

# **Income, Energy Efficiency and Emissions**

*The Critical Relationship*

A paper of the  
**Energy Programs Consortium**

February 26, 2008

## CONTENTS

Acknowledgments .....	ii
About the Energy Programs Consortium .....	ii
Executive Summary .....	iii
Introduction .....	1
Perspective: What Does State Median Income Actually Mean? .....	1
Integrating Income, Greenhouse Gas Emissions and Energy Efficiency .....	3
Policy Implications .....	11

## **Tables and Figures**

### **Table**

1. Estimated Median Family Income by State, Family of Four, 2006 .....	2
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### **Figures**

1. Percent of Households and Residential Energy Consumption by Income Group .....	3
2. Residential Carbon Emissions by Income Group .....	4
3. Average Residential Carbon Emissions by Income Group and Region .....	4
4. Home Square Footage by Income Group .....	5
5. Residential Energy Consumption Per Square Foot by Region and Income Group .....	6
6. Percent of Residential Energy Used by End Use, by Income Group .....	7
7. Energy Efficiency of New Refrigerators, 1972-2003 .....	7
8. Energy Efficiency of New Gas and Oil Furnaces, 1970-2003 .....	8
9. Energy Efficiency of New Central and Room Air Conditioners, 1970-2003 .....	8
10. Average House Size by Income Group .....	9
11. Percent of Residential Energy Used by Home Type by Income Group .....	10
12. Percent of Residential Energy Used by Home Type and Ownership by Income Group .....	11
13. Mean Residential Energy Bill by Income Group .....	12
14. Mean Residential Energy Burden by Income Group .....	12

## **Appendix: Supporting Tables**

1. Number of Households by Income Category .....	15
2. Average Household Residential Energy Use by Income Category and Region .....	15
3. Total Residential Energy Use by Income Category and Region .....	15
4. Estimated Carbon Dioxide Emissions by Region and Income Group .....	16
5. Estimated per-Household Carbon Dioxide Emissions by Region and Income Group .....	16
6. Total Energy Usage by Income Group by Size .....	17-19
7. Average Square Footage by Region and Income Group .....	20
8. Average Household Energy Use Per Square Foot by Income and Region .....	20
9. Home Age by Region and Income Group .....	20
10. Age of Appliances by Income Group, Years .....	21
11. Average House Size by Year of Construction .....	21
12. Change in Average House Size, 1987-2001 .....	21
13. Percentage Change in Average House Size .....	22
14. Average House Size by Household Income .....	22
15. Total Residential Energy Use and Carbon Emissions by Income and Fuel Type .....	22
16. Total Residential Energy Use by Income and End Use .....	23
17. Total Residential Energy Use by Income and Home Type .....	23
18. Total Residential Energy Use by Income, Home Type, and Ownership .....	23
19. Total Residential Energy Use and Carbon Emissions by Region, Income, Home Type, and Ownership .....	24-25
20. National Statistics—Total Energy Costs and Burden .....	26

## **ACKNOWLEDGMENTS**

The Energy Programs Consortium (EPC) thanks Mark Wolfe for directing the project and Matthew Brown for his substantial contributions to the report. EPC would also like to thank Jackie Berger, Jim Devlin, and Ping Li of APPRISE Incorporated for preparing the tables and charts on residential energy usage, Tim Pettit, Greg Clendenning of Nexus Market Research, Inc. for preparing the state carbon emission profiles and Peter Slavin for editorial review. In addition, EPC thanks Sharon Alpert and Vanitha Venugopal of the Surdna Foundation as well as Brian Ng of the U.S Environmental Protection Agency for their thoughtful comments and encouragement to develop this paper.

## **ABOUT THE ENERGY PROGRAMS CONSORTIUM**

The Energy Programs Consortium (EPC) is a 501(c)(3) nonprofit organization that conducts policy research and demonstration programs. It is sponsored by the four main organizations representing state energy and regulatory agencies: the National Association of State Energy Officials; National Energy Assistance Directors' Association; National Association of Regulatory Utility Commissioners; and National Association of State and Community Services Programs.

EPC is supported by grants from the Ford, Heron and Surdna foundations; state energy and housing finance agencies; the U.S. Environmental Protection Agency; and the U.S. Department of Energy.

Other reports prepared by EPC in this series include:

- *State Residential Energy Efficiency Loan Programs*
- *The New Energy Efficient Mortgage: An Innovative Financial Tool for Energy Efficiency*
- *State-Sponsored Energy Efficiency Grant, Loan and Tax Credit Programs*
- *Energy Efficiency in Multi-Family Housing: A Profile and Analysis*

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## **EXECUTIVE SUMMARY**

This report asserts that state and the federal government policymakers must take household income into account when they develop policies and programs to cut greenhouse gas emissions and residential energy consumption. Many programs that are appropriate for higher-income households—loans, grants, rebates, education and technical assistance—are also appropriate for the lower-income population. In addition, programs that serve lower-income households can also leverage federal and state funding designed to make housing more affordable, including tax-exempt mortgage bonds, low-income housing tax credits, weatherization grants, and related sources of funding.

The report sets out the relationship between housing, income, energy use, and greenhouse gas emissions. Household energy use varies considerably by income and type of dwelling:

- Higher-income households (those with incomes of more than 120 percent of the median) represent 38 percent of U.S. households yet consume 45 percent of total energy in the residential sector. Lower-income households (those with incomes up to 80 percent of the median) make up a larger 43 percent of the U.S. population yet consume only 36 percent of total energy in the residential sector. The relationship between greenhouse gas emissions and income is almost identical to that for energy.
- Lower-income households live in homes that average 1,480 square feet, compared to higher-income households which occupy homes that average over 2,700 square feet. However, lower-income households consume 28 percent more energy per square foot of living space than higher-income households. Lower-income households tend to be older, less well insulated and have older less-energy-efficient appliances and space heating systems. The combination of these features accounts for much of their higher per-square-foot energy use in these households.
- Higher-income households devote 2 percent of their annual income to paying energy bills even though their bills (at an average of \$2,317) are close to 50 percent higher than those of average lower-income households (at an average of \$1,542). Lower-income households devote 8 percent of their annual income to paying their energy bills.

Policy options discussed in this report include:

- Developing and adopting a new energy efficiency mortgage product designed to offer an alternative to conventional mortgages for all households.
- Requiring energy efficiency measures paired with innovative financing tools to make those efficiency measures affordable as a condition of federal and state first-time homebuyer programs that are financed from the proceeds of tax-exempt bonds.

- Requiring multi-family developers to 1) meet high energy efficiency standards as a prerequisite for receiving funds from the proceeds of tax-exempt bonds, or 2) set high and specific standards in the Qualified Allocation Plans that states use to distribute this Low Income Housing Tax Credit benefit to housing developers.
- Increasing core funding for the federal programs that can help to sustain lower-income home ownership. This is especially important for very-low-income households who have fewer resources available to pay back loans, even when subsidized.

## **INTRODUCTION**

The residential sector accounts for 22 percent of the nation's energy use and 20 percent of its greenhouse gas emissions. As a result, any successful strategy to reduce total energy use and emissions must find a way to reduce emissions and energy use in homes. This paper focuses on this critical goal.

The idea of reducing energy consumption in homes is hardly new; state and federal energy efficiency programs have put significant resources into programs to reduce residential energy use, and some have had success in doing so, at least among limited numbers of homes. The fact is, however, that despite some important successes, energy efficiency programs as a whole have not made energy efficiency part of the mainstream across the United States; most energy efficiency programs are either pilot programs or have not affected much more than a few thousand households. As a result, energy consumption, while lower than it would have been in the absence of efficiency programs, continues to rise, and greenhouse gas emissions are growing as well.

If the nation is to create and meet ambitious goals to increase energy efficiency and reduce greenhouse gas emissions, it will need to develop efficiency programs that move quickly to scale. This paper presents evidence that this new approach must consider household incomes as a key factor in the design of these programs. This is especially important for the lower-income population because policy makers often assume that the sector is smaller and has less potential for savings than it actually has. Increasing energy efficiency in the residential sector will not only help the nation achieve significant reductions in greenhouse gas emissions, it will also help to increase the sustainability of lower-income homeownership and the affordability of lower-income multi-family housing.

The data presented in this report suggest the importance of two of the Energy Program Consortium's (EPC) primary goals: 1) increasing energy efficiency in the residential sector and reducing the sector's greenhouse gas emissions and 2) increasing the sustainability of lower-income homeownership and affordability of lower-income multi-family housing.

## **PERSPECTIVE: WHAT DOES STATE MEDIAN INCOME ACTUALLY MEAN?**

This paper refers repeatedly to state median income and to 80 percent of median income and 120 percent of median income as cut-off points to define what is a lower- or higher-income household. Such terms are often hard to understand in the abstract. This paper defines lower income as less than 80 percent of the state median, middle income as 80 percent to 120 percent of the median and higher income as greater than 120 percent of the median. Income levels of 80 percent and 120 percent are commonly used cutoff points not only for U.S. census and other statistical analyses of household income, but also may be used to define who is eligible for certain income-based government support programs such as first-time homebuyer supports. For comparison purposes, tables also include data on households eligible for assistance under the Low Income Home Energy Assistance Program (LIHEAP). The eligibility ceiling for these households is 150 percent of the federal poverty level or 60 percent of state median income, whichever is greater.

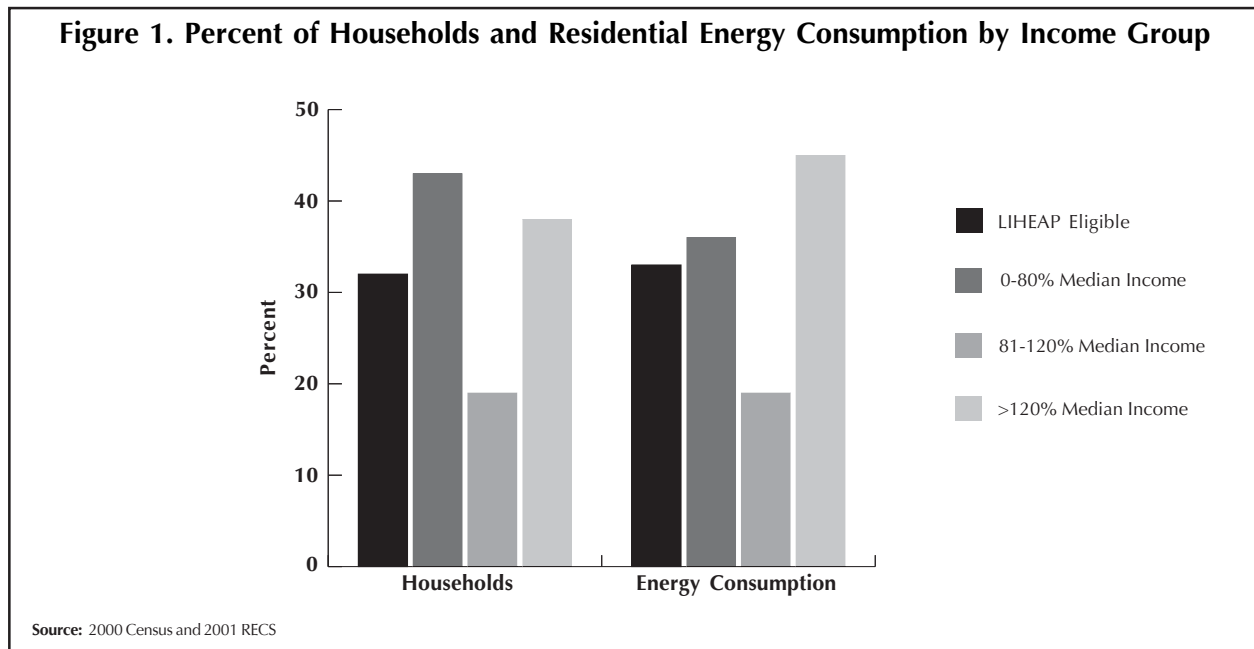
Table 1 shows state median income as well as 80 percent and 120 percent of median income. Median income in Connecticut is over \$92,000 and a family of four at 80 percent of median income earns close to \$74,000 per year. In Colorado median income is over \$70,000 and a family of four at 80 percent of the median earns slightly more than \$56,000 per year.

