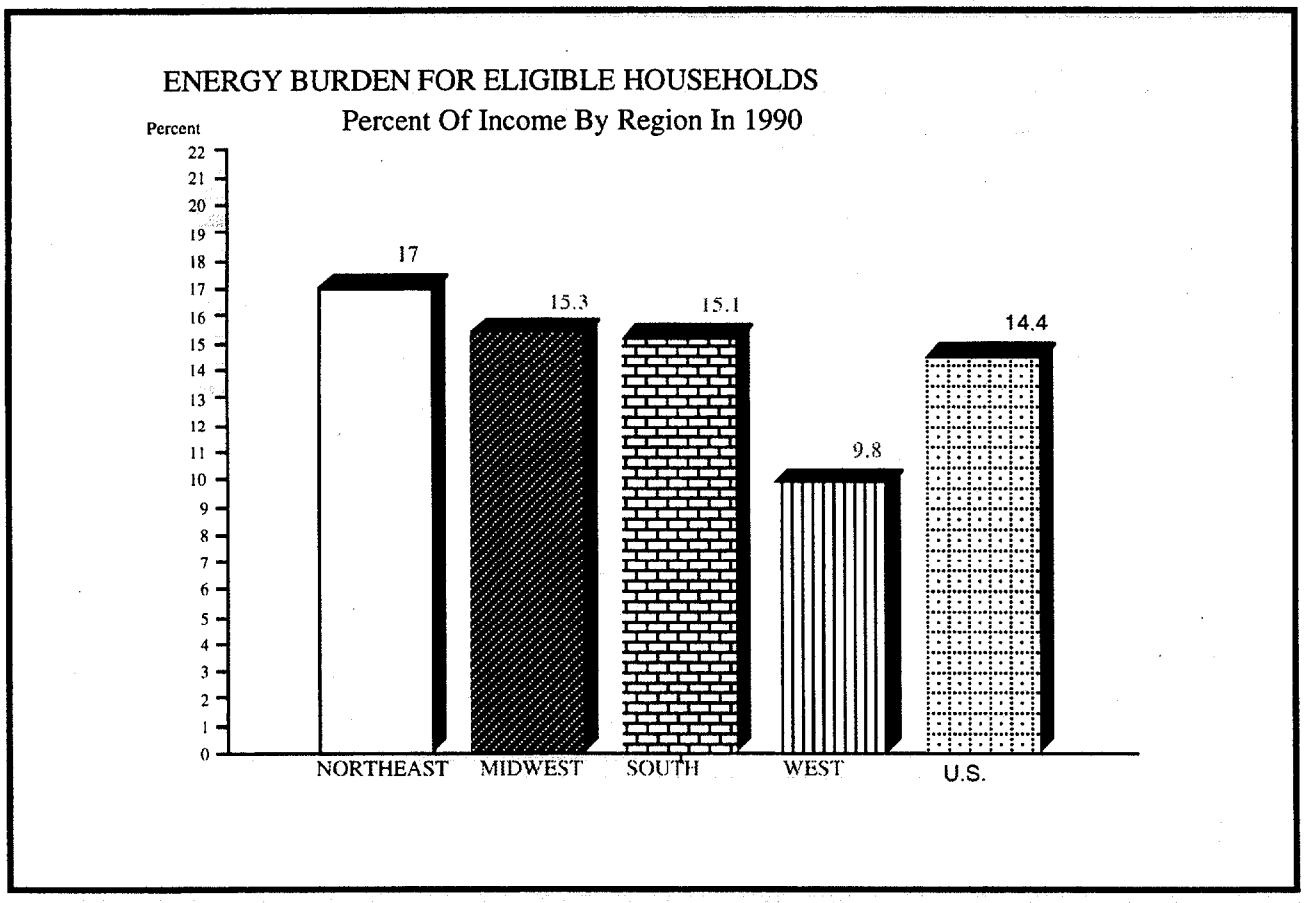

Figure 2.2 Energy Bufden for Eligible Households by Region

2.5 DEMOGRAPHICS OF THE ELIGIBLE POPULATION

2.5.1 Elderly

Among all low-income households, 12.2 million (43.7%) had at least one person classified as elderly, that is say, over the age of 60. Of these, 70% owned their own homes and an additional 8% rented single-family homes. There were only 1.6 million households with elderly persons who rented in multifamily dwellings. Please see Table 2.5 for further details of major characteristics of low-income households by demographic group.

Table 2.5 Characteristics of the Eligible Households in 1990

	Percent of Eligibles	Percent Renters	Average Expenditure	Average Burden
Elderly	43.7%	29.6%	$ 984	14.0%
With Children	42.9%	60.9%	1,116	14.0%
Single Parent	19.9%	67.5%	1,068	18.0%
African American	18.5%	66.1%	1,089	19.0%
AFDC	11.9%	80.9%	1,013	22.0%
SSI	8.4%	55.4%	831	16.0%
LIHEAP	13.7%	52.9%	1,000	19.0%
Food Stamps	20.0%	72.5%	964	20.9%
All Eligible Households	100.0%	49.7%	$ 994	14.4%

The average energy expenditure for households with elderly persons was $984 in 1990, essentially the same at that of the low-income population as a whole. In addition their energy burden was 14.0%, also near the average for all low-income households. Among the elderly, those renting in large multifamily dwellings had a substantially lower energy burden than their non-renting counterparts, at only 9% of income. The 580 thousand living in mobile homes, both renters and owners, also had a lower energy burden than the average, at 11.0% of income.

2.5.2 Children

Approximately 12 million (or 42.9%) of the low-income households, were households with children. This compares with 37.0% of all U.S. households in 1990 that had at least one person under the age of 18 related to the householder. These households, in stark contrast to those with elderly residents, were much more likely to rent their homes than to own them. Only 39.1% of households with children owned their dwellings and 27% were renters in single-family homes. Approximately 10.5% lived in mobile homes and 15.4% lived in large multifamily buildings.

Households with children had significantly higher mean energy expenditures than did the low-income population as a whole, $1,116 compared to $994. Households with children that owned their own homes had average expenditures of $1,291, 30% higher than the low-income mean, and the 812 thousand who owned their own mobile homes had average expenditures of $1,300.

The average energy burden for these households, nonetheless, was the same as that for all low-income households at 14.0%. Among households with children the highest energy burdens were found among the 1.8 million households living in small multifamily dwellings, at 20.0% of income, and among renters of mobile homes, at 18.0% of income.

2.5.3 Single-Parent Households

These households comprise a unique subset of the low-income households with children and are 19.9% of the total eligible population. As one might expect, these households tended to rent dwellings, with 67.5% renting and 32.5% owning their homes. Approximately 2.8 million, or 50.2% were living in single-family homes and 20.7% were living in small multifamily dwellings.

Among the single-parent population, mean energy expenditures were close to the norm for all the poor at $982 in 1990. Those living in their own single-family homes had average expenditures of $1,257 per year and those in owned mobile homes averaged $1,224 for the year.

The overall energy burden for the single-parent households was higher than the average for all low-income households at 18.0% of income. This can be attributed, in part, to higher than average energy expenditures among those households living in rental dwellings. Their expenditures averaged $982 and their energy burden averaged 20.0%. This compares to averages of $854 and 15.0% of income for all low-income renter households. Among the 1.1 million residents of small multifamily dwellings the burden in 1990 was 22.0% of income.

2.5.4 Ethnicity

African American households comprised 18.5% of all low-income households in the RECS sample and hispanics 10.1%. This compares to 11.3% and 6.6% respectively among all households. Approximately 66% of both groups rented their homes as compared to 49.7% of all low-income households. Roughly 20% of African Americans and 25.8% of Hispanics rented single-family homes.

Despite these similarities the average energy burdens of the two groups are substantially different. The average for Hispanics in 1990 was 13.0%, just below the average for all low-income households. The average energy burden for African Americans was 19.0%, well above the low-income mean. The major explanation for this appears to be a geographic one. Approximately 43.0% of eligible Hispanic households are located in the West where average residential energy costs tend to be lower than they are in the rest of the country. By contrast, only 10.5% of eligible African

American households were located in the West. For further details concerning the demographic and energy characteristics of the low-income population please see Appendix A, Table A-29.

2.6 PROGRAM PARTICIPATION

Among eligible households, an estimated 3.3 million (11.9%) participated in the Aid To Families With Dependent Children (AFDC) Program, 2.336 million (8.4%) were recipients of Supplemental Security Income (SSI), and 5.586 million, (20%) were Food Stamp recipients. An estimated 3.824 million, 13.7% of all households eligible, reported receiving heating assistance (LIHEAP).

These estimates from RECS as well as participation estimates from other surveys such the CPS and Survey of Income and Program Participation made for the Department of Health and Human Services, tend to understate program participation when compared to other sources, such as the offices that administer the programs themselves. For example, approximately 8.3 million households received Food Stamps in 1990 and 5.8 million received LIHEAP according to statistics provided by the Committee on Ways and Means of the U.S. House of Representatives based on information from the Department of Health and Human Services. The undercount of program participation has been persistent through the household surveys for many years. For purposes of calculating rates of program participation, sources other than RECS are superior. The statistics presented below nonetheless are the best available regarding energy costs and burdens for these populations.

2.6.1 AFDC

Participants in the AFDC Program, often described as the "welfare poor" because AFDC is the federal government's major general income maintenance program, tend to rent rather than own their homes. In 1990 an estimated 80.9% were renters. Among the renters, occupancy was split almost evenly among single-family units at 27.3%, small multifamily units at 24.7%, and large multifamily units at 23.5%.

Average energy expenditures for all AFDC households were $1,013 in 1990, very close to the norm for all low-income households. Those living in and owning single-family homes had average expenditures of $1,239, higher by $100 than the average for other low-income households with similar housing type and tenure. The average expenditure for AFDC renters in large multifamily buildings was $723, higher than the $633 average for the general low-income population who were similarly situated.

The average energy burden for AFDC households was higher than the average for all eligible households at 22% of income in 1990. This reflects comparable energy expenditures and significantly lower average incomes. Households that owned their own homes had a mean burden of 18% as did those who rented in large multifamily buildings. Renters in small multifamily buildings

had an average burden of 23% of income and those renting in single-family homes had an average burden of 26%. For details of energy burden by program participation please see Appendix A, Table A-30.

2.6.2 SSI

Supplemental Security Income (SSI) is a social security program that provides income to the elderly poor and the disabled. Among SSI households, an estimated 44.6% were owners and an additional 14.2% rented single-family homes. Approximately 9.7% of SSI households lived in mobile homes and 25.0% lived in large multifamily buildings.

Residential energy expenditures for SSI households averaged $831 in 1990, well below that for all low-income households. Expenditures by renters averaged $722 compared to $854 for all low-income renters and outlays for owners averaged $967 compared to $1,131 for all low-income owners.

Despite lower average energy expenditures, SSI households had an average energy burden of 16% in 1990 reflecting lower average incomes than the eligible population as a whole.

2.6.3 LIHEAP

Among households receiving LIHEAP assistance, 53.0% were renters, which is roughly comparable to those for all low-income households. Approximately 12.5% lived in mobile homes and 24.6% rented in single-family homes. An estimated 12.0% lived in rented small multifamily units and 12.5% rented in large buildings, below the low-income average of 18.5% for renters in large multifamily buildings.

Energy expenditures by LIHEAP recipients averaged $1000 in 1990, approximately the same as the average for all low-income households. Expenditures by renters averaged $1003, well above the average for the same tenure group among all low-income households. By contrast those who owned their own single-family homes had average expenditures of $963, well below the average of $1,139 for similarly situated households in the general low-income population.

LIHEAP recipients had an average energy burden higher than that of all low-income households at 19.0% of income. The burden was 21.0% among renters and 12% for owners. Renters of single-family and mobile homes had particularly high-burdens of 23.0%. Those in large multifamily buildings also had a high average burden of 20.0% of income.

2.6.4 Food Stamps

Food Stamp recipients were much more likely to rent their homes than the low-income population as a whole. An estimated 72.5% were renters. Of these the largest proportion, 28.1% of

the total, rented single-family homes, 22.8% lived in large buildings, 16.9% were in small multifamily buildings and 4.7% were in mobile homes.

The average energy expenditure for food stamp recipients was $964 in 1990, near the average for all low-income households. The average renter expenditure was $924, higher than the average for all the poor of $854 and reflecting the high proportion of renters of single-family homes. Residents in mobile homes also had a high average expenditure at $1,065, compared to $978 for all low-income residents of mobile homes.

The average energy burden for food stamp recipients was 20.0% of income in 1990, well above the 14.4% average for all the poor. Renters had an average energy burden of 21.0% and those in small multifamily buildings were particularly hard hit at 24.0% of income. Renters in single-family homes also had a high-burden of 22.0%. Mobile home residents had an average burden of 19.0%.

Households participating in public assistance programs tended to have higher burden levels than low-income households in general, reflecting a tendency to lower incomes, not higher energy bills. This conclusion applies to all four public assistance programs examined.

3. PROFILE OF THE "HIGH-EXPENDITURE" HOUSEHOLDS

According to the results presented in "The Scope of the Weatherization Assistance Program: The Weatherization Population and The Resource Base" (Meg Power et. al.), 3.9 million households received weatherization services from DOE, utility, or other sources, from Program Year 1978 through Program Year 1989. The number of households not yet benefitting from weatherization services is therefore quite substantial, particularly when considered in light of the number of households that can be weatherized each year with existing resources.

In order to identify a population within the larger low-income base that might best be targeted with weatherization services, the research team chose to take samples of the low-income population based on two criteria -- high energy expenditure and high energy burden.

Households with "high-expenditures" were defined as those whose residential heating expenditures, measured in expenditures per square foot per heating degree day, were one standard deviation or more above the mean for all households in their climate zone and Census Division. "High-burden" households were those with residential energy burdens, measured as residential heating expenditures divided by income, that were one standard deviation or more above the mean for all low-income households in their climate zone and Census Division. Five climate zones based on heating degree days were applied across the nine Census Divisions. For maps delineating Census Division and climate zones please see Appendix B.

This chapter describes the high-expenditure households and their characteristics. Chapter 4 describes the high-burden population.

The use of heating expenditures weighted by heating degree days per unit of living space to define a potential weatherization target population has several features to recommend it. First, it takes into account the energy efficiency of the dwelling weighted by fuel cost and measures it against similarly situated households. Since the weatherization program seeks to improve the energy efficiency of low-income dwellings as one of its major objectives the least efficient of those homes in each area are one of the logical target populations.

Second, energy expenditures per heating degree day per square foot is a measure used in some states to prioritized weatherization candidates or to help determine the appropriate level of efficiency investment. It therefore has some acceptance within the weatherization community as a targeting concept.

Finally, there are a host of reasons why any individual housing unit may be energy inefficient. It would be unrealistic to expect that any general survey would be able to capture these characteristics. The measure used to define high-expenditure households conveys a picture of the least efficient low-income housing stock around the country without engaging in the nearly impossible task of defining that housing stock by the characteristics that make it inefficient.

One issue of major concern in defining this set of households was the use of expenditures rather than Btus to define consumption. The advantage of the expenditure approach is that it translates all consumption into a uniform measure that reflects both its energy value, that is volume of Btus consumed, but also its economic value to consumers. The risk with this measure is that it tends to favor the selection of households using higher priced fuels rather than those that consume the most. This posed the danger that large price differentials would badly skew the selection process causing an underestimate of households using lower-priced fuels, particularly natural gas, that could benefit substantially from weatherization.

In practice, the use of regional and climate zones to define measurement groups for the selection of the high-expenditure households tended also to neutralize interfuel price disparities. Natural gas in the Northeast, for example, does not enjoy the significant price advantage over fuel oil and propane that national average prices might suggest. The high-expenditure households measured in terms of expenditures therefore tended to reflect the same general heating fuel penetration patterns as did all low-income households in each region. There was no apparent fuel-type bias as further explained in the heating fuel section below.

3.1 HIGH-EXPENDITURE HOUSEHOLDS: HOUSING CHARACTERISTICS

An estimated 5.0 million households of the 27.9 million low-income households in the 1990 RECS met the definition of high-expenditure households. Of these, 51.4% lived in single-family homes and 19.2% lived in mobile homes. The percentage living in mobile homes was much higher than the 8.2% that did so among all low-income households. There were 19.2% living in small multifamily buildings and 10.2% lived in large multifamily dwellings. This compares to 19.1% and 14.1% for the respective housing types among all low-income households.

High-expenditure households in the Northeast were much less likely to live in single-family dwellings; just 23.8% did so in 1990. The proportion living in small multifamily dwellings was 36%, more than twice proportion for all the poor. In the Midwest, on the other hand, 45.7% of high-expenditure households lived in single-family homes and 21.7% lived in mobile homes.

In the South, high-expenditure households were characterized by very high residency rates in single-family dwellings. An estimated 71.6% lived in single-family homes and 16.2% lived in mobile homes. About 10% were in small multifamily buildings. In the West 52.5% of high-expenditure households lived in single-family homes and nearly a quarter, 24.9% lived in mobile homes. The proportions in small and large multifamily dwellings were 12.2% and 10.4%, respectively.

3.1.1 High-Expenditure Households: Tenure

Owners comprised 46.2% of the high-expenditure population, a percentage that was comparable to that for the general eligible population. Approximately two thirds of the owners lived

in single-family homes with 27.7% owning mobile homes. An estimated 7% owned their own residences in small multifamily buildings.

Among renters, who comprised 53.8% of all high-expenditure households, approximately 39.0% rented single-family homes and 30.0% lived in small multifamily dwellings. Approximately 18.9% of renters lived in large multifamily buildings while 12.0% rented mobile homes. The proportion living in small multifamily dwellings and mobile homes was higher than that of the overall low-income population while the percentage in large buildings was only about half the proportion for all the poor. Please see Figure 3.1 for details of housing and tenure characteristics.

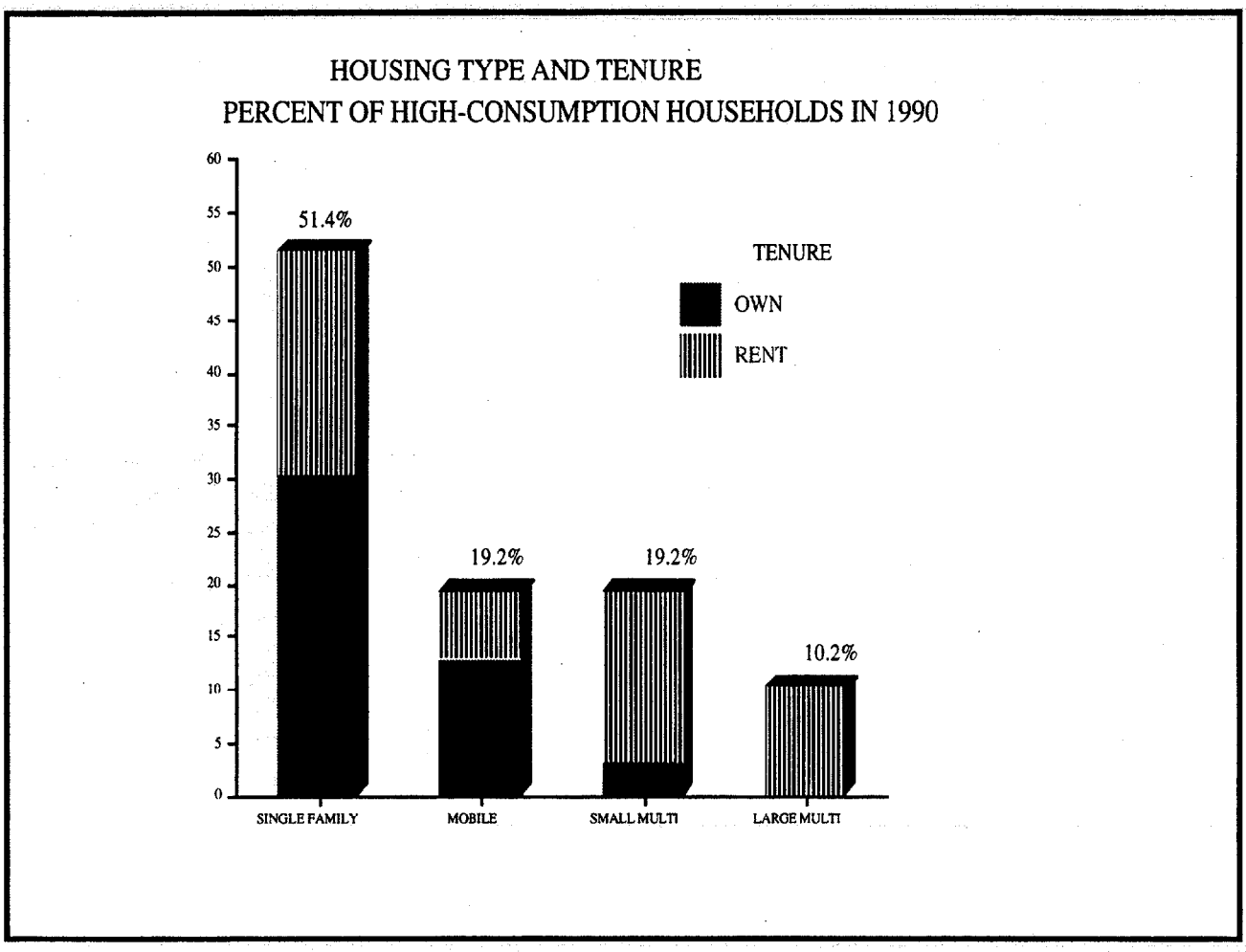

Figure 3.1 Housing Type and Tenure for High-Expenditure Households

3.1.2 High-Expenditure Households: Heating Fuel

The proportions of heating fuel use by type for high-expenditure households tends to be consistent with that of the general low-income population. Natural gas was the dominant primary heating fuel with 47.2% of all households, followed by 18.7% for electricity and 11.3% for fuel oil.

The most striking figure was the proportion of high-expenditure households using propane, 17.4% of the subpopulation. This figure is far higher than the proportion among all low-income households and is consistent with the disproportionate representation of mobile homes within the high-expenditure population.

The pattern of regional fuel use variability that characterized the general low-income population also is present among high-expenditure households. In the Northeast, 32.8% of high-expenditure households heated with fuel oil, 7.8% used kerosene and only 3.9% heated with propane. In the Midwest, natural gas predominated as the heating fuel for 54.3% of high-expenditure households but propane was the second most common fuel with 23% of high-expenditure households. Fuel oil and electricity followed with about 10% each of the high-expenditure households in the region.

In the South natural gas was the most frequently used home heating fuel, employed by 40.9% of the high-expenditure households. Propane was once again the second most frequently used heating fuel with 22.9% of households heating with it followed by electricity at 18.6%. In the West, by contrast, while natural gas predominated with 51.6% of high-expenditure households, electricity was used for heat by 36.1%. An estimated 12.3% used propane.