<b>State</b>	<b>Median Income</b>	<b>LIHEAP Eligible<sup>1</sup></b>	<b>80% of Median</b>	<b>120% of Median</b>
Alabama <sup>2</sup>	\$53,690	\$32,214	\$42,952	\$64,428
Alaska	76,560	45,936	61,248	91,872
Arizona	61,102	36,661	48,882	73,322
Arkansas	52,217	31,330	41,774	62,660
California	70,712	42,427	56,570	84,854
Colorado	70,300	42,180	56,240	84,360
Connecticut	92,205	55,323	73,764	110,646
Delaware	76,288	45,773	61,030	91,546
Dist of Columbia	50,248	30,149	40,198	60,298
Florida	62,269	37,361	49,815	74,723
Georgia	64,427	38,656	51,542	77,312
Hawaii	79,240	47,544	63,392	95,088
Idaho	52,470	31,482	41,976	62,964
Illinois	72,368	43,421	57,894	86,842
Indiana	64,564	38,738	51,651	77,477
Iowa	65,575	39,345	52,460	78,690
Kansas	64,929	38,957	51,943	77,915
Kentucky	54,992	32,995	43,994	65,990
Louisiana	55,945	33,567	44,756	67,134
Maine	64,806	38,884	51,845	77,767
Maryland	89,608	53,765	71,686	107,530
Massachusetts	85,420	51,252	68,336	102,504
Michigan	71,542	42,925	57,234	85,850
Minnesota	77,395	46,437	61,916	92,874
Mississippi	47,726	30,000	38,181	57,271
Missouri	63,847	38,308	51,078	76,616
Montana	55,641	33,385	44,513	66,769
Nebraska	64,800	38,880	51,840	77,760
Nevada	61,777	37,066	49,422	74,132
New Hampshire	81,522	48,913	65,218	97,826
New Jersey	90,261	54,157	72,209	108,313
New Mexico	48,223	30,000	38,578	57,868
New York	72,170	43,302	57,736	86,604
North Carolina	59,481	35,689	47,585	71,377
North Dakota	59,926	35,956	47,941	71,911
Ohio	66,734	40,040	53,387	80,081
Oklahoma	53,138	31,883	42,510	63,766
Oregon	61,945	37,167	49,556	74,334
Pennsylvania	68,646	41,188	54,917	82,375
Rhode Island	78,297	46,978	62,638	93,956
South Carolina	57,932	34,759	46,346	69,518
South Dakota	61,309	36,785	49,047	73,571
Tennessee	56,874	34,124	45,499	68,249
Texas	57,511	34,507	46,009	69,013
Utah	57,999	34,799	46,399	69,599
Vermont	71,382	42,829	57,106	85,658
Virginia	77,430	46,458	61,944	92,916
Washington	72,103	43,262	57,682	86,524
West Virginia	52,292	31,375	41,834	62,750
Wisconsin	71,064	42,638	56,851	85,277
Wyoming	62,933	37,760	50,346	75,520
National Total <sup>3</sup>	70,312	42,187	56,250	84,374

1. Source: <http://aspe.hhs.gov/poverty/06poverty.shtml>; federal maximum standard: max (150% FPL, 60% state median income).  
 2. Source for all state-by-state data: <http://www.census.gov/hhes/www/income/statemedfaminc.html>  
 3. Source: <http://www.census.gov/hhes/www/income/histinc/f08ar.html>

## INTEGRATING INCOME, GREENHOUSE GAS EMISSIONS AND ENERGY EFFICIENCY<sup>4</sup>

The lower-income residential sector is an important component of the residential sector. Households with income of up to 80 percent of the median make up approximately 43 percent of the U.S. population as shown in Figure 1, and consume 36 percent of total energy in the residential sector.<sup>5</sup> Households with incomes of more than 120 percent of the median represent 38 percent of U.S. households and consume 45 percent of energy in the residential sector.



The relationship between greenhouse gas emissions and income is almost identical to that for energy.<sup>6</sup> Lower income households, again representing 43 percent of the population, are responsible for approximately 36 percent of greenhouse gas emissions. Higher-income households, representing 38 percent of the U.S. population, are responsible for approximately 45 percent of greenhouse gas emissions. Figure 2 displays estimated carbon dioxide emissions by income group.<sup>7</sup> Figure 3 shows average household residential carbon emissions by income group and region.

4. Additional supporting tables are displayed in the Appendix to this report.

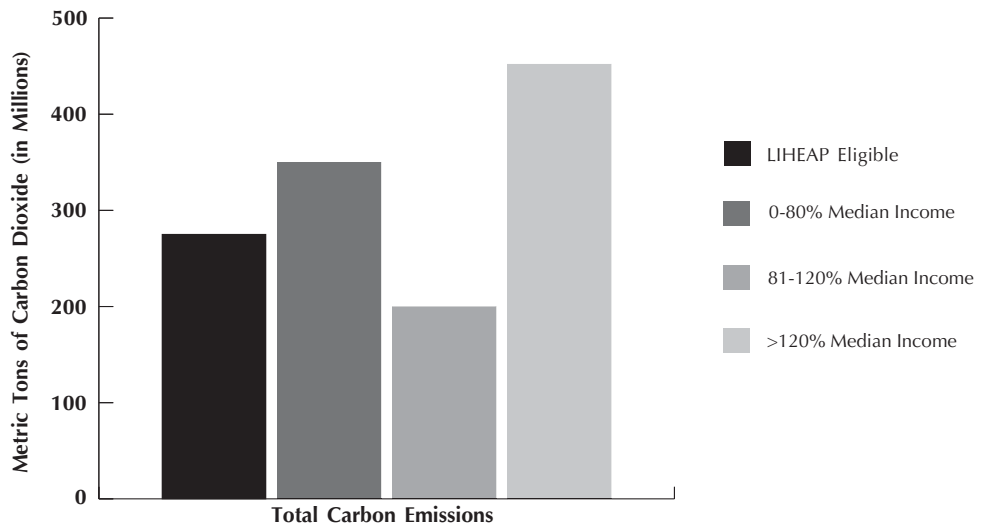
5. This percentage varies from 30 percent in the Midwest to about 40 percent in the Northeast and the West regions.

6. Estimated carbon dioxide emissions were calculated using the following data sources and methods. Energy usage by state, residency status and income level were derived from the 2001 U. S. Department of Energy's Energy Information Administration (EIA) Residential Energy Consumption Survey (RECS). The analysis used additional RECS data to calculate the percentage of fuel by region. RECS provides fuel usage by region for the following fuels: kerosene, electricity, natural gas, fuel oil and LPG.

Using regional fuel distributions, the paper estimates fuel use by state, residency status and income level. The estimates in the paper assume that individual states within each Census region consume the same percentage of each fuel as the region as a whole, and that fuel use distributions are identical across residency status and income level. Carbon emissions by state, residency status and income level were calculated using emission factors from EIA for kerosene, natural gas, fuel oil and LPG, and state level emissions factors for electricity from EIA. Household data used to estimate per household emissions of carbon dioxide were obtained from the U.S. Census Bureau.

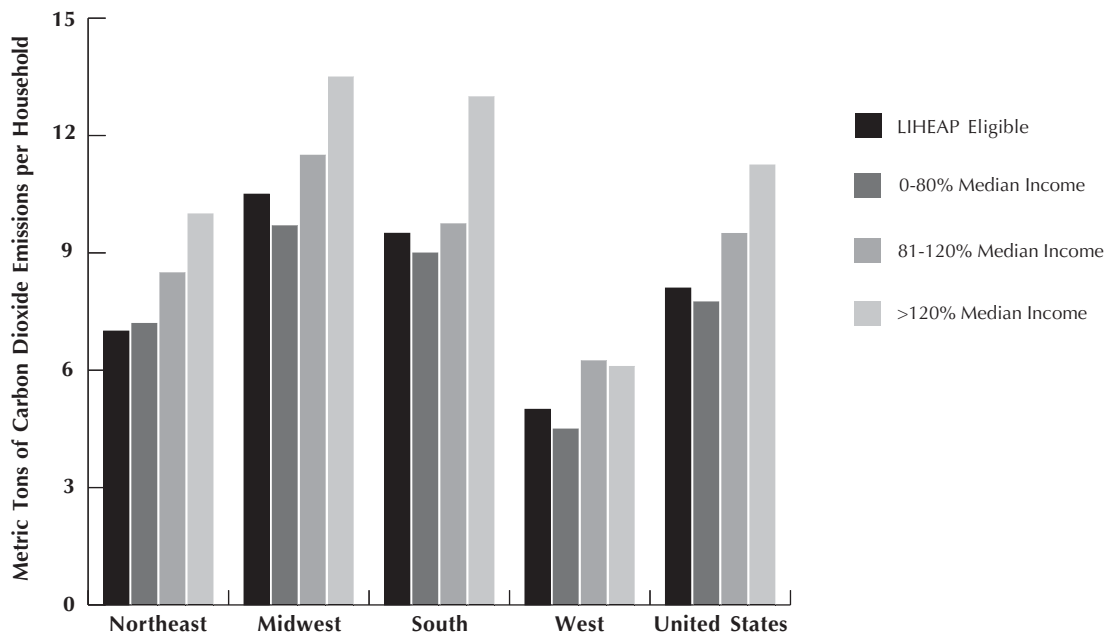
7. Emissions attributable to region and income group were calculated by applying that sector's percentage of total energy usage to the total residential carbon dioxide emissions for the United States.

**Figure 2. Residential Carbon Emissions by Income Group**



Source: 2001 RECS. Emissions attributed to income group were calculated by applying that sector's percentage of total energy usage to the total residential carbon dioxide emissions for the United States.

**Figure 3. Average Residential Carbon Emissions by Income Group and Region**



Source: 2001 RECS. Emissions attributed to income group were calculated by applying that sector's percentage of total energy usage to the total residential carbon dioxide emissions for the United States.

Appendix Table 6 details residential energy usage and emissions by state and income group. The table shows, for example, that households in New York use 7 percent of total residential energy consumption and account for 52 million metric tons of carbon dioxide emissions. Households in New York with income below 80 percent of the median are responsible for 21 million metric tons of carbon dioxide emissions.

Two important points emerge from Figures 1, 2 and 3 as well as Appendix Table 6: 1) lower-income households use less energy per household than higher-income households and 2) higher-income households, while smaller in number, use more energy and generate more greenhouse gas emissions in total than lower-income households.

Figures 4 and 5 describe two other important factors: 1) the size of lower-income and higher-income families' homes and 2) the energy use per square foot in those homes. Figure 4 shows that one reason for the lower energy use by lower-income households is that they occupy smaller residences. Households with income below 80 percent of the median live in homes that average 1,480 square feet, compared to households with income above 120 percent of the median which occupy homes that average over 2,700 square feet.

Homes in the Midwest are largest for both groups, averaging over 1,650 square feet for households with income below 80 percent of the median and over 3,160 square feet for households with income above 120 percent of the median.