3.3 HIGH-EXPENDITURE HOUSEHOLDS: ENERGY EXPENDITURES

The mean energy expenditure for high-expenditure households was $1,233 in 1990, which was substantially higher than the average for all low-income households of $994. The average expenditure varied substantially by fuel type. Households heating with natural gas and electricity had average expenditures of $1,155 and $1,073 respectively. Those high-expenditure households using home fuel oil, on the other hand had average expenditures of $1,567. High-expenditure propane users who heated with that fuel had average expenditures of $1,343. Please see Table 3.1 and Appendix A, Tables B-11, B-12 and B-13 for details of income, expenditures, and burdens for high-expenditure households.

Among households in the high-expenditure sample there was substantial variation in household expenditure in 1990. The standard deviation for expenditures was $537. This high level of variability characterizes households across all fuel types.

Table 3.1 Income, Energy Expenditures and Energy Burden on High-Expenditure Households in 1990

FUEL		HOUSEHOLD			
Main Heating Fuel	Percentage of All Types	Income	Expenditure	Burden	Group Burden
Natural Gas	47.2%	$9,301	$1,155	17.0%	12.4%
Electricity	18.7%	7,863	1,073	21.0%	13.6%
Fuel Oil	11.3%	10,235	1,567	27.3%	15.3%
Propane	17.4%	9,817	1,343	16.5%	13.7%
Other	5.4%	9,828	1,417	24.4%	22.5%
All	100.0%	$9,254	$1,233	19.2%	13.3%

3.4 HIGH-EXPENDITURE HOUSEHOLDS: INCOME

The average mean income of high-expenditure households was less than the average for all low-income households, $9,254 in 1990 compared to $10,048 for all low-income households. This varied substantially by fuel type. High-expenditure households heating with natural gas had an average income of $9,301 in 1990 and those using propane for heat had an average income of $9,817. Fuel oil users, on the other hand had an average income of $10,235, well above the mean for all high consuming households. Households heating with electricity had income well below that mean at an average of $7,863.

There was remarkably little disparity in incomes based on tenure. High-expenditure households that owned their own homes had an average income of $9,324 whereas renters had an average income of $9,195. Renters in large multifamily buildings had an average income of $6,953 and those renting mobile homes averaged $7,325, a pattern generally consistent with that for all low-income households.

3.5 HIGH-EXPENDITURE HOUSEHOLDS: ENERGY BURDEN

Energy burden, the measure of the combination of energy costs and household income, reflects the heavy burden imposed by above-average fuel consumption on these households. The mean energy burden for high-expenditure households in 1990 was 19.2%, substantially higher than the 14.4% average for all low-income households.

The energy burden of high-expenditure households shows substantial variation by fuel type. Fuel oil users had by far the highest average burden among the major heating fuel types at 27.3% of income. This compares to 21% for electricity and 17% for households heating with natural gas. The

average energy burden for high-expenditure propane users in 1990 was 16.5%. These burden statistics are all substantially higher than the comparable averages for all low-income households by fuel type with the exception of propane.

In contrast with the general low-income population, where the average burden for renters in large multifamily buildings was somewhat lower than the average for all households, among high-expenditure households these renters faced a high 22.3% burden in 1990. This results from the fact that average expenditures for these households were 35% higher than for similarly situated renters in the general low-income population and the average income was 14.6% lower.

Residents of single-family homes, both renters and owners, had burdens between 18.0 and 19.0% of income while mobile home owners had a burden of 15.7%. Renters of mobile homes, on the other hand, had an average burden of 20.3% and those renting in small multifamily buildings had an average burden of 20.4%. This is consistent with the general pattern of higher energy burdens for renter households than for owner households in similar housing types.

High-expenditure households in the Northeast have the highest average burden at 23.4% of income and those in the West had the lowest at 16.5% of income. Households in the South and Midwest had average burdens of 18.6% and 19% respectively. The burden figure for high-expenditure households in the West, though lower than the average in other regions, is substantially higher than the burden faced by all low-income households in the region, which was 9.8%.

3.6 DEMOGRAPHICS OF THE HIGH-EXPENDITURE HOUSEHOLDS

3.6.1 Elderly

The proportion of low-income households with at least one person over the age of 60 among low-income high-expenditure households was 44.5%, 2.2 million households, about the same as the proportion for the low-income population as a whole. Housing tenure and type for high-expenditure households with elderly residents was roughly the same as that for similar households in the general low-income population. The energy expenditures for high-expenditure households with elderly residents was $1,146 and the average burden was 17.0%, somewhat below the 19.0% average for all high-expenditure households.

3.6.2 Children

About 2 million households in the high-expenditure category, 42.0% of the total, were households with children. These had housing and tenure characteristics comparable to those of similar households in the general low-income population. Approximately a third of the high-expenditure households with children lived in rented single-family homes and about 15.0% lived in mobile homes.

Mean energy expenditures for these households averaged $1,403 in 1990 compared to $1,233 for all high-expenditure households. Particularly high expenditures were reported for households in their own mobile homes at $1,569 for the year. The average energy burden for households with children in the high-expenditure category was approximately 20.0%.

3.6.3 Single-Parent Households

These households numbered 1 million, with about 75.0% of these renting and 25.0% owning their homes. Approximately 50.0% were living in single-family homes, 20.0% in small multifamily homes and 15.0% in mobile homes.

The average energy burden for these households was approximately 25.0% of income in 1990. The average expenditure was roughly the same as that for all low-income high-expenditure households but incomes were somewhat lower. Renters had generally higher burdens than did owners.

3.6.4 Ethnicity

African-Americans comprised 27.3% of the high-expenditure class, a much higher proportion than their representation in the general low-income population. Hispanics, on the other hand, were present in the same proportion as in the overall low-income population. The energy burden averaged 20.0% for both groups. Please see Appendix A, Tables B-18, B-19, B10 and B-21 for further details regarding the demographic characteristics of the high-expenditure population.

3.7 PROGRAM PARTICIPATION AMONG HIGH-EXPENDITURE HOUSEHOLDS

Among high-expenditure households the rate of participation in basic public assistance programs was roughly comparable to that for the low-income population as a group. Approximately 14.4% were AFDC recipients compared to 11.9% for all the poor. The proportions of SSI and LIHEAP recipients were 11.2 and 15.7% compared to 8.3 and 13.8% for the general low-income population. The Food Stamp participation rate was 26.7% compared to 20% among all eligible households but, given the general uncertainties surrounding the participation rates in RECS, it would be prudent not to assign too much significance to these differences.

The residential energy expenditures of the population participating in public assistance programs in the high-expenditure group were consistently higher than those for the equivalent groups in the general low-income population. High-expenditure AFDC recipients averaged expenditures of $1,239 in 1990 compared to $1,013 for all AFDC households. SSI households in the high-expenditure class had an average expenditure of $1,013 compared to $831 for all SSI recipients. For LIHEAP recipients, high-expenditure households averaged $1,266 in 1990 compared to $1000

for all LIHEAP recipients. Among food stamps households, high consumers averaged $1,216 compared to $964 for all Food Stamp recipients.

Average energy burdens for high-expenditure program participants were generally higher than those of their counterparts in the general low-income population. In as much as the program participant population generally has a higher average energy burden than all qualified households, the high-expenditure portion of the population is particularly hard hit by energy costs.

High-expenditure AFDC households faced an average energy burden of 27% in 1990, while LIHEAP recipients and Food Stamp recipients were each confronted by 25%-of-income average burdens. This compared to 19% for the high-expenditure population as a whole and 14% for the total eligible population. High-expenditure households living in subsidized housing were something of an anomaly in this regard. Their energy burden was 17% of income compared to a burden of 19% of all eligible households living in subsidized housing. For details of the characteristics of the high-expenditure population participating in public assistance programs please see Appendix A, Tables B-11 through B-17.

In summary, high-expenditure households were characterized by a relatively high proportion of mobile-home residents when compared to all low-income households as well as a significantly higher usage rate for propane. The average residential energy expenditure was $1,233 in 1990, well above the average for all low-income households, whereas the average income of $9,254 was below the low-income average. The average burden for this population was 19.2% of income, compared to 14.4% for all low-income households. The proportion of high-expenditure households with an African-American member was high relative to the total low-income population. There are otherwise no major disparities between high-expenditure households and all low-income households in terms of program participation or other demographic characteristics.

4. HIGH-BURDEN AND HIGH-BURDEN/HIGH-EXPENDITURE HOUSEHOLDS

Another means of determining who may be most in need of energy efficiency services among low-income households is to focus on those who are most heavily burdened by residential energy costs relative to income. The households described in this chapter are those whose residential energy burden, measured as expenditures divided by income, was one standard deviation or more above the mean for all households within their Census Division and climate zone.

Energy burden is a frequently used measure for evaluating the need for energy assistance and Weatherization services as well as for targeting those services within the low-income population. Where high-expenditure households are most likely to reduce their energy consumption through weatherization, high-burden households are perceived to be most in need of those services. To the extent that these populations overlap they provide a major target for weatherization services from both efficiency and equity perspectives.

This chapter first describes the high-burden population and then examines the characteristics of these households that fall into both high-burden and high-expenditure categories.

4.1 HIGH-BURDEN HOUSEHOLDS: HOUSING CHARACTERISTICS

High-burden households comprised 7.2 million of the 27.9 million households federally eligible for weatherization in 1990, 26% of the total. A breakdown by housing types and tenure is shown in Figure 4.1.

An estimated 56.2% of high-burden households lived in single-family houses and an additional 8.5% lived in mobile homes, proportions that are comparable to those for low-income population as a whole. Approximately 19.1% lived in large multifamily buildings and 16.2% lived in small multifamily structures.

In the South, approximately 60% of high-burden households lived in single-family homes and 9.2% lived in mobile homes with 21% living in large multifamily dwellings. In the Northeast, by contrast 38.2% lived in single-family dwellings, 30.8% lived in small multifamily structures, and only 4.7% lived in mobile homes.

In the Midwest, 68.6% of high-burden households lived in single-family homes and only 5% lived in large multifamily dwellings. In the West, by contrast 23.8% of high-burden households lived in large multifamily structures, 13.2% lived in small multifamily buildings and 9.9% were in mobile homes.

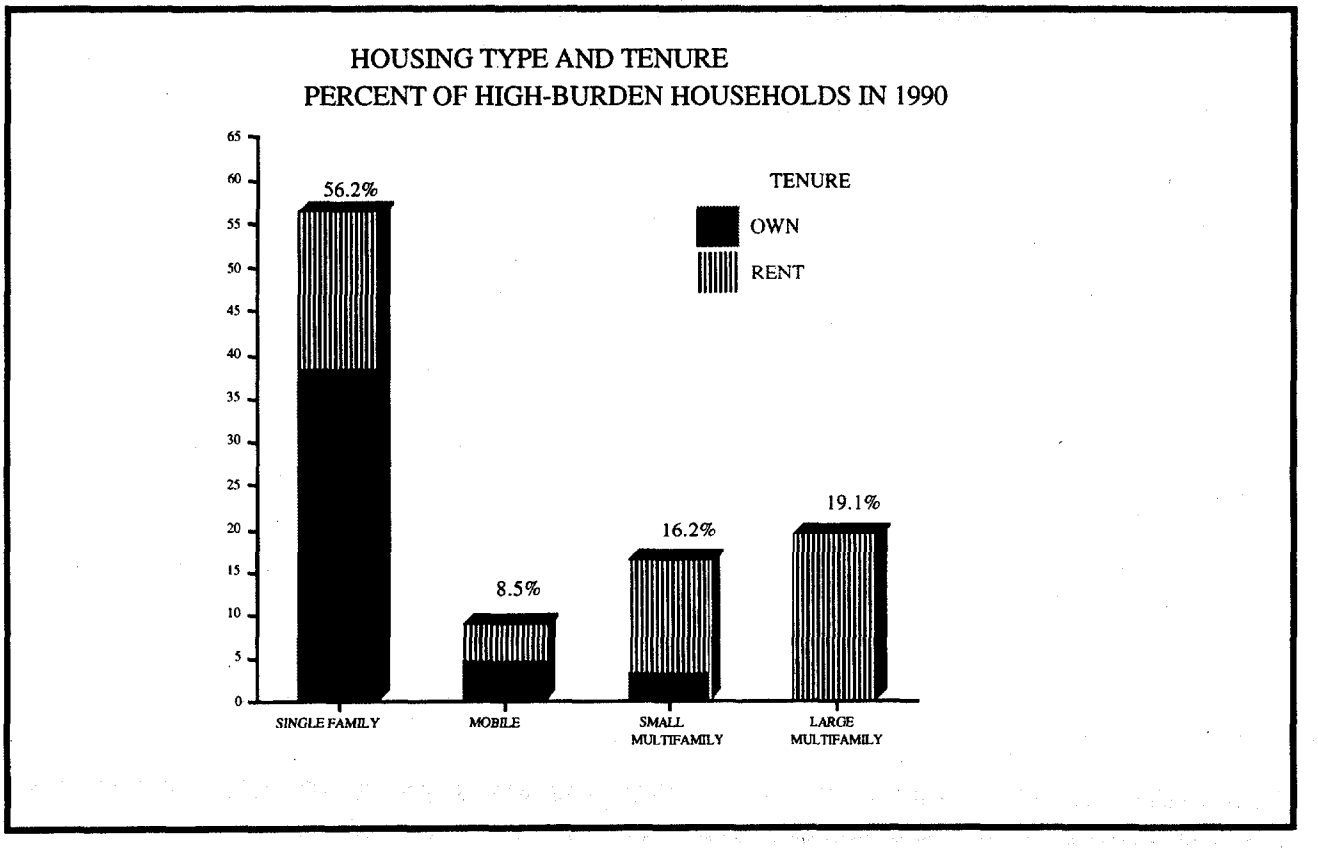

Figure 4.1 Housing Type and Tenure for High-Burden Households

Those national and regional patterns were consistent with those found among all low-income households.

4.1.1 Tenure of High-Burden Households

Home ownership patterns were generally the same for high-burden households as they were for all low-income households. Approximately 46.2% were owners compared to 50.3% of all low-income households. Of the households that own their own homes, 82.7% were in single-family homes and 10.3% were in mobile homes.

Among renter households, 35.5% of the total subgroup lived in large multifamily buildings, 24.2% were in small multifamily buildings, and 7% rented mobile homes.

On a regional basis tenure patterns were varied. About 35% of high-burden households in the Northeast were owners but in the Midwest the proportion of owners was 57.2%. In the South 50% were owners and the West 37.3% owned their own homes. These statistics are consistent with those for the larger low-income population.

4.1.2 High-Burden Households: Heating Fuel

Heating fuel patterns for high-burden households are largely the same as those for all low-income households. An estimated 49.4% heated with natural gas, 17.3% used electricity, 15.6% used fuel oil, 2.5% used kerosene, and 10.9% used propane.

Prevailing regional patterns of fuel use for all low-income households were present and even stronger among high-burden households. In the Northeast 49.5% of households used fuel oil and 41% heated with natural gas. In the Midwest 60.4% of high-burden households used gas for heat and 16.6% used propane. A surprisingly high proportion heated with fuel oil-- 14.0% compared to just 6.0% for all low-income households in the Midwest.

In the South, 14.7% of high-burden households heated with propane, 25.2% employed electricity, and 45.5% heating with gas. In the West 52.2% of high-burden households used gas for heating, 29.1% used electricity, and 8.3% used propane.

4.2 ENERGY EXPENDITURES OF HIGH-BURDEN HOUSEHOLDS

The mean residential energy expenditure for all high-burden households was $1,175, significantly higher than the average for all low-income households and statistically comparable to that for high-expenditure households, which was $1,233 in 1990. Households in the high-burden population that heat with natural gas and electricity had expenditures averaging $1,150 and $954 respectively. For households with high-burdens using fuel oil, expenditures averaged $1,422 in 1990 and for those heating with propane the average was $1,324.

The pattern of high variability in expenditures even within climate zones and fuel types that was present for high-expenditure households was also found among high-burden households. For details of expenditure, income, and burdens for high-burden households please see Table 4.1.

4.3 INCOME OF HIGH-BURDEN HOUSEHOLDS

The single characteristic that most distinguishes high-burden households from low-income households in general is income. The average income of these households was only $5,419 compared to $10,048 for all low-income households in 1990.

There was little substantial difference in incomes for households using different home heating fuels among all low-income households with one exception. The average income for high-burden households heating with gas was $5,598 and for fuel oil heaters it was $5,865. For households heating with propane average income was $5,712. For households heating with electricity, on the other hand, income averaged only $4,240. These differences are insignificant, however, compared to the differences between any of those averages and those for all U.S. households or even low-income households in general.

Table 4.1 Income, Energy Expenditures and Energy Burden of High-Burden Households in 1990

FUEL		HOUSEHOLD			
Main Heating Fuel	Percentage of All	Income	Expenditure	Burden	Group Burden
Natural Gas	49.4%	$5,598	$1,150	28.8%	20.5%
Electricity	17.3%	4,240	954	30.8%	22.5%
Fuel Oil	15.6%	5,865	1,422	34.0%	24.2%
Propane	10.9%	5,712	1,324	30.5%	23.2%
Other	5.9%	4,475	1,077	31.6%	19.0%
All	100.0%*	$5,419	$1,175	30.1%	21.7%

* Does not sum due to missing data for kerosene.

There was some distinction between high-burden household when measured in terms of housing tenure and type. Households that owned their own homes had an average income of $6,447 in 1990 and those renting their homes had an average income of $4,538. Renters in large multifamily buildings, 1.4 million households, had an average income of only $3,630.

4.4 ENERGY BURDEN OF HIGH-BURDEN HOUSEHOLDS

The households in this category are those in each census division and climate zone whose energy burdens substantially exceed the norm. As one might expect, the energy burden figures for this group are startling. The average burden nationwide was 30.1% compared to 14.4 % for all low-income households.

When measured in terms of primary heating fuel, high-burden households have a much lower level of variation between fuel types than do all low-income households. The average burden for households heating with gas was 28.8%, for electricity 30.8%, for fuel oil 34.0%, and for propane 30.5%. The differences between these averages is minor compared to the differences between any one of them and the averages for all low-income households.

The energy burden for renters averaged 33.1%, and that for owners 26.7%. Though average expenditures for owners were $342 higher than for renters, the average income for the latter was $1,909 below that of the former. Particularly hard hit in the renter population were 941 thousand households living in small multifamily dwellings with an average energy burden of 37.4%. Renters in single-family and mobile homes had average burdens of 32.7%. Owners of single-family homes had an average burden of 27.1% and owners of mobile homes had an average burden of 22.5%.

Those compare with average burdens of 13.8% for owners of single-family homes in the entire low income population and 12% for owners of mobile homes.

The large disparities in energy burdens by region that was previously noted in the low-income population in general and among high-expenditure households persists in the high-burden sample. High-burden households in the West had an average burden of 20.8% of income in 1990. High as this was, it was significantly lower than the average burden in the Northeast, which was 36.5%. The average burdens in the Midwest was 33.0% and that in the South was 30.5%.

4.5 DEMOGRAPHICS OF THE HIGH-BURDEN POPULATION

The elderly compromise 41.3% of the high-burden population and households with children were 39.9% of the total. These proportions are comparable to those for the low-income population as a whole.

The proportion of single-parent and African-American households was higher in the high-burden population than among low-income households in general. Approximately 25.9% of high-burden households were single-parent households in 1990 compared to 19.9% of all low-income households. The same proportion or 25.9% of high-burden households was African American. This compares with 18.5% of all low-income households.

4.6 PROGRAM PARTICIPATION AMONG HIGH-BURDEN HOUSEHOLDS

The substantially lower average income of high-burden households than that of all low-income households would generally qualify them for participation in public assistance programs at a higher rate than for the low-income population as a whole. This would appear to be born out by the statistics on participation rates.

Approximately 22.6% of these households were AFDC recipients compared to 11.9% of all the poor who received those benefits. An estimated 22.7% received LIHEAP benefits compared to 13.8% of all the poor. The Food Stamp participation rate was 33.3% compared to 20% for all the poor.

Energy burdens for high-burden AFDC and Food Stamp recipients both averaged 34% of income in 1990. The burden for LIHEAP recipients averaged 31% and that of SSI recipients was 27%. For further details concerning the high-burden population please see Appendix A, Tables C-1 through C-21.

4.7 HIGH-BURDEN/HIGH-EXPENDITURE HOUSEHOLDS

Households that are both high-expenditure households and high-burden households are of particular interest to those concerned with targeting weatherization for maximum energy efficiency and equity benefits. These households were both one standard deviation above the mean for heating

expenditures per heating degree day per square foot and for the percentage of income devoted to home heating, a figure estimated for each household based on an Energy Information Administration model of disaggregated residential fuel use.

An estimated 2.1 million households fitted into this category in 1990. These were 42.6% of all high-expenditure households, and 29.3% of all high-burden households, and 7.6% of all low-income households. At present rates of weatherization it would take four to five years to weatherize this number of households. The relatively small size of this sample imposes certain limitations on the statistics that can be drawn from it, particularly for smaller elements of interest such as regional housing characteristics or program participation rates.

4.7.1 Housing Characteristics of High-Burden/High-Expenditure Households

An estimated 51.4% of the high-expenditure/high-burden households lived in single- family homes with 19.3% living in small multifamily dwellings and 17.5% in mobile homes. The percentage in large multifamily buildings was 11.8%.

An estimated 323 thousand of these households were located in the Northeast, 628 thousand in the Midwest, 604 thousand in the South and 567 thousand in the West.

4.7.2 Tenure of the High-Burden/High-Expenditure Households

Approximately 46.9% of the high-burden/high-expenditure households owned their homes which is a slightly lower percentage than for the low-income population as a whole. Mobile home owners comprised 10.7% of the total and owners of single-family homes comprised 30.2%. An estimated 21.2% of the total rented single-family homes. The statistics for housing type and tenure are not significantly different than those for the larger low-income population.

4.7.3 Heating Fuels of the High-Burden/High-Expenditure Households

Natural gas was the single most widely used fuel for heating in this population, with 40.0% using it nationwide. Electricity was used for heating by 25.3% fuel oil by 13.1%, and propane by 16.6% of the households. The proportion of households using propane was more than twice the proportion doing so among all low-income households. These figures are consistent with those for the larger high-burden population.

4.7.4 Energy Expenditures and Income of the High-Burden/High-Expenditure Households

The average energy expenditure of the high-burden/high-expenditure households in 1990 was $1,339, well above the average for all low-income households of $994. Average expenditures ranged from $1,066 for households heating with electricity to $1,566 for those using fuel oil.

Heating systems fueled by natural gas had average expenditures of $1,340 and those heating with propane faced average expenditures of $1,500.