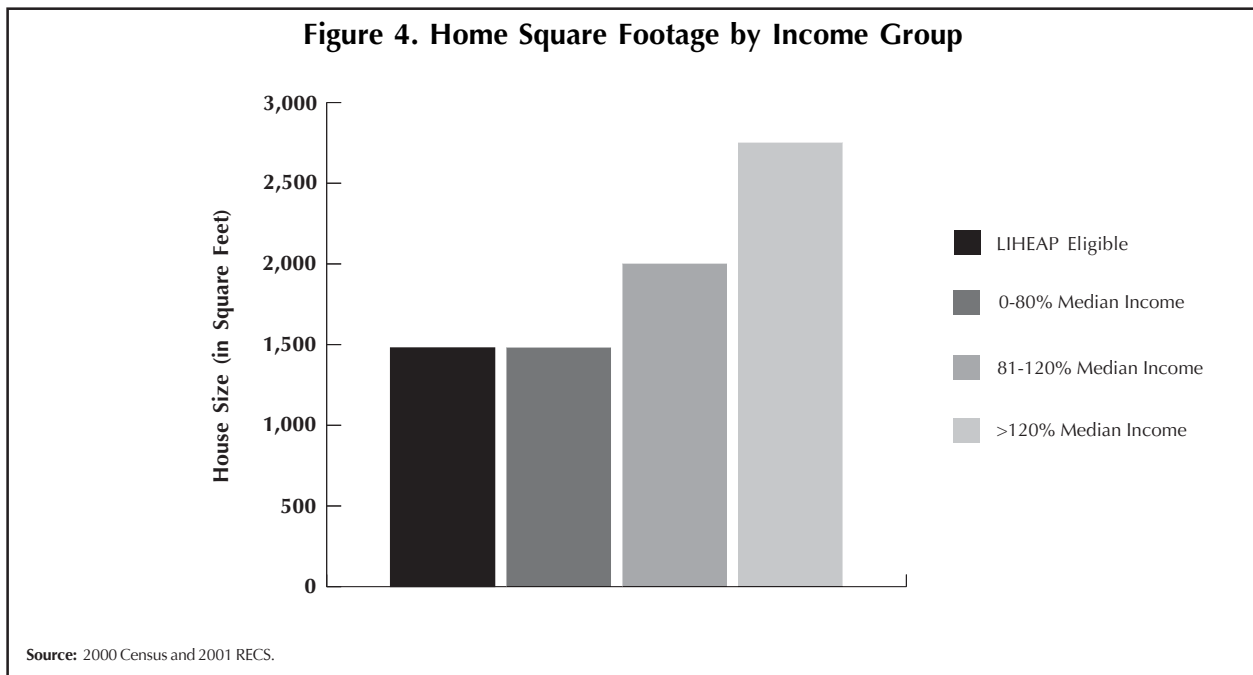
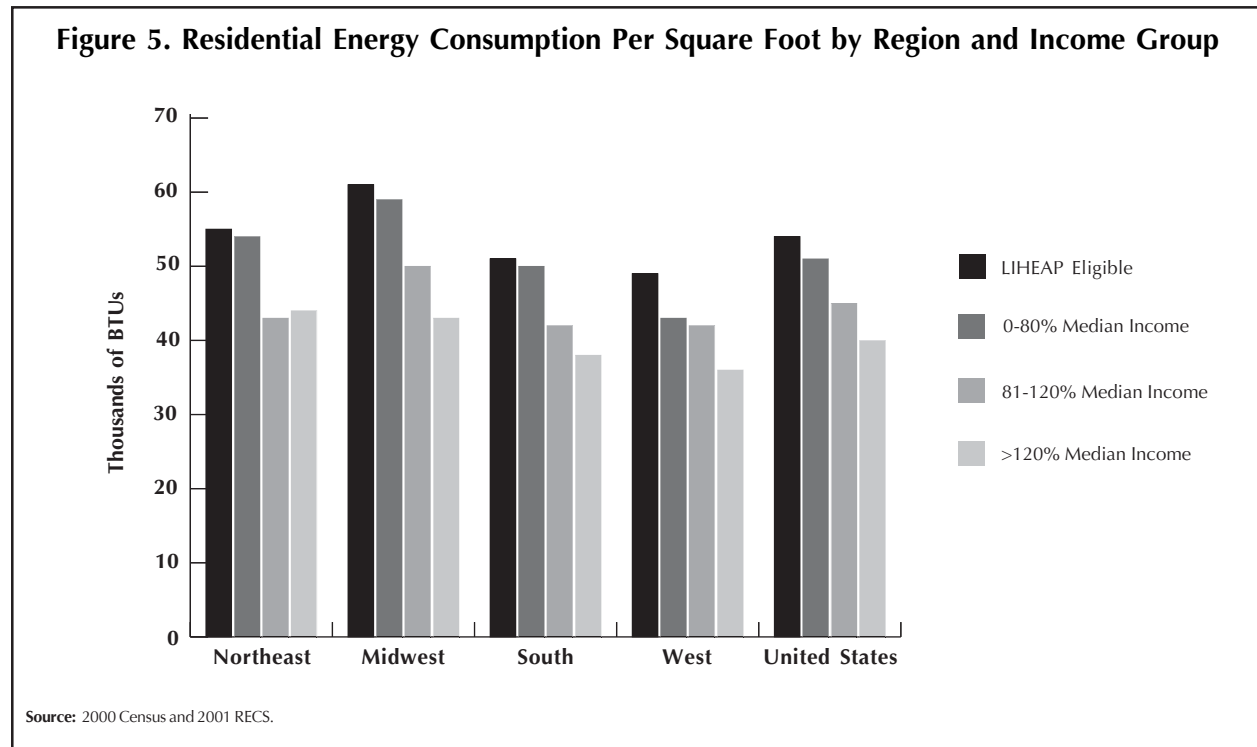


Figure 5 shows that while lower-income households consume less energy per household than higher-income households, they use more energy per square foot of living space. Households with income below 80 percent of median income consume 28 percent more energy per square foot of living space than households with income above 120 percent of median income. The difference is even greater in the Midwest where

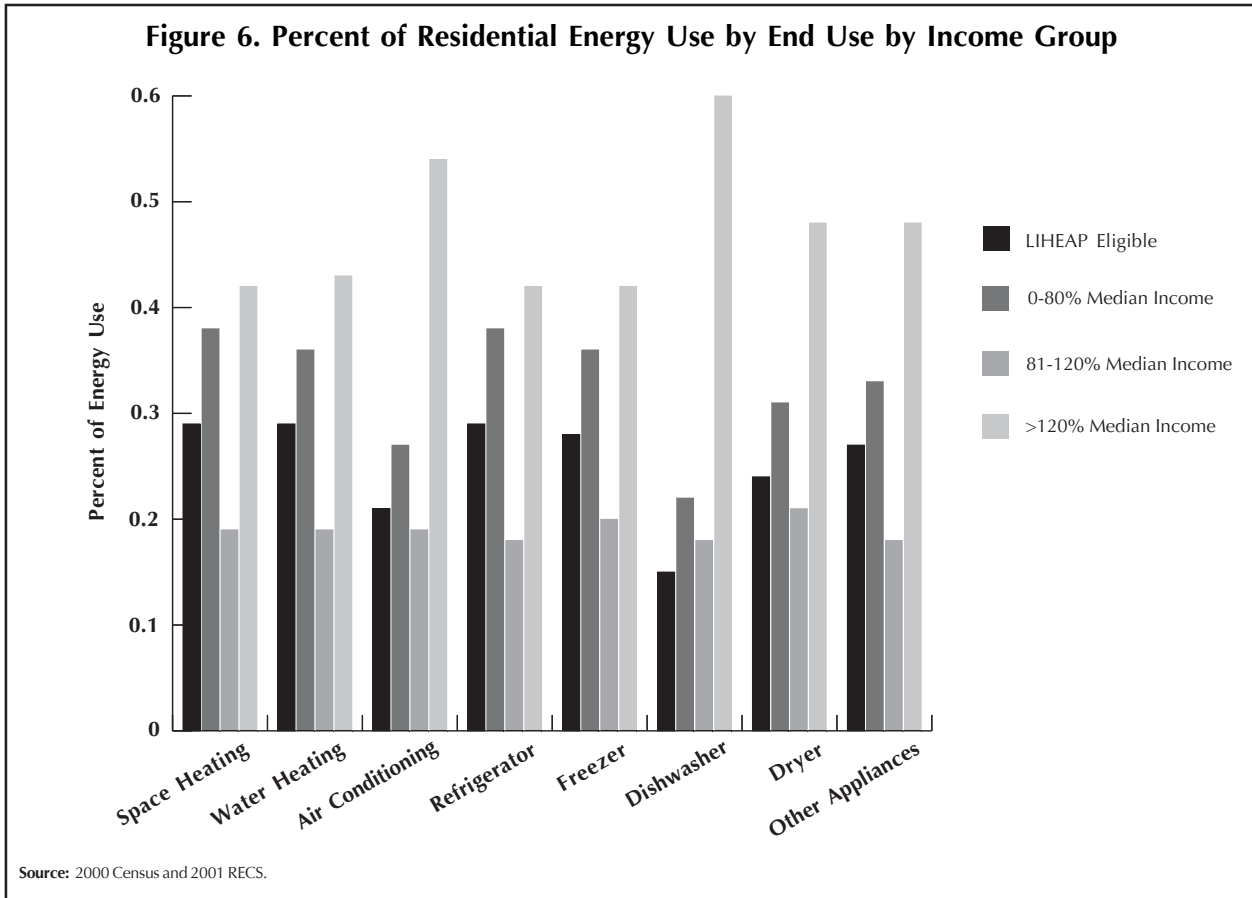
households with incomes below 80 percent of state median income consume 37 percent more per square foot of living space than households with income above 120 percent of median income.



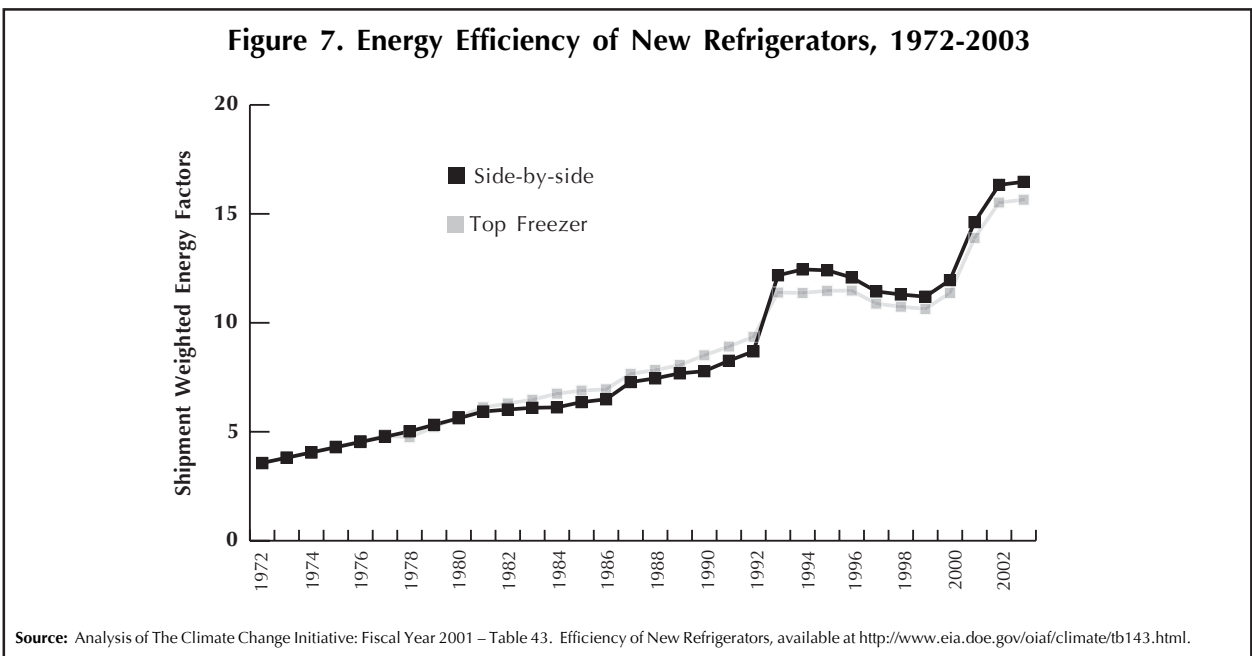
Data show that lower-income families use more energy per square foot than higher-income families for a number of reasons. Lower-income households tend to be older, less-well insulated and constructed with lower-quality windows than higher-income homes. Appliances in lower-income households tend to be somewhat older as well and older appliances tend to be less energy efficient. Space heating systems also tend to be somewhat older in lower-income households. The combination of these features—somewhat older appliances, older and less-well insulated homes, and older and less-efficient furnaces—together account for much of the higher per square foot energy use in lower-income households.

Appendix Table 9 shows that while 45 percent of households with incomes below 80 percent of the median have homes that are older than 50 years, only 30 percent of those with income above 120 percent of the median live in such older homes.

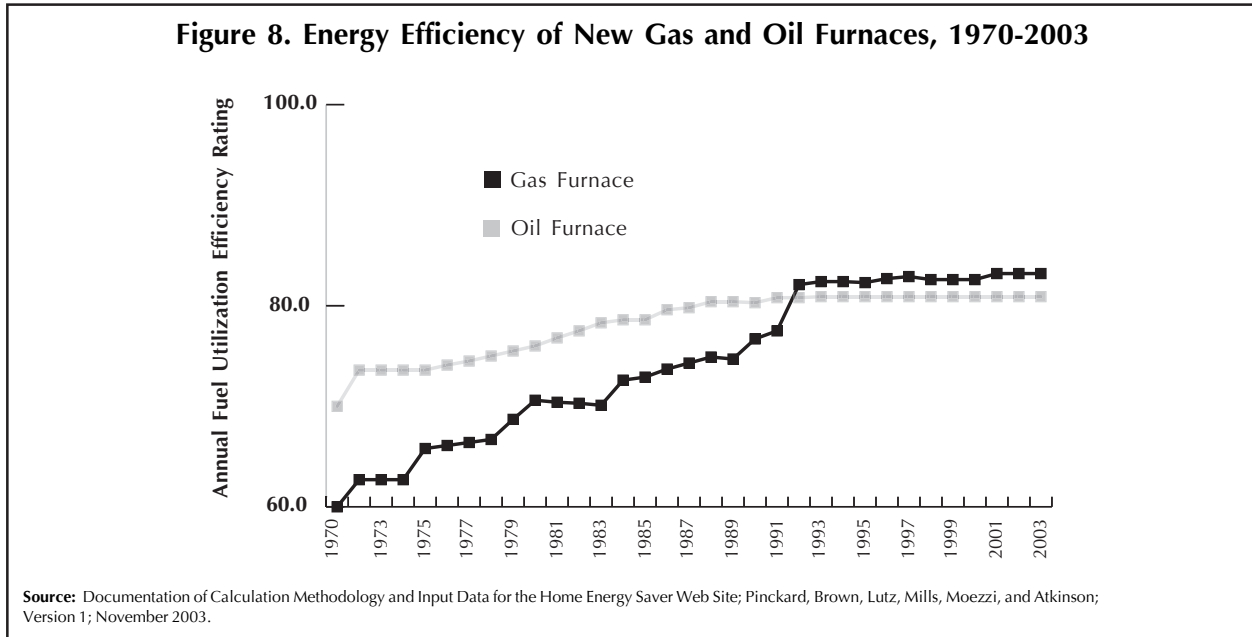
Energy usage varies between higher- and lower-income families inside the home as well. In general, lower-income families' energy use is concentrated in space and water heating as well as refrigeration. Dishwashers, air conditioners, and dryers are less common. Figure 6 shows that while lower-income households consume about 38 percent of the total energy used for space heating, water heating, and refrigerator and freezer usage, they consume only 22 percent of energy used by dishwashers, 27 percent of energy used by air conditioners, and 31 percent of energy used by dryers. Households with income above 120 percent of the median consume 60 percent of the energy used by dishwashers and 54 percent of the energy used by air conditioning.



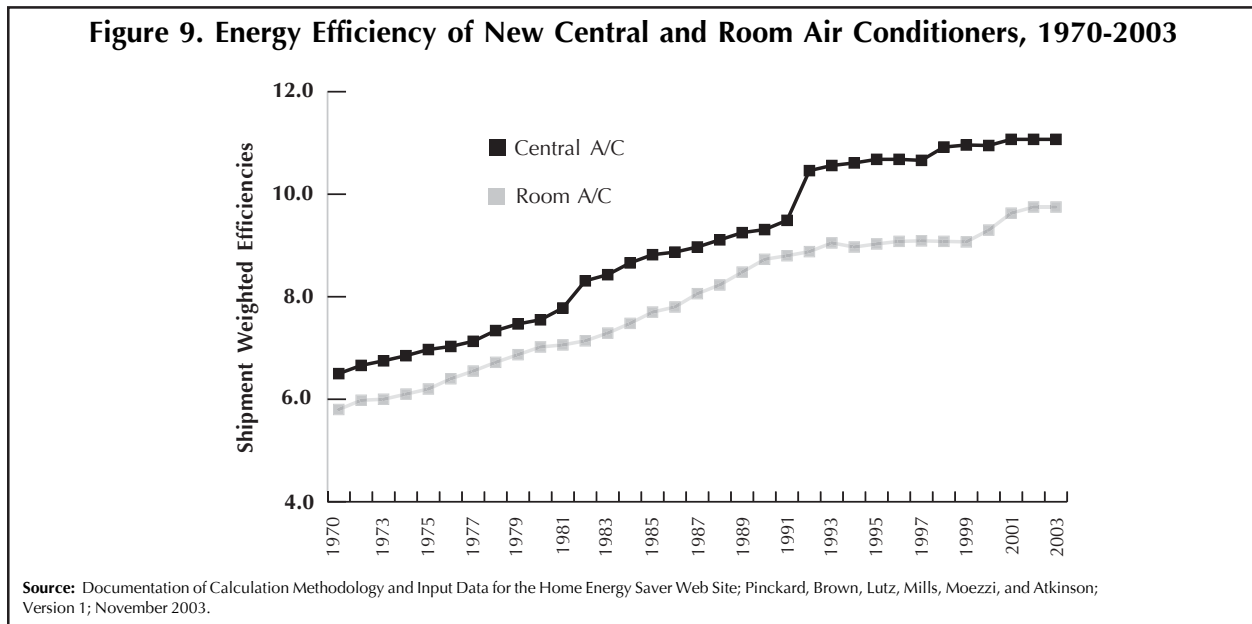
Appliances have become more efficient over the past 20 years, as technologies have improved and appliance energy efficiency standards have been ratcheted up. The clearest example is probably with refrigerators. Figure 7 shows how the energy efficiency of new refrigerators has increased from 1972 through 2003.



The efficiency of heating and air conditioning systems has also improved. Efficiency for furnaces is measured as AFUE, or Annual Fuel Utilization Efficiency Rating, which measures the seasonal or annual efficiency of the furnace. Figure 8 shows that gas furnaces have increased in efficiency levels by 40 percent between 1970 and 2003 and oil furnaces have increased efficiency by 15 percent in that period.

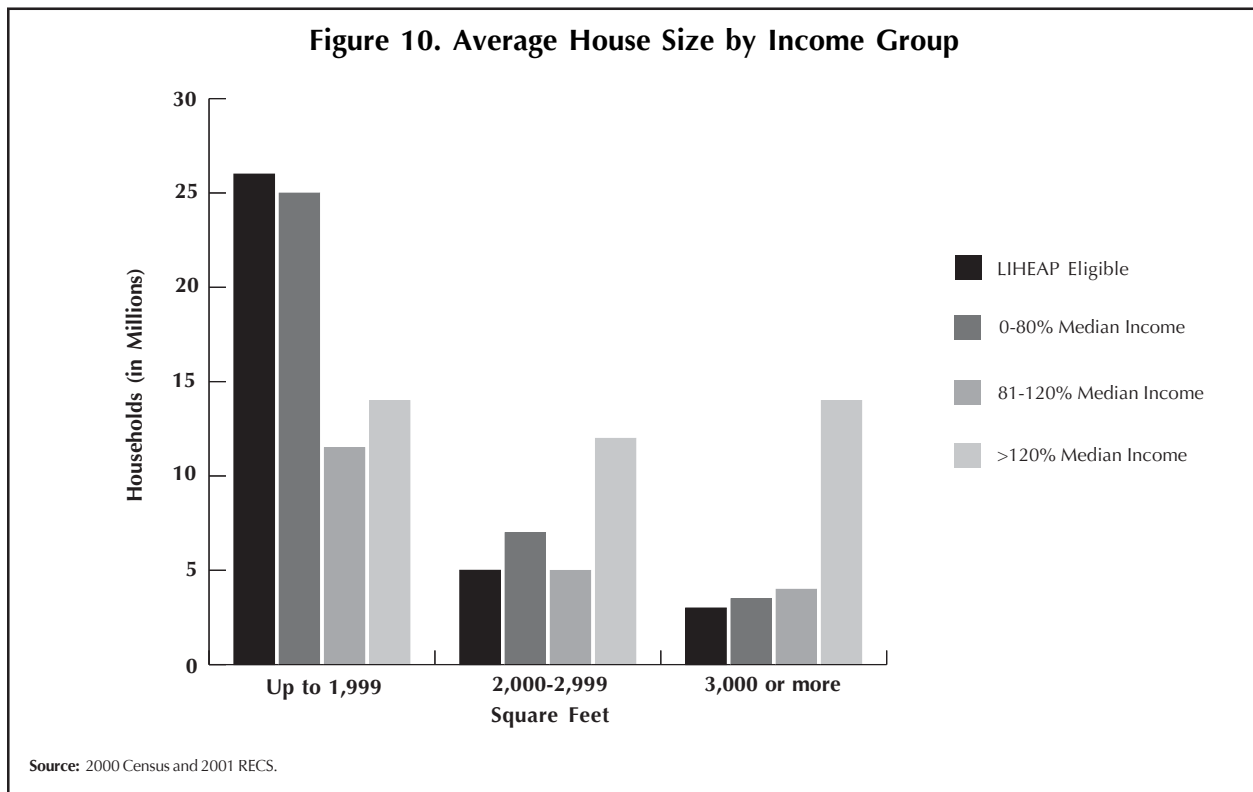


The cooling efficiency for central air conditioners is rated by the seasonal efficiency of the equipment, or SEER. Room air conditioners are rated by energy efficiency ratio, or EER, which is the ratio of the cooling equipment (in BTU) divided by the energy consumption (in watt-hours). Figure 9 shows that central air conditioners have increased in efficiency by 47 percent between 1970 and 2003, and room air conditioner efficiency has increased by 68 percent in the same period.



Appendix Table 10 shows that almost 60 percent of households with incomes below 80 percent of the state median have heating systems that are older than 10 years, compared to just under 50 percent of households with income above 120 percent of the median. Thirty-six percent of households with income below 80 percent of the state median income have heating equipment that is more than 15 years old, while only 22 percent of households with income above 120 percent of median income have heating equipment of similar age. Comparable differences exist for window air conditioners.

While appliances and heating and cooling systems have become more efficient, home size has increased, resulting in greater energy use in residences. Figure 10 illustrates average house size by income group.



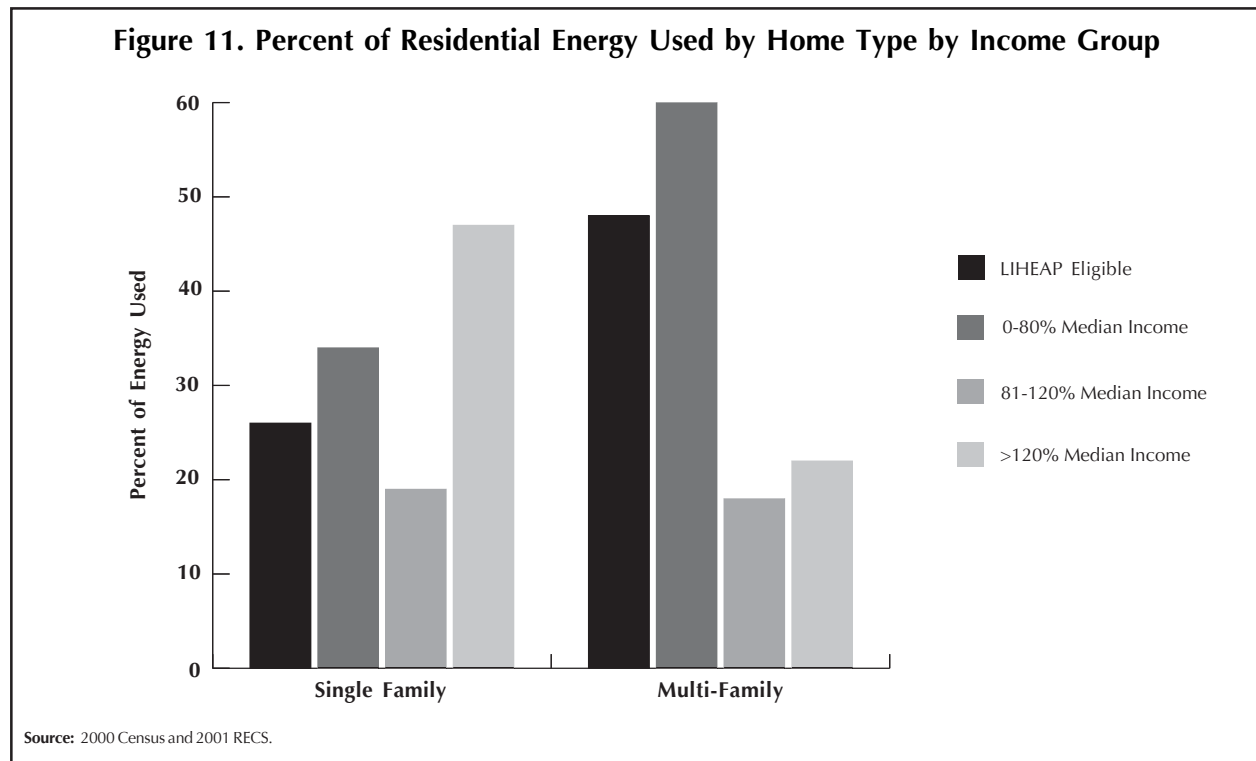
This data on home energy use fits into a larger context of national average figures. Notably, 86 percent of all home energy use falls into one of five categories: space heating or air conditioning; lighting; water heating; refrigeration; and electronics.