Expenditures by owner households averaged $1,450 and those of renters averaged $1,240. This compares to an average expenditure of $1,131 for all low-income owners and $854 for all low-income renters.

Households in the high-burden/high-expenditure category had an average income of $6,114 in 1990 compared to $10,048 for all low-income households. Those households that owned their own homes had an average income of $6,644 while renter income averaged only $5,647. The large proportion of households renting single-family homes had an average income of $7,498 while renters in small multifamily dwellings had an average income of $3,804. Those in large multifamily buildings had an average income of $4,869. Please see Table 4.2 for details of income, energy expenditures and energy burden for high-burden/high-expenditure households.

Table 4.2 Income, Energy Expenditures and Energy Burden High-Burden/High-Expenditure Households in 1990

Main Heating Fuel	Percentage of All	Income	Expenditure	Burden	Group Burden
Natural Gas	40.0%	$6,952	$1,340	27.2%	19.3%
Electricity	25.3%	4,914	1,066	29.6%	21.7%
Fuel Oil	13.1%	5,417	1,566	43.7%	28.6%
Propane	16.6%	6,935	1,500	24.1%	21.6%
All	100.0%*	$6,114	$1,339	30.4%	29.9%

* Does not sum to 100% due to missing data for kerosene and other minor fuels.

4.7.5 Energy Burden: High-Burden/High-Expenditure Households

The energy burden for those households averaged 30.4% of income, a figure comparable to that for high-burden households and well above the average for high-expenditure households, which was 19.2% in 1990. The burden for owners averaged 25.9% of income and that of renters was 34.4%. The energy burden for renters in small multifamily buildings was 39.2%.

The average energy burden ranged from 24.1% for propane users to 43.7% for home fuel oil users though the fuel oil sample is rather small. Those heating with natural gas had an average burden of 27.2% and for heaters with electricity the average energy burden was 29.6%.

4.7.6 Demographics and Program Participation of High-Expenditure/High-Burden Households

Households with the elderly comprised 40.4% of all high-expenditure/high-burden households and households with children were 38.6% of the total. Single parent households were 24.2% of the population and African Americans 29.7%. These statistics are all consistent with those for the high-burden population.

AFDC households comprised 22.1% of the high-burden/high-expenditure households compared to 11.9% for all low-income households. LIHEAP recipients were 20.7% of the population compared to 13.8% among all the poor and Food Stamp recipients were 34.1% of the total. This compared to 20% Food Stamp recipiency rate among the general low-income population. SSI recipients were 12.6% of the households in the high-expenditure/high-burden population. These participation rates are also consistent with those of the high-burden population. For detailed statistics for the high-burden/high-expenditure households please see Appendix A, Tables D-1 through D-21.

5. OTHER POPULATIONS OF INTEREST

The research team identified three other populations within the large set of low-income households that could potentially provide additional insights into the best ways to target weatherization assistance. One of these was the subset of households with housing characteristics that might indicate the need for weatherization, i.e. "low-efficiency" households. The second subset consists of those households that were qualified for assistance in both 1987, the next most recent RECS survey, and in 1990 - "persistent-eligible" households. The third subset consisted of households weatherized in 1990.

5.1 LOW-EFFICIENCY HOUSEHOLDS

Low-efficiency households were defined as those households nationwide who reported little or no attic insulation as well as those households located in the Northeast and Midwest who reported having storm windows on less than 25% of their windows. The use of the additional measure of storm-window utilization in the two colder climate regions was intended to capture the fact that storm windows were widely perceived to be cost-effective by building owners there. The survey questions concerning housing characteristics focus on storm doors, storm windows, and attic insulation and do not permit a better definition of unweatherized housing, based on physical characteristics alone.

Of the 27.9 million households estimated to be eligible for weatherization in 1990, 4.6 million fitted the definition for this subset. Of these, 26.9% were located in the Northeast compared to 18.9 of all low-income households and 28.2% were in the Midwest compared to 23.1% of all low-income households. Approximately 31.6% were in the South and 12.1% were in the West compared to 37.1% and 20.7%, respectively, among all low-income households.

5.1.1 Low-Efficiency Households: Tenure, and Fuel Use

Low-efficiency households had generally similar tenure characteristics to the general eligible population. Owners comprised 53.3% of the total whereas in the general eligible population they were 50.3% of the households.

The low-efficiency households tend to have the same heating fuel penetrations as the general eligible population with the exception of electric heating. Only 9.5% heated with electricity compared to 20% among all poor households. This may be attributable to the fact that the housing stock heating with electricity tends to be newer and therefore, more energy efficient. The difference is spread rather evenly across natural gas, fuel oil, kerosene and "No Heating Fuel Used."

5.1.2 Low-Efficiency Households: Energy Expenditures and Burden

The average expenditure for residential energy for the low efficiency group was $1,084, a figure that was above the average for all low-income households by only $92, a difference that was not statistically significant.

The single-family households in the low efficiency sample had average expenditures of $1,185 comparable to $1,115 for all the poor in this type of dwelling. Residents in small multifamily buildings had somewhat higher average expenditures than the mean for all similarly situated low-income households: $1,122 as compared to $938. Residents of mobile homes in the low-efficiency class had average expenditures of $807 in 1990, well below the mean for low-income mobile home residents in general, who spent an average of $978 in 1990. Expenditures by those living in large multifamily dwellings were roughly comparable to those of the larger multifamily population at $620.

The energy burden faced by low efficiency households in 1990 was 15.9% of income, not statistically different than that of the all low-income population at 14.4%.

Measured in terms of energy expenditures or energy burden this "low-efficiency" subset offers little in the way of insight as to the households within the low-income population that could most benefit from weatherization services. The absence of insulation or storm windows alone does not seem to set these households apart in a meaningful way from all eligible households. Put another way, the absence of storm windows in the Northeast and Midwest and the absence of a high level of attic insulation nationwide as reported in RECS do not appear to be good indicators of household energy efficiency.

5.2 THE PERSISTENT-ELIGIBLE HOUSEHOLDS

Households that qualified for weatherization and LIHEAP in both 1987 and 1990 totaled 17,254,000, 61.9% of all households that qualified in 1990. They are of particular interest because they are a natural target group for the program in as much as their inadequate incomes and problems with energy affordability persist over time.

As one might expect, this population had a slightly higher participation rate in public assistance programs than the general low-income population. However, the difference is a matter of a few percentage points in the case of each program.

The elderly comprised a somewhat higher proportion of the persistent population, at 52.8% than of the 1990 population, in which 43.7% were households with elderly residents. The proportions of households with children and single-parent households were roughly comparable in the two samples but African-Americans were more heavily represented in the persistent eligible group. They comprised 24.6% of that set of households and 18.5% of those eligible only in 1990.

Expenditures for residential energy by the persistently eligible population averaged $990 in 1990, essentially the same as the "1990-only" population. There were no major distinctions between the two groups in terms of expenditures by housing type, with the exception of residents in multifamily buildings. The average expenditure in this group was $1,029 for the persistent eligibles and $938 for those eligible in 1990 alone.

The average income of the persistent population was $9,410 compared to $10,048 for the "1990-only" population but energy burdens were not significantly different. The only exception to this trend was among households using propane for heat. Their energy burden in the persistent population averaged 25.1% of income and in the "1990-only" population it averaged 18.1%, largely as a consequence of higher fuel bills in the former group.

Though the energy-related characteristics of these households do not stand out compared to all those eligible in 1990, there are reasons that the persistent eligible population may deserve prioritization in the weatherization program, not the least of which is the persistence of need for help as well as eligibility. Their energy-affordability problems appear less likely to be solved by a positive change in their financial circumstances.

5.3 THE WEATHERIZED POPULATION IN 1990

The number of households weatherized in the period from October 1989 through September of 1990 was 851 thousand based on the RECS for 1990. This count is two-thirds higher than the estimate by Power et al.(1992) that approximately 500,000 units were weatherized in 1989. This large difference is probably attributable to the small sample size for recently weatherized homes in the 1990 RECS.

Indeed, this relatively small sample does not offer significant insights regarding the general characteristics of all low-income households that have been weatherized and it is impossible to derive meaningful data on income, expenditure, or energy burden for the full class of households weatherized across the past decade from any known data source. There are nevertheless some interesting points to be gleaned from the 1990 statistics.

Among households weatherized in 1990 the fuel-use distribution was roughly equivalent to that for all low-income households with a somewhat higher concentration on households using propane for heat. These comprised 15.3% of the weatherized sample. The major distinction between this subset and the others studied for this report was in regard to housing type. Approximately 80.8% of the households weatherized lived in single-family homes, a significantly higher proportion than the 58.7 living in such housing in the general eligible population. The proportion of owners, at 59%, was slightly higher than in the general low-income population. The greater percentage of single-family homes and owners reflects the orientation of most weatherization programs, including DOE's.

The average income for the weatherized sample was $8,316 which was somewhat below the average for all low-income households but this difference was not statistically significant because of the sample size. The energy burden averaged 17.6% but the margin of error for the sample is such as to range from below the average for all eligibles at 14.4% to above the 19% burden of high-expenditure households. They certainly did not have a burden comparable to that for the high-burden or high-burden/high-expenditure populations.

There were no statistically significant differences between the demographics and program participation rates of this group when compared to the general eligible population. This finding was surprising in that LIHEAP participants often serve as a pool from which weatherization candidates are drawn. The tendency of the RECS and other surveys to underreport program participation together with the relatively small sample size may explain this result.

6. COMPARISON OF ELIGIBLE, HIGH-BURDEN AND HIGH-EXPENDITURE POPULATIONS AND CONCLUSIONS

This chapter presents a comparison of the summary statistics for the populations that are the primary focus of this study- the eligible households, high-expenditure households, and high-burden households. Statistics are also presented for the relatively small sample of high-burden/high-expenditure households. These statistics indicate that in many respects there is remarkable consistency among the high-burden and high-expenditure subgroups relative to the overall low-income population. The outstanding characteristics that distinguish the subgroups are the characteristics that define them, namely energy expenditures for the high-expenditure group and income for the high-burden group.

There is no discussion of regional data in this chapter. There are two reasons for this omission. First, the size of the subgroup samples at the regional level is not sufficiently large to permit statistically significant comparisons for several key statistics. Second, the nature of the selection process for the high-burden and high-expenditure households was based on comparisons made among households in the same region and climate zone. By definition the households in each subgroup are distributed along the same regional lines as the eligible population as a whole.

6.1 HOUSING TYPE AND TENURE

As Figure 6.1 shows there is very little distinction among subpopulations based on housing type. The differences between the percentages for single-family occupancy are not statistically significant, based on pair-wise t-tests at .1 level of significance. The two differences that do emerge involve mobile homes and large multifamily units occupied by high-expenditure households. Mobile homes are nearly 20% of the high-expenditure subgroup though they comprise only 8.2% of all eligible households and 8.5% of high-burden households. Mobile home residents may therefore be a subpopulation of particular interest from an energy efficiency perspective.

The percentage of households in the high-expenditure population that lives in large multifamily buildings is proportionally smaller than it is among either eligible or high-burden households. The tendency to smaller unit size and lower expenditures per unit in large multifamily buildings helps explain this difference.

Figure 6.2 presents the summary data regarding housing tenure for the total eligible and subpopulations. It is clear from the table that there are no large differences to note regarding housing tenure on a national basis.

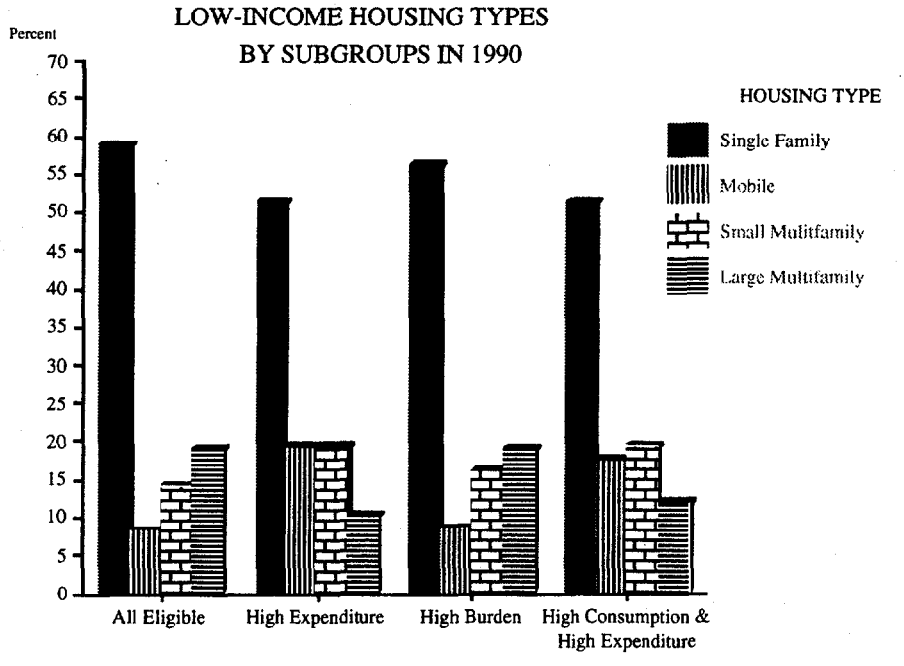

Figure 6.1 Low-Income Housing Types by Subgroups

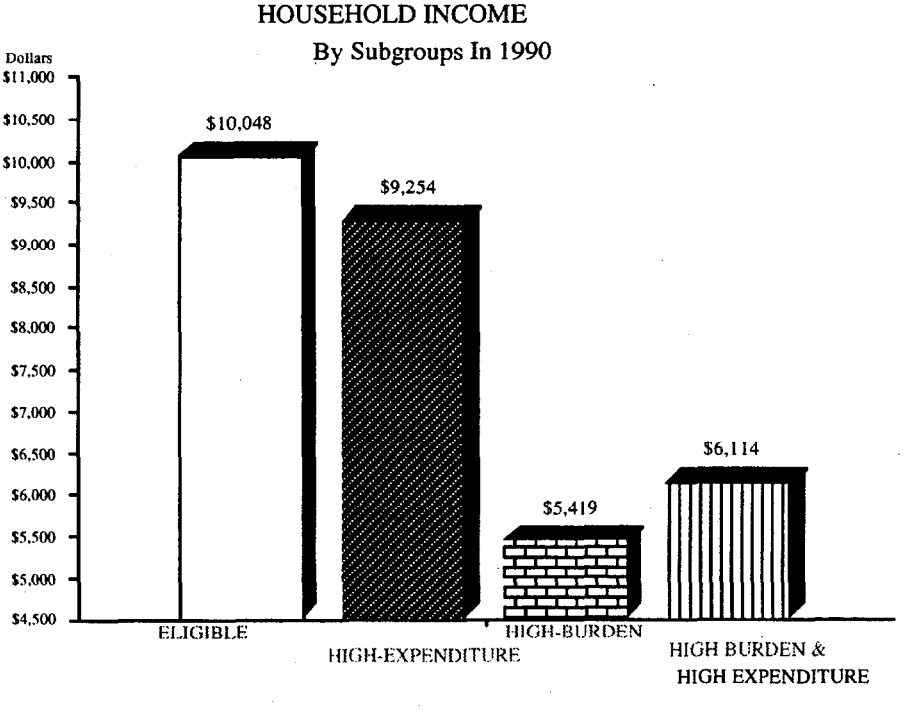

Figure 6.2 Low-Income Housing Tenure by Subgroups

6.2 DEMOGRAPHICS AND PROGRAM PARTICIPATION

One would expect to see some differences among the various populations, particularly in regard to program participation. Indeed, as Table 6.1 shows, high-burden households do have higher rate of participation in AFDC, LIHEAP, and Food Stamps than does the eligible population as a whole. LIHEAP participation rates in particular are much greater for high-burden households than for all low-income households, a result that is consistent with the legislative mandate of that program to serve households with the greatest energy burdens. The significantly lower incomes of high-burden households relative to the eligible population as a whole as well as high-expenditure households may also help to explain the higher public assistance participation rates for this group.

Table 6.1 Demographics and Program Participation
Percent in 1990

	Eligible	High-Expenditure	High-Burden	High-Burden/ High-expenditure
Elderly	43.7%	44.5%	41.3%	40.4%
With Children	42.9%	41.7%	39.9%	38.6%
African American	18.5%	27.3%	25.9%	29.7%
Single Parent	19.9%	20.2%	25.9%	24.2%
AFDC	11.9%	14.4%	22.6%	22.1%
LIHEAP	13.7%	15.7%	22.7%	20.7%
Food Stamps	20.0%	26.7%	33.3%	34.1%

Other demographic characteristics such as the presence of senior citizens, children, or single-parent families did not vary among the subgroups and eligible population to any significant degree. The exceptions to this are the African American population, which appears to be disproportionately represented in the high-burden and high-expenditure groups, and single-parent households, which are disproportionately represented in the high-burden population.

6.3 INCOME, ENERGY EXPENDITURES, AND ENERGY BURDEN

The eligible population constitutes approximately 30% of all U.S. households. In a group of this size there are certain to be tremendous variations around the average for household income and these are reflected in the income statistics shown in Figure 8. The average income for high-burden households was only $5,419 compared to an average of $10,048 for the entire eligible population. It is interesting to note that the average income of high-expenditure households at $9,254 was not significantly different on average than that of the overall population. Here too, there is substantial

variation around the mean. There are over two million households within the high-expenditure group that also qualify as high-burden households. Their average income was only $6,114.

Energy expenditures, as shown in Figure 6.3, are remarkably consistent among the subpopulations which are all well above the average for all eligible households at $994. The relatively small difference between the average expenditures of the high-expenditure and high-burden groups is somewhat surprising given the lower income of the latter population.

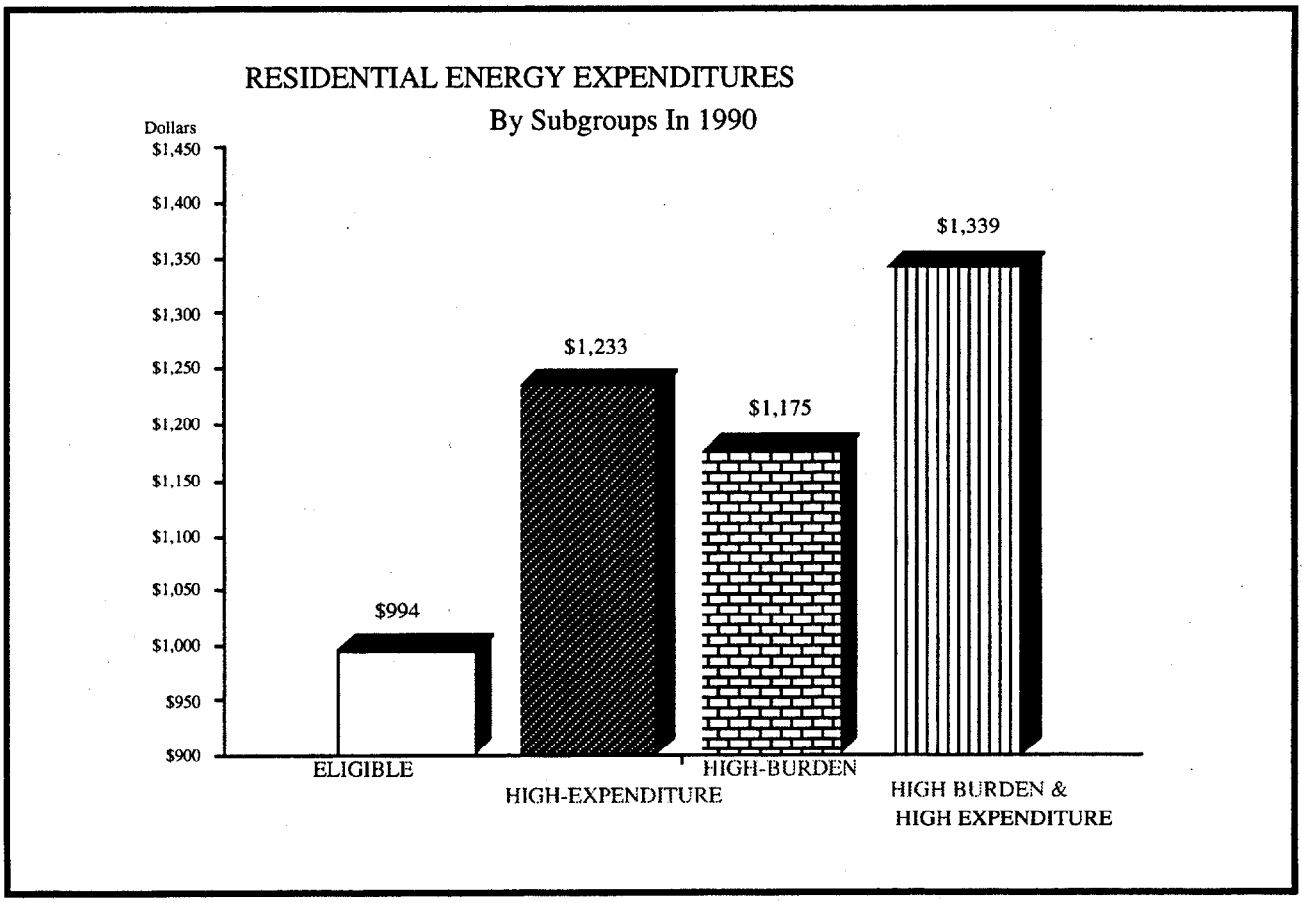

Figure 6.3 Residential Energy Expenditures by Subgroups

With expenditures that are near the levels of the least energy-efficient households and incomes well below the low-income average, it is not surprising that the high-burden group has a much higher energy burden than the eligibles as a whole or the high-expenditure group. The high-expenditure group has an average burden of 19.2%, well above that of the low-income population as a whole. But high-burden households have an average burden of over 30%, as shown in Figure 6.4.