The conclusion from this analysis is that lower-income households have great opportunities to be more energy efficient and to reduce their share of greenhouse gas emissions. In one sense, the lower-income sector represents a market with a great deal of potential; the opportunities to reduce energy consumption and greenhouse gas emissions in the lower-income sector are significant on a per-square-foot basis.

### **Energy Use and Greenhouse Gas Emissions: Distinctions Between Single and Multi-Family Homes and Between Renters and Owners**

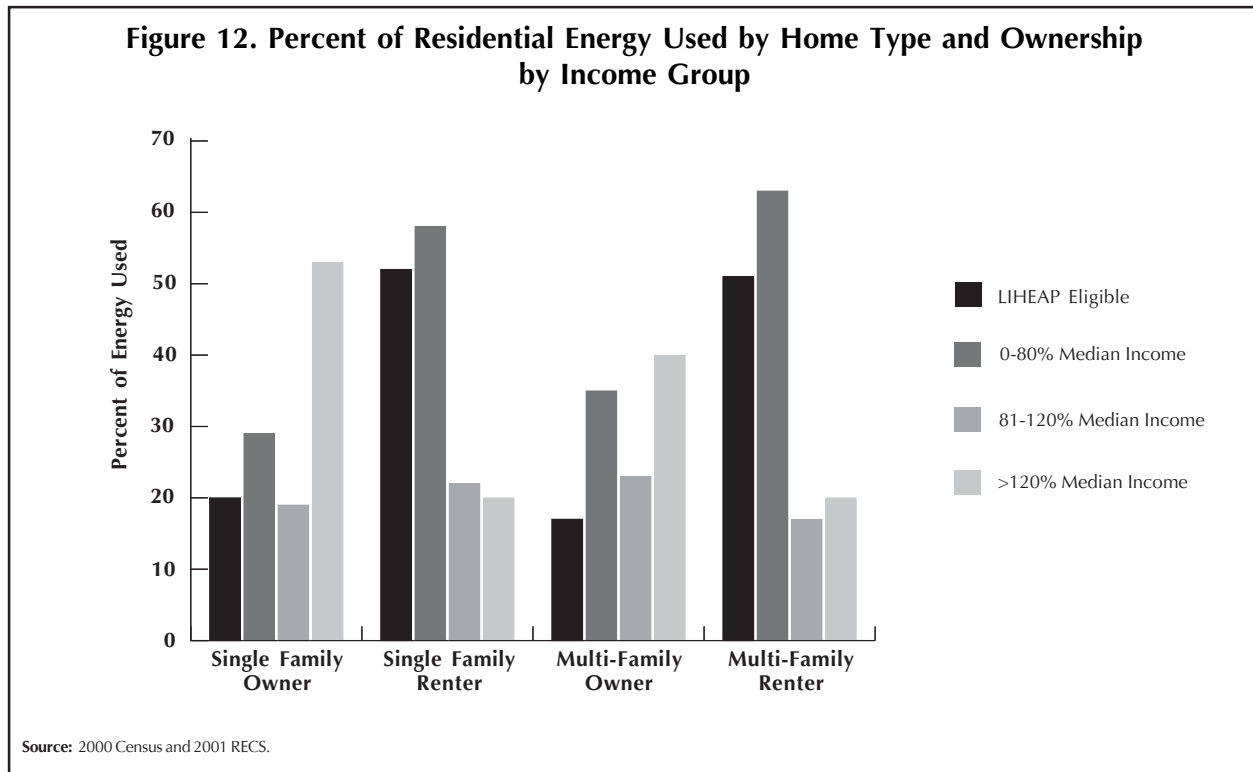
In addition to income, it is important to look at other factors that typically go along with income: do families rent or own their homes and do families live in single- or multi-family buildings? The design of energy efficiency programs for multi-family buildings is very different than from that of single-family homes. Several differences between the two markets exist; in particular: energy efficiency programs for multi-family buildings require interaction not only with residents, but also with developers and building managers, and; the financing process for lower income multi-family buildings is largely confined to that market.

The majority of multi-family building occupants are lower-income families, and lower-income families use the majority of the energy consumed in these buildings. The reverse is true for single-family homes. Figure 11 shows that households with income of up to 80 percent of median income consume 34 percent of the energy used in single-family homes and 60 percent of the energy used in multi-family homes. By comparison, households with income above 120 percent of the median consume 47 percent of the energy used in single-family homes and only 22 percent of the energy used in multi-family homes.



Renters are also more difficult to serve with energy efficiency programs, as the incentives are split between the owners and the occupants. When tenants pay the energy bills in their residences, landlords do not have an incentive to make efficiency improvements outside of common areas. Tenants do not have an incentive to make energy efficiency improvements because they do not know how long they will live in the home. Landlords that serve lower-income households often make only limited investments in homes that are rented, because it is uncertain as to whether the next tenant will be lower-income; lower-income tenants

often pay subsidized or capped rents that make it hard for the landlord to earn a fast payback on those investments. Figure 12 shows that households with income of up to 80 percent of median consume 58 percent of rented single-family homes' energy consumption and 63 percent of rented multi-family homes' energy consumption. This compares to their consumption of only 29 percent of total energy among owned single-family residences and 35 percent of owned multi-family residences.



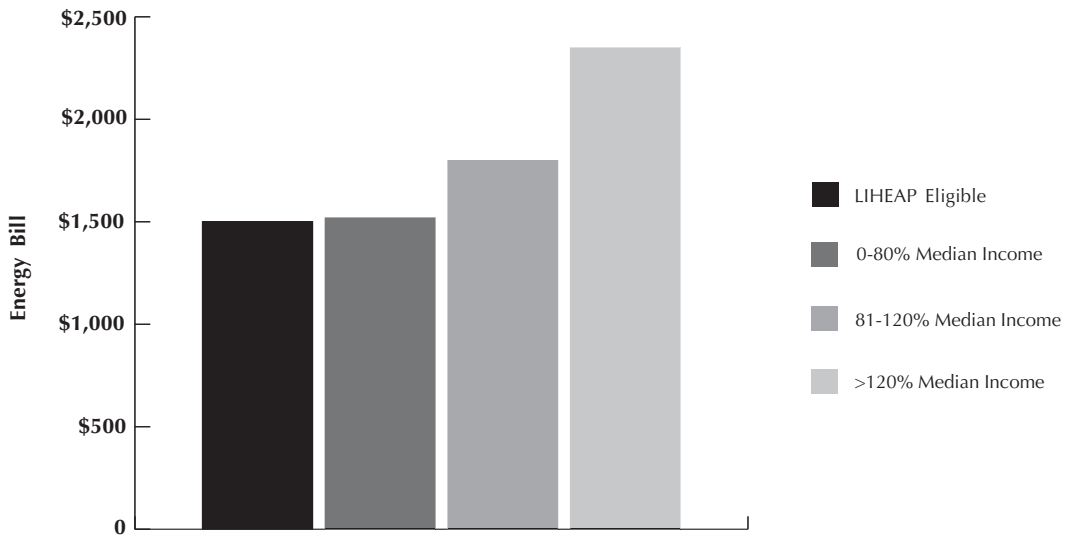
## POLICY IMPLICATIONS

This paper has linked data on greenhouse gas emissions, residential energy consumption and family income. This data shows the relationships among these three areas, and implies important directions on policy. One of the most important general concepts is that policies that address greenhouse gases or residential energy consumption must be market driven—and household income is one of the primary factors in defining residential energy efficiency markets. What works for higher-income families may not work for lower-income families, and what works for lower-income families is often inapplicable to higher-income families.

Energy represents a more significant income burden for lower-income families than higher-income families, straining their ability to maintain home ownership and threatening the viability of multi-family housing. Households with income below 80 percent of the median devoted 8 percent of their income to paying their energy bills (an average of \$1,542 per year) while higher-income households devoted only 2 percent of their income to paying energy bills. This was true, although their bills were close to 50 percent higher than those of average lower-income household, \$2,317. Figures 13 and 14 illustrate this point. This data leads to a fundamental conclusion about the difference between energy efficiency programs for lower- and for higher-

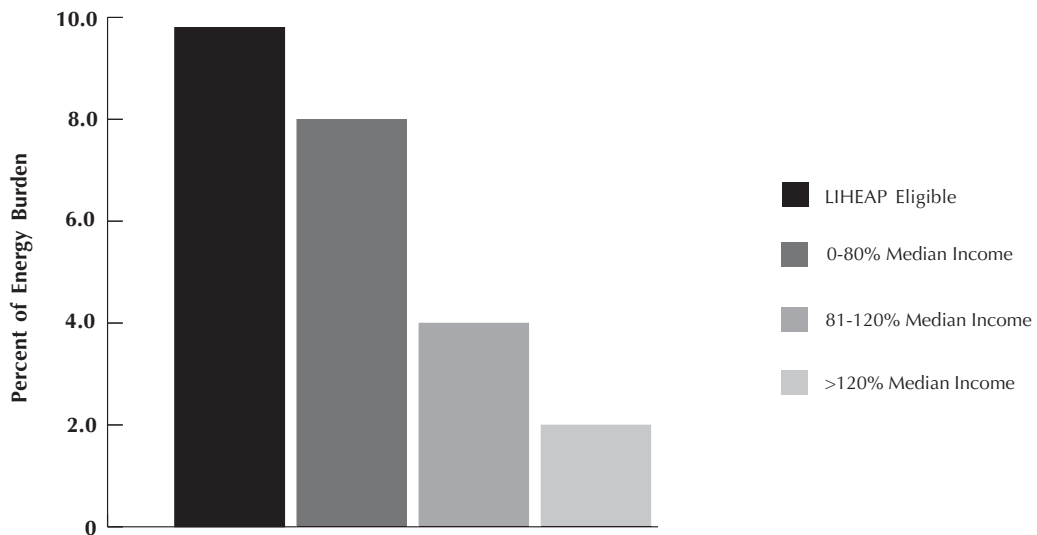
income markets: financial assistance is almost a necessity for the lower-income groups whereas it may not always be necessary for higher-income groups.

**Figure 13. Mean Residential Energy Bill by Income Group**



Source: 2000 Census and 2001 RECS.

**Figure 14. Mean Residential Energy Burden by Income Group**



Source: 2000 Census and 2001 RECS.

Federal and state governments as well as utilities have achieved some measure of energy savings through three decades of grants, subsidized loans, and tax credits programs. Voluntary programs such as EPA's Energy Star program have also had an impact on energy efficiency; builders construct 10 percent of all new homes to Energy Star standards, a cumulative total of 750,000 homes as of 2007.

Nonetheless, the total number of households in the United States exceeds 100 million. Energy efficiency programs must find a way to move quickly into the mainstream of housing finance so that home retrofits and new homes have incentives, financing, information, and standards that make energy efficiency the norm instead of the exception.

A new energy efficiency program that targets households by their income and energy-savings potential could make a significant difference in the nation's ability to achieve these goals. The needs and opportunities of higher- and lower-income households differ, and programs should be targeted to each of these markets. Many programs that are appropriate for higher-income households—loans, grants, rebates, education and technical assistance—are also appropriate for the lower-income population. However, lower-income programs also have an opportunity to leverage federal and state programs designed to make housing more affordable, including tax-exempt mortgage bonds, low-income housing tax credits, weatherization grants, and other sources of funding that support lower-income and first-time homebuyer housing.

This effort should involve at least the following:

- Developing and adopting a new energy efficiency mortgage product designed to offer an alternative to conventional mortgages for all households. For lower-income households, the product would include weatherization and interest rate subsidies, thereby making home ownership more affordable for them. This is important because home ownership rates are high across all income sectors, although highest for upper-income families.
- Requiring energy efficiency measures as a condition of federal and state first-time homebuyer programs that are financed from the proceeds of tax-exempt bonds. In 2005, close to \$10 billion in proceeds from tax-exempt bonds helped approximately 87,000 families to buy their first home and \$3.3 billion in tax-exempt bonds supported construction or rehabilitation of 33,000 multi-family buildings.
- Either requiring multi-family developers to meet high energy efficiency standards as a prerequisite for receiving funds from the proceeds of the Low Income Housing Tax Credit (LIHTC) program and tax-exempt bonds, or setting high and specific standards in the Qualified Allocation Plans that states use to distribute this Low Income Housing Tax Credit benefit to housing developers. Between 70,000 and 100,000 units are built or renovated annually using LIHTC proceeds.
- Establishing new and coordinated programs that link state energy efficiency funding to state housing finance funding—supplementing housing finance funding with an additional pool of money that could be applied to reducing the incremental cost of energy efficiency measures in lower-income households.

- Maintaining core funding for the federal programs that can help to sustain lower-income home ownership. This is especially important for very-low-income households who have fewer resources available to pay back loans, even when subsidized. These programs include the federal Weatherization Assistance and Low Income Home Energy Assistance, Lead Hazard Control, HOME and Community Development Block Grant programs, as well as state public benefit-supported weatherization and energy assistance programs.
- Supporting energy efficiency mortgage lending and provide subsidies for lower-income families.

Please see the following EPC papers for further detail on residential energy efficiency financing options:

- *State Residential Energy Efficiency Loan Programs*
- *The New Energy Efficient Mortgage: An Innovative Financial Tool for Energy Efficiency*
- *State-Sponsored Energy Efficiency Grant, Loan and Tax Credit Programs*
- *Energy Efficiency in Multi-Family Housing: A Profile and Analysis*

Copies of these reports can be downloaded from the EPC website at: [www.energyprograms.org](http://www.energyprograms.org).

APPENDIX. SUPPORTING TABLES

	<b>Number of Households</b>	<b>Percent of Total</b>
<b>All Households</b>	106,989,274	100.0%
<b>LIHEAP Eligible</b>	33,804,801	31.6%
<b>0-80% Median Income</b>	46,110,439	43.1%
<b>81%-120% Median Income</b>	20,581,879	19.2%
<b>&gt;120% Median Income</b>	40,296,956	37.7%

Source: 2000 Census and 2001 RECS

	<b>All</b>	<b>LIHEAP Eligible</b>		<b>0-80% Median Income</b>		<b>81-120% Median Income</b>		<b>&gt;120% Median Income</b>	
	<b>Average Usage</b>	<b>Average Usage</b>	<b>Percentage</b>	<b>Average Usage</b>	<b>Percentage</b>	<b>Average Usage</b>	<b>Percentage</b>	<b>Average Usage</b>	<b>Percentage</b>
Northeast	106,569	88,154	82.7%	89,159	83.7%	107,256	100.6%	128,437	120.5%
Midwest	116,738	106,060	90.9%	98,106	84.0%	114,293	97.9%	137,180	117.5%
South	82,507	71,157	86.2%	68,307	82.8%	75,925	92.0%	100,391	121.7%
West	70,132	60,512	86.3%	58,480	83.4%	71,130	101.4%	85,898	122.5%
United States	92,202	79,915	86.7%	76,116	82.6%	91,365	99.1%	111,037	120.4%

Source: 2001 RECS

	<b>All</b>	<b>0-80% Median Income</b>		<b>81-120% Median Income</b>		<b>&gt;120% Median Income</b>	
	<b>Total Usage</b>	<b>Total Usage</b>	<b>Percentage</b>	<b>Total Usage</b>	<b>Percentage</b>	<b>Total Usage</b>	<b>Percentage</b>
Northeast	2,158,411	887,273	41.1%	263,420	12.2%	1,007,718	46.7%
Midwest	2,859,088	868,491	30.4%	772,690	27.0%	1,217,906	42.6%
South	3,212,336	1,092,014	34.0%	569,033	17.7%	1,551,289	48.3%
West	1,634,797	661,960	40.5%	275,317	16.8%	697,520	42.7%
United States	9,864,631	3,509,739	35.6%	1,880,460	19.1%	4,474,433	45.4%

Source: 2001 RECS

**Table 4. Estimated Carbon Dioxide Emissions by Region and Income Group  
(in million metric tons of Carbon Dioxide)**

	All	0-80% Median Income		81-120% Median Income		>120% Median Income	
	Carbon Emissions	Carbon Emissions	Percentage	Carbon Emissions	Percentage	Carbon Emissions	Percentage
Northeast	168	69	41.3%	20	12.2%	78	46.6%
Midwest	286	87	30.4%	77	27.0%	122	42.6%
South	419	143	34.1%	73	17.4%	203	48.4%
West	131	54	40.8%	25	19.4%	52	39.8%
United States	1,005	353	35.1%	196	19.5%	456	45.4%

**Source:** 2001 RECS

**Table 5. Estimated Per-Household Carbon Dioxide Emissions by Region and Income Group  
(in metric tons of Carbon Dioxide)**

	All	0-80% Median Income		81-120% Median Income		>120% Median Income	
	Per Household Carbon Emissions	Per Household Carbon Emissions	Percentage	Per Household Carbon Emissions	Percentage	Per Household Carbon Emissions	Percentage
Northeast	8.3	7.0	84.0%	8.3	100.3%	10.0	120.4%
Midwest	11.7	9.8	84.1%	11.4	97.7%	13.7	117.5%
South	10.8	8.9	83.1%	9.7	90.5%	13.1	122.1%
West	5.6	4.7	84.1%	6.6	116.6%	6.4	114.3%
United States	9.4	7.7	81.5%	9.5	101.4%	11.3	120.4%

**Source:** 2001 RECS

**Table 6. Total Energy Usage by Income Group by Size**  
(total usage in billions BTU, emissions in million metric tons)

State	ALL Households				LIHEAP Eligible Households			
	Number of Households	Total Usage	Carbon Dioxide Emissions	Percent	Number of Households	Total Usage	Carbon Dioxide Emissions	Percent
Alabama	1,792,611	154,188	19.30	1.6%	622,088	44,489	5.57	0.6%
Alaska	222,025	14,639	1.55	0.1%	65,937	3,009	0.32	0.0%
Arizona	1,905,046	166,162	14.70	1.7%	717,588	59,739	5.29	0.5%
Arkansas	1,066,480	97,486	12.02	1.0%	347,059	32,874	4.05	0.4%
California	12,347,204	768,799	49.80	7.8%	3,585,548	180,780	11.71	1.2%
Colorado	1,661,482	144,918	19.61	1.5%	648,018	53,947	7.30	0.7%
Connecticut	1,306,474	150,600	11.53	1.5%	375,907	37,398	2.86	0.3%
Delaware	306,398	26,335	4.36	0.3%	94,795	6,750	1.12	0.1%
District of Columbia	254,707	21,892	2.83	0.2%	70,038	4,987	0.65	0.1%
Florida	6,327,945	367,419	48.32	3.7%	1,353,049	64,707	8.51	0.8%
Georgia	3,083,474	265,025	34.26	2.7%	1,077,911	76,756	9.92	1.0%
Hawaii	404,014	26,637	3.23	0.3%	117,445	5,360	0.65	0.1%
Idaho	470,564	41,044	1.39	0.4%	175,336	14,597	0.49	0.0%
Illinois	4,551,025	541,326	44.84	5.5%	1,379,866	151,219	12.53	1.2%
Indiana	2,315,570	275,428	32.28	2.8%	692,796	75,923	8.90	0.9%
Iowa	1,135,456	126,762	13.93	1.3%	333,029	32,579	3.58	0.4%
Kansas	1,025,410	114,477	11.73	1.2%	311,754	30,498	3.12	0.3%
Kentucky	1,641,497	141,190	25.35	1.4%	547,171	39,131	7.02	0.7%
Louisiana	1,693,827	154,831	17.75	1.6%	547,401	51,851	5.95	0.6%
Maine	520,113	59,954	4.41	0.6%	147,448	14,669	1.08	0.1%
Maryland	2,031,663	174,621	22.61	1.8%	590,601	42,056	5.44	0.5%
Massachusetts	2,452,599	282,716	24.74	2.9%	739,096	73,532	6.44	0.6%
Michigan	3,752,062	446,293	43.97	4.5%	1,168,397	128,044	12.62	1.3%
Minnesota	1,872,338	209,028	20.14	2.1%	546,810	53,492	5.15	0.5%
Mississippi	1,079,886	92,884	11.50	0.9%	379,793	27,161	3.36	0.3%
Missouri	2,168,203	242,058	26.22	2.5%	688,481	67,351	7.30	0.7%
Montana	359,369	31,345	3.42	0.3%	116,347	9,686	1.06	0.1%
Nebraska	658,173	73,478	6.74	0.7%	193,155	18,896	1.73	0.2%
Nevada	752,634	65,646	7.45	0.7%	270,503	22,519	2.56	0.3%
New Hampshire	476,358	54,911	3.74	0.6%	125,075	12,444	0.85	0.1%
New Jersey	3,034,896	325,918	22.45	3.3%	1,052,245	92,208	6.35	0.6%
New Mexico	679,297	59,250	8.31	0.6%	248,744	20,708	2.90	0.3%
New York	7,081,069	701,196	51.79	7.1%	2,512,114	205,076	15.15	1.5%
North Carolina	3,212,341	276,101	33.03	2.8%	1,111,765	79,167	9.47	0.9%
North Dakota	254,060	28,363	3.50	0.3%	69,556	6,804	0.84	0.1%
Ohio	4,406,315	524,114	55.99	5.3%	1,347,975	147,724	15.78	1.6%
Oklahoma	1,372,910	125,496	19.72	1.3%	426,118	40,362	6.34	0.6%
Oregon	1,336,283	88,104	4.17	0.9%	452,271	20,642	0.98	0.1%
Pennsylvania	4,730,633	508,023	44.28	5.1%	1,683,243	147,503	12.86	1.3%
Rhode Island	409,931	47,254	3.79	0.5%	117,855	11,725	0.94	0.1%
South Carolina	1,573,193	135,216	11.88	1.4%	543,000	38,666	3.40	0.3%
South Dakota	286,755	32,013	2.21	0.3%	89,129	8,719	0.60	0.1%
Tennessee	2,304,287	198,199	24.57	2.0%	775,241	55,442	6.87	0.7%
Texas	7,668,968	678,589	92.98	6.9%	2,536,921	179,909	24.65	2.5%
Utah	702,653	61,287	8.33	0.6%	260,760	21,708	2.95	0.3%
Vermont	241,522	27,841	1.30	0.3%	65,922	6,559	0.31	0.0%
Virginia	2,768,399	237,944	27.04	2.4%	822,444	58,565	6.65	0.7%
Washington	2,275,757	150,045	6.82	1.5%	746,450	34,068	1.55	0.2%
West Virginia	755,370	64,924	11.50	0.7%	239,761	17,073	3.02	0.3%
Wisconsin	2,066,043	245,748	24.78	2.5%	616,597	67,573	6.81	0.7%
Wyoming	193,987	16,920	2.49	0.2%	58,246	4,849	0.71	0.1%
<b>United States</b>	<b>106,989,274</b>	<b>9,864,633</b>	<b>1,004.64</b>	<b>100.0%</b>	<b>33,804,801</b>	<b>2,701,495</b>	<b>276.26</b>	<b>27.5%</b>

Source: 2000 Census and 2001 RECS

**Table 6 (continued). Total Energy Usage by Income Group by Size  
(total usage in billions BTU, emissions in million metric tons)**