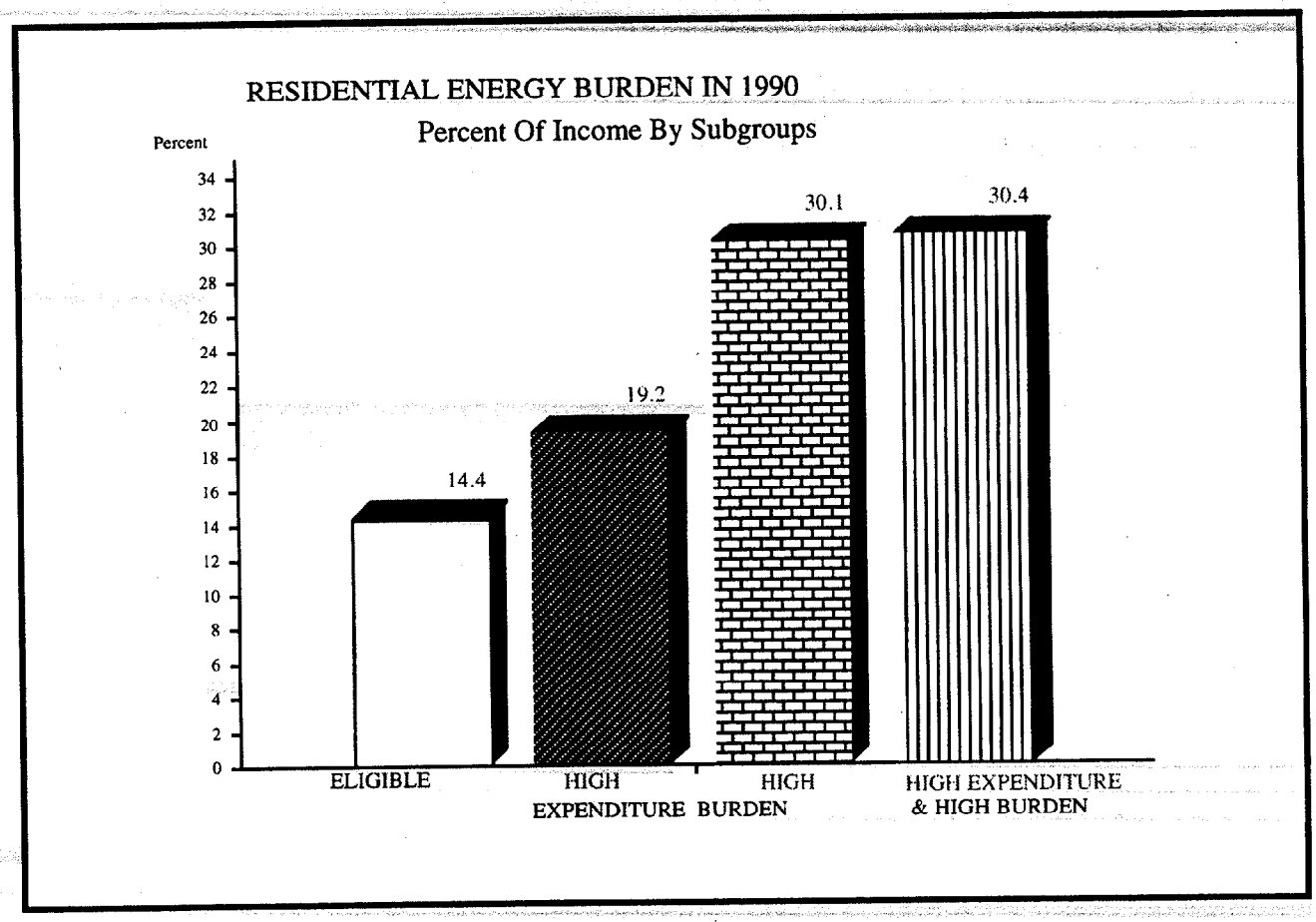

Figure 6.4 Residential Energy Burden by Subgroups

Again, it is important to note that high-burden and high-expenditure households overlap to a considerable degree. These households, who have the unenviable combination of high energy costs and very low incomes, comprise a logical target for attention from those seeking to maximize both the energy efficiency and distributive equity impacts of the weatherization program.

6.4 STATISTICAL SUMMARY AND CONCLUSIONS

The statistics allow the following comparisons to be drawn:

1) Average income for the eligible population is higher than that of the high-expenditure subpopulation and significantly higher than the average income for the high-burden population.

2) Both high-expenditure and high-burden households have higher average expenditures than do the eligibles taken as a whole.

3) Expenditures by the high-expenditure households are not significantly higher than for the high-burden households.

4) There is a significant difference in energy burden between the population of all eligible households at 14.4% and the high-expenditure households at 19.2%.

5) There is an even larger gap between the high-burden households - with a mean burden of 30.1%, and high-expenditure households.

6) Approximately 43% of the high-expenditure households, 2.125 million, are also in the high-burden category. These households are particularly worthy of greater attention in that they appear to offer a major energy efficiency and equity opportunity.

The results of this analysis indicate, in broad brush strokes, the types of households that may be the appropriate focus of the federal low-income weatherization effort. Clearly the statistics presented here are not sufficiently specific to serve as a guide to state or local decisionmakers as to the types of households or housing that should be targeted for weatherization in their locales. There is, nonetheless, some value to these decisionmakers in knowing that an apparently ample stock of housing is available to which efficiency services can be applied to maximum efficiency and equity effect.

A logical focus for future research is a more in-depth evaluation of the demographics, location, housing, and energy profile of the high-burden/high-expenditure group. This may prove useful to state, community, and utility weatherization specialists who are trying to maximize the return for the low-income efficiency dollar.

APPENDIX A

DETAILED TABLES

APPENDIX A

TABLE A-1

ALL LIHEAP-ELIGIBLE HOUSEHOLDS
NATIONAL

THOUSANDS OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure														All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	437	280	717	5,931	2,679	8,610	466	2,206	2,671	55	2,649	2,704	6,889	7,814	14,703
Electricity	320	81	401	1,538	977	2,515	46	665	711	59	1,898	1,958	1,963	3,622	5,585
Fuel Oil	41	20	61	1,621	323	1,944	153	331	483	30	601	631	1,844	1,275	3,119
Kerosene	74	122	196	106	161	266	13	0	13	0	20	20	193	302	495
Propane	547	164	711	1,102	265	1,367	17	23	40	0	0	0	1,665	452	2,117
Other Fuels	183	7	190	1,226	250	1,476	0	0	0	0	0	0	1,409	257	1,666
No Heating Fuel Used	0	0	0	65	112	177	0	19	19	0	0	0	65	132	197
All Households	1,602	674	2,277	11,589	4,767	16,355	694	3,244	3,938	144	5,168	5,313	14,029	13,854	27,883

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE A-2

ALL LIHEAP-ELIGIBLE HOUSEHOLDS
NATIONAL

PERCENT OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure														All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	1.6	1.0	2.6	21.3	9.6	30.9	1.7	7.9	9.6	0.2	9.5	9.7	24.7	28.0	52.7
Electricity	1.1	0.3	1.4	5.5	3.5	9.0	0.2	2.4	2.5	0.2	6.8	7.0	7.0	13.0	20.0
Fuel Oil	0.1	0.1	0.2	5.8	1.2	7.0	0.5	1.2	1.7	0.1	2.2	2.3	6.6	4.6	11.2
Kerosene	0.3	0.4	0.7	0.4	0.6	1.0	0.0	0.0	0.0	0.0	0.1	0.1	0.7	1.1	1.8
Propane	2.0	0.6	2.5	4.0	1.0	4.9	0.1	0.1	0.1	0.0	0.0	0.0	6.0	1.6	7.6
Other Fuels	0.7	0.0	0.7	4.4	0.9	5.3	0.0	0.0	0.0	0.0	0.0	0.0	5.1	0.9	6.0
No Heating Fuel Used	0.0	0.0	0.0	0.2	0.4	0.6	0.0	0.1	0.1	0.0	0.0	0.0	0.2	0.5	0.7
All Households	5.7	2.4	8.2	41.6	17.1	58.7	2.5	11.6	14.1	0.5	18.5	19.1	50.3	49.7	100.0

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE A-3

ALL LIHEAP-ELIGIBLE HOUSEHOLDS
REGIONAL / NORTHEAST

THOUSANDS OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	0	17	17	714	232	945	273	680	953	0	590	590	987	1,519	2,506
Electricity	18	0	18	106	44	150	16	90	106	0	188	188	140	321	461
Fuel Oil	0	9	9	805	154	959	153	252	404	30	601	631	987	1,016	2,003
Kerosene	74	40	115	0	17	17	13	0	13	0	0	0	88	57	145
Propane	35	0	35	16	0	16	0	0	0	0	0	0	51	0	51
Other Fuels	0	0	0	106	0	106	0	0	0	0	0	0	106	0	106
No Heating Fuel Used															
All Households	128	66	194	1,746	447	2,193	455	1,022	1,477	30	1,379	1,409	2,359	2,914	5,273

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE A-4

ALL LIHEAP-ELIGIBLE HOUSEHOLDS
REGIONAL / NORTHEAST

PERCENT OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
Natural Gas	0.0	0.3	0.3	13.5	4.4	17.9	5.2	12.9	18.1	0.0	11.2	11.2	18.7	28.8	47.5
Electricity	0.3	0.0	0.3	2.0	0.8	2.8	0.3	1.7	2.0	0.0	3.6	3.6	2.7	6.1	8.7
Fuel Oil	0.0	0.2	0.2	15.3	2.9	18.2	2.9	4.8	7.7	0.6	11.4	12.0	18.7	19.3	38.0
Kerosene	1.4	0.8	2.2	0.0	0.3	0.3	0.3	0.0	0.3	0.0	0.0	0.0	1.7	1.1	2.8
Propane	0.7	0.0	0.7	0.3	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0
Other Fuels	0.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0
No Heating Fuel Used															
All Households	2.4	1.3	3.7	33.1	8.5	41.6	8.6	19.4	28.0	0.6	26.2	26.7	44.7	55.3	100.0

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE A-5

ALL LIHEAP-ELIGIBLE HOUSEHOLDS
REGIONAL / MIDWEST

THOUSANDS OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	139	63	202	1,779	847	2,626	170	658	829	45	632	676	2,133	2,200	4,332
Electricity	61	0	61	224	0	224	0	92	92	43	92	135	328	184	512
Fuel Oil	0	0	0	306	61	368	0	24	24	0	0	0	306	85	391
Kerosene	0	0	0	0	0	0	0	0	0	0	20	20	0	20	20
Propane	169	53	222	374	61	435	17	23	40	0	0	0	560	137	697
Other Fuels	80	7	88	358	56	413	0	0	0	0	0	0	438	63	501
No Heating Fuel Used															
All Households	449	123	573	3,040	1,025	4,065	187	797	984	88	743	832	3,765	2,689	6,454

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE A-6

ALL LIHEAP-ELIGIBLE HOUSEHOLDS
REGIONAL / MIDWEST

PERCENT OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	2.1	1.0	3.1	27.6	13.1	40.7	2.6	10.2	12.8	0.7	9.8	10.5	33.0	34.1	67.1
Electricity	0.9	0.0	0.9	3.5	0.0	3.5	0.0	1.4	1.4	0.7	1.4	2.1	5.1	2.9	7.9
Fuel Oil	0.0	0.0	0.0	4.7	0.9	5.7	0.0	0.4	0.4	0.0	0.0	0.0	4.7	1.3	6.1
Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.3	0.3
Propane	2.6	0.8	3.4	5.8	0.9	6.7	0.3	0.4	0.6	0.0	0.0	0.0	8.7	2.1	10.8
Other Fuels	1.2	0.1	1.4	5.5	0.9	6.4	0.0	0.0	0.0	0.0	0.0	0.0	6.8	1.0	7.8
No Heating Fuel Used															
All Households	7.0	1.9	8.9	47.1	15.9	63.0	2.9	12.4	15.2	1.4	11.5	12.9	58.3	41.7	100.0

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE A-7

ALL LIHEAP-ELIGIBLE HOUSEHOLDS
REGIONAL / SOUTH

THOUSANDS OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure														All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	142	62	204	2,548	817	3,365	22	468	490	0	523	523	2,712	1,870	4,583
Electricity	194	17	212	908	583	1,491	0	289	289	0	1,039	1,039	1,102	1,928	3,030
Fuel Oil	41	11	52	494	82	576	0	56	56	0	0	0	535	149	684
Kerosene	0	81	81	106	144	249	0	0	0	0	0	0	106	225	330
Propane	228	99	328	637	139	775	0	0	0	0	0	0	865	238	1,103
Other Fuels	31	0	31	484	101	586	0	0	0	0	0	0	515	101	616
No Heating Fuel Used	0	0	0	22	0	22	0	0	0	0	0	0	22	0	22
All Households	637	271	907	5,199	1,866	7,065	22	812	835	0	1,562	1,562	5,858	4,511	10,368

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE A-8

ALL LIHEAP-ELIGIBLE HOUSEHOLDS
REGIONAL / SOUTH

PERCENT OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	1.4	0.6	2.0	24.6	7.9	32.5	0.2	4.5	4.7	0.0	5.0	5.0	26.2	18.0	44.2
Electricity	1.9	0.2	2.0	8.8	5.6	14.4	0.0	2.8	2.8	0.0	10.0	10.0	10.6	18.6	29.2
Fuel Oil	0.4	0.1	0.5	4.8	0.8	5.6	0.0	0.5	0.5	0.0	0.0	0.0	5.2	1.4	6.6
Kerosene	0.0	0.8	0.8	1.0	1.4	2.4	0.0	0.0	0.0	0.0	0.0	0.0	1.0	2.2	3.2
Propane	2.2	1.0	3.2	6.1	1.3	7.5	0.0	0.0	0.0	0.0	0.0	0.0	8.3	2.3	10.6
Other Fuels	0.3	0.0	0.3	4.7	1.0	5.6	0.0	0.0	0.0	0.0	0.0	0.0	5.0	1.0	5.9
No Heating Fuel Used	0.0	0.0	0.0	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2
All Households	6.1	2.6	8.8	50.1	18.0	68.1	0.2	7.8	8.1	0.0	15.1	15.1	56.5	43.5	100.0

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE A-9

ALL LIHEAP-ELIGIBLE HOUSEHOLDS
REGIONAL / WEST

THOUSANDS OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	156	139	295	891	783	1,674	0	399	399	10	904	915	1,058	2,225	3,282
Electricity	46	64	110	301	350	651	30	194	224	16	580	596	393	1,189	1,581
Fuel Oil	0	0	0	15	25	41	0	0	0	0	0	0	15	25	41
Kerosene															
Propane	114	11	125	76	65	141	0	0	0	0	0	0	190	76	266
Other Fuels	72	0	72	278	93	371	0	0	0	0	0	0	350	93	443
No Heating Fuel Used	0	0	0	42	112	155	0	19	19	0	0	0	42	132	174
All Households	388	214	602	1,603	1,429	3,032	30	613	643	26	1,484	1,510	2,048	3,740	5,788

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE A-10

ALL LIHEAP-ELIGIBLE HOUSEHOLDS
REGIONAL / WEST

PERCENT OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	2.7	2.4	5.1	15.4	13.5	28.9	0.0	6.9	6.9	0.2	15.6	15.8	18.3	38.4	56.7
Electricity	0.8	1.1	1.9	5.2	6.0	11.2	0.5	3.4	3.9	0.3	10.0	10.3	6.8	20.5	27.3
Fuel Oil	0.0	0.0	0.0	0.3	0.4	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.7
Kerosene															
Propane	2.0	0.2	2.2	1.3	1.1	2.4	0.0	0.0	0.0	0.0	0.0	0.0	3.3	1.3	4.6
Other Fuels	1.2	0.0	1.2	4.8	1.6	6.4	0.0	0.0	0.0	0.0	0.0	0.0	6.0	1.6	7.6
No Heating Fuel Used	0.0	0.0	0.0	0.7	1.9	2.7	0.0	0.3	0.3	0.0	0.0	0.0	0.7	2.3	3.0
All Households	6.7	3.7	10.4	27.7	24.7	52.4	0.5	10.6	11.1	0.5	25.6	26.1	35.4	64.6	100.0

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE A-11

ALL LIHEAP-ELIGIBLE HOUSEHOLDS
NATIONAL

MEAN RESIDENTIAL ENERGY EXPENDITURES IN CURRENT DOLLARS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	820	772	801	1,126	1,075	1,110	1,264	906	968	506	649	646	1,111	872	984
Electricity	943	536	860	1,113	909	1,034	839	759	764	634	573	574	1,064	697	826
Fuel Oil	1,704	1,392	1,601	1,358	1,430	1,370	1,698	1,143	1,318	1,024	762	774	1,388	1,040	1,246
Kerosene	1,396	890	1,082	1,066	1,381	1,256	1,257	0	1,257	0	364	364	1,206	1,116	1,151
Propane	1,248	1,082	1,210	1,200	973	1,156	1,706	1,673	1,687	0	0	0	1,221	1,049	1,184
Other Fuels	709	938	718	880	964	894	0	0	0	0	0	0	857	964	874
No Heating Fuel Used	0	0	0	1,419	847	1,056	0	1,038	1,038	0	0	0	1,419	875	1,054
All Households	1,027	860	978	1,139	1,059	1,115	1,342	906	983	665	633	634	1,131	854	994

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE A-12

ALL LIHEAP-ELIGIBLE HOUSEHOLDS
NATIONAL

STANDARD DEVIATION OF MEAN EXPENDS. IN CURRENT DOLLARS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	311	337	322	445	424	439	595	423	477	94	305	303	459	424	456
Electricity	552	111	522	399	418	418	88	464	450	130	282	278	431	387	440
Fuel Oil	0	583	365	585	498	572	580	366	514	0	419	413	584	515	583
Kerosene	223	360	399	339	752	640	0	0	0	0	0	0	326	669	562
Propane	569	593	579	476	222	447	0	5	17	0	0	0	509	424	497
Other Fuels	345	0	342	515	423	502	0	0	0	0	0	0	500	417	489
No Heating Fuel Used	0	0	0	583	562	633	0	350	350	0	0	0	583	541	611
All Households	523	452	508	487	460	481	603	441	502	217	318	316	502	447	495

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE A-13

ALL LIHEAP-ELIGIBLE HOUSEHOLDS
REGIONAL / NORTHEAST

MEAN RESIDENTIAL ENERGY EXPENDITURES IN CURRENT DOLLARS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	0	1,212	1,212	1,357	1,309	1,345	1,189	1,193	1,192	0	820	820	1,310	1,066	1,162
Electricity	1,058	0	1,058	1,188	853	1,090	842	1,308	1,239	0	688	688	1,132	884	959
Fuel Oil	0	2,044	2,044	1,552	1,599	1,560	1,698	1,187	1,380	1,024	762	774	1,559	1,006	1,278
Kerosene	1,396	1,143	1,307	0	1,223	1,223	1,257	0	1,257	0	0	0	1,374	1,167	1,292
Propane	2,177	0	2,177	914	0	914	0	0	0	0	0	0	1,789	0	1,789
Other Fuels	0	0	0	1,286	0	1,286	0	0	0	0	0	0	1,286	0	1,286
No Heating Fuel Used															
All Households	1,564	1,282	1,468	1,428	1,361	1,415	1,350	1,202	1,247	1,024	777	782	1,415	1,027	1,201

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE A-14

ALL LIHEAP-ELIGIBLE HOUSEHOLDS
REGIONAL / NORTHEAST

STANDARD DEVIATION OF MEAN EXPENDS. IN CURRENT DOLLARS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	0	0	0	491	401	471	499	446	461	0	369	369	499	454	487
Electricity	0	0	0	275	288	318	0	896	843	0	228	228	264	582	520
Fuel Oil	0	0	0	656	563	643	580	392	533	0	419	413	644	544	657
Kerosene	223	324	290	0	0	0	0	0	0	0	0	0	212	274	259
Propane	296	0	296	0	0	0	0	0	0	0	0	0	632	0	632
Other Fuels	0	0	0	600	0	600	0	0	0	0	0	0	600	0	600
No Heating Fuel Used															
All Households	458	395	458	583	498	567	572	492	522	0	380	377	575	503	570

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE A-15

ALL LIHEAP-ELIGIBLE HOUSEHOLDS
REGIONAL / MIDWEST

MEAN RESIDENTIAL ENERGY EXPENDITURES IN CURRENT DOLLARS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	987	977	984	1,162	1,238	1,186	1,452	899	1,012	534	555	553	1,160	933	1,045
Electricity	1,340	0	1,340	1,211	0	1,211	0	578	578	663	555	590	1,163	567	948
Fuel Oil	0	0	0	1,467	1,363	1,449	0	1,119	1,119	0	0	0	1,467	1,295	1,430
Kerosene	0	0	0	0	0	0	0	0	0	0	364	364	0	364	364
Propane	1,402	1,599	1,449	1,469	1,027	1,407	1,706	1,673	1,687	0	0	0	1,456	1,357	1,436
Other Fuels	760	938	774	971	1,230	1,006	0	0	0	0	0	0	932	1,197	965
No Heating Fuel Used															
All Households	1,150	1,242	1,170	1,211	1,232	1,217	1,474	891	1,001	597	550	555	1,203	943	1,094

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE A-16

ALL LIHEAP-ELIGIBLE HOUSEHOLDS
REGIONAL / MIDWEST

STANDARD DEVIATION OF MEAN EXPENDS. IN CURRENT DOLLARS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	300	131	259	450	400	436	695	368	507	82	228	221	480	441	475
Electricity	476	0	476	414	0	414	0	47	47	141	60	107	449	55	461
Fuel Oil	0	0	0	386	440	398	0	148	148	0	0	0	386	397	395
Kerosene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Propane	642	534	624	584	187	567	0	5	17	0	0	0	596	462	573
Other Fuels	510	0	492	596	522	593	0	0	0	0	0	0	587	500	583
No Heating Fuel Used															
All Households	570	477	552	503	405	480	667	378	503	132	214	207	527	456	515

Source: 1990 Residential Energy Consumption Survey

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TABLE A-17

ALL LIHEAP-ELIGIBLE HOUSEHOLDS
REGIONAL / SOUTH

MEAN RESIDENTIAL ENERGY EXPENDITURES IN CURRENT DOLLARS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	880	622	802	1,121	928	1,074	737	754	754	0	747	747	1,105	824	990
Electricity	890	365	847	1,165	969	1,088	0	726	726	0	609	609	1,116	733	873
Fuel Oil	1,704	871	1,526	997	1,170	1,021	0	955	955	0	0	0	1,051	1,067	1,054
Kerosene	0	764	764	1,066	1,399	1,258	0	0	0	0	0	0	1,066	1,170	1,137
Propane	1,199	726	1,056	1,074	969	1,055	0	0	0	0	0	0	1,107	867	1,055
Other Fuels	589	0	589	771	774	772	0	0	0	0	0	0	761	774	763
No Heating Fuel Used	0	0	0	969	0	979	0	0	0	0	0	0	979	0	979
All Households	1,037	697	935	1,077	983	1,052	737	758	757	0	655	655	1,071	812	958

Source: 1990 Residential Energy Consumption Survey

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ALL LIHEAP-ELIGIBLE HOUSEHOLDS
REGIONAL / SOUTH

STANDARD DEVIATION OF MEAN EXPENDS. IN CURRENT DOLLARS

Primary Heating Fuel	Housing Type and Tenure														All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	202	219	239	417	368	414	184	303	299	0	255	255	412	333	406
Electricity	543	0	540	382	347	381	0	287	387	0	310	310	428	356	426
Fuel Oil	0	0	342	335	331	340	0	214	214	0	0	0	372	302	358
Kerosene	0	307	307	339	793	662	0	0	0	0	0	0	339	727	631
Propane	437	314	458	353	247	339	0	0	0	0	0	0	381	302	378
Other Fuels	47	0	47	387	296	288	0	0	0	0	0	0	281	296	284
No Heating Fuel Used	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All Households	477	294	458	398	421	406	184	297	295	0	300	300	407	384	418

Source: 1990 Residential Energy Consumption Survey

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TABLE A-19

ALL LIHEAP-ELIGIBLE HOUSEHOLDS
REGIONAL / WEST

MEAN RESIDENTIAL ENERGY EXPENDITURES IN CURRENT DOLLARS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	616	693	652	884	984	931	0	606	606	384	547	545	840	720	759
Electricity	594	581	587	854	817	834	837	640	666	554	472	475	810	607	658
Fuel Oil	0	0	0	634	1,397	1,111	0	0	0	0	0	0	634	1,397	1,111
Kerosene															
Propane	828	1,807	915	989	933	963	0	0	0	0	0	0	893	1,060	940
Other Fuels	704	0	704	796	1,012	850	0	0	0	0	0	0	777	1,012	826
No Heating Fuel Used	0	0	0	1,652	847	1,067	0	1,038	1,038	0	0	0	1,652	875	1,064
All Households	692	717	701	886	939	911	837	630	640	487	518	517	844	708	756

Source: 1990 Residential Energy Consumption Survey

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TABLE A-20

ALL LIHEAP-ELIGIBLE HOUSEHOLDS
REGIONAL / WEST

STANDARD DEVIATION OF MEAN EXPENDS. IN CURRENT DOLLARS

Primary Heating Fuel	Housing Type and Tenure														All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	291	377	336	347	424	388	0	249	249	0	262	261	353	388	381
Electricity	474	77	312	364	512	450	108	266	260	0	231	228	372	370	381
Fuel Oil	0	0	0	0	0	369	0	0	0	0	0	0	0	0	369
Kerosene															
Propane	215	0	345	116	184	154	0	0	0	0	0	0	198	351	263
Other Fuels	43	0	43	576	371	541	0	0	0	0	0	0	515	371	498
No Heating Fuel Used	0	0	0	603	562	677	0	350	350	0	0	0	603	541	649
All Households	289	401	334	422	456	439	108	269	267	83	253	251	403	402	408

Source: 1990 Residential Energy Consumption Survey

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TABLE A-21

ALL LIHEAP-ELIGIBLE HOUSEHOLDS
NATIONAL

MEAN ANNUAL CASH INCOME

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	9,559	8,788	9,258	10,998	11,165	11,050	10,605	8,374	8,763	9,380	8,951	8,959	10,867	9,541	10,162
Electricity	10,613	6,327	9,744	11,742	9,580	10,902	7,541	10,065	9,903	7,444	7,116	7,126	11,331	8,304	9,368
Fuel Oil	8,250	10,751	9,071	11,445	12,842	11,677	10,916	8,727	9,419	4,500	6,626	6,526	11,219	8,811	10,234
Kerosene	11,656	4,908	7,468	11,244	10,696	10,913	11,750	0	11,750	0	1,500	1,500	11,437	7,760	9,195
Propane	11,175	6,339	10,061	9,024	7,770	8,781	11,750	12,536	12,208	0	0	0	9,758	7,496	9,275
Other Fuels	9,159	3,500	8,946	12,031	10,494	11,771	0	0	0	0	0	0	11,659	10,299	11,449
No Heating Fuel Used	0	0	0	22,803	13,904	17,157	0	9,724	9,724	0	0	0	22,803	13,293	16,429
All Households	10,339	7,199	9,409	11,149	10,779	11,041	10,521	8,795	9,099	7,581	7,978	7,967	10,989	9,095	10,048

Source: 1990 Residential Energy Consumption Survey

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TABLE A-22

ALL LIHEAP-ELIGIBLE HOUSEHOLDS
NATIONAL

MEAN ENERGY BURDEN - EXPENDITURES AS % OF INCOME

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	10.4	13.2	11.5	13.5	15.1	14.0	15.2	17.0	16.7	5.8	11.7	11.6	13.3	14.4	13.9
Electricity	8.7	8.5	8.7	12.7	16.5	14.2	12.5	12.8	12.8	8.4	12.9	12.8	11.9	13.8	13.1
Fuel Oil	20.7	13.7	18.4	16.3	12.7	15.7	18.9	28.6	25.5	22.8	21.9	21.9	16.7	21.2	18.5
Kerosene	27.7	32.1	30.4	10.6	17.3	14.6	10.7	0.0	10.7	0.0	24.3	24.3	17.2	23.7	21.2
Propane	13.4	20.2	14.9	19.2	22.8	19.9	14.5	13.5	13.9	0.0	0.0	0.0	17.3	21.4	18.1
Other Fuels	8.8	26.8	9.5	9.4	10.4	9.6	0.0	0.0	0.0	0.0	0.0	0.0	9.4	10.9	9.6
No Heating Fuel Used	0.0	0.0	0.0	6.7	6.7	6.7	0.0	11.4	11.4	0.0	0.0	0.0	6.7	7.4	7.2
All Households	12.0	17.9	13.7	13.8	15.3	14.2	15.7	17.3	17.0	10.4	13.4	13.3	13.7	15.2	14.4

Source: 1990 Residential Energy Consumption Survey

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TABLE A-23

ALL LIHEAP-ELIGIBLE HOUSEHOLDS BY PROGRAM PARTICIPATION NATIONAL

THOUSANDS OF HOUSEHOLDS

	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
All LIHEAP-Eligible Households	1,602	674	2,277	11,589	4,767	16,355	694	3,244	3,938	144	5,168	5,313	14,029	13,854	27,883
AFDC Recipients	145	179	324	486	902	1,388	0	819	819	0	779	779	631	2,679	3,310
SSI Recipients	133	93	226	899	331	1,230	11	289	300	0	580	580	1,043	1,293	2,336
Heating Assistance Recipients	329	150	479	1,433	939	2,372	39	457	496	0	477	477	1,801	2,023	3,824
Food Stamps Recipients	279	262	541	1,227	1,571	2,798	11	944	955	18	1,274	1,293	1,534	4,051	5,586
Unemployment Compensation Recipients	132	9	141	500	130	630	84	83	166	16	134	150	731	356	1,087
Subsidized Housing Recipients	0	92	92	0	338	338	0	434	434	0	590	590	0	1,453	1,453

Source: 1990 Residential Energy Consumption Survey

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ALL LIHEAP-ELIGIBLE HOUSEHOLDS BY PROGRAM PARTICIPATION NATIONAL

PERCENT OF HOUSEHOLDS

	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
All LIHEAP-Eligible Households	5.7	2.4	8.2	41.6	17.1	58.7	2.5	11.6	14.1	0.5	18.5	19.1	50.3	49.7	100.0
AFDC Recipients	0.5	0.6	1.2	1.7	3.2	5.0	0.0	2.9	2.9	0.0	2.8	2.8	2.3	9.6	11.9
SSI Recipients	0.5	0.3	0.8	3.2	1.2	4.4	0.0	1.0	1.1	0.0	2.1	2.1	3.7	4.6	8.4
Heating Assistance Recipients	1.2	0.5	1.7	5.1	3.4	8.5	0.1	1.6	1.8	0.0	1.7	1.7	6.5	7.3	13.7
Food Stamps Recipients	1.0	0.9	1.9	4.4	5.6	10.0	0.0	3.4	3.4	0.1	4.6	4.6	5.5	14.5	20.0
Unemployment Compensation Recipients	0.5	0.0	0.5	1.8	0.5	2.3	0.3	0.3	0.6	0.1	0.5	0.5	2.6	1.3	3.9
Subsidized Housing Recipients	0.0	0.3	0.3	0.0	1.2	1.2	0.0	1.6	1.6	0.0	2.1	2.1	0.0	5.2	5.2

Source: 1990 Residential Energy Consumption Survey

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TABLE A-25

ALL LIHEAP-ELIGIBLE HOUSEHOLDS BY PROGRAM PARTICIPATION NATIONAL

MEAN RESIDENTIAL ENERGY EXPENDITURES IN CURRENT DOLLARS

	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
All LIHEAP-Eligible Households	1,027	860	978	1,139	1,059	1,115	1,342	906	983	665	633	634	1,131	854	994
AFDC Recipients	1,045	1,043	1,044	1,239	1,130	1,168	0	1,014	1,014	0	723	723	1,194	971	1,013
SSI Recipients	832	918	867	992	817	945	553	883	871	0	556	556	967	722	831
Heating Assistance Recipients	987	986	987	963	1,105	1,019	2,330	1,044	1,146	0	769	769	997	1,003	1,000
Food Stamps Recipients	1,054	1,077	1,065	1,086	1,038	1,059	553	978	973	553	714	712	1,070	924	964
Unemployment Compensation Recipients	1,105	404	1,058	1,174	1,086	1,156	1,652	1,295	1,474	554	623	616	1,203	942	1,118
Subsidized Housing Recipients	0	986	986	0	1,032	1,032	0	1,079	1,079	0	752	752	0	929	929

Source: 1990 Residential Energy Consumption Survey

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TABLE A-26

ALL LIHEAP-ELIGIBLE HOUSEHOLDS BY PROGRAM PARTICIPATION NATIONAL

MEAN ENERGY BURDEN - EXPENDITURES AS % OF INCOME

	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
All LIHEAP-Eligible Households	12	18	14	14	15	14	16	17	17	10	13	13	14	15	14
AFDC Recipients	26	20	22	16	26	22	0	23	23	0	18	18	18	22	22
SSI Recipients	15	15	15	16	17	17	37	16	17	0	13	13	16	15	16
Heating Assistance Recipients	16	23	18	17	23	19	22	17	17	0	20	20	17	21	19
Food Stamps Recipients	17	21	19	18	22	20	37	24	24	5	18	18	18	21	20
Unemployment Compensation Recipients	8	4	8	11	7	10	16	10	13	8	13	13	11	10	11
Subsidized Housing Recipients	0	19	19	0	23	23	0	20	20	0	16	16	0	19	19

Source: 1990 Residential Energy Consumption Survey

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TABLE A-27

ALL LIHEAP-ELIGIBLE HOUSEHOLDS BY DEMOGRAPHIC CHARACTERISTICS NATIONAL

THOUSANDS OF HOUSEHOLDS

	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
All LIHEAP-Eligible Households	1,602	674	2,277	11,589	4,767	16,355	694	3,244	3,938	144	5,168	5,313	14,029	13,854	27,883
Households with Elderly Members	528	52	580	7,536	1,013	8,549	444	746	1,189	68	1,798	1,866	8,576	3,608	12,184
Households with Children	812	449	1,260	3,708	3,229	6,938	114	1,806	1,920	36	1,805	1,841	4,670	7,289	11,959
Single-Parent Households	255	173	429	1,480	1,301	2,781	30	1,115	1,145	36	1,148	1,184	1,802	3,737	5,539
African-American Households	127	119	247	1,407	1,044	2,451	179	922	1,101	30	1,319	1,348	1,744	3,404	5,148
Hispanic Households	27	114	141	847	727	1,574	62	379	441	0	659	659	935	1,879	2,814
White Households	1,444	526	1,970	9,953	3,413	13,367	514	2,144	2,658	115	3,631	3,746	12,026	9,714	21,741

Source: 1990 Residential Energy Consumption Survey

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TABLE A-28

ALL LIHEAP-ELIGIBLE HOUSEHOLDS BY DEMOGRAPHIC CHARACTERISTICS NATIONAL

PERCENT OF HOUSEHOLDS

	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
All LIHEAP-Eligible Households	5.7	2.4	8.2	41.6	17.1	58.7	2.5	11.6	14.1	0.5	18.5	19.1	50.3	49.7	100.0
Households with Elderly Members	1.9	0.2	2.1	27.0	3.6	30.7	1.6	2.7	4.3	0.2	6.4	6.7	30.8	12.9	43.7
Households with Children	2.9	1.6	4.5	13.3	11.6	24.9	0.4	6.5	6.9	0.1	6.5	6.6	16.7	26.1	42.9
Single-Parent Households	0.9	0.6	1.5	5.3	4.7	10.0	0.1	4.0	4.1	0.1	4.1	4.2	6.5	13.4	19.9
African-American Households	0.5	0.4	0.9	5.0	3.7	8.8	0.6	3.3	3.9	0.1	4.7	4.8	6.3	12.2	18.5
Hispanic Households	0.1	0.4	0.5	3.0	2.6	5.6	0.2	1.4	1.6	0.0	2.4	2.4	3.4	6.7	10.1
White Households	5.2	1.7	7.1	35.7	12.2	47.9	1.8	7.7	9.5	0.4	13.0	13.4	43.1	34.8	78.0

Source: 1990 Residential Energy Consumption Survey

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TABLE A-29

ALL LIHEAP-ELIGIBLE HOUSEHOLDS BY DEMOGRAPHIC CHARACTERISTICS NATIONAL

MEAN RESIDENTIAL ENERGY EXPENDITURES IN CURRENT DOLLARS

	Housing Type and Tenure													
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
All LIHEAP-Eligible Households	1,027	860	978	1,139	1,059	1,115	1,342	906	983	665	633	634	1,131	854	994
Households with Elderly Members	923	463	882	1,110	941	1,090	1,207	791	946	639	552	555	1,099	709	984
Households with Children	1,300	935	1,170	1,289	1,129	1,215	1,545	1,022	1,053	501	778	772	1,291	1,003	1,116
Single-Parent Households	1,224	844	1,070	1,257	1,158	1,211	1,825	1,038	1,059	501	749	742	1,247	982	1,068
African-American Households	1,179	1,071	1,127	1,247	1,244	1,246	1,767	1,066	1,181	1,024	714	721	1,292	985	1,089
Hispanic Households	816	643	676	951	946	949	1,775	859	987	0	678	678	1,002	816	878
White Households	1,021	832	971	1,128	1,009	1,097	1,193	841	909	572	614	613	1,112	815	979

Source: 1990 Residential Energy Consumption Survey

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TABLE A-30

ALL LIHEAP-ELIGIBLE HOUSEHOLDS BY DEMOGRAPHIC CHARACTERISTICS NATIONAL

MEAN ENERGY BURDEN - EXPENDITURES AS % OF INCOME

	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
All LIHEAP-Eligible Households	12	18	14	14	15	14	16	17	17	10	13	13	14	15	14
Households with Elderly Members	11	8	11	15	15	15	15	12	13	9	9	9	15	12	14
Households with Children	13	18	15	10	14	12	11	20	19	4	15	15	11	16	14
Single-Parent Households	17	19	18	14	20	16	30	22	22	4	19	19	14	20	18
African-American Households	14	35	24	15	20	17	23	25	25	23	16	16	16	20	19
Hispanic Households	5	12	11	12	11	12	13	18	18	0	15	15	12	14	13
White Households	12	15	13	14	15	14	13	14	14	7	13	13	13	14	14

Source: 1990 Residential Energy Consumption Survey

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TABLE B-1

ALL LIHEAP-ELIGIBLE, HIGH-EXPENDITURE HOUSEHOLDS NATIONAL

THOUSANDS OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	94	129	223	668	592	1,260	133	476	609	0	258	258	895	1,455	2,350
Electricity	84	54	138	220	245	465	10	168	178	0	152	152	314	619	933
Fuel Oil	41	9	50	201	62	262	10	143	153	0	97	97	251	311	562
Kerosene	49	41	90	58	91	149	0	0	0	0	0	0	107	132	239
Propane	338	89	427	363	59	422	0	17	17	0	0	0	701	165	866
Other Fuels	31	0	31	0	0	0	0	0	0	0	0	0	31	0	31
No Heating Fuel Used															
All Households	637	321	958	1,510	1,049	2,559	152	804	956	0	507	507	2,299	2,681	4,980

Source: 1990 Residential Energy Consumption Survey

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TABLE B-2

ALL LIHEAP-ELIGIBLE, HIGH-EXPENDITURE HOUSEHOLDS

NATIONAL

PERCENT OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	1.9	2.6	4.5	13.4	11.9	25.3	2.7	9.6	12.2	0.0	5.2	5.2	18.0	29.2	47.2
Electricity	1.7	1.1	2.8	4.4	4.9	9.3	0.2	3.4	3.6	0.0	3.0	3.0	6.3	12.4	18.7
Fuel Oil	0.8	0.2	1.0	4.0	1.2	5.3	0.2	2.9	3.1	0.0	2.0	2.0	5.0	6.2	11.3
Kerosene	1.0	0.8	1.8	1.2	1.8	3.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	2.7	4.8
Propane	6.8	1.8	8.6	7.3	1.2	8.5	0.0	0.3	0.3	0.0	0.0	0.0	14.1	3.3	17.4
Other Fuels	0.6	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.6
No Heating Fuel Used															
All Households	12.8	6.5	19.2	30.3	21.1	51.4	3.1	16.1	19.2	0.0	10.2	10.2	46.2	53.8	100.0

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE B-3

ALL LIHEAP-ELIGIBLE, HIGH-EXPENDITURE HOUSEHOLDS
REGIONAL / NORTHEAST

THOUSANDS OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	0	17	17	79	22	101	56	119	175	0	89	89	135	247	382
Electricity	0	0	0	0	15	15	0	61	61	0	47	47	0	123	123
Fuel Oil	0	9	9	79	22	101	10	82	92	0	97	97	89	210	299
Kerosene	49	23	71	0	0	0	0	0	0	0	0	0	49	23	71
Propane	35	0	35	0	0	0	0	0	0	0	0	0	35	0	35
Other Fuels															
No Heating Fuel Used															
All Households	84	48	132	158	59	217	66	263	328	0	234	234	308	603	911

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE B-4

ALL LIHEAP-ELIGIBLE, HIGH-EXPENDITURE HOUSEHOLDS
REGIONAL / NORTHEAST

PERCENT OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure														All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	0.0	1.8	1.8	8.6	2.4	11.1	6.2	13.1	19.2	0.0	9.8	9.8	14.8	27.1	41.9
Electricity	0.0	0.0	0.0	0.0	1.6	1.6	0.0	6.7	6.7	0.0	5.2	5.2	0.0	13.5	13.5
Fuel Oil	0.0	1.0	1.0	8.7	2.4	11.1	1.1	9.0	10.0	0.0	10.7	10.7	9.8	23.1	32.8
Kerosene	5.3	2.5	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3	2.5	7.8
Propane	3.9	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	0.0	3.9
Other Fuels															
No Heating Fuel Used															
All Households	9.2	5.3	14.5	17.4	6.4	23.8	7.2	28.8	36.0	0.0	25.6	25.6	33.8	66.2	100.0

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE B-5

ALL LIHEAP-ELIGIBLE, HIGH-EXPENDITURE HOUSEHOLDS
REGIONAL / MIDWEST

THOUSANDS OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	21	63	84	138	188	327	54	239	294	0	104	104	213	595	808
Electricity	52	0	52	60	0	60	0	19	19	0	28	28	112	47	160
Fuel Oil	0	0	0	84	40	124	0	24	24	0	0	0	84	64	148
Kerosene															
Propane	103	53	156	147	24	170	0	17	17	0	0	0	250	93	343
Other Fuels	31	0	31	0	0	0	0	0	0	0	0	0	31	0	31
No Heating Fuel Used															
All Households	207	116	323	429	252	681	54	299	353	0	133	133	691	800	1,490

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE B-6

ALL LIHEAP-ELIGIBLE, HIGH-EXPENDITURE HOUSEHOLDS
REGIONAL / MIDWEST

PERCENT OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	1.4	4.2	5.6	9.3	12.6	21.9	3.6	16.1	19.7	0.0	7.0	7.0	14.3	39.9	54.3
Electricity	3.5	0.0	3.5	4.0	0.0	4.0	0.0	1.3	1.3	0.0	1.9	1.9	7.5	3.2	10.7
Fuel Oil	0	0	0	5.6	2.7	8.3	0.0	1.6	1.6	0.0	0.0	0.0	5.6	4.9	9.9
Kerosene															
Propane	6.9	3.6	10.5	9.9	1.6	11.4	0.0	1.1	1.1	0.0	0.0	0.0	16.8	6.3	23.0
Other Fuels	2.1	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0	2.1
No Heating Fuel Used															
All Households	13.9	7.8	21.7	28.8	16.9	45.7	3.6	20.0	23.7	0.0	8.9	8.9	46.3	53.7	100.0

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE B-7

ALL LIHEAP-ELIGIBLE, HIGH-EXPENDITURE HOUSEHOLDS
REGIONAL / SOUTH

THOUSANDS OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure														All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	23	22	45	358	158	516	22	54	76	0	20	20	403	253	656
Electricity	22	0	22	120	94	214	0	42	42	0	20	20	142	156	298
Fuel Oil	41	0	41	37	0	37	0	37	37	0	0	0	78	37	115
Kerosene	0	19	19	58	91	149	0	0	0	0	0	0	58	109	167
Propane	110	24	134	197	36	232	0	0	0	0	0	0	307	60	367
Other Fuels															
No Heating Fuel Used															
All Households	195	65	260	771	378	1,149	22	133	156	0	39	39	988	615	1,604

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE B-8

ALL LIHEAP-ELIGIBLE, HIGH-EXPENDITURE HOUSEHOLDS
REGIONAL / SOUTH

PERCENT OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	1.4	1.4	2.8	22.3	9.8	32.2	1.4	3.4	4.7	0.0	1.2	1.2	25.2	15.8	40.9
Electricity	1.3	0.0	1.3	7.5	5.9	13.4	0.0	2.6	2.6	0.0	1.2	1.2	8.9	9.7	18.6
Fuel Oil	2.6	0.0	2.6	2.3	0.0	2.3	0.0	2.3	2.3	0.0	0.0	0.0	4.9	2.3	7.2
Kerosene	0.0	1.2	1.2	3.6	5.6	9.3	0.0	0.0	0.0	0.0	0.0	0.0	3.6	6.8	10.4
Propane	6.9	1.5	8.4	12.3	2.2	14.5	0.0	0.0	0.0	0.0	0.0	0.0	19.1	3.8	22.9
Other Fuels															
No Heating Fuel Used															
All Households	12.2	4.0	16.2	48.1	23.6	71.6	1.4	8.3	9.7	0.0	2.5	2.5	61.6	38.4	100.0

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE B-9

ALL LIHEAP-ELIGIBLE, HIGH-EXPENDITURE HOUSEHOLDS
REGIONAL / WEST

THOUSANDS OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
Natural Gas	51	27	78	92	224	317	0	64	64	0	45	45	143	360	503
Electricity	10	54	64	40	137	176	10	45	55	0	57	57	60	292	352
Fuel Oil															
Kerosene															
Propane	89	11	101	19	0	19	0	0	0	0	0	0	109	11	120
Other Fuels															
No Heating Fuel Used															
All Households	151	92	242	151	361	512	10	109	119	0	101	101	312	663	975