State	0-80% Median Income				81-120% Median Income			
	Number of Households	Total Usage	Carbon Dioxide Emissions	Percent	Number of Households	Total Usage	Carbon Dioxide Emissions	Percent
Alabama	892,964	64,637	8.09	0.7%	217,838	17,313	2.17	0.2%
Alaska	112,553	5,692	0.60	0.1%	22,580	1,608	0.17	0.0%
Arizona	930,224	69,240	6.13	0.7%	548,775	45,843	4.06	0.5%
Arkansas	522,093	44,690	5.51	0.5%	167,432	12,969	1.60	0.1%
California	5,836,166	305,908	19.81	3.1%	1,459,192	79,182	5.13	0.8%
Colorado	817,527	60,852	8.23	0.6%	512,434	42,807	5.79	0.4%
Connecticut	563,347	53,557	4.10	0.5%	183,663	21,534	1.65	0.2%
Delaware	112,947	7,925	1.31	0.1%	79,391	6,541	1.08	0.1%
District of Columbia	125,380	8,797	1.14	0.1%	67,238	5,540	0.72	0.1%
Florida	2,007,985	83,892	11.03	0.9%	1,827,905	105,128	13.83	1.1%
Georgia	1,202,184	84,349	10.90	0.9%	716,022	58,996	7.63	0.6%
Hawaii	217,382	10,993	1.33	0.1%	36,834	2,623	0.32	0.0%
Idaho	232,537	17,309	0.59	0.2%	139,565	11,659	0.39	0.1%
Illinois	1,558,458	156,715	12.98	1.6%	1,340,245	156,972	13.00	1.6%
Indiana	787,381	79,177	9.28	0.8%	698,995	81,868	9.59	0.8%
Iowa	468,188	43,710	4.80	0.4%	261,023	27,614	3.03	0.3%
Kansas	409,116	38,195	3.91	0.4%	225,202	23,824	2.44	0.2%
Kentucky	829,499	60,043	10.78	0.6%	192,714	15,316	2.75	0.2%
Louisiana	855,051	73,191	8.39	0.7%	241,898	18,736	2.15	0.2%
Maine	240,626	22,876	1.68	0.2%	64,017	7,506	0.55	0.1%
Maryland	727,281	51,028	6.61	0.5%	587,070	48,371	6.26	0.5%
Massachusetts	1,094,618	104,064	9.11	1.1%	331,839	38,907	3.41	0.4%
Michigan	1,274,538	128,165	12.63	1.3%	1,087,003	127,312	12.54	1.3%
Minnesota	733,111	68,443	6.60	0.7%	471,733	49,905	4.81	0.5%
Mississippi	540,502	39,124	4.84	0.4%	122,755	9,756	1.21	0.1%
Missouri	904,060	84,403	9.14	0.9%	462,957	48,977	5.31	0.5%
Montana	188,026	13,995	1.53	0.1%	99,501	8,312	0.91	0.1%
Nebraska	271,453	25,343	2.32	0.3%	148,554	15,716	1.44	0.2%
Nevada	350,859	26,116	2.96	0.3%	215,895	18,035	2.05	0.2%
New Hampshire	201,154	19,124	1.30	0.2%	69,070	8,098	0.55	0.1%
New Jersey	1,435,911	133,240	9.18	1.4%	398,962	38,726	2.67	0.4%
New Mexico	342,474	25,492	3.58	0.3%	177,389	14,819	2.08	0.2%
New York	3,533,766	286,228	21.14	2.9%	801,394	88,348	6.52	0.9%
North Carolina	1,263,025	88,618	10.60	0.9%	765,893	63,105	7.55	0.6%
North Dakota	108,805	10,158	1.25	0.1%	55,797	5,903	0.73	0.1%
Ohio	1,515,828	152,429	16.28	1.5%	1,285,004	150,502	16.08	1.5%
Oklahoma	678,642	58,090	9.13	0.6%	215,366	16,681	2.62	0.2%
Oregon	691,820	34,984	1.66	0.4%	133,078	9,477	0.45	0.1%
Pennsylvania	2,553,788	236,969	20.65	2.4%	538,838	52,303	4.56	0.5%
Rhode Island	219,648	20,882	1.67	0.2%	36,702	4,303	0.35	0.0%
South Carolina	629,557	44,172	3.88	0.4%	361,163	29,758	2.61	0.3%
South Dakota	121,260	11,321	0.78	0.1%	62,971	6,662	0.46	0.1%
Tennessee	1,094,554	79,229	9.82	0.8%	302,669	24,055	2.98	0.2%
Texas	3,224,115	214,349	29.37	2.2%	721,607	61,979	8.49	0.6%
Utah	338,418	25,190	3.42	0.3%	232,182	19,396	2.64	0.2%
Vermont	108,724	10,336	0.48	0.1%	31,501	3,693	0.17	0.0%
Virginia	963,872	67,628	7.68	0.7%	752,394	61,993	7.04	0.6%
Washington	1,160,789	58,699	2.67	0.6%	238,290	16,969	0.77	0.2%
West Virginia	317,181	22,254	3.94	0.2%	155,283	12,794	2.27	0.1%
Wisconsin	700,425	70,433	7.10	0.7%	661,148	77,435	7.81	0.8%
Wyoming	100,626	7,490	1.10	0.1%	54,912	4,587	0.67	0.0%
<b>United States</b>	<b>46,110,439</b>	<b>3,509,743</b>	<b>353.06</b>	<b>35.6%</b>	<b>20,581,879</b>	<b>1,880,458</b>	<b>196.05</b>	<b>19.1%</b>

Source: 2000 Census and 2001 RECS

**Table 6 (continued). Total Energy Usage by Income Group by Size  
(total usage in billions BTU, emissions in million metric tons)**

State	>120% Median Income			
	Number of Households	Total Usage	Carbon Dioxide Emissions	Percent
Alabama	684,313	72,214	9.04	0.7%
Alaska	86,455	7,363	0.78	0.1%
Arizona	415,977	50,549	4.47	0.5%
Arkansas	374,201	39,528	4.87	0.4%
California	5,051,846	383,703	24.85	3.9%
Colorado	346,607	42,119	5.70	0.4%
Connecticut	550,732	75,082	5.75	0.8%
Delaware	114,529	11,990	1.99	0.1%
District of Columbia	63,477	6,646	0.86	0.1%
Florida	2,492,055	178,401	23.46	1.8%
Georgia	1,156,125	121,038	15.65	1.2%
Hawaii	156,772	13,352	1.62	0.1%
Idaho	99,927	12,143	0.41	0.1%
Illinois	1,648,580	227,181	18.82	2.3%
Indiana	833,178	114,815	13.46	1.2%
Iowa	406,301	55,155	6.06	0.6%
Kansas	390,921	53,068	5.44	0.5%
Kentucky	626,830	66,148	11.87	0.7%
Louisiana	601,633	63,552	7.29	0.6%
Maine	219,614	29,940	2.20	0.3%
Maryland	731,227	76,554	9.91	0.8%
Massachusetts	1,020,457	139,121	12.18	1.4%
Michigan	1,383,908	190,708	18.79	1.9%
Minnesota	667,858	90,662	8.74	0.9%
Mississippi	422,925	44,630	5.52	0.5%
Missouri	800,915	108,724	11.78	1.1%
Montana	74,450	9,047	0.99	0.1%
Nebraska	238,178	32,333	2.97	0.3%
Nevada	172,139	20,918	2.37	0.2%
New Hampshire	201,194	27,429	1.87	0.3%
New Jersey	1,144,253	150,269	10.35	1.5%
New Mexico	150,762	18,320	2.57	0.2%
New York	2,745,909	326,618	24.12	3.3%
North Carolina	1,177,866	123,314	14.75	1.3%
North Dakota	89,466	12,145	1.50	0.1%
Ohio	1,597,091	220,085	23.51	2.2%
Oklahoma	476,902	50,376	7.92	0.5%
Oregon	515,343	43,892	2.08	0.4%
Pennsylvania	1,693,777	222,435	19.39	2.3%
Rhode Island	168,347	22,951	1.84	0.2%
South Carolina	577,438	60,454	5.31	0.6%
South Dakota	102,528	13,918	0.96	0.1%
Tennessee	890,716	93,996	11.65	1.0%
Texas	3,723,246	402,263	55.12	4.1%
Utah	143,713	17,464	2.37	0.2%
Vermont	101,744	13,871	0.65	0.1%
Virginia	1,061,517	111,133	12.63	1.1%
Washington	866,183	73,774	3.35	0.7%
West Virginia	277,485	29,051	5.14	0.3%
Wisconsin	719,235	99,113	10.00	1.0%
Wyoming	40,114	4,875	0.72	0.0%
<b>United States</b>	<b>40,296,956</b>	<b>4,474,432</b>	<b>455.63</b>	<b>45.4%</b>

Source: 2000 Census and 2001 RECS

**Table 7. Average Square Footage by Region and Income Group**

	Households Average Sq. Ft.	LIHEAP Eligible		0-80% Median Income		81-120% Median Income		>120% Median Income	
		Average Sq. Ft.	Percentage	Average Sq. Ft.	Percentage	Average Sq. Ft.	Percentage	Average Sq. Ft.	Percentage
Northeast	2,236	1,617	72.3%	1,663	74.4%	2,441	109.2%	2,898	129.6%
Midwest	2,376	1,735	73.0%	1,658	69.8%	2,276	95.8%	3,167	133.3%
South	1,968	1,388	70.5%	1,366	69.4%	1,798	91.4%	2,675	135.9%
West	1,758	1,240	70.5%	1,344	76.5%	1,663	94.6%	2,381	135.4%
United States	2,066	1,478	71.5%	1,480	71.6%	2,006	97.1%	2,767	133.9%

Source: 2001 RECS

**Table 8. Average Household Energy Use Per Square Foot by Income and Region  
(in thousands BTU)**

	All Average Usage	LIHEAP Eligible		0-80% Median Income		81-120% Median Income		>120% Median Income	
		Average Usage	Percentage	Average Usage	Percentage	Average Usage	Percentage	Average Usage	Percentage
Northeast	47.66	54.51	114%	53.61	112%	43.94	92%	44.32	93%
Midwest	49.14	61.12	124%	59.18	120%	50.21	102%	43.32	88%
South	41.92	51.26	122%	50.02	119%	42.24	101%	37.54	90%
West	39.89	48.81	122%	43.53	109%	42.77	107%	36.07	90%
United States	44.62	54.07	121%	51.41	115%	45.54	102%	40.12	90%

Source: 2001 RECS

**Table 9. Home Age by Region and Income Group**

	0-80% Median Income			81-120% Median Income			>120% Median Income		
	>25 Years Old	>50 Years Old	>75 Years Old	>25 Years Old	>50 Years Old	>75 Years Old	>25 Years Old	>50 Years Old	>75 Years Old
Northeast	88.0%	61.0%	40.0%	86.0%	61.0%	32.0%	76.0%	50.0%	23.0%
Midwest	85.0%	53.0%	34.0%	82.0%	52.0%	28.0%	66.0%	38.0%	17.0%
South	73.0%	36.0%	13.0%	60.0%	26.0%	8.0%	50.0%	17.0%	6.0%
West	76.0%	37.0%	12.0%	72.0%	25.0%	9.0%	65.0%	27.0%	9.0%
United States	79.0%	45.0%	22.0%	72.0%	38.0%	18.0%	62.0%	30.0%	12.0%

Source: 2001 RECS

		All Households	0-80% Median Income	81-120% Median Income	>120% Median Income
<b>1st Refrigerator</b>	> 10 Yrs (%)	34%	37%	36%	29%
	> 15 Yrs (%)	7%	11%	6%	4%
<b>2nd Refrigerator</b>	> 10 Yrs (%)	60%	67%	62%	56%
	> 15 Yrs (%)	22%	29%	27%	18%
<b>Freezer</b>	> 10 Yrs (%)	57%	59%	58%	54%
	> 15 Yrs (%)	22%	26%	21%	19%
<b>Heating Equipment</b>	> 10 Yrs (%)	54%	58%	55%	49%
	> 15 Yrs (%)	28%	36%	26%	22%
<b>Water Heater</b>	> 10 Yrs (%)	35%	38%	39%	32%
	> 15 Yrs (%)	10%	13%	10%	6%
<b>Air Conditioner</b>	> 10 Yrs (%)	40%	43%	45%	37%
	> 15 Yrs (%)	12%	16%	12%	8%
<b>Window/Wall Unit</b>	> 10 Yrs (%)	31%	34%	32%	25%
	> 15 Yrs (%)	11%	12%	10%	7%

Source: 2001 RECS

Square Feet	All Years		1990-2001		1980-1989	
	Households	Percent	Households	Percent	Households	Percent
<b>Up to 1,999</b>	65.0	60.7%	7.7	50.3%	11.5	63.2%
<b>2,000 - 2,999</b>	22.8	21.3%	3.3	21.6%	3.6	19.8%
<b>3,000 or More</b>	19.2	17.9%	4.3	28.1%	3.1	17.0%
<b>Total</b>	107.0	100.0%	15.3	100.0%	18.2	100.0%

Source: 2001 RECS

Square Feet	2001		1990		1987	
	Households	Percent	Households	Percent	Households	Percent
<b>Up to 1,999</b>	65.0	60.7%	69.6	74.2%	69.2	76.4%
<b>2,000 - 2,999</b>	22.8	21.3%	16.8	17.9%	16.1	17.8%
<b>3,000 or More</b>	19.2	17.9%	7.4	7.9%	5.3	5.8%
<b>Total</b>	107.0	100.0%	93.8	100.0%	90.6	100.0%

Source: 2001 RECS

Square Feet	2001		1990		Change 1990 to 2001	
	Households	Percent	Households	Percent	Households	Percent
<b>Up to 1,999</b>	65.0	60.7%	69.6	74.2%	-4.6	-6.6%
<b>2,000 - 2,999</b>	22.8	21.3%	16.8	17.9%	6.0	35.7%
<b>3,000 or More</b>	19.2	17.9%	7.4	7.9%	11.8	159.5%
<b>Total</b>	107.0	100.0%	93.8	100.0%	13.2	14.1%