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE B-10

ALL LIHEAP-ELIGIBLE, HIGH-EXPENDITURE HOUSEHOLDS
REGIONAL / WEST

PERCENT OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
Natural Gas	5.2	2.8	8.0	9.5	23.0	32.5	0.0	6.5	6.5	0.0	4.6	4.6	14.7	36.9	51.6
Electricity	1.1	5.5	6.6	4.1	14.0	18.1	1.0	4.6	5.7	0.0	5.8	5.8	6.2	30.0	36.1
Fuel Oil															
Kerosene															
Propane	9.2	1.1	10.3	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	11.2	1.1	12.3
Other Fuels															
No Heating Fuel Used															
All Households	15.4	9.4	24.9	15.5	37.0	52.5	1.0	11.2	12.2	0.0	10.4	10.4	32.0	68.0	100.0

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE B-11

ALL LIHEAP-ELIGIBLE, HIGH-EXPENDITURE HOUSEHOLDS NATIONAL

MEAN RESIDENTIAL ENERGY EXPENDITURES IN CURRENT DOLLARS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	703	978	862	1,195	1,266	1,228	1,844	1,142	1,295	0	722	722	1,239	1,104	1,155
Electricity	1,172	555	931	1,277	1,057	1,161	989	1,138	1,129	0	868	868	1,239	989	1,073
Fuel Oil	1,704	2,044	1,765	1,897	1,716	1,855	1,997	1,196	1,247	0	1,192	1,192	1,870	1,323	1,567
Kerosene	1,480	1,157	1,332	1,257	1,665	1,506	0	0	0	0	0	0	1,358	1,506	1,440
Propane	1,335	1,449	1,359	1,357	1,056	1,314	0	1,670	1,670	0	0	0	1,346	1,329	1,343
Other Fuels	1,237	0	1,237	0	0	0	0	0	0	0	0	0	1,237	0	1,237
No Heating Fuel Used															
All Households	1,250	1,090	1,196	1,341	1,266	1,311	1,797	1,162	1,263	0	856	856	1,346	1,136	1,233

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE B-12

ALL LIHEAP-ELIGIBLE, HIGH-EXPENDITURE HOUSEHOLDS NATIONAL

MEAN ANNUAL CASH INCOME

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	5,794	8,527	7,373	8,250	12,918	10,444	9,069	8,695	8,777	0	6,621	6,621	8,114	10,031	9,301
Electricity	10,999	6,750	9,340	7,372	6,315	6,815	4,500	8,667	8,430	0	9,072	9,072	8,249	7,667	7,863
Fuel Oil	8,250	9,500	8,473	13,081	11,791	12,776	5,500	10,382	10,075	0	4,525	4,525	12,003	8,807	10,235
Kerosene	10,224	6,445	8,486	12,141	11,104	11,510	0	0	0	0	0	0	11,268	9,642	10,370
Propane	11,773	6,123	10,600	8,858	9,515	8,951	0	11,750	11,750	0	0	0	10,264	7,913	9,817
Other Fuels	5,500	0	5,500	0	0	0	0	0	0	0	0	0	5,500	0	5,500
No Heating Fuel Used															
All Households	10,138	7,325	9,195	9,060	10,959	9,838	8,542	9,052	8,971	0	6,953	6,953	9,324	9,195	9,254

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE B-13

ALL LIHEAP-ELIGIBLE, HIGH-EXPENDITURE HOUSEHOLDS NATIONAL

MEAN ENERGY BURDEN - EXPENDITURES AS % OF INCOME

Primary Heating Fuel	Housing Type and Tenure														All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	15.4	16.5	16.0	18.4	14.8	16.7	25.0	17.2	18.9	0	14.4	14.4	19.1	15.7	17.0
Electricity	10.6	8.2	9.7	21.3	29.7	25.7	22.0	26.1	25.8	0.0	10.9	10.9	18.4	22.2	21.0
Fuel Oil	20.7	21.5	20.8	17.6	14.8	16.9	36.3	25.2	25.9	0.0	60.8	60.8	18.8	34.2	27.3
Kerosene	37.7	33.4	35.7	10.1	23.0	17.9	0.0	0.0	0.0	0.0	0.0	0.0	22.7	26.3	24.6
Propane	12.8	26.9	15.7	18.2	13.0	17.5	0.0	14.2	14.2	0.0	0.0	0.0	15.6	20.6	16.5
Other Fuels	22.5	0.0	22.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.5	0.0	22.5
No Heating Fuel Used															
All Households	15.7	20.3	17.3	18.4	18.9	18.6	25.5	20.4	21.2	0.0	22.3	22.3	18.1	20.2	19.2

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE B-14

ALL LIHEAP-ELIGIBLE, HIGH-EXPENDITURE HOUSEHOLDS BY PROGRAM PARTICIPATION NATIONAL

THOUSANDS OF HOUSEHOLDS

	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
All LIHEAP-High Expend. Households	637	321	958	1,510	1,049	2,559	152	804	956	0	507	507	2,299	2,681	4,980
AFDC Recipients	98	90	189	63	222	285	0	187	187	0	59	59	161	558	719
SSI Recipients	46	69	115	236	51	287	11	48	59	0	98	98	293	266	559
Heating Assistance Recipients	123	104	228	133	245	378	29	131	161	0	19	19	286	500	785
Food Stamps Recipients	164	141	305	266	330	596	11	225	236	0	193	193	441	890	1,331
Unemployment Compensation Recipients	36	0	36	53	49	102	29	44	73	0	22	22	118	115	233
Subsidized Housing Recipients	0	47	47	0	64	64	0	111	111	0	36	36	0	257	257

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE B-15

ALL LIHEAP-ELIGIBLE, HIGH-EXPENDITURE HOUSEHOLDS BY PROGRAM PARTICIPATION NATIONAL

PERCENT OF HOUSEHOLDS

	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
All LIHEAP-High Expend. Households	8.3	8.3	16.7	16.7	25.0	41.7	8.3	16.7	25.0	0.0	16.7	16.7	33.3	66.7	100.0
AFDC Recipients	12.5	12.5	25.0	12.5	25.0	37.5	0.0	25.0	25.0	0.0	12.5	12.5	25.0	75.0	100.0
SSI Recipients	12.5	12.5	25.0	12.5	12.5	25.0	12.5	12.5	25.0	0.0	25.0	25.0	37.5	62.5	100.0
Heating Assistance Recipients	10.0	10.0	20.0	10.0	30.0	40.0	10.0	20.0	30.0	0.0	10.0	10.0	30.0	70.0	100.0
Food Stamps Recipients	9.1	9.1	18.2	9.1	27.3	36.4	9.1	18.2	27.3	0.0	18.2	18.2	27.3	72.7	100.0
Unemployment Compensation Recipients	16.7	0.0	16.7	16.7	16.7	33.3	16.7	16.7	33.3	0.0	16.7	16.7	50.0	50.0	100.0
Subsidized Housing Recipients	0.0	14.3	14.3	0.0	42.9	42.9	0.0	28.6	28.6	0.0	14.3	14.3	0.0	100.0	100.0

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE B-16

ALL LIHEAP-ELIGIBLE, HIGH-EXPENDITURE HOUSEHOLDS BY PROGRAM PARTICIPATION NATIONAL

MEAN RESIDENTIAL ENERGY EXPENDITURES IN CURRENT DOLLARS

	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
All LIHEAP-High Expend. Households	1,250	1,090	1,196	1,341	1,266	1,311	1,797	1,162	1,263	0	856	856	1,346	1,136	1,233
AFDC Recipients	1,101	1,235	1,165	1,407	1,415	1,413	0	1,218	1,218	0	696	696	1,220	1,244	1,239
SSI Recipients	1,080	1,053	1,064	1,061	999	1,050	553	837	784	0	981	981	1,045	977	1,013
Heating Assistance Recipients	1,256	974	1,127	1,453	1,264	1,330	2,437	1,113	1,355	0	907	907	1,469	1,150	1,266
Food Stamps Recipients	1,316	1,303	1,310	1,304	1,295	1,299	553	1,200	1,169	0	865	865	1,289	1,179	1,216
Unemployment Compensation Recipients	1,424	0	1,424	1,303	1,429	1,363	2,437	1,154	1,666	0	1,149	1,149	1,621	1,270	1,448
Subsidized Housing Recipients	0	1,168	1,168	0	922	922	0	1,110	1,110	0	935	935	0	1,050	1,050

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE B-17

ALL LIHEAP-ELIGIBLE, HIGH-EXPENDITURE HOUSEHOLDS BY PROGRAM PARTICIPATION NATIONAL

MEAN ENERGY BURDEN - EXPENDITURES AS % OF INCOME

	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
All LIHEAP-High Expend. Households	16	20	17	18	19	19	25	20	21	0	22	22	18	20	19
AFDC Recipients	31	18	25	16	25	23	0	39	39	0	11	11	25	27	27
SSI Recipients	18	16	17	18	17	18	37	18	22	0	26	26	19	20	19
Heating Assistance Recipients	27	23	25	29	22	24	26	21	22	0	60	60	28	23	25
Food Stamps Recipients	22	21	22	20	23	22	37	35	36	0	30	30	21	27	25
Unemployment Compensation Recipients	11	0	11	8	8	8	26	10	16	0	49	49	13	17	15
Subsidized Housing Recipients	0	21	21	0	19	19	0	18	18	0	8	8	0	17	17

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE B-18

ALL LIHEAP-ELIGIBLE, HIGH-EXPENDITURE HOUSEHOLDS BY DEMOGRAPHIC CHARACTERISTICS NATIONAL

THOUSANDS OF HOUSEHOLDS

	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
All LIHEAP-High Expend. Households	637	321	958	1,510	1,049	2,559	152	804	956	0	507	507	2,299	2,681	4,980
Households with Elderly Members	287	40	327	1,177	241	1,419	67	154	221	0	248	248	1,531	684	2,216
Households with Children	354	207	561	354	681	1,035	17	349	366	0	116	116	725	1,353	2,078
Single-Parent Households	124	87	211	129	375	504	0	205	205	0	88	88	254	755	1,009
African-American Households	86	60	146	364	381	745	68	239	306	0	162	162	517	842	1,359
Hispanic Households	10	28	38	161	185	347	0	75	75	0	38	38	171	326	497
White Households	551	261	812	1,110	627	1,738	85	530	615	0	345	345	1,746	1,746	3,510

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE B-19

ALL LIHEAP-ELIGIBLE, HIGH-EXPENDITURE HOUSEHOLDS BY DEMOGRAPHIC CHARACTERISTICS NATIONAL

PERCENT OF HOUSEHOLDS

	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
All LIHEAP-High Expend. Households	8.3	8.3	16.7	16.7	25.0	41.7	8.3	16.7	25.0	0.0	16.7	16.7	33.3	66.7	100.0
Households with Elderly Members	9.1	9.1	18.2	18.2	27.3	45.5	9.1	18.2	0.0	0.0	18.2	18.2	36.4	63.6	100.0
Households with Children	10.0	10.0	20.0	10.0	30.0	40.0	10.0	20.0	30.0	0.0	10.0	10.0	30.0	70.0	100.0
Single-Parent Households	12.5	12.5	25.0	12.5	37.5	50.0	0.0	12.5	12.5	0.0	12.5	12.5	25.0	75.0	100.0
African-American Households	10.0	10.0	20.0	10.0	20.0	30.0	10.0	20.0	30.0	0.0	20.0	20.0	30.0	70.0	100.0
Hispanic Households	12.5	12.5	25.0	25.0	25.0	50.0	0.0	12.5	12.5	0.0	12.5	12.5	37.5	62.5	100.0
White Households	9.1	9.1	18.2	18.2	27.3	45.5	9.1	18.2	27.3	0.0	9.1	9.1	36.4	63.6	100.0

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE B-20

ALL LIHEAP-ELIGIBLE, HIGH-EXPENDITURE HOUSEHOLDS BY DEMOGRAPHIC CHARACTERISTICS NATIONAL

MEAN RESIDENTIAL ENERGY EXPENDITURES IN CURRENT DOLLARS

	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
All LIHEAP-High Expend. Households	1,250	1,090	1,196	1,341	1,266	1,311	1,797	1,162	1,263	0	856	856	1,346	1,136	1,233
Households with Elderly Members	1,034	457	963	1,290	1,042	1,248	1,506	866	1,059	0	881	881	1,252	910	1,146
Households with Children	1,569	1,235	1,445	1,560	1,362	1,429	2,121	1,348	1,383	0	1,026	1,026	1,577	1,310	1,403
Single-Parent Households	1,377	900	1,181	1,466	1,313	1,352	0	1,239	1,239	0	1,008	1,008	1,422	1,210	1,263
African-American Households	1,473	1,127	1,330	1,339	1,422	1,382	2,046	1,329	1,487	0	835	835	1,454	1,262	1,335
Hispanic Households	1,212	534	708	1,145	1,136	1,140	0	1,599	1,599	0	1,592	1,592	1,149	1,244	1,211
White Households	1,216	1,081	1,172	1,352	1,120	1,268	1,599	1,098	1,167	0	865	865	1,321	1,058	1,189

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE B-21

ALL LIHEAP-ELIGIBLE, HIGH-EXPENDITURE HOUSEHOLDS BY DEMOGRAPHIC CHARACTERISTICS NATIONAL

MEAN ENERGY BURDEN - EXPENDITURES AS % OF INCOME

	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
All LIHEAP-High Expend. Households	16	20	17	18	19	19	25	20	21	0	22	22	18	20	19
Households with Elderly Members	13	9	12	19	15	18	31	13	18	0	18	18	18	15	17
Households with Children	18	21	19	14	17	16	11	25	25	0	41	41	16	22	20
Single-Parent Households	23	25	24	17	22	21	0	31	31	0	39	39	20	27	25
African-American Households	14	36	23	18	21	19	31	19	22	0	19	19	19	21	20
Hispanic Households	9	6	7	17	13	15	0	21	21	0	77	77	16	22	20
White Households	16	17	16	18	19	18	21	20	20	0	24	24	18	20	19

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE C-1

ALL LIHEAP-ELIGIBLE, HIGH-BURDEN HOUSEHOLDS NATIONAL

THOUSANDS OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	92	81	173	1,201	705	1,905	148	642	789	0	704	704	1,440	2,131	3,572
Electricity	8	10	19	350	287	637	30	111	140	0	457	457	388	865	1,254
Fuel Oil	0	9	9	631	63	694	55	169	225	0	201	201	686	443	1,129
Kerosene	23	73	96	27	35	62	0	0	0	0	20	20	50	128	178
Propane	190	93	283	389	118	507	0	0	0	0	0	0	579	211	790
Other Fuels	31	7	38	157	54	212	0	0	0	0	0	0	188	61	250
No Heating Fuel Used	0	0	0	11	38	49	0	19	19	0	0	0	11	58	68
All Households	344	274	618	2,765	1,300	4,065	233	941	1,173	0	1,382	1,382	3,342	3,897	7,239

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE C-2

ALL LIHEAP-ELIGIBLE, HIGH-BURDEN HOUSEHOLDS NATIONAL

PERCENT OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure														All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	1.3	1.1	2.4	16.6	9.7	26.3	2.0	8.9	10.9	0.0	9.7	9.7	19.9	29.4	49.3
Electricity	0.1	0.1	0.3	4.8	4.0	8.8	0.4	1.5	1.9	0.0	6.3	6.3	5.4	12.0	17.3
Fuel Oil	0.0	0.1	0.1	8.7	0.9	9.6	0.8	2.3	3.1	0.0	2.8	2.8	9.5	6.1	15.6
Kerosene	0.3	1.0	1.3	0.4	0.5	0.9	0.0	0.0	0.0	0.0	0.3	0.3	0.7	1.8	2.5
Propane	2.6	1.3	3.9	5.4	1.6	7.0	0.0	0.0	0.0	0.0	0.0	0.9	8.0	2.9	10.9
Other Fuels	0.4	0.1	0.5	2.2	0.8	2.9	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.8	3.4
No Heating Fuel Used	0.0	0.0	0.0	0.1	0.5	0.7	0.0	0.3	0.3	0.0	0.0	0.0	0.1	0.8	0.9
All Households	4.8	3.8	8.5	38.2	18.0	56.2	3.2	13.0	16.2	0.0	19.1	19.1	46.2	53.8	100.0

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE C-3

ALL LIHEAP-ELIGIBLE, HIGH-BURDEN HOUSEHOLDS
REGIONAL / NORTHEAST

THOUSANDS OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	0	17	17	104	124	228	50	162	212	0	122	122	154	424	578
Electricity	0	0	0	0	15	15	0	13	13	0	48	48	0	76	76
Fuel Oil	0	9	9	244	36	280	55	154	209	0	201	201	299	400	699
Kerosene	23	18	40	0	0	0	0	0	0	0	0	0	23	18	40
Propane															
Other Fuels	0	0	0	17	0	17	0	0	0	0	0	0	17	0	17
No Heating Fuel Used															
All Households	23	43	66	365	175	539	105	329	434	0	371	371	493	918	1,411

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE C-4

ALL LIHEAP-ELIGIBLE, HIGH-BURDEN HOUSEHOLDS
REGIONAL / NORTHEAST

PERCENT OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
Natural Gas	0.0	1.2	1.2	7.3	8.8	16.1	3.6	11.5	15.1	0.0	8.6	8.6	10.9	30.1	41.0
Electricity	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.9	0.9	0.0	3.4	3.4	0.0	5.4	5.4
Fuel Oil	0.0	0.6	0.6	17.3	2.6	19.8	3.9	10.9	14.8	0.0	14.3	14.3	21.2	28.4	49.5
Kerosene	1.6	1.2	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	1.2	2.9
Propane															
Other Fuels	0.0	0.0	0.0	1.2	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	1.2
No Heating Fuel Used															
All Households	1.6	3.1	4.7	25.9	12.4	38.2	7.5	23.3	30.8	0.0	26.3	26.3	34.9	65.1	100.0

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE C-5

ALL LIHEAP-ELIGIBLE, HIGH-BURDEN HOUSEHOLDS
REGIONAL / MIDWEST

THOUSANDS OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	8	11	19	347	294	641	75	177	252	0	53	53	430	534	964
Electricity	8	0	8	34	0	34	0	0	0	0	8	8	43	8	50
Fuel Oil	0	0	0	199	8	207	0	16	16	0	0	0	199	24	223
Kerosene	0	0	0	0	0	0	0	0	0	0	20	20	0	20	20
Propane	53	35	88	139	38	176	0	0	0	0	0	0	191	73	264
Other Fuels	31	7	38	20	16	36	0	0	0	0	0	0	51	23	74
No Heating Fuel Used															
All Households	100	54	154	738	355	1,094	75	193	268	0	80	80	914	682	1,595

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE C-6

ALL LIHEAP-ELIGIBLE, HIGH-BURDEN HOUSEHOLDS
REGIONAL / MIDWEST

PERCENT OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	0.5	0.7	1.2	21.8	18.4	40.2	4.7	11.1	15.8	0.0	3.3	3.3	26.9	33.5	60.4
Electricity	0.5	0.0	0.5	2.1	0.0	2.1	0.0	0.0	0.0	0.0	0.5	0.5	2.7	0.5	3.2
Fuel Oil	0.0	0.0	0.0	12.5	0.5	13.0	0.0	1.0	1.0	0.0	0.0	0.0	12.5	1.5	14.0
Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.2	0.0	1.2	1.2
Propane	3.3	2.2	5.5	8.7	2.4	11.0	0.0	0.0	0.0	0.0	0.0	0.0	12.0	4.6	16.6
Other Fuels	1.9	0.4	2.4	1.2	1.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	3.2	1.4	4.6
No Heating Fuel Used															
All Households	6.3	3.4	9.6	46.3	22.3	68.6	4.7	12.1	16.8	0.0	5.0	5.0	57.3	42.7	100.0

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE C-7

ALL LIHEAP-ELIGIBLE, HIGH-BURDEN HOUSEHOLDS
REGIONAL / SOUTH

THOUSANDS OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
Natural Gas	23	17	40	547	145	692	22	205	227	0	271	271	592	638	1,230
Electricity	0	0	0	213	130	343	0	42	42	0	296	296	213	468	681
Fuel Oil	0	0	0	188	19	207	0	0	0	0	0	0	188	19	207
Kerosene	0	56	56	27	35	62	0	0	0	0	0	0	27	91	118
Propane	105	46	152	194	52	246	0	0	0	0	0	0	299	99	398
Other Fuels	0	0	0	45	23	68	0	0	0	0	0	0	45	23	68
No Heating Fuel Used															
All Households	128	119	247	1,214	404	1,618	22	247	269	0	566	566	1,364	1,336	2,701

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE C-8

ALL LIHEAP-ELIGIBLE, HIGH-BURDEN HOUSEHOLDS
REGIONAL / SOUTH

PERCENT OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	0.8	0.6	1.5	20.2	5.4	25.6	0.8	7.6	8.4	0.0	10.0	10.0	21.9	23.6	45.5
Electricity	0.0	0.0	0.0	7.9	4.8	12.7	0.0	1.6	1.6	0.0	10.9	10.9	7.9	17.3	25.2
Fuel Oil	0.0	0.0	0.0	7.0	0.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	7.0	0.7	7.7
Kerosene	0.0	2.1	2.1	1.0	1.3	2.3	0.0	0.0	0.0	0.0	0.0	0.0	1.0	3.4	4.4
Propane	3.9	1.7	5.6	7.2	1.9	9.1	0.0	0.0	0.0	0.0	0.0	0.0	11.1	3.7	14.7
Other Fuels	0.0	0.0	0.0	1.7	0.8	2.5	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.8	2.5
No Heating Fuel Used															
All Households	4.7	4.4	9.2	45.0	15.0	59.9	0.8	9.1	10.0	0.0	21.0	21.0	50.5	49.5	100.0

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE C-9

ALL LIHEAP-ELIGIBLE, HIGH-BURDEN HOUSEHOLDS
REGIONAL / WEST

THOUSANDS OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	62	37	98	203	142	345	0	98	98	0	259	259	265	535	800
Electricity	0	10	10	103	143	245	30	55	85	0	106	106	133	314	447
Fuel Oil															
Kerosene															
Propane	32	11	43	56	28	85	0	0	0	0	0	0	88	39	127
Other Fuels	0	0	0	75	16	91	0	0	0	0	0	0	75	16	91
No Heating Fuel Used	0	0	0	11	38	49	0	19	19	0	0	0	11	58	68
All Households	93	58	151	448	366	814	30	172	202	0	365	365	571	961	1,532

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE C-10

ALL LIHEAP-ELIGIBLE, HIGH-BURDEN HOUSEHOLDS
REGIONAL / WEST

PERCENT OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	4.0	2.4	6.4	13.3	9.2	22.5	0	6.4	6.4		16.9	16.9	17.3	34.9	52.2
Electricity	0	.7	.7	6.7	9.3	16	2.0	3.6	5.6		6.9	6.9	8.7	20.5	29.1
Fuel Oil															
Kerosene															
Propane	2.1	.7	2.8	3.7	1.8	5.5	0	0	0	0	0	0	5.8	2.6	8.3
Other Fuels	0	0	0	4.9	1.0	5.9	0	0	0	0	0	0	4.9	1.0	5.9
No Heating Fuel Used	0	0	0	.7	2.5	3.2	0	1.3	1.3	0	0	0	.7	3.8	4.5
All Households	6.1	3.8	9.9	29.2	23.9	53.1	2	11.2	13.2	0	23.8	23.8	37.3	62.7	100.0

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE C-11

ALL LIHEAP-ELIGIBLE, HIGH-BURDEN HOUSEHOLDS NATIONAL

MEAN RESIDENTIAL ENERGY EXPENDITURES IN CURRENT DOLLARS

Primary Heating Fuel	Housing Type and Tenure														All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	621	999	798	1,349	1,355	1,352	1,774	973	1,122	0	722	722	1,346	1,017	1,150
Electricity	1,879	716	1,237	1,252	994	1,135	837	845	843	0	724	724	1,234	829	954
Fuel Oil	0	2,044	2,044	1,474	1,732	1,497	2,275	1,243	1,496	0	1,051	1,051	1,538	1,241	1,422
Kerosene	1,333	892	997	880	2,410	1,744	0	0	0	0	364	364	1,088	1,225	1,186
Propane	1,435	1,390	1,420	1,399	848	1,271	0	0	0	0	0	0	1,411	1,087	1,324
Other Fuels	1,237	938	1,181	940	1,033	963	0	0	0	0	0	0	988	1,022	997
No Heating Fuel Used	0	0	0	1,240	1,526	1,464	0	1,038	1,038	0	0	0	1,240	1,363	1,344
All Households	1,203	1,124	1,168	1,344	1,268	1,320	1,772	1,008	1,159	0	765	765	1,359	1,017	1,175

Source: 1990 Residential Energy Consumption Survey

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TABLE C-12

ALL LIHEAP-ELIGIBLE, HIGH-BURDEN HOUSEHOLDS NATIONAL

STANDARD DEVIATION OF MEAN EXPENDS. IN CURRENT DOLLARS

Primary Heating Fuel	Housing Type and Tenure														All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	236	412	380	576	458	536	579	393	535	0	275	275	606	463	550
Electricity	0	0	578	495	400	473	108	232	212	0	337	337	493	368	451
Fuel Oil	0	0	0	576	759	599	571	296	586	0	478	478	615	532	602
Kerosene	58	230	277	0	977	1,056	0	0	0	0	0	0	229	924	795
Propane	442	519	469	564	69	547	0	0	0	0	0	0	527	440	525
Other Fuels	0	0	117	544	582	556	0	0	0	0	0	0	509	548	519
No Heating Fuel Used	0	0	0	0	380	357	0	350	350	0	0	0	0	436	404
All Households	505	483	497	574	555	569	681	379	548	0	354	354	588	492	565

Source: 1990 Residential Energy Consumption Survey

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TABLE C-13

ALL LIHEAP-ELIGIBLE, HIGH-BURDEN HOUSEHOLDS
NATIONAL

MEAN ANNUAL CASH INCOME

Primary Heating Fuel	Housing Type and Tenure														All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Own	Both Tenures	Own	Rent	
Natural Gas	4,825	4,468	4,658	6,599	6,955	6,731	6,746	3,947	4,470	0	4,030	4,030	6,501	4,988	5,598
Electricity	8,250	5,500	6,732	5,711	3,480	4,705	5,990	3,736	4,216	0	3,495	3,495	5,788	6,545	4,240
Fuel Oil	0	9,500	9,500	7,006	7,872	7,084	8,274	3,602	4,749	0	2,751	2,751	7,108	3,939	5,865
Kerosene	2,982	2,007	2,239	5,500	6,099	5,838	0	0	0	0	1,500	1,500	4,344	3,046	3,409
Propane	7,722	4,905	6,797	5,864	2,609	5,107	0	0	0	0	0	0	6,474	6,621	5,712
Other Fuels	5,500	3,500	5,124	5,103	5,804	5,283	0	0	0	0	0	0	5,169	5,535	5,259
No Heating Fuel Used	0	0	0	11,750	14,631	14,011	0	9,724	9,724	0	0	0	11,750	12,992	12,800
All Households	6,446	4,136	5,422	6,400	5,993	6,270	7,011	3,978	4,579	0	3,630	3,690	6,447	4,538	5,419

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE C-14

ALL LIHEAP-ELIGIBLE, HIGH-BURDEN HOUSEHOLDS NATIONAL

MEAN ENERGY BURDEN - EXPENDITURES AS % OF INCOME

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	15.9	27.7	21.4	26.6	32.2	28.7	28.6	35.6	34.3	0	24.9	24.9	26.1	30.7	28.8
Electricity	22.8	13.0	17.4	25.6	37.6	31.0	14.9	35.2	30.9	0	30.9	30.9	24.7	33.5	30.8
Fuel Oil	0	21.5	21.5	26.3	22.3	26.0	32.1	48.6	44.6	0	50.6	50.6	26.8	45.2	34.0
Kerosene	66.3	47.4	51.9	16.0	46.3	33.1	0	0	0	0	24.3	24.3	39.1	43.5	42.3
Propane	20.4	29.2	23.2	33.2	38.5	34.5	0	0	0	0	0	0	29.0	34.4	30.5
Other Fuels	22.5	26.8	23.3	26.1	17.0	23.8	0	0	0	0	0	0	25.5	18.1	23.7
No Heating Fuel Used	0	0	0	10.6	12.0	11.7	0	11.4	11.4	0	0	0	10.6	11.8	11.6
All Households	22.5	32.7	27.0	27.1	32.7	28.9	27.7	37.4	35.5	0	30.6	30.6	26.7	33.1	30.1

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE C-15
ALL LIHEAP-ELIGIBLE, HIGH-BURDEN HOUSEHOLDS BY PROGRAM PARTICIPATION
NATIONAL

THOUSANDS OF HOUSEHOLDS

	Housing Type and Tenure													
	Mobile Home			Single Family			Small Multifamily			Large Multifamily		All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Rent	Both Tenures	Own	Rent	All House-Holds
All LIHEAP, High-Burden Households	344	274	618	2,765	1,300	4,065	233	941	1,173	1,382	1,382	3,342	3,897	7,239
AFDC Recipients	80	111	192	178	488	666	0	382	382	394	394	259	1,375	1,634
SSI Recipients	59	36	95	238	100	338	11	106	117	156	156	308	399	707
Heating Assistance Recipients	125	105	230	500	446	946	29	213	242	226	226	654	991	1,645
Food Stamp Recipients	98	158	256	452	729	1,181	11	496	507	465	465	561	1,848	2,409
Unemployment Compensation	0	0	0	67	0	67	29	0	29	30	30	96	30	127
Subsidized Housing	0	43	43	0	158	158	0	167	167	175	175	0	543	543

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE C-16
ALL LIHEAP-ELIGIBLE, HIGH-BURDEN HOUSEHOLDS BY PROGRAM PARTICIPATION
NATIONAL

PERCENT OF HOUSEHOLDS

	Housing Type and Tenure													
	Mobile Home			Single Family			Small Multifamily			Large Multifamily		All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Rent	Both Tenures	Own	Rent	All House-Holds
All LIHEAP, High-Burden Households	7.1	14.3	21.4	14.3	28.6	42.9	7.1	14.3	21.4	14.3	14.3	28.6	71.4	100
AFDC Recipients	12.5	12.5	25.0	12.5	25.0	37.5	0	25.0	25.0	12.5	12.5	25.0	75.0	100
SSI Recipients	10.0	20.0	30.0	20.0	10.0	30.0	10.0	10.0	20.0	20.0	20.0	40.0	60.0	100
Heating Assistance Recipients	8.3	16.7	25.0	16.7	25.0	41.7	8.3	16.7	25.0	8.3	8.3	33.3	66.7	100
Food Stamp Recipients	8.3	16.7	25.0	8.3	25.0	33.3	8.3	16.7	25.0	16.7	16.7	25.0	75.0	100
Unemployment Compensation	0	0	0	33.3	0	33.3	33.3	0	33.3	33.3	33.3	66.7	33.3	100
Subsidized Housing	0	14.3	14.3	0	42.9	42.9	0	28.6	28.6	14.3	14.3	0	100.0	100

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE C-17

ALL LIHEAP-ELIGIBLE, HIGH-BURDEN HOUSEHOLDS BY PROGRAM PARTICIPATION NATIONAL

MEAN RESIDENTIAL ENERGY EXPENDITURES IN CURRENT DOLLARS

	Housing Type and Tenure													
	Mobile Home			Single Family			Small Multifamily			Large Multifamily		All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Rent	Both Tenures	Own	Rent	All House-Holds
All LIHEAP, High-Burden Households	1,203	1,124	1,168	1,344	1,268	1,320	1,772	1,008	1,159	765	765	1,359	1,017	1,175
AFDC Recipients	1,212	1,122	1,160	1,374	1,361	1,364	0	1,048	1,048	827	827	1,324	1,101	1,137
SSI Recipients	1,104	1,695	1,329	1,285	1,018	1,206	553	1,132	1,077	854	854	1,224	1,045	1,123
Heating Assistance Recipients	1,277	1,013	1,157	1,153	1,249	1,198	2,437	1,110	1,270	801	801	1,234	1,092	1,148
Food Stamp Recipients	1,146	1,173	1,163	1,216	1,187	1,199	553	971	961	875	875	1,191	1,050	1,082
Unemployment Compensation	0	0	0	1,251	0	1,251	2,437	0	2,437	931	931	1,612	931	1,448
Subsidized Housing	0	1,086	1,086	0	1,135	1,135	0	1,194	1,194	1,081	1,081	0	1,132	1,132

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE C-18

ALL LIHEAP-ELIGIBLE, HIGH-BURDEN HOUSEHOLDS BY PROGRAM PARTICIPATION NATIONAL

MEAN ENERGY BURDEN - EXPENDITURES AS % OF INCOME

	Housing Type and Tenure													
	Mobile Home			Single Family			Small Multifamily			Large Multifamily		All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Rent	Both Tenures	Own	Rent	All House-Holds
All LIHEAP, High-Burden Households	22	33	27	27	33	29	28	37	35	31	31	27	33	30
AFDC Recipients	39	26	31	28	40	37	0	37	37	28	28	31	35	34
SSI Recipients	22	26	23	25	29	26	37	26	27	29	29	25	28	27
Heating Assistance Recipients	31	28	30	27	37	32	26	25	25	33	33	28	32	31
Food Stamp Recipients	34	28	31	30	36	34	37	36	36	33	33	31	35	34
Unemployment Compensation	0	0	0	35	0	35	26	0	26	42	42	32	42	34
Subsidized Housing	0	31	31	0	37	37	0	34	34	36	36	0	35	35

Source: 1990 Residential Energy Consumption Survey

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TABLE C-19

ALL LIHEAP-ELIGIBLE, HIGH-BURDEN HOUSEHOLDS BY DEMOGRAPHIC CHARACTERISTICS
NATIONAL
THOUSANDS OF HOUSEHOLDS

	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
All LIHEAP-High-Burden Households	344	274	618	2,765	1,300	4,065	233	941	1,173	0	1,382	1,382	3,342	3,897	7,239
Households with Elderly Members	122	0	122	2,042	251	2,293	141	171	312	0	265	265	2,305	687	2,992
Households with Children	176	211	386	543	780	1,324	17	621	638	0	541	541	736	2,153	2,889
Single-Parent Households	91	72	163	319	385	704	21	468	488	0	522	522	431	1,447	1,878
African-American Households	72	119	191	294	339	633	94	395	489	0	561	561	460	1,414	1,874
Hispanic Households	0	36	36	172	143	315	17	113	130	0	178	178	189	470	659
White Households	262	155	427	2,387	875	3,262	139	470	609	0	807	807	2,798	2,307	5,105

Source: 1990 Residential Energy Consumption Survey

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TABLE C-20

ALL LIHEAP-ELIGIBLE, HIGH-BURDEN HOUSEHOLDS BY DEMOGRAPHIC CHARACTERISTICS NATIONAL

PERCENT OF HOUSEHOLDS

	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
All LIHEAP-High-Burden Households	7.1	14.3	21.4	14.3	28.6	42.9	7.1	14.3	21.4	0.0	14.3	14.3	28.6	71.4	100.0
Households with Elderly Members	10.0	0.0	10.0	20.0	30.0	50.0	10.0	10.0	20.0	0.0	20.0	20.0	40.0	60.0	100.0
Households with Children	8.3	8.3	16.7	16.7	33.3	50.0	8.3	16.7	25.0	0.0	8.3	8.3	33.3	66.7	100.0
Single-Parent Households	9.1	9.1	18.2	18.2	27.3	45.5	9.1	18.2	27.3	0.0	9.1	9.1	36.4	63.6	100.0
African-American Households	8.3	8.3	16.7	16.7	25.0	41.7	8.3	16.7	25.0	0.0	16.7	16.7	33.3	66.7	100.0
Hispanic Households	0.0	12.5	12.5	25.0	25.0	50.0	12.5	12.5	25.0	0.0	12.5	12.5	37.5	62.5	100.0
White Households	8.3	16.7	25.0	16.7	33.3	50.0	8.3	8.3	16.7	0.0	8.3	8.3	33.3	66.7	100.0

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE C-21

ALL LIHEAP-ELIGIBLE, HIGH-BURDEN HOUSEHOLDS BY DEMOGRAPHIC CHARACTERISTICS
NATIONAL

MEAN RESIDENTIAL ENERGY EXPENDITURES IN CURRENT DOLLARS

	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
All LIHEAP-High-Burden Households	1,203	1,124	1,168	1,344	1,268	1,320	1,772	1,008	1,159	0	765	765	1,359	1,017	1,175
Households with Elderly Members	1,031	0	1,031	1,319	1,072	1,292	1,444	1,108	1,260	0	813	813	1,311	981	1,235
Households with Children	1,485	1,101	1,275	1,554	1,388	1,456	2,974	1,006	1,058	0	847	847	1,570	1,114	1,230
Single-Parent Households	1,799	978	1,437	1,677	1,387	1,518	1,736	1,053	1,081	0	810	810	1,706	1,050	1,201
African-American Households	1,510	1,071	1,236	1,475	1,380	1,424	2,038	1,066	1,253	0	822	822	1,595	1,045	1,180
Hispanic Households	0	642	642	1,118	1,092	1,106	2,974	745	1,038	0	819	819	1,286	871	990
White Households	1,122	1,166	1,138	1,339	1,179	1,296	1,593	971	1,113	0	733	733	1,331	980	1,172

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE C-22
ALL LIHEAP-ELIGIBLE, HIGH-BURDEN HOUSEHOLDS BY DEMOGRAPHIC CHARACTERISTICS NATIONAL

MEAN ENERGY BURDEN - EXPENDITURES AS % OF INCOME

	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
All LIHEAP-High-Burden Households	22	33	27	27	33	29	28	37	35	0	31	31	27	33	30
Households with Elderly Members	17	0	17	26	29	27	27	23	25	0	26	26	26	26	26
Households with Children	27	30	29	27	34	31	22	41	41	0	35	35	27	36	33
Single-Parent Households	29	35	32	29	43	37	39	37	37	0	32	32	29	37	35
African-American Households	16	35	28	32	39	36	34	43	41	0	26	26	30	35	33
Hispanic Households	0	23	23	29	32	31	22	42	39	0	42	42	28	37	35
White Households	24	31	27	27	32	28	24	33	31	0	34	34	26	33	29

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE D-1

ALL ELIGIBLE, HIGH-EXPENDITURE, HIGH-BURDEN HOUSEHOLDS NATIONAL

THOUSANDS OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	64	45	109	200	203	404	106	127	233	0	103	103	371	478	849
Electricity	8	0	8	144	203	347	10	100	110	0	71	71	162	375	537
Fuel Oil	0	9	9	118	8	126	10	56	65	0	77	77	127	149	277
Kerosene	23	19	41	0	35	35	0	0	0	0	0	0	23	53	76
Propane	102	71	173	179	0	179	0	0	0	0	0	0	282	71	352
Other Fuels	31	0	31	0	0	0	0	0	0	0	0	0	31	0	31
No Heating Fuel Used															
All Households	229	143	372	641	450	1,091	126	283	409	0	251	251	996	1,127	2,123

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE D-2

ALL ELIGIBLE, HIGH-EXPENDITURE, HIGH-BURDEN HOUSEHOLDS NATIONAL

PERCENT OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	3.0	2.1	5.1	9.4	9.6	19.0	5.0	6.0	11.0	0.0	4.9	4.9	17.5	22.5	40.0
Electricity	0.4	0.0	0.4	6.8	9.6	16.3	0.5	4.7	5.2	0.0	3.4	3.4	7.6	17.7	25.3
Fuel Oil	0.0	0.4	0.4	5.5	0.4	5.9	0.5	2.6	3.1	0.0	3.6	3.6	6.0	7.0	13.0
Kerosene	1.1	0.9	2.0	0.0	1.6	1.6	0.0	0.0	0.0	0.0	0.0	0.0	1.1	2.5	3.6
Propane	4.8	3.3	8.2	8.4	0.0	8.4	0.0	0.0	0.0	0.0	0.0	0.0	13.3	3.3	16.6
Other Fuels	1.5	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	1.5
No Heating Fuel Used															
All Households	10.8	6.7	17.5	30.2	21.2	51.4	5.9	13.3	19.3	0.0	11.8	11.8	46.9	53.1	100.0

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE D-3

ALL ELIGIBLE, HIGH-EXPENDITURE, HIGH-BURDEN HOUSEHOLDS
REGIONAL / NORTHEAST

THOUSANDS OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	0	17	17	10	0	10	30	9	38	0	35	35	40	60	100
Electricity	0	0	0	0	15	15	0	13	13	0	15	15	0	42	42
Fuel Oil	0	9	9	23	0	23	10	40	50	0	77	77	33	126	158
Kerosene	23	0	23	0	0	0	0	0	0	0	0	0	23	0	23
Propane															
Other Fuels															
No Heating Fuel Used															
All Households	23	25	48	33	15	47	39	62	101	0	126	126	95	228	323

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE D-4

ALL ELIGIBLE, HIGH-EXPENDITURE, HIGH-BURDEN HOUSEHOLDS
REGIONAL / NORTHEAST

PERCENT OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure														All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	0.0	5.1	5.1	3.1	0.0	3.1	9.2	2.7	11.9	0.0	10.8	10.8	12.2	18.6	30.8
Electricity	0.0	0.0	0.0	0.0	4.5	4.5	0.0	4.0	4.0	0.0	4.6	4.6	0.0	13.1	13.1
Fuel Oil	0.0	2.8	2.8	7.1	0.0	7.1	3.0	12.4	15.4	0.0	23.7	23.7	10.1	38.9	49.0
Kerosene	7.1	0.0	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.1	0.0	7.1
Propane															
Other Fuels															
No Heating Fuel Used															
All Households	7.1	7.9	15.0	10.2	4.5	14.7	12.1	19.1	31.3	0.0	39.1	39.1	29.4	70.6	100.0

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE D-5

ALL ELIGIBLE, HIGH-EXPENDITURE, HIGH-BURDEN HOUSEHOLDS
REGIONAL / MIDWEST

THOUSANDS OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	0	11	11	55	77	132	54	87	142	0	17	17	109	192	301
Electricity	8	0	8	34	0	34	0	0	0	0	0	0	43	0	43
Fuel Oil	0	0	0	58	8	66	0	16	16	0	0	0	58	24	82
Kerosene															
Propane	19	35	55	118	0	118	0	0	0	0	0	0	137	35	172
Other Fuels	31	0	31	0	0	0	0	0	0	0	0	0	31	0	31
No Heating Fuel Used															
All Households	59	46	105	264	85	349	54	103	157	0	17	17	377	251	629

Source: 1990 Residential Energy Consumption Survey

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TABLE D-6

ALL ELIGIBLE, HIGH-EXPENDITURE, HIGH-BURDEN HOUSEHOLDS
REGIONAL / MIDWEST

PERCENT OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure														All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	0.0	1.7	1.7	8.7	12.2	21.0	8.7	13.9	22.5	0.0	2.7	2.7	17.4	30.5	47.9
Electricity	1.3	0.0	1.3	5.5	0.0	5.5	0.0	0.0	0.0	0.0	0.0	0.0	6.8	0.0	6.8
Fuel Oil	0.0	0.0	0.0	9.2	1.3	10.5	0.0	2.5	2.5	0.0	0.0	0.0	9.2	3.8	13.0
Kerosene															
Propane	3.0	5.6	8.7	18.7	0.0	18.7	0.0	0.0	0.0	0.0	0.0	0.0	21.7	5.6	27.4
Other Fuels	4.9	0.0	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	4.9
No Heating Fuel Used															
All Households	9.3	7.4	16.7	42.1	13.5	55.6	8.7	16.4	25.0	0.0	2.7	2.7	60.0	40.0	100.0

Source: 1990 Residential Energy Consumption Survey

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TABLE D-7

ALL ELIGIBLE, HIGH-EXPENDITURE, HIGH-BURDEN HOUSEHOLDS
REGIONAL / SOUTH

THOUSANDS OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure														All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	23	0	23	75	32	107	22	21	43	0	20	20	120	73	192
Electricity	0	0	0	80	62	142	0	42	42	0	0	0	80	104	184
Fuel Oil	0	0	0	37	0	37	0	0	0	0	0	0	37	0	37
Kerosene	0	19	19	0	35	35	0	0	0	0	0	0	0	53	53
Propane	51	24	76	61	0	61	0	0	0	0	0	0	113	24	137
Other Fuels															
No Heating Fuel Used															
All Households	74	43	117	253	129	382	22	63	85	0	20	20	349	255	604