Source: 2001 RECS

Square Feet	All Households		LIHEAP Eligible		0-80% Median Income		81-120% Median Income		>120% Median Income	
	Households	Percent	Households	Percent	Households	Percent	Households	Percent	Households	Percent
<b>Up to 1,999</b>	65.0	60.7%	26.1	77.2%	24.8	69.5%	12.0	58.3%	14.4	35.8%
<b>2,000 - 2,999</b>	22.8	21.3%	5.0	14.8%	7.4	20.6%	4.9	23.7%	11.5	28.7%
<b>3,000 or More</b>	19.2	17.9%	2.7	8.0%	3.5	9.8%	3.7	18.0%	14.3	35.5%
<b>Total</b>	107.0	100.0%	33.8	100.0%	35.7	100.0%	20.6	100.0%	40.2	100.0%

Source: 2001 RECS

	All Households		0-80% Median Income			81-120% Median Income			>120% Median Income		
	Usage	Carbon Dioxide Emissions	Usage	Carbon Dioxide Emissions	Percent of Usage	Usage	Carbon Dioxide Emissions	Percent of Usage	Usage	Carbon Dioxide Emissions	Percent of Usage
<b>Kerosene</b>	46,975	3.4	30,098	2.2	64.1%	7,612	0.6	16.2%	9,265	0.7	19.7%
<b>Electricity</b>	3,889,193	668.0	1,314,882	232.2	33.8%	754,642	131.9	19.4%	1,819,669	304.0	46.8%
<b>Natural Gas</b>	4,844,243	257.3	1,725,473	91.6	35.6%	917,333	48.7	18.9%	2,201,438	116.9	45.4%
<b>Fuel Oil</b>	707,796	51.8	285,855	20.9	40.4%	107,756	7.9	15.2%	314,185	23.0	44.4%
<b>LPG</b>	376,424	23.7	153,431	9.7	40.8%	93,117	5.9	24.7%	129,876	8.2	34.5%
<b>Total</b>	9,864,631	1,004.2	3,509,739	356.6	35.6%	1,880,460	195.0	19.1%	4,474,433	452.7	45.4%

Source: 2001 RECS

**Table 16. Total Residential Energy Use by Income and End Use  
(in billions BTU)**

	Households	LIHEAP Eligible		0-80% Median Income		81-120% Median Income		>120% Median Income	
	Usage	Usage	Percent	Usage	Percent	Usage	Percent	Usage	Percent
Space Heating	4,621,527	1,316,977	28.5%	1,749,492	37.9%	891,668	19.3%	1,980,366	42.9%
Water Heating	1,682,476	471,679	28.0%	598,247	35.6%	318,979	19.0%	765,250	45.5%
Air Conditioner	623,683	131,663	21.1%	170,412	27.3%	118,975	19.1%	334,296	53.6%
Refrigerator	532,752	149,994	28.2%	204,623	38.4%	98,415	18.5%	229,714	43.1%
Freezer	134,217	36,595	27.3%	49,488	36.9%	27,391	20.4%	57,337	42.7%
Dishwasher	98,967	15,303	15.5%	21,367	21.6%	18,166	18.4%	59,435	60.1%
Dryer	224,786	55,063	24.5%	69,833	31.1%	47,762	21.2%	107,191	47.7%
Other Appliances	1,946,224	524,222	26.9%	646,277	33.2%	359,103	18.5%	940,844	48.3%
<b>Total</b>	<b>9,864,631</b>	<b>2,701,496</b>	<b>27.4%</b>	<b>3,509,739</b>	<b>35.6%</b>	<b>1,880,460</b>	<b>19.1%</b>	<b>4,474,433</b>	<b>45.4%</b>

Source: 2001 RECS

**Table 17. Total Residential Energy Use by Income and Home Type  
(in billions BTU)**

	All	0-80% Median Income		81-120% Median Income		>120% Median Income	
	Usage	Usage	Percent	Usage	Percent	Usage	Percent
<b>Single Family</b>	9,166,700	3,090,368	33.7%	1,755,267	19.1%	4,321,065	47.1%
<b>Multi-Family</b>	697,932	419,371	60.1%	125,193	17.9%	153,368	22.0%
<b>Total</b>	<b>9,864,631</b>	<b>3,509,739</b>	<b>35.6%</b>	<b>1,880,460</b>	<b>19.1%</b>	<b>4,474,433</b>	<b>45.4%</b>

Source: 2001 RECS

**Table 18. Total Residential Energy Use by Income, Home Type and Ownership  
(in billions BTU)**

		All	0-80% Median Income		81-120% Median Income		>120% Median Income	
		Usage	Usage	Percent	Usage	Percent	Usage	Percent
<b>Single Family</b>	<b>Owner</b>	7,574,212	2,160,867	28.5%	1,411,235	18.6%	4,002,110	52.8%
	<b>Renter</b>	1,592,488	929,500	58.4%	344,032	21.6%	318,955	20.0%
<b>Multi-Family</b>	<b>Owner</b>	75,469	26,734	35.4%	18,181	24.1%	30,554	40.5%
	<b>Renter</b>	622,463	392,637	63.1%	107,012	17.2%	122,814	19.7%
<b>Total</b>		<b>9,864,631</b>	<b>3,509,739</b>	<b>35.6%</b>	<b>1,880,460</b>	<b>19.1%</b>	<b>4,474,433</b>	<b>45.4%</b>

Source: 2001 RECS

**Table 19. Total Residential Energy Use and Carbon Emissions by Region, Income, Home Type and Ownership (in billions BTU)**

		Single Family							
		Owner				Renter			
		Usage	Emissions	Pct. of U.S. usage	Pct. of regional usage	Usage	Emissions	Pct. of U.S. usage	Pct. of regional usage
<b>Northeast</b>	<b>0-80% Median Income</b>	527,128	53.70	5.3%	24.4%	208,139	21.21	2.1%	9.6%
	<b>81%-120% Median Income</b>	204,481	20.83	2.1%	9.5%	43,603	4.44	0.4%	2.0%
	<b>&gt;120% Median Income</b>	886,378	90.30	9.0%	41.1%	63,667	6.49	0.6%	2.9%
	<b>All</b>	1,617,987	164.84	16.4%	75.0%	315,409	32.13	3.2%	14.6%
<b>Midwest</b>	<b>0-80% Median Income</b>	521,064	53.09	5.3%	18.2%	269,159	27.42	2.7%	9.4%
	<b>81%-120% Median Income</b>	599,198	61.05	6.1%	21.0%	149,820	15.26	1.5%	5.2%
	<b>&gt;120% Median Income</b>	1,140,199	116.16	11.6%	39.9%	64,111	6.53	0.6%	2.2%
	<b>All</b>	2,260,460	230.29	22.9%	79.1%	483,090	49.22	4.9%	16.9%
<b>South</b>	<b>0-80% Median Income</b>	718,916	73.24	7.3%	22.4%	284,453	28.98	2.9%	8.9%
	<b>81%-120% Median Income</b>	405,140	41.28	4.1%	12.6%	106,321	10.83	1.1%	3.3%
	<b>&gt;120% Median Income</b>	1,400,496	142.68	14.2%	43.6%	107,503	10.95	1.1%	3.3%
	<b>All</b>	2,524,552	257.20	25.6%	78.6%	498,277	50.76	5.1%	15.5%
<b>West</b>	<b>0-80% Median Income</b>	393,759	40.12	4.0%	24.1%	167,749	17.09	1.7%	10.3%
	<b>81%-120% Median Income</b>	202,416	20.62	2.1%	12.4%	44,289	4.51	0.4%	2.7%
	<b>&gt;120% Median Income</b>	575,037	58.58	5.8%	35.2%	83,674	8.52	0.8%	5.1%
	<b>All</b>	1,171,212	119.32	11.9%	71.6%	295,712	30.13	3.0%	18.1%
<b>United States</b>	<b>0-80% Median Income</b>	2,160,867	220.15	21.9%	21.9%	929,500	94.70	9.4%	9.4%
	<b>81%-120% Median Income</b>	1,411,235	143.78	14.3%	14.3%	344,032	35.05	3.5%	3.5%
	<b>&gt;120% Median Income</b>	4,002,110	407.73	40.6%	40.6%	318,955	32.49	3.2%	3.2%
	<b>All</b>	7,574,212	771.65	76.8%	76.8%	1,592,488	162.24	16.1%	16.1%

Source: 2001 RECS

**Table 19 (continued). Total Residential Energy Use and Carbon Emissions by Region, Income, Home Type and Ownership (in billions BTU)**

		Multi-Family							
		Owner				Renter			
		Usage	Emissions	Pct. of U.S. usage	Pct. of regional usage	Usage	Emissions	Pct. of U.S. usage	Pct. of regional usage
<b>Northeast</b>	<b>0-80% Median Income</b>	8,856	0.90	0.1%	0.4%	143,150	14.58	1.5%	6.6%
	<b>81%-120% Median Income</b>	3,711	0.38	0.0%	0.2%	11,625	1.18	0.1%	0.5%
	<b>&gt;120% Median Income</b>	12,487	1.27	0.1%	0.6%	45,186	4.60	0.5%	2.1%
	<b>All</b>	25,054	2.55	0.3%	1.2%	199,961	20.37	2.0%	9.3%
<b>Midwest</b>	<b>0-80% Median Income</b>	5,937	0.60	0.1%	0.2%	72,331	7.37	0.7%	2.5%
	<b>81%-120% Median Income</b>	465	0.05	0.0%	0.0%	23,208	2.36	0.2%	0.8%
	<b>&gt;120% Median Income</b>	*	*	*	*	13,596	1.39	0.1%	0.5%
	<b>All</b>	6,403	0.65	0.1%	0.2%	109,135	11.12	1.1%	3.8%
<b>South</b>	<b>0-80% Median Income</b>	5,594	0.57	0.1%	0.2%	83,050	8.46	0.8%	2.6%
	<b>81%-120% Median Income</b>	1,507	0.15	0.0%	0.0%	56,066	5.71	0.6%	1.7%
	<b>&gt;120% Median Income</b>	13,688	1.39	0.1%	0.4%	29,601	3.02	0.3%	0.9%
	<b>All</b>	20,789	2.12	0.2%	0.6%	168,717	17.19	1.7%	5.3%
<b>West</b>	<b>0-80% Median Income</b>	6,347	0.65	0.1%	0.4%	94,105	9.59	1.0%	5.8%
	<b>81%-120% Median Income</b>	12,498	1.27	0.1%	0.8%	16,113	1.64	0.2%	1.0%
	<b>&gt;120% Median Income</b>	4,378	0.45	0.0%	0.3%	34,431	3.51	0.3%	2.1%
	<b>All</b>	23,223	2.37	0.2%	1.4%	144,650	14.74	1.5%	8.8%
<b>United States</b>	<b>0-80% Median Income</b>	26,734	2.72	0.3%	0.3%	392,637	40.00	4.0%	4.0%
	<b>81%-120% Median Income</b>	18,181	1.85	0.2%	0.2%	107,012	10.90	1.1%	1.1%
	<b>&gt;120% Median Income</b>	30,554	3.11	0.3%	0.3%	122,814	12.51	1.2%	1.2%
	<b>All</b>	75,469	7.69	0.8%	0.8%	622,463	63.42	6.3%	6.3%

\* = No households fall into these categories

Source: 2001 RECS

**Table 20. National Statistics—Total Energy Costs and Burden**

		<b>LIHEAP Eligible</b>	<b>0-80% Median Income</b>	<b>81%-120% Median Income</b>	<b>&gt;120% Median Income</b>
<b>Northeast</b>	<b>Average Energy Costs</b>	\$1,631	\$1,687	\$2,105	\$2,797
	<b>Average Energy Burden</b>	10.9%	8.9%	4.6%	2.4%
<b>Midwest</b>	<b>Average Energy Costs</b>	\$1,570	\$1,593	\$1,873	\$2,268
	<b>Average Energy Burden</b>	10.1%	8.1%	4.1%	2.2%
<b>South</b>	<b>Average Energy Costs</b>	\$1,608	\$1,626	\$1,874	\$2,347
	<b>Average Energy Burden</b>	10.6%	8.6%	4.1%	2.2%
<b>West</b>	<b>Average Energy Costs</b>	\$1,173	\$1,194	\$1,441	\$1,901
	<b>Average Energy Burden</b>	7.3%	6.0%	3.1%	1.7%
<b>United States</b>	<b>Average Energy Costs</b>	\$1,516	\$1,542	\$1,821	\$2,317
	<b>Average Energy Burden</b>	9.8%	8.0%	4.0%	2.1%

Source: 2001 RECS