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE D-8

ALL ELIGIBLE, HIGH-EXPENDITURE, HIGH-BURDEN HOUSEHOLDS
REGIONAL / SOUTH

PERCENT OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	3.8	0.0	3.8	12.4	5.3	17.6	3.7	3.5	7.1	0.0	3.3	3.3	19.8	12.0	31.8
Electricity	0.0	0.0	0.0	13.2	10.3	23.4	0.0	7.0	7.0	0.0	0.0	0.0	13.2	17.3	30.4
Fuel Oil	0.0	0.0	0.0	6.1	0.0	6.1	0.0	0.0	0.0	0.0	0.0	0.0	6.1	0.0	6.1
Kerosene	0.0	3.1	3.1	0.0	5.8	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.9	8.9
Propane	8.5	4.0	12.6	10.2	0.0	10.2	0.0	0.0	0.0	0.0	0.0	0.0	18.7	4.0	22.7
Other Fuels															
No Heating Fuel Used															
All Households	12.3	7.1	19.4	41.9	21.3	63.2	3.7	10.5	14.1	0.0	3.3	3.3	57.8	42.2	100.0

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE D-9

ALL ELIGIBLE, HIGH-EXPENDITURE, HIGH-BURDEN HOUSEHOLDS
REGIONAL / WEST

THOUSANDS OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	41	17	58	61	94	155	0	10	10	0	32	32	102	154	256
Electricity	0	0	0	30	127	157	10	45	55	0	57	57	40	228	269
Fuel Oil															
Kerosene															
Propane	32	11	43	0	0	0	0	0	0	0	0	0	32	11	43
Other Fuels															
No Heating Fuel Used															
All Households	73	28	101	91	221	312	10	55	65	0	89	89	174	393	567

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE D-10

ALL ELIGIBLE, HIGH-EXPENDITURE, HIGH-BURDEN HOUSEHOLDS
REGIONAL / WEST

PERCENT OF HOUSEHOLDS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	7.2	3.0	10.3	10.8	16.6	27.4	0.0	1.7	1.7	0.0	5.7	5.7	18.0	27.1	45.1
Electricity	0.0	0.0	0.0	5.2	22.4	27.6	1.8	7.9	9.7	0.0	10.0	10.0	7.0	40.3	47.3
Fuel Oil															
Kerosene															
Propane	5.6	2.0	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	2.0	7.6
Other Fuels															
No Heating Fuel Used															
All Households	12.9	5.0	17.9	16.0	39.0	55.0	1.8	9.7	11.5	0.0	15.7	15.7	30.6	69.4	100.0

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE D-11

ALL ELIGIBLE, HIGH-EXPENDITURE, HIGH-BURDEN HOUSEHOLDS NATIONAL

MEAN RESIDENTIAL ENERGY EXPENDITURES IN CURRENT DOLLARS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	543	1,289	851	1,451	1,545	1,498	1,816	1,269	1,518	0	838	838	1,399	1,295	1,340
Electricity	1,879	0	1,879	1,260	1,023	1,121	989	873	884	0	986	986	1,275	976	1,066
Fuel Oil	0	2,044	2,044	1,747	2,264	1,780	1,997	1,375	1,466	0	1,244	1,244	1,765	1,396	1,566
Kerosene	1,333	875	1,128	0	2,410	2,410	0	0	0	0	0	0	1,333	1,878	1,715
Propane	1,468	1,463	1,466	1,533	0	1,533	0	0	0	0	0	0	1,509	1,463	1,500
Other Fuels	1,237	0	1,237	0	0	0	0	0	0	0	0	0	1,237	0	1,237
No Heating Fuel Used															
All Households	1,180	1,369	1,253	1,485	1,389	1,446	1,763	1,150	1,338	0	1,004	1,004	1,450	1,240	1,339

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE D-12

ALL ELIGIBLE, HIGH-EXPENDITURE, HIGH-BURDEN HOUSEHOLDS NATIONAL

STANDARD DEVIATION OF MEAN EXPENDS. IN CURRENT DOLLARS

Primary Heating Fuel	Housing Type and Tenure												All Housing Types		All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily					
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	204	300	443	605	459	539	677	307	578	0	343	343	717	469	593
Electricity	0	0	0	362	399	402	0	225	217	0	148	148	375	329	370
Fuel Oil	0	0	0	132	0	180	0	348	389	0	398	398	143	452	392
Kerosene	58	0	232	0	977	977	0	0	0	0	0	0	58	1,076	935
Propane	423	575	491	659	0	659	0	0	0	0	0	0	585	575	583
Other Fuels	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No Heating Fuel Used															
All Households	514	508	520	542	639	586	664	357	552	0	363	363	579	531	564

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE D-13

ALL ELIGIBLE, HIGH-EXPENDITURE, HIGH-BURDEN HOUSEHOLDS NATIONAL

MEAN ENERGY BURDEN - EXPENDITURES AS % OF INCOME

Primary Heating Fuel	Housing Type and Tenure														All House Holds
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	
Natural Gas	16.7	31.6	22.8	29.5	23.8	26.6	28.4	34.3	31.7	0.0	24.3	24.3	27.0	27.4	27.2
Electricity	22.8	0.0	22.8	26.4	34.4	31.1	22.0	37.5	36.1	0.0	13.4	13.4	25.9	31.2	29.6
Fuel Oil	0.0	21.5	21.5	22.4	23.8	22.5	36.3	53.1	50.6	0.0	75.1	75.1	23.4	60.9	43.7
Kerosene	66.3	58.3	62.7	0.0	46.3	46.3	0.0	0.0	0.0	0.0	0.0	0.0	66.3	50.5	55.2
Propane	18.8	30.2	23.5	24.7	0.0	24.7	0.0	0.0	0.0	0.0	0.0	0.0	22.6	30.2	24.1
Other Fuels	22.5	0.0	22.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.5	0.0	22.5
No Heating Fuel Used															
All Households	23.6	33.8	27.5	26.2	30.3	27.9	28.5	39.2	35.9	0.0	36.7	36.7	25.9	34.4	30.4

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE D-14

ALL ELIGIBLE, HIGH-EXPENDITURE, HIGH-BURDEN HOUSEHOLDS BY PROGRAM PARTICIPATION NATIONAL

THOUSANDS OF HOUSEHOLDS

	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
All Households	229	143	372	641	450	1,091	126	283	409	0	251	251	996	1,127	2,123
AFDC Recipients	65	46	110	50	167	218	0	109	109	0	32	32	115	354	469
SSI Recipients	31	29	60	84	29	113	11	23	34	0	60	60	126	140	266
Heating Assistance Recipients	74	60	134	99	120	219	29	39	68	0	19	19	202	238	440
Food Stamps Recipients	74	73	147	131	207	337	11	129	140	0	100	100	216	509	725
Unemployment Compensation Recipients	0	0	0	0	0	0	29	0	29	0	22	22	29	22	51
Subsidized Housing Recipients	0	24	24	0	42	42	0	20	20	0	0	0	0	86	86

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE D-15

ALL ELIGIBLE, HIGH-EXPENDITURE, HIGH-BURDEN HOUSEHOLDS BY PROGRAM PARTICIPATION NATIONAL

PERCENT OF HOUSEHOLDS

	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
All Households	9.1	9.1	18.2	18.2	27.3	45.5	9.1	9.1	18.2	0.0	18.2	18.2	36.4	63.6	100.0
AFDC Recipients	14.3	14.3	28.6	14.3	28.6	42.9	0.0	14.3	14.3	0.0	14.3	14.3	28.6	71.4	100.0
SSI Recipients	12.5	12.5	25.0	12.5	12.5	25.0	12.5	12.5	25.0	0.0	25.0	25.0	37.5	62.5	100.0
Heating Assistance Recipients	12.5	12.5	25.0	12.5	25.0	37.5	12.5	12.5	25.0	0.0	12.5	12.5	37.5	62.5	100.0
Food Stamps Recipients	11.1	11.1	22.2	11.1	22.2	33.3	11.1	11.1	22.2	0.0	22.2	22.2	33.3	66.7	100.0
Unemployment Compensation Recipients	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	50.0	0.0	50.0	50.0	50.0	50.0	100.0
Subsidized Housing Recipients	0.0	25.0	25.0	0.0	50.0	50.0	0.0	25.0	25.0	0.0	0.0	0.0	0.0	100.0	100.0

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE D-16

ALL ELIGIBLE, HIGH-EXPENDITURE, HIGH-BURDEN HOUSEHOLDS BY PROGRAM PARTICIPATION NATIONAL

MEAN RESIDENTIAL ENERGY EXPENDITURES IN CURRENT DOLLARS

	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
All Households	1,180	1,369	1,253	1,485	1,389	1,446	1,763	1,150	1,338	0	1,004	1,004	1,450	1,240	1,339
AFDC Recipients	1,194	1,545	1,340	1,507	1,503	1,504	0	1,191	1,191	0	579	579	1,331	1,329	1,329
SSI Recipients	1,237	1,884	1,549	1,306	1,110	1,256	553	1,156	958	0	1,037	1,037	1,223	1,245	1,235
Heating Assistance Recipients	1,122	1,013	1,074	1,592	1,238	1,398	2,437	1,248	1,760	0	907	907	1,543	1,157	1,334
Food Stamps Recipients	1,122	1,443	1,281	1,608	1,404	1,483	553	1,204	1,152	0	1,106	1,106	1,387	1,300	1,326
Unemployment Compensation Recipients	0	0	0	0	0	0	2,437	0	2,437	0	1,149	1,149	2,437	1,149	1,890
Subsidized Housing Recipients	0	963	963	0	910	910	0	1,058	1,058	0	0	0	0	959	959

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE D-17

ALL ELIGIBLE, HIGH-EXPENDITURE, HIGH-BURDEN HOUSEHOLDS BY PROGRAM PARTICIPATION NATIONAL

MEAN ENERGY BURDEN - EXPENDITURES AS % OF INCOME

	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
All Households	24	34	28	26	30	28	29	39	36	0	37	37	26	34	30
AFDC Recipients	40	27	34	18	28	26	0	56	56	0	13	13	30	35	34
SSI Recipients	22	25	24	22	16	21	37	26	29	0	37	37	24	29	26
Heating Assistance Recipients	36	31	34	32	30	31	26	44	36	0	60	60	33	35	34
Food Stamps Recipients	36	30	33	27	28	27	37	51	50	0	51	51	31	39	36
Unemployment Compensation Recipients	0	0	0	0	0	0	26	0	26	0	49	49	26	49	36
Subsidized Housing Recipients	0	28	28	0	21	21	0	49	49	0	0	0	0	29	29

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE D-18

ALL ELIGIBLE, HIGH-EXPENDITURE, HIGH-BURDEN HOUSEHOLDS BY DEMOGRAPHIC CHARACTERISTICS NATIONAL

THOUSANDS OF HOUSEHOLDS

	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
All Households	229	143	372	641	450	1,091	126	283	409	0	251	251	996	1,127	2,123
Households with Elderly Members	104	0	104	464	58	522	67	45	112	0	120	120	635	223	859
Households with Children	124	105	229	132	275	407	0	110	110	0	74	74	256	564	820
Single-Parent Households	66	43	109	56	171	226	0	123	123	0	55	55	122	391	513
African-American Households	61	60	121	111	176	287	58	69	127	0	95	95	230	400	630
Hispanic Households	0	0	0	76	72	148	0	31	31	0	23	23	76	126	203
White Households	168	83	251	495	232	727	68	188	256	0	157	157	730	660	1,391

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE D-19

ALL ELIGIBLE, HIGH-EXPENDITURE, HIGH-BURDEN HOUSEHOLDS BY DEMOGRAPHIC CHARACTERISTICS NATIONAL

PERCENT OF HOUSEHOLDS

	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
All Households	9.1	9.1	18.2	18.2	27.3	45.5	9.1	9.1	18.2	0.0	18.2	18.2	36.4	63.6	100.0
Households with Elderly Members	11.1	0.0	11.1	22.2	22.2	44.4	11.1	11.1	22.2	0.0	22.2	22.2	44.4	55.6	100.0
Households with Children	12.5	12.5	25.0	12.5	37.5	50.0	0.0	12.5	12.5	0.0	12.5	12.5	25.0	75.0	100.0
Single-Parent Households	12.5	12.5	25.0	12.5	37.5	50.0	0.0	12.5	12.5	0.0	12.5	12.5	25.0	75.0	100.0
African-American Households	11.1	11.1	22.2	11.1	22.2	33.3	11.1	11.1	22.2	0.0	22.2	22.2	33.3	66.7	100.0
Hispanic Households	0.0	0.0	0.0	33.3	33.3	66.7	0.0	16.7	16.7	0.0	16.7	16.7	33.3	66.7	100.0
White Households	10.0	10.0	20.0	20.0	30.0	50.0	10.0	10.0	20.0	0.0	10.0	10.0	40.0	60.0	100.0

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE D-20

ALL ELIGIBLE, HIGH-EXPENDITURE, HIGH-BURDEN HOUSEHOLDS BY DEMOGRAPHIC CHARACTERISTICS NATIONAL

MEAN RESIDENTIAL ENERGY EXPENDITURES IN CURRENT DOLLARS

	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
All Households	1,180	1,369	1,253	1,485	1,389	1,446	1,763	1,150	1,338	0	1,004	1,004	1,450	1,240	1,339
Households with Elderly Members	824	0	824	1,427	997	1,380	1,506	993	1,299	0	989	989	1,337	992	1,247
Households with Children	1,478	1,347	1,418	1,644	1,500	1,547	0	1,200	1,200	0	1,055	1,055	1,563	1,355	1,420
Single-Parent Households	1,763	925	1,432	1,645	1,411	1,469	0	1,209	1,209	0	1,106	1,106	1,709	1,251	1,360
African-American Households	1,677	1,127	1,404	1,605	1,609	1,607	2,107	1,273	1,653	0	933	933	1,750	1,318	1,476
Hispanic Households	0	0	0	1,245	1,020	1,136	0	781	781	0	1,841	1,841	1,245	1,111	1,161
White Households	999	1,544	1,179	1,490	1,106	1,367	1,472	1,111	1,207	0	1,046	1,046	1,376	1,148	1,268

Source: 1990 Residential Energy Consumption Survey

APPENDIX A

TABLE D-21

ALL ELIGIBLE, HIGH-EXPENDITURE, HIGH-BURDEN HOUSEHOLDS BY DEMOGRAPHIC CHARACTERISTICS NATIONAL

MEAN ENERGY BURDEN - EXPENDITURES AS % OF INCOME

	Housing Type and Tenure														
	Mobile Home			Single Family			Small Multifamily			Large Multifamily			All Housing Types		
	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	Both Tenures	Own	Rent	All House Holds
All Households	24	34	28	26	30	28	29	39	36	0	37	37	26	34	30
Households with Elderly Members	17	0	17	28	24	28	31	21	27	0	27	27	27	25	26
Households with Children	29	31	30	21	28	26	0	56	56	0	59	59	25	38	34
Single-Parent Households	33	41	36	25	35	33	0	43	43	0	59	59	29	41	39
African-American Households	16	36	26	29	33	31	34	36	35	0	27	27	27	32	30
Hispanic Households	0	0	0	23	24	23	0	36	36	0	123	123	23	45	37
White Households	26	32	28	25	33	28	24	38	34	0	43	43	25	36	31

Source: 1990 Residential Energy Consumption Survey

APPENDIX B

ENERGY INFORMATION ADMINISTRATION MAPS

U.S. CLIMATE ZONES

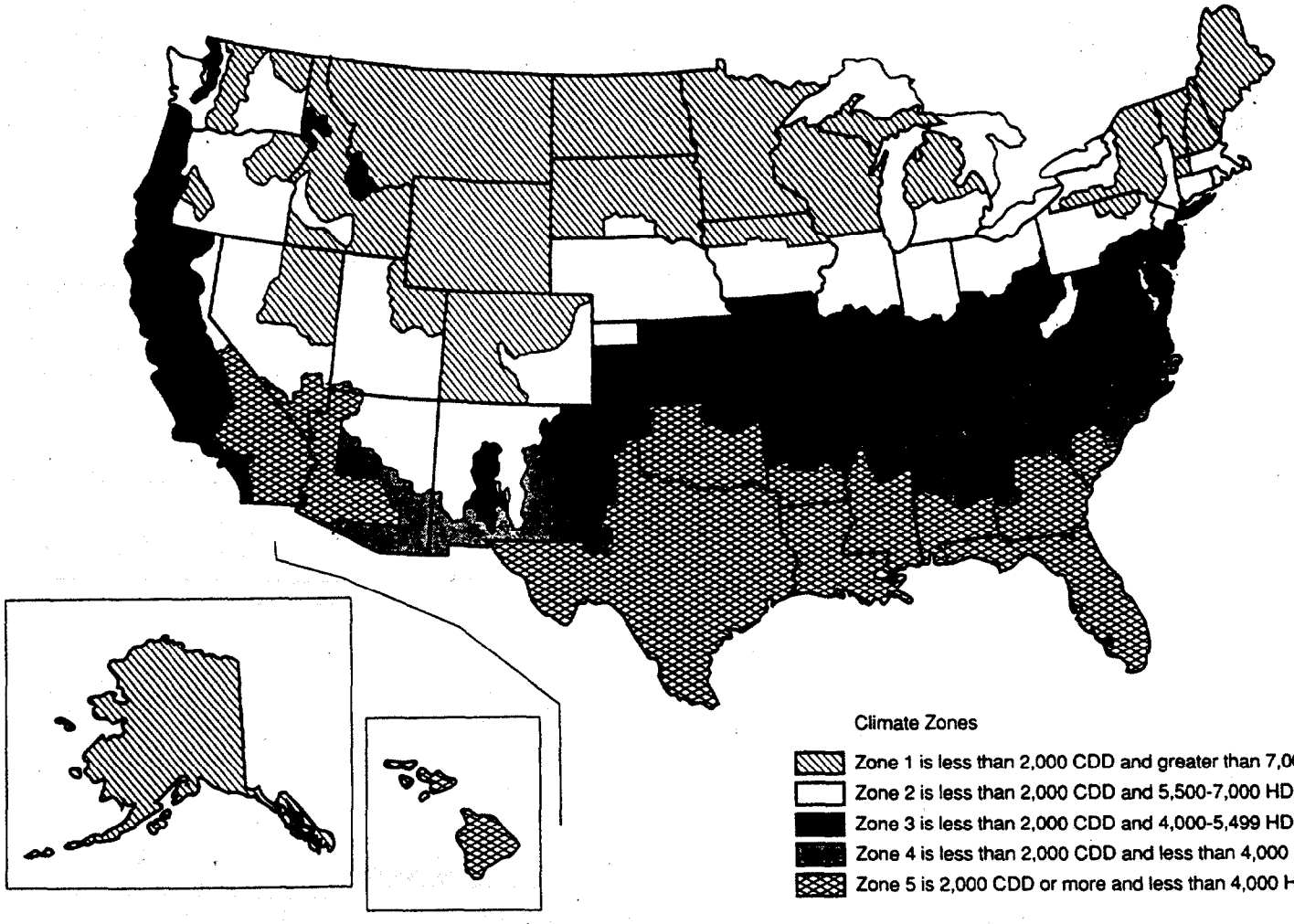
CENSUS REGIONS

CENSUS DIVISIONS

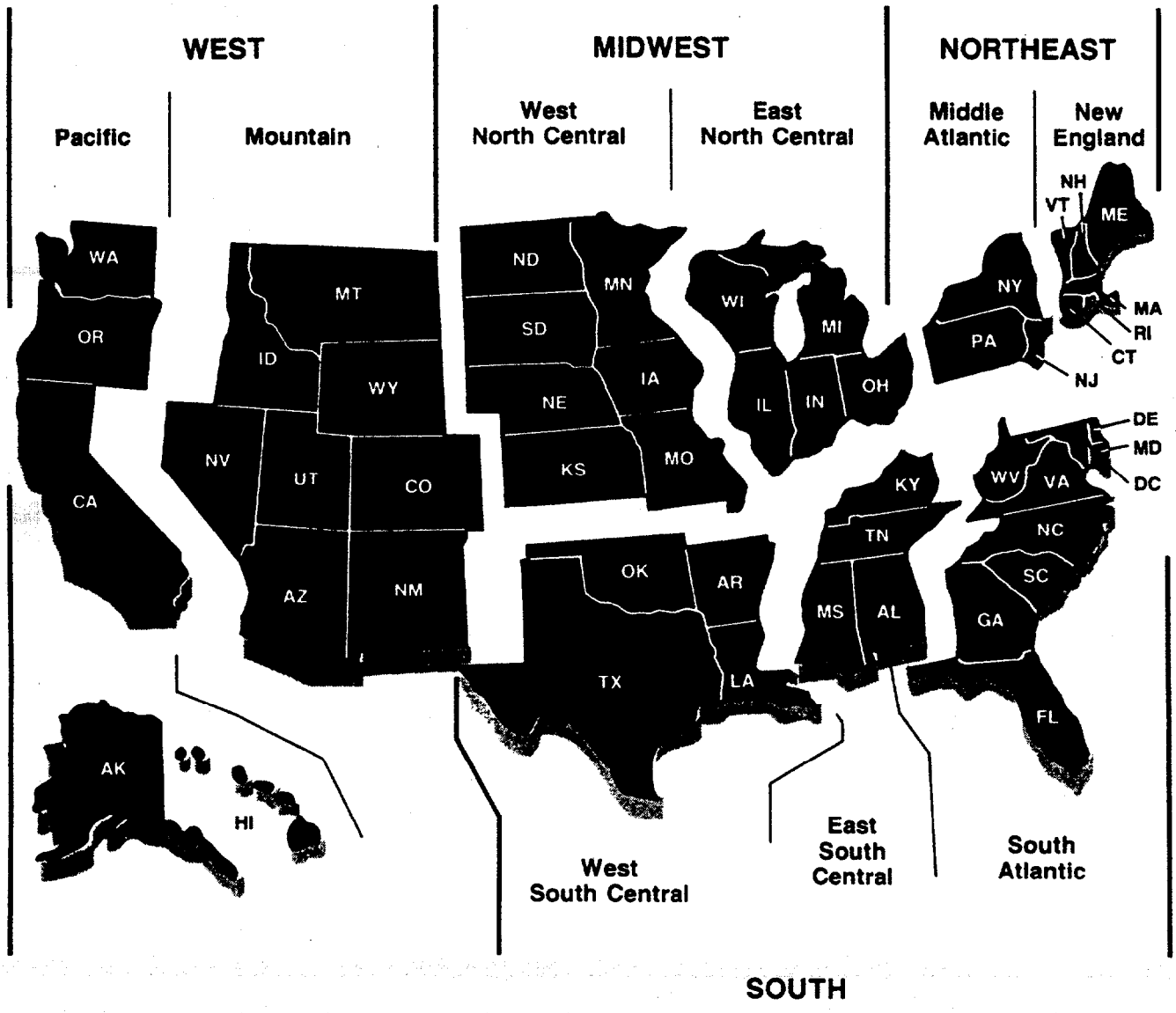
APPENDIX C
ENERGY INFORMATION ADMINISTRATION MAPS

U.S. Climate Zone and Census Regions and Divisions Maps

U.S. Climate Zone Map



U.S. Census Regions and Divisions



